

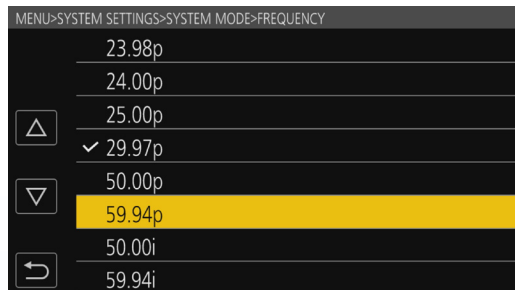
Recording the AU-EVA1's Raw Output on an Atomos Shogun Inferno

The AU-EVA1 features the ability to output raw video through its SDI port, in several frame sizes and frame rates. In order to take advantage of this feature, you need an external video recorder that is capable of capturing and storing the raw images that the camera outputs. In this paper we will explore the necessary steps to record raw video from an EVA1 onto the Atomos Shogun Inferno external recorder.

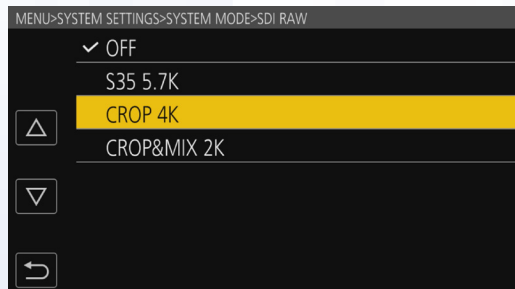
Note that in this paper, the current firmware of the Shogun Inferno is version 9.11. With this firmware, the recorder can record 5.7K raw, 4K raw, and 2K raw, at certain frame rates, but it does not yet support recording variable frame rate output beyond a fixed set of frame rates (23.98, 24.00, 25.00, 29.97, 30.00, 50.00, 59.94, 60.00, 100.00, 119.98, 120.00, 200.00, 239.76, and 240.00 frames per second). Please [check with Atomos](#) to see if variable frame rate recording has been enabled in a later firmware version than 9.11.

Configuring the Camera for Raw Output

First, ensure that the camera is set to generate progressive-scan video, and not interlaced video. In the **SYSTEM SETTINGS > SYSTEM MODE > FREQUENCY** menu, choose the timebase of your program, making sure to not choose 50.00i or 59.94i.



Generally the camera's SDI port outputs a standard video signal. You can change the SDI port to output raw video by going into the **SYSTEM SETTINGS > SYSTEM MODE > SDI RAW** menu item, and choosing one of the available options:



OFF: the SDI port will output conventional video, not raw video

S35 5.7K: the SDI port will output uncompressed raw images using the full 5.7K output of the sensor, in a frame size of 5,720 x 3,016 pixels, at frame rates between 1 and 30 frames per second. This is the highest resolution and widest field of view the camera can generate.

CROP 4K: the SDI port will output the central 4,096 x 2,160 pixels, at frame rates between 1 and 60 frames per second. The field of view will be somewhat narrower (tighter) than S35 5.7K mode.

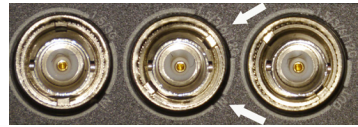
CROP&MIX 2K: the SDI port will output the same field of view as CROP 4K mode, but employing pixel mixing technology to reduce the frame size to 2,048 x 1,080 pixels, at frame rates between 1 and 240 frames per second.

Connecting the Camera to the Recorder

Attach an SDI cable to the camera's SDI OUT port. You can only use SDI for outputting raw footage; the HDMI port cannot output raw footage. Connect the other end of the SDI cable to the 1.5/3/6/12G SDI input on the back of the Atomos recorder.



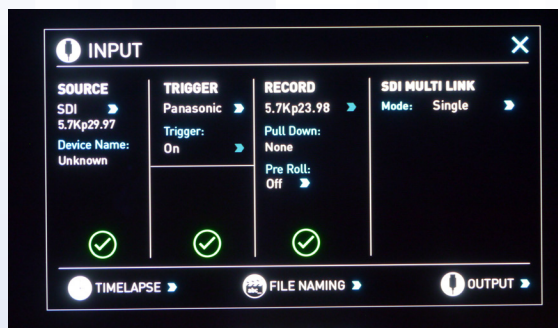
Note that while the Atomos Shogun Inferno offers four SDI inputs, only one of those inputs is capable of accepting a 6G signal. The camera's output is 6G-SDI, so the Shogun Inferno's 6G-capable video input is the only input that can be used.



Ensure that the camera is in live view mode, by pressing the VIEW button (also known as User Button 2) on the side of the camera.

Configuring the Recorder to Accept and Record Raw Video

Tap the upper left corner of the recorder's screen to bring up the INPUT menu. Tap the SOURCE until it says SDI. At this point, the Shogun Inferno should automatically recognize the incoming video signal and report it as either 5.7Kp, 4KDCI, or

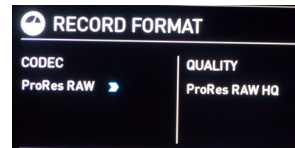


2KDCI. You should also see the upper left display change to “SDI Raw”, and the monitor should be displaying the video image from the camera.

Ensure that the SDI MULTI LINK menu shows “Single”. Raw input will not work if it shows “Dual” or “Quad”.

You may also want to change the recording trigger so that the Shogun Inferno will automatically begin recording when you press the camera’s REC button. Choose TRIGGER repeatedly until it says “Panasonic”. Do not choose “Pana Type 3”.

Finally, you need to configure the recording codec you intend to use. Tap the codec name at the top of the screen to bring up the RECORD FORMAT menu box. The Atomos recorders provide several different options including:



ProRes RAW: this option will record the raw camera output into Apple’s ProRes RAW compressed raw codec, in either normal ProRes RAW or higher-quality ProRes RAW HQ. When set to utilize ProRes RAW, the Atomos recorder has the most flexibility in what EVA1 formats it can record: 5.7K up to 30.00 frames per second, 4K at up to 60.00 frames per second, and 2K at up to 240 frames per second. ProRes RAW is currently (at the time of this writing) only available in Apple’s Final Cut X editing software, so this option would only be suitable for people who intend to edit on a Macintosh computer using Final Cut X.

Cinema DNG: this option will record the raw camera output into Cinema DNG files. These files should be compatible with either Windows or Macintosh computers and editing programs. Note that the maximum raw video frame size that can be recorded on the Atomos recorder in Cinema DNG format is 4K, at a maximum frame rate of 30 frames per second. Or, it can record 2K at a maximum framerate of 120 frames per second. This option cannot be used to record 5.7K raw, or 4K raw at frame rates faster than 30.00 frames per second, or 2K raw at frame rates faster than 120 frames per second.

ProRes: this option causes the raw input to be converted to conventional video and recorded in ProRes HQ, ProRes 422, or ProRes LT. This is not a desirable option for recording raw video, as it results in losing the advantages of raw footage when it converts it to conventional video.

DNxHR: this option causes the raw input to be converted to conventional video and recorded in AVID DNxHR, at various quality levels. This is not a desirable option for recording raw video, as it results in losing the advantages of raw footage when it converts it to conventional video.

Utilizing the Variable Frame Rate (VFR) Feature with Raw Video and the Atomos Recorder

The AU-EVA1 is capable of outputting raw video in a wide variety of frame rates. However, as of version 9.11 of the Shogun Inferno's firmware, only a select limited supply of frame rates are supported by the Atomos recorder. Stay tuned to the Atomos website to see if future firmware updates are released that enable the recording of more or all of the EVA1's frame rates.

When the camera is set to output 5.7K raw video, the Shogun Inferno can record at 23.98, 24.00, 25.00, 29.97 or 30.00 frames per second (but only when using the Apple ProRes RAW codec options).

When the camera is set to output 4K CROP raw video, the Shogun Inferno can record at 23.98, 24.00, 25.00, 29.97 or 30.00 frames per second in either Cinema DNG or ProRes RAW codecs. If using ProRes RAW, the Shogun Inferno can also record at 50.00, 59.94 and 60.00 frames per second.

When the camera is set to output 2K CROP&MIX raw video, the Shogun Inferno can record at 23.98, 24.00, 25.00, 29.97, 50.00, 59.94, 100.00, 119.98 and 120.00 frames per second in either Cinema DNG or ProRes RAW codecs. If using ProRes RAW, the Shogun Inferno can also record at 200.00, 239.76 and 240.00 frames per second.

Note that the Shogun Inferno can recognize other frame rates (such as, say, 2 frames per second), and can display the images properly on its monitor, but the on-screen Record button will be dimmed and the unit will not record, nor will it respond to pressing the camera's record buttons. If you've set the camera's CAMERA SETTINGS>FPS>VALUE to a frame rate different from those listed above, the recorder will not be able to record the footage and the Record button will be dimmed (as of version 9.11 of the Shogun Inferno firmware; this could potentially change in a later version).

Also, it is important to note that the AU-EVA1 does not record or process audio when utilizing variable frame rates (unless the frame rate exactly matches the system frequency, such as 23.98 Frequency and 23.98 Frames Per Second). As such, if you have set the camera's Frequency to, say, 29.97 and you set the variable frame rate to 23.98, the Shogun Inferno will be able to record that footage, but no audio will be included. Ensure that the chosen Frame Rate matches the chosen Frequency, or turn VFR recording OFF, if you need to record audio in the raw footage.