OZO

OZO+ EXPOSURE GUIDE

Updated 15th August 2017

References OZO Creator v2.1

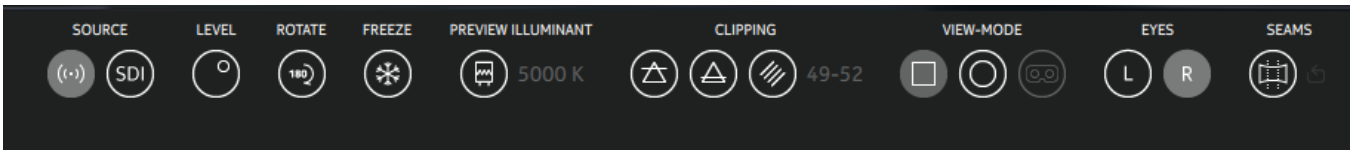
Overview

This document provides general guidelines for effective lighting and exposure control of the OZO+ camera. It will be useful to understand the following terms: **ISO, IRE, f-stop, dynamic range, shutter speed, white balance, color temperature**, **clipping, temporal** and **fixed pattern noise** prior to reading this document.

Basic Camera Information

- Sensitivity: 400 ISO
- Aperture; f 2.4
- Dynamic Range: 10 stops
- Data precision: 10bit RAW (RGB monitoring path)
- Color Correction: White Balance at reference color temperature illuminants

Using Exposure Tools In OZO Remote



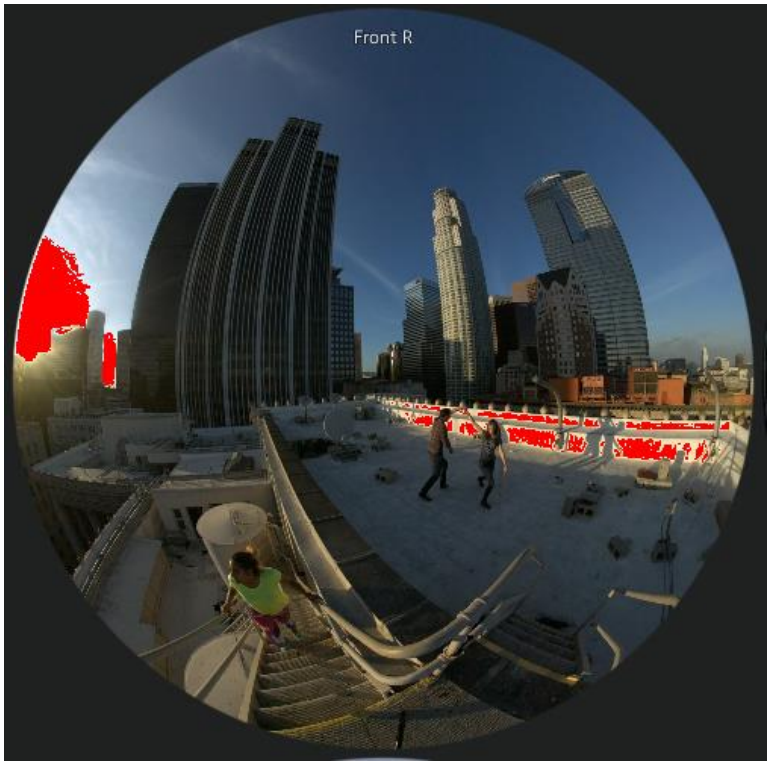
The Exposure Tools panel in OZO Remote

OZO Remote provides a variety of exposure indicators, which include programmable zebras, pixel clip and crush false color overlay, and high-resolution freeze frame. It is very important to note the camera RAW sensor data (accessible via Cinema DNG files) contains slightly more detail than these RGB monitoring tools might suggest.

It is a good idea when working with complex lighting to make frequent reference to the OZO+ exposure tools.

The red pixel clip false color overlay gives an indication of overexposed zones in your frame. Treat the border of these red zones as a rough guideline and know that footage exported from OZO Creator in Cinema DNG format will have slightly more latitude in the highlights than indicated here.

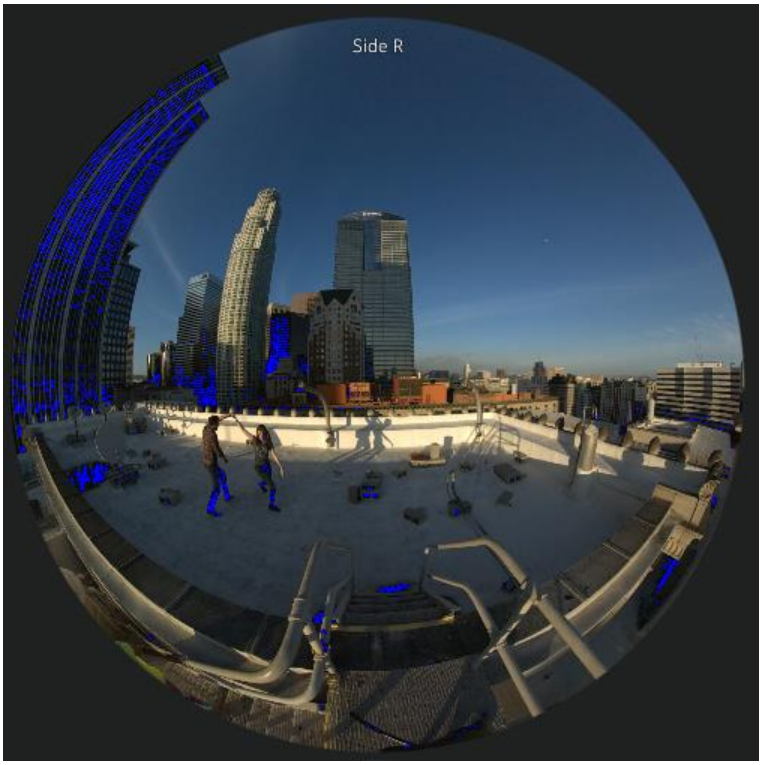
Clipping Button



Example of red false color overlay indicating 100 IRE regions

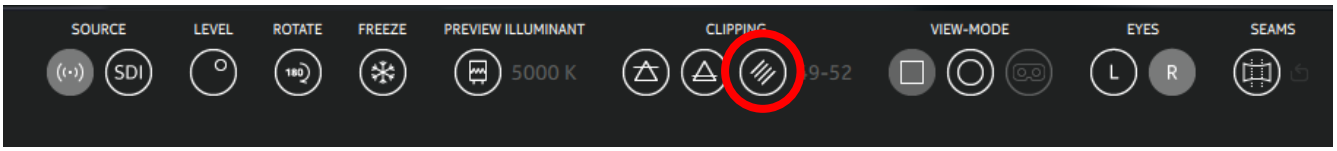
The blue pixel crush false color overlay gives an indication of underexposed zones in your frame. Treat the border of these blue zones as a rough guideline and know that footage exported from OZO Creator in Cinema DNG format will have slightly more latitude in the lowlights than indicated here.

Crushing button



An example of “crushing” overlay. Blue=no detail from lack of light.

Programmable “zebra” overlays allow the user to identify a desired exposure range in the image by an animated striped pattern. This feature can have a variety of uses but is typically used to highlight skin tone exposure with programed values between 40-50 IRE. To use the feature adjust camera exposure until the subject’s skin tones have the zebra overlay.

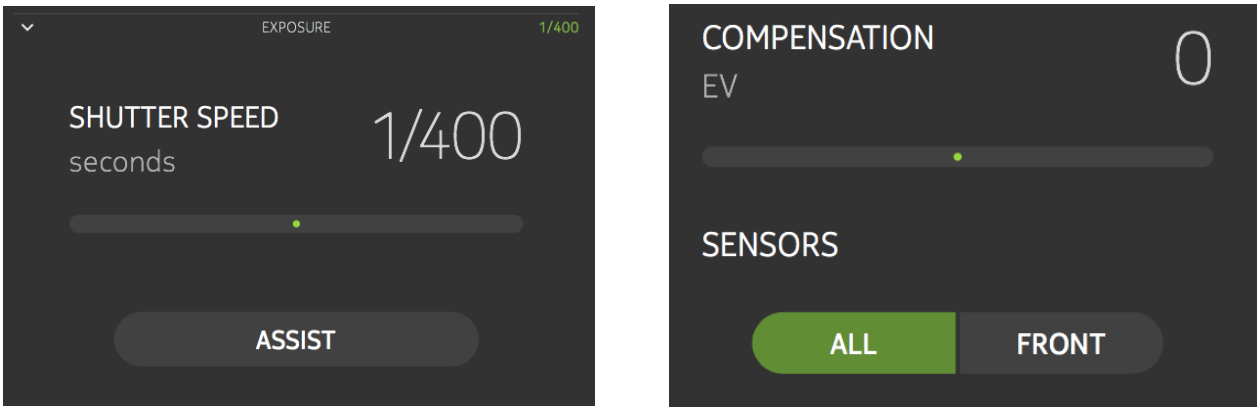


Zebra toggle button

Zebras on skin tones, sky, and buildings

When setting exposure, pay special attention to the direction of the available light. Shooting subjects with a 360 degree FOV, especially in day exterior circumstances, can be quite challenging compared to cinema or ENG applications. Identifying camera placements out of direct sunlight will help significantly in controlling exposure, ensuring better dynamic range, color balance and motion characteristics in your captured footage.

Exposure Assist



Exposure Assist tools

Exposure assistance tools were introduced in OZO Remote V1.3.0. The tools are quite simple and most functionality will be intuitive or is covered in the **Remote Help** document. Because of this coverage, this section will primarily describe how best to use the Assist tools to operate the camera without image preview. Operating

without image is not recommended but may be necessary when weather or environment prevents the use of a computer or cables. It may also be favorable in a situation where time is more important than quality. Sometimes the camera must be setup in seconds and in these situations the Assist tools are quite helpful. The fastest path to recording adequately exposed footage is as follows:

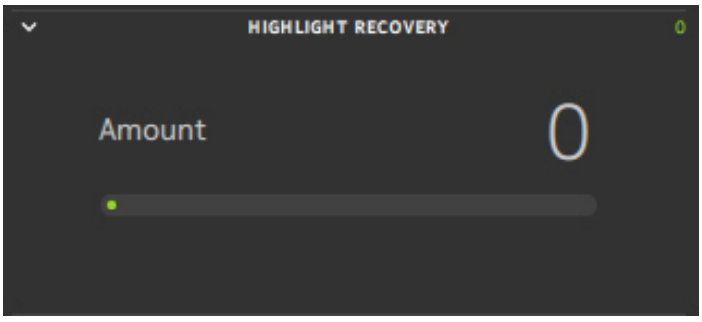
1. Turn the camera on, allow it to boot up until the far right (**capture**) button is flashing red every 3 seconds.
2. Press the **capture** button down for at least 4 seconds until the capture LED blinks regularly.
3. After pressing, the LED will keep blinking while exposure is calculated before returning to its previous state.
4. Press the **capture** button to begin recording.

Added functionality for the **ASSIST** tools includes **ALL/FRONT** and **COMPENSATION**. **ALL/FRONT**. This allows the user to select whether the **ASSIST** will use all sensors to calculate exposure or only the front two. In a situation where a certain action MUST be captured properly, it might be advantageous to point the camera at the subject and use **ASSIST** with **FRONT** selected.

Compensation allows the image to be set 1-2 stops over or under exposed. In a dark room with highlights coming through the windows, it might be advantageous to set the **COMPENSATION** for 2 stops over (to the right) in order to allow the dark areas of the image to be brighter. Similarly, if you were in a very sunny environment but needed to preserve detail on something in a highlight, two stops under exposed might be a good choice.

Highlight Recovery

This parameter allows the user to visualize in OZO Remote the amount of highlight recovery that can be achieved in OZO Creator. This helps the production crew to know exactly what can and cannot be recovered with highlight recovery on set when they can still make adjustments to lights, exposure time etc.. It can reclaim roughly 1-stop of dynamic range in the highlights depending on the settings and conditions. Note that the **Highlight Recovery** adjustment only acts as a reference in OZO Remote, It doesn't impact the ozoraw data being captured.



Highlight Recovery tool

Before adjusting the Highlight Recovery. The red pixel clip false color overlay provides an indication of overexposed zones.

After adjusting the Highlight Recovery

Exposure Time and Motion Blur

Users familiar with cinema cameras will be used to shooting with a 180-degree shutter, which at OZO+'s frame capture rate of 30 fps, corresponds to an exposure time of 1/60th Sec. This provides a film-like motion blur. However, in uncontrolled lighting environments, shooting at 1/60th Sec may not be possible and you may have to reduce exposure time (increase shutter speed) to avoid over-exposure. It is very important to note that on OZO+ higher shutter speeds will not tend to produce "choppy" imagery in the way conventional cameras might.

Recap

- Use a shutter speed as close to 1/60th second as possible (even in a daylight exterior setting and have to use a much lower value.).
- As monitoring is post-White Balance, you can experiment with different illuminant settings to get a more accurate idea of how much detail you are really shooting in the camera RAW domain and so may be recoverable in post.

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