



ISO RECALIBRATION FOR HELIUM

This document describes changes to RED's ISO calibration starting with HELIUM-based cameras.

DEFINITION

The ISO speed determines how sensitive the camera sensor is to incoming light. Similar to shutter speed, units correlate 1:1 with how much the exposure increases or decreases; an increase from ISO 400 to ISO 800 therefore represents a one stop increase in sensitivity. In practice, a higher ISO just means that dimmer scenes become lighter in the image.

RED VS. OTHER CAMERAS

The main difference between RED and most other cameras is when the ISO gets applied to image data. With other cameras, a higher ISO typically means the signal gets amplified and filtered before being recorded—effectively baking ISO into the RAW data. With RED, the original signal remains unamplified before being saved as a RAW file. The idea is to record as much as possible from the sensor, and to maximize flexibility for adjusting exposure in post-production. As a result, the full 16+ stop dynamic range is captured regardless of ISO choice, and ISO can be specified after the exposure.

However, even though ISO can be adjusted in post-production, ISO controls how one thinks about exposure—through one's choice of aperture, shutter speed, and lighting. In practice, exposing for a higher ISO provides more insurance against clipped highlights, and when highlights do clip, the transition to clipping typically appears less abrupt. Similarly, exposing for a lower ISO decreases the appearance of noise.

ISO RECALIBRATION

Effective starting with the 6.4 beta firmware, RED cameras with the HELIUM sensor have a new ISO calibration to better match a light meter and improve overall exposure quality. HELIUM cameras will therefore depict a one stop brighter image compared to prior sensors (when set to an otherwise identical ISO, T-stop, and shutter speed). ISO 400 will now appear as bright as ISO 800 did before, for example.

EXPOSURE MATCHING

To match exposure on HELIUM and non-HELIUM RED cameras, either reduce your HELIUM-based camera's ISO speed by 1 stop compared to the other camera, or uncheck the box within "Menu>Image>ISO" labeled "Use new ISO calibration for HELIUM sensor" on your HELIUM-based camera. As usual, RED recommends using ISO 800 as a starting point for exposure, then adjusting the T-stop and lighting or ND filters to match.