



Dark Energy Xenon™
By Cinnafilm®

Advanced HDR by
technicolor



THE AUTOMATED HDR CONVERSION SYSTEM YOU'VE BEEN WAITING FOR

Dark Energy Xenon (Xenon) combines Cinnafilm's industry-leading texture management and noise removal technology (Dark Energy) with the state-of-the-art Advanced HDR by Technicolor solution.

Dark Energy for Transcoders

- 601/709/2020/2100 color space conversion
- Automated denoise/degrain with four unique filters to address:
 - Film grain
 - Gaussian noise
 - Chrominance noise
 - Luminance noise
 - Dustbusting
- Superlative upres with multi-stage sharpening
 - SD ↔ HD +
 - HD ↔ UHD+
 - Downres
- Image texture generation
 - Broadcast-appropriate image texture
 - Film grain simulation

Advanced HDR by Technicolor Features

- HDR ITM (Intelligent Tone Management) presets that accurately tone map via a machine-learning process that mimics the color mastery of Technicolor's top colorists to create HLG, HDR, HDR10, and SLog3 automatically from SDR assets
- SL-HDR generates files that contain dynamic metadata for delivery
 - SL-HDR1 encodes an SDR file with HDR-10 metadata so broadcasters can send only one signal to cover both SDR and HDR applications
 - SL-HDR2 is an HDR file with dynamic adjustment allowing a higher nit asset to automatically adjust for lower HDR-capable displays
- Process via template using a Technicolor-generated JSON file
- Automated bright spot and Adaptive Light Control ensures excessive bright spots and diffuse white areas are not created during the HDR upconversion process
- Content is automatically and dynamically adjusted on a frame-by-frame, scene-by-scene basis
- Preset ITM models to match different artistic intent
- Algorithms based on a machine learning system and years of experience from Technicolor research and innovation teams



Overview

Dark Energy Xenon (Xenon) is Cinnafilm's partnership with Technicolor that combines Cinnafilm's Dark Energy technology and Advanced HDR by Technicolor to supply an enterprise-grade, HDR conversion solution to the market. Xenon provides an incomparable file-based solution for automated, high-quality HDR conversions from SDR source material to the popular HDR standards as well as the integration of advanced SL-HDR metadata.

Xenon's output capabilities breathe fresh life into SDR libraries for OTT delivery and viewing on the latest home theatre technology. It also streamlines editorial and production workflows for non-HDR content to be seamlessly edited into natively-captured HDR material. Xenon converts SDR to HDR using Advanced HDR by Technicolor HDR Intelligent Tone Management technology to generate up to 2,000 nit assets from SDR sources in HDR, HDR-10, HLG, and SLog3 formats.

The wizards at Technicolor did not stop with superlative ITM. They developed SL-HDR1 and SL-HDR2, a metadata encoding standard for broadcasters needing to maximize their HDR delivery into a limited amount of channels and bandwidth.

- SL-HDR1 allows cable providers to generate an SDR file, but it contains HDR-10 metadata that automatically displays the expanded HDR color and brightness range without making any set-top box or display adjustments.
- SL-HDR2 enables cable providers to encode HDR-10 with metadata that auto-adjusts the signal based on the nit capability of the television. So whether it is a 400 nit or 1,000 nit capable display, the single 1,000 nit HDR-10 asset will be seen without loss of detail if it is shown on a 400 nit capable display.

What Makes Xenon Different?

It is impossible to take an SDR asset and tone-map it to the HDR color space without addressing noise. We've all seen HDR upconverts where the dark sections of the image are crawling, or the sky has a strange pattern or shimmer that just isn't natural. Using the automated process of Xenon, users can take standard definition/dynamic range material, remove noise or grain and reapply as needed, upres to HD, UHD or beyond, and tone-map with up to 2,000 nits of HDR brilliance!

The simplicity of Xenon, a combination of Cinnafilm Dark Energy and the state-of-the-art Technicolor HDR ITM software, gives new options to efficiently convert your libraries of SDR into high-quality HDR content. Do your part to bring trillions of archived content hours into millions of living rooms equipped with HDR televisions.