Dark Energy™

Available in PixelStrings™ and **OEM** transcoders

IMAGE OPTIMIZATION MAGIC

The industry's leading noise, grain, artifact, and texture surgical control system for image excellence

Features

- Automatically remove or adjust film grain or signal noise from moving pictures without image degradation for most standard video, or use the manual adjustment settings for high precision control when optimizing particularly challenging content
- Dark Energy was built for cinematic excellence, leveraging a full 32-bit per color channel processing engine
- Scale your images without noise and grain, ensuring the sharpest quality upres
- Advanced sharperning algorithms developed for cinematic quality, minimizing artifacts
- Dark Energy's grain simulator has been trusted by over a decade for the most pronounced film and television restoration projects in the world – leverage this killer grain modeler to create the exact right texture for compression and delivery optimization
- Combined with Tachyon™, Dark Energy provides the fastest, most automated path for updating legacy libraries for modern delivery specifications, ensuring the best and most fluid playback experience possible
- Remove dust and other single frame anomalies with ease
- Remove pesky chroma noise from tape transfers
- Simplified interface for enterprise volume applications ensures optimal outputs with minimal setup

Specifications

- Automated denoise/degrain with four unique filters to address:
  - Film grain
  - Gaussian noise
  - Chrominance noise
  - Luminance noise
  - Dustbusting
  - Wavelet
  - Impulse
- 32-bit per color channel processing (RGB)
- Noise analysis separated into 16 frequency ranges
  - Low 1-4
  - Medium Low 1-4
  - Medium 1-4
  - High 1-4
- 601/709/2020/2100 color space conversion
- Upscaling with multi-stage advanced sharpening, downscaling with advanced low pass filtering or any resolutions

Image texture control

- "Broadcast" image texture for crisp images at low, broadcast bitrates
- Film grain simulation
  - Vary grain structure from 8mm to 100mm film
  - Control grain size (in microns)
  - Control grain amounts

Overview

Dark Energy is the industry's leading noise reduction and texture-aware scaling solution, addressing gaussian / chroma / camera sensor / compression-based noise, film grain, and single-frame anomalies (dust, digital dropouts).

This powerful technology set is integral to the workflows of the most prolific broadcasters, OTT providers, and content distributors processing large libraries of compressed content for next-gen distribution.

Texture Management

Dark Energy's texture management tools allow users to scale video while maintaining authentic-looking texture. As operators prepare to provide premium UHD channels to their customers, the ability to repurpose existing HD content for distribution over those channels will be vital. Tandem usage of Dark Energy and Tachyon (Cinnafilm's award-winning standards conversion solution) creates UHD assets that are virtually indistinguishable from content that was shot on a UHD camera.

Noise Reduction

Reducing noise prior to encoding can significantly increase compression efficiency, giving better-looking video at lower bit rates. The ability to encode video at lower bit rates without quality loss can provide enormous cost savings to anyone distributing content via a CDN, or to cable or satellite operators trying to get maximum throughput from their distribution channels.

Working in an automated, semi-automated, and even template-based fashion, users have the following at their fingertips:

- Independent analysis per color channel and frequency ranges
- Noise is analyzed on a scene-by-scene basis and every 24 frames within a scene to ensure camera and lighting changes are always taken into account
- Upres from SD to UHD and beyond. Resolution limits are based solely on the capability of the encoder. If the encoder supports it, so does Dark Energy.
- Precise upres that is texture-aware – automatically adjusts grain structure based on target resolution
- Upres sharpening tailored and adjusted automatically given source resolution and target resolution
- Tailor the processing method to the type of footage being processed. Operators can choose from fully automated, semi-automated, or template-based modes to ensure the denoise meets customer expectations.
- Template-based processing for especially challenging projects
- Single event artifact removal that eliminates 90% of dust, scratches, and dropouts that are not in the same location on adjacent frames
- 35mm presets for cinematic material