

# Thor

ACCELERATED IMAGE  
PROCESSING SD HD 4K



*For the past twenty five years Digital Vision has been in the forefront of processing and enhancing images.*

*From the ground breaking and award winning DVNR, a standard in Telecine suites the world over, to our Nucoda colour grading system and Phoenix restoration system.*

## Introducing Thor?

Even though the world is turning to digital technology for acquiring images, and film is quickly being replaced, the need for enhancing images is as important as it has ever been. Digital images suffer from different problems, but those issues still need to be addressed.

As for archives, they are faced with masses of decaying film and video that need digitalization and processing. Image processing can be a complex task and even with advances in technology, the speed is seldom adequate.

We have gone back to our roots and designed a hardware system that will allow real time or faster processing, without compromising the quality of the final image.



Conceived and designed by the team that brought you the DVNR. Thor is designed for both speed and quality, a challenge to achieve when heavy duty image processing is involved.

*Thor is a hardware processor designed for running the most demanding algorithms in real-time or faster. It is capable of processing image sequences or video signals for tape or live operation.*

## How does Thor fit into your workflow?

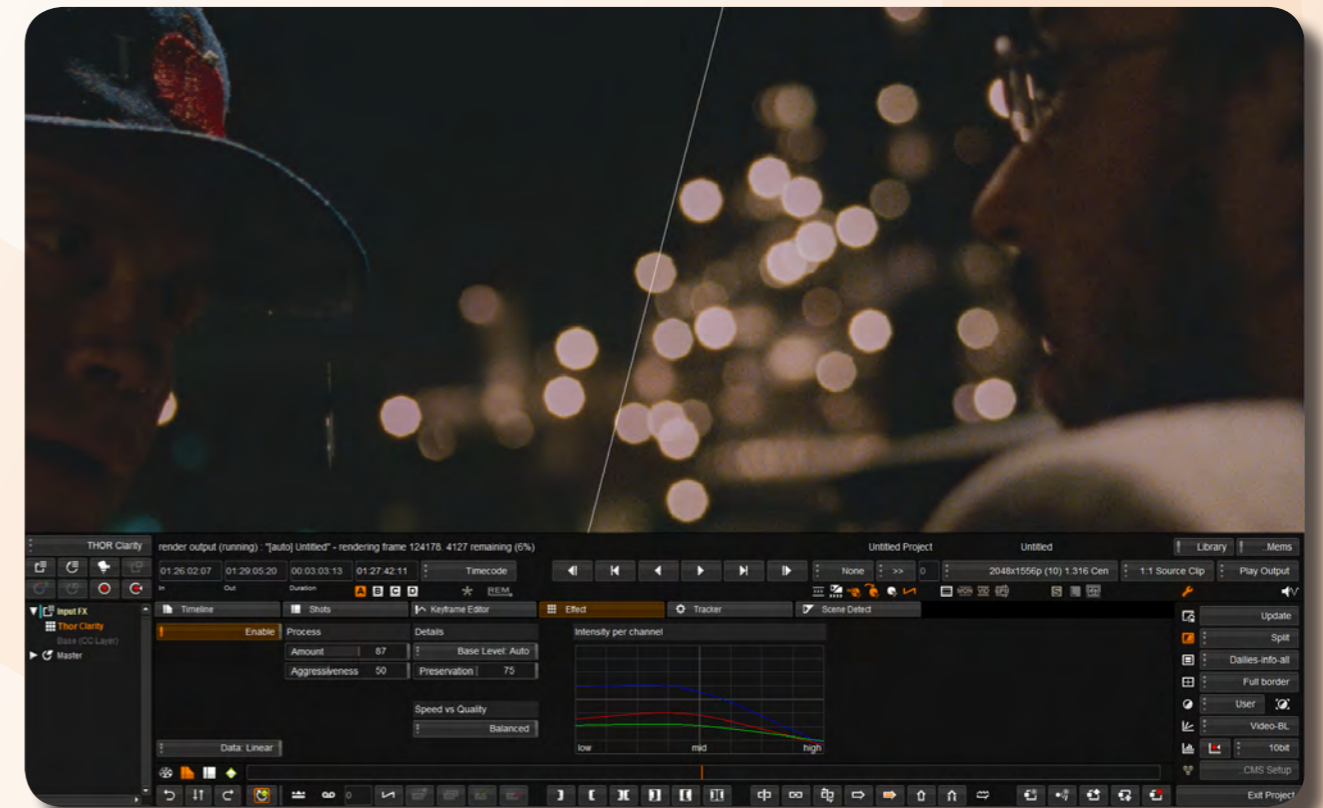
Thor will be a part of the Nucoda, Phoenix and Loki software. It will be transparent to the user and will automatically speed up processing for supported algorithms.

Users will also be able to use Thor either with a standalone interface - or as a video device in a post-production or broadcast environment.

## How fast is Thor? (Please see specification for details)

Used as a video device Thor will process four streams of SD or HD video, in real time. In 4K a single stream will be processed in real-time up to 30fps. To apply multiple effects, depending on the chosen algorithm, separate passes could be required.

However for certain processes multiple Thor tools will be supported simultaneously.



*When used to process image sequences, multiple Thor tools can be applied for processing.*

Using the on board frame buffer, it is also possible to store image sequences, switch between algorithms and process the frames again using a different tool.

## What plug-ins will be available?

Digital Vision has a comprehensive set of DVO (Digital Vision Optical) algorithms. All our tools are highly automated and provide superior results. We have tools for film and video restoration and also tools for enhancing and improving digital images.

These tools are well known and loved by Nucoda and Phoenix users.

Thor uses the same DVO algorithms, but optimised and adapted to make the most of the incredible processing power of the Thor hardware.

The first to benefit from the power of Thor will be DVO Clarity. Clarity is an important tool, in the restoration arena, where it is used to manage film grain. It is also used on a daily basis to process digitally acquired material and remove digital noise and compression artefacts before grading or editing.



Following on from Clarity, other tools will be made available for Thor

Thor Dust II - automated dust busting  
Thor Steady II - automated image stabilisation  
Thor Twister II - motion estimated standards conversion  
Thor Intelligent Sharpen - high quality adaptive sharpening  
Thor Smart Scale - upscale from SD / HD to 2K and 4K

*This list is not exhaustive and the development is subject to market needs.*

## Plug-in Specification:

### Thor Clarity

Automated texture and detail controls preserving grain with noise management. Thor Clarity is designed to work in any resolution, from SD to 4K and above.

The algorithm includes grain/noise characteristics analysis for automated grain and noise reduction, motion estimation engine and spatio-temporal filter. Thor Clarity provides stunning images, virtually artefact free but still retaining the original image sharpness and texture. Having become a much used tool and approved by major players in broadcast, restoration and post production, DVO Clarity has now replaced DVO Grain as the industry standard in grain and noise management.

8 -16 bit integer data as well as floating point data (ACES)

## Specifications:

### Video Processing:

- 4K, HD and SD input and output
- 8 x 3G SDI configurable input/outputs
- 4K (UHDTV) real-time processing (specified as up to 30fps) \*
- For higher 4K frame rates is possible to run two cascaded boards.
- 4 x HD Video streams real-time (specified at 30fps)

### 4 Real-time Streams

- 525i
- 625i
- 720p 60/59.94
- 720p 50
- 720p 30/29.97
- 720p 25
- 720p 24/23.98
- 1080p 24/23.98
- 1080p 25
- 1080i 50
- 1080i 60
- 1080p 30/29.97

### 2 Real-time streams

- 1080p 60/59.94
- \*
- \*UHDTV specification to be confirmed
- Pas through of audio and ancillary data is planned as an upgrade after release

### File processing:

- 4K real-time file based processing
- Full aperture 4096 x 3112 20fps\*
- 4 x real-time in HD\*
- 30 x real-time in SD\*
- Support for Nucoda, Phoenix and Loki
- Standalone operation

### Specifications:

- PCI-e
- Gen 3 x16 mech / x8 electrical
- Full length - Double width board
- 250W power requirement
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**\*Note:**  
*Processing benchmarks are not final and are subject to change.*

*For file based processing, speed of storage may be a limiting factor.*

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