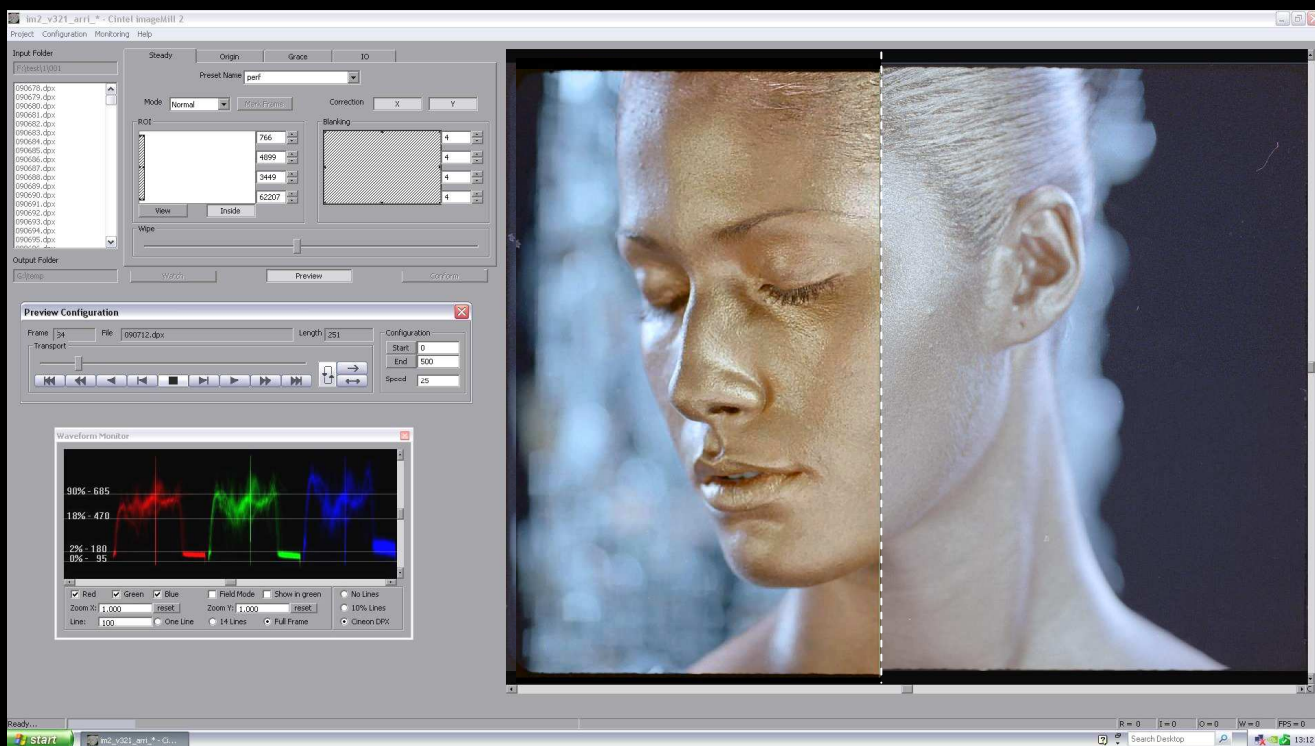


imageMill2

Faster-Than-Real-Time HD 2K and 4K image restoration system



imageMill2 is the world's fastest digital image processing system.

GRACE Film grain management and digital **noise reduction**, **ORIGIN** dust and **scratch** correction and **STEADY** image **stabilisation** on data files, faster than real time.

HD at **47** *fps*

2K at **31** *fps*

4K at **10** *fps*



GRACE - film grain and digital noise management

GRACE provides a very simple to use, yet powerful, set of both SPATIAL filters (MAIN, High Frequency and BLUE-only) and RECURSIVE filters which can be adjusted in real time to remove digital noise or reduce film grain to the users preferred level. Additional emphasis and source LUT settings provide all the tools needed. DETAIL controls with GAIN and FREQUENCY adjustments allow a level of sharpening to be applied on soft and de-focused images.

STEADY - high quality image stabilisation

STEADY provides very high quality vertical and horizontal image stabilisation with no enhancement or interpolation artefacts at previously unattainable speeds. A flexible selection area tool gives the user the ability to correct for in-camera instability or instability due to a film transfer process.

STEADY uses optimum sinc ($\sin x/x$) interpolation and has movement accuracy to $1/32^{\text{nd}}$ of a pixel and a flat frequency response in X and Y axis. Vertical range is +/- 12 lines, horizontal range is +/- 8 pixels.

SUPER-Y is an extended vertical range version of STEADY providing +/- 60 lines of stabilisation

SUPER-Y was developed in conjunction with ARRI and The National Film Board of Canada to address the instability from film scanners such as ARRISCAN when running in non-pin archive mode on shrunken film.

SUPER-X is an extended horizontal range version of STEADY providing +/- 80 pixels of stabilisation

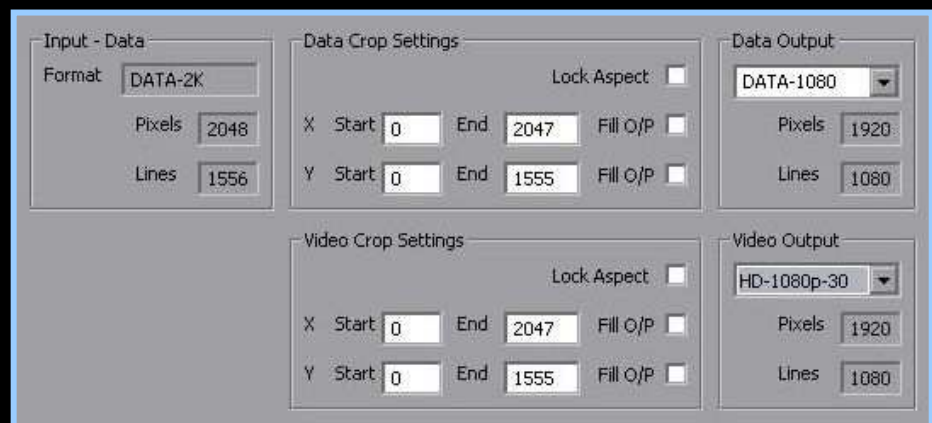
ORIGIN - dust and scratch reduction

ORIGIN is a real-time automatic dust and scratch reduction system which gives the user the ability to create 'exclusion zones' around certain image areas and/or 'regions of interest' around tramline scratches.

Adjustments for dust/scratch THRESHOLD as well as black/white bias and MOVEMENT detection are available. The level of correction on the tramline scratch can also be adjusted.

RE-SIZE and CROP engine

SD-HD-2K-4K,
16:9, 4:3,
you choose.....



In addition to the worlds fastest image restoration and processing tools, imageMill2 includes a SIMULTANEOUS RE-SIZE engine allowing any DPX file size from SD to 4K to be scaled to anything from 4K to SD. The additional CROP feature allows formats and aspect ratios to be defined at the output of the system. (The RE-SIZE engine can actually accommodate 6K and 8K files. Ask us, and we will make it so).



HD at 47fps. 2K at 31 fps. 4K at 10fps.

imageMill2 achieves these speeds by utilising a unique hardware engine to perform the complex calculations. Comparative software systems will often take a number of *seconds-per-frame* to calculate similar processes. This speed of throughput removes the image restoration bottle-neck that previously occurred when working on high resolution data files and allows a cost-effective and economical method of re-purposing content for today's high resolution requirements.

imageMill2 is available in three hardware configurations:

The imageMill2 hardware acceleration engine is built onto a PCI-e card which can be purchased in LITE and PRO versions:

- LITE can process GRACE, STEADY and ORIGIN, one at a time, plus RE-SIZE
- PRO can process GRACE, STEADY, ORIGIN and RE-SIZE all simultaneously



imageMill2 PCI-e card

The third configuration is the imageMill2 workstation which includes the PRO card built-in to a high spec. PC with 4Tbytes of local RAID storage and accommodation for high speed network interfaces such as Fibre Channel and 10Gb Ethernet. It also includes the FLOW timeline interface (upgradeable to COLOURFLOW) and support for various control panels.



imageMill2 Workstation

A real-time **SD/HD video output** is optional on the LITE cards and included on the PRO and Workstation versions. This can be used for **monitoring** during set-up or to **play-out** the processed images in broadcast quality SD HD video formats.

imageMill2 has a selection of user interface options:

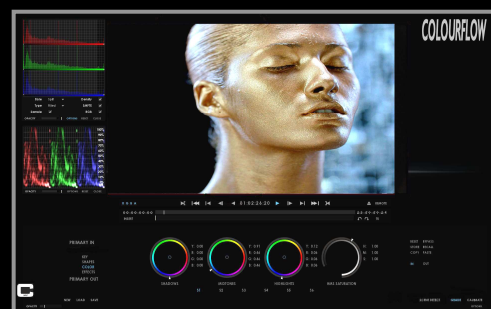
The Cintel IM2 windows GUI is included with every imageMill2 and allows easy setting of GRACE, STEADY, ORIGIN and RE-SIZE parameters when processing on a clip-by-clip basis as well as in a 'WATCH' folder workflow.

The GUI includes Waveform, Vector-scope and Histogram monitoring, a WIPE control and a real-time PREVIEW. Pressing CONFIRM starts the real-time data processing, pressing RECORD plays real time video out.

For more complex workflows, FLOW provides a full timeline interface allowing scene-by-scene changes in GRACE, STEADY and ORIGIN parameters. The expanded COLOURFLOW version also adds primary colour correction and zoom, pan, rotate scan effects. FLOW and COLOURFLOW both support control surfaces such as the 'Element' panels from Tangent Wave Ltd.



imageMill2 user interface software



COLOURFLOW timeline user interface



Tangent Wave 'Element' Control Panels



imageMill2 is in use at a number of top Post Production facilities and Film Archives around the world. These include....



...and here are some of the things they say about imageMill2:

"ORIGIN, STEADY and GRACE are very powerful and extremely fast and make our film restoration process many times more efficient. We have been stabilising, reducing film grain and eliminating dust and scratches simultaneously on the imageMill2 system with extremely good results"
Raakesh Parekh, CEO, Purple Haze, Mumbai

"ORIGIN is the fastest restoration system around and GRACE is excellent at noise and film grain management. We did a restoration of a 50 year old movie with very good results..."
Taufiq Marhaban, MD, Render Digital, Jakarta

"...easily the fastest restoration system around, the quality of STEADY in real time on 2K DPX files is fantastic"
Wojciech Janio, Fixafilm, Warsaw

"The imageMill2 applications GRACE, STEADY and ORIGIN are incredibly powerful and amazingly fast – to be able perform these complex corrections on my image data in real time is brilliant"
Cesare Pollacci Libardi, Filmina Scan, Milan

Future upgrades to imageMill2 are planned to include:

- Real time SD and HD video input and output
- A real time, high quality de-Bayer engine for digital acquisition
- Support for OSX and Linux operating systems
- DPX File-handling up to 8K resolution
- Automatic Colour Correction
- Gourmet Coffee-making facilities

OK, one of these may not be true.....but the imageMill2 system already has extensive real time data restoration tools and has many more features and upgrades to come. imageMill2 is an essential image processing platform for all post production and archive applications.

For more information please contact: sales@cintel.co.uk

Host PC specifications for the LITE and PRO cards: Windows 7 or Windows XP pro. Minimum Spec: PCIe x8 or x16 slot, 2GB RAM, 1GHz processor speed, 1600x1200 resolution video adapter and monitor. (For example - HP COMPAQ ELITE 8100). Graphics card needs to be a minimum of Nvidia FX580 with OpenGL 2.0 loaded. Network Interface: Recommend 10GigE/net or 8Gb Fibre Channel. OSX and Linux support due 2012.