

# Nucoda

Colour Grading and Finishing



Features & Benefits  
Version 2014.2 R1

**DigitalVision**  
[www.digitalvision.tv](http://www.digitalvision.tv)

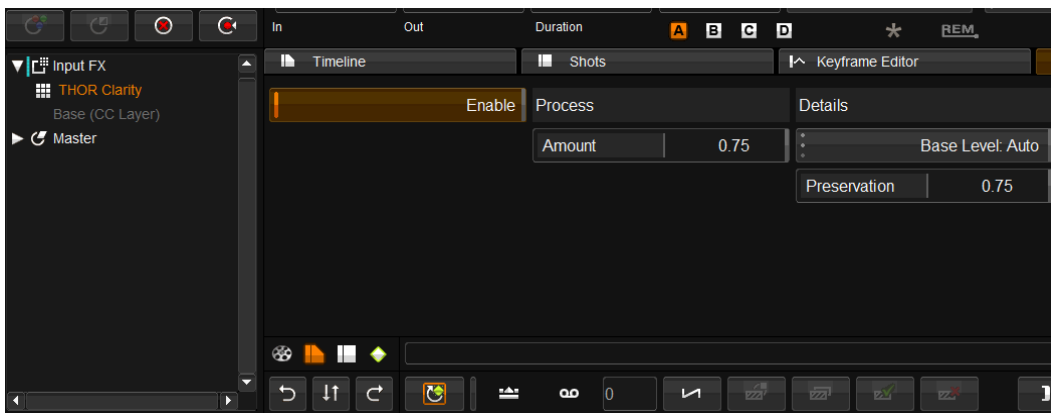
## New Hardware Support Thor

2014.2 is the first release of Nucoda, Phoenix and Loki to include support for Thor.

This will be Thor 1.0 release and will contain **Thor Clarity**. It will be accessible from within Nucoda, Phoenix and Loki. The 1.0 version of **Thor Clarity** will have spatial based noise and grain reduction with clip based analysis.

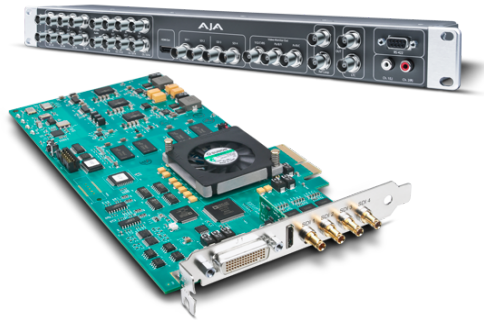
If you are lucky enough to own a Thor, the installation of the software driver is part of the Nucoda and Phoenix installer.

You will notice the addition of an effect called Thor Clarity.



## AJA Video Card Support

### AJA Kona 3G and Kona 4 with optional breakout box



Initial support is for **monitoring only**, but we have already started development for output to tape, and this will feature in a later release. Currently there is free software supplied by AJA to allow deck control, capture and lay back if required.

#### Supported Features:

- 10 bit monitoring is supported in all modes including HD, UHDTV and Stereo
- 12 bit monitoring is supported in HD for Dolby EDR but is not supported in 4K or Stereo projects.
- LTC out is supported via LTC out on the BOB and also embedded TC on the SDI
- Video capture and lay back to tape are in development - playout will be the initial focus.
- High frame rate support in Kona 4 is currently not enabled
- HDMI support for Kona 3G up to 2K and Kona 4 up to 4K - for specific resolutions.

#### Driver Installation:

The driver is installed by selecting the AJA Driver install option in the installer. Depending on the version of the Kona 3G or Kona 4 a firmware update may be required. This is done during installation.

Make sure the instructions for reboot and power down of the system are followed.

If you already have a AJA driver installed for other software, please make sure that the versions are the same.

In the AJA Control Panel, under firmware, please choose between 4K mode or UFC mode - we recommend that if you are mainly working in 2K projects or smaller, that you remain in UFC mode.

When the Nucoda/Phoenix software is running, the AJA Control Panel will report that it is In use by app (DVIO)



See the Digital Vision wiki for further information on the AJA installation<sup>1</sup>.

## Technical Notes on AJA Implementation

### Mapping of Signals to SDI Ports

The SDI I/O are mapped as they are labelled on the AJA Breakout Box and cable.

Channels are mapped as labelled on the Kona 3G and Kona 4 - 4K or UHDTV modes will map all four links as output, starting with SDI 1 - 4

### HDMI Support

If the AJA video I/O card supports HDMI output, video will automatically be output over HDMI in addition to SDI.

The DVIO AJA component will detect the capabilities of the downstream receiver attached to the HDMI port and configure the output accordingly, updating if the receiver changes while running. Specifically:

- HDMI output will be set to 10 bits/component if the receiver supports that, otherwise 8 bits/component.
- The protocol sent via the HDMI port will be switched between HDMI and DVI to match the receiver's expectations.

<sup>1</sup> <http://www.digitalvision.tv/w/index.php?title=Category:Support>

The HDMI output is always set to RGB, which all HDMI implementations are required to support, regardless of the receiver's support for YUV. No option is provided to enable YUV over HDMI.

The Kona 3G supports 4K video (3840/4096x2160) over SDI but not HDMI. HDMI output is disabled while a 4K video format is selected, resulting in a green display on the attached HDMI receiver.

Normal HDMI display will resume when a non-4K video format is selected.

### **Changes to I/O Mode Behaviour:**

The DVIO AJA component handles incompatibilities between video formats and the I/O mode set in preferences by the user.

The AJA component attempts to set up the desired video format and may adjust the requested I/O mode if necessary in order to achieve this. In such cases, it takes the I/O mode as specifying absolutely the available hardware connectivity and receiver functionality (i.e. dual-link connection & 3G support), while treating provision of RGB444 colour as desired rather than obligatory. There are still cases where incompatibility can result in card set-up failure but fall-back options will be used wherever possible.

### **The following limitations and fall-back behaviours apply:**

RGB444 is not supported for 720p, NTSC and PAL video formats and they never need more than 1.5Gbit/s bandwidth.

- Fall back to YUV422, single link, no 3G for these formats.

When YUV422 is requested, this is taken to indicate that only 1 physical link is present (or 4 if a 4K format is desired), without 3G support.

- High frame rate 1080p or 4x1080p video formats can not be set as sufficient bandwidth is not available.

When RGB444 via dual-link is requested, this is taken to indicate that 2 physical links are present (or 4 if a 4K format is desired), without 3G support.

- High frame rate 4x1080p video formats can not be set as sufficient bandwidth is not available (8 physical links would be required just for YUV422).
- High frame rate 1080p video formats and normal frame rate 4x1080p video formats are supported but fall back to YUV422. Otherwise, RGB444 is provided.

When RGB444 via 3G level A is requested, this is taken to indicate that only 1 physical link is present (or 4 if a 4K format is desired), with 3G support.

- It is assumed that 3G-supporting devices will support both levels A and B. It seems that the AJA cards support 3G level A only for high frame rate 1080p and 4x1080p video formats; we provide 3G level A for these formats but fall back to YUV422. For all other video formats, we fall back to 3G level B.

When RGB444 via 3G level B is requested, this is taken to indicate that only 1 physical link is present (or 4 if a 4K format is desired), with 3G support.

- It is assumed that 3G-supporting devices will support both levels A and B. High frame rate 4x1080p video formats can't be implemented using 3G level B due to the way the card needs to be configured for high frame rates with 3G level B, so we fall back to 3G level A YUV422 for these formats.
- High frame rate 1080p video formats are supported but fall back to YUV422. Otherwise, RGB444 is provided.

\* 12 bit/component I/O modes are not supported for AJA cards at this time.

Note: "High frame rate" here means > 30fps, i.e. 50, 59.94 and 60 fps. "Normal frame rate" means <= 30fps.

## Tools

### DVO Tools

#### Changes:

DVO Alias is now part of the DVO Video tools

DVO Brickwall is now part of DVO Video tools

### DVO Regrain RGB

A new RGB regrain tool has been added which will complement the original DVO Regrain. The new DVO Regrain RGB will not be in DVO Classic

Within the tool, adjustments for grain can now be made for each separate channel, this includes the size of the grain, the grain sharpness and colour mode.

### DVO Clarity

New features include an auto mode to detect Colour or B/W material. If the material is B/W processing will now be faster than for colour material.

There is a mode to convert Colour to B/W

Using Clarity in a ACES or Float project will now pass through values without clipping.

Using Clarity with LOG images will produce improved results.

### DVO Alias and DVO Brickwall

These tools have been enhanced by adding an option to process interlaced material.

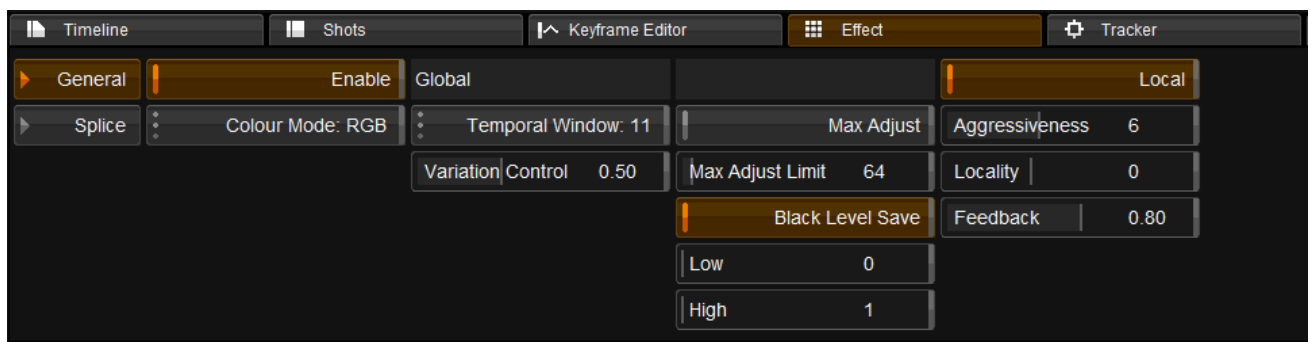
### DVO Flicker

DVO Flicker has been considerably enhanced.

Modes now exist for Luma, BW and RGB flicker correction

The temporal window choices have been expanded and an option to remove localised flicker has been added.

The splice option allows the user to automatically balance material exhibiting flicker around splices, the user can also specify a selected frame to use as a sample



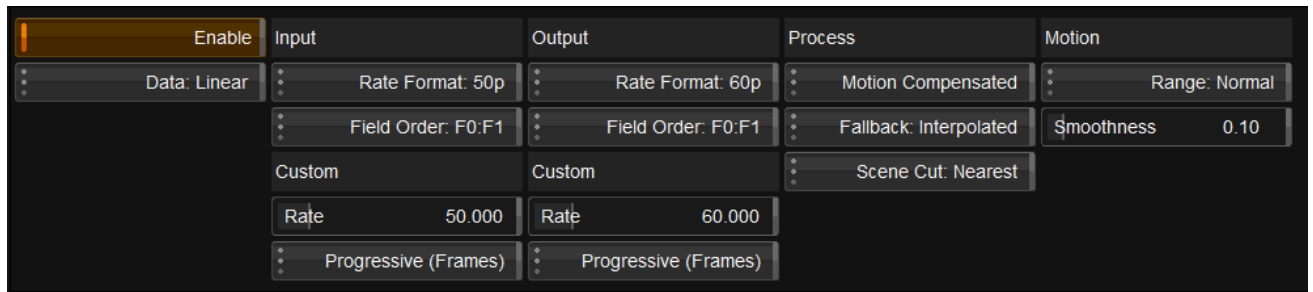
### DVO Twister

DVO Twister has small changes to the UI and a new option for selecting the fallback mode in cases where motion estimation might fail to properly calculate the results.

There is also a setting for motion range (previously called spike)

To use Twister as a normal retime function with motion compensation, set the output rate to 100 and the input rate to the rate you want for the material, eg 50 would (in this case the rate is a %).

To use the “Rate” setting for custom frame rates , please set the Rate Format to “Custom”



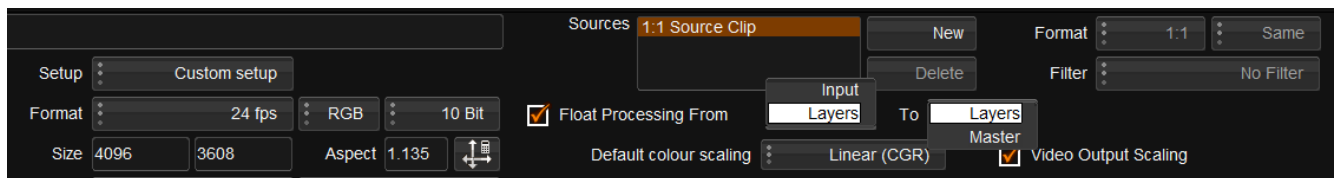
**There is a new behavior in Twister.** when using a single clip with scene edits, Twister will use the correct starting frame and not use the start of the clip as the starting point at edits.

## Project settings

### Float processing

A new feature has been implemented which will allow users working in 10 or 16 bit to keep operation between layers in floating point to prevent clipping. This is not applicable in HALF projects.

It is not recommended that you change these settings during the project.



Illustrated below is the caching policy for the type of image when rendering with 10 bit sources in a 10 bit project, and the various float pipeline settings:

### Layers to Layers:

Input FX caches: 10 bit DPX

Colour and User FX Layer cache: 10 bit DPX

Master cache: 10 bit DPX

**Note: Most DVO tools will clip the output to 10 bit when used as User FX layer, exceptions are:**

DVO Aperture

DVO Sharpen

DVO Clarity



All other DVO tools will introduce clipping if used as a **USER FX** Layer either at the beginning or between colour layers.

**Input to Layers:**

Input FX caches: 16 bit EXR

Colour and User FX Layer cache: 10 bit DPX

Master cache: 10 bit DPX

**Layers to Master:**

Input FX caches: 10 bit DPX

Colour and User FX Layer cache: 16 bit EXR

Master cache: 16 bit EXR

**Input to Master:**

Input FX caches: 16 bit EXR

Colour and User FX Layer cache: 16 bit EXR

Master cache: 16 bit EXR

If you would like to work with colour tools on an adjustment track and want to avoid inter layer clipping, you have to be in the **Input to Master** setting.

**Input to Master: Lower tracks**

Input FX caches: 16 bit EXR

Colour and User FX Layer cache: 16 bit EXR

Master cache: 16 bit EXR

**Adjustment track:**

Input FX caches: 10 bit DPX

Colour and User FX Layer cache: 10 bit DPX

Master cache: 16 bit EXR

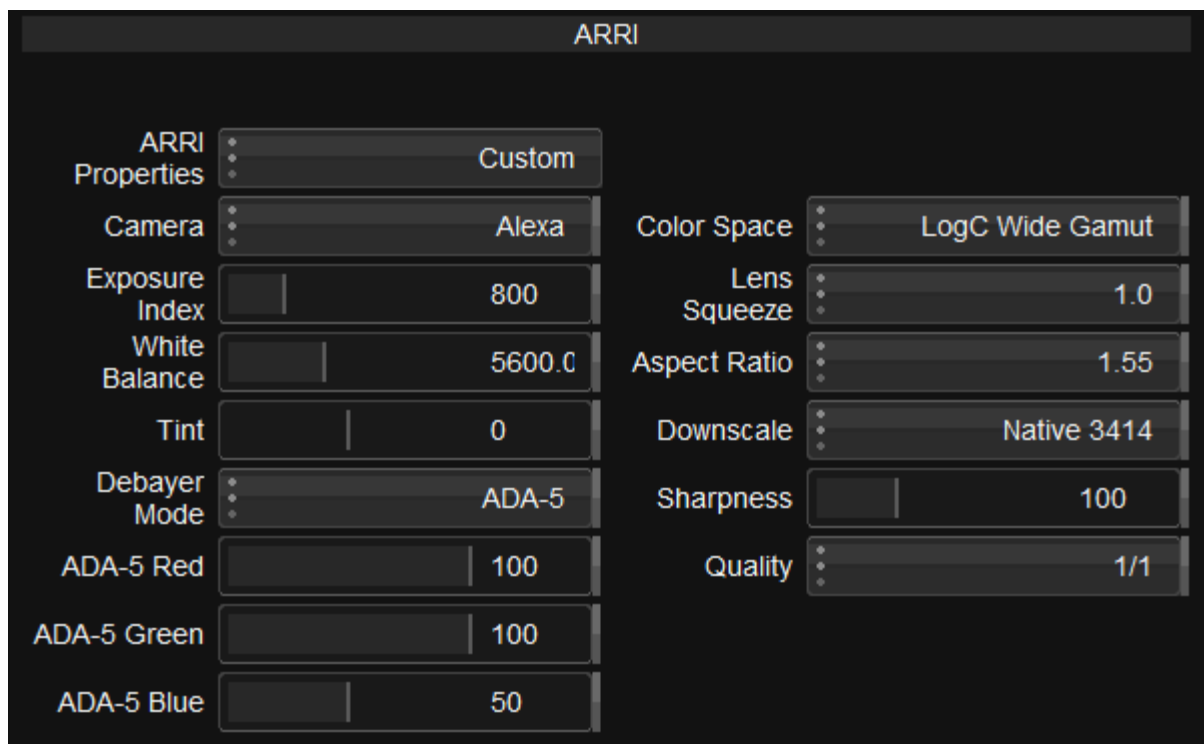
## Camera Formats

### Arri RAW debayer updated

Arri RAW debayer has been updated to Arri Raw\_SDK\_4.6.0b3\_x64

Please note that in keeping with Arri specifications, certain options are only available with certain files. Therefore you will only have access to settings appropriate to the file you have imported.

Support for new debayering mode ADA-5 SW, including API for fine-tuning ADA-5 SW-specific algorithm parameters. This debayering mode eliminates the issue of overshooting at image edges mentioned in the ARRIRAW SDK 4.5 release notes under 'Known Bugs & Limitations' and the use of ADA-5 is strongly recommended for process photography, especially blue screen or red screen photography.



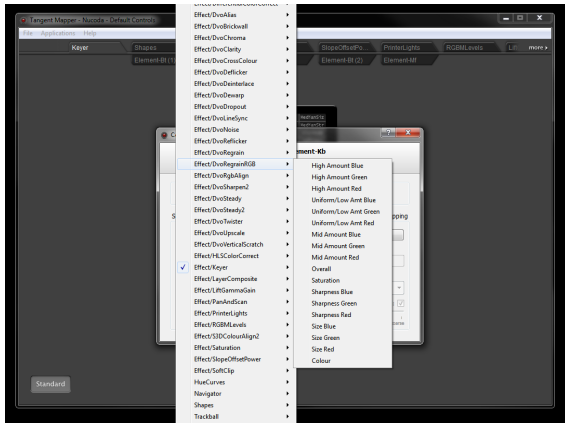
The screenshot shows the ARRI settings menu with various parameters and their values:

ARRI	
ARRI Properties	Custom
Camera	Alexa
Exposure Index	800
White Balance	5600.0
Tint	0
Debayer Mode	ADA-5
ADA-5 Red	100
ADA-5 Green	100
ADA-5 Blue	50
Color Space	LogC Wide Gamut
Lens Squeeze	1.0
Aspect Ratio	1.55
Downscale	Native 3414
Sharpness	100
Quality	1/1

Support for 4:3 cropped (ALEXA software version SUP 10.0) image format: 2:1 anamorphic de-squeeze from full-height 2578 x 2160 4:3 capture to HD, 2K, Quad HD and 4K resolutions. Support for image rotation, assisting the use of UWZ lenses or upside-down mounted cameras. Various bug fixes, especially in format handling

## Control Panels

### Tangent Mapping Updated (File versions are 1.7)



For Tangent Element users we have added the mapping for the updated and changed DVO tools to the Tangent Mapper and the new Default map.

**Important: Due to changes in the names of the effect ID's, users who have custom mapping, and who want to keep the custom mapping will have to map the new tools themselves.**

New users can install and work with the new tools as usual.

Tools with changed or updated mappings:

#### Tool ID:

DVOClarity (new)  
DVOREgrainRGB (new)  
DVOAlias (previously DvoAls in Tangent Mapper)  
DVOBrickwall (previously DvoBwf)  
DVOTwister (previously DvoConvert)

**Note: The old versions of DVO Clarity and DVO Flicker will no longer be available on the panel, so loading an old project with the old effect will mean the controls are not available.**

#### Other changes:

Play Forward and Backward now mapped to J and K as fake keypresses, this allows for Multi Speed playback Fwd and Rev - Press on once for normal speed, tap twice for double, three times for three times speed.

### **The sensitivity for tools using rings:**

We have added preferences to the general.prefs file that allows for the sensitivity of the coarse and fine setting for the rings and balls to be set by the user. This is the internal increments used when using tools that require input from the rings and balls.

Example The value for Balance/Mid/Red is 1.000 with the values below it, using the normal setting it will increment by .005 so 1.005/1.010

In Alt mode (fine) it will increment by .001 so 1.001 / 1.002

So the value in the preferences is x10 of what it is in the application.

```
tangent
{
    trackballCoarseSpeed 50.000000
    trackballFineSpeed 10.000000
    trackRingCoarseSpeed 50.000000
    trackRingFineSpeed 10.000000
}
```

### **Precision Mapping Updated**

Tools with changed or updated mappings:

DVOClarity (new)

DVORegrainRGB (new)

DVOAlias (previously DvoAls in Tangent Mapper)

DVOBrickwall (previously DvoBwf)

DVOTwister (previously DvoConvert)

There was an issue with the "Cue Playhead" command where head B could not be cued to the current position. This has been fixed.

### **QuickTime v7.7.6**

QuickTime v7.7.6 is now supported and included in the installer. Users are recommended to upgrade to this version of QuickTime.

Nucoda Features and Benefits  
2014.2

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