

# Nucoda



GRADING | FINISHING

## 2017.1 FEATURES GUIDE



<b>Enhanced GPU support</b>	<b>3</b>
<b>New real time Waveforms and Vectorscope</b>	<b>3</b>
<b>Overview of timeline cache indicators</b>	<b>4</b>
<b>ACES</b>	<b>6</b>
ACEScct 1.0.3 - Explanation by Scott Dyer (ACES Mentor on ACES Central)	6
Scale to Full range in ACES	6
Apply composite in ACES Linear	7
New ACES ODT	7
<b>HDR Support</b>	<b>8</b>
Dolby Vision Option	8
<b>Video I/O</b>	<b>8</b>
Support for AJA 12.5.0 Drivers	9
New supported video formats	9
AJA Sync timing	9
SDI Output capture	9
Improvements and fixes to capture and play out using Kona cards	10
<b>EDL</b>	<b>10</b>
Fix invalid timecode	10
Improved Autodesk EDL support	10
<b>Change to single GUI monitor options</b>	<b>10</b>
<b>Enhancements to the Matte Tool (Index Matte)</b>	<b>11</b>
<b>New and updated DVO tools</b>	<b>12</b>
DVO Frame	12
DVO GrainGT	12
DVO Zoom	12
DVO Print Align Seq	

<b>Effect Updates</b>	<b>13</b>
Changes to Pan & Scan filtering	13
<b>Updates to DVO Classic</b>	<b>13</b>
<b>OFX Support for Tiffen Pro Filters</b>	<b>13</b>
<b>Control Panels</b>	<b>14</b>
Additional commands added to the Tangent mapper	14
<b>Colour Tools</b>	<b>15</b>
Gamma Matrix update - Load Matrix values from file or Clipboard	15
<b>Avid AAF media export</b>	<b>15</b>
<b>EDL Enhancements - Layer and Matte additions</b>	<b>15</b>
Syntax for additions to the EDL:	16

## Enhanced GPU support

2017.1 contains enhance GPU support for preview and real time technical monitoring tools.

For an explanation of the new settings and Preferences please go to this link :

- [Manual - GPU Preview and Caching](#)

For a FAQ list about GPU support, please click below:

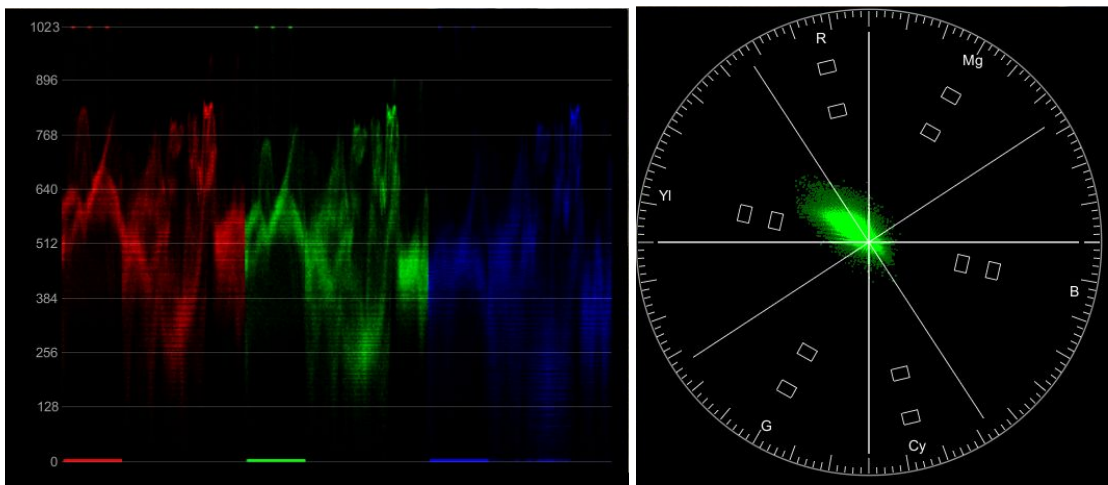
- [Support - GPU FAQ](#)

## New real time Waveforms and Vectorscope

This version see the addition of new Waveform and Vectorscope tools. These are part of the overlay function and can therefore be overlaid on the SDI output or viewed on the GUI, or both.

On the GUI, with the MON setting turned on the scopes will update in real-time along with the GUI image, update on the SDI screen will also be real-time. Using the mouse the user can draw a region of interest on the GUI image and view the result on the Waveform or Vectorscope.

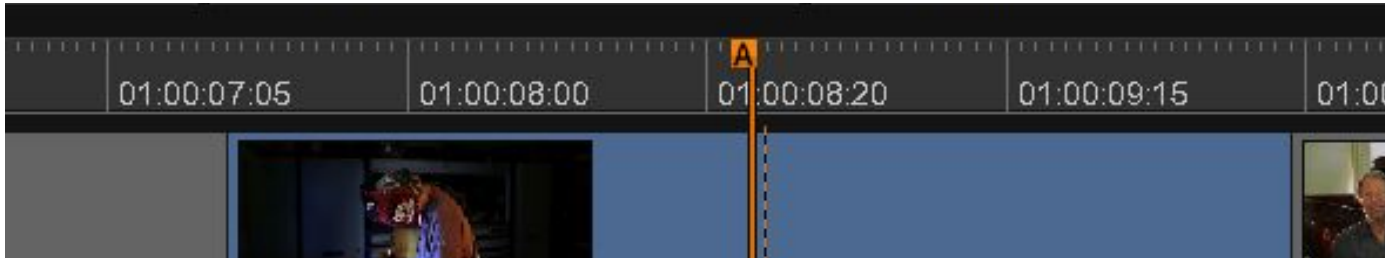
The colour range settings 8 bit, 10 bit, 16 bit, 0-1, 0-2, 0-4, 0-8, 0-16 also affect the WFM. We have included setting for PQ in Rec.2020 and P3.



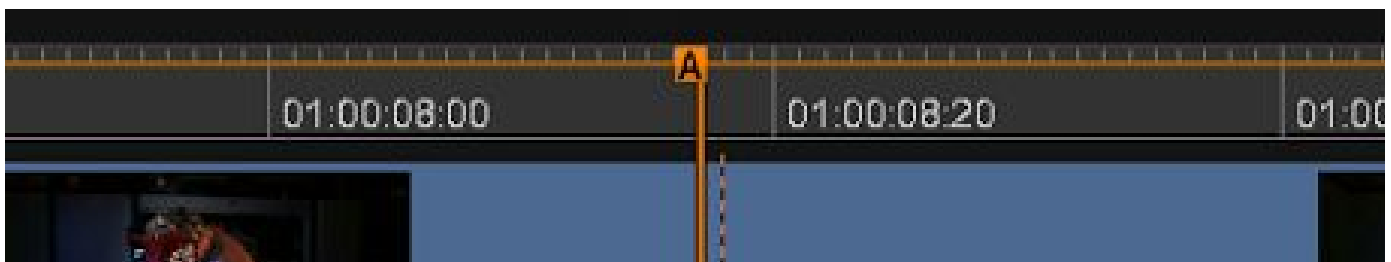
See : [Manual - Graphs Specification](#)

## Overview of timeline cache indicators

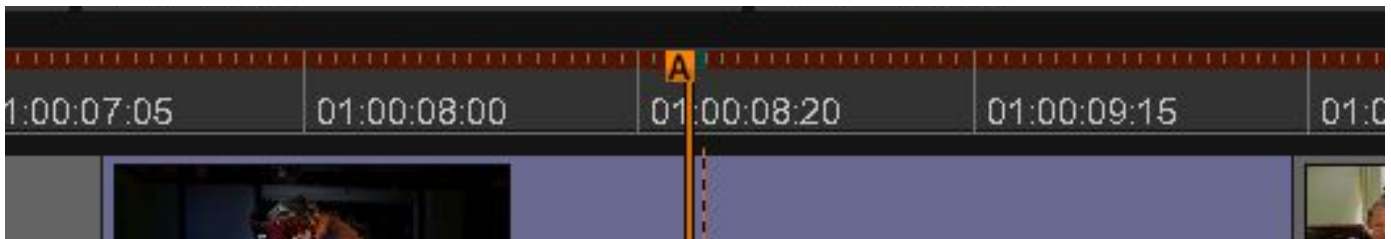
There has been an addition to the cache colour indicators in Nucoda.



No colour in the timeline - this indicates no processing of any kind is required - in this case the media matches the output format and there is no scaling done on the master layer (project scaling options)



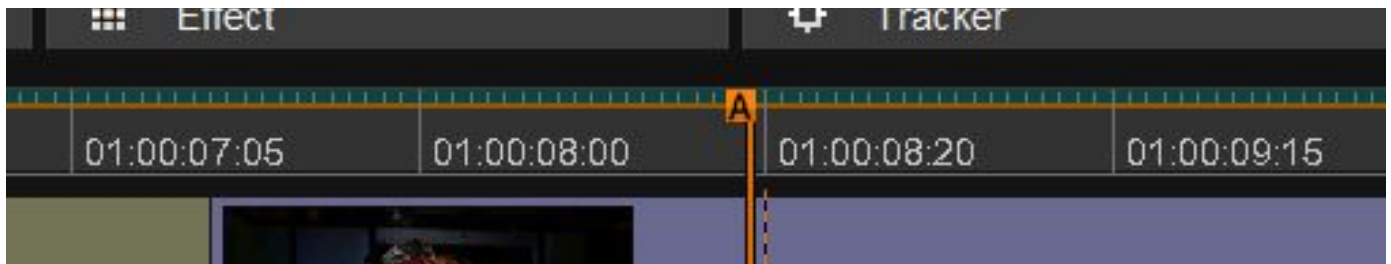
The new thin orange line indicates that there is a GPU layer that has not been cached - so it is a realtime preview. In this case the material is 1920x1080 but the output format of the project is larger and scaling has been set to Fit - so in this case the Master layer will do the resize and that is on the GPU. To cache Master layer effects, turn on the Output cache in the Caches tab.



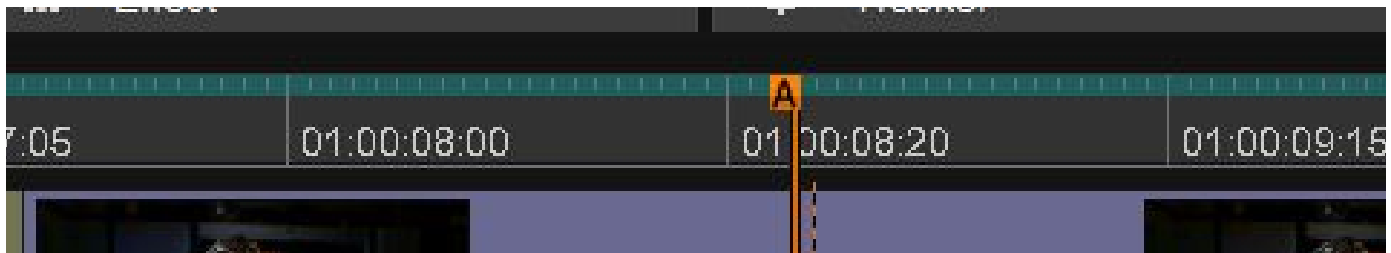
Dark red indicates uncached media that has been set to create source clone in DPX or EXR



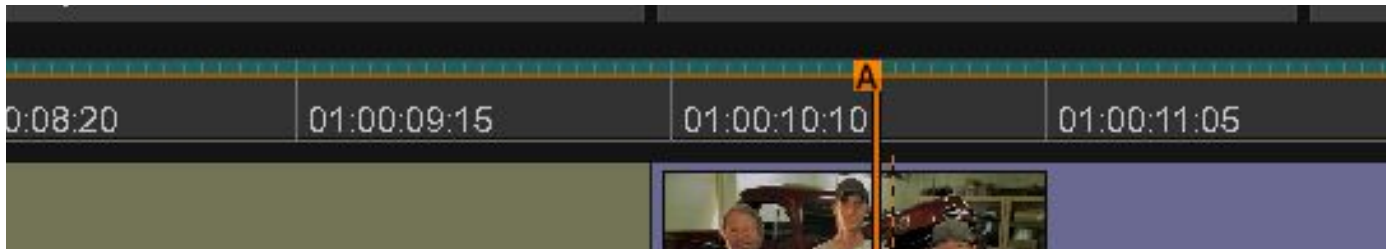
Dark green is source media that has been cached as DPX or EXR



Dark green and thin orange line - cloned source media with a uncached GPU layer (this can be a colour layer or a master layer)



Light green - all layers are cached - the light red indicates uncached material.



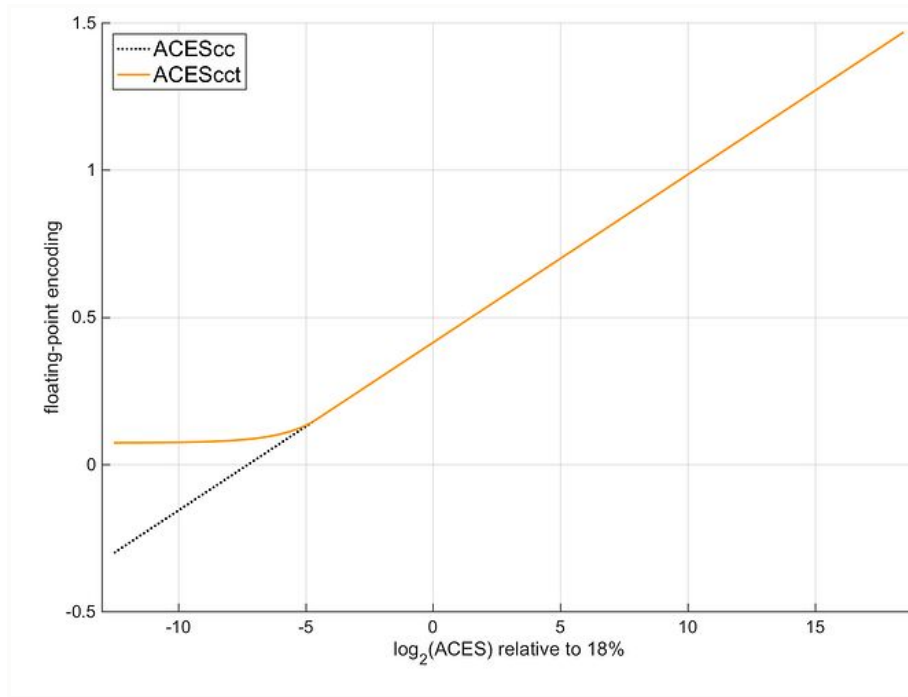
Light green and thin orange line - there are some cached layers but also some GPU layers that have not been cached.

The orange line serves as an indicator that although playback may be real time because of the GPU previews, there are uncached layers that will need to be processed during export or cached before playing out to tape to guarantee playback.

## ACES

### ACEScct 1.0.3 - Explanation by Scott Dyer (ACES Mentor on ACES Central)

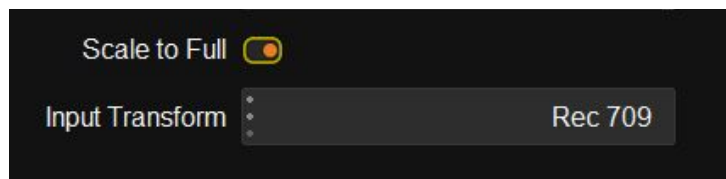
ACEScct is very similar to ACEScc across most of the range, except that it adds a "toe" to make it more akin to traditional "log" curves (e.g. Cineon, LogC, S-Log, etc.). The addition of a "toe" results in a more distinct "milking" or "fogging" of shadows when a lift operation is applied (and compared to the same operation applied in ACEScc). This difference in grading behavior is being provided in response to colorist requests for behavior more similar to that of traditional legacy log film scan encodings when grading using a working space from the "ACES" family of color spaces.



Specifically, for ACES values greater than 0.0078125, the ACEScct encoding function is identical to the pure-log encoding function of ACEScc. It is only below that point that the curves differ. However, note that because of the toe, ACEScct is *not* compatible with ACESproxy.

### Scale to Full range in ACES

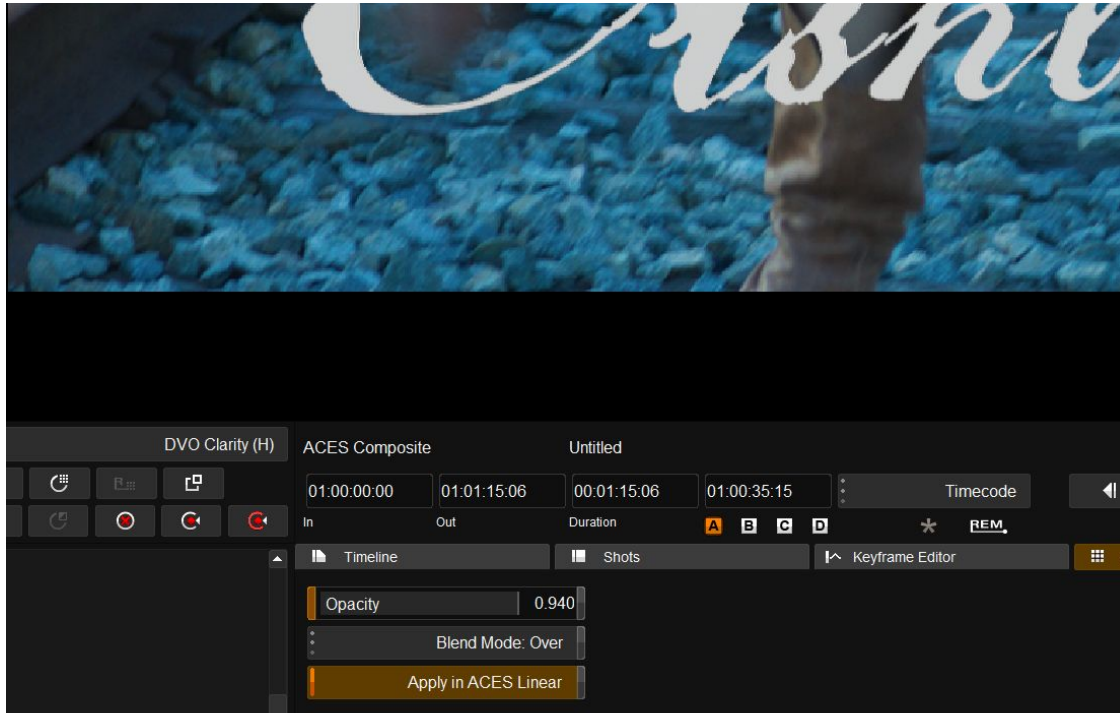
When working in an ACES project with Avid MXF media that will be exported back to Avid, the media should be scaled from SMPTE to Full range, on export to a MXF OPAtom file, the range will once again be scaled to SMPTE.





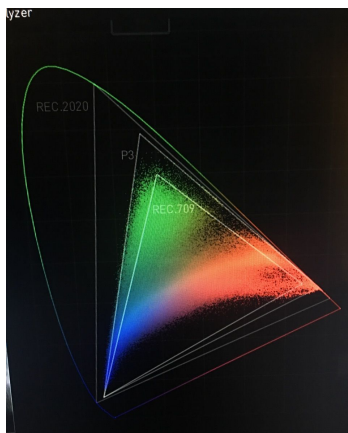
## Apply composite in ACES Linear

- Compositing should be done in a linear environment and working in ACEScc or ACEScct means that compositing titles could produce unexpected results when using an Alpha matte. A function has been added to the Over composite tool "Apply in Linear ACES" - enabling this option when compositing in ACES cc or ACEScct will give the correct results.



## New ACES ODT

Rec.2020 D65 ST2084 Clamped to P3



Also see : [Manual - ACES](#)



## HDR Support

### Dolby Vision Option

This version of Nucoda contains the release version of the Dolby Vision implementation. To use this option you will need an additional licence. Please contact [Sales@Digitalvision.se](mailto:Sales@Digitalvision.se)

- Support for the release version of the CMU Firmware 2.5.2
- Support for Dolby SDK 2.5.8
- Changes have been made to the analysis speed
- The Mastering Display and selected Trim monitor is now correctly saved as part of the project.
- Users can now use the values from a single frame as analysis values
- MaxFall and MaxCLL is calculated and included in the Dolby XML
- The exported XML now contains the Nucoda Project and Composition in the comments field
- A new preferences file DolbyOutputFormat.prefs has been added to All Users to define the Image aspect for analysis. This file is user editable.
- Trim and Analysis values can now be recalled to other clips
- The Aspect ratio for analysis will now be applied to the CMU during trimming operations so masks are excluded from the trims.
- Recall and Reset analysis and trim values between clips
- Revert now works with Dolby CM layer
- Every unique clip in the timeline is now added to the source list in the XML with the material name as a descriptor.
- Trim values for dissolves and dynamics is updated
- We have updated the Nucoda splash screen to be less overwhelming in HDR environments

### New Precision controls for Dolby

- Recall Trim and Reset Trim has been mapped to the Precision Panel on the Turbine and P button. Press once to recall or hold down to reset.
- ***Note - using the normal recall will the whole Dolby layer and will overwrite the Trim and Analysis.***

See : [Mastering HDR content with Dolby Vision in Nucoda](#) (Nucoda Portal PDF)

## Video I/O

### Support for AJA 12.5.0 Drivers

Updated drivers support for AJA Kona 4 - this driver pack improves compatibility and makes it easier to run Avid Media Composer or Adobe Premiere on the same system.

One of the major features in the new drivers pack is support for embedding HDR data over HDMI 2. This includes settings for tuning HDR, Colorimetry, EOTF, Gamut and custom functions.

These controls are available from the AJA control panel and will be available in the Nucoda interface soon.

HDR Mode	BT 2020	Red	x	0.71	y	0.29
EOTF	ST 2084	Green	x	0.17	y	0.80
Ext. Colour	Const Luma	Blue	x	0.13	y	0.05
		White	x	0.31	y	0.33
Displaying Mastering Luminance		Min	0.00	Max	1000.00	
Maximum		CLL	0.00	FALL	0.00	

### New supported video formats

It is now possible to use 3G Level A and RGB444 for HD and UHD below 30 fps.

### AJA Sync timing

Changing the Vertical and Horizontal timing in the **AJA Control Panel** in the **Playback Timing** settings will now be stored in preferences.

Playback Timing	
Genlock: <input checked="" type="radio"/> Free Run	Timing Horiz 0
<input type="radio"/> Ref In No Video	Vert 0
<input type="radio"/> Video In No Video	

### SDI Output capture

When laying to tape Nucoda will switch to the incoming video signal, sometimes producing clicks or pops, switching this option to Blank Video will send black from the AJA framebuffer to the VTR, preventing pops and clicks. Default is Pass-through.

Capture SDI Output	Direct Pass-through
--------------------	---------------------

Also see : [Support - AJA Video](#)

## VTR

### Improvements and fixes to capture and play out using Kona cards

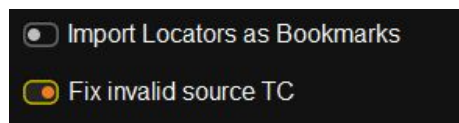
It is now possible to capture from Digital Betacam and other sources that have no timecode embedded in the SDI stream.

## EDL

### Fix invalid timecode

This feature will work for any material that is not in the base frame rate of the project. The conversion is done by taking the frame count and scaling it to the closest valid frame number. This will of course not provide valid time codes for conforming but is more about just getting the EDL loaded and providing some reference.

On import, Red markers will be added to the timeline to indicate the clips that have been modified, the marker will contain the line in the EDL that was changed.



Bookmark list					
Created	Bookmark	Note	Source	Record	Colour
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 57		10:00:34:19	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 219		10:02:51:09	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 646		10:11:18:10	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 812		10:13:46:12	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 1365		10:25:50:15	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 1373		10:25:54:00	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 1501		10:29:24:15	
Wed 25 Jan 2017 13:27	Timeline	Fixed invalid timecode from EDL line 1505		10:29:34:07	

### Improved Autodesk EDL support

- Nucoda will now support Autodesk EDL's with Motion effects
- Tape name translation will now translate the DEDL comments in Autodesk EDL's

### Change to single GUI monitor options

There is a new setting in the Monitoring Prefs labeled "Display Image only on SDI" with this in the on position it will emulate the default single monitor behaviour when GPU Readback is on, ie the user has no viewer for the image in Nucoda and must interact with the image on the SDI screen.

With the new option turned off, the user now has access to the monitor canvas in Nucoda in a single screen configuration, but also with GPU Readback enabled, to allow shape and comparison overlays on the SDI monitor. This change will allow users to do their shape editing on the GUI, which will be faster and more responsive. The Image canvas is shared with the Mems display and can be scaled by dragging the left edge of the Mems window, please be careful NOT to drag the edge all the way to the edge of the screen.

A change has been made here in the way that scaling works, in that if the user presses "f" to fit the image, it will automatically scale to fit the available canvas space, with the image scaled and zoomed, it will remain in that state.

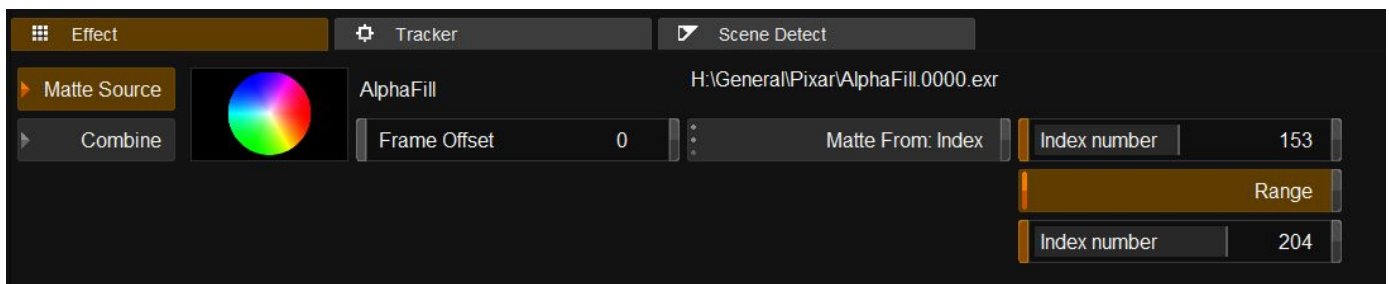
### Enhancements to the Matte Tool (Index Matte)

This enhancement to the matte effect will let the user specify one or a range of greyscale colours in the image alpha channel to be used as a matte in a layer. Using grayscale index values from 0 to 255 allows the creation of multiple mattes in a single alpha channel.

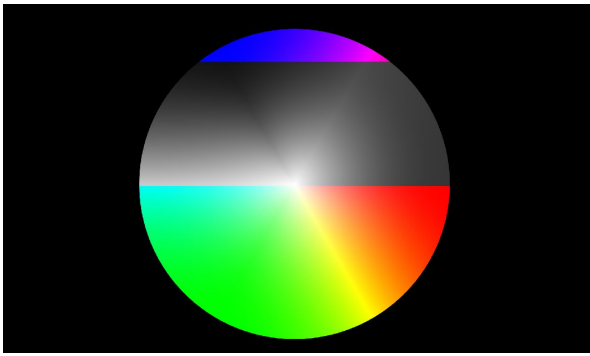
Mattes can be created using a single index value or a range of values.



This EXR image has a colour fill and alongside is the alpha channel containing 5 bars of colour, the index values are 255, 204, 153, 102, 1 from top to bottom.



In the matte effect, the image has been set as its own matte source, the Matte From selection is Index and a single index number or range is selected. Using 153 to 204 as a range results in the following image after being desaturated.



Additions were made to the Nucoda EDL format to facilitate setting the mattes. See syntax for additions to the EDL on the next page for information.

## New and updated DVO tools

### DVO Frame

- [DVO Frame](#) is an advanced **frame reconstruction** tool. It reconstructs missing or badly damaged frames using the DVO Twister algorithm.

### DVO GrainGT

- [DVO Grain GT](#) is a version of [DVO Grain](#) that makes use of some the enhanced instructions now available on processors and compilers. It does not have the Keyer option that is in DVO Grain. If you would like to use a keyer to separate areas for grain reduction, use DVO Grain GT in a user FX Layer.
- In HD, DVO Grain GT is typically double the speed of the old DVO Grain tool.

### DVO Zoom

- [DVO Zoom](#) has improved edge filtering - this has removed the black line on the edges of the images that could appear (see attached)
- Added a ROI (region of interest) to allow the operator to set the area to be scaled. This means that images that already have letterboxes can be scaled using a POI that excludes the letterboxed area, this results in sharp edges.
- Modes for soft inside or outside edge or hard edge to the letterbox.

The scaling used in DVO Zoom is very close to Lanczos and is adaptive, so it will change slightly depending on the scaling.

### DVO Print Align Seq

- [DVO Print Align Seq](#) is a version of the [DVO Print Align](#) tool that automatically combines and aligns film separations that were printed on one reel in sequential order (ie Frame 1 R, G, B - Frame 2 R,G,B)
- Frames are automatically combined and aligned.
- The offset controls are can now be operated completely manually, allowing for larger and more complex alignment. (Also available in DVO Print Align)

## Effect Updates

### Changes to Pan & Scan filtering

- Add Edge Shrink mode
- Add Edge Sharpness mode
- Remove extend edges button

The new Edge Shrink mode and Edge sharpness mode in Pan and Scan gives fine control over the way that edges are processed in Pan & Scan, it provides more pleasing results than using the edge extend method. The Precision panel has been updated with the new parameters and for Tangent they are available to be mapped by the user if required.

### Updates to DVO Classic

DVO Classic has been expanded to include:

- [DVO Chroma](#)  
Use DVO Chroma to take care of those nasty Chroma artefacts on video material, or to fix Chromatic Aberration. It also fixes those nasty de-bayer artefacts you notice on the edges of your digital camera files.
- [DVO Alias](#)  
Cure out-of-band vertical frequencies and “twitter”  
Essential for curing the side effects of out-of-band vertical frequencies that show up on-screen as line flicker or “twitter”. Venetian blinds and car grills can be shown as sharply as the interlaced television system will allow.
- [DVO Pixel](#)  
Automatic detection and removal of even the deadest pixels on your image. Also has a manual mode for those stubborn pixels.
- [DVO Grain GT](#)  
This is a version of DVO Grain that makes use of some enhanced instructions now available on processors and compilers. It does not have the Keyer option that is in DVO Grain. If you would like to use a keyer so separate areas for grain reduction, use DVO GrainGT in a user FX Layer.  
  
In HD DVO Grain GT is typically double the speed of the old DVO Grain Tool.
- [DVO Steady](#)  
Designed to automatically stabilize based on image content this tool was originally designed for film frame instability, but it is very handy in a tight situation.

## OFX Support for Tiffen Pro Filters

- **Tiffen Dfx OFX Pro Plug-in - Version 5 - Yet to be released**

Simulating 2,000+ popular award-winning Tiffen glass filters, specialized lenses, optical lab processes, film grain, exacting color correction, plus natural light and photographic effects, the Tiffen Dfx digital filter suite is the definitive set of digital optical filters for professional photographers, top motion picture filmmakers, video editors, and visual effects artists around the world.

[Tiffen Pro Filters](#)

## Control Panels

### Additional commands added to the Tangent mapper

The following list of commands have been added to Tangent, they are not mapped by default but can be added by the user. Some commands replace ones that are currently mapped as Keyboard shortcuts

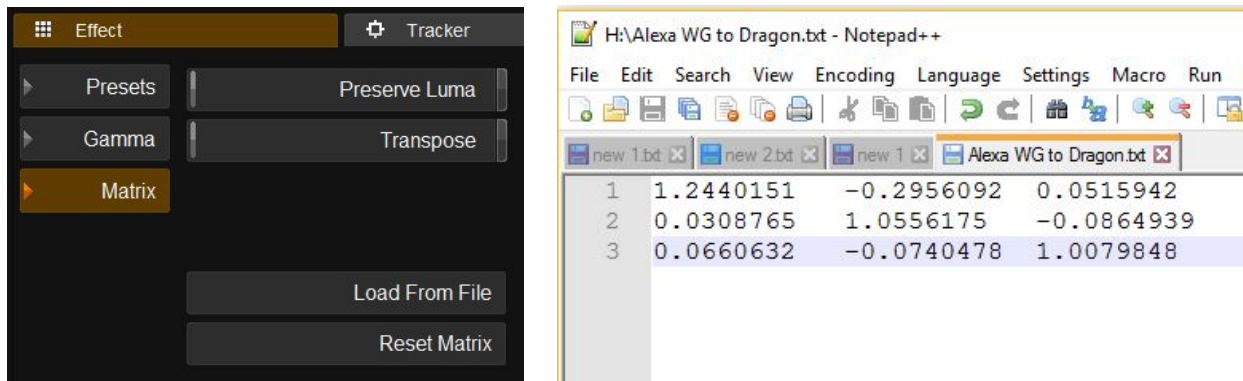
Keyframes: Add keyframe Remove Keyframe Previous Keyframe Next Keyframe	Misc: Cycle compare modes Dynamic Cache Set thumbnail Export Still	Monitor: Zoom to Fit Zoom 1:1 Zoom in Zoom out
Tracker: Autotrack to Start Autotrack to End Track forward one Frame Track Backwards one Frame Reset tracking to start Reset tracking to end Reset all tracking	Universal: Add Edit Remove Edit Add Dynamic Remove Dynamic	Memories: Revert Set Revert Save Note Copy all forward
Versions Set Next Version Set Previous Version Add Clip Version Add Grade Version Set Version Remove version	Pan & Scan: Edge Softness Edge Shrink	



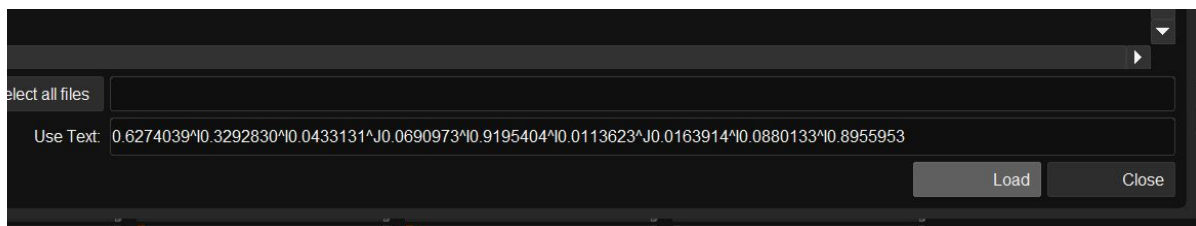
## Colour Tools

### Gamma Matrix update - Load Matrix values from file or Clipboard

- Accessed by pressing the Load button in the Gamma Matrix.



- A text file can be selected and loaded or the values can be selected and copied/pasted into the "Use text" below the file selection area.
- Depending on how the values were written the "Transpose" button may have to be used to get the correct result.



## Avid AAF media export

- There have been isolated cases where illegal windows characters were used to name clips in Avid Media Composer, this would cause a failure when exporting media. Illegal characters will now automatically be stripped and replaced with an underscore. This should not affect the exported AAF

## EDL Enhancements - Layer and Matte additions

In order to simplify workflows where multiple mattes and layers are involved in a production we have added ability to use extensions to our EDL format to allow the creation of colour and effects layers and to assign mattes to specific layers.

The purpose of the feature is to allow for the accurate and quick creation of named matte layers and to correctly assign matte sources inside the Nucoda layer stack. In addition to matte assignment the user will also be able to define and add User FX layers, colour layers and locators. The commands are added as comments after the main event and are processed automatically when importing the EDL.

## Syntax for additions to the EDL:

**\*NUCODA\_LAYER** [layer name] [-effect <effect-id>] [-matte.r|g|b|a <matte file and path>] [-offset <frame-offset>]

**[layer name]** - optional layer name - no spaces allowed

**[-effect <effect-id>]** - optionally add effect to layer on creation - see index for effect list. This includes OFX

**[-matte.r|g|b|a <matte file and path>]** - Set matte file and specify image channel to use

**[-matte.i <lowindex> <highindex> <matte file and path>]** - Use Index values - please note the both low and high index values must be present - if there is no range set them to equal

**[-offset <frame-offset>]** - optionally offset the matte (the importer will automatically offset the matte so it starts at the same frame as the clip, but you use this to add an additional offset) This will work around the issue of Mattes starting at the wrong TC when using mixed down media with mattes.

**\* LOC:** <timecode> <locator color> [Locator information]

Locator colours: BLUE | CYAN | MAGENTA | ORANGE | RED | WHITE | YELLOW

**\* ASC\_Inp** <LUT Name> -- importLUTFolder

LUT is added to grading stack before the Channel Mixer

**\* ASC\_Out** <LUT Name> - Path is set in general preferences -- importLUTFolder

LUT is added to grading stack before the Router

**\* ASC\_SAT** <(Saturation Value)>

If the ASC\_SAT value is before the ASC\_SOP values, the SAT values are place in Saturation in the colour stack. Else it is placed in the HLS tool.

**\* ASC\_SOP** <(Slope Values) (Offset values) (Power Values)>

Up to decimal places are supported

**\* FROM FILE:** <file path and filename>

## EDL Examples - please note that line breaks are not supported.

TITLE: A L-S3D-with-Mattes-DEMO001

FCM: FILM

003 Undead-S3D-LEFT V C 03:00:08:15 03:00:17:20 03:00:08:15 03:00:17:20

\*FROM FILE: S:\Undead\Media\S3D\Left\Undead-S3D-LEFT\_259407.dpx

\*NUCODA\_LAYER Primary

\*NUCODA\_LAYER Matrix -effect GammaMatrix

\*NUCODA\_LAYER 6015\_v002 -matte.r S:\Undead\Media\VFX\Mattes\mt\_003\le\mos\_reel03\_scn0043\_shot6015\_v002\_mt\_003\_le.0001.dpx

\*NUCODA\_LAYER 6015\_v002 -matte.g S:\Undead\Media\VFX\Mattes\mt\_003\le\mos\_reel03\_scn0043\_shot6015\_v002\_mt\_003\_le.0001.dpx

\*NUCODA\_LAYER 6015\_v002 -matte.b S:\Undead\Media\VFX\Mattes\mt\_003\le\mos\_reel03\_scn0043\_shot6015\_v002\_mt\_003\_le.0001.dpx

\*NUCODA\_LAYER 6015\_v002 -matte.r S:\Undead\Media\VFX\Mattes\mt\_003\le\mos\_reel03\_scn0043\_shot6015\_v002\_mt\_004\_le.0001.dpx

\*NUCODA\_LAYER 6015\_v002 -matte.g S:\Undead\Media\VFX\Mattes\mt\_003\le\mos\_reel03\_scn0043\_shot6015\_v002\_mt\_004\_le.0001.dpx

\*NUCODA\_LAYER 6015\_v002 -matte.b S:\Undead\Media\VFX\Mattes\mt\_003\le\mos\_reel03\_scn0043\_shot6015\_v002\_mt\_004\_le.0001.dpx

\*LOC: 03:00:08:15 RED RGB Left + Right Mattes

### This example EDL will:

- Import and place the the main shot on the timeline
- Create a colour layer named Primary
- Create a UserFX layer called Matrix with Gamma Matrix effect in the layer
- Create six separate colour layers each with Mattes set as specified in the EDL using the Red, Green and Blue channels respectively.

### Luma matte example:

TITLE: Pxr  
FCM: FILM

001 Alphafill V C 00:00:00:01 00:00:00:07 03:00:00:01 03:00:00:07

\*FROM FILE: H:\Pxr\AlphaFill.0000.exr

\*NUCODA\_LAYER Primary

\*NUCODA\_LAYER Index\_0 -matte.i 0 0 0 H:\Pxr\AlphaFill.0000.exr

\*NUCODA\_LAYER Index\_51 -matte.i 51 51 H:\Pxr\AlphaFill.0000.exr

\*NUCODA\_LAYER Index\_153 -matte.i 153 153 H:\Pxr\AlphaFill.0000.exr

\*NUCODA\_LAYER Index\_204 -matte.i 204 204 H:\Pxr\AlphaFill.0000.exr

\*NUCODA\_LAYER Index\_255 -matte.i 255 255 H:\Pxr\AlphaFill.0000.exr

\*NUCODA\_LAYER Index\_255 -matte.i 1 255 H:\Pxr\AlphaFill.0000.exr

### This example EDL will:

- Import and place the the main shot on the timeline
- Create a colour layer named Primary
- Create six separate colour layers each with Mattes set as specified in the EDL using the index numbers and in the last case, a range of indexes to create the matte.

### Import EDL

On importing the **EDL** into Nucoda there are options to import locators and LUT layers, if you need these options, make sure to select the options.

The **\*NUCODA\_LAYER** options will be imported and created automatically if they are in the EDL, if the media required for the mattes is not available, layers will be created but mattes will not be assigned.

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