Nucoda

Colour and Finish

New Features Guide for 2019.2 016

Contents

What's new in Nucoda and Phoenix 2019.2

Reprise License Manager

- Reprise replaces the current license system
- New licenses are placed in the same folder and are a .lic file - the file name does not matter
- Added support for RLM Dongles (additional charge)

DVO Updates

DVO Clarity

- Algorithm update - Improved look, quality and computational precision.
- New features - Both internal (e.g. safety mechanisms) and for user control (Sharpness)
- Improved look relates to a better balanced sharpness:

    - +1 should correspond to previous versions of Clarity, whereas
    - 0 is the new default, and
    - -1 could be recommended for material with heavy grain or just for a softer look.

- The different profiles may   also have an effect on grain/noise reduction. Impact/difference obviously depends on other parameters, but should be clear if heavy grain reduction is applied.

DVO Scala

- Release version
- Increased computational precision.
- Performance optimizations.
- AVX2 requirement remains.
- Additional features/parameters for Aspect Ratio, Zoom, Offset, Blanking
- Processing for Half/Float available (automatically selected)

Colour Management and LUT's

To make things clearer for new users we have minimised the use of CMS (Colour Management System)

- CMS had been renamed to LUT in Colour Management menu
- No separate CMS or CMS path effects -
- The new LUT effect replaces both (combined version of CMS Path and CMS)
- Apply LUT option (used to be Apply CMS) can now be on any output format

- Tetrahedral LUT support

  - The Tetrahedral LUT option uses a different method of interpolating between LUT point, this could make a difference to combat image banding due to low resolution LUT.
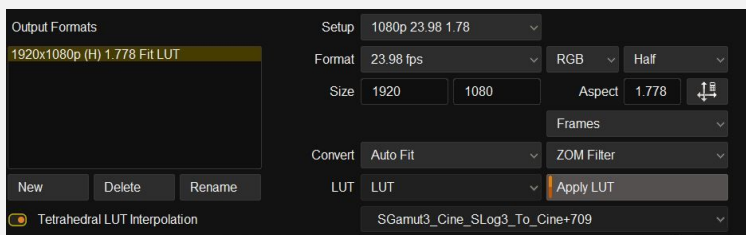

- The Tetrahedral option can be turned on for all LUT;s in the project or on a per LUT basis in the LUT effect.
- It is possible that there could be a small performance hit when using Tetrahedral interpolation.|
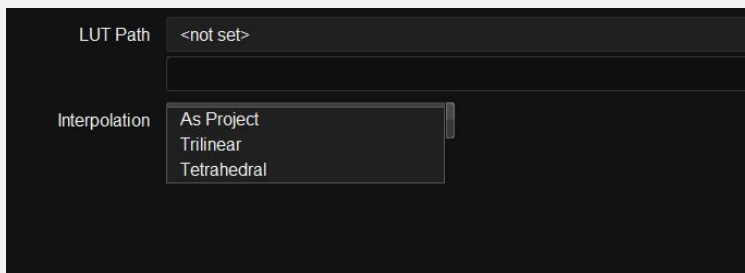
Scopes and Measurement

- A magnifying function has been added to the image canvas - use the new magnifier icon to turn on magnify mode,click and hold the left mouse button while on the image canvas for a magnified view - use scroll wheel to zoom in and out of the window.
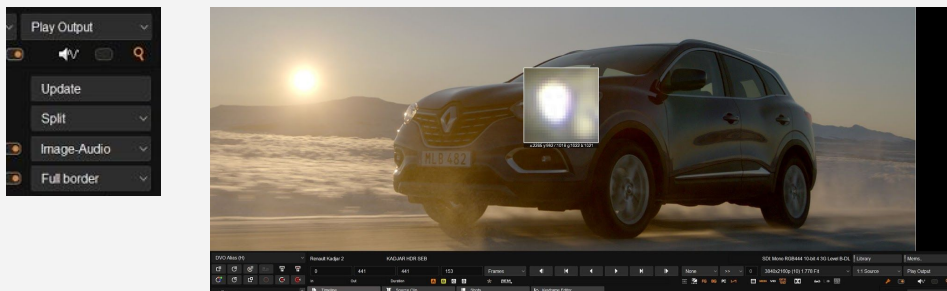
- Gamut Warning when using CIE Scopes
- The gamut warning is accessible from the setup menu
- Turn it on in the "safe colour display" menu and choose how to show the affected areas, Option are Red and Heat Map
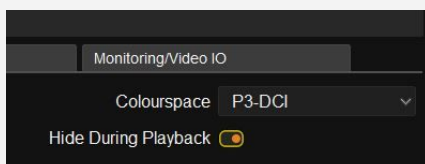
- Set the working colour space - it should match the monitor.
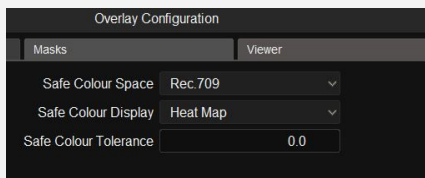
- Set the Safe colour space - colour that are outside this gamut will have a waning displayed as Either Red or Heat map, depending on the setting in safe colour display.
- Safe colour tolerance default is 0
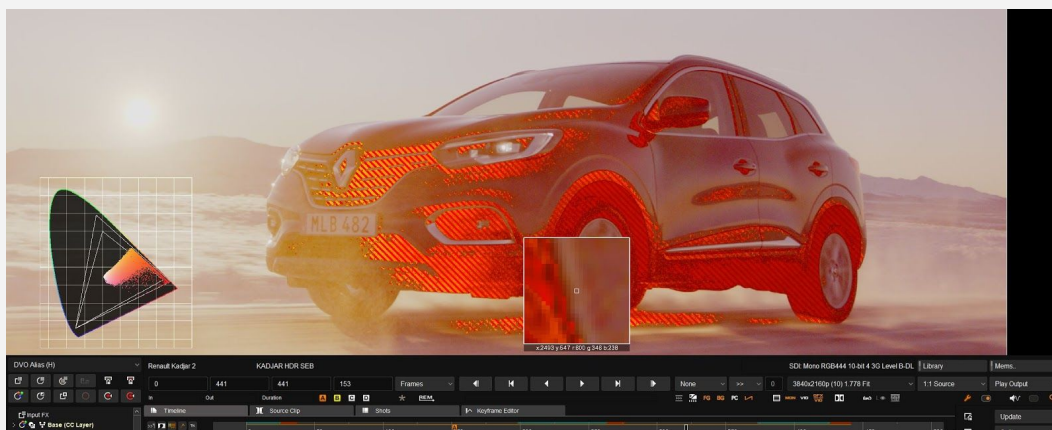
EDL

- New EDL commands to create and assign Effect Layers with LUT effect and LUT's
  Please see the **Guide to Matte, EDL and Stereo Enhancements** at the end of this document
- Failed EDL import will attempt to display the line where the error has occurred

Timeline

- Timeline editing functions like Add Scene Edit and Add Edit Cut are now available in Segment Mode
- Restrictions have been removed allowing users to permanently work in segment mode
- *Change in behaviour -* In segment mode, to copy a clip, use "d" when you click and drag
  ("d" replaces "c")
- *Change in behaviour -* Timeline editing - remove cuts from clip hotkey is now Alt-C

Memories and Recall

- *Change in behaviour -* Copy All Forward/ Backward will not copy Input FX Layer or Dolby Layer -

Export

- Frame Padding default can now be set for new projects - in Conform / Edit preferences

Colour Tools

- LGG no longer clips between layers in Half projects

Video I/O and Monitoring

- Support for AJA Driver 15.1.0.2 and Firmware - new AJA SDK **(2018.3 and 2019.1 build are compatible)**
- Dolby HDMI Tunneling (AJA only)
- Monitoring and I/O controls now in the Setup menu in Nucoda .setting are saved per project.
- New projects will use the setting in preferences
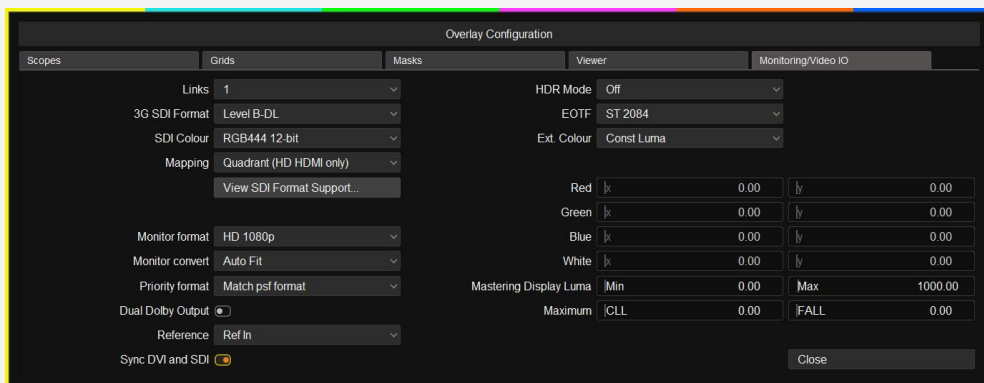
- Support for AJA Kona 5 (no 8k or multi 4k at the moment)
- Added 8K support with Blackmagic 8K Decklink
- Support for 12G (Kona 5 and Decklink 8K) - Currently untested

Dolby Vision - Bug Fixes

- Changes to XML for keyframes and clips that have not been analysed
- Allow multi select to change Analysis Aspect Ratio on multiple clips
- Support for the3.0.2 eCMU Firmware including HDMI Tunneling

Known Issue with eCMU firmware version 3.0.2

Switching between frame rates does not properly initialise the eCMU video output :

When using 3.0.2 and you are setting up the eCMU you may have to toggle the SDI/HDMI switch in the configuration menu to force the eCMU to lock to the incoming signal

We have worked with Dolby to try and find the issue but we have not been able to resolve it before the release of the 3.0.2 firmware.
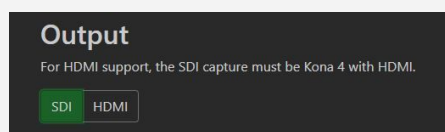
OFX - (Beta) - Fixes have been tested but require user testing

- Support for Sapphire using Mocha from within the Sapphire Plugin using the open Mocha button.
- Support for Mocha Pro - currently the Remove Tool in Mocha causes issues in Nucoda

Monitoring

- The SDI and GUI monitor playback has been synchronized (+-1 frame) - there could be a small performance hit during playback. Can be found in Preferences/Monitoring and IO (second page) and in the setup menu inside Nucoda and Phoenix
- When switching between output formats the Canvas and SDI image will maintain their zoom or fit settings.
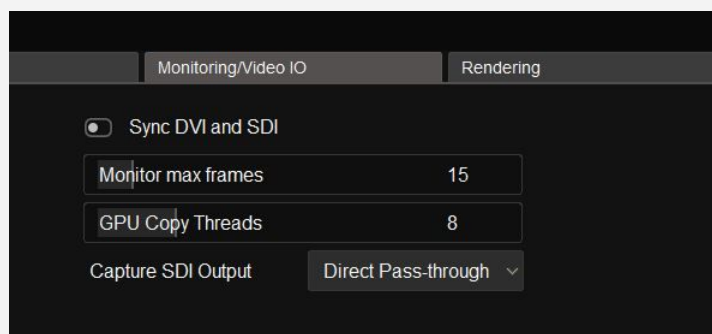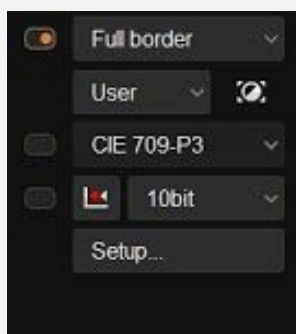
Pan & Scan
New source transform mode and masking based on aspect-ratio

We have made a change to the way Pan & Scan is used in generating masters with different aspect ratios.

The two additions are:

- A drop down menu with a list of common aspect ratios - this is to be used instead of the blanking values to create the masking - this value will be set on all selected clips when updated in the master layer, or if there is a matching Pan & Scan FX layer on every clip.
- This mask will update dynamically and show the correct cropping based on the selected aspect ratio for the output format.

- A new source transform menu - Pan / Tilt and Scale - any transforms made here are applied to the source image and are done before the aspect ratio transform is calculated.
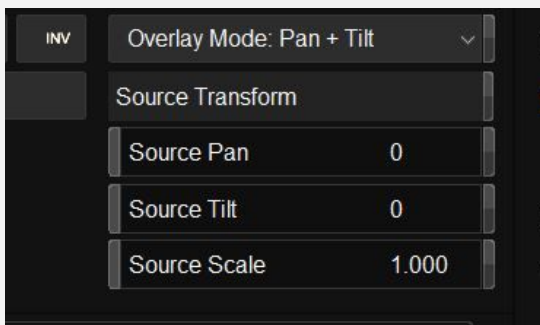
- A typical workflow would be to set up the outputs required with the source format as the main output and then additional output formats for every deliverable.

- In this case the orignal is a 4:3 full aperture frame that needs to be panned and tilted to create the main deliverable which is DCI 4K Flat 1.85 - after that we need the HD 1.7778 version

- Use the transparency option for the masks to make repositioning the image easier, in this case the 1.85 mask is shown as an overlay.
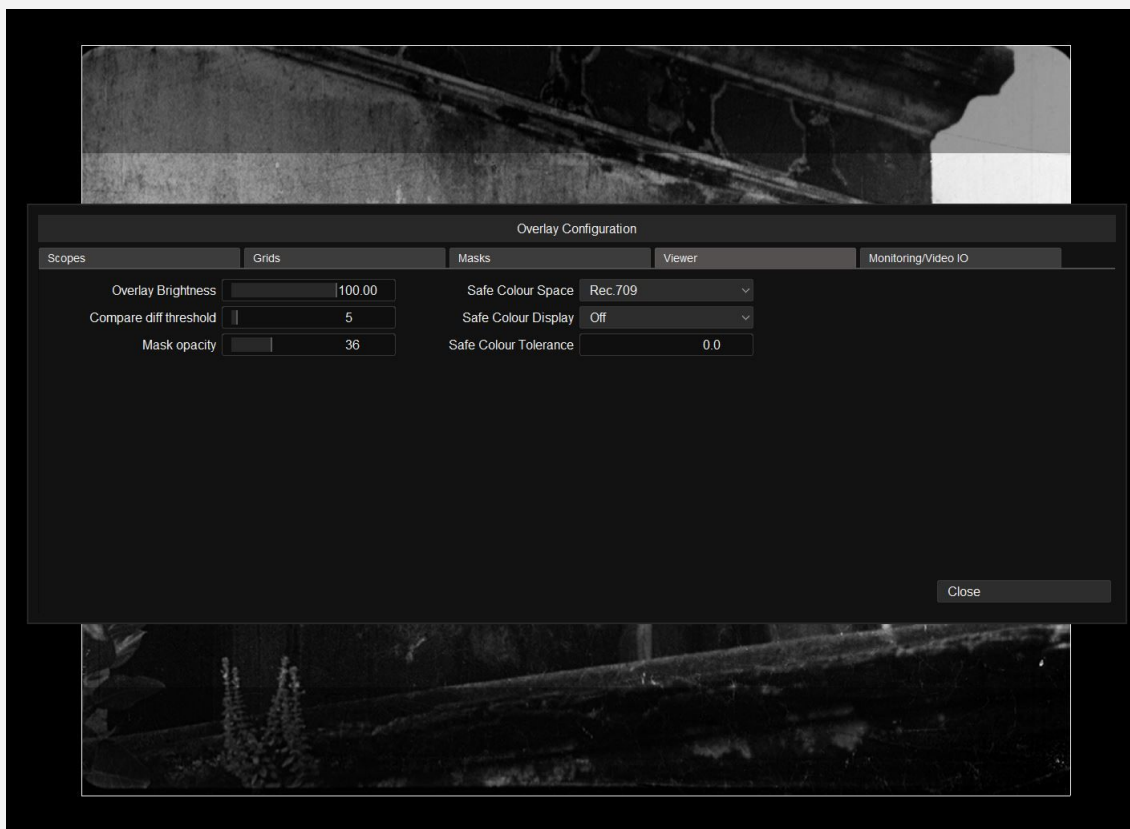
- Once the repositioning is done using the Source Transform tool in Pan & Scan, select the correct aspect ratio for the image from the dropdown in the Pan & Scan tool - select all the clips on the timeline and set the Aspect ratio in the Pan & Scan to 1.85 and set the conversion mode to Auto Crop (you can also do this in the project setup for every output format

- Turn off the mask overlay.

- In DCI 4K Flat the mask will not be visible, however, switching to 1080p 1.7778 will correctly re-calculate the mask for the new resolution and aspect ratio.

Fix, Paint and Matte Paint

Saving the state of the brush tools

In 2019.2 the state of the brushes (size, softness and type) will be stored when they are changed, allowing users to set and keep brush parameters they prefer using. Resetting the parameters must be done using the orange reset buttons next to the values.

Effect reset and Master reset will not affect them.
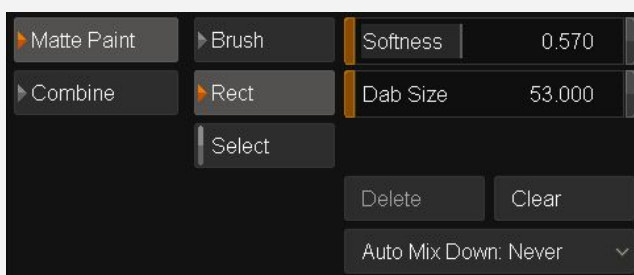
Sony RAW Format updates

- Support has been added for the latest Sony X-OCN formats including:
- XT Support for all Venice and CineAlta bitstreams

    - Venice X-OCN 4K 2.39:1 LT
    - Venice X-OCN 4K 2.39:1 ST
    - Venice X-OCN 4K 2.39:1 XT
    - Venice X-OCN 6K 2.39:1 LT
    - Venice X-OCN 6K 2.39:1 ST
    - Venice X-OCN 6K 2.39:1 XT
    - Venice X-OCN 6K 16:9 LT
    - Venice X-OCN 6K 16:9 ST
    - Venice X-OCN 6K 16:9 XT

File format support

- V210 archive export added
- H.264 and V210 will read and display correct framerate in library
- Improved playback of camera and Avid generated AVCI files and XAVC 4K
- Fix to XDCAM metadata showing 51Mbit instead of 50Mbit
- Speed up ProRes MXF file playback
- Fix clipped highlights on certain DNG files
- Correct offset TC read from certain Avid created XAVC, AVCI and ProRes MXF media
- Incorrect TC read from some Avid generated AVC-100 and XAVC files

Guide to Matte, EDL and Stereo Enhancements

Revision 3 - April 2019
Nucoda 2016.1 - Index Matte added
Nucoda 2018.3 EXR Extended Mattes
Nucoda 2019.2 Enhanced LUT assignment (not released)

EDL Enhancements - Layer and Matte additions

- In order to simplify workflows where multiple mattes and layers are involved in a production we have added the 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.

Matte Tool - Using mattes from multilayer EXR files

This update to the matte effect allows Nucoda to extract mattes from inside a multilayer EXR file. MAttes can be assigned automatically using the EDL. Please note, only the DataWindow display in the EXR is supported. Please see 2019.1 New Features for a full description of the new EXR Multi matte support

Syntax for EXR Layer additions to the EDL

*NUCODA_LAYER [layer name] [-effect <effect-id>] [-matte.part.channel]

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

      [-effect <effect-id>] - optionally add effect to layer on creation - see end of document for effect ID list.

      [-matte part.channel] - Set matte part and channel (this will depend on the EXR file)

This example EDL will:

- Import and place the the main shot on the timeline
- Add a layer called Shirts and set the Matte input to use the Part called CharMatte10 and channel R
- There is no need to specify the filename - if there is no filename we will use the file that was imported to the timeline as the source.

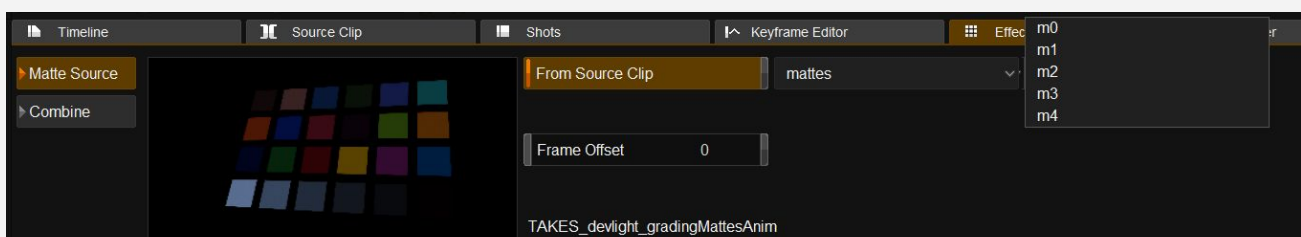   TITLE: WIR Mattes
      FCM: FILM

      001 WIR V   C   00:00:00:01 00:01:07:05 01:00:00:00 01:01:07:04

      *FROM FILE: S:\media\EXR-Mattes\wdasMultipartEXRtest\WIR_244.0_011.00_364_main.0001.exr
      *NUCODA_LAYER Shirts -matte.part charMatte10.R
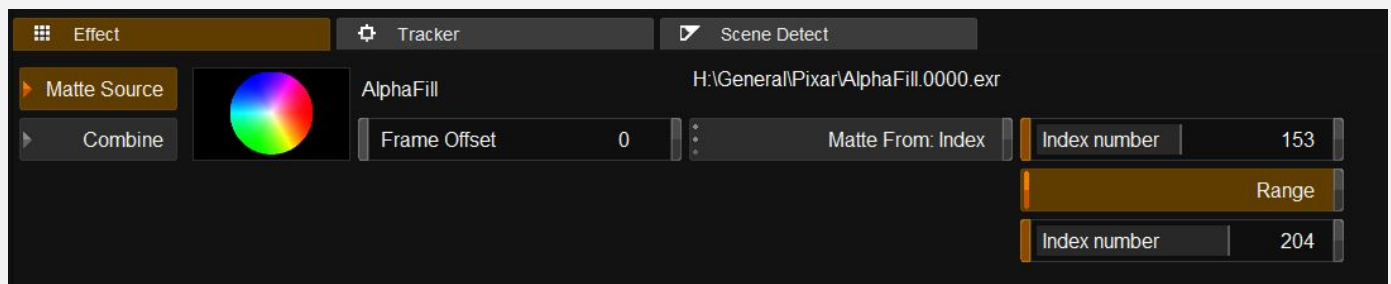   *NUCODA_LAYER Noses -matte.part charMatte3.B

Matte Tool - Using the Index Matte option

This update to the matte effect will let the user specify one or a range of grey scale 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.
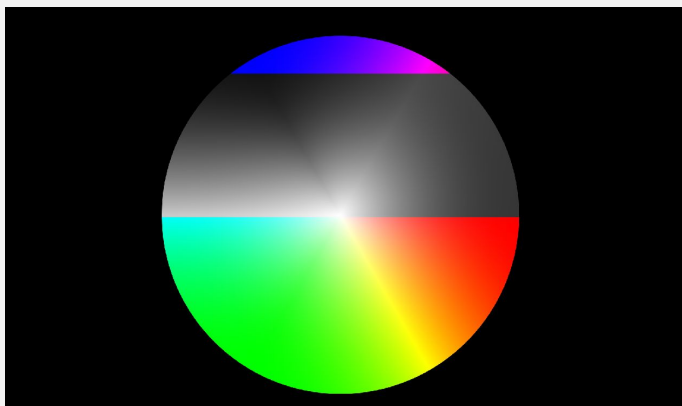
Mattes can be created using a single index value or a range of values.

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.

Syntax for matte additions to the EDL

*NUCODA_LAYER [layer name] [-effect <effect-id>] [-lut <path and LUT name>]
[-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 end of this doc for effect list.

[-lut <path and LUT name>] - Adds a LUT Effect in an effects layer and sets the LUT

> **Example:**
>
> * NUCODA_LAYER LUT_Test -lut "D:\example.cms"
> * NUCODA_LAYER LUT_Test2 -lut D:\cool.cms -tetrahedral
> * NUCODA_LAYER LUT_Test3 -lut "Log to CGR - generic s-curve.cms"
> * NUCODA_LAYER LUT_Test3 -lut "f:\Extras\Log to CGR - generic s-curve.cms"

Quotes are not needed if the filename has no spaces. If the filename doesn't contain an "x:\" the path is taken relative to the ImportLutFolder preference, otherwise it's taken as an absolute path.

You can optionally add -tetrahedral or -trilinear to force the interpolation mode (by default it will be "From Project").

The behavior with quotes and absolute/relative paths has also been added for the ASC_Inp and ASC_Out commands.

[-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.

Other available extensions in the EDL

* FROM FILE: <file path and filename> to conform media

* LOC: <timecode> <locator color> [Locator information] ***Note: This bookmark is a segment bookmark***
Locator colours: BLUE | CYAN | MAGENTA | ORANGE | RED | WHITE | YELLOW

* 00:58:22:00 Timeline Bookmark ***Note: This bookmark will always be red***

* ASC_Inp <LUT Name>
  LUT is added to Base or Master layer before the Channel Mixer - check colour preferences to choose
  Base or Saster layer

* ASC_Inp <LUT Name>
  LUT is added to Base or Master layer before the Channel Mixer - check colour preferences to choose
  Base or Saster layer

* ASC_Out <LUT Name>
   LUT is added to Base or Master layer before the Router

* ASC_SAT <Saturation Value>
If the ASC_SAT value is before the ASC_SOP values, the SAT values are placed in Saturation in the
colour layer. Else it is placed in the HLS tool.

* ASC_SOP <(Slope Values) (Offset values) (Power Values)>
Up to 6 decimal places are supported

Matte import EDL Examples - please note that line breaks are not supported

This example EDL will:

- Import and place the the main shot on the timeline
- Create a colour layer named Primary
- Create a User FX 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.

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

Luma matte example - using the index

This example EDL will:

- Import and place the the main shot on the timeline
- Create a colour layer named Primary
- Add a blue segment bookmark with a comment "Graded"
- 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.

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

*LOC 03:00:00:00 Blue Graded

*NUCODA_LAYER Index_0 -matte.i 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 12 255 H:\Pxr\AlphaFill.0000.exr

Import EDL...

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

Nucoda and Phoenix effect names

Use the Effect ID as the identifier for adding effects to projects using the extended EDL functions

Effect Name	Effect ID
3:2 Add/Remove..	ThreeTwoPulldown
3:2 Auto Remove...	ThreeTwoRemove
Balance...	Balance
.	Blend
Blend..	Blur
Blur...	BrightnessContrast
Brightness Contrast (Bright Contrast)...	BrightnessRegions
Brightness Regions (Bright Regions).....	ChannelAlign
Channel Align..	ChannelCombine|
Channel Combine..	ChannelExtract
Channel Extract...	ChannelMixer
Channel Mixer...	CloneColor
Clone Colour...	NucodaCMS
CMS...	NucodaCMSPath
CMS Path...	Color
Colour..	ColourSpace
Colour Convert..	DiifferentialColorCorrect
Colour Curves (Col Curves).......................	Composite
Composite..	Convert
Convert...	Dissolve
Dissolve...	DvoAlias
DVO Alias...	ApertureCorrection
DVO Aperture..	DvoBrickwall
DVO	DvoChroma
Brickwall..	DvoClarity
DVO Chroma..	DvoCrossColour
DVO Clarity..	DvoDeinterlace
DVO Cross	DvoDirtMap
Colour...	DvoDropout
DVO Deinterlace...	DvoDust2
DVO Dirt Map...	DvoDustO
DVO Dropout..	Deblotch
DVO Dry Clean...	ASC3
DVO Dust GT..	DvoDeflicker
DVO Fix..	DvoFrame
DVO Dust..	DvoGrainO
DVO	AGR4
Flicker..	DvoLineSync
DVO Frame...	DvoNoise
DVO Grain GT...	DvoPixel
DVO	DvoRgbAlign_Seq
Grain...	DvoRgbAlign
DVO Line Sync..	DvoRegrainRGB

DVO Noise..	DvoRegrain
DVO Pixel...	DvoSuperZoom
DVO Print Align (Seq)................................	DvoScratchTarget
DVO Print Align...	DvoSharpen
DVO Regrain RGB.......................................	DvoSharpen2
DVO Regrain..	DvoVariTimeSource
DVO Scala (Demo).....................................	DvoVariTime
DVO Scratch Target...................................	DvoSteady
DVO Sharpen..	DvoSteady2
DVO Sharpen..	S3DColourAlign2
DVO Speed Source.....................................	DvoThreeTwo
DVO Speed...	DvoTwister
DVO Steady..	DvoUpscale
DVO Steady II..	DvoDewarp
DVO Stereo Fix..	DvoZoom
DVO Three	Fade
Two...	FieldDomCorrect
DVO	FieldRemove
Twister...	FieldSwap
DVO Upscale..	GammaMatrix
DVO Warp..	HLSColorCorrect
DVO Zoom..	HueCurves
Fade Colour..	Invert
Field Dom Correct.....................................	KelvinTint
Field Remove...	Keyer
Field Swap...	LensDistort
Gamma Matrix..	RGBMLevels
HLS Colour Correct (HLS).........................	LiftGammaGain
Hue Curves...	LinearToLog
Invert..	LogToLinear
Kelvin and Tint (Kelvin Tint)...................	MeshWarper
Keyer...	Paint
Lens Distort..	PanAndScan
Levels..	PQMatrix
Lift Gamma Gain..	PrinterLights
Linear to Log...	DvoQuadBalance
Log to Linear...	DvoReflicker
Mesh Warper...	Reinterlace
Paint..	Retime
Pan and Scan (Pan Scan).........................	RGBMCurves
PQ Matrix..	RGBAover
Printer Lights (Printer).............................	S3DColourAlign
Quad Balance..	Saturation
Reflicker...	SlopeOffsetPower
Reinterlace...	SoftClip
Retime...	DvoTestPattern
RGB Curves...	Warper_4
RGBA Over (Over).....................................	Warper
S3D Colour + Align....................................	
Saturation..	
Slope Offset Power (SOP).........................	
Soft Clip..	
Test Pattern...	
Warp 4...	
Warp 9...	

Digital Vision World
21 Poplar Business Park
10 Prestons Road
E14 9RL
London
United Kingdom

+44 (0) 3330 148 148

Digital Vision
Sweden Filial
Sankt Eriksgatan 63A,
112 34
Stockholm
Sweden

+44 (0) 3330 148 148

US Service address
ALT Systems,
7642 Clybourn Avenue
Sun Valley
CA 91352
USA

+1 (818) 504 6800

Nucoda

Colour and Finish

New Features Guide for 2019.1

Library

Interactive thumbnails in Library

Moving the mouse pointer over the small timeline below the thumbnail will scrub the contents, clicking will set the poster frame for the clip. Any source mark in or out point will also be shown.
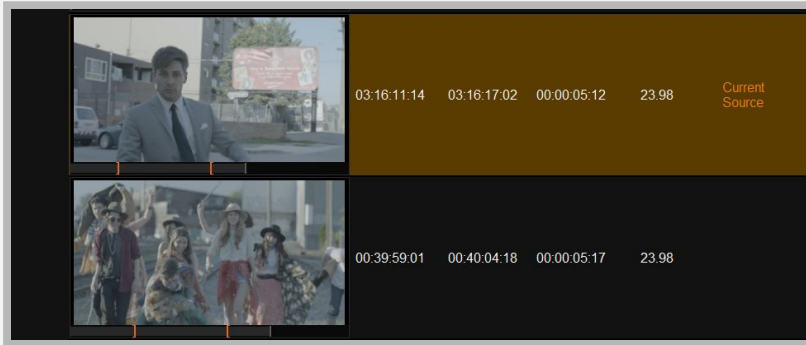
Source replace while preserving effects

Used to replace source on the timeline but preserving effects

The new source replace command will allow replacing of material on the timeline with a different source, but will retain any cuts or effects that were applied to the original.

The effect is used on a per track basis and the replacement material should be the same length as the original material being replaced.

The replacement is done purely on the source length and position, so even sources with mismatched timecodes can be replaced. Typically it is used for mixdowns, eg: a reconform at a higher resolution or possibly a rescan of archive material.

To use:

Right click on new source -> Overwrite -> Overwrite new source, keep effects
Hotkey Alt B, Alt E

Select the replacement clip in the library, place the playhead at the start of the mixdown clip on the timeline and use mouse or hotkey - without moving the playhead, repeat this for every video track in the composition, make sure to deactivate other tracks.

"From Source" option for Matte Effect

It is no longer necessary to select a clip in the library to set it as its own matte source, simply click the **From Source** option in the **Matte Source** tool and we will set the source clip as the matte source.
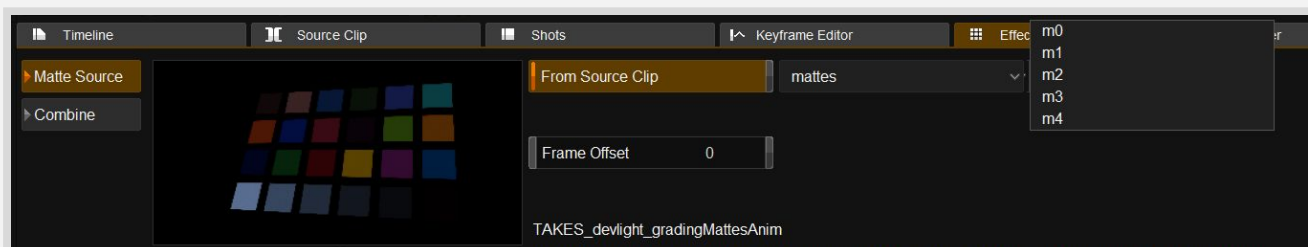
DVO Tools

Updates to current tools

DVO Dirt Map - Added option for spatial processing
DVO Steady II - Option for analysis at lower resolutions

New - DVO Dust GT

Dustbusting features very similar to DVO Dust, but optimised for performance.
Results may differ slightly from DVO Dust

Beta Access to features

DVO's

For the first time we are making some new tools available in a Beta state - they are marked as such in the effects list and you should not use them if you are not comfortable with using beta software in a project. Also please note that these may not be released in the next version.

DVO Scala - This is a preview of our new upscale technology - it is designed to automatically scale to the current output format - there are controls for Sharpness and Image noise level - it will only be available to users with a full DVO license or DVO Convert license.

Notes on the current parameters:

Source Grain Level

If you don't have grain/noise, choose "Minimal" to not lose detail, otherwise try and set it in relation to how grain/noise affects what should be a clean line. Very important to understand that this parameter always have a meaning regardless of "Output Grain Suppression".

Source Detail Level

This will try and preserve details, but not only about "clean lines" actually more about other things. You may need to balance this in regards to grain/noise. Somewhat related to keeping things sharp.

Output Grain Suppression

Refers to grain suppression of the whole image and impact depends on the "Source Grain Level".

Sharpness

Algorithm variations for keeping/making things softer or sharper. Also use Source Detail Level for keeping things sharp.

FINAL IMPORTANT NOTE

Memory usage is not yet optimized and mostly relates to the input format. Please note that you can crash the application if you don't have enough memory.

Technically a full frame 4K as an input frame, will have a memory load of 15.5Gb. A 1080p frame will have a load of 3GB ... this refers to the input format and will vary depending on your output format - but less so.

This tool requires AVX2 capable processors - processors older than 2014 will not work.
Check the Intel website for compatibility - it is not fully optimised, but we would like feedback on quality.

DVO Speed Source

The first version of new retime tool with DVO motion analysis - this tool makes vari-speed motion effects easy to achieve.

Apply to the clip and switch to Source view (Q) you are now able to set the speeds and keyframes based on the original source material, once you are done, switch back to Output view and the correct calculations will be made for the render.

This tool will be included as standard with Nucoda and Phoenix and will not require a license.

We would appreciate your comments and feedback.
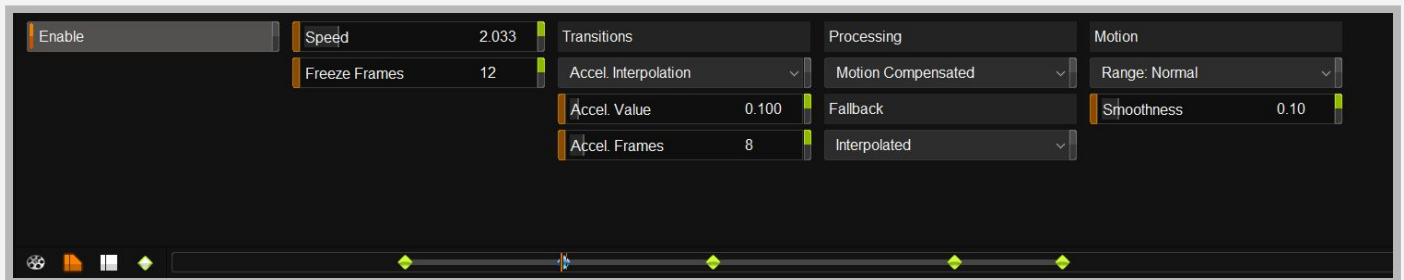
 The effect can be used in an effects layer (not only input FX) - opening up a some creative possibilities.

Parameters:

Speed: 0.50 - 10.000 - Default is 1.000 (normal speed) 0.500 is half speed.

Freeze Frames: Locate the frame you want to freeze - enter the amount of frames you want the freeze frame to be and set a keyframe.

Transitions - this affects how the changes between keyframe values will be calculated

Immediate -Change applied immediately upon reaching the keyframe
Accel Value -Distance from the keyframe at which point the transition to the new speed will be applied
Accel Frames - Number of frames from the next keyframe that the transition to the new speed will be applied.
Accel Interpolation - Automatic interpolation of the values

Current limitations:

 - No reverse (use in conjunction with Retime)
 - Frames cannot be animated backward in time

2019.1 - New Hotkey types - Dual and Hold hotkeys

There are only so many keys available on the keyboard, we have a lot of hotkeys, and we keep adding more. So we have implemented two new types of hotkey that will allow us to use the keys we have more effectively.

We are not jumping all in, but have remapped some common features using this function, and it is possible that we may remap more in the future.

Dual hotkey

- Two keys (and a modifier) can be assigned as a hotkey - this allows us to group keys in a sensible manner and make use of the same keys for multiple functions.

- By pressing and holding down the first key and then pressing the second key.
- By pressing and holding down a modifier, pressing the first, then the second key

Hold down

- This is as simple as holding down a key for slightly longer than a normal keypress, activating a second command.

Here are some of the first changes we have made:

Dual hotkeys

```
Splice                       : v
Splice Adjustment segment    : Shift v
Splice Black to timeline     : Alt v, Alt b
Splice Aux to the timeline   : Alt v, Alt a

Overwrite                    : b
Overwrite to Source TC       : Alt b, Alt s
Overwrite Preserve Effects   : Alt b, Alt e
Overwrite Adjust segment     : Shift b
Overwrite Black to timeline  : Alt b, Alt b
Overwrite Aux to the timeline : Alt b, Alt a
```

Hold down (the hold time can be affected by the Keyboard settings in Windows)

Add scene cut: c
Add edit cut: c (hold)

Enhanced JKL Functionality

J - Play Backward x1 x2 x3 x5 x8
K- Stop
L - Play Forward x1 x2 x3 x5 x8

K held followed by J - Step back one frame
K followed by J and Held - Play Backward x1/4

(new) K held followed by L - Step forward one frame
(new) K followed by L and Held - Play Forward x1/4

Scene cuts and edit cuts

Important : New behaviour for DVO when adding a scene cut

From 2019.1 adding a scene cut to a rendered clip with a DVO will invalidate the cache and re-render the DVO effect, this is an intended result because adding a scene cut changes the analysis range of the clip.

If a cut needs to be added to trim or remove media, an edit cut can be used - this will not force a re-render and can be added using the GUI, mouse or Precision panel (see below)

Scene cut - cut with a blue line one either side of the cut

Scene cuts are the default when adding a cut to material, the serve a dual purpose:

- Indicate that the timecode one either side of the cut is continuous.
- Used as analysis boundaries for DVO Tools, this means that DVO tools will not use the material before or after a scene cut for analysis or repair.
- Scene cuts cannot be trimmed and will be ignored when exporting source media

Edit cut - black line

This is a normal edit and will allow trimming
.
- Exporting material with edit cuts will result in separate clips being created in source export mode
- Edit cuts are ignored by DVO Tools and extra frames will be used in analysis, even if they are not visible on the timeline. This can cause problems when using DVO's like DVO Flicker.

Toggle scene cut to edit cut

Toggle edit cut to single sided scene cut

Precision panel changes:

Add Scene cut : Cut
Add Edit cut : Cut (hold)
Toggle Scene cut: Ctrl + Cut
Toggle Edit cut to single sided scene cut : Alt + Cut

Single sided scene cut - what is it and why do we need it

DVO Tools automatically use scene cuts as a boundary for image analysis, this means that data from a previous/next scene won't affect the processing of the current scene.

Scene Cut - Continuous timecode
Cannot be trimmed
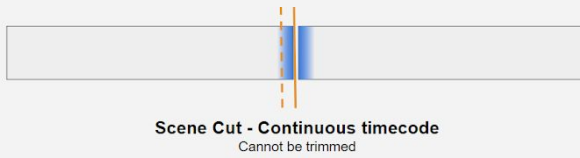
If the material being processed has extra material that must be removed, this would pose a problem for analysis, because there is no scene cut, the analysis would automatically process the trimmed frames (even if there were no visible) sometimes producing unexpected results.

To trim the frames, add an edit cut - switch to trim mode - apply the required trims. Use the right click menu or shortcut keys to change either side of the edit cut into a single sided scene cut.

Edit Cut
Can be trimmed in trim mode
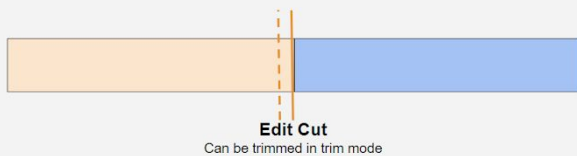
The single sided scene command allows any edit cut to be changed to a single sided scene cut (green line) - this will prevent analysis past the edit cut.
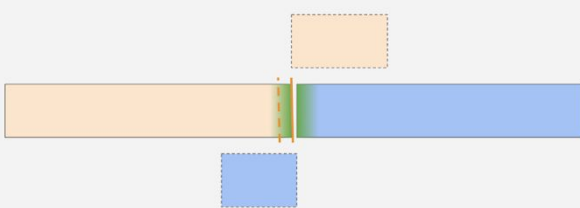
Trimmed material on both clips
Both sides converted to single sided scene cuts
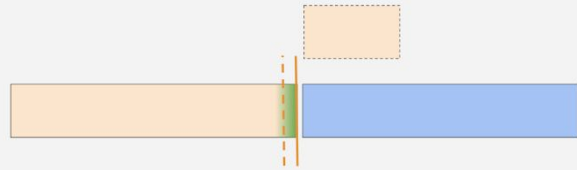
Trimmed material on one clip
Only one side converted to single sided scene cut

Hotkey changes:

Add Scene cut : C
Add Edit cut : C (hold)
Toggle Scene cut: Alt C, Alt S
Toggle Edit cut to single sided scene cut : Alt C, Alt S

Dolby Vision update

Dolby Vision 2.9 and 4.0 - Working with letterboxed content

Taken from Dolby Vision best practices guide

- Avoid using positive values on the LIFT trim control for letterboxed content.
  (negative Lift can be used).
- The current implementation on Ultra HD Blu-ray and some OTT HDMI devices apply the Trims to the letterbox blanking area to allow sub titles to appear over them.
- If the scene contains positive Lift values to raise the target black levels, this may cause the letterboxed area to also lift.
- An alternate way to achieve the desired result is to use GAIN and GAMMA trims more aggressively as these controls are manipulating the tone curve to achieve a more lifted black effect without using Lift.
- If the content matches the canvas ratio, i.e. no letterbox, positive Lift can be used.

Show Blanking

In 2019.1 we have added a function in the Dolby Vision tool to allow you to see the effect of the trims on the letterboxed area. This way you can be sure there is no lift applied.
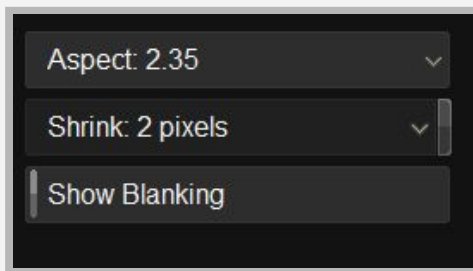
Turning on this function will hide the letterboxing and allow you to see the effect the trim is having on the letterboxed areas. The function will not affect analysis and is purely for viewing, it affects all clips globally.

Analysis - Shrink area (use with care

Due to the way that specifically pillarboxed areas are sometimes calculated it is sometimes possible to have material that has a single black line that may fall into the analysis area.

Example:

Material is pillarboxed with 1.66 mask in a 1920 x 1080 project - the exact calculation means that the blanking on the left and right is 63.4 pixels.

Most users will calculate their images to have a blanking of 64 pixels left and right, rounding up the values. Iit is possible that the left edge of the image will be one pixel smaller than the 1.66 mask used for analysis of images for Dolby Vision mastering

We have added a Shrink option in the analysis menu that will make the analysis area 2 or 4 pixels smaller on the edges, meaning that the black edge will not be used to calculate the analysis. Please note, it is only valid for the analysis phase.

Customisable Measurement and Viewer Tools

User configurable Scopes and other viewer tools

In this version we have added the option for users to display multiple scopes and measurement tool at the same time. It is easily configurable and it is easy to create user presets.

> Please remember - having a lot of scopes on the monitor will affect real-time performance, especially in UHD or 4K and high frame rates. There is an option to not display the tools while playing back.
>
> Currently the scopes can only be placed on the GUI image or on the SDI monitor output.

The ...setup button previously used for CMS setup will now open a Viewer Configuration menu containing option to configure Scopes, CMS setup (if active and Apply CMS is not selected), Grids, Masks, Viewer tools

The region of interest that can be set by clicking and dragging the mouse on the image canvas can now be reset by clicking on the image, or using the reset icon as before
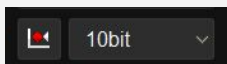
The icon still functions to turn CMS on and Off if "apply CMS" is not activated
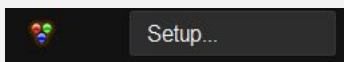
New features:

- CIE Graph with two configurable gamut outlines per graph to display limits
- Choice of working colour space for CIE and Vectorscope rendering - 601, 709, P3, 2020
- Working space will also adjust P3 or 2020 luma coefficients for PQ scope
- Compare Diff threshold can be set interactively (lower value is more sensitive)
- Overlay brightness can be set interactively (HDR function)
- Mask transparency can be set interactively (view only)
- Easy to add Masks and Grids as needed
- Per user presets for scopes, masks and grids - inside the the user folder.
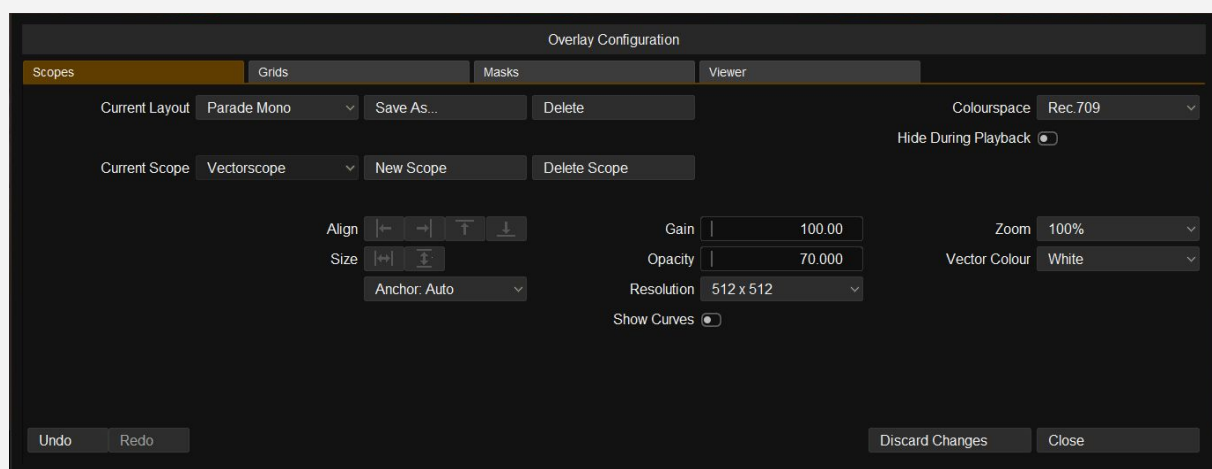
Scopes Tab

- Make sure the curves (top icon) scopes and scopes button is turned on
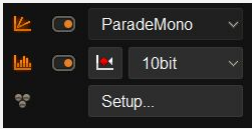
- Click the ...setup button to open the menu - the first tab is scopes.

Create a new or modified layout

The Current Layout list is the same as what you have in the GUI, choose a layout here to customise, click Save As... and enter a name for a new layout. Press discard to return to the last saved position.

Adding another scope to a layout

- Make sure no scope is selected (green outline)
- Choose the scope you want to add from current scope menu
- Press new scope, this will add a scope.
- With a scope selected, changing the current scope will change the selected scope
- The curves are always shown overlaid on the first scope added to a layout, they can be activated for other scopes or added to a layout using the Curves scope preset.
- Curves will only be displayed if it is relevant to the selected tool.
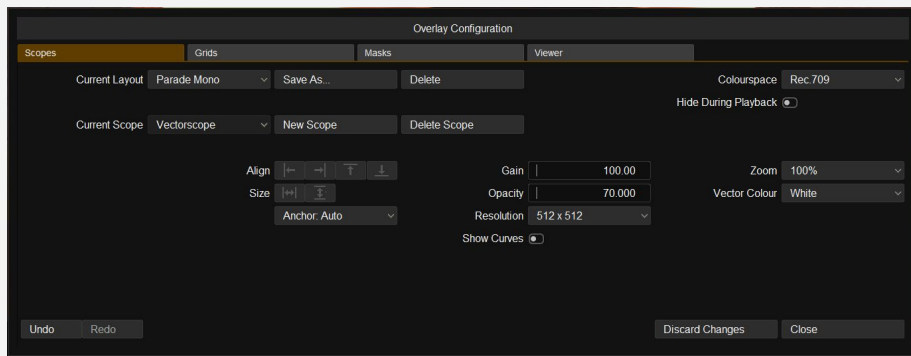
All changes are saved when the close button is pressed.

Select a scope by clicking on the scope, moving over scopes will show a red box, this is to show the scope that will be selected if clicked

After selecting a scope, select a second using ctrl and clicking, the second selection will have a dotted outline and the first a solid outline. The first selected scope is used as the guide to align or resize other selected scopes.

Holding down Ctrl with scopes selected will allow you to move all selected scopes at once.
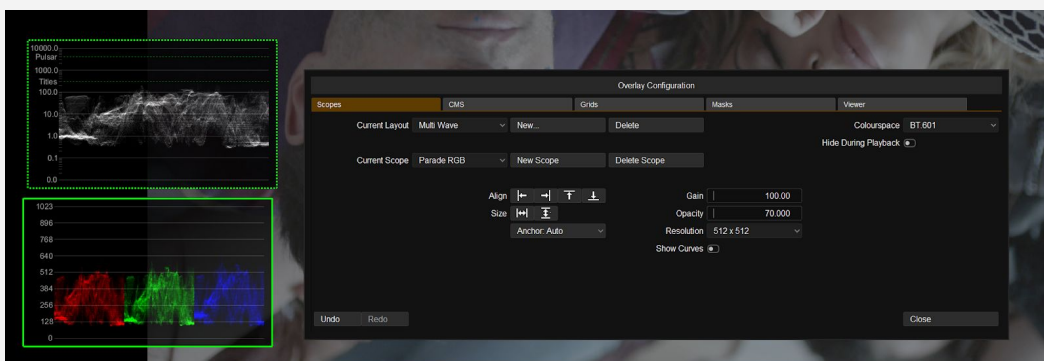
Available settings include:

- Align Left, Right, Top and Bottom - Based on multiple selections
- Match Width and Height
- Gain - Gain of the measurement data in the scope
- Opacity - Opacity of the scope lines and layout
- Resolution - this sets the sampling resolution for the selected scope - 512x512 is the default - higher sampling rates will affect performance.
- Show curves - this will select which waveform will show a curve overlay when curves is selected
- Magnification settings for Vectorscope 200% and 500%
- Green or white display for Vectorscope

The following settings are not saved per layout but are project settings

- Colourspace - choose between BT601, Rec.709, P3, 2020 for Vectorscope and CIE display
- Hide during playback
-

Anchor - this defaults to Auto - it will automatically adjust the origin corner of the scope depending on the size of the screen.

For example: if your GUI is 1920x1080 and you are trying to position a scope bottom right on a 4K SDI screen, the Auto option will automatically jump to that corner once you have moves the scope past half way

CMS Tab

The CMS tab has the same function as it did before - if set - you are able to change the LUT being used, either by using the preset LUT menu or the path. It will not be available if the CMS for the output format is set to "Apply CMS"

Masks and Grids

Please note - the masks and grid tools cannot create boxes or shapes

- In these tabs you are able to add and remove user define masks or grids, select the New button
- Type the aspect of the mask you need - in this case 2.888
- The mask or grid ratio will be derived from the name
- Click delete to remove the selected Mask or Grid
- Masks and Grids are available immediately as a user preset.

Viewer

- Use Overlay brightness for HDR - reduce that levels of keys, shapes drawn on the SDI output
- Use compare Diff threshold to change comparison values for Red and Diff compares
- Use Mask opacity to change the opacity of masks, useful when repositioning material
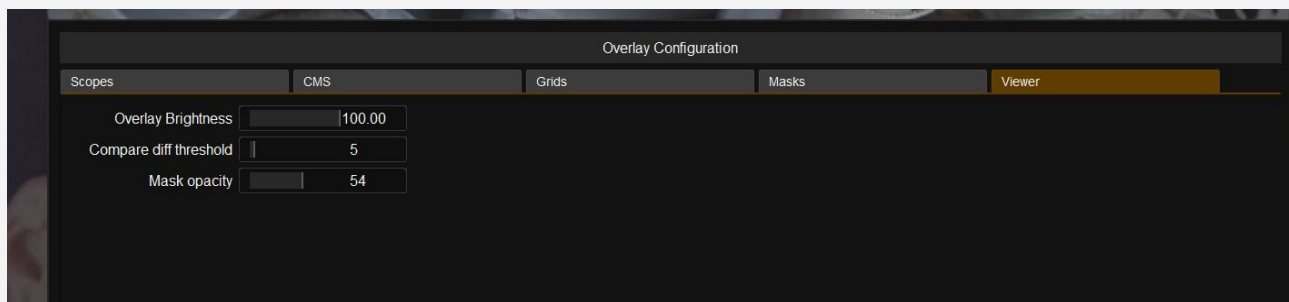
Support for EXR files with multiple embedded mattes

This version supports multiple embedded mattes within Open EXR Files. These special files will generally have a Base image (Main RGB image) and then multiple separate parts that contain images in matte or R G B channels - usually mattes for grading or compositing.

Compressed EXR are supported, but performance will depend on the compression and size of the files, since a very large amount of information can be placed in the files.

- In Nucoda we only support the datawindow in the image - use of the display window is not supported
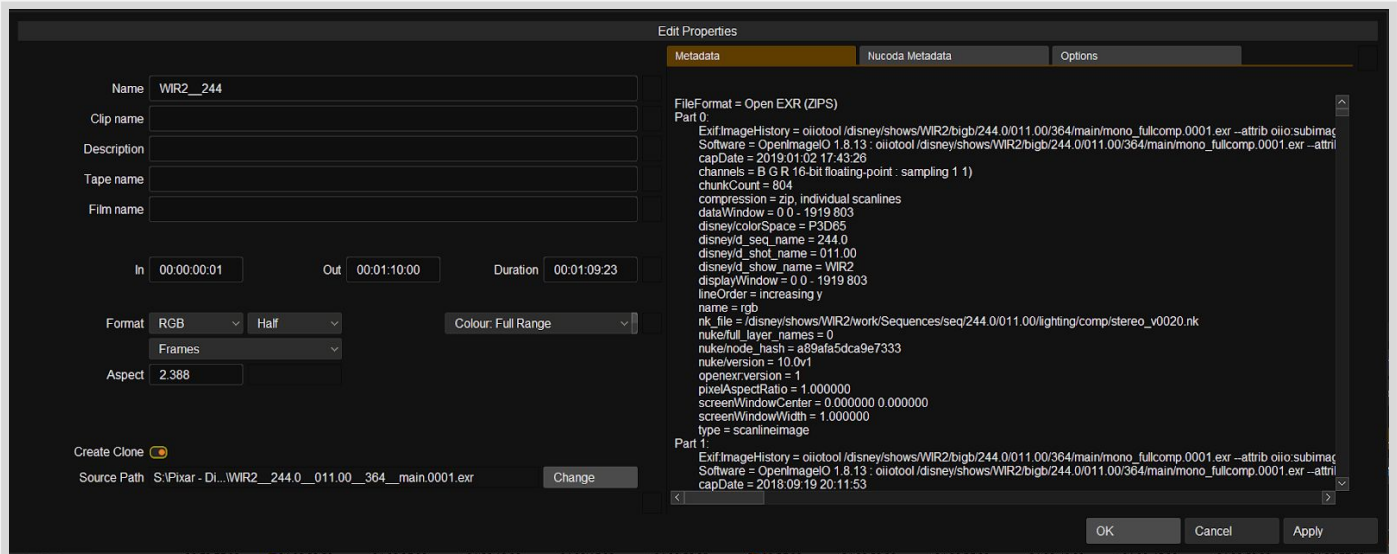
In the Matte Tool in the layer stack, there is a new option to use the Source as Matte, this makes setup much quicker. Once selected, the image is read and we will show the Base image.
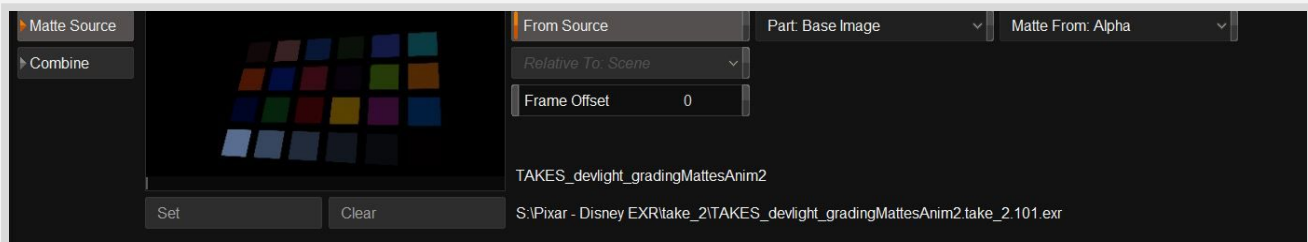
If there are any additional parts they are shown in the list, and any available channels in the part is listed in the order they are in the file. Selecting a part and a channel will select the matte.
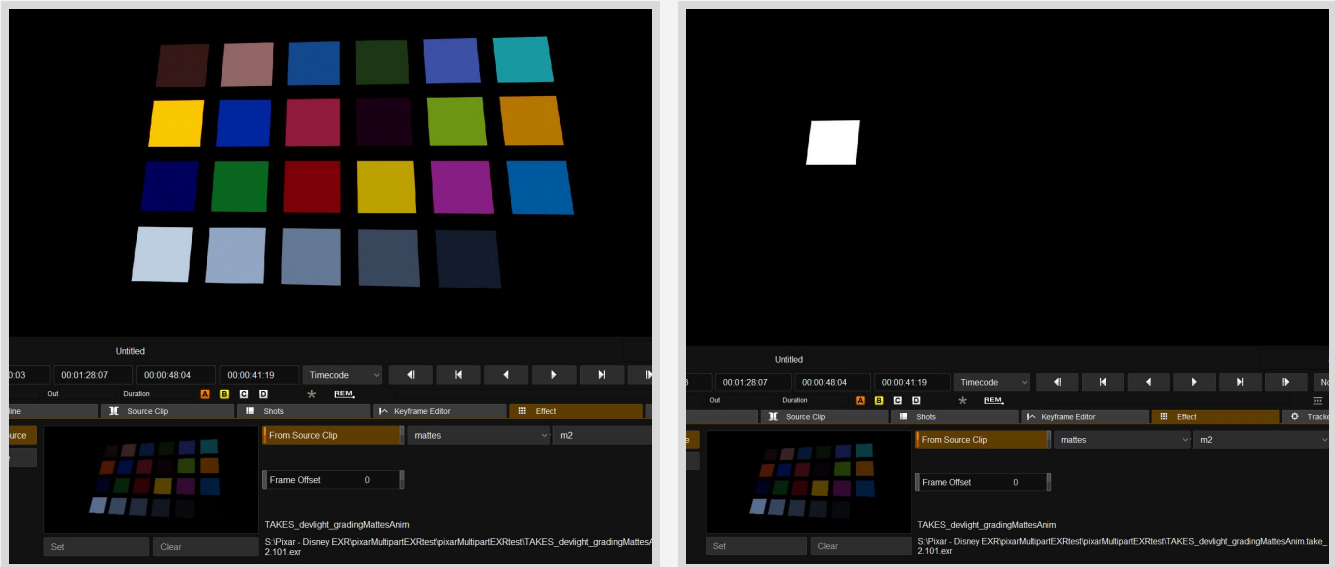
Use the show function in the Router (Show on Precision panel) to see the selected matte

Precision Panel Control

In the Matte tab on the third screen from the left (default) you will find some new controls

- From Source button - This allows you to set a file as its own source, without messing around in the library.
- Matte Part - Name of the part in the file
- Matte from - which layer contains the matte - normally R, G, B or Matte depending on the file type.

Using the knob or rocker switches will allow you to select a Matte Part, and Matte from will let you choose the matte you wish to use - layout is very individual and will depend on the way the EXR are build.

The joystick (hold down until it beeps) will let you either turn or nudge the joystick to select Matte Part and Matte from selections. It will cycle through all the matte and from options, making is really easy to find and choose a matte.

Syntax for EXR Layer additions to the EDL

*NUCODA_LAYER [layer name] [-effect <effect-id>] [-matte.part.channel]

> **[layer name]** - optional layer name - no spaces allowed
> **[-effect <effect-id>]** - optionally add effect to layer on creation
> **[-matte part.channel]** - Set matte part and channel (this will depend on the EXR file)
>
> TITLE: WIR Mattes
>
> 001 WIR V   C   00:00:00:01 00:01:07:05 01:00:00:00 01:01:07:04
> *FROM FILE: :\media\EXR-Mattes\wdasMultipartEXRtest\WIR__244.0__011.00__364__main.0001.exr
> *NUCODA_LAYER Shirts -matte.part charMatte10.R
> *NUCODA_LAYER Noses -matte.part charMatte3.B

This example EDL will:

- Import and place the the main shot on the timeline
- Add layers called Shirts and Noses and set the Matte input to use the correct parts
- There is no need to specify the filename for the mattes - if there is no filename we will use the file that was imported to the timeline as the source.

Digital Vision World
21 Poplar Business Park
10 Prestons Road
E14 9RL
London
United Kingdom

+44 (0) 3330 148 148

Digital Vision
Sweden Filial
Sankt Eriksgatan 63A,
112 34
Stockholm
Sweden

+44 (0) 3330 148 148

US Service address
ALT Systems,
7642 Clybourn Avenue
Sun Valley
CA 91352
USA

+1 (818) 504 6800

Nucoda
Colour and Finish

New Features Guide
2018.3 R2

Source Editor

Source viewer to allow viewing and marking of material using a 3 point editing system

To allow the preview and marking of source clips before editing to the timeline a source mode has been added to Nucoda. Double clicking on a image clip will set the current status of the clip to "Source Clip" and load the clip into the new source clip viewer - located in a tab beside the timeline (access via F3)

Once in the source viewer the clip can be scrubbed and In/ou points can be set to allow splicing or overwriting of the clip into the record timeline. Mark in, Mark Out and Marked Duration columns have been added to the library to indicate whether a clip has been marked for in or out.

Using the source editing mode

Select the clip you would like to trim by double clicking the clip - the status will change to "Current Source" and the interface will switch to the Source Edit tab (F3). This clip remains in the source viewer until replaced by another clip.
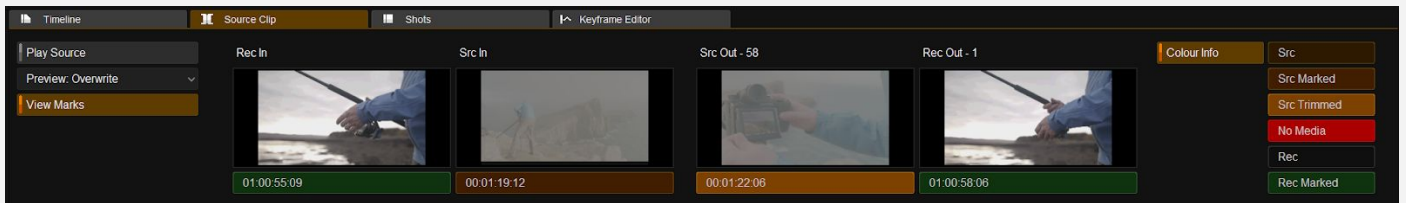
The timeline below the thumbnails will be scaled to allow access to the entire clip. The source is indicated by a grey line, the orange line is the scrub bar, with no in or out point set the timecode boxes appear as dull orange.

Once a in or out point has been set (I or O) the colour in the timecode boxes will change - green for the composition and red for the source.An] or [indicator will appear on the scrub bar and on the image in the viewer. The on screen marks can be turned of using the View Mark button in the source viewer.
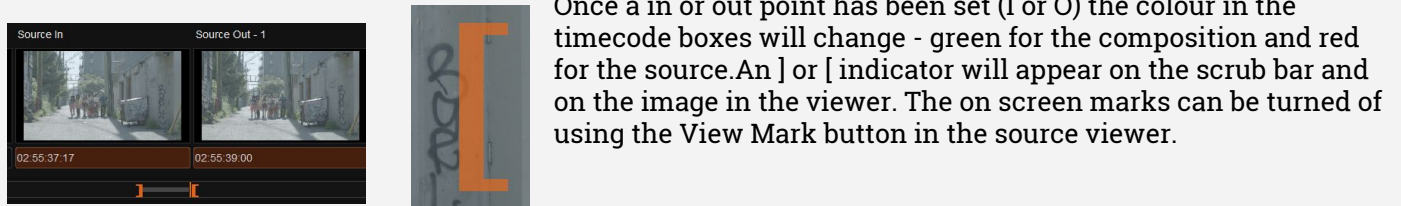
The Colour info button displays the meaning of the different interface colours.
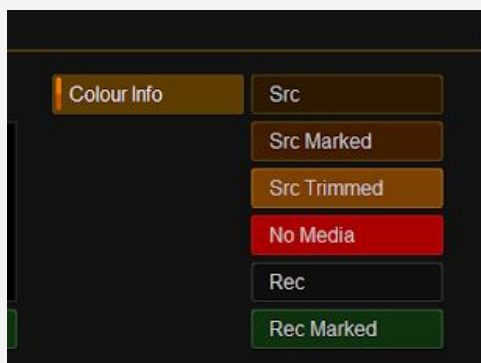
Src - Colour of unmarked source

Src Marked - In / Out point added to source

Src Trimmed - The out point was trimmed to fit

No Media - No enough media to complete the edit

Rec - Unmarked composition

Rec Marked - In / Out point on timeline

Source viewer notes:

The text above the thumbnails wil give information on position and status for example:

- Rec In indicates you are viewing the frame you will replace
- Src Out -1 indicates you are viewing the frame you will replace

- If there is not enough material to make the edit you will receive a warning that there is not enough material
- Compositions cannot be loaded into the source viewer
- To clear In/Out points on a clip, right click on the clip and select "Clear Source Marks"
- Any audio attached to the media will be cut and placed in the same way as the video.

Editing example 1

Adding a specific clip to the composition

- Source clip in and out
- Sequence in or playhead only

The in point of the source clip is placed at the in point in the composition, the duration of the edit is determined by the Source in and out. Seq in point can also be the active playhead.

When using overwrite, the in point of the source clip is placed at the in point in the composition and the media is overwritten until the source out is reached.

Using splice (insert) will use the source in and out and splice the source material into the composition starting at the Composition in point. Seq In point can also be the active playhead.
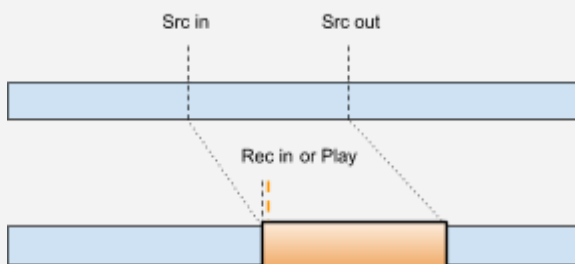
In and Out points are set on the source, only the Rec in point or playhead position is required to perform the edit.

In point will take priority over play head
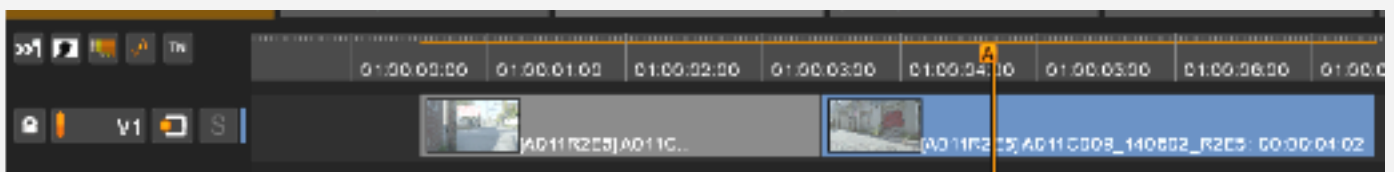
Choose where you would like to place the edit on the timeline, with no in or out points set the playhead will indicate where the clip is to be inserted - the length of the clip is based on the source In and Out.

Switch between source and composition using the Play Source button in the source mode (Alt +F3) or use the tabs in the top.

Use the Preview button to see the result of splicing or overwriting the current source to the timeline. The four thumbnails will indicate what the result will be.

If you are satisfied with the marks, switch to the composition view and splice (V) or overwrite (B) the clip into the composition. Make sure a track is selected. If more than one track is selected the clip will be placed on the top most track.

Editing example 2

- Source clip In only
- Sequence In and Out

The In point of the source clip is placed at the In point in the composition, the duration of the edit is determined by the composition In and Out.

When using overwrite the in point of the source clip is placed at the in point in the composition and the media is overwritten until the rec out is reached.

Using splice will use the source in as as a start and splice the rest of the source material into the composition.
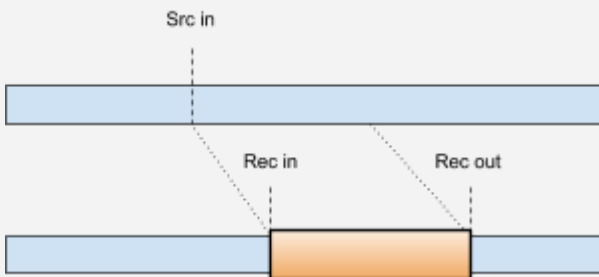
When in and out points are set on the composition side the timecode boxes will have a green overlay to indicate this. In this case, even On the source side In and Out points are indicated with a dark red colour.

If there is not enough material you will not be able to overwrite to the timeline and you will receive a warning dialog.

In the source view there will be a bright red indicator in the timecode box to indicate that there is not enough media.

If there is enough media and the clip is overwritten to the composition, any additional source material will be trimmed. This will also be indicated above the out icon with the word trimmed and the amount of trimmed frames.

Editing example 3

- Source clip out
- Sequence In and Out

When using overwrite (B) the out point of the source clip is placed at the out point in the composition and the media is overwritten until the Rec in is reached.

Splice will use the source start as an in and splice the source into the composition from the rec in point.

If there is not enough media to complete the edit you will receive a warning and the edit will not be performed.
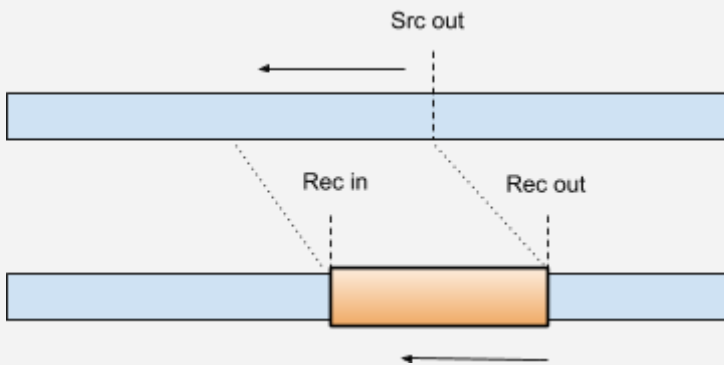
Only an out point on the source but In and Out on the composition, the source will be trimmed to fit when spliced (inserted)

A splice (B) since a splice would use the entire length of the source material after the mark in. If there is not enough media to complete the edit you will receive a warning and the edit will not be performed.

Editing example 4

- Source clip in and out
- Sequence out only

When using overwrite (B) the out point of the source clip is placed at the rec out point in the composition and the media is overwritten until the Rec in is reached.
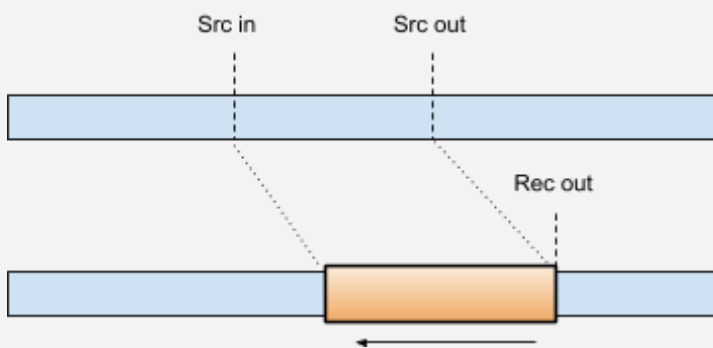
Splice will use the source start as an in and splice the source into the composition from the record out point.

Rec Out only and source in and out marked. Overwrite will write the material forward over the composition. Splice will insert the material from the Rec Out point on the composition.

In case of multiple tracks, where ripple is required the splice must be made to the top most track.

The clip can be moved down to another track if required by selecting Segment mode and moving the clip using the mouse or shift up/down arrow.

Editing example 5

- Source clip in and out
- Sequence in and out

In this case specific source will be spliced to a specific part of the composition. If the marked material is not enough the source is extended automatically.

If there is insufficient material there is a dialog and bright red timecode box to warn the user.
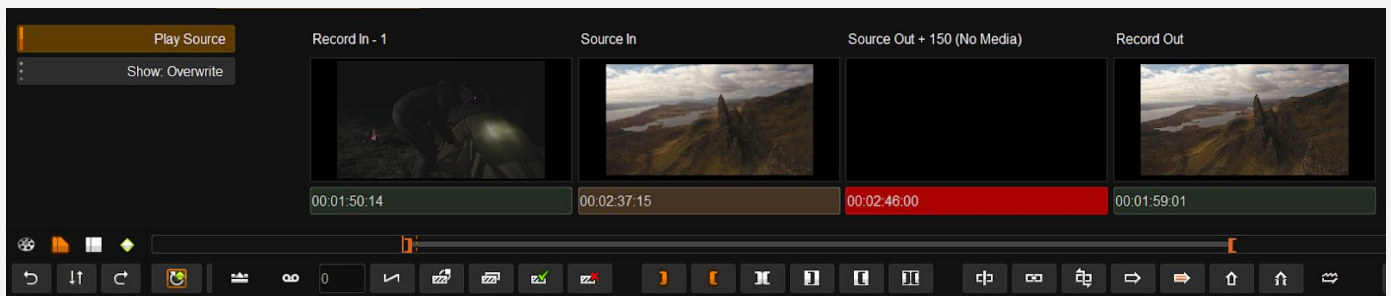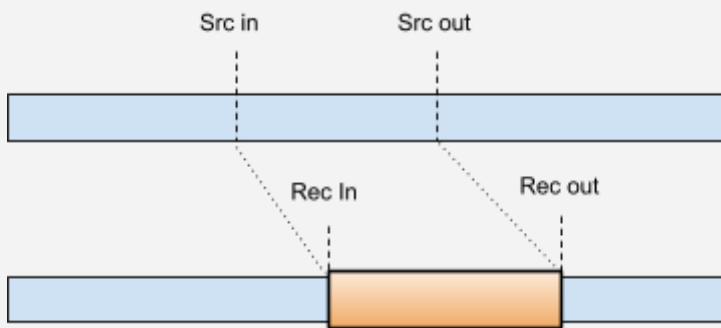
Composition Reports

A new feature has been added to Phoenix and Nucoda to generate a report based on the current open composition. The **Export Report...** button is in the main library menu next to export media.
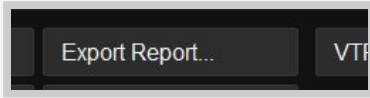
These reports can be useful for:

- Restoration reports
- Reports on VFX shots used in productions

Here you can choose the type of information you would like available in the report. This includes;

- DVO tools
- Colour tools
- Amount of fix strokes made by the operator (this includes per clip and totals)
- Comments in markers (bookmarks)
- Thumbnails

The user can select the sort order for the list based on Timecode sorting options
The report will respect the view state of the tracks - only active tracks are included
Export as Frames or Timecode

Selecting the Export Report button will automatically generate the report.
Making any changes to the required data will allow the report to be regenerated if you want to see the result

To export thumbnails they must exist in the event viewer as the same thumbnails are used.

Once generated, the report can be saved as CSV file (no thumbnail support) or as HTML using the supplied template. The template can be customised for your requirements and can be found in C:\2018/3\Root\Presets\System

The HTML file and a directory with the required data will be saved in the same location. The directory will have the same name as the name you specified for the HTML file.

A custom logo can be added by replacing the logo.png file in "C:\Nucoda\2018_3\root\ReportTemplates" with your own company logo. The html template is also located here.

Information on customising the html template file is in Appendix A.
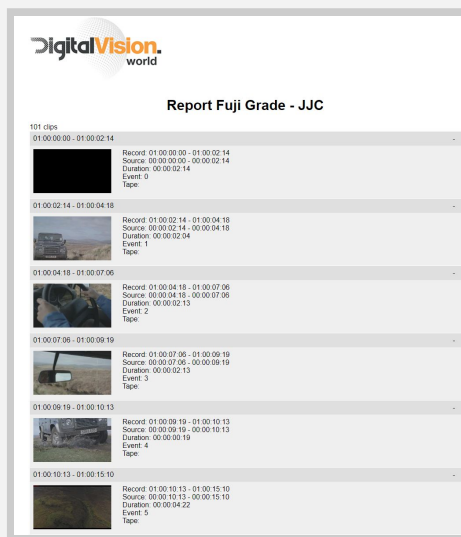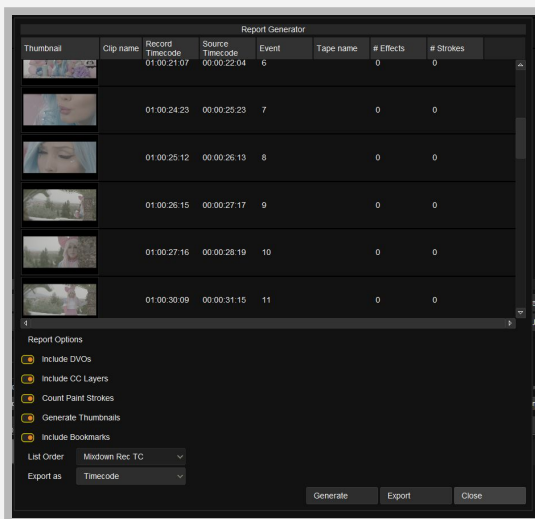
Interface Improvements

Context sensitive right click menus have been added to Nucoda and Phoenix

Menus have been added for the Timeline, Timeline clips, Viewer, Library, Notes & Event view and the Project screen. Menus will display commands and current hotkeys for the command.

Right click anywhere in the GUI to see if there are menus currently available.
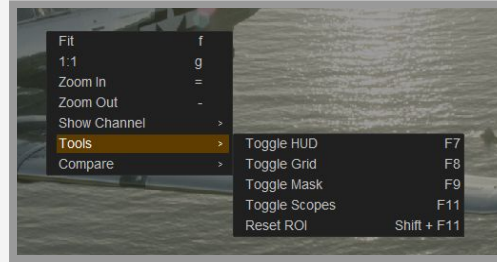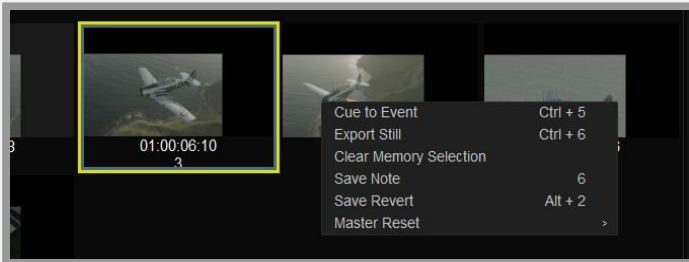
User Default setting for Effects

This version introduces user defaults for effects. It will work with any effect that is applied as Input FX or Effects Layer.

Currently it is only possible to add one User Preset

Presets are stored per user in a folder names EffectDefaults, this will contain all the presets that the user saves. Deleting this folder will delete the presets but will not affect any projects.

The process for saving a user effect is simple

- Add the effect you would like to save a default for (eg Clarity)
- Set the effect to the desired settings
- Right click on the effect and choose "Save Default" from the menu.
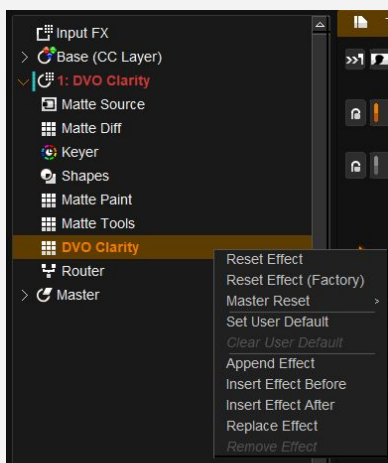
When applied again Clarity will use the new values as the Defaults.

- The effect will show as edited in the layer stack (Bold)

Other options in the menu:

- Reset effect (same as reset in the GUI) - will reset the effect back to user default (if it exists)
- Reset Effect (Factory) will reset the effect to the shipped values - it will not change the defaults
- Clear User Default - This will remove the User Default

More options include :

Master Reset
Append
Insert Before
Insert After
Replace Effect

When adding layers make sure that your layer is selected before right clicking to add, insert or append.

Layer Focus on shot change

The preference to choose whether to match layers between shots or remember per shot is now available from inside Nucoda by right clicking on the timeline - setting it to match between shots is a handy feature **Dolby Vision** work.

Reset Layer default tool

The default colour tool when moving to a new clip can now be reset from within Nucoda, double click the colour tool you would like to set as the new default colour effect for all selected clips in the composition, right click on the timeline and select the Set Default effect on selection command.

The selected effect will be the default tool on any selected clip. Layer selection may change when using this tool, especially if you have differing number of layers on clips.
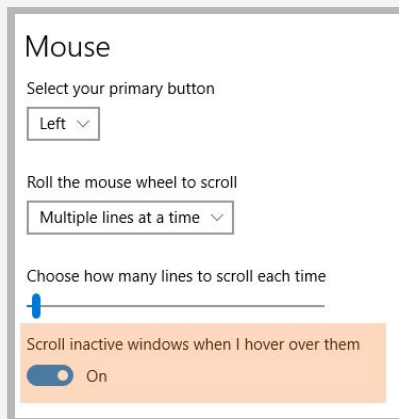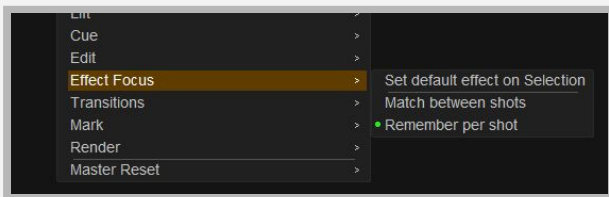
Misc interface changes

- In Win 10 the default mouse settings will work correctly
- Text is now left justified in menus and button
- Arrow to replace three dots on menu buttons
- You can now delete or detach multiple projects at once
- Cleaned up GUI inconsistencies
- Fix text overlaps on buttons
- Tabbed interface for clip properties

New timeline zoom level

Ctrl + G will zoom the timeline to a level where keyframes are easily visible and editable - the zoom is based on the proximity of keyframes to each other at the playhead.
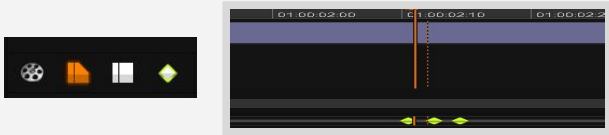
The timeline view mode must be set to Timeline mode

Setting the timeline view to Clip mode will also make editing keyframes easier when zoomed out of the timeline as it will display the keyframe area of the current viewed clip to the width of the timeline in the keyframe display area.

Rename tracks dialog

The rename tracks dialog is available from composition properties or by right clicking on the timeline or a composition in the library. Once open double click the name field to update the track name.

Changes to Import and List dialog boxes

Options that were previously hidden have now been placed prominently in the dialog box, this makes certain functions more discoverable for users.
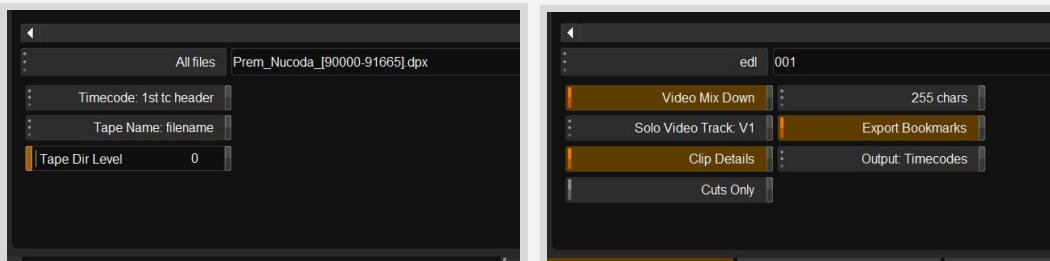
Deform tracker - new defaults

Defaults for Flexibility and tightness can now be set in preferences. Setting Flexibility to lower values will prevent the shape from deforming - although it will still scale. Tightness will change where the tracking points are placed - this is best left at current defaults.
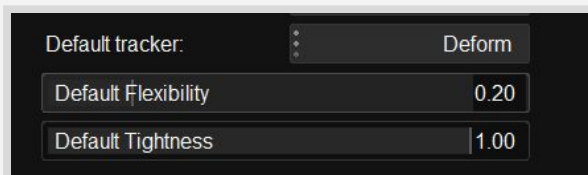
Lockable tracks and clips

Tracks and clips can now be locked to prevent any accidental changes to grading parameters. Locking can be per clip or multiple selected clips, selected tracks or all tracks. All panels and the GUI is affected.
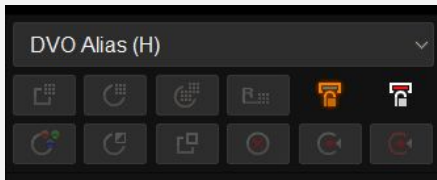
Make sure you have the playhead over a clip, pressing the lock icon will lock all tracks,.
Ctrl+click to lock only the track with the active clip.

With clips or multiple clips selected - clicking the clip lock icon will lock the clips - to unlock - select the clips to unlock and make sure the playhead is on a locked clip. Click the clip lock icon.

On Precision, use the Lock button on the Transport panel. Transport keys are not affected.

Markers

Export in EDL

There is now support for Avid timeline and segment (clip) marker types

When exporting an EDL from Nucoda, the syntax for the EDL matches the Avid format, allowing them to be imported into Avid from Nucoda - this includes notes. Segment markers will retain specific colour information while timeline markers are always Red.

```
005  REEL0B02 V    C       00:21:19:14 00:21:25:12 00:58:17:20 00:58:23:18
* FROM CLIP NAME:
* FROM FILE: S:\NAB Demo_Material\Flight\REEL0B02_SCENE001_TAKE_0009_camB_0031900.ari
* FROM COMMENT:
* LOC: 00:58:19:11 GREEN Test
* 00:58:22:00 TImeline Bookmark
```

Merging and Importing bookmarks

When merging grades, bookmarks that are merged to the new track can be identified using the new Track Column in the bookmarks list - this makes finding and deleting duplicate bookmarks easier.

If the EDL option to import bookmarks is selected during the merge, a check will be done for new bookmarks and they will be merged. Any duplicates will not be merged

Adding and Deleting markers from the Timeline

Right clicking on the Timecode track will show the bookmark menu, you can Add, Delete or move between bookmarks.

- Right clicking to add a bookmark will add the bookmark at the playhead position
- Right click and delete will directly delete the bookmark (timeline and segment)

- The bookmarks list can remain open while working and double clicking a bookmark will locate the playhead to the bookmark.
- The list is also an easy way to delete bookmarks

Media offline warning

A blue timeline bar will indicate offline media in the composition, trying to export when media is offline will present a warning that media is offline and indicate where the issues are.
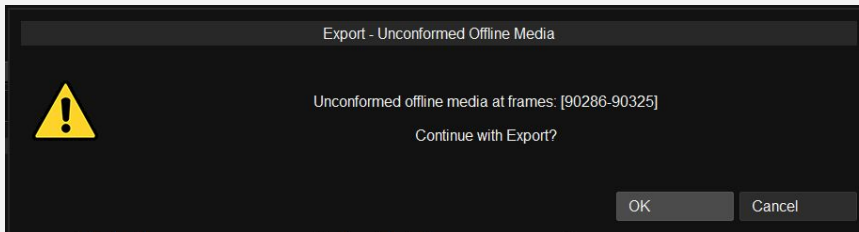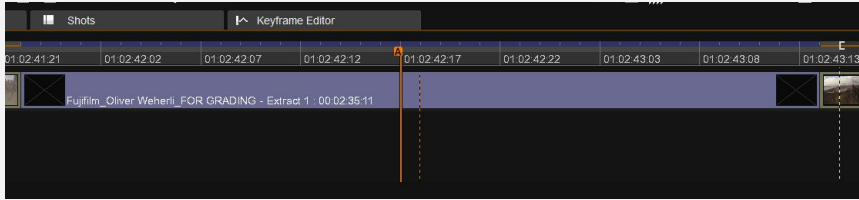
Dolby Vision 2.9 and 4.0 Integrated Content Mapping

Please note that projects approved to use CM 2.9 should still use the CM 2.9 processing pipeline.
Do NOT update projects automatically to CM 4.0

Dolby Vision - License

Access to the Trim features in the Integrated CM versions requires a license from Dolby. The license file should be renamed to *"DolbyCM_License.bin"* and placed in the c:\Nucoda\Licenses directory.

Any attempt at altering the license will invalidate it.

Contact Dolby dolbyvisionmastering@dolby.com for license information

- CM 4.0 or CM 2.9 version are selected on project creation.
- Projects cannot be converted between versions - all values will be lost when switching.
- External CMU is available only in a 2.9 project and can be selected from the config menu.
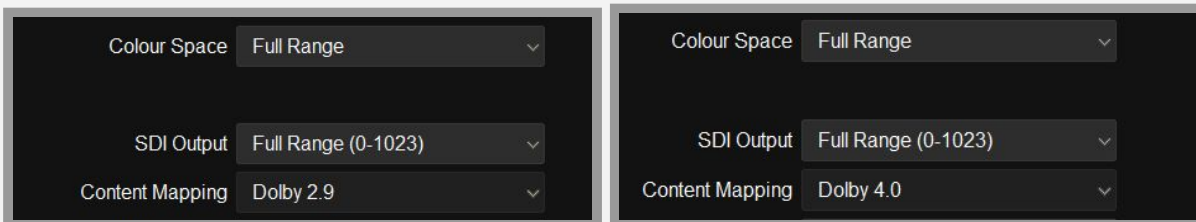
There is a new viewing mode available that will output the HDR and SDR Trim versions using the Kona4 card (Output 3 and 4) - this allows viewing of both version simultaneously while trimming. It is only available in HD up to 1080P 30 at 444 12 bit - 3G

For UHD projects set the monitor format to 1080P (see below)
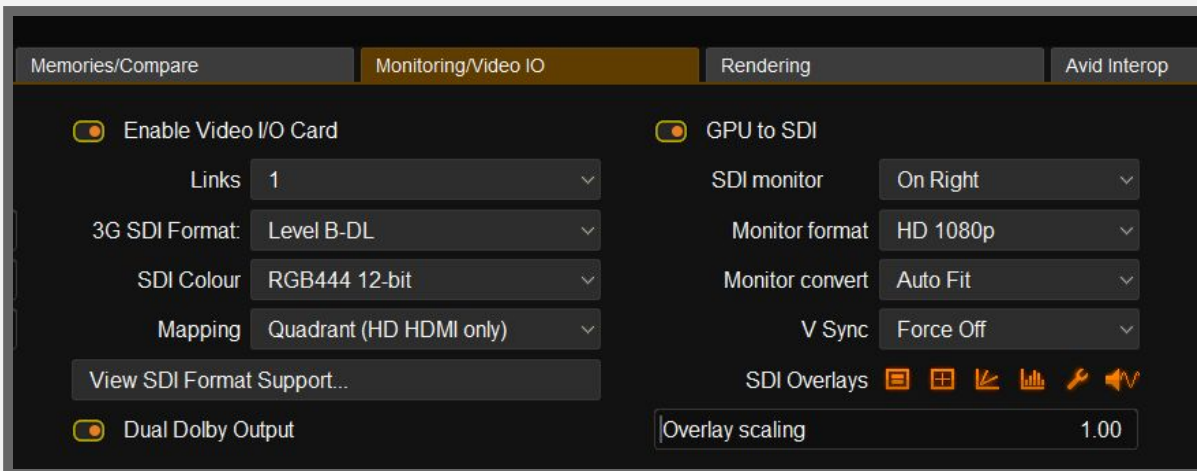
To view both the HDR master output and the Trim pass at the same time with the **Integrated CM** Option, select the Dual Dolby Output.

Please note this is only supported in HD resolutions and 444 is not supported in frame rates above 30fps

In Dual Dolby mode the Dolby Vision view will be on SDI 3 of the Kona 4 and the HDR output will be on SDI 4

Changes in Dolby Vision 2.9

Integrated Content Mapping 2.9 and External CMU - Firmware v2.6.3 and v3.0

- Added Scene Analysis mode - multi select analysed clips and press scene merge - will apply averaged analysis across all selected clips
- Lockable Trim controls for Precision Panel and GUI
- Dolby Vision bypass per clip
- XML Validation on export
- It is no longer possible to manually edit L1 Analysis Values
- Per clip masking and letterboxing
- There is now an Enable button for every clip that can disable the Doly Mapping effect on a per clip basis.
- Main trims and colour trims can be bypassed

What's in Dolby Vision 4.0

- Improved Tone Curve
- Custom Mastering monitor (one per project)
- Lockable Trim controls for Precision Panel and GUI
- New Mid Offset control
- New Trim metadata per target
    - 2.9 Metadata calculation for backwards compatibility
    - Updated Global Trim behaviours - LGG, Chroma Weight offset, Saturation Gain, Tone Detail Weight offset
    - 6 Vector RGBCMY Saturation and Hue trims
    - Mid tones offset, Mid contrast Bias and Highlight Clipping adjustments
- New licensing mechanism for Dolby Vision
- New Mastering and Target display updating mechanism
- Per clip masking and letterboxing
- It is no longer possible to manually edit L1 Analysis Values
- Scene based analysis - select multiple clips and apply average analysis to all selected clips
- XML Verify option for 2.9 and 4.0 XML files

New Precision controls option for Dolby Vision

A new mode has been added to the Precision Panel that will allow users to use the familiar Master Reset, Bypass All, Recall and Append buttons on the panel while doing Dolby Trims.

In a Dolby project, press the Turbine button, this will place the layer focus on the Dolby Content Mapping effect and place the panel in Dolby group mode, in this mode the following buttons will have their functions changed as follows:

MReset   - Reset trim values - LGG and Colour
Ctrl + MReset - Reset Secondaries (4.0)
Hold MReset   - Reset Analysis

Recall   - Recall trim values - LGG and Colour
Ctrl + Recall   - Recall Secondaries (4.0)
Hold Recall   - Recall Analysis

Append   - Analyse single frame
Ctrl + Recall   - Analyse Scene Average

Bypass All   - Bypass all trim values - LGG, Colour and Secondaries (4.0)
Ctrl + Recall   - Bypass Colour and LGG
Hold Recall   - Bypass Secondaries (4.0)

ACES 1.1 Support

New HDR Output Transforms

With the ACES 1.1 update there are new Output Transforms added, mainly for HDR, this includes new 2020 and P3D65 Transforms.

Some Output Transforms have been renamed for consistency

Support for Sony Venice/CineAltaV

X-OCN RAW file support - renamed image resolutions

With the update to support the Sony Venice/CineAltaV bitstreams some changes were made to the naming of image resolutions in the clip properties. Old projects will correctly remap to the new resolutions.
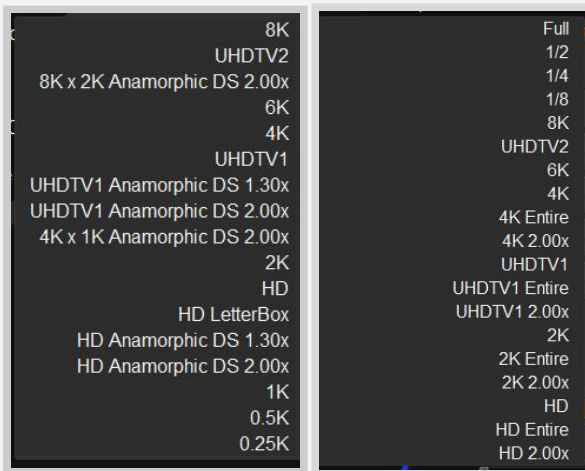
Old Sony Menu	New Sony menu
8K	Full
UHDTV2	1/2
8K x 2K Anamorphic DS 2.00x	1/4
6K	1/8
4K	8K
UHDTV1	UHDTV2
UHDTV1 Anamorphic DS 1.30x	6K
UHDTV1 Anamorphic DS 2.00x	4K
4K x 1K Anamorphic DS 2.00x	4K Entire
2K	4K 2.00x
HD	UHDTV1
HD LetterBox	UHDTV1 Entire
HD Anamorphic DS 1.30x	UHDTV1 2.00x
HD Anamorphic DS 2.00x	2K
1K	2K Entire
0.5K	2K 2.00x
0.25K	HD
	HD Entire
	HD 2.00x

- Anamorphic 1.30x options have been removed
- 1K, 0.5K and 0.25 K has been replaced with 1/2, 1/4 and 1/8
- We have removed the word Anamorphic - it is now indicated by the 2.00x
- Letterbox has been replaced by the word Entire - this indicates that the whole image will be shown but scaled to fit, which may cause letterboxing.
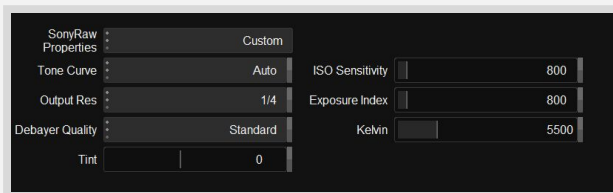
Kelvin and Tint tool has been added to the properties and will read any metadata from the RAW file.

De-Bayer

Standard and High are available debayer settings. F55 and F65 RAW files cannot use the high setting, it is only available to F5 and F700 bitstream of 2K or less.

Appendix A - Report generator template information:

HTML template file located here: "C:\Nucoda\2018_3\root\ReportTemplates"

Some knowledge of HTML and CSS is required to edit - please make a copy before editing

A section is a part of the report that is repeatable. A section is denoted by "#section <name> ... #end" where <name> is to be replaced by with the name of the section. Anything up until the "#end" keyword will be repeated. Some sections are only available from inside of another section.

The current sections are:
composition: this section is implicit and does not need to be defined
└ clips: the content to be repeated for each clip in the composition
 ├ effects: the content to be repeated for each effect on the clip
 └ bookmarks: the content to be repeated for each bookmark on the clip

A variable is just some dynamic value to be inserted into the report. These are denoted by a prefix of "$" - these are sensitive to the section that they are inside of. Variables are fairly trivial to implement should we want to make more information available. The current variables available in each section are:

Composition:
• $name
• $numclips: number of clips in the composition
• $numeffects: total number of *non-default* effects
• $numstrokes: total number of paint strokes

Clips:
• $record: record timecode
• $source: source timecode
• $event: event number
• $tape: tape name
• $name
• $numeffects: number of *non-default* effects on the clip
• $numstrokes: number of paint strokes on the clip
• $thumbnail: path to the clip's thumbnail

Effects:
• $name
• $numstrokes: number of paint strokes on the effect
• $count: number of times this effect occurs on this clip

Bookmarks:
• $name
• $note
• $record: record timecode

There is also the ability to do conditionals. These are fairly primitive in that they only include their contents if a variable has a value. Conditionals are denoted by "#if <variable> ... #end" where <variable> is to be replaced by a variable name.

For example:
#if tape
        $name has a tape name of $tape
#end

The contents would only be output if $tape has a value.

Digital Vision World
21 Poplar Business Park
10 Prestons Road
E14 9RL
London
United Kingdom

+44 (0) 3330 148 148

Digital Vision
Sweden Filial
Sankt Eriksgatan 63A,
112 34
Stockholm
Sweden

+44 (0) 3330 148 148

US Service address
ALT Systems,
7642 Clybourn Avenue
Sun Valley
CA 91352
USA

+1 (818) 504 6800

Nucoda

GRADING AND FINISHING

2018.2 NEW FEATURES GUIDE

Digital Vision

www.digitalvision.tv

Video card support

AJA Kona 4

Driver 14.01 Included with installer

- Support for the Kona 14.01 driver from AJA
- The SDI format support list has been cleaned up and is much easier to read, a Links column has been added.
- Preference for setting Horizontal and Vertical timing for the Kona - this is in Monitoring I/O, click on the Next button in the bottom right of the menu to access page 2.
- Data Format menu is replaced by 3G SDI Format, the preferred choice is to use Level B, but there is a selection to force the setup to use Level A.
- 4K modes have been removed
- Nucoda will determine the correct video setup based on the amount of links and SDI Colour format. If the selection is not possible Nucoda will fall back to the best available setup.

Support for 2Si:

- 4 x SDI in 10-bit RGB in UHD/4K - Kona SDI Out 1 to 4
- 2 x SDI in 10-Bit YUV422 in 4K/UHD - Kona SDI Out 3 and 4
- ***12 Bit RGB not supported - will fall back to RGB 10-bit (For Dolby Vision use Quadrant Mapping)***
- HDMI output will always map to the main output
- New Mapping menu to select between Quadrant and 2Si

Changes:

- 4K/UHD HDMI is always downconverted to HD in Quadrant mode (Firmware restriction)
- HDMI in 2Si mode will always map to the main output format (Firmware restriction)

BMD Decklink

Nucoda and Phoenix now have support for the Blackmagic Design range of Decklink video cards. Decklink support is limited to monitoring only and does not allow for the ingest or playout of video using the device.

Nucoda was tested with the Decklink 12g Extreme 4K card with HDMI and also using the optional 4 Link SDI Adapter, the HD Mini Monitor was also tested.

All Decklink cards should be supported but have not been tested, only features that are available on the installed card will be exposed in the setup menu.

Please download Desktop Video 10.10 driver from www.blackmagicdesign.com

Known Issues for Decklink

Can not be used for Dolby Vision with VANC
LTC timecode will only display on the image during playback.
Flashing HDMI output in UHD 50p and 60p

Changes to video settings and SDI output settings

We have updated the labels for the SDI output setting to make them easier to understand

- Video SMPTE - working in SMPTE range - ideal for working with scaled Avid Media
- Full Range - working with the full available range 0 -1023
- Cineon Log - Film log working space
- *Video Log - Video log working space (not in general use)*
- ACES - ACES 2065-1 ACEScc ACEScct

Project SDI Output settings
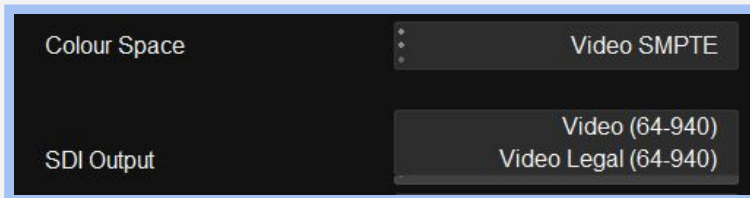
Video (64 to 940)
SMPTE Levels

Video Legal (64 to 940)
SDI Output is clipped to SMPTE legal levels
To export material with SMPTE Legal levels make sure the SMPTE legal button is set in file export
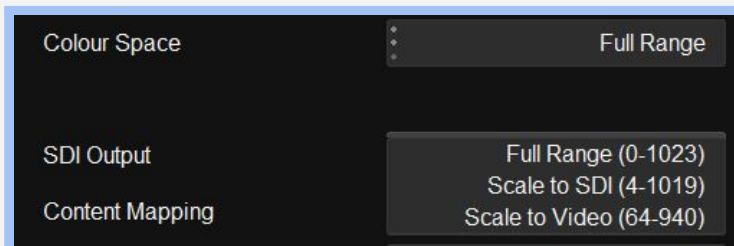
Full Range (0 -1023)
Default for Full Range

Scale to SDI (4-1019)
This setting scales SDI values (0 to 1023) into range and is required when working in RGB444 12-Bit
Required for working in Dolby Vision

Scale to Video (64-940) Scale the SDI output to SMPTE range
Useful for working in Full Range and monitoring on a display that cannot display full range images. To export material with SMPTE levels from a Full Range project make sure to set the Full --> SMPTE scaling option in file export dialog

Some file formats like DNx will automatically scale the image, ensure you don't double scale the images.

SDI Output configuration
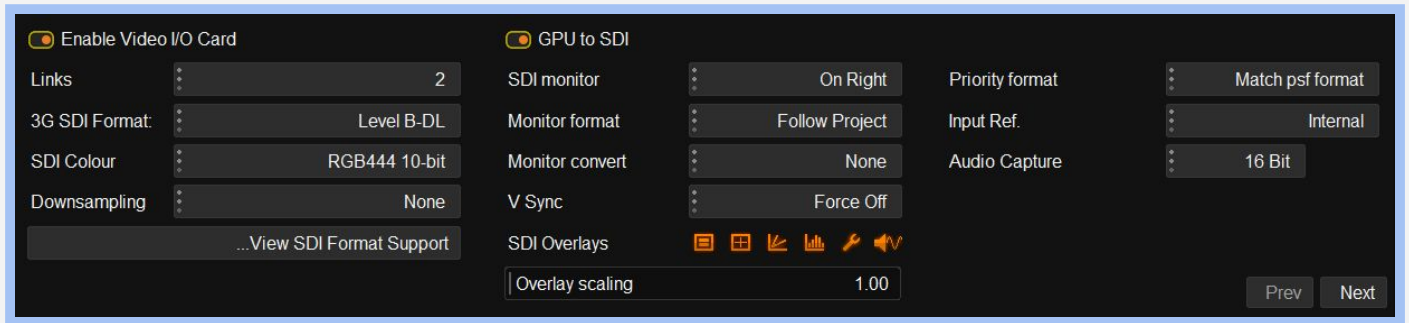
The configuration of the output format is based on:

- SDI Colour encoding (YUV or RGB)
- Number of available SDI Links
- 3G SDI Format - Level B DL is preferred but can be set to Level A if required

The most important setting for the user is the SDI Colour encoding, during configuration this will only be changed if it is not supported by the requested video standard. The number of links will only be taken into account if there are multiple valid configurations possible with a different number of links.

Example:

If one or four links are specified:
1080 25p RGB 444 will be set up as 1 x SDI link using 3G.

If two links are specified:
1080 25p RGB 444 it will be set up as 2 x SDI links at 1.5G

The SDI configuration is displayed above the timeline, and is colour coded, white indicates that the configuration is exactly as requested, yellow means that a change was made due to an invalid setup option. Red will indicate invalid options.

The monitor format

The monitor format option can be used to always monitor in a particular format, and the monitor convert option will specify how the content is scaled to fit the output.
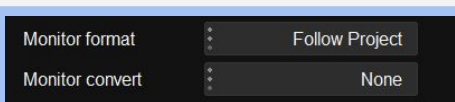
This way the user can set monitoring to always be 1080p and the conversion is set to fit. Regardless of the output format size, it will always be scaled to 1080p
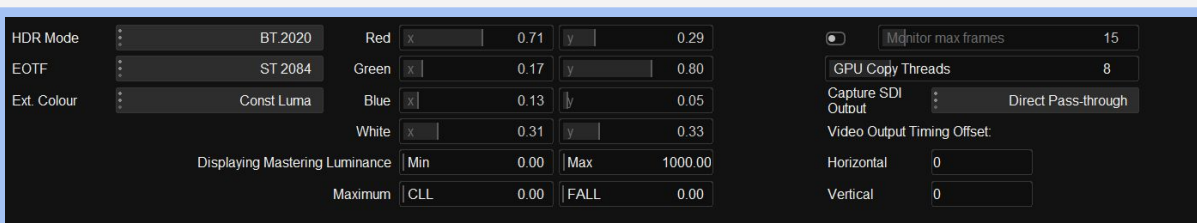
Using the next and previous button on the bottom right of the Monitoring I/O tab will switch to a second menu containing additional settings for the installed card. Settings will only be shown if supported by the installed card.

Compressed and Mono Caches

Cache format can now be determined by the user

An option has been added to allow the user to specify the use of compressed caches, or an additional Monochrome DPX option. Using compressed caches can save a significant amount of space but will incur some overhead during caching and playback.

Cache formats can be set on a system and project basis.

In the preferences, under the Rendering tab, you can set the default cache format for all projects:

The default is uncompressed for 8 |10 |16 and Half.
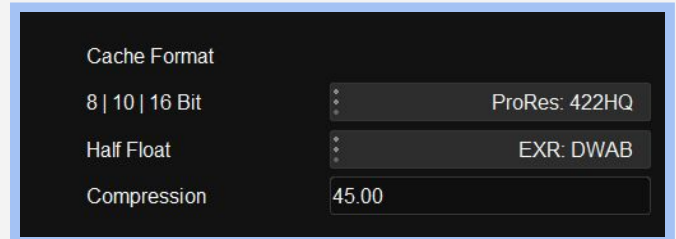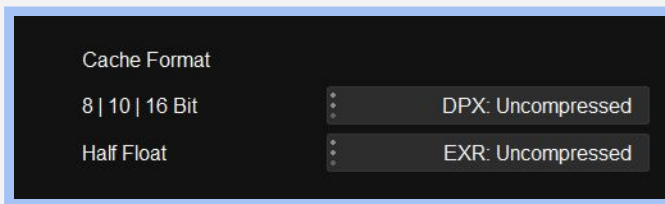
For 8 | 10| and 16 bit media, caches can be created in any of the available Prores formats. These files will be written to disk as .dvc files (Digital Vision Compressed) - these files cannot be read outside Nucoda or Phoenix.
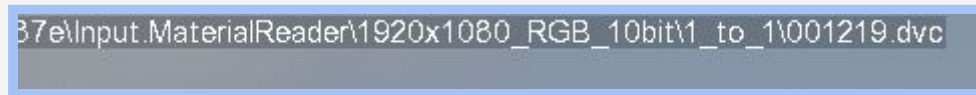
For Half media the choice is DWAA and DWAB (Dreamworks Animation) the default compression is 45 and is a good value, the compression is lossy, but very good and is optimised for playback in real time. UHD playback of compressed EXR sources will have a high CPU overhead.

File size examples:

1920x1080 EXR, DWAB 45 compressed : Average 2mb or less.
3840x2160 EXR, DWAB 45 compressed : Average 3.5mb or less.

Choosing DPX Mono as the cache format is specifically designed for restoration users, this will use a single channel DPX file for caching and will save significant amounts of space.
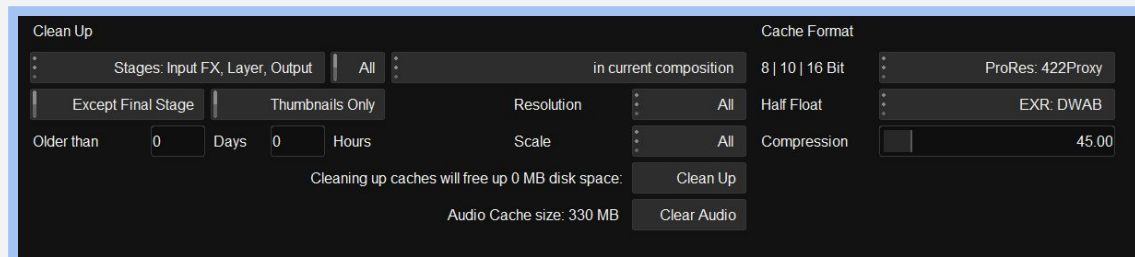
Cache setting for on project level is accessible from the Caches tab on the timeline - these setting are stored per project. It is advisable to clear caches before changing formats. Due to the compression used, the space calculation for formats may sometimes be inaccurate.
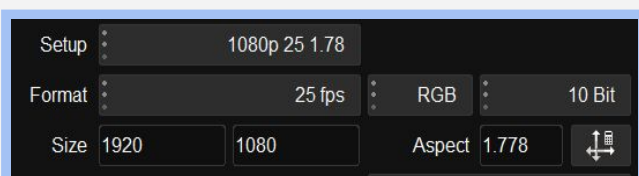
Project settings

While the format of the project will determine the format (8, 10, 16 or Half) of imported media, and therefore the cache format, users can change the media to any bit depth using the media properties, caches for selected clips can be set to half, giving the user the benefit of not clipping between layers when needed.
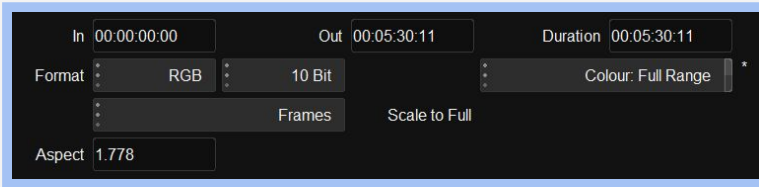
Clip Properties

Although possible, it is not recommended to change the image format while the system is caching as it could cause orphaned caches.

Just a reminder, in order to cache your sources make sure that the Source option is turned on in the Cache Tab, and that the material you want to cache has the Create Clone option set in the Clip properties. Create clone can be set on multiple clips by using Ctrl + Select.

Both Create Clone and Source must be enabled for source caches to be created.
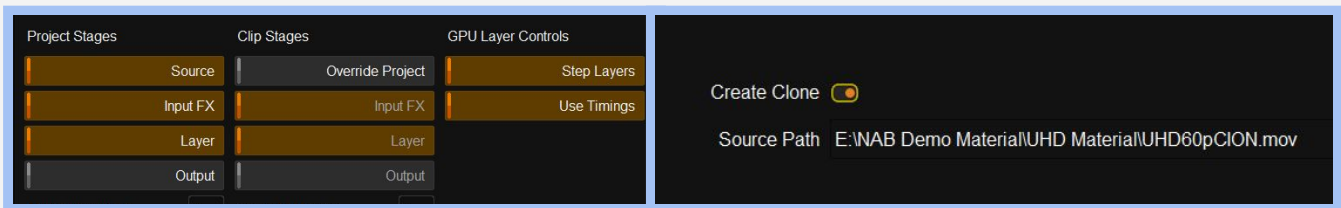
Please remember - the export quality of your project will be same as the quality of your caches, if you want to export at a higher quality you will need to remove your caches and re-render.

OpenEXR 2.2

Added support for DWAA and DWAB compressed file types

The OpenEXR implementation has been updated to version 2.2. Two new compressed codecs have been added DWAA and DWAB (DreamWorks Animation) - these codecs are high quality visually lossless and are designed to be used for realtime playback.

They have a default compression setting of 45 (Range is 0 - 300) that is a good compromise between quality and visual quality. *Please note that in although optimised for real time playback, performance will be dependant on resolution, CPU performance for encoding and decoding The preferred version is DWAB. There is no guarantee that performance will be raltime.*

Colorspace conversion Tools

New tools to allow easy conversion between colour spaces

Colour Space Convert

The Colorspace tool has been added to allow for simple accurate conversion between colour spaces. It can be applied as an input effect or user effect. It allows the user to select the input and output from a preset list that can be updated by the user.

The tool uses GPU acceleration and covers all the major colour spaces, illuminants and curves and also has settings for chromatic adaptation. Custom Gamma can also be entered by selecting Gamma in the curve dropdown.

Colour Management -> Colour Convert
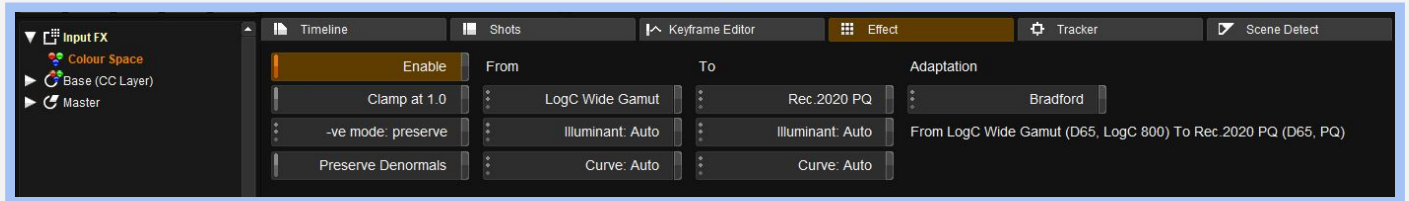
Set the current colorspace of the image using the From setting and then select the To colorspace on the output side. The correct conversion will be applied to the material.

Usually, the Illuminant and the Curve setting should be left on auto as they will be specified to match the colour space. Using the dropdown menus you can override the defaults for the Illuminant and Curve

The adaptation setting defaults to Bradford, which is the most commonly used chromatic adaptation. The adaptation setting will only be used if there is a change in the illuminants between the colour spaces, for example in the case of P3 and Rec.709.

Colour Spaces	Curves
ACES_2065-1	ACES cc
ACEScc	ACES cct
ACEScct	PQ
Adobe Wide Gamut RGB	Alexa Log C 800
Alexa Wide Gamut	BT 2020
*CIE RGB	D-Log
Cinema Gamut	Rec 709
P3-DCI	S-Log 2
P3-D65	S-Log 3
P3-D65PQ	Cineon Log
Protune Native	Protune
Rec.709	RED3G10
BT.1886	RED3G10Legacy
Rec.2020	*RED3G12
Rec.2020_PQ	*REDLog
Rec.2020_HLG	V-Gamut
* Red Color	sRGB
* Red Color 2	HLG
* Red Color 3	
* Red Color 4	
*Dragon Color	
Dragon Color 2	
RED Wide Gamut RGB	
S-Gamut	
S-Gamut3	
S-Gamut3.cine	
V-Gamut	
D-Gamut	
XYZ	

Below the adaptation menu there is a colour trail that shows the conversion that was performed - the illuminant and curve is displayed in brackets.

The menu to the left will allow clamping of values above 1.0 and give option on how to handle negative values (clamp, preserve or process). It should not to be used in ACES projects.

The Rec.709 setting assumes Rec.709 Linear Gamma we have added Bt.1886 as option.
The colour spaces and function curves can be edited by the user to create new presets.

Files are located here:

```
C:\Nucoda\2018_2\root\Presets\System\ColourSpaceDefs.txt
C:\Nucoda\2018_2\root\Presets\System\UserMathsFunctions.txt
```

To use PQ or HLG optional Luma value as in the PQ Matrix effect, specify the preference in the file to be:

```
"Rec.2020 PQ": {
            "primaries": [0.708, 0.292, 0.170, 0.797, 0.131, 0.046],
            "illuminant": "D65",
            "transferFunc": ["PQ (1000)"]
      },
```

Where the value in brackets after PQ is value in Nits. Default value will just be "transferFunc": ["PQ"]

Source export with rendered transitions

The is a new option when exporting as Source that allows for transitions to be rendered as part of the export. It is available in the export menu as a setting that is exposed when setting source as export.

When selected it is not possible to export with handles.

Tangent Panel updates

We have made the following changes to the Tangent panel support.

Some tool names have been changed and additional characters added to descriptions to make them easier to read, for example:

```
Play ->      Play Forward
Clip -|      Go to end of current clip
|-Clip       Go to end of previous clip

<-Knobs-> Cycle through Knob banks
<-Btns->    Cycle through button banks
-> Cue       Cue to
```

- Ball and Ring resets should now work automatically for all Tangent panel models including Wave, Wave 2, CP200 and the new Arc panels
- Selecting Bezier, Ellipse or Rectangle when not in shapes mode will now set the mode to shapes and create the shape.
- It is now possible to map the Jog/Shuttle command provided in the Tangent mapper, this will have the benefit of being able to use the Jog sensitivity control in the Tangent mapper, as it is not seem as a ring control any longer. The current default is mapped via the Navigation menu.
- Improved description for certain controls
- Control Resets have been removed since resets work by pressing the knobs and additional resets are not needed.
- Added "Shift" controls to the keyer for HSL, HSV, RGB - these controls will allow shifting the value of the control in the same way as using the mouse and dragging the Hue strip.

    Use the Tolerance and Softness controls to set the points on the strip - use the HSL Shift controls to move the Hue strip, relative to the control points

    <-Hue-> <-Light-> <-Set->   <-Red-> <-Green-> <Blue>   <-Hue-> <-Light-> <-Value->
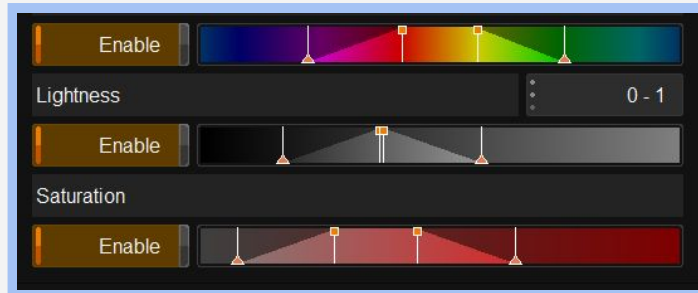
Update Arri RAW SDK

ARRIRAW_SDK_5.4.3 -This update adds support for the Alexa LF camera

Update to RED RAW - IPP2 support

For more information visit:

RED IPP2 Overview
IPP2 Output Transforms and IPP2 Image Pipeline Stages

The addition of the IPP2 image processing features have required some changes in the RED RAW interface in Nucoda. The approach has been to try and mirror what has been done in RedcineX with regards to features that are exposed.

Depending on the chosen Colour Science, certain features will no longer be available to the user.

When importing RED material the Colour Processing should switch based on camera settings, so the menu will be either in the FLUT or IPP2 depending on the material. This does not mean you have to use the selected option, feel free to change to the other colour pipeline if required.

Another change is that the Colour Space and Colour Curve in the properties will now match the settings in the camera file.
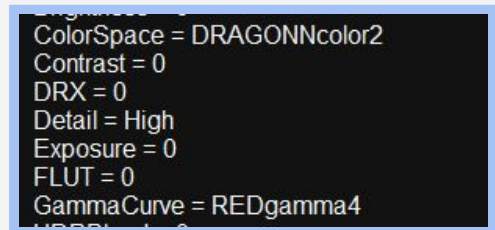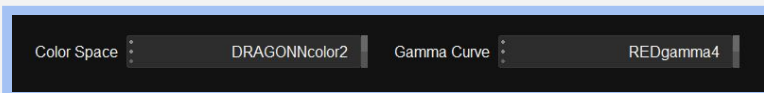
Colour science menu:

> Select: ***Original, FLUT or IPP2***
> Colour space, gamma curve and other controls shown based on the colour science chosen

Colour science: Original
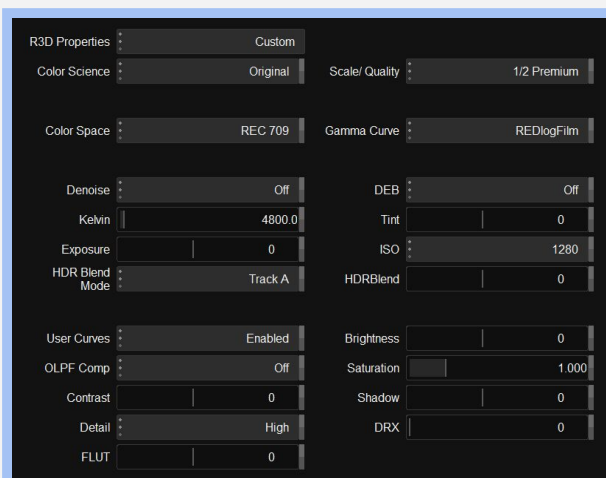
Colour Science: FLUT
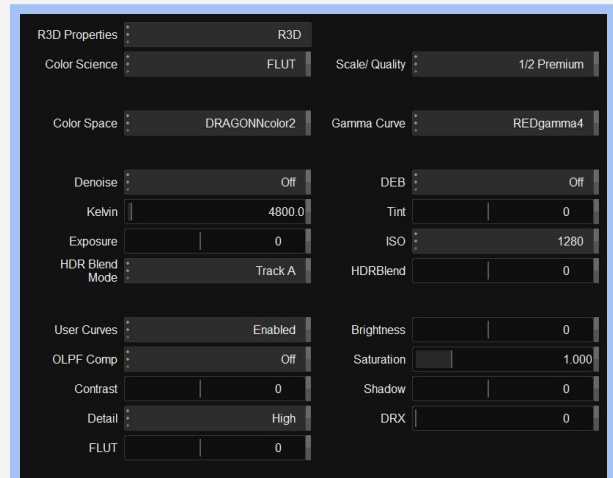
Colour Science: IPP2

Image Pipeline: RAW - (IPP2 Stage 1 - Primary RAW development)

Using the RAW image pipeline restricts the output to REDWideGamutRGB and Log3G10
There are minimal other controls available to the user in this mode.

LUT's are available from the RED website or from RedcineX to convert from RAW to various outputs using the Roll Off and Tone map settings available in the creative mode.

R3D Properties	Custom		
Color Science	IPP2	Scale/ Quality	1/2 Premium
Image Pipelie	Raw		
Color Space	REDWideGamutRGB	Gamma Curve	Log3G10
Denoise	Off	DEB	Off
Kelvin	4800.0	Tint	0
Exposure	0	ISO	1280
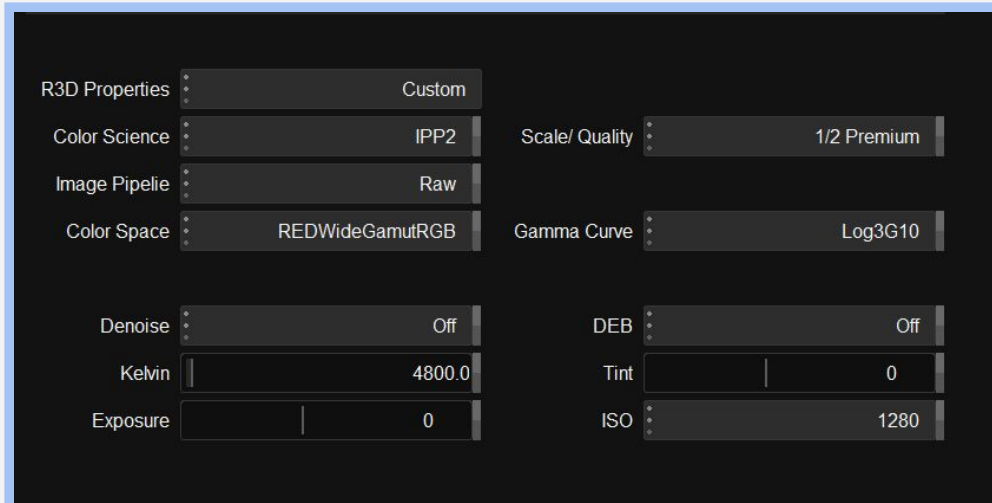
Colour Science: IPP2
Image Pipeline: Creative - (IPP2 Stage 2/3 - Grading and output transforms)

Using the Creative options allows control over Colour space and Gamma curves, as well as some additional parameters. The roll off and tone map parameters are very useful new options.

It will allow you to develop images using some of the creative and Image transform features available in IPP2. It is not really ideal as a starting point for grading.

Color Space	REC 709	Gamma Curve	REDlogFilm
Denoise	Off	DEB	Off
Kelvin	4800.0	Tint	0
Exposure	0	ISO	1280
HDR Blend Mode	Track A	HDRBlend	0
Roll Off	None	Tone Map	None
User Curves	Enabled	Brightness	0
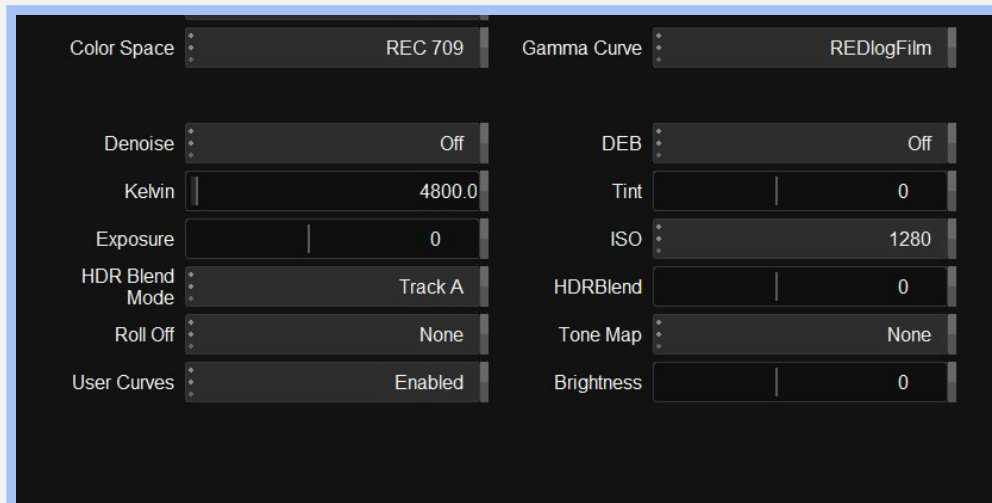
Importing markers from AAF and EDL

Markers imported as Segment or Timeline

Nucoda and Phoenix now correctly assigns Segment and Timeline markers when imported from AAF, based on the marker type in the Avid timeline.

For EDL the Avid convention is followed:

* LOC: 01:00:01:14 RED VIDEO will add a segment bookmark
* 01:00:03:23 BLUE - will add a timeline bookmark

Using markers in AAF to indicate speed changes

If an AAF is imported into the application any speed or variable speed changes that were applied in Avid will be marked on the clip as segment bookmarks. The bookmarks will contain the value of the keyframe at that point.

This will allow the user to easily duplicate speed ramps when using tools like Re:Vision FX Twixtor.

Nucoda

GRADING | FINISHING

2018.1 NEW FEATURES GUIDE

Timeline changes

New track solo mode, updates to track lock, selecting and viewing

- Ctrl + click a lock, view or solo icon will switch all tracks to the new selected mode, this way it is easy to quickly lock/unlock, view or solo all or no tracks.

- Track select works differently, ctrl+click on a track will deselect all other tracks only leave the clicked track selected.
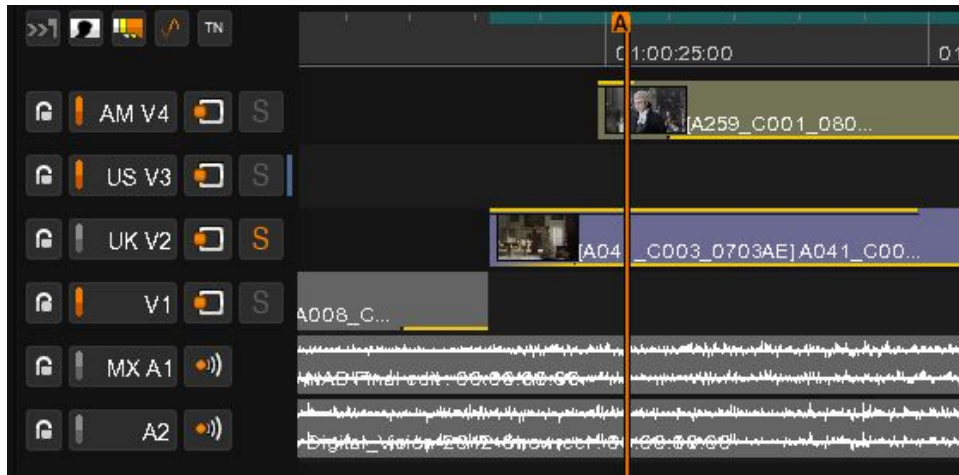
- To the right of the track icons is a small blue bar, this indicates the last clicked on track, using this indicator and then shift clicking on a different track icon will select or deselect the range. The range selection works for locking, selecting and viewing modes.

- The new solo mode will override the view settings and allow you to quickly view the solo track, grades will be applied to the viewed track. You can solo multiple tracks. Ctrl click to turn all on or off.

- The track sizes of compositions will now be saved per composition

Clip Extract - extract single clips to library from a mixdown source

(note projects with extracted clips cannot be loaded into older versions)

The main application for this feature is to allow users working in ACES projects using a Record order mixdown, to apply Input Transforms to individual clips.

.
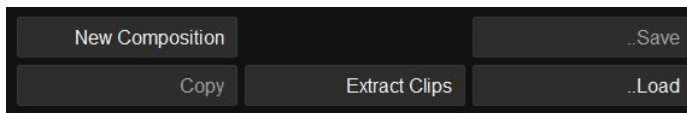
- After importing a mixdown source, selecting clips on the timeline and clicking the "Export Clips" option will extract scene detected or Record order EDL imported media to separate clips in the selected library folder.
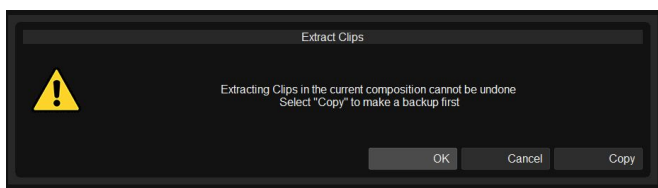
- The user will be given the option to automatically clone the original sequence before starting the extract.
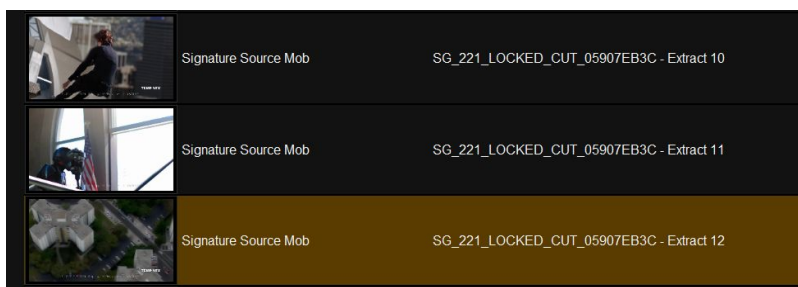
- Clips are renamed by adding - Extract - (n) and replaced in the new composition.
- To extract 1000 clips takes about 60 sec - a progress bar is displayed during the operation
- Any Original TC or Original Tape name data applied to the clips using the Record Order conform method will be retained.
- The user can now apply individual ACES IDT's to clips extracted from a mixdown.
- Please note, extracted clips cannot be re-extracted
- This function is designed for a mixdown workflow, use the Clip Properties to relink to material if It has gone offline.

New ACES Input transform

S-Log3 -> Rec 2020

- This transform is specifically for Sony studio cameras that use Slog3 but record in Rec.2020 - provided by Sony

New Sync status display

Updates have been made to the SDI input and Reference status displays for the Kona 4.

With the sync set to Ref In or Input Video will check the validity of the provided sync signal for the selected frame rate. If the sync is missing or incorrect a yellow status message will be displayed to warn the user.
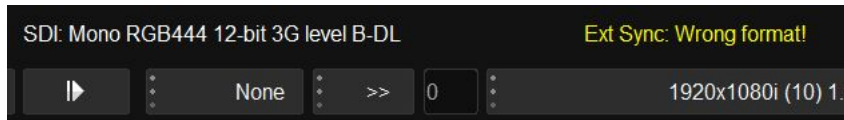
- If the sync source is incompatible with the selected output video format there

- PAL & NTSC Black & Burst are now valid sync signals for 1080p 25 and 50i and 1080i 29.94 (59.94)

The reporting of sync validity in the layoff UI (by a red background on the relevant input video format display) is updated to use the new criteria. It also now updates immediately when a change to the selected external sync source occurs, rather than waiting for the user to click Refresh. The displayed names of input video formats also update immediately.

In the capture UI, the displayed names of input video formats and their compatibility with the desired capture format also update immediately on a change to available input, again avoiding the need for manual Refresh.

Dolby Vision

CMU Preferences

- Any previously connected Content Management Unit will be stored and the setup and selections will be accessible to the user to view even while the CMU is offline. It will not be editable.

Content Analysis and Trimming now available in 10 bit projects

- Previously only projects det to Half would allow analysis and CMU trimming. This has been changed in this version to include 10 bit projects.

Library

Auto name and show all

- Adding a folder now automatically places the folder in Rename mode - type a new name immediately or press enter to close and keep "New Folder" as a name.
- It is now possible to Ctrl or Shift select multiple folders and drag and drop them in the library.

- A new button called Show all has been added next to the Recurse button, pressing show all will show a flattened view of all the folders in the library, turning it off will return you to the folder selection selected when you were not in show all mode.

New Find button functionality

- When clicking the find button you will be located to the first clip in the list of found clips, pressing Find again will move to the next clip and so on.

Content file changes

- The software version is now placed into the content file, there will be a warning when you attempt to import a content file from newer version into older version.

Matte Source - Matte clips are no longer offset when used in a mixdown source

- The Matte effect has new settings that will let the user choose to use the Clip start, media start or scene cut as the start point for matte sources

- Scene mode is the default.

ACES file properties change for YCbCr files

- Option to select SMPTE or Full Range output for YCbCr files when in ACES

Auto create folders when creating a new project

- In the general.prefs file the you can now add a line "libraryFolders" with comma separated values that will generate a folder structure when creating a new project in Nucoda or Phoenix.
- Using the $p variable will use the project name in the directory name
- Folders will be sorted alphabetically in the application

Example:

autoFolderMode "folders"
libraryFolders "$p - Compositions, $p - Audio, $p - VFX/1/2, $p - FX/1,$p - FX/2, $p - FX/3"
compositionStart "01:00:00:00"

Project name is: 002

Result::

Effects layer changes

- Add multiple effects in Effects Layer
- You are now able to have multiple effects in one effects layer. Drag and drop to re-organise the effects. As soon as more than one effect is added the layer will be renamed to Multiple FX.
- On the GUI, once an effects layer has been added, selecting a new effect and clicking the new multi effect icon will add the effect to the currently selected effects layer.
- From Precision, using the FX or DVO button will add the currently selected effect to the currently selected effects layer, if no effect layer is selected a new layer will be added with the effect.
- ***Please note, from Precision this action is context sensitive, so if you are in the Input FX layer, the selected effect will be added to Input FX, with the effect in the layer selected, Alt+FX/DVO will place the new effect before the currently selected effect.***
- For Tangent users, use the Add to FX button to add the currently selected effect to the currently selected effects layer, if no effect layer is selected a the effect will be added to the Input FX layer
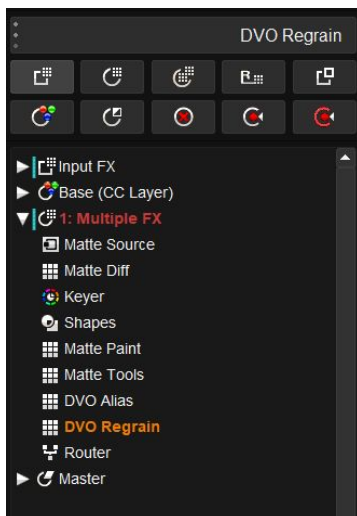
Video I/O - Control for HDR via HDMI with AJA Kona

- Consumer devices used for monitoring can now be switched to PQ2084 with a custom or preset colour space.
- Option for constant or non-constant luminance
- Available in Preferences/Video IO page 2 (Press Next)
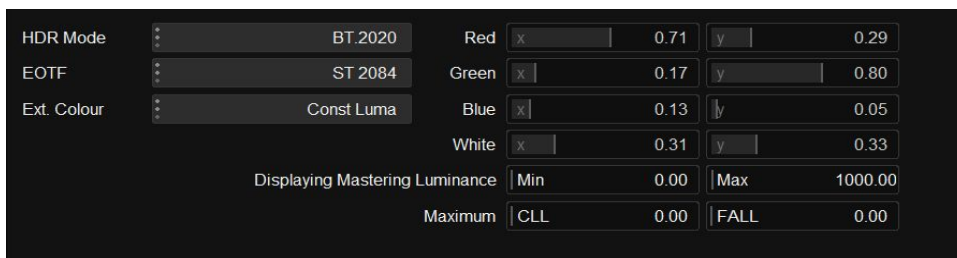
Apple Prores update

- This is an entirely new implementation of Apple ProRes
  - It provides a substantial speed increase in both decoding and encoding
  - This new code does not require the installation of Quicktime

- Listed as ProRes in the export menu
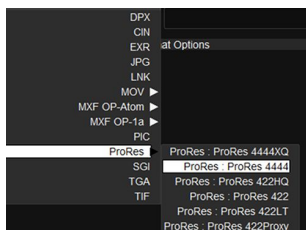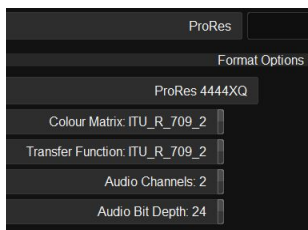
- Add Metadata on export - note this is not an actual transform - just a metadata flag

  - Colour Matrices
    - Rec.2020
    - Rec.709
    - Rec.601

  - Transfer Functions
    - 709
    - PQ2084 and HLG flags

- Audio export is currently 1 track per channel Mono
- Audio Bit Depth and number of exported channels can be selected
- ProRes XQ is now available at all project bit depths
- Correctly interpret and display Rec.2020 material on import

Colour Tools

Updated Hue Curve tool

- New controls for both the new and old Hue Curves tools

  - Luma Damping
  - Hue Damping
  - Saturation Scaling - when adding Luma to the image it will affect the saturation, this control will let you scale the saturation.

- Mode switch to change between Hue Curves 2.0 and Legacy
- Old projects will use the old tool automatically
- The default will be the new Hue Curves tool - the default is the new version.

Updates

- A range mode has been added to affect the range of influence that each point has on the surrounding points. Clicking on the arrow head and moving the mouse will expand or shrink the area of influence on the surrounding points.

- The new curve reset button on the right will reset the curves for Hue, Lightness and Saturation independently, but not remove the points that have been added. It is NOT a reset.
- The option to add a points has been removed because the range tool is more effective way to control influence.
- All controls are on the Precision Panel and Tangent Panels

Expanded Lift Gamma Gain tool
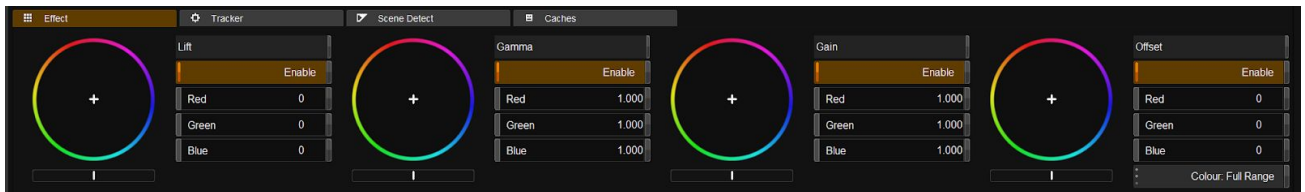
- Until now the application has used the Offset Gamma Gain model in the Lift Gamma Gain tool, this was a decision based on other colour correction systems that existed at the time. We made the decision to expand the tool based on user feedback.
  While the control in the original tool was labeled as Lift, its actual effect was Offset. This has caused some confusion in the past and has been rectified.
- The new tool is completely backward compatible, old Lift values will be converted to offset when an older project is imported
- The Lift tool has been added to the interface, so there are now four control wheels, although panel control will remain only for the three primary controls.
- The current tool layout (Offset Gamma Gain) will be the default.
- Users who want to use the new Lift Gamma Gain model can change the preference in the colour tools section of preferences, or switch while grading using the Ctrl+Shift and Insert hotkey or using the Precision hold down the Byp button on the left ball and ring control
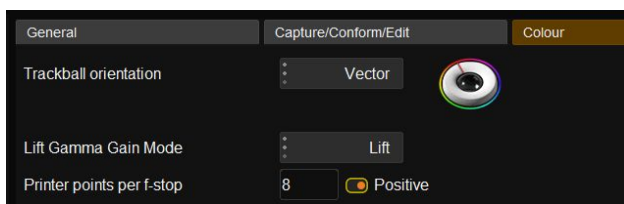
- The only difference in switching is to change the left ring and ball to control either Offset or Lift., and no colour changes will occur.
- No remapping of any panels are required

  For information on LLG tools please check this link: [Pro Video Coalition - Alexis van Hurkman](#)

DigitalVision

VR Flip viewing mode

VR Flip allows the user to see the effect of "stitching" the opposite sides of images that is designed to be viewed in a Virtual Reality device. It is only a viewing mode (listed under compare modes)

- This new viewing mode is under the comparisons menu and is off by default in the preferences
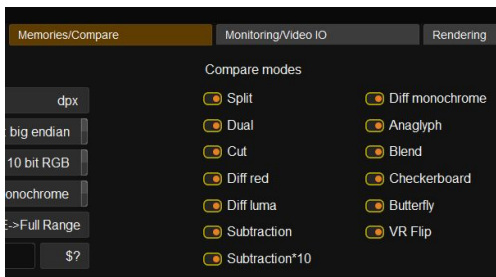
- It is currently not listed on the Precision Panel

Original Image

Image is flipped and the opposite sides are aligned

Bookmarks

It is now possible to display Bookmark information in the HUD

- A Bookmark item has been added to the HUD display list
- The bookmark info will only be displayed in the HUD when the timeline cursor is on the bookmark

Other changes

- When editing markers the "Enter" key will close the editor as in previous versions.
- To add an extra line when entering text press "shift+enter"

Bookmark window and icons

- The bookmark window can be left open while working in the application, window position is now saved.
- Last bookmark selected will be saved in the list
- Two new icons for opening the bookmark list and add bookmark menu.

File import and export

DPX

The following changes were made to DPX tags to conform to SMPTE recommendations

SMPTE and ADX have been added as Tag options

- In NTSC or PAL projects setting the tag to SMPTE will tag the DPX as:

    ITU-R 601 NTSC Transfer and Colorimetric BT 470 System M
    ITU-R 601 PAL Transfer and Colorimetric BT 470 System G, System B

- HD and larger, setting tag to SMPTE will tag the files as:

    Rec.709 Transfer and Colorimetric Rec.709

- Set Tag to Log : Logarithmic Transfer no Colorimetric
- Set Tag to Lin : Linear Transfer no Colorimetric
- Tag to ADX: Reserved

H264 export

Users with extended format license will now have access to H264 exports under the MP4 heading

VariSpeed playback in Nucoda

This option is available via the Video IO preferences, on the second page (next in bottom corner)
. It is intended for use in restoration, to allow playback of material at non SDI frame rates.

When using this option, playback is NOT available on the SDI output of Nucoda.
VID and GFX/SDI settings must be disabled to allow VariSpeed playback.
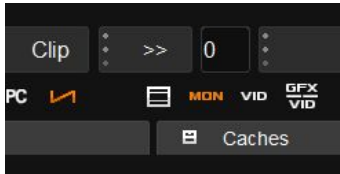
In the GUI, turn off Vid and GFX/SDI modes - now click next to the VariSpeed icon and enter a frame rate. ***Press enter*** and then enable the varispeed icon.

Playback will now be at the desired speed.
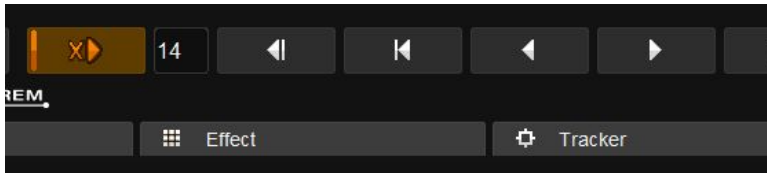
Improved grade merge tool

Merging grades is the process of automatically matching and copying grades and effects from a graded composition to an ungraded updated version It can also be used when working with a project where there are constant updates to the VFX during the grade, the process will apply the correct grade to new material added to the timeline that is replacing older versions.

In order for grades to be successfully merged, we need some commonality between the material to allow for matching.

Matching by Source:

To match material by source we need matching metadata. We will need matching Timecode and at least one of the following:

- Tape Name (and Original tape name in case of Mixdown workflow)
- Clip Name
- Source ID (Only for AAF imports)
  Choosing this option will only match from material that is already imported into the application, it must me the exact same material that was used before, position and length may have been updated in the edit.

Matching by Record Timecode:

To match by Record Timecode, all we need is an incoming shot that is the same duration as the shot being replaced, and also in the position on the timeline. Typically this is used for VFX replacements in a show that has been locked for edit, or in the case of a Stereo grade, where shots are identical.

The merge process takes place during the import of a new EDL, AAF or XML. The options for the merge is in the import dialog.

Some notes on merging grades:

- Ensure that you have a valid way of identifying material in source mode.
- You are able to merge between EDL, AAF and XML and grades will be copied if if there is no media to conform.
- Any bookmarks will also be conformed
- Make a copy of your composition before merging into it, the merge cannot be undone.
- The entire grade will be copied, including keyframes.
- When importing a new AAF, EDL or XML, the name of the file will automatically be assigned as the track nam, multiple tracks will be named with an extension. This can be edited in the Composition properties window if needed.
- When new material is added to an existing shot, the application will automatically attempt to copy the correct grade either from the left or right hand side of the new material.
- ANy dissolves or dynamics will also be copied, unless the material is altered so that the dynamic will no longer fit. In this case we will add a marker to the timeline and warn the user.

Merge by source timecode:

Merge by Source Timecode (Matching to Tape, Clip name or Clip ID) is normally used when separate clips are conformed to the timeline, however, if you are using a mixdown media workflow, but have an EDL with the original TC and original Tape name, it can be applied to the mixdown media to still allow for a traditional Source merge workflow. (see Mixdown Source workflow)
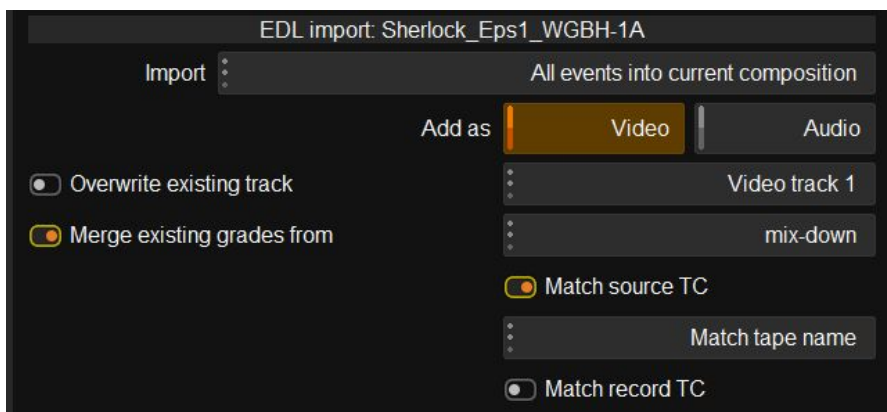
- Select import and the new EDL, AAF or XMl that is to be merged with the current composition. (It is good practice to make a copy of the current composition)

- Choose whether you want to import the new composition into the current composition or whether a new composition should be created.
- Select "Merge grades from" and choose either a specific track, or choose mix down, if mixdown is chosen it will take the grade from the top most clip in the composition.
- Choose whether to conform to media and then import.
- Depending on matches found, the new sequence will be added to the current composition, after checking the merge results, the tracks from the original composition can be deleted.

Merge by Record Timecode

Merging by record timecode will merge clips purely on whether they match the position and length of the current material in the composition.

Record merge is usually reserved for Stereo or mixdown workflows, typically locked edits with versioned VFX replacements in the same location.
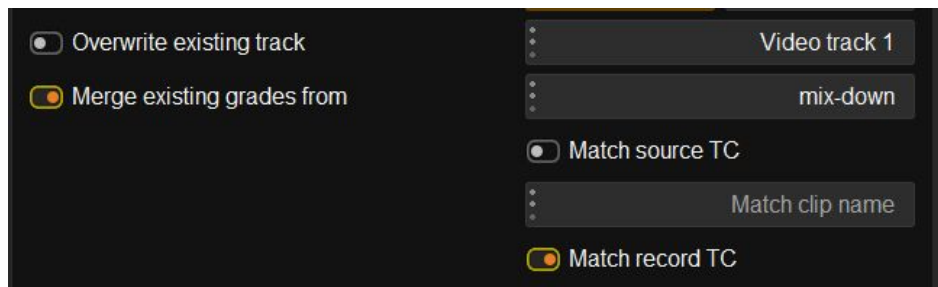
Merge Result window

To check the status of the merge, we have added a new list window in the library called "Merge Results"
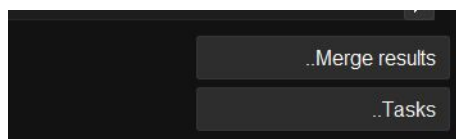
The purpose of the Merge results dialog is to show which clips were matched during the process, any matched clips with a grade applied will have the grade copied to the new clip. All clips are colour coded (there are 16 repeating colours) that will help give a visual cue to how shots were matched.

Using the option to only colour selected clips will give the user an even better view of merged clips and will allow a higher level of confidence. Each layer is saved separately and using the layer view icon will let the user check the merge results for each layer. Results can also be exported as a text file.

This list is interactive and will remain open as long as the library is open. Selecting and event in the list will locate to that event in the timeline, moving the playhead will also update the list selection.
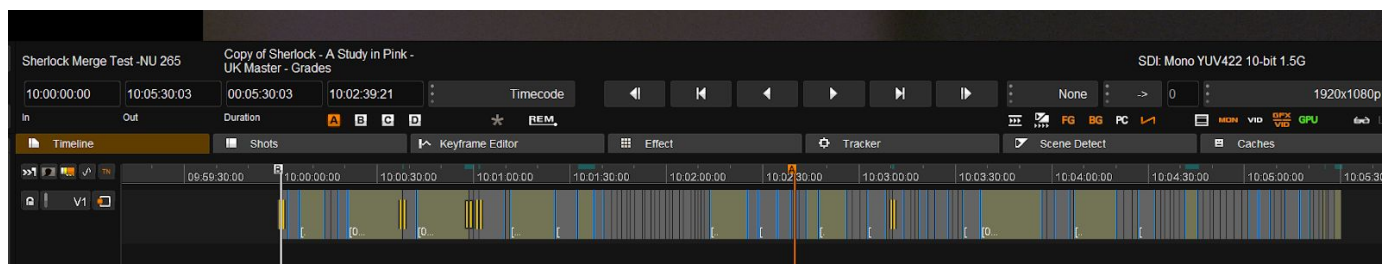
Original partly graded timeline
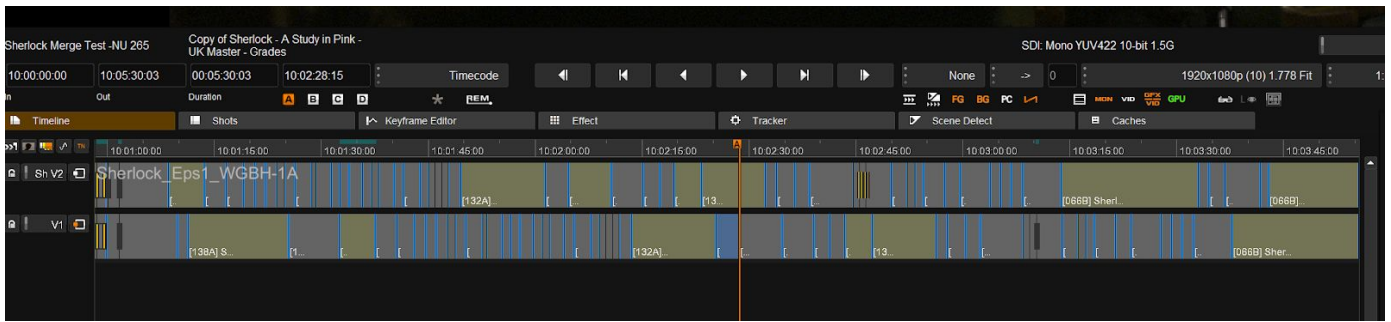
Grades merged by Source/Tape Name - Using the Mixdown Source workflow.
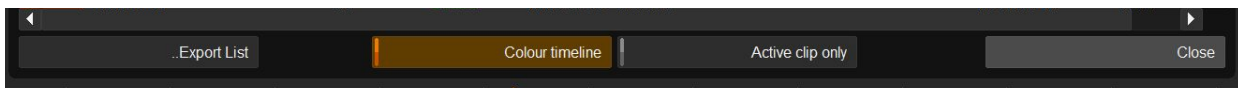
Export, colour timeline and active clip only options.

The list is based on the current top viewed track, this list indicates that the merge was done by Source, it shows the Record TC where the clip was located, the source TC (it matches the Record TC because this is a mixdown workflow) and the the Original Source TC and Tape name that the match was based on.
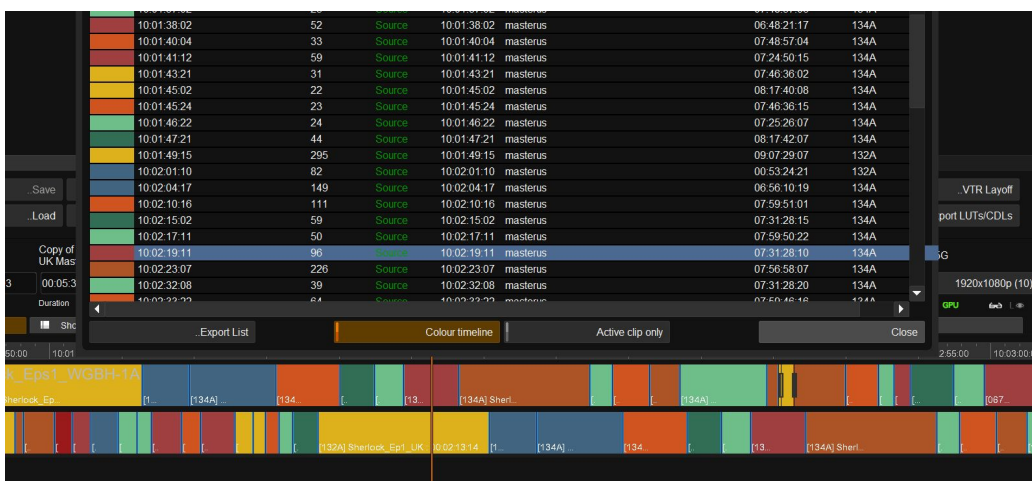
This is the coloured merge results window, note the corresponding yellow and blue clips
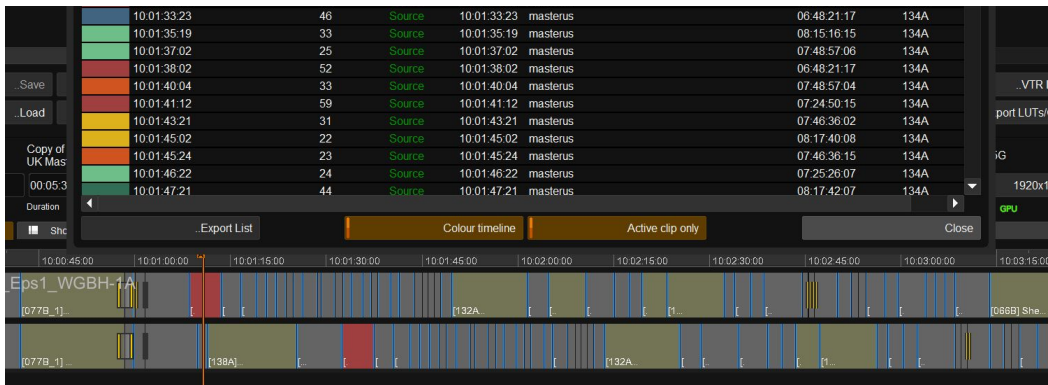
Selecting to only show the matching clip in colour

Merge Result bookmarks

After a merge, any dynamics that were not merged will be flagged with a bookmark and descriptive text. You are now able to leave the bookmark window open while working in the application.

Expanded notes metadata

New sort modes and extended data in notes

When saving notes, data from Original TC and Original Source (Mixdown Src workflow) is saved in the notes. Additional sort modes have been added to mirror those in the events view.
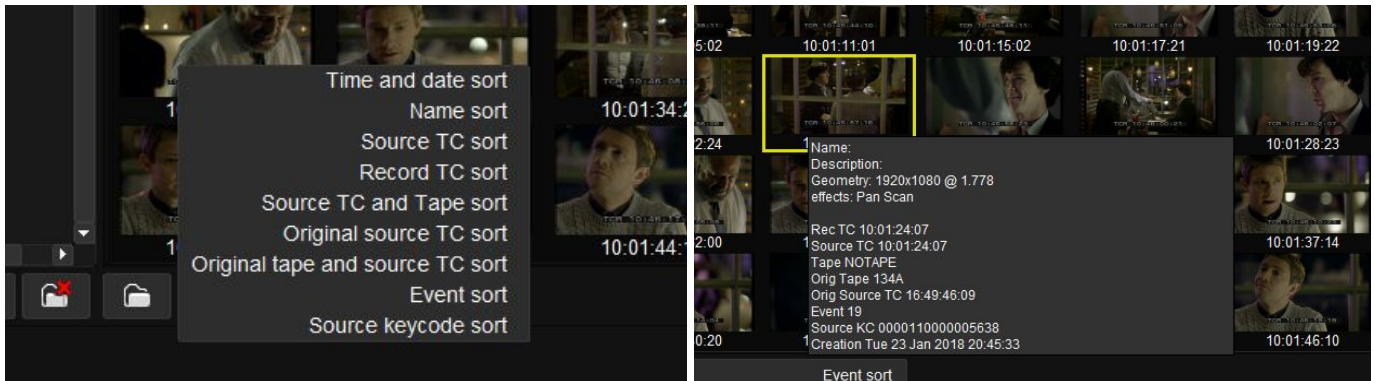
CLI commands

New EDL import option

Markers in EDl's that are created using the *LOC entry in the EDL can now be imported to the timeline from the CLI

Command:

Usage: --import-edl <PATH> <--new | --add | --mark> [options]

Additional options:

--import-bookmarks will import Import *LOC markers to the timeline.

AAF and Avid workflow changes

Changes to Avid MXF Relink workflows

In this release we have made improvements to the Relink workflow when using MXF OpAtom files, we have reinstated a feature that was removed in 2016.1 that precluded users from relinking by Source ID, it required a Tape Name or Tape Name data duplicate into the LabRoll,Camroll or Soundroll fields to relink against.

We have made a change that will now correctly use the Source ID from the original Avid MXF to ensure relinking is successful. Please ensure that the new exported material is exported to a new folder or volume to allow for easy relinking.

The Source ID field is also correctly propagated when using DNxHR (Larger than HD) resolutions allowing relinking of DNxHR sources as well.

New option when importing AAF

Users can now choose which audio track should be imported when importing an AAF, by default the setting is to import all tracks.

Clicking on the Select Audio Tracks button will open a dialog that will show available tracks to select for import. Once opened, a track selection must be made else no tracks will be imported at all

.
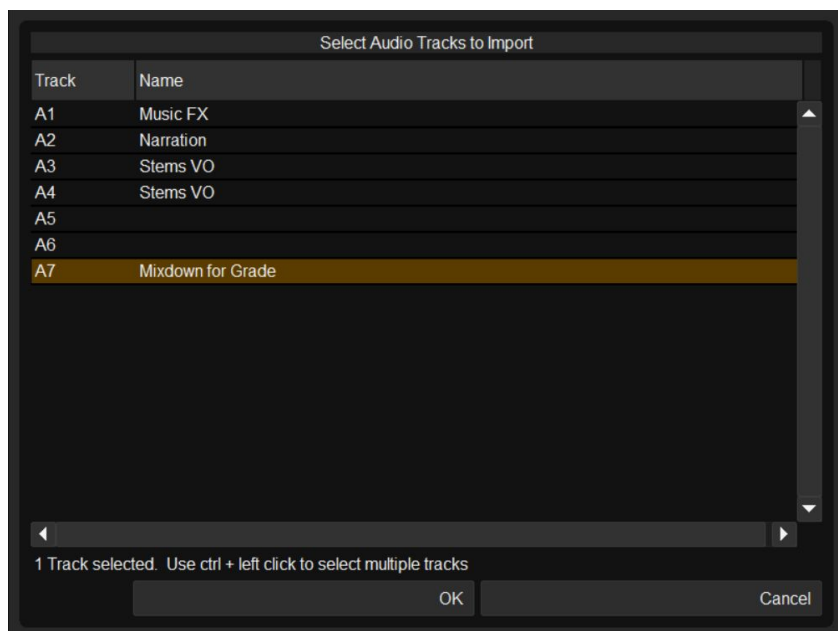
Track names are retained but the will be reordered numerically in Nucoda.
Using this option will not affect AAF round trip workflows.

DVO Scratch Target

The DVO Scratch Target tool is an enhanced version of the original DVO Scratch. It has the same controls as the original and can be used in place of the original.

The new option allow the user to add and remove columns to the image and then specify whether processing should be forced or bypassed on a per column basis. This will allow scratches that are not detected by the Auto setting to be targeted for removal.

A paint tool can also be used for shorter scratches and a frame duration can be specified for each column.

DVO Scratch Target online manual

http://www.digitalvision.tv/w/index.php?title=UM:Dvo_Effects_Dvo_Scratch
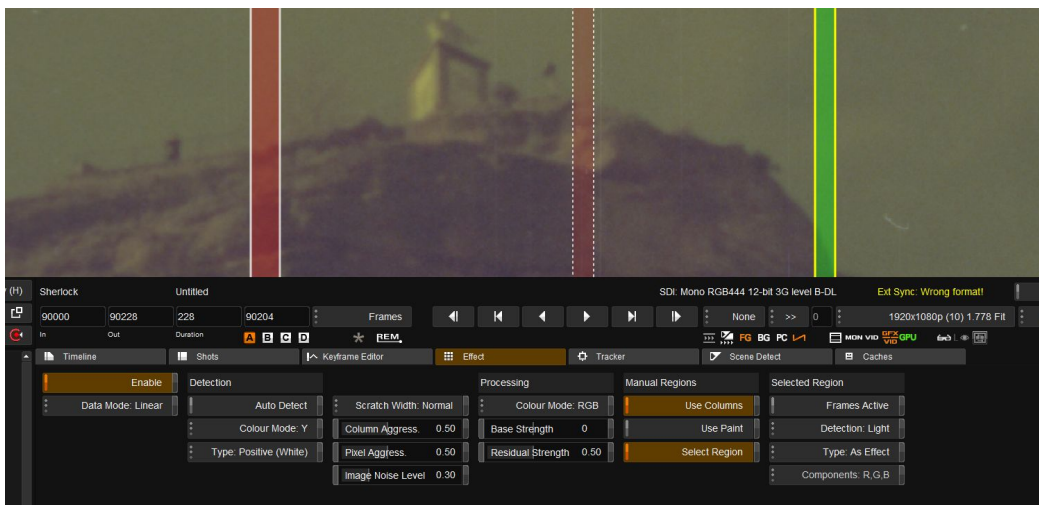
DVO Dirt Map

DVO Dirt map uses the technology behind DVO Dry Clean to selectively fix images based on an embedded dirt map created when the image was scanned. Please contact your scanner manufacturer to see if your scanner supports Infrared dirt map creation.

DVO Dirt Map online manual

http://www.digitalvision.tv/w/index.php?title=UM:Dvo_Effects_Dvo_DirtMap

DVO Dry Clean Updates

DVO Dry Clean now has a new Flash protection mode to guard against false positives when flashes of light appear on film, such as flash bulbs in cameras.

There is also a new cut safely mode as well as a Super Aggressive setting for very noisy material.

DVO Dry Clean online manual

http://www.digitalvision.tv/w/index.php?title=UM:Dvo_Effects_Dvo_DryClean

Digital Vision (UK)
110 Wapping High Street
Wapping
London
E1W 2NE
United Kingdom

Tel +44(0)20 7734 8282
Fax+44(0)20 7734 8282

Digital Vision Development AB
Sankt Eriksgatan 48 C
112 34
Stockholm
Sweden

Tel:+46 (0)8 546 18200
Fax:+46 (0)8 546 18209

Digital Vision Systems Inc.
6464 Sunset Blvd
Suite 830
Hollywood
CA 90028
USA

Tel:+1 818 769 8111
Fax:+1 818 769 1888

Nucoda

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2017.1 FEATURES GUIDE

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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.
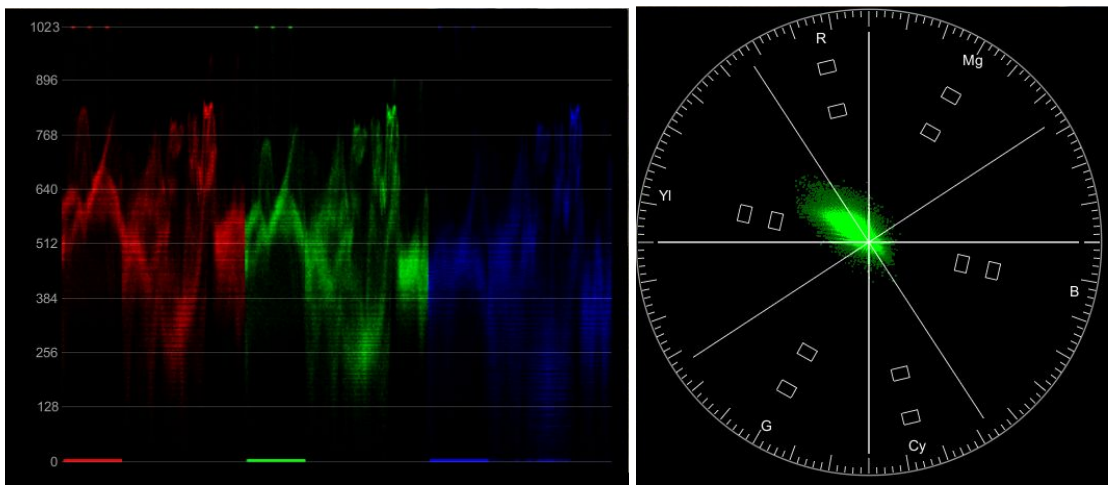
See : Manual - Graphs Specification

Overview of timeline cache indicators

There has been an addition to the cache colour indicators in Nucoda.
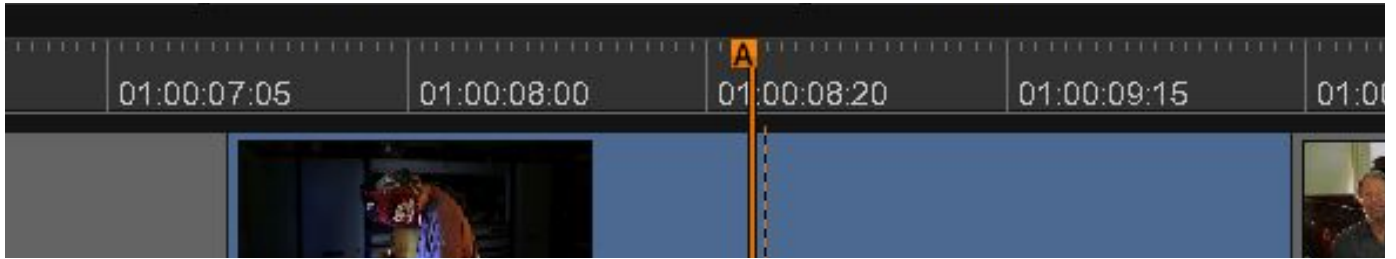
No colour in the timeline - this indicates no processing of any kind is required - in this case the media matches the output format and there is no scaling done on the master layer (project scaling options)
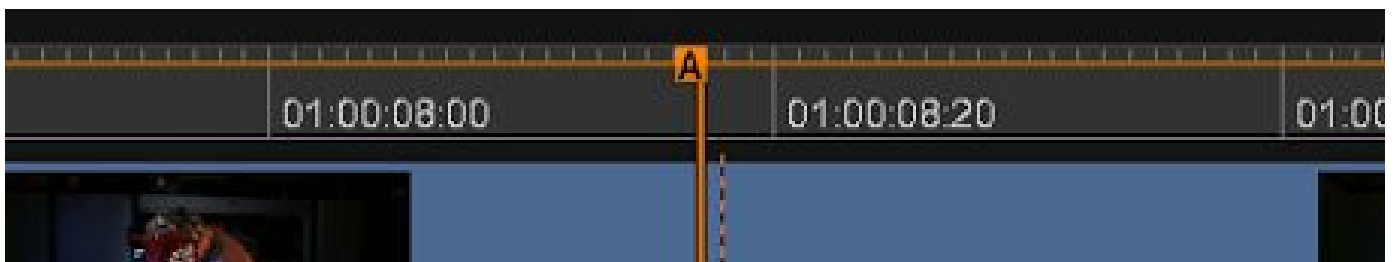
The new thin orange line indicates that there is a GPU layer that has not been cached - so it is a realtime preview. In this case the material is 1920x1080 but the output format of the project is larger and scaling has been set to Fit - so in this case the Master layer will do the resize and that is on the GPU. To cache Master layer effects, turn on the Output cache in the Caches tab.
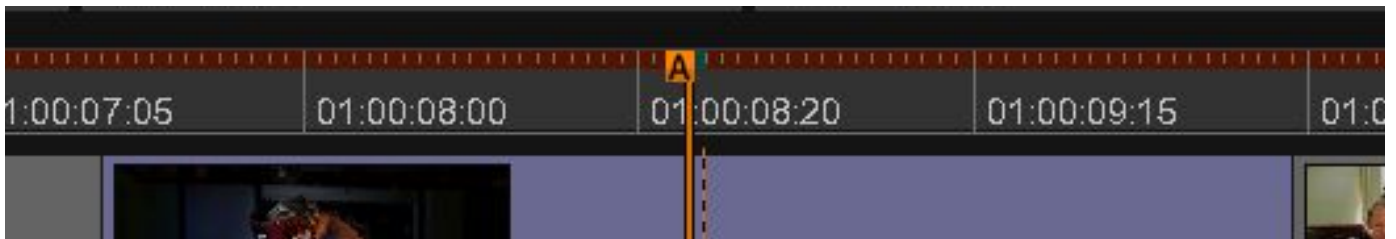
Dark red indicates uncached media that has been set to create source clone in DPX or EXR
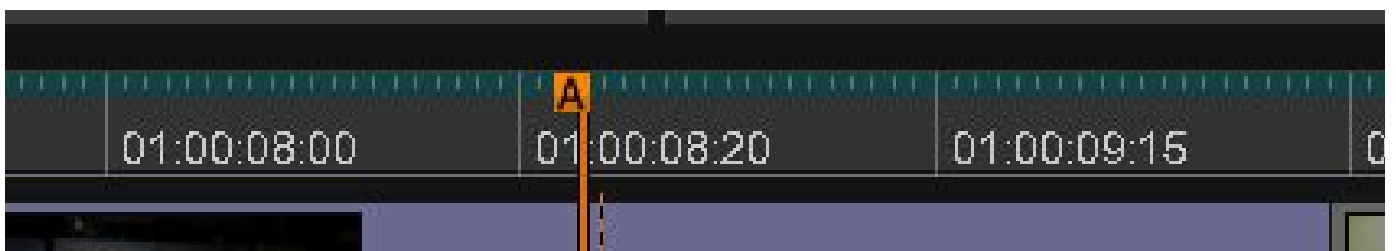
Dark green is source media that has been cached as DPX or EXR
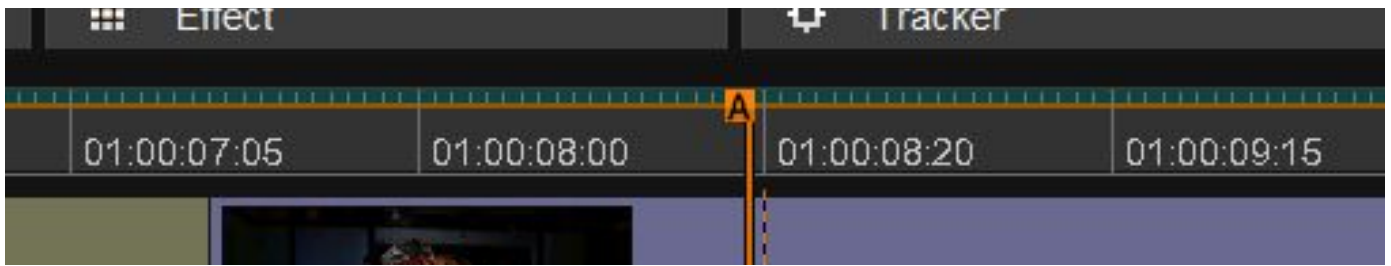
Dark green and thin orange line - cloned source media with a uncached GPU layer (this can be a colour layer or a master layer)

Light green - all layers are cached - the light red indicates uncached material.
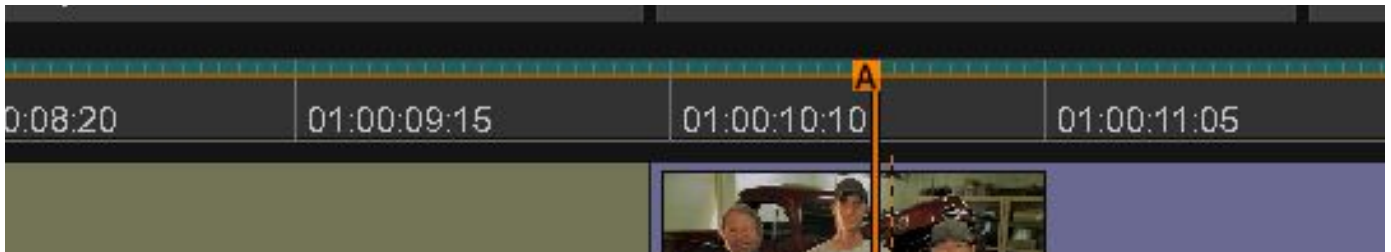
Light green and thin orange line - there are some cached layers but also some GPU layers that have not been cached.

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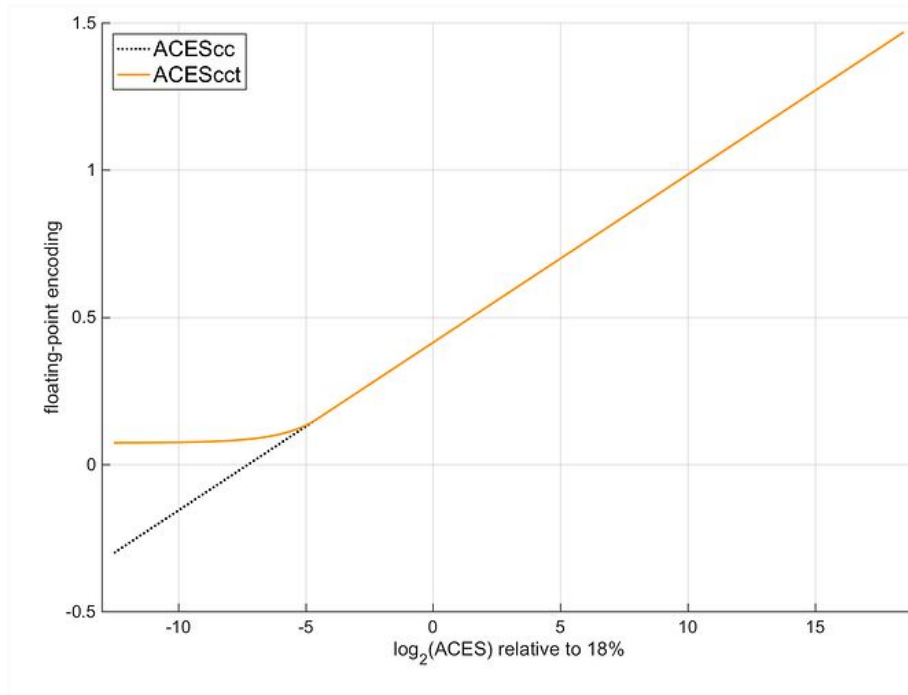
Specifically, for ACES values greater than 0.0078125, the ACEScct encoding function is identical to the pure-log encoding function of ACEScc. It is only below that point that the curves differ. However, note that because of the toe, ACEScct is *not* compatible with ACESproxy.

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.

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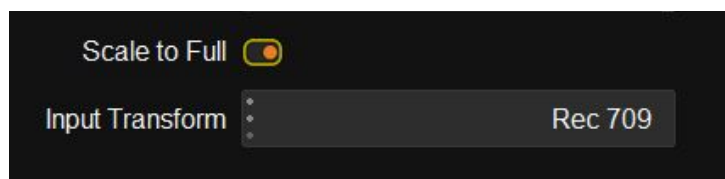
Apply composite in ACES Linear

- 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.
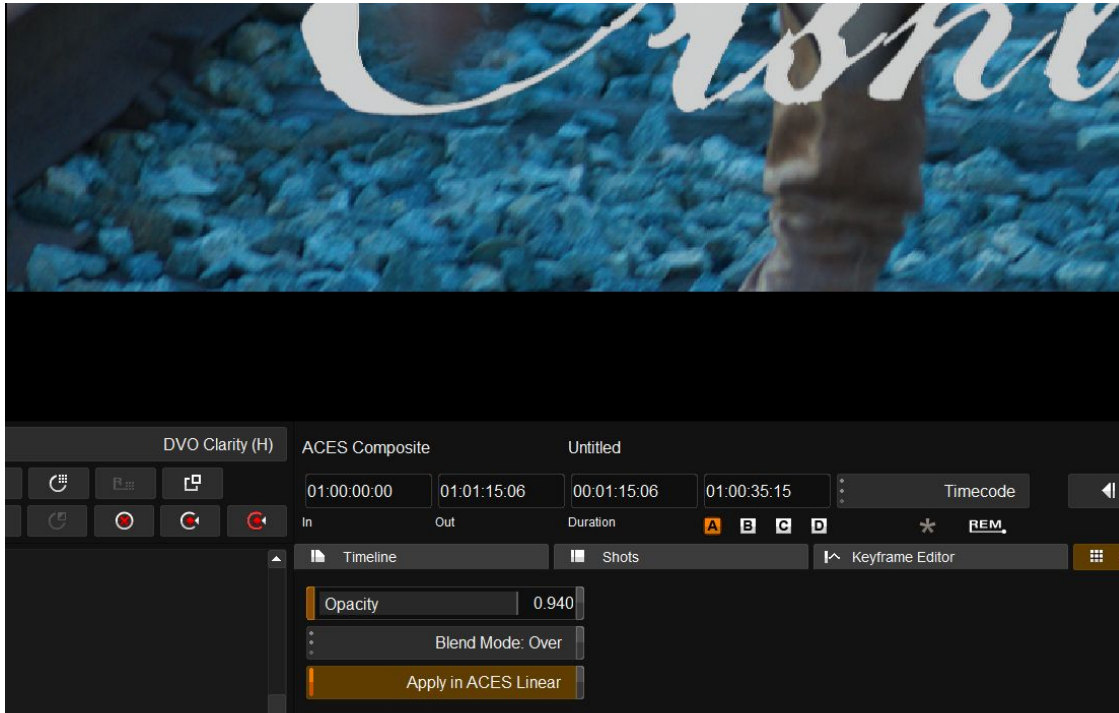
New ACES ODT

Rec.2020 D65 ST2084 Clamped to P3
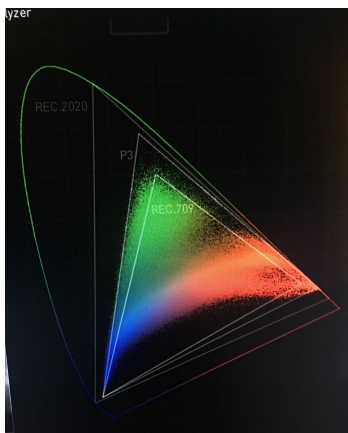
Also see : Manual - ACES

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

- 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 DolbyOuputFormat.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)

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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.
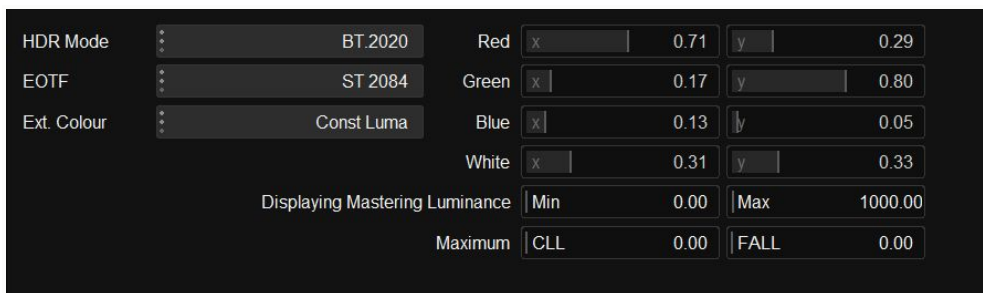
New supported video formats

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.
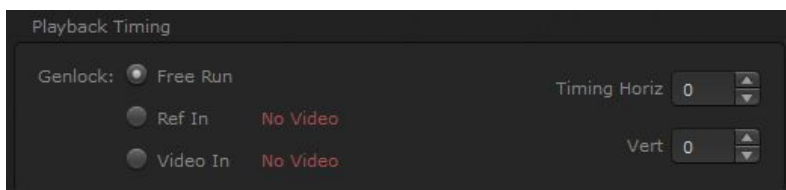
SDI Output capture

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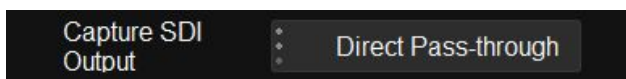
Also see : [Support - AJA Video](#)

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.

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 remained in that state.
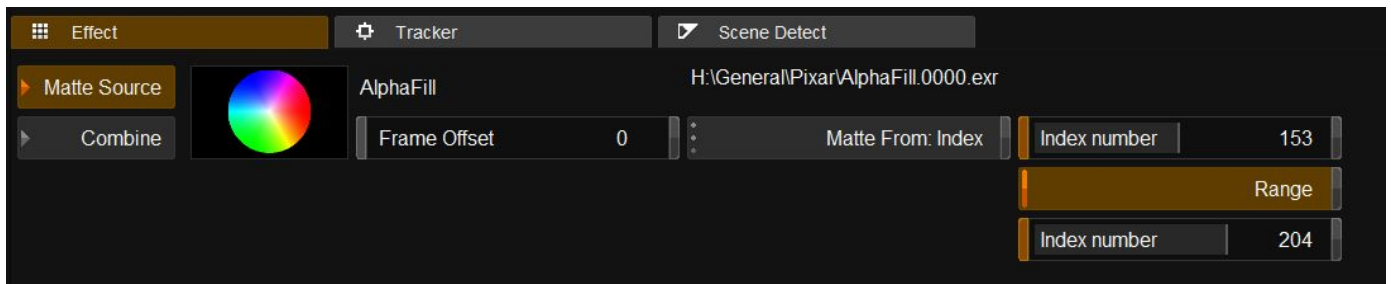
Enhancements to the Matte Tool (Index Matte)

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 it's 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 that 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 enhances 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	

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Colour Tools

Gamma Matrix update - Load Matrix values from file or Clipboard

- Accessed by pressing the Load button in the Gamma Matrix.
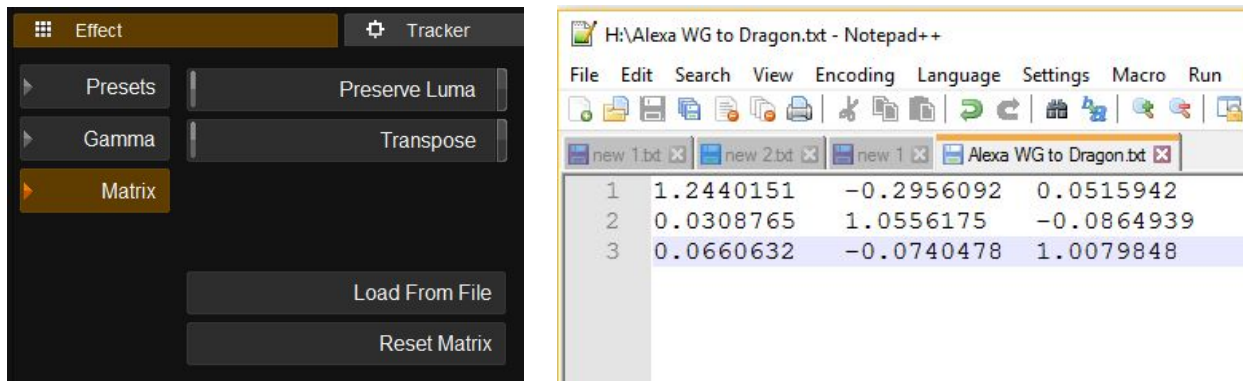
- A text file can be selected and loaded or the values can be selected and copied/pasted into the "Use text" below the file selection area.

- Depending on how the values were written the "Transpose" button may have to be used to get the correct result.
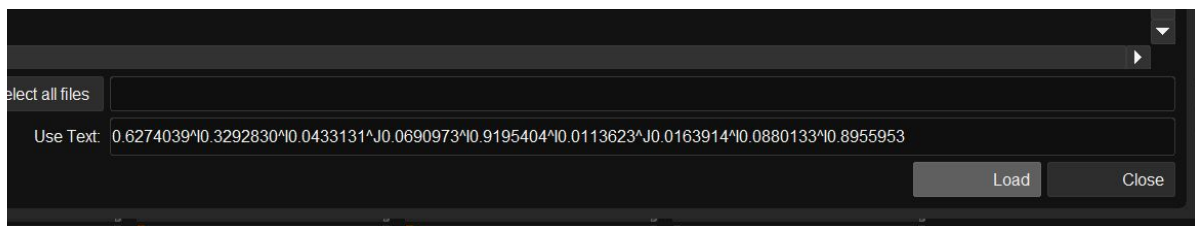
Avid AAF media export

- 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 _ . 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

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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 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.

Digital Vision UK

Digital Vision (UK)
110 Wapping High St
Wapping
London   E1W 2NE
United Kingdom

Tel:+44 (0) 20 7734 8282
Fax:+44 (0) 20 7481 2334

Digital Vision US

Digital Vision (US)
6464 Sunset Blvd/Suite 830
Hollywood
CA 90028
USA

Tel:+1 818 769 8111
Fax:+1 818 769 1888

Digital Vision Sweden

Digital Vision
Telefonvägen 30
SE-126 26
Hägersten
Sweden

Tel:+46 (0)8 546 18200
Fax:+46 (0)8 546 18209

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SDK Updates

Arri support for Alexa Mini

- Support for Alexa Mini MXF files - Audio and Video
- Support for new 3168 format in Alexa SXT
- New colour processing version for Alexa SXT ALF-2 Looks
- New anamorphic factor 1.33 (4:3)

RED support (6.2.2)

- Rec.2020 colour space support
- Support for Helium sensors
- Weapon 8K and Raven 4K support
- New HDR GAmma options HDR-2984, BT.1886 and Log3G12
- Support for Red Wide colour Gamut
- Imagegammalog 3G10
- Rocket-X driver 2.1.34.0 and firmware 1.4.22.18 or later
- Rocket driver 2.1.23.0 and firmware 1.1.18.0 or later

Sony SDK - Change to previous behaviour

In this version of Nucoda, when importing Sony RAW files, the tone curve for the files will be set based on the video project settings. Previously it always defaulted to SLog/

New settings:

- Video SMPTE > Rec.709
- Full Range > Rec.709
- Cineon Log > SLog2
- Video Log > SLog2
- Aces > Aces

New GUI features for Nucoda and Phoenix

Keyboard shortcuts added for making tracks larger and smaller

- Using Alt+Up or Down arrows will make timeline tracks larger and smaller

Record time splice

After selecting one or multiple clips - pressing Alt+B will splice the clips to the selected track but will splice the clips based on their in code. This way it is easy to paste VFX clips where they belong based on their start timecode.

- This mode always overwrites

In and out points are respected when splicing:

- If both in and out are set and the material falls inside the range it will be spliced
- If the in or out points are shorter that the source, but in a valid timecode range, the source clip will be trimmed and pasted between the in and out points.
- If the in and out points are not in a valid range an error dialog will be shown.

Progress bar for XML and AAF imports

When importing AAF or XML files there will now be a progress bar while importing, import functions can also be cancelled using the cancel button on the progress bar.
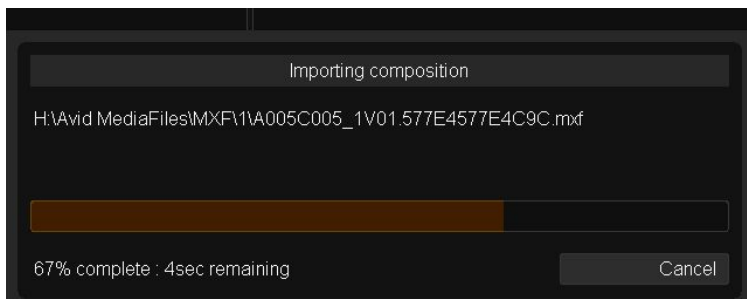
Improvement when moving multiple clips on the timeline

Moving many clips on the timeline is now much faster.

New sorted dropdown list for project setup

Nothing that big, but hopefully makes life easier....
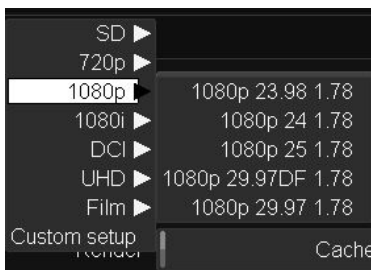
Icon indicator for layers

An icon will be displayed next to the layer name that will indicate if any of the following layers are active:

- Matte Source
- Shape
- Keyer
- Router
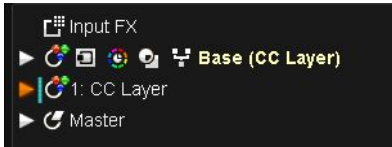
Update in the File chooser

When using the file chooser, Local drives will now display the name of the drive next to the drive letter. When any new drives (external, network) is added, a refresh using F5 will refresh the File chooser and show the new
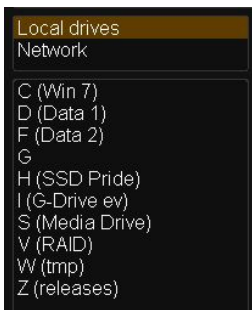
Changes to Track colours

Alternating tracks are now differentiated with a slight colour difference.

Addition of reset button on effects boxes

To make editing easier for Phoenix and non panel users, we have added a new element to the GUI.

This new button will indicate if a value or menu has been changed from it's default state by turning orange. Clicking on the button will reset the parameter to default.
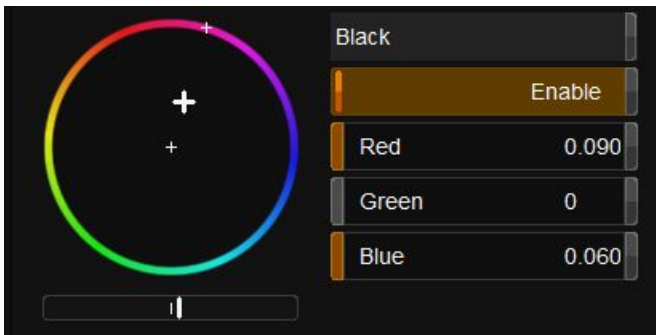
Avid

Change to relink behaviour in Avid

Due to changes made for the support of Subclips in the Avid workflow changes were made that will affect the relinking of clips in Avid when exported from Nucoda.

The change is in the method used for identification when relinking. We source file name that is embedded in the media when creating MXF media in the Avid is automatically copied to the Tape field in Nucoda, any extensions are stripped from the name.

A file named ***A008C003_140601_R2E5.mov*** will have that name in the Source File column in Avid, importing the file into Nucoda and exporting again as MXF will return the file without a source file name, but with a tape name of ***A008C003_140601_R2E5***, see below.

This has not changed between 2015,3 and 2016.1

		Name	FPS	Start	End	Duration	Camroll	Labroll	Soundroll	Source File	Tape	Image Aspect Ratio
		Outside guy and girl.new.02	23.98	02:40:00:00	02:40:18:17	18:17	A010C030_140602_R2E5			A010C030_140602_R2E5.mov		16:9
		MCU Feet on sidewalk.new.02	23.98	01:38:26:09	01:38:45:14	19:05	A010C012_140602_R2E5			A010C012_140602_R2E5.mov		16:9
		Dancing in line going to house.new.02	23.98	02:00:45:10	02:00:58:22	13:12	A010C019_140602_R2E5			A010C019_140602_R2E5.mov		16:9
		Office counter.new.02	23.98	01:05:42:19	01:05:57:20	15:01	A008C003_140601_R2E5			A008C003_140601_R2E5.mov		16:9
		A010C030_1V01.03f0a41d_Nucoda	23.98	02:40:00:00	02:40:18:17	18:17					A010C030_140602_R2E5	16:9
		A010C019_1V01.03efe761_Nucoda	23.98	02:00:45:10	02:00:58:22	13:12					A010C019_140602_R2E5	16:9
		A010C012_1V01.03eed2c1_Nucoda	23.98	01:38:26:09	01:38:45:14	19:05					A010C012_140602_R2E5	16:9
		A008C003_1V01.03ee0491_Nucoda	23.98	01:05:42:19	01:05:57:20	15:01					A008C003_140601_R2E5	16:9

However, to relink in Avid, the selection in the Avid relink dialog used to be: ***Start TC and Source ID***
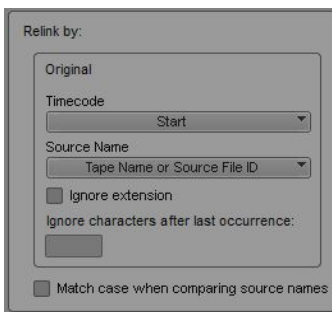
To relink to MXF files created in 2016.1, use: ***Start TC and Source Name and check "Ignore extension"***
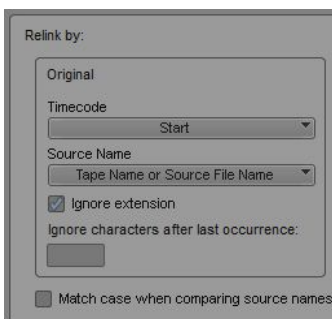
Also remember that you can specify files for relinking to "Selected items" in all open bins.

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Colour Tools

Updates to Printer Lights keyboard controls

Printer light are accessible via the numeric keypad at any time - for the printer light shortcuts to work Numlock must be turned off.

Additionally, all the controls can now be assigned in the Hotkeys.prefs file, the keys can also be assigned a specific value for printer light increments. The Numeric keypad controls are as follows:

7 8 9 - Increase R G B printer light by 1 stop

4 5 6 - Decrease R G B printer light setting by 1 stop

1 2 3 - Reset values

Numpad Minus - Reset all

Numpad + to Increase all by one stop
Numpad enter to decrease by one stop

Use Shift & Key to make changes in .5 of a stop
Add Ctrl & Key to change value by .25 of a stop

Enhancements to the Clean Up tool

Media can now be purged based on the media resolution.
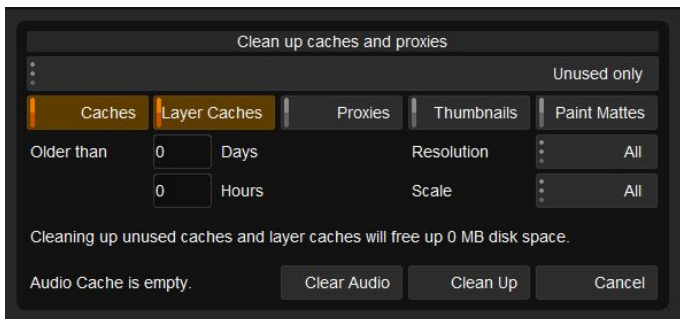
LUT exports

Using the export LUT menu, users can now export both a LUT and an Inverse LUT.

This is particularly useful for restoration workflows where a LUT is applied during the restoration work, but the LUT need to be removed afterwards.

- Only 1D LUT's are supported - no colour transforms
- The Inverse LUT function will only be available if the 3D LUT option is deselected
- v2 CMS and HDR is supported for export - for V2 files the range is restricted between 0 and 1
- No negative values are supported
- If an invalid Master Curve is used the export will report an error.
- Remember to specify the layer to be exported
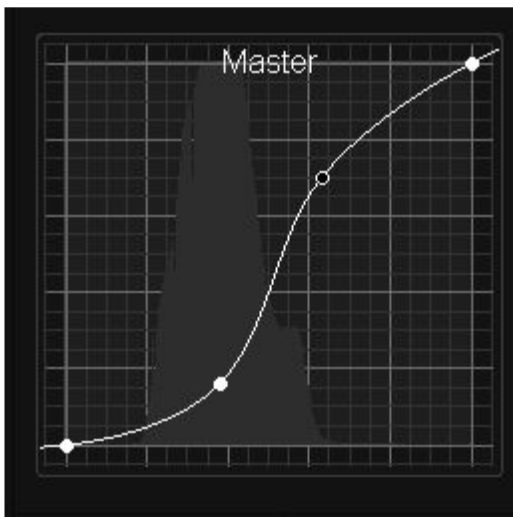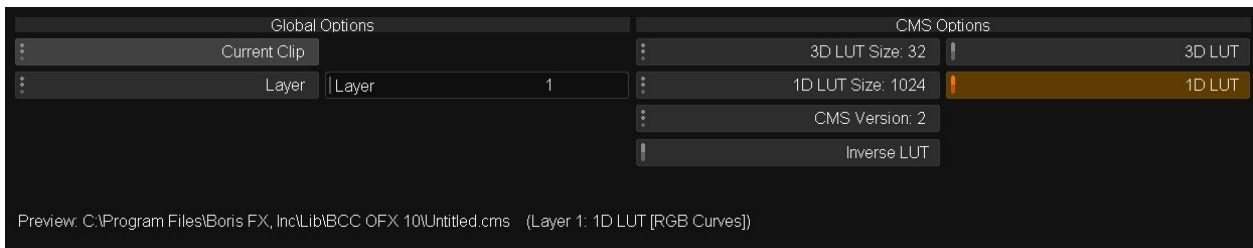
Valid Curve for inversion   Invalid curve
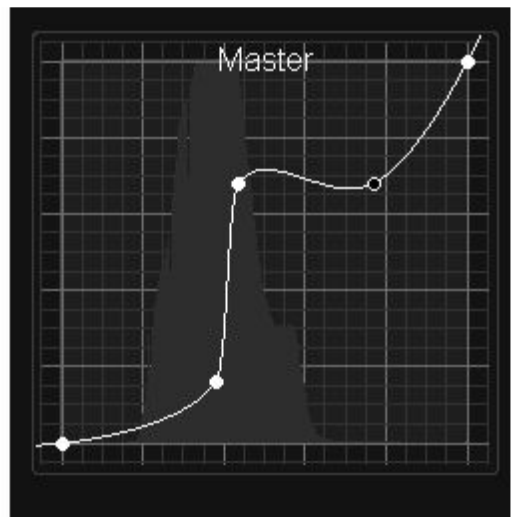
ACES 1.0.2

New Look Management Transform

- A new LMT has been added to the CMS/ACES 1.0.2/LMT folder
- LMT.Academy.ChromaFix.1.0.2.cms
- It is to be used as a LUT in an ACEScc project, ensure that the "Apply in Linear ACES" button is selected when using this LMT.
- It is designed to mitigate an issue with certain cameras that seem to generate colour values that are not correctly rendered in an ACES project. This can include blues and cyans, reds.
- Older ACES version LMT's have been updated.

  For those of you grading in ACES regularly, we have a beta version of ACES with ACEScct colour space available.

Before and after comparison using the ChromaFix LMT
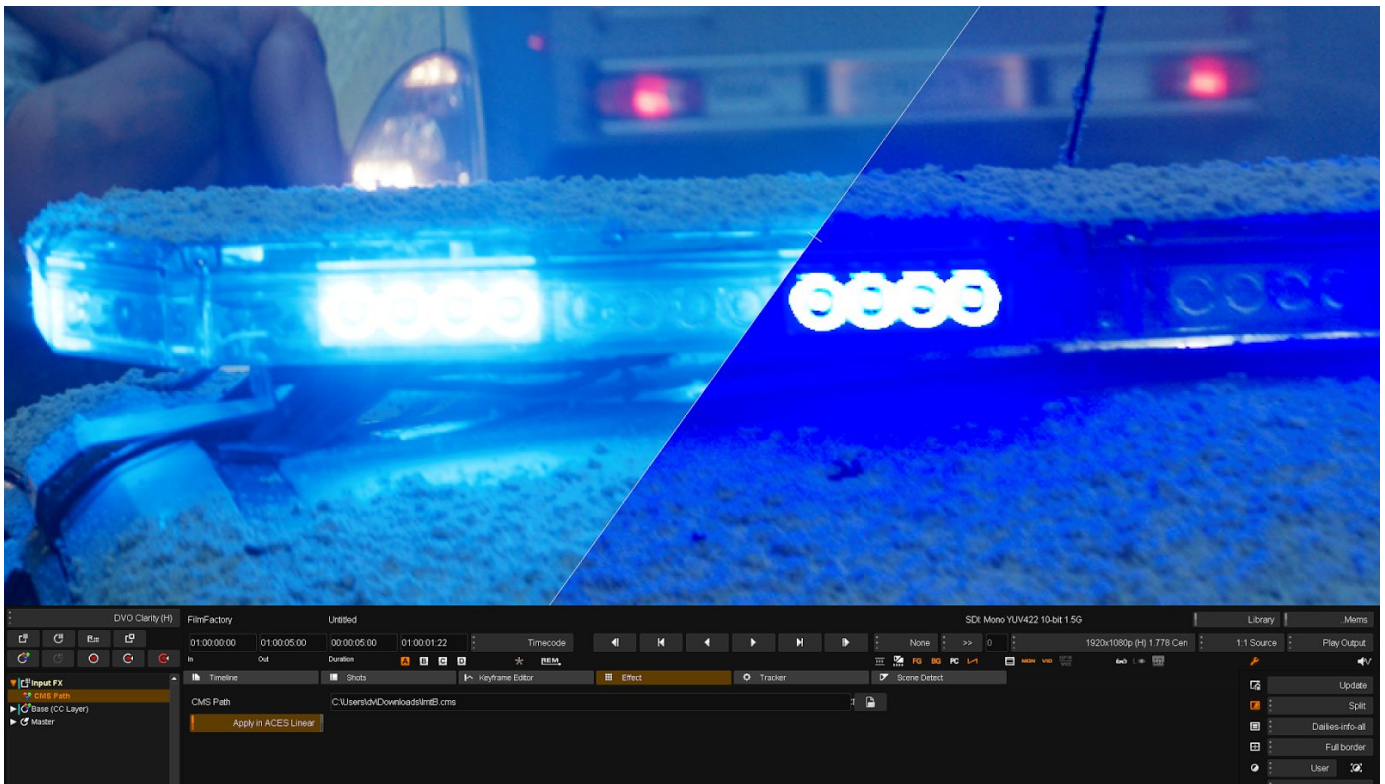
Video output

Removed 444 12 Bit PQ

- This option has been removed to avoid confusion

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AJA Kona updates

AJA Kona Video Driver Update

- This release includes AJA video driver v12.3.7.8
- **You must uninstall any current AJA driver and restart your PC before running the installer.**
- To make life easier, we have created a version of 2015.3 that uses the new Kona 4 driver This version is called 2015.3.038-SP1
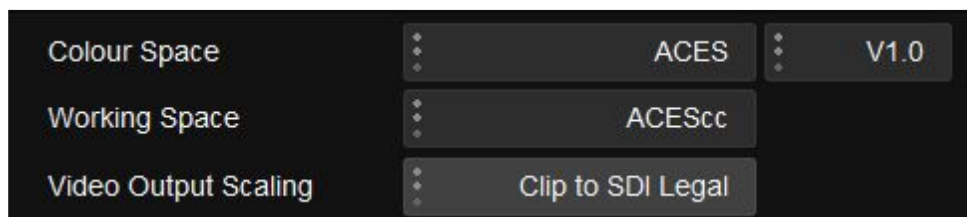
AJA Kona support for video and audio capture

- This version of Nucoda adds video and audio capture using the Kona card
- Up to 8 audio channels are supported
- For capture from DigiBeta please contact support@digitalvision.se

Preference for AJA Kona buffer depth

- Add a preference to allow control of the buffer depth on the AJA card
- This will allow less of a delay between the Kona SDI and GUI monitor but can cause playback reliability issues if set to low.

Support for ACES 1.0.2

- We have implemented ACES 1.0.2
- Includes new ACEScc working space, this allows grading controls respond like they would in Log space.
- Please see the full documentation in the online user manual
- 128 point transforms are available for users who require additional precision

    - http://www.digitalvision.tv/w/index.php?title=UM:ACES

Updates to the interface

Nucoda and Phoenix

- The button style in the interface has been updated and refreshed
- There have been some icons updated.
- Playback, thumbnail, multi playhead options will now retain their state.
  This is a per user preference and is set at application level.
- The size and split of the GUI is now saved on a per user basis.
- The In, Out and Duration timecode boxes are now editable.
  The user can set in and out points by entering the timecode directly into the In / Out boxes above the timeline. After entering an In point, adding duration will add the Out point automatically.
- Default timeline start can now be set in preferences.
- The size and split of the effects and timeline interface will now be saved per user
- Focus will not be lost anymore when editing layer names and other labels until the user hits return
- The speed of turning track visibility on/off has been much improved

Precision Panel

- The size and style of the menu buttons have been updated
- Changes has been made to the on screen graphics
- The keys on the touch screen keyboard has been enlarged and some keys have been removed

Find option in the library

Addition of a Find button to the filter matrix below the library, selecting clips in the library and clicking find will select the selected clip (or clips) in the timeline.

Once selected it is easy to apply grades, move or add them all to a group for group grading.

Selected clips in segment mode can be moved using keyboard shortcuts

In segment mode, clip that have been selected on the timeline (audio or video) can be moved using shift+up arrow shift+down arrow.

Locked tracks will be skipped automatically and new tracks will be created as required.
Using the m , and . / hotkeys will let you nudge clips by single frames (, and.) or multiples of 10 (m and /)
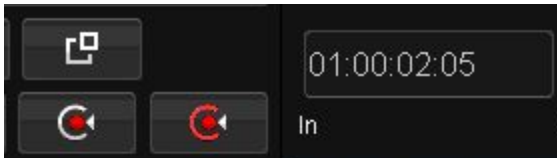
Moving clips in this manner will not allow other clips to be overwritten and if any clips are in the way and the track is not locked, the move will be cancelled. This is to avoid any accidental timeline catastrophes.

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New Master Reset features

Changes to Master Reset - Retain selected effects on reset

To make working with complex matte configurations in Nucoda easier the layer reset function has been redesigned to accommodate this. An additional Reset option has been added,which will allow the user to specify which effect types are reset.
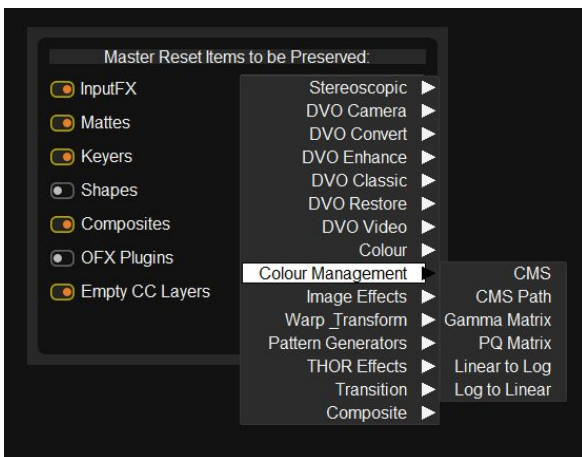
This is done via a new popup menu, that can be accessed the holding Ctrl+Shift and clicking on the new reset icon:

This menu will allow the user to specify which effects will be reset and which will be retained when Master Reset is pressed. The user can also use the effects menu in the Master Reset Option box to choose any available effect to not be affected.

Master reset will retain Input FX (current default) - we have chosen to keep the default behaviour but
Can recommend that you enable Matte layers, CMS and CMS Path layers and Pan & Scan to the defaults

On the Precision, keyboard using "Backspace" or mouse click master reset in GUI

Alt+Master reset will still reset *everything*
Shift+Master Reset will reset the selected layer (except selected items)
Ctrl+Master reset will reset selected tool

Precision Button changes

Changes to Show K options (Precision)

Show K : Enable Show Key (alpha) mode for current layer.

The matte viewed will be the combination of Matte - Matte Diff - Keyer and Shape

Ctrl + Show K
The matte viewed will be the Keyer only

Shift + Show K
The matte viewed will be the Shapes only

Alt + Show K
The matte viewed will be the Matte Diff only

Long Press Show Key
The Matte viewed will included all layers that can contribute to the matte
Matte - Matte Diff - Keyer - Shapes -Matte Paint - Matte Tools

Hotkey updates

Please check the Keyboard shortcuts document for updates to the **Master reset keys** and also for the addition of **Revert and Set New Revert** to the keyboard shortcuts. Also new shortcuts for moving clips on the timeline.

HUD and Grid updates

The HUD files have been updated and all the presets will now scale depending on the image resolution. Some of the presets have been tidied up and some have been renamed but all the favorites are still there.

Option for 1.66, 1.77, 2.40 and 2:1 has been added as default to the Masks and Grids

New Project Format files in Examples

We have added two files to the examples directory. They are extended project formats as a Menu or List configuration and contain more resolutions and frame rates. In the Project Formats directory there are files with individual files for each resolution if you would like to construct your own format list.

Shape handling

When creating shapes the you are now able to add points to the shape by simply holding the Ctrl key and clicking on the shape outline.

- Clicking and dragging the mouse will allow for selection of multiple points
- Double clicking a shape outline will switch it to transform mode
- Pressing Ctrl while inside the shape will allow you to move the shape

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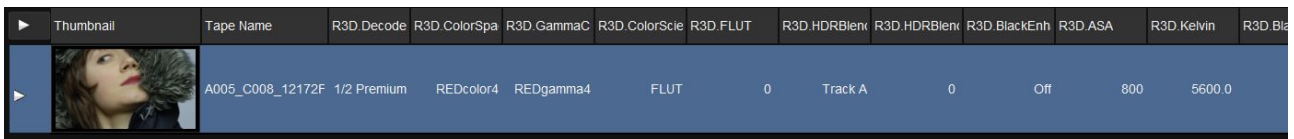● Pressing Ctrl while clicking on a corner point will allow you to rotate the shape

File Formats

SDK Updates for Sony

- Full support for Kelvin, Exposure Index and manual exposure settings in Sony SDK
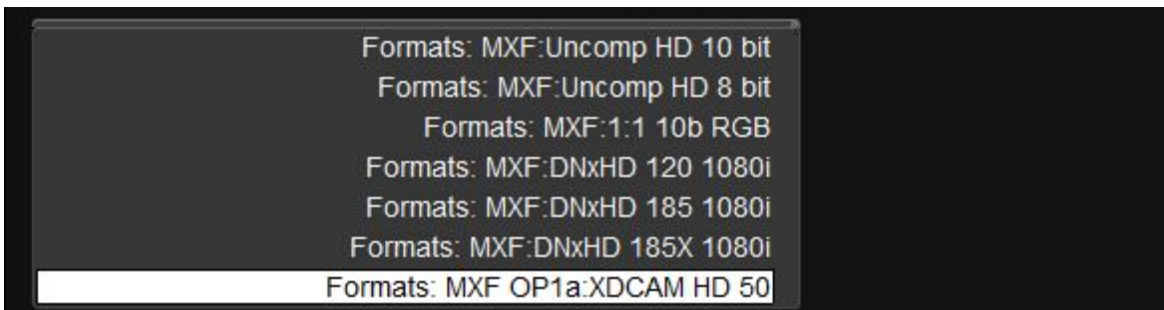- Improved SLog2 Slog3 and .cine support for Sony sources

SDK Updates for Red

- New processing support for DEB (Dragon Enhanced Blacks)
- Loading DEB setting from RMD files
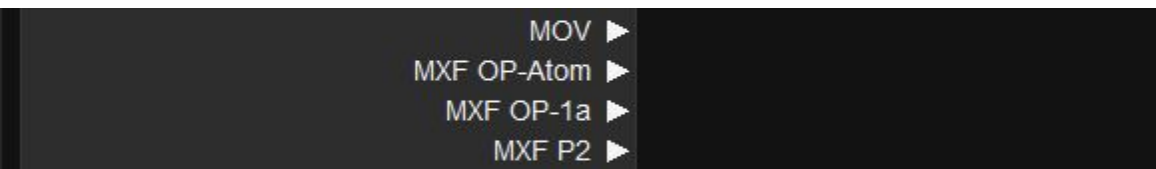- Two new colour spaces - REDcolor 4 and DRAGONcolor 2

Changes to MXF file exporting and naming of DNxHD/R

- In the previous version all MXF files were grouped under the MXF label
- Included in this group were OP-Atom and OP-1a

- MXF exports have been split into 3 subcategories to make it clearer for users what format they are exporting.

  ○ MXF OP-Atom - Video and Audio files are separate, used in Avid workflows.
  ○ MXF OP-1a - Video and Audio combined into a single file, typically used in Broadcast servers.
  ○ MXF P2 - AVC-i 100

- In the MXF OP-Atom category DNxHD and DNxHR files have been renamed according to the new standards created by Avid.

- In keeping with Avid guidelines, the formats have been renamed

  - DNxHD LB   (Similar to DNxHD 36)
  - DNxHD SQ   (Similar to DNxHD 115)
  - DNxHD HQ   (Similar to DNxHD 175)
  - DNxHD HQX (12 bit)   (Similar to DNxHD 175X)
  - DNxHD 444   (12 Bit RGB)   (Similar to DNxHD 440X)

- Note that not all options are available for all resolutions and frame rates

- In the new MXF OP-1a category XDCAM HD 50 has been supplemented with;

  - AVCi 100
  - DVCPRO HD 100
  - YCbCr 8 bit

- AVC-i 100 is also available for export in the P2 layout, note, that the export in P2 will result in a directory structure suitable for use on a P2 memory card, and not only a single MXF file.

Extended Properties for ProRes files (when available)

● When importing ProRes media clicking on the Properties of the file will show new extended Meta Data information

New file options for export

● Support to tag DPX files as ADX 10 or 16 on export

Avid interchange updates

Changes to Avid support
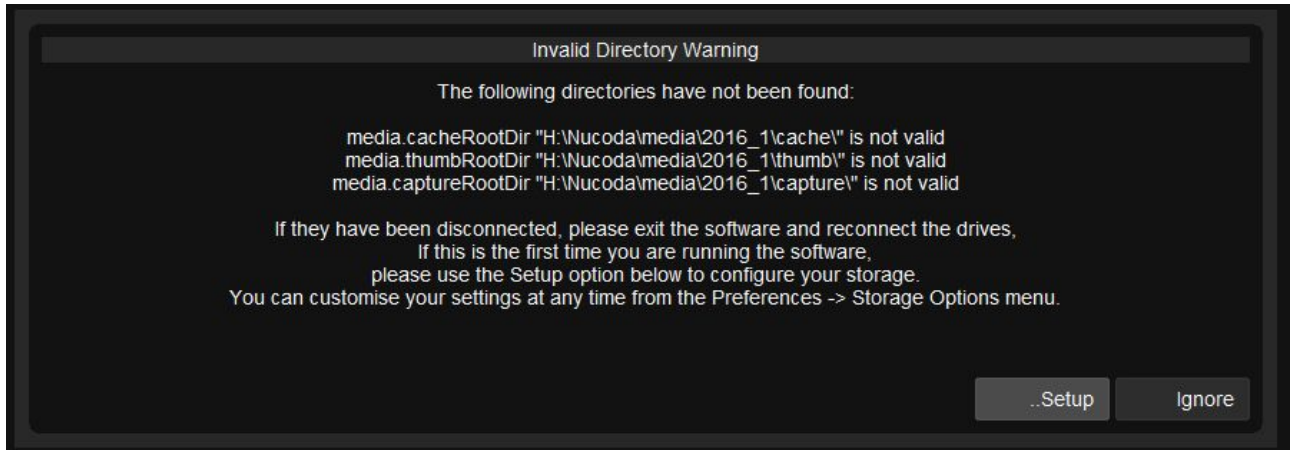
● Subclips are now supported in AAF compositions.

Support for Avid locator import from AAF

● If an AAF has locators they will automatically be imported to the Nucoda Timeline as TImeline Markers - colours will be retained.

Updates to Preferences

The setting of paths for Nucoda and Phoenix can now be done from inside the application using a path setup tool in the preferences. If you start up the application without setting valid default storage paths you will be presented with the option to do so.

The settings for Avid media paths and Avid Interplay setup has been added to the preferences.

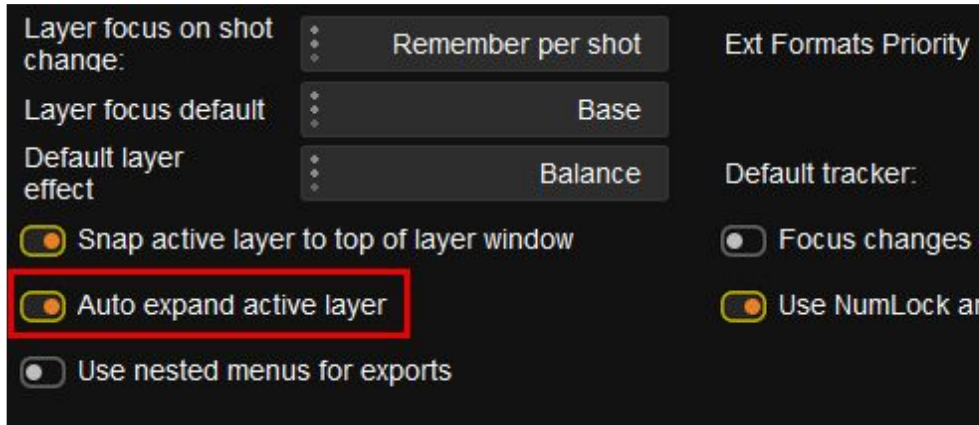In the Precision preferences the order of colour tools on the Precision panel can now be set using drag and drop menus.

Layer focus on shot change - General Tab

- Option changed from a Radio Button to a Drop down

Auto Expand active layer - General Tab

- The text "Snap layer list to active layer" has been replaced with "Snap active layer to top of layer window" to be more descriptive of the function
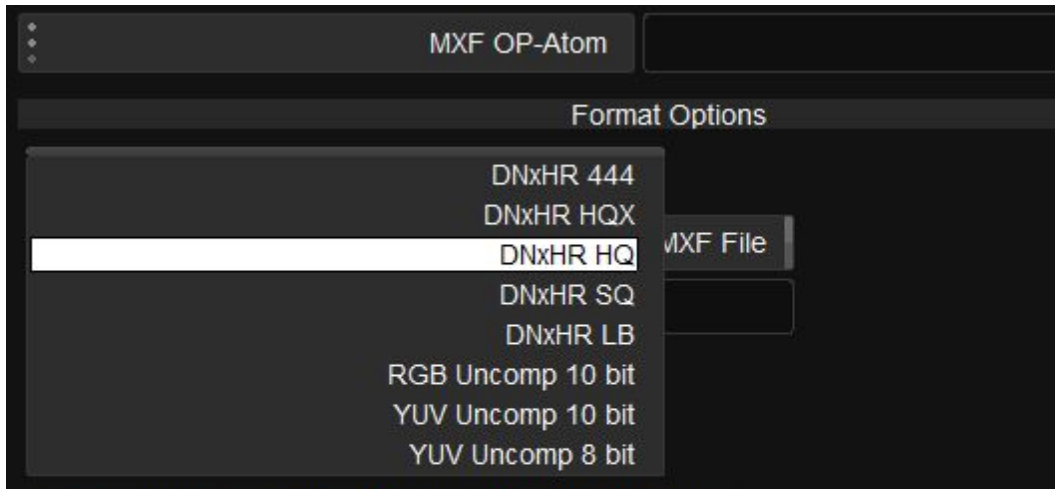

- This preference allows the user to select whether colour and effects layers are expanded when selected.

- When a layer has been expanded with the mouse it is assumed that the user wants to keep the active layer expanded, so even with the option off the active layer will stay open until it is collapsed with the mouse, at which point the active layer should no longer automatically expand.

- The arrow next to the layer name will now be orange when you switch between layers to indicate which layer is active. The icon goes back to white when you expand the layer and start clicking on tools as the icon is only orange if you have a tool highlighted (orange background)

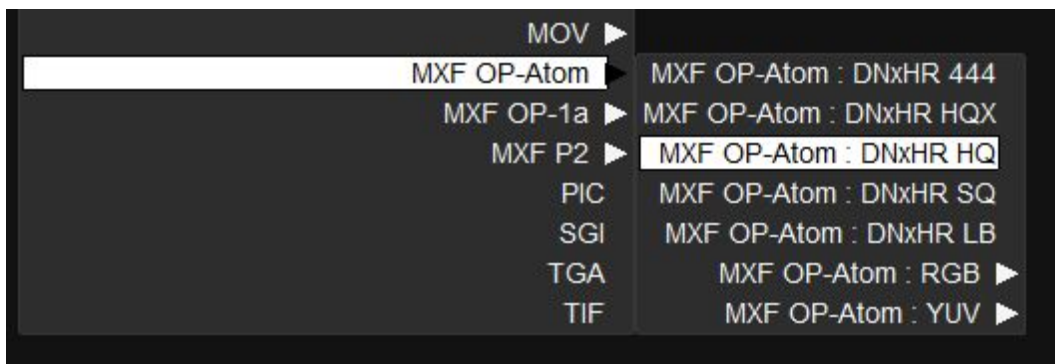**Use nested menus for exports - General Tab**

- When exporting files from the application it's now possible to choose nested menus instead of the default behaviour.

- In the default behaviour (as in previous versions) the main file type is selected from a drop down menu first ie MXF OP-Atom. Then the sub-type ie DNxHR HQ is selected from a second drop down menu

- When using nested menus the sub type can be selected directly from the first drop down.

Consolidate and Match Folder added to - Capture/Conform/Edit Tab in preferences

Two preferences from the conform page have been added

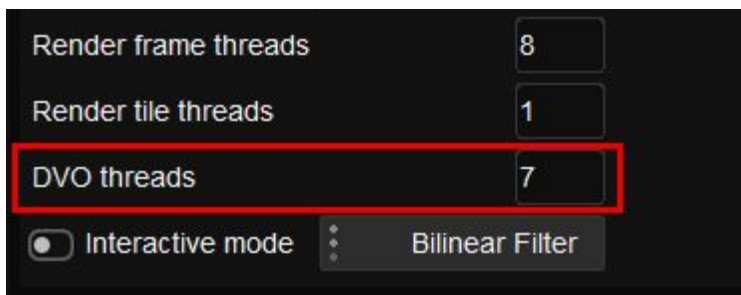- Consolidate drop down menu
- Match open library folder - On/Off

Composition Start added to - Capture/Conform/Edit Tab

- Users can now determine the default start time for when a composition is created within the project.

DVO threads - Rendering Tab in preferences

- This affects only DVO tools and is most noticeable on machines with a high core count, e.g. 16 cores and up. The setting should be set automatically, but for reference, if you have 16-22 cores, it should be set to 2 cores less than the total amount for 24-28 cores it should be 3 or 4 cores less than the total. Please make sure that hyperthreading is turned **OFF** on the workstation

  Currently some DVO tools are not affected by this change

  - DVO Dust
  - DVO Dropout
  - DVO Grain
  - DVO Noise

LUT's

Support for importing .cube lut format

- .cube LUT's can now be imported into Nucoda. We have tested as many variants a we could, please email support@digitalvision.se if you find any issues.
- New LUT's have been added to the CMS folder: PQ to HLG and HLG to PQ

DigitalVision

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.

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
> **[-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)

EDL Example - *please note that line breaks are not supported.*

TITLE: Animal Logic-S3D-with-Mattes-DEMO001
FCM: FILM

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

*FROM FILE S:\Immortals\Media\S3D\Left\Immortals-S3D-LEFT_259407.dpx
*NUCODA_LAYER Primary
*NUCODA_LAYER Matrix -effect GammaMatrix

*NUCODA_LAYER 6015_v002 -matte.r
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.g
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.b
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx

*NUCODA_LAYER 6015_v002 -matte.r
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_004_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.g
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_004_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.b
S:\Immortals\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

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.

The 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.

Other available extensions in the EDL:

*LOC: <timecode> <locator color] [Locator information]
          Locator colours:
          BLUE | CYAN | MAGENTA | ORANGE | RED | WHITE | YELLOW

Enhancements to Stereo workflow - track copy and media replacement

Two new functions have been added to Nucoda to make the stereo workflow more streamlined.

Copy tracks

Copy tracks will make copies of all selected tracks and place the copies above the existing tracks. In a stereo project, the tracks will be copied to the same eye

Copy S3D (Stereo 3D)

This function is only available in a stereo project and is used in conjunction with the Copy Tracks function.
After selecting and copying tracks using the copy tracks command, pressing the Copy S3D button will automatically move the new tracks to the other eye (depending on whether the left or right eye was copied) at the same time it will scan the source location of the current source and matte files for the material that corresponds to the eye that is being created. If the new media is found, all the material will be automatically replaced with same material but from the opposite eye.

This works based on the the naming of the material and requires that the material for the other eye is available from the same drive letter, and that the material and directories clearly indicate whether the material is for the left or right eye. The default is to look for the following patterns (case-insensitive):

Left eye: "left" "le" "li"
Right eye: "rIght" "re" "ri"

It will only work if these letter combinations appear on their own, for example :

"Shot_02_panleft_left" will correctly be replaced by "Shot_02_panleft_right" because we ignore "panleft" as an indicator, the same is true for directories.

In this example we will find the words left and le in both the directory and filename, replace them with right and re and conform and import the new material.

*FROM FILE S:\Immortals\Media\S3D\Left\Immortals-S3D-**LEFT**_259407.dpx
*NUCODA_LAYER Primary
*NUCODA_LAYER Matrix -effect GammaMatrix

*NUCODA_LAYER 6015_v002 -matte.r
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.g
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
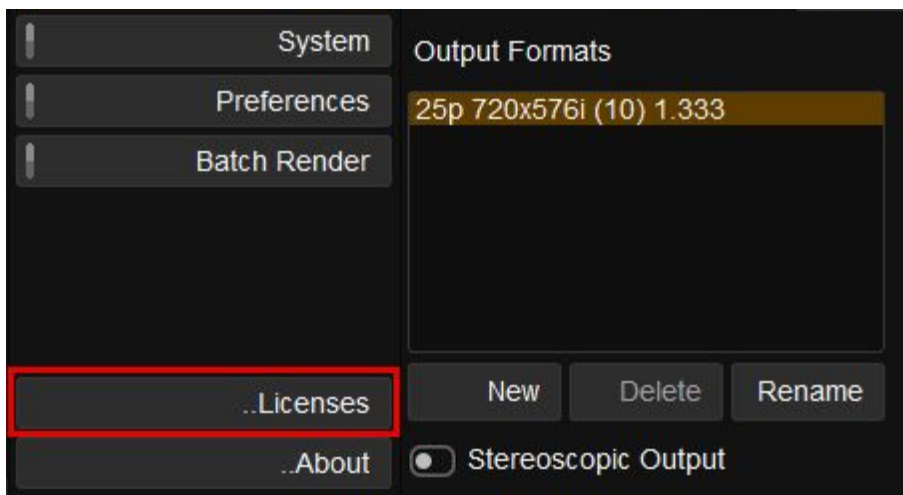
*NUCODA_LAYER 6015_v002 -matte.b
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx

Updates to the CLI (Command Line Interface)

- Create Adjustment Segment with CLI
- CLI Should be able to pass through MXF audio
- CLI in/out point function exports wrong frames if filename contains a number

Licenses - New Information panel

- A new .. Licenses information option has been added to the Projects Page making
  It easier to see what licences exist on the system and when they will expire.

Changes to the Router tool

Use any layer as input for current layer

An often requested feature, it is now possible to route any layer as an input for the current layer, this is available from the Matte, Source, Key, Diff and Matte layers in the router.

Any new layers that are added will appear as selection in the dropdown menu, to keep menus organised, once there are 10 layers, they will be nested and labeled accordingly.

- If a layer that is used as an input is deleted, the input for the layer will default to previous layer.
- If a layer is moved around the layer stack, we will track the layer and maintain the correct input.
- In the example below, we are routing Blue Layer into the current layer.

New tools in the User FX and Colour layers

These features were primarily designed for use in Phoenix, but there are some creative uses in Nucoda and we have decided to include them for Nucoda users.

Matte Paint

The matte paint feature allows paint strokes to be added directly to the current layer - for now the strokes are single frame only.
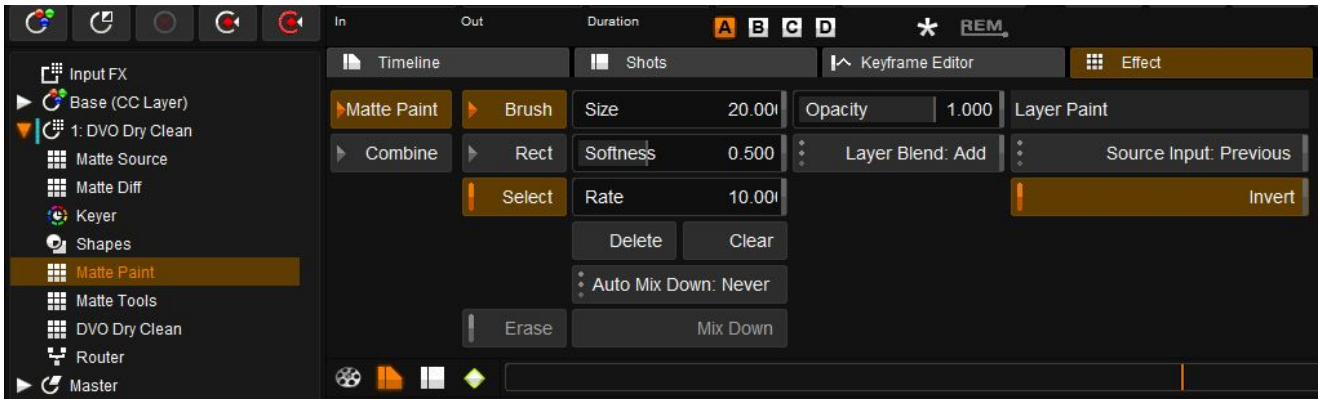
The default paint style is INVERT, the primary purpose being to use the paint tool to reveal the original source image. You can choose the Source input in the tool. This is especially useful when wanting to reveal material removed by mistake during working with DVO Dust or the new DVO Dry Clean tool. There is no need for users to use an additional fix tool, just remember to add your dust layers as FX layers to get access to Matte Paint.

In this example the Matte Paint tool is used to reveal the blemish originally fixed by using DVO Dry Clean

The tool will also paint on the alpha of the image, so it can be combined with the composite tool to reveal images on tracks below.

Matte Diff

Matte diff is a tool that will allow the user to create a matte based on the difference between the current layer, and any other layer. Using this feature, it is possible to easily create a matte for fixes that were done using a tool like DVO Dust or DVO Dry Clean or DVO Scratch.
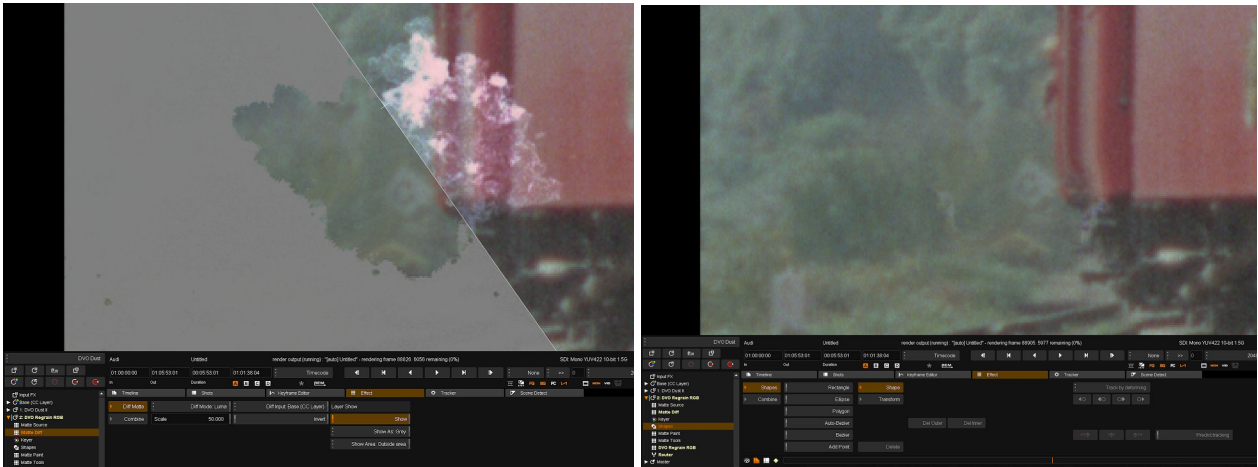
Blemish removed by DVO Dry Clean

Apply DVO Regrain RGB as a user FX layer after DVO Dry Clean
Go to Matte Diff tool on the DVO RegrainRGB layer and Set Layer show to on, and Diff Mode to Luma
Select the Base layer as Diff input - use the Scale option to grow or shrink the visible matte

Turn off Show - the DVO RegrainRGB tool will process the image based on the matte, regraining the area that was repaired.

New DVO tool

DVO Dry Clean

What is the difference between DVO Dust and DVO Dry Clean?

DVO Dry Clean is the result of new and improved techniques in dust and defect detection and concealment, it allows for significantly better detection of defects and also allows much larger defects to be automatically repaired.

Defects that previously would require manual intervention can now be detected and repaired using an automated tool. Meaning that more time can be spent on other aspects of the restoration.

Do I still need to use DVO Dust?

DVO Dust still has it's place in the restoration toolset. It is an exceptional tool and is highly customisable. Many users have specific setups for dust removal that have been refined over a long period of time. For removing smaller dust specks and imperfections it is ideal. Revealing original source material is very easy to do using the new Matte Paint tool. *Please note, the Matte Paint tool is only available in an FX Layer*

Some guidance when using DVO Dry Clean

When using the tool always use it as a Effect layer since it is the most flexible
Using any temporal tools (like Clarity or Flicker) after DVo Dry Clean should be avoided, it will
Work, but any changes using paint will cause the entire affected clip to re-process.

When would I use DVO Dry Clean?

DVO Dry Clean uses a very advanced detection engine, there are not many settings in DVO Dry Clean and it is a lot more automated. If you have material with medium or very large blemishes DVO Dry Clean may be the tool to use. If the material has fast moving images, DVO Dry Clean will also be better suited, with the likelihood of motion artifacts being a much lower.

DVO Dry Clean will also attempt to repair much larger issues such as scratches and tears, often providing a very good starting point for further manual repairs.

Because of the very sensitive analysis and repair functions, DVO Dry Clean is also capable of fixing blemishes that are too small for DVO Dust to detect. The repair function, when pushed all the way to the maximum value, will effectively serve as a degrain tool.

When can it go wrong?

As with any auto detection tool, and when looking for dust, generally, you are looking for elements that are static and only visible in single frames, because of this, it is easy to remove blinking lights, water drops and flashing elements, like reflections. This is still true for DVO Dry Clean, in cases like these, the Matte Paint tool will allow revealing the source material, to repair any unintended repairs.

List of the file formats supported for <u>Export</u> via the Extended Formats

AVC Intra 100 *OP-1a .MXF*
- AVCi.mxf
- Panasonic AVCi codec in OP1A mxf file
- Bit rate is 100mbps
- Can only be exported at 720 or 1080 resolutions.

DVCPRO HD *Op-1A .MXF*
- DV.mxf
- Bit rate is 100mbps
- Can only be exported at 720 or 1080 resolutions.

JP2 *OP-1a .MXF*
- This is a Variable bit rate VBR file.
- There will be no limitation on the resolution of the exported file.

XDCAM *Op-1A .MXF*
- This is HD4:2:2
- Bit rate is 50mbps
- Can only be exported at 720 or 1080 resolutions.
- Container Format
  - XDCAM
  - HDF01A

DVCPRO HD *.Mov*
- DV100.mov
- Bit rate is 100mbps
- Can only be exported at 720 or 1080 resolutions.

DV50 and DV25 *.Mov*
- For PAL and NTSC

JP2 *.JP2*
- This will be a Variable bit rate VBR file.
- There will be no limitation on the resolution of the exported file.

DCP Package
- Jpeg 2000 with XYZ Color Space.
- Basic implementation for previews

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Nucoda

Colour Grading and Finishing

Features & Benefits
Version 2016.1

Doc Rev 1

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AJA Kona updates

AJA Kona Video Driver Update

- This release includes AJA video driver v12.3.7.8
- **You must uninstall any current AJA driver and restart your PC before running the installer.**
- To make life easier, we have created a version of 2015.3 that uses the new Kona 4 driver This version is called 2015.3.038-SP1

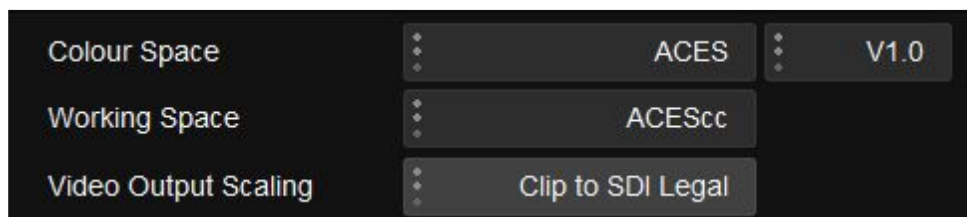### AJA Kona support for video and audio capture

- This version of Nucoda adds video and audio capture using the Kona card
- Up to 8 audio channels are supported
- For capture from DigiBeta please contact support@digitalvision.se

Preference for AJA Kona buffer depth

- Add a preference to allow control of the buffer depth on the AJA card
- This will allow less of a delay between the Kona SDI and GUI monitor but can cause playback reliability issues if set to low.

Support for ACES 1.0.2

- We have implemented ACES 1.0.2
- Includes new ACEScc working space, this allows grading controls respond like they would in Log space.
- Please see the full documentation in the online user manual
- 128 point transforms are available for users who require additional precision

    - http://www.digitalvision.tv/w/index.php?title=UM:ACES

Updates to the interface

Nucoda and Phoenix

- The button style in the interface has been updated and refreshed
- There have been some icons updated.
- Playback, thumbnail, multi playhead options will now retain their state.
  This is a per user preference and is set at application level.
- The size and split of the GUI is now saved on a per user basis.
- The In, Out and Duration timecode boxes are now editable.
  The user can set in and out points by entering the timecode directly into the In / Out boxes above the timeline. After entering an In point, adding duration will add the Out point automatically.
- Default timeline start can now be set in preferences.
- The size and split of the effects and timeline interface will now be saved per user
- Focus will not be lost anymore when editing layer names and other labels until the user hits return
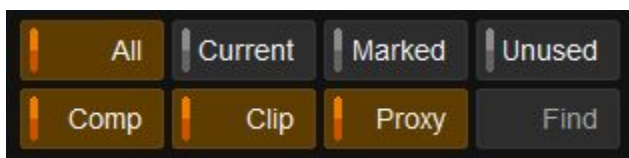- The speed of turning track visibility on/off has been much improved

Precision Panel

- The size and style of the menu buttons have been updated
- Changes has been made to the on screen graphics
- The keys on the touch screen keyboard has been enlarged and some keys have been removed

Find option in the library

Addition of a Find button to the filter matrix below the library, selecting clips in the library and clicking find will select the selected clip (or clips) in the timeline.

Once selected it is easy to apply grades, move or add them all to a group for group grading.

Selected clips in segment mode can be moved using keyboard shortcuts

In segment mode, clip that have been selected on the timeline (audio or video) can be moved using shift+up arrow shift+down arrow.

Locked tracks will be skipped automatically and new tracks will be created as required.
Using the m , and . / hotkeys will let you nudge clips by single frames (, and.) or multiples of 10 (m and /)
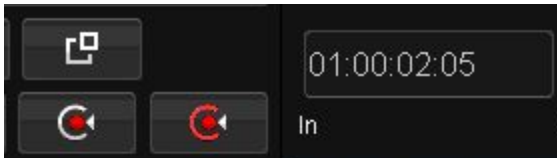
Moving clips in this manner will not allow other clips to be overwritten and if any clips are in the way and the track is not locked, the move will be cancelled. This is to avoid any accidental timeline catastrophes.

New Master Reset features

Changes to Master Reset - Retain selected effects on reset

To make working with complex matte configurations in Nucoda easier the layer reset function has been redesigned to accommodate this. An additional Reset option has been added,which will allow the user to specify which effect types are reset.
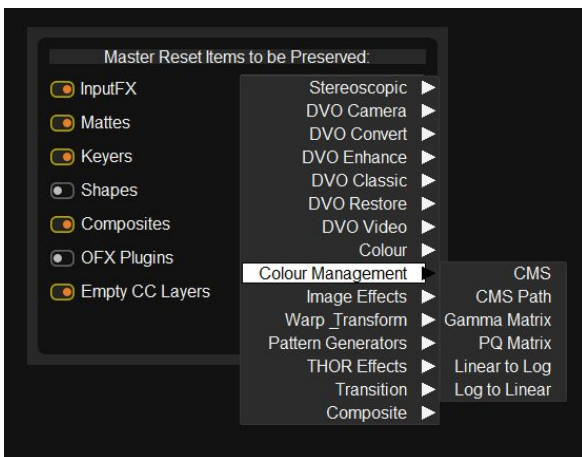
This is done via a new popup menu, that can be accessed the holding Ctrl+Shift and clicking on the new reset icon:

This menu will allow the user to specify which effects will be reset and which will be retained when Master Reset is pressed. The user can also use the effects menu in the Master Reset Option box to choose any available effect to not be affected.

Master reset will retain Input FX (current default) - we have chosen to keep the default behaviour but
Can recommend that you enable Matte layers, CMS and CMS Path layers and Pan & Scan to the defaults

On the Precision, keyboard using "Backspace" or mouse click master reset in GUI

Alt+Master reset will still reset *everything*
Shift+Master Reset will reset the selected layer (except selected items)
Ctrl+Master reset will reset selected tool

Precision Button changes

Changes to Show K options (Precision)

Show K : Enable Show Key (alpha) mode for current layer.

The matte viewed will be the combination of Matte - Matte Diff - Keyer and Shape

Ctrl + Show K
The matte viewed will be the Keyer only

Shift + Show K
The matte viewed will be the Shapes only

Alt + Show K
The matte viewed will be the Matte Diff only

Long Press Show Key
The Matte viewed will included all layers that can contribute to the matte
Matte - Matte Diff - Keyer - Shapes -Matte Paint - Matte Tools

Hotkey updates

Please check the Keyboard shortcuts document for updates to the **Master reset keys** and also for the addition of **Revert and Set New Revert** to the keyboard shortcuts. Also new shortcuts for moving clips on the timeline.

HUD and Grid updates

The HUD files have been updated and all the presets will now scale depending on the image resolution. Some of the presets have been tidied up and some have been renamed but all the favorites are still there.

Option for 1.66, 1.77, 2.40 and 2:1 has been added as default to the Masks and Grids

New Project Format files in Examples

We have added two files to the examples directory. They are extended project formats as a Menu or List configuration and contain more resolutions and frame rates. In the Project Formats directory there are files with individual files for each resolution if you would like to construct your own format list.

Shape handling

When creating shapes the you are now able to add points to the shape by simply holding the Ctrl key and clicking on the shape outline.

- Clicking and dragging the mouse will allow for selection of multiple points
- Double clicking a shape outline will switch it to transform mode
- Pressing Ctrl while inside the shape will allow you to move the shape

- Pressing Ctrl while clicking on a corner point will allow you to rotate the shape
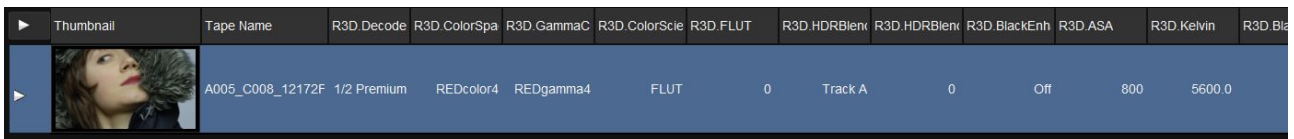
File Formats

SDK Updates for Sony

- Full support for Kelvin, Exposure Index and manual exposure settings in Sony SDK
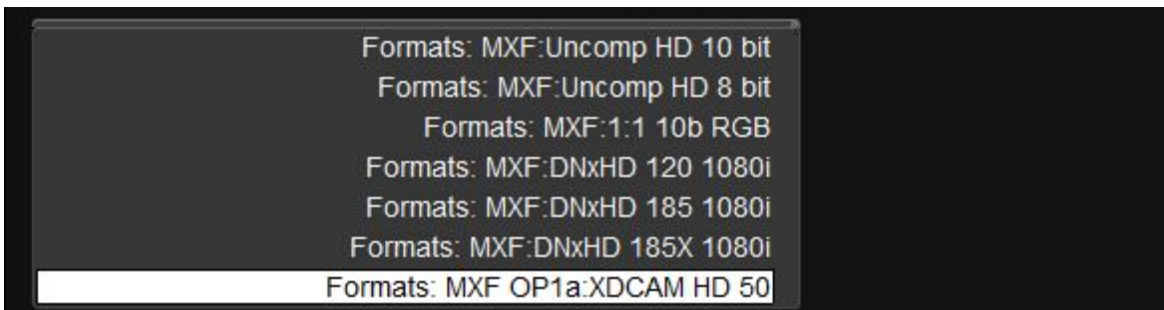- Improved SLog2 Slog3 and .cine support for Sony sources

SDK Updates for Red

- New processing support for DEB (Dragon Enhanced Blacks)
- Loading DEB setting from RMD files
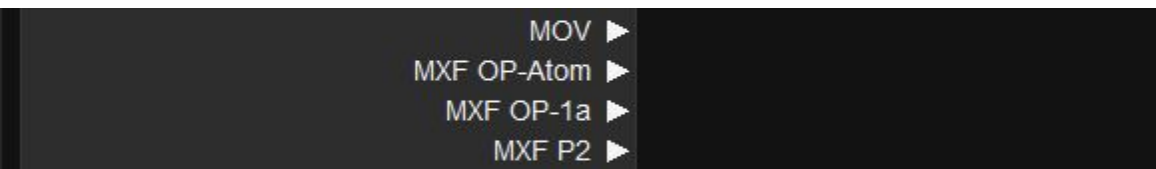- Two new colour spaces - REDcolor 4 and DRAGONcolor 2

Changes to MXF file exporting and naming of DNxHD/R

- In the previous version all MXF files were grouped under the MXF label
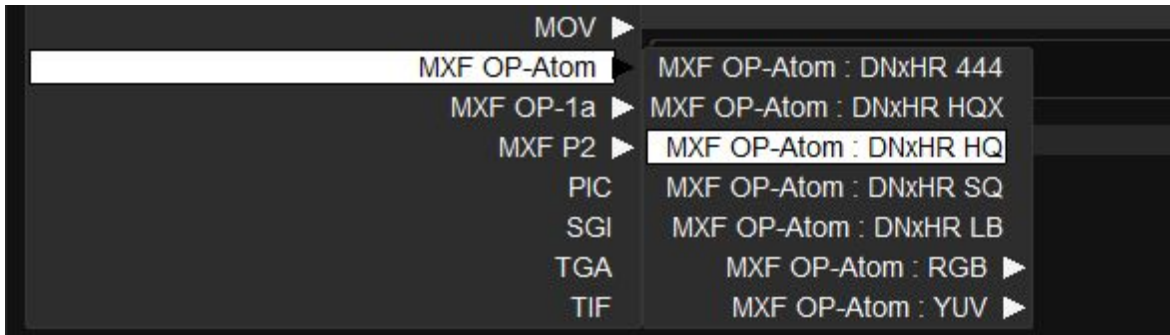- Included in this group were OP-Atom and OP-1a

- MXF exports have been split into 3 subcategories to make it clearer for users what format they are exporting.

  - MXF OP-Atom - Video and Audio files are separate, used in Avid workflows.
  - MXF OP-1a - Video and Audio combined into a single file, typically used in Broadcast servers.
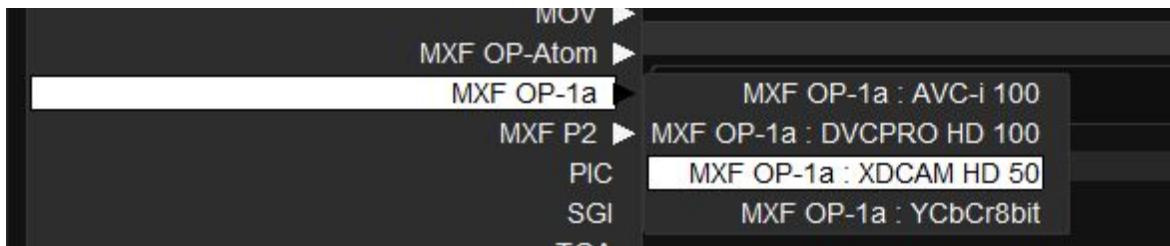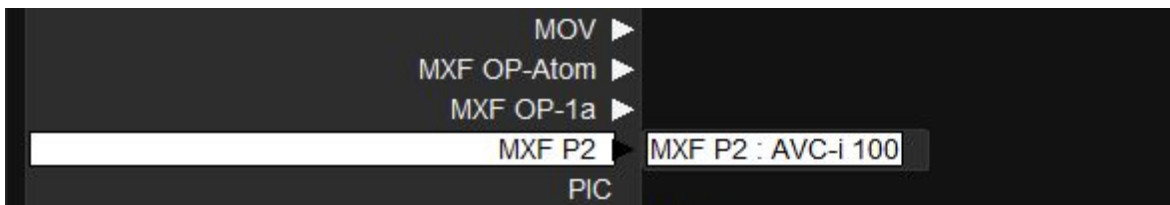 - MXF P2 - AVC-i 100

- In the MXF OP-Atom category DNxHD and DNxHR files have been renamed according to the new standards created by Avid.

- In keeping with Avid guidelines, the formats have been renamed

  - DNxHD LB   (Similar to DNxHD 36)
  - DNxHD SQ   (Similar to DNxHD 115)
  - DNxHD HQ   (Similar to DNxHD 175)
  - DNxHD HQX (12 bit)   (Similar to DNxHD 175X)
  - DNxHD 444   (12 Bit RGB)   (Similar to DNxHD 440X)

- Note that not all options are available for all resolutions and frame rates

- In the new MXF OP-1a category XDCAM HD 50 has been supplemented with;
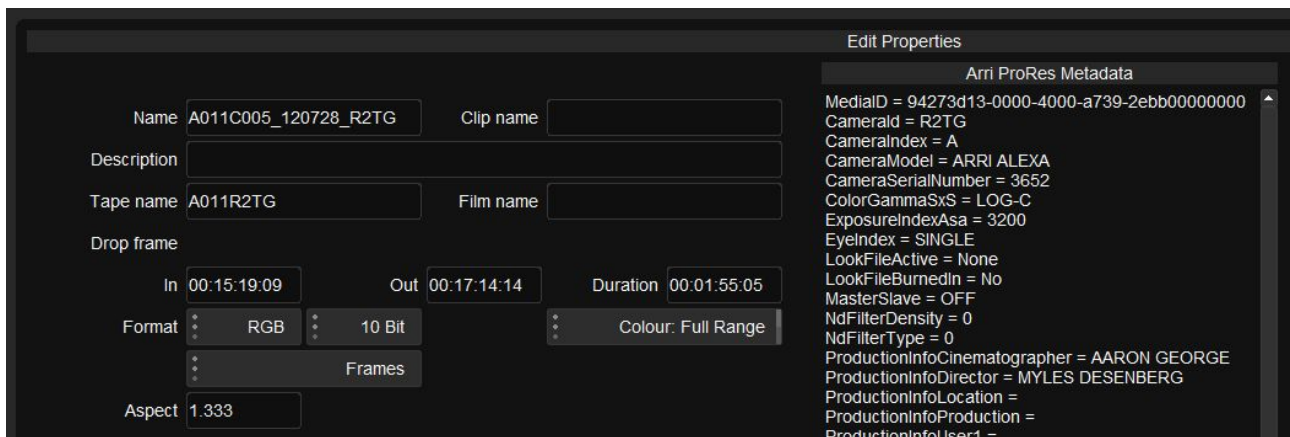
  - AVCi 100
  - DVCPRO HD 100
  - YCbCr 8 bit

- AVC-i 100 is also available for export in the P2 layout, note, that the export in P2 will result in a directory structure suitable for use on a P2 memory card, and not only a single MXF file.

Extended Properties for ProRes files (when available)

- When importing ProRes media clicking on the Properties of the file will show new extended Meta Data information

New file options for export

- Support to tag DPX files as ADX 10 or 16 on export

Avid interchange updates

Changes to Avid support

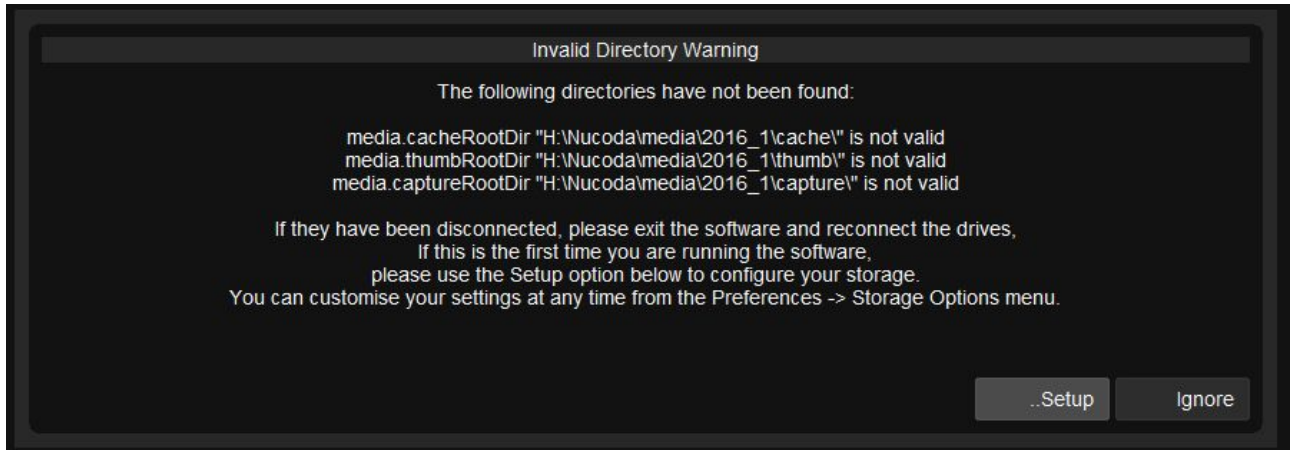- Subclips are now supported in AAF compositions.

Support for Avid locator import from AAF

- If an AAF has locators they will automatically be imported to the Nucoda Timeline as TImeline Markers - colours will be retained.

Updates to Preferences

The setting of paths for Nucoda and Phoenix can now be done from inside the application using a path setup tool in the preferences. If you start up the application without setting valid default storage paths you will be presented with the option to do so.
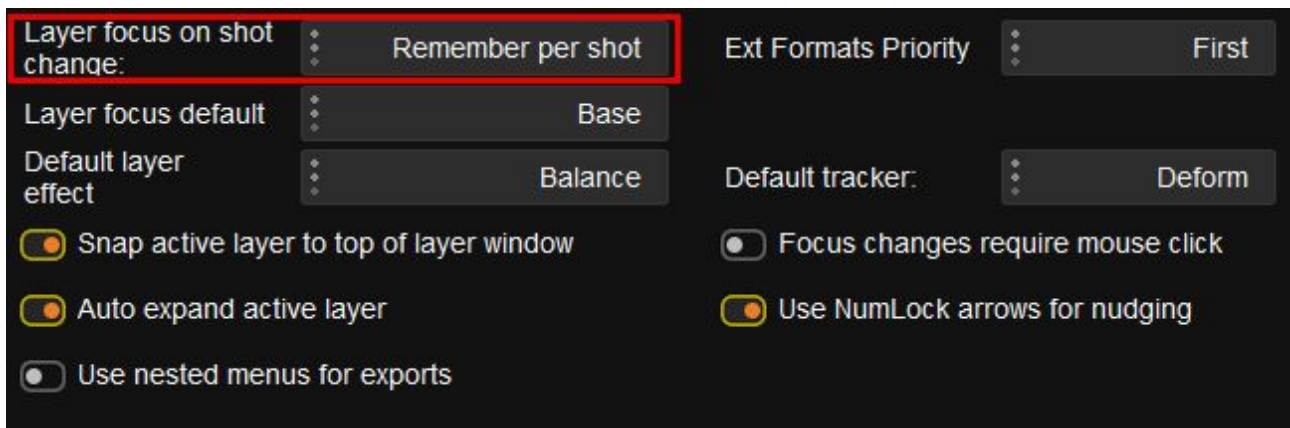

The settings for Avid media paths and Avid Interplay setup has been added to the preferences.

In the Precision preferences the order of colour tools on the Precision panel can now be set using drag and drop menus.
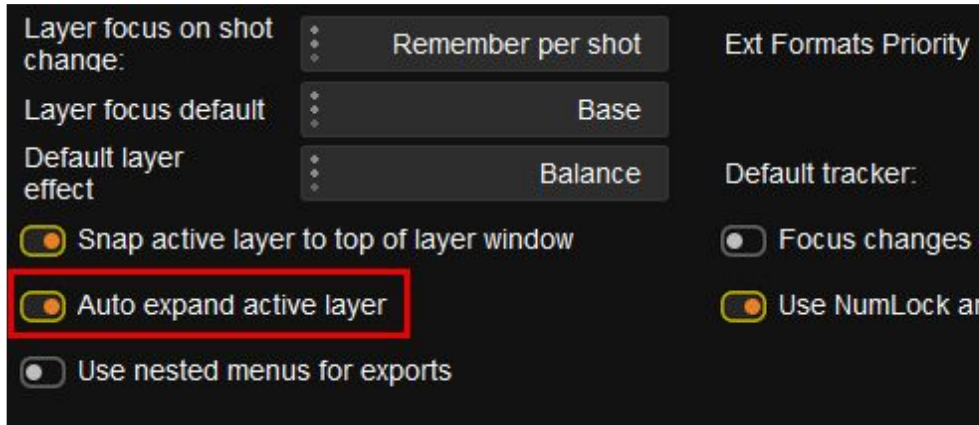
Layer focus on shot change - General Tab

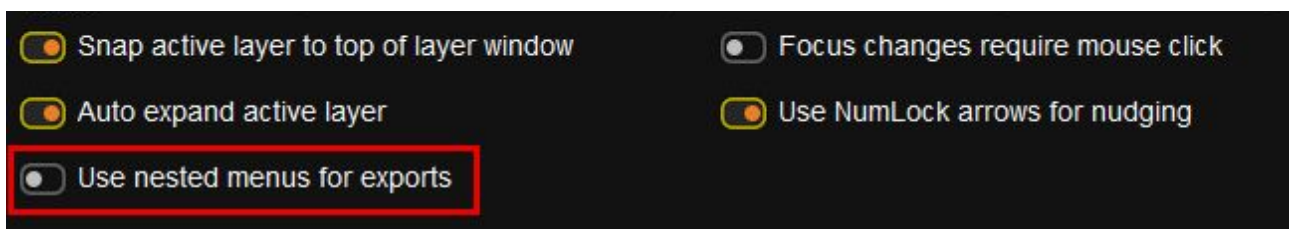- Option changed from a Radio Button to a Drop down

Auto Expand active layer - General Tab

- The text "Snap layer list to active layer" has been replaced with "Snap active layer to top of layer window" to be more descriptive of the function
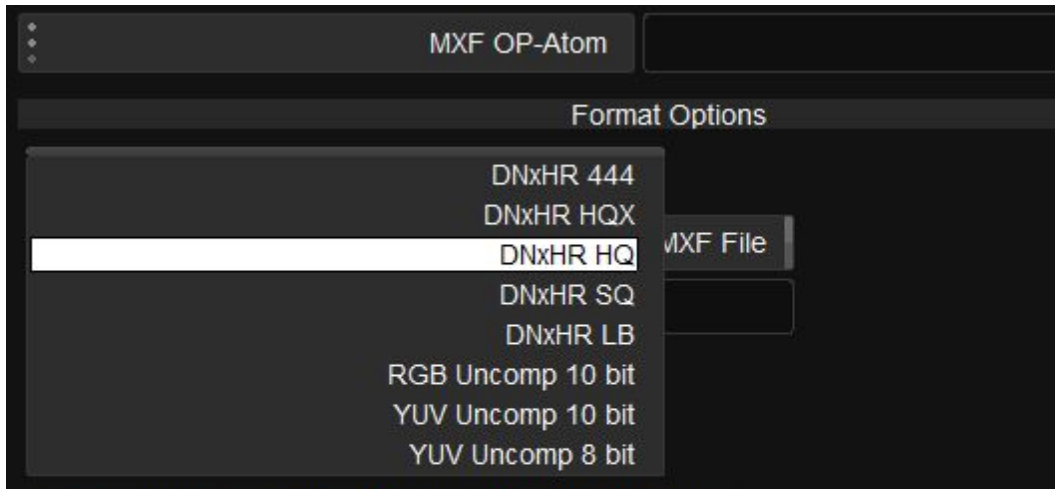

- This preference allows the user to select whether colour and effects layers are expanded when selected.

- When a layer has been expanded with the mouse it is assumed that the user wants to keep the active layer expanded, so even with the option off the active layer will stay open until it is collapsed with the mouse, at which point the active layer should no longer automatically expand.

- The arrow next to the layer name will now be orange when you switch between layers to indicate which layer is active. The icon goes back to white when you expand the layer and start clicking on tools as the icon is only orange if you have a tool highlighted (orange background)

Use nested menus for exports - General Tab

- When exporting files from the application it's now possible to choose nested menus instead of the default behaviour.

- In the default behaviour (as in previous versions) the main file type is selected from a drop down menu first ie MXF OP-Atom. Then the sub-type ie DNxHR HQ is selected from a second drop down menu

- When using nested menus the sub type can be selected directly from the first drop down.

Consolidate and Match Folder added to - Capture/Conform/Edit Tab in preferences

Two preferences from the conform page have been added

- Consolidate drop down menu
- Match open library folder - On/Off

Composition Start added to - Capture/Conform/Edit Tab

- Users can now determine the default start time for when a composition is created within the project.

DVO threads - Rendering Tab in preferences

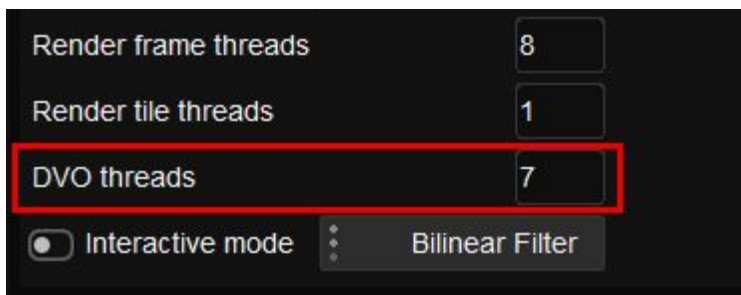- This affects only DVO tools and is most noticeable on machines with a high core count, e.g. 16 cores and up. The setting should be set automatically, but for reference, if you have 16-22 cores, it should be set to 2 cores less than the total amount for 24-28 cores it should be 3 or 4 cores less than the total. Please make sure that hyperthreading is turned **OFF** on the workstation

  Currently some DVO tools are not affected by this change

  - DVO Dust
  - DVO Dropout
  - DVO Grain
  - DVO Noise

LUT's

Support for importing .cube lut format

- .cube LUT's can now be imported into Nucoda. We have tested as many variants a we could, please email support@digitalvision.se if you find any issues.
- New LUT's have been added to the CMS folder: PQ to HLG and HLG to PQ

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.

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
> **[-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)

EDL Example - *please note that line breaks are not supported.*

TITLE: Animal Logic-S3D-with-Mattes-DEMO001
FCM: FILM

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

*FROM FILE S:\Immortals\Media\S3D\Left\Immortals-S3D-LEFT_259407.dpx
*NUCODA_LAYER Primary
*NUCODA_LAYER Matrix -effect GammaMatrix

*NUCODA_LAYER 6015_v002 -matte.r
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.g
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.b
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx

*NUCODA_LAYER 6015_v002 -matte.r
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_004_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.g
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_004_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.b
S:\Immortals\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

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.

The 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.

Other available extensions in the EDL:

*LOC: <timecode> <locator color] [Locator information]
        Locator colours:
        BLUE | CYAN | MAGENTA | ORANGE | RED | WHITE | YELLOW

Enhancements to Stereo workflow - track copy and media replacement

Two new functions have been added to Nucoda to make the stereo workflow more streamlined.

Copy tracks

Copy tracks will make copies of all selected tracks and place the copies above the existing tracks. In a stereo project, the tracks will be copied to the same eye

Copy S3D (Stereo 3D)

This function is only available in a stereo project and is used in conjunction with the Copy Tracks function.
After selecting and copying tracks using the copy tracks command, pressing the Copy S3D button will automatically move the new tracks to the other eye (depending on whether the left or right eye was copied) at the same time it will scan the source location of the current source and matte files for the material that corresponds to the eye that is being created. If the new media is found, all the material will be automatically replaced with same material but from the opposite eye.

This works based on the the naming of the material and requires that the material for the other eye is available from the same drive letter, and that the material and directories clearly indicate whether the material is for the left or right eye. The default is to look for the following patterns (case-insensitive):

Left eye: "left" "le" "li"
Right eye: "rIght" "re" "ri"

It will only work if these letter combinations appear on their own, for example :

"Shot_02_panleft_left" will correctly be replaced by "Shot_02_panleft_right" because we ignore "panleft" as an indicator, the same is true for directories.

In this example we will find the words left and le in both the directory and filename, replace them with right and re and conform and import the new material.

*FROM FILE S:\Immortals\Media\S3D\Left\Immortals-S3D-LEFT_259407.dpx
*NUCODA_LAYER Primary
*NUCODA_LAYER Matrix -effect GammaMatrix

*NUCODA_LAYER 6015_v002 -matte.r
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
*NUCODA_LAYER 6015_v002 -matte.g
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx
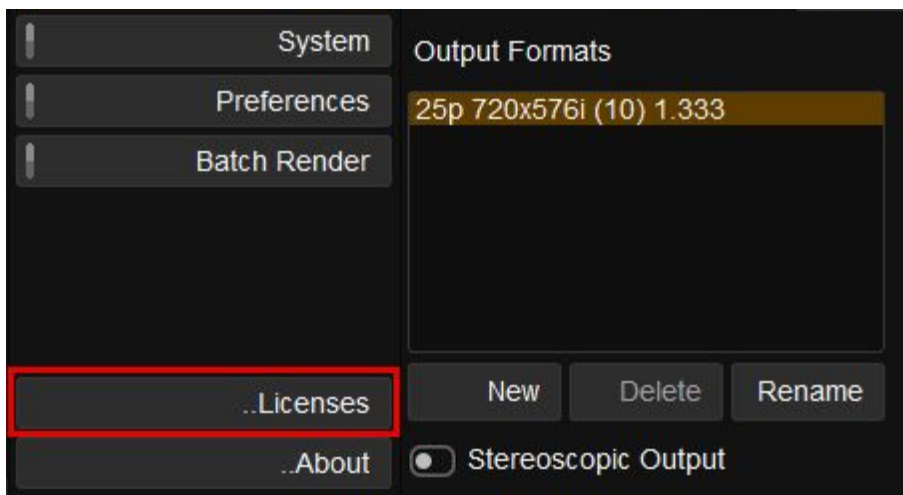
*NUCODA_LAYER 6015_v002 -matte.b
S:\Immortals\Media\VFX\Mattes\mt_003\le\mos_reel03_scn0043_shot6015_v002_mt_003_le.0001.dpx

Updates to the CLI (Command Line Interface)

- Create Adjustment Segment with CLI
- CLI Should be able to pass through MXF audio
- CLI in/out point function exports wrong frames if filename contains a number

Licenses - New Information panel

- A new .. Licenses information option has been added to the Projects Page making
  It easier to see what licences exist on the system and when they will expire.
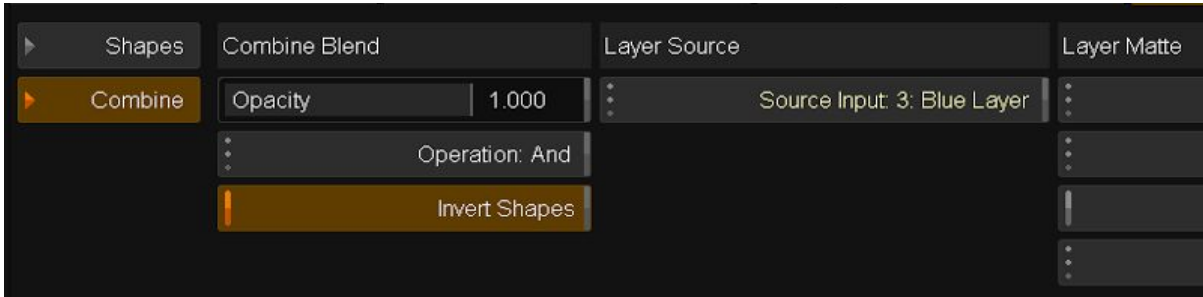

Changes to the Router tool

Use any layer as input for current layer

An often requested feature, it is now possible to route any layer as an input for the current layer, this is available from the Matte, Source, Key, Diff and Matte layers in the router.

Any new layers that are added will appear as selection in the dropdown menu, to keep menus organised, once there are 10 layers, they will be nested and labeled accordingly.

- If a layer that is used as an input is deleted, the input for the layer will default to previous layer.
- If a layer is moved around the layer stack, we will track the layer and maintain the correct input.
- In the example below, we are routing Blue Layer into the current layer.
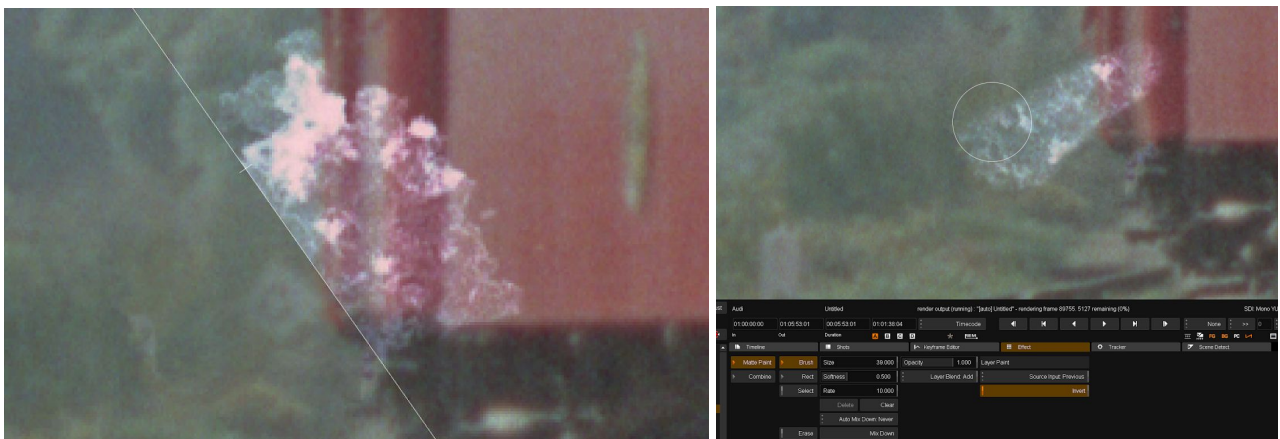
New tools in the User FX and Colour layers

These features were primarily designed for use in Phoenix, but there are some creative uses in Nucoda and we have decided to include them for Nucoda users.

Matte Paint

The matte paint feature allows paint strokes to be added directly to the current layer - for now the strokes are single frame only.
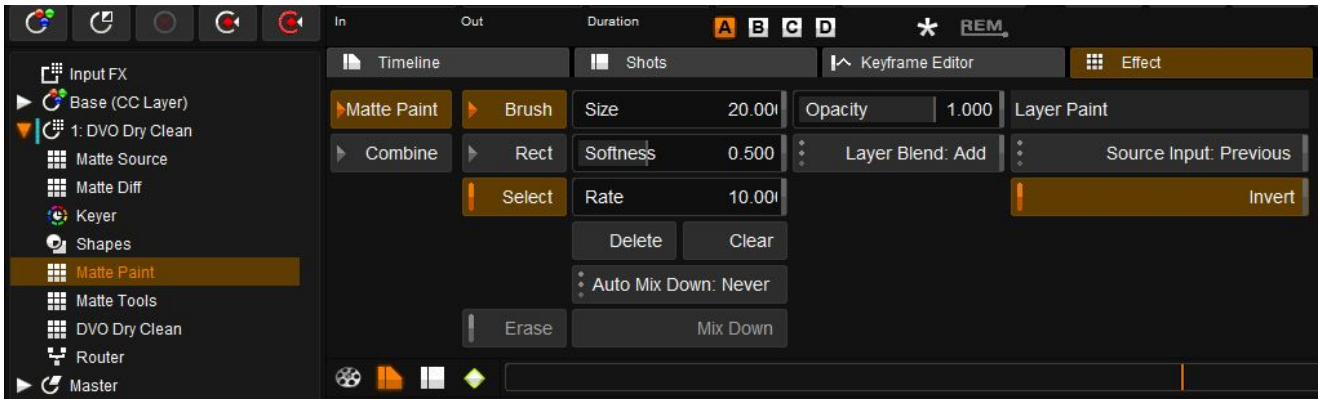
The default paint style is INVERT, the primary purpose being to use the paint tool to reveal the original source image. You can choose the Source input in the tool. This is especially useful when wanting to reveal material removed by mistake during working with DVO Dust or the new DVO Dry Clean tool. There is no need for users to use an additional fix tool, just remember to add your dust layers as FX layers to get access to Matte Paint.

In this example the Matte Paint tool is used to reveal the blemish originally fixed by using DVO Dry Clean

The tool will also paint on the alpha of the image, so it can be combined with the composite tool to reveal images on tracks below.

Matte Diff

Matte diff is a tool that will allow the user to create a matte based on the difference between the current layer, and any other layer. Using this feature, it is possible to easily create a matte for fixes that were done using a tool like DVO Dust or DVO Dry Clean or DVO Scratch.
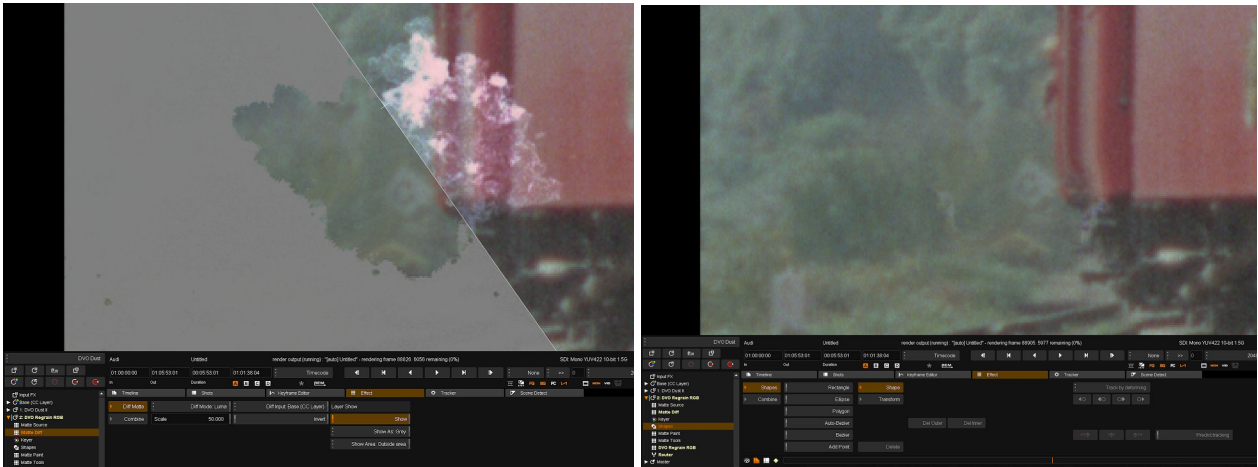
Blemish removed by DVO Dry Clean

Apply DVO Regrain RGB as a user FX layer after DVO Dry Clean
Go to Matte Diff tool on the DVO RegrainRGB layer and Set Layer show to on, and Diff Mode to Luma
Select the Base layer as Diff input - use the Scale option to grow or shrink the visible matte

Turn off Show - the DVO RegrainRGB tool will process the image based on the matte, regraining the area that was repaired.

New DVO tool

DVO Dry Clean

What is the difference between DVO Dust and DVO Dry Clean?

DVO Dry Clean is the result of new and improved techniques in dust and defect detection and concealment, it allows for significantly better detection of defects and also allows much larger defects to be automatically repaired.

Defects that previously would require manual intervention can now be detected and repaired using an automated tool. Meaning that more time can be spent on other aspects of the restoration.

Do I still need to use DVO Dust?

DVO Dust still has it's place in the restoration toolset. It is an exceptional tool and is highly customisable. Many users have specific setups for dust removal that have been refined over a long period of time. For removing smaller dust specks and imperfections it is ideal. Revealing original source material is very easy to do using the new Matte Paint tool. ***Please note, the Matte Paint tool is only available in an FX Layer***

Some guidance when using DVO Dry Clean

When using the tool always use it as a Effect layer since it is the most flexible
Using any temporal tools (like Clarity or Flicker) after DVo Dry Clean should be avoided, it will
Work, but any changes using paint will cause the entire affected clip to re-process.

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When would I use DVO Dry Clean?

DVO Dry Clean uses a very advanced detection engine, there are not many settings in DVO Dry Clean and it is a lot more automated. If you have material with medium or very large blemishes DVO Dry Clean may be the tool to use. If the material has fast moving images, DVO Dry Clean will also be better suited, with the likelihood of motion artifacts being a much lower.

DVO Dry Clean will also attempt to repair much larger issues such as scratches and tears, often providing a very good starting point for further manual repairs.

Because of the very sensitive analysis and repair functions, DVO Dry Clean is also capable of fixing blemishes that are too small for DVO Dust to detect. The repair function, when pushed all the way to the maximum value, will effectively serve as a degrain tool.

When can it go wrong?

As with any auto detection tool, and when looking for dust, generally, you are looking for elements that are static and only visible in single frames, because of this, it is easy to remove blinking lights, water drops and flashing elements, like reflections. This is still true for DVO Dry Clean, in cases like these, the Matte Paint tool will allow revealing the source material, to repair any unintended repairs.

List of the file formats supported for <u>Export</u> via the Extended Formats

AVC Intra 100 ***OP-1a .MXF***
- AVCi.mxf
- Panasonic AVCi codec in OP1A mxf file
- Bit rate is 100mbps
- Can only be exported at 720 or 1080 resolutions.

DVCPRO HD ***Op-1A .MXF***
- DV.mxf
- Bit rate is 100mbps
- Can only be exported at 720 or 1080 resolutions.

JP2 ***OP-1a .MXF***
- This is a Variable bit rate VBR file.
- There will be no limitation on the resolution of the exported file.

XDCAM ***Op-1A .MXF***
- This is HD4:2:2
- Bit rate is 50mbps
- Can only be exported at 720 or 1080 resolutions.
- Container Format
  - XDCAM
  - HDF01A

DVCPRO HD ***.Mov***
- DV100.mov
- Bit rate is 100mbps
- Can only be exported at 720 or 1080 resolutions.

DV50 and DV25 ***.Mov***
- For PAL and NTSC

JP2 ***.JP2***
- This will be a Variable bit rate VBR file.
- There will be no limitation on the resolution of the exported file.

DCP Package
- Jpeg 2000 with XYZ Color Space.
- Basic implementation for previews

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