

Blackmagicdesign



DaVinci Resolve

Colorist's Reference Manual

Spring 2010 Manual

Welcome to DaVinci Resolve



The world's most powerful color correction now on Linux and Mac!

DaVinci color correctors have been the standard in post production since 1984. There are thousands of colorists worldwide who understand the performance, quality and workflow of DaVinci.

DaVinci is the name behind more feature films, television commercials, documentaries, television production and music videos than any other grading system.

When you're in a room full of demanding clients with conflicting ideas, colorists know that DaVinci Resolve has the quality, real time performance, creative features, and powerful control panel you need to work fast! DaVinci Resolve is now available for both Mac OS X and the clustered super computer power of Linux!

DaVinci Resolve 7.1

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Introduction

1

Introducing DaVinci Resolve

Welcome to the DaVinci Resolve user manual. DaVinci Resolve carries the tradition of DaVinci color correction into the next generation of color enhancement.

DaVinci Resolve carries the 25 year tradition of DaVinci color correction combined with DaVinci's Emmy award-winning image enhancement expertise and the latest GPU technology. DaVinci Resolve provides the most efficient workflow for television long form, TV commercials, and feature film digital intermediate color grading and finishing applications.



Color enhancement in DaVinci Resolve centers around clip-based color correction and real time conforming process. Within each clip, nodes are used to create and control the color correction and to enhance the image by simply adding a series of nodes together. Within each node, a primary and/or secondary YRGB correction may be applied and combined with a Circular, Linear, Polygon, or Power Curve Window. Each node can also have image and matte defocus as well as custom curves.

DaVinci Resolve also includes an automatic image tracking tool for PowerWindows, native file support for a number of camera and image formats, powerful EDL and conforming tools, and real time SD and HD tape ingest and playout.

You can use internal, external direct attached, or even Open File System LAN or SAN storage with DaVinci Resolve and connection to the control panels is as simple as plugging in the USB connection.

We invite you to read on and discover all the features of this exciting new system. You'll soon learn that it's the most powerful and easy to operate color enhancement system that has ever been introduced.

Shown with Blackmagic UltraScope

What's New in DaVinci Resolve 7.1

For Mac OS X

Clustered GPU support for Resolve on Mac

- Smashing the single GPU limit for Mac OS X DaVinci Resolve now supports clustered GPUs for image processing.
- Using a PCIe expander colorists can double or triple grading performance.

PCIe Expander support

- By connecting a x16 PCIe expander to the second slot in the MacPro colorists can now install the UI GPU, one or more image processing GPUs as well as the DeckLink HD Extreme, HDMI breakout, Red Rocket and a drive controller.
- Two Red Rockets can be installed for stereoscopic r3d grading.

JL Cooper Eclipse CX control panel support

- The Ethernet based JL Cooper Eclipse CX control panel is now supported.

Additional Tangent Wave control panel menus

- An additional ten menus have been added to the Tangent Wave control panel, which will provide faster operation and ease of use.
- There are also an additional two 'master' menus and the use of the 'Alt' button for extra functionality.

Shortcut key for Highlight control

- In the View pulldown menu, two keyboard shortcuts related to 'Highlight' have been added.
- Highlight shows the key blended with the image, while Highlight BW shows the key over a black background.

Native ProRes read and write support without installing FCP

- DaVinci Resolve for Mac now natively supports ProRes read and write without the need to install FCP.
- Installation of FCP is continues to offer a wide range of other QuickTime codecs.

XDCAM in QT wrapper read and write support

- Using a customer supplied FCP QuickTime codec, DaVinci Resolve will now read and write files in the XDCAM formats.

For Linux

New single chassis dual GPU configuration for Stereoscopic 3D grading

- The Dec 2010 Linux configuration guide now specifies a new Supermicro server chassis and motherboard model that permits multiple double-wide cards including the C2050 CUDA GPU.
- The new motherboard and server can save customers considerable cost for a basic stereoscopic 3D system as the 2 GPU configuration is ideal for on-set or low budget 3D applications.

Updated DVS SDK 4.0 support for the Centaurus II card replacement - Atomix and Atomix LT

- DVS have released a new SDK to support the Centaurus and the new Atomix and Atomix LT cards. All customers using DVS video I/O are required to upgrade to this new driver.

Both Mac and Linux

Drop frame timecode support

- A number of 30fps NTSC TV programs and commercials use Drop Frame timecode and this is now supported in DaVinci Resolve.

720p50 and 720p60 support

- V7.1 now supports 720p50 and 720p60. Colorists can set these parameters in the configuration screen under the Timeline format, Deck I/O and video monitoring sections.

Automatic multi-project ColorTrace to transfer digital dailies grades

- ColorTrace permits colorists to copy grades from one project to another using the source clip timecode. With V7.1, the colorist can now copy the grades from any of the 'Master Sessions' in their 'User' account and not just from a single session within one project.

ARRI Alexa RAW read support

- ARRI Alexa cameras generate RAW and ProRes files and DaVinci Resolve V7.1 can read both of these file formats.

Phantom .cine read support

- DaVinci Resolve now permits real time playback and grading of .cine Phantom files.
- New MX color space and user controls.

Tiff read support

- DaVinci Resolve can now play and grade .tif natively.

OpenEXR read and write, uncompressed and compressed support

- OpenEXR is a high dynamic-range (HDR) image file format developed by Industrial Light & Magic for use in computer imaging applications.
- With DaVinci Resolve V7.1 .exr files in 32 or 16 bit floating point can be graded in real time. The ZIP, RLE and PIZ compressed formats are also supported.

Sony MPEG4 SStP read support for network file transfer

- The new Sony HDCAM SR 5800/2 decks have an optional Gigabit Ethernet file transfer card to permit images stored on the deck as MPEG 4 Simple Studio Profile to be transferred in a MXF wrapper using a web browser. These files can now be read by DaVinci Resolve and graded like all others.

REDcolor2 and Adobe 1998 color space, REDgamma2 gamma space for RED files

- DaVinci Resolve now supports the new REDcolor2 and Adobe 1998 color space as well as the REDgamma2 gamma space for decoding RED clips.
- RED clips now are always listed in the Browse screen at their full resolution, irrespective of the decode mode being used.

Automatic camera metadata support for HFlip and VFlip for RED clips

- V7.1 also supports the horizontal and vertical image flip camera metadata for r3d clips, which is very helpful for stereoscopic 3D projects to flip the eye that is shot through the mirror rig.

Ganged adjustment of decode settings for RED clips

- RED clips in V7.1 can be ganged together and adjustments to the decode settings applied to all the ganged clips.
- This new feature is ideal for making ISO or Gamma or Color Space changes to all the clips while maintaining the camera metadata or project metadata settings for all the other parameters.

RED metadata saved in stills

- RED clips can have individual decode settings, which can now be saved with stills thus permitting these settings to be copied to other clips.

Stereoscopic 3D timeline slip to sync left/right eye

- With V7.1 the colorist can now slip one eye in relation to the other while remaining on the color screen to correct image sync issues.

Stereoscopic 3D Auto color matching

- DaVinci Resolve can now apply an automatic color correction to match two stereoscopic images using either Custom Curves or primary controls.

Stereoscopic 3D image keystone control

- The mirror rigs used for Stereoscopic 3D production may introduce geometric distortion to the image that can be trimmed using the new Yaw and Pitch controls.

Stereoscopic 3D side-by-side and line-by-line render option

- All DaVinci Resolve systems can be used for Stereoscopic 3D grading and provide monitoring in Side-by-side and Line-by-line mode on the HD-SDI output of the DeckLink card.
- These modes are now also available for rendering.

Clip count display on Color screen primary tab

- On the primary tab of the Color screen, the top status item is now called 'Clips' where DaVinci Resolve reports the number of clips in the timeline.
- The Stereo Grade status item now reports which eye is active for control and whether grading is in Solo or Ganged mode.

Session duration display on conform screen

- On the Conform screen within the Timeline Management display V7.1 now includes a new indication of the duration of the timeline for each EDL.

New Slate option to display source clip name

- The Slate controls on the Format screen now include a new option to select the source clip name for burn in.

1080P/50, 59.94 and 60 monitoring

- There are three new monitoring options on the Configuration screen that can be selected for 1080P monitoring. Select 50, 59.94 and 60 as required.

GPU debayering for Cineform mov files

- To further improve the 3D playback performance of Cineform .mov files a new GPU based debayer algorithm is implemented in V7.1.

Updated Autosave options

- Colorists can now select the Autosave to 'On' for fast incremental saving of projects or 'To backup project' for a full backup of the current project.

New DaVinci Resolve control surface function to enable/disable all nodes

- Using the DaVinci Resolve control surface, colorists can now enable or disable all nodes by using the Shift Down and Disable Current buttons.



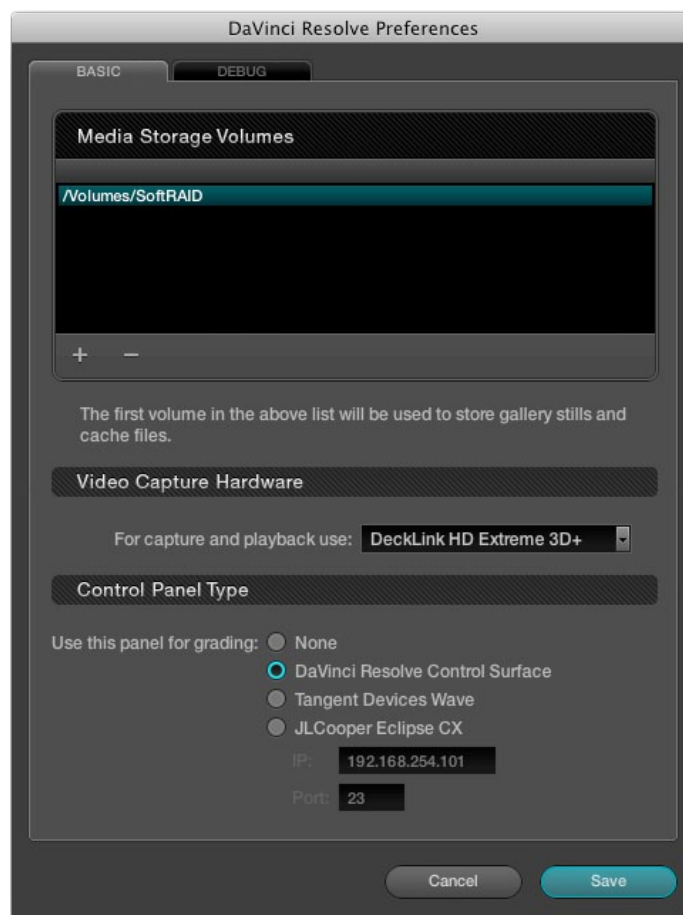
System Setup

2

System Setup

DaVinci Resolve on Mac systems require three simple hardware items to be configured when you start the application for the very first time.

Start the application, select the DaVinci Resolve menu, and choose Preferences. The three items to establish are: the location of your media images; the video capture card, if any; and the type of control panel that will be connected to your system, if any.



DaVinci Resolve Preferences

Media Storage Volumes

In the Media Storage Volumes window select the '+' (add) button to add a volume, folder, or mount point to the list of disk storage for your media. The first location in the storage list will become the default location for images, all proxies, cached files and gallery stills. This location should have plenty of storage capacity and be permanently connected to your Mac. Often this is the internal RAID you have established, but it can be an external drive too.

Click on the '-' (remove) button to remove a volume, folder or mount point from the list of disk storage.

Video Capture Hardware

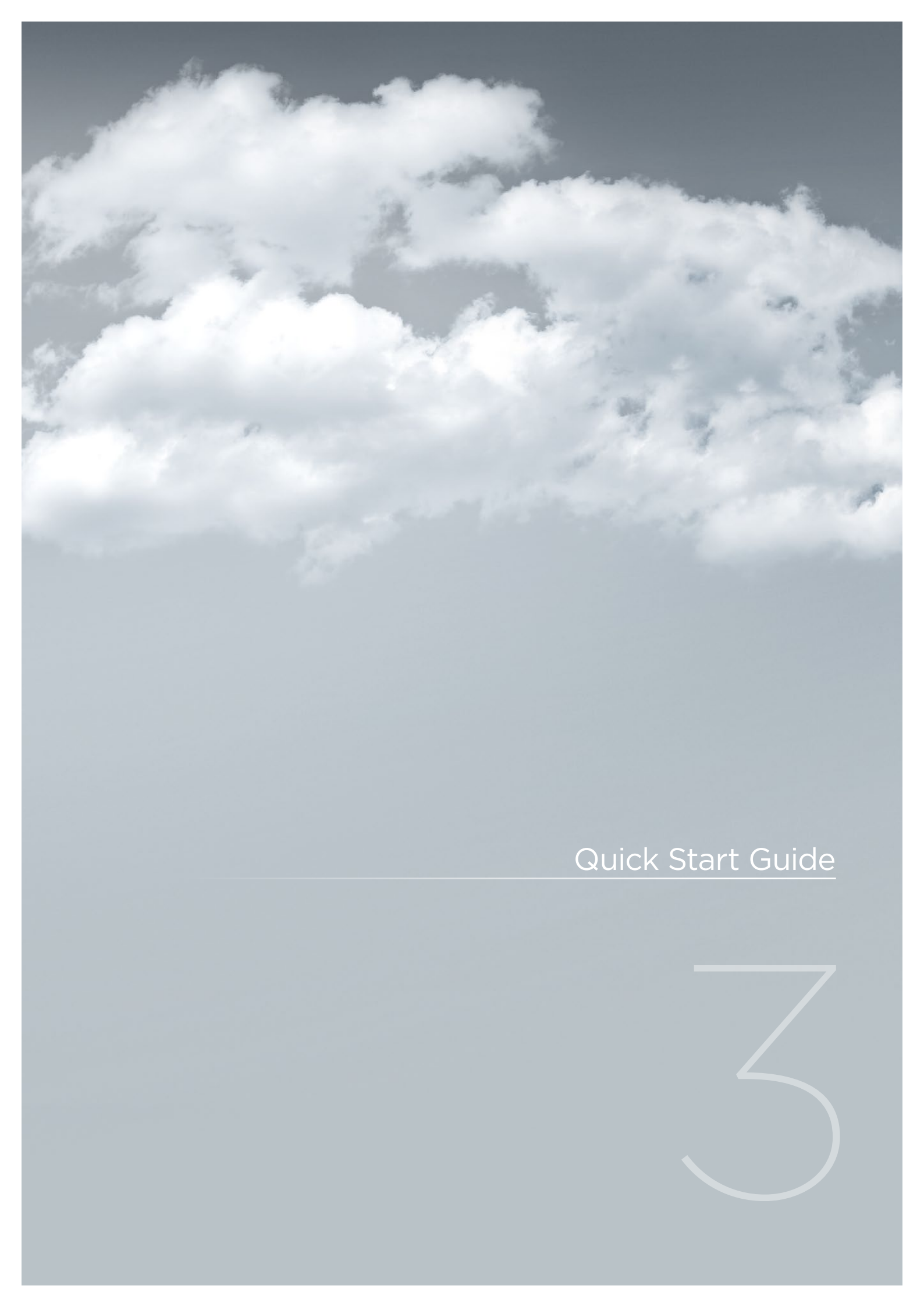
If you have a video capture and playback card, select it from the pulldown list. The options include supported cards, so if you do not see your card on this list, it has either not been detected by DaVinci Resolve or it is not currently supported.

Control Panel Type

Finally, select which control panel hardware you have connected to your DaVinci Resolve from the list provided.

After you have made each of these selections select 'Save' and then restart the DaVinci Resolve application.

You may have noticed a 'Debug' tab. This is used for engineering and is not required for general use.



Quick Start Guide

3

Quick Start Guide

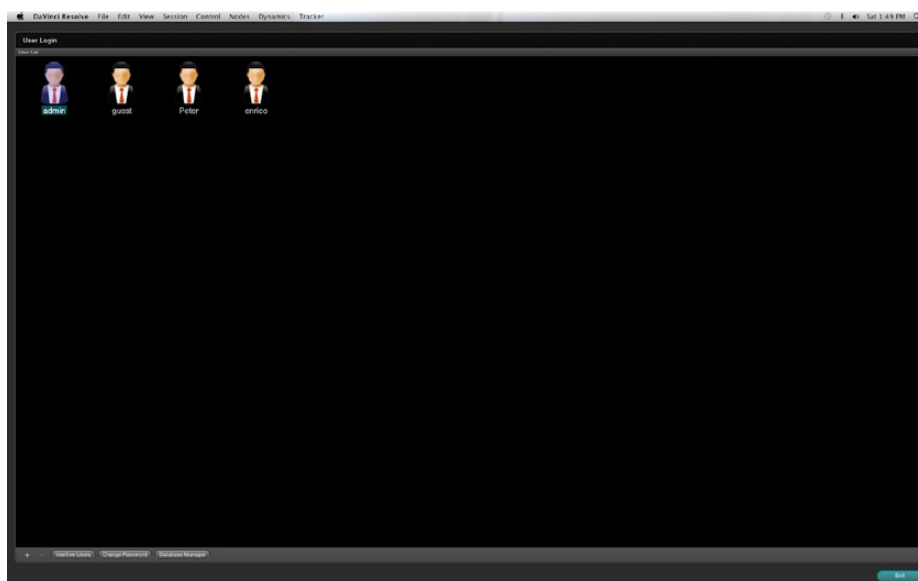
Before getting into the details of grading with DaVinci Resolve let's have a quick look at each of the main application screens and their functions.

When you start DaVinci Resolve the launch window opens and each software module reports its loading status.



Mac Start-Up

When the start-up is complete the User Login screen appears. Double click on a User icon to switch to the Configuration screen for that user.



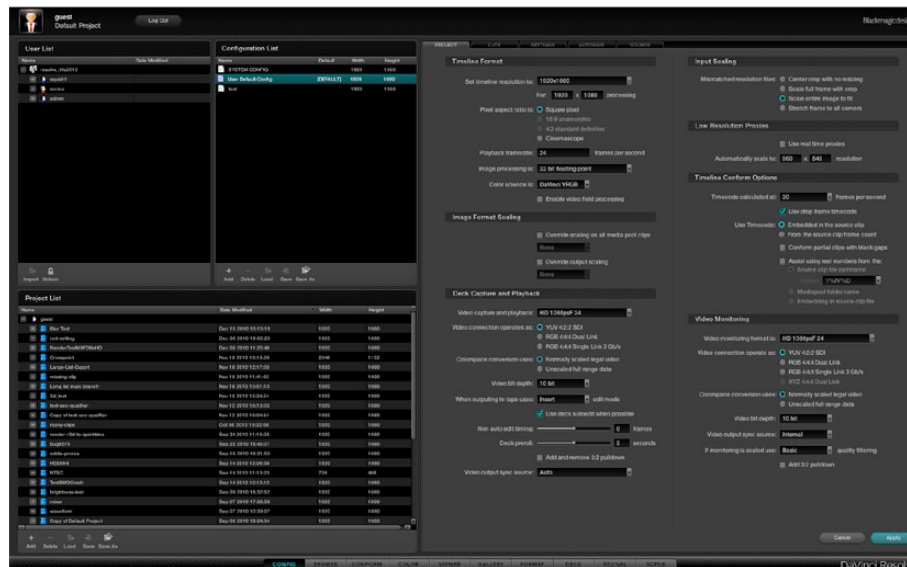
User Login

After you login to Resolve, this navigation bar appears at the bottom of every main screen. Use a left mouse click on this bar to switch to each screen.



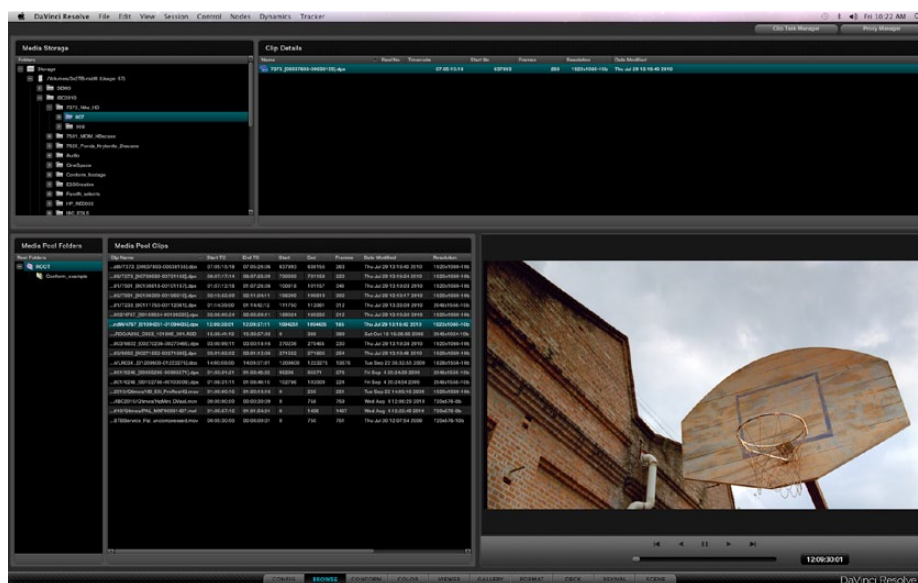
Navigation Bar

The Configuration screen shown below is used to configure projects based on the user. With the five tabs located on the right half of this screen you can set up new projects, load existing projects, and select the format and connection type for deck capture and playback.



Configuration Screen

Use the Browse screen shown below to select and review clips that are in your media storage and to mark the individual clips you need for your project. On the Browse screen you can create a Master timeline, load your EDLs and compare the hi-res source clips to your offline video from the edit system.



Browse

The Conform screen is used to establish your Master Session/ timeline, organize clips into a numbered order designated by an edit decision list and to confirm the edit via an offline video.



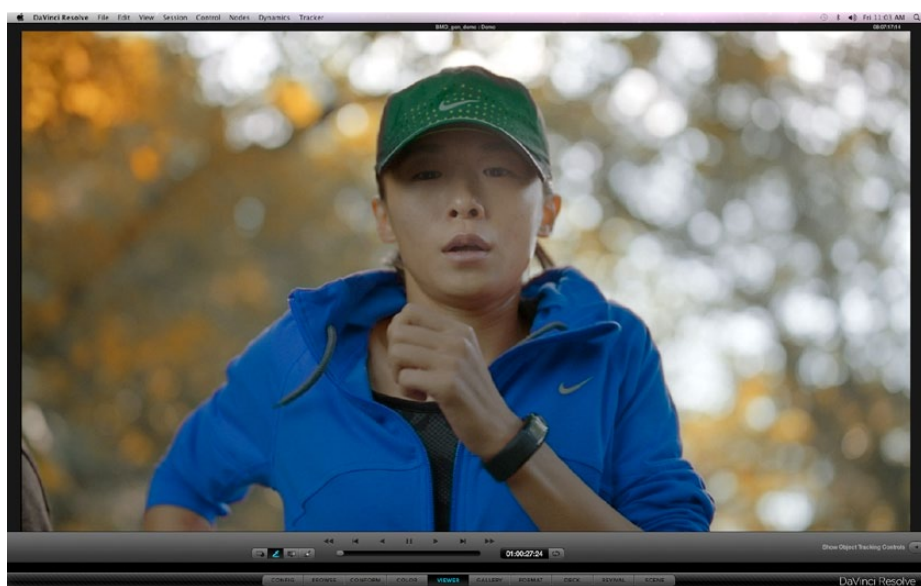
Conform

Most of your grading time will be spent here, at the Color screen. This includes a viewer, gallery of stills, a project and clip timeline and all the tools you need to create a master grade.



Color

The Viewer screen provides a full screen view of your images with transport controls, and controls for the automatic image object tracker.



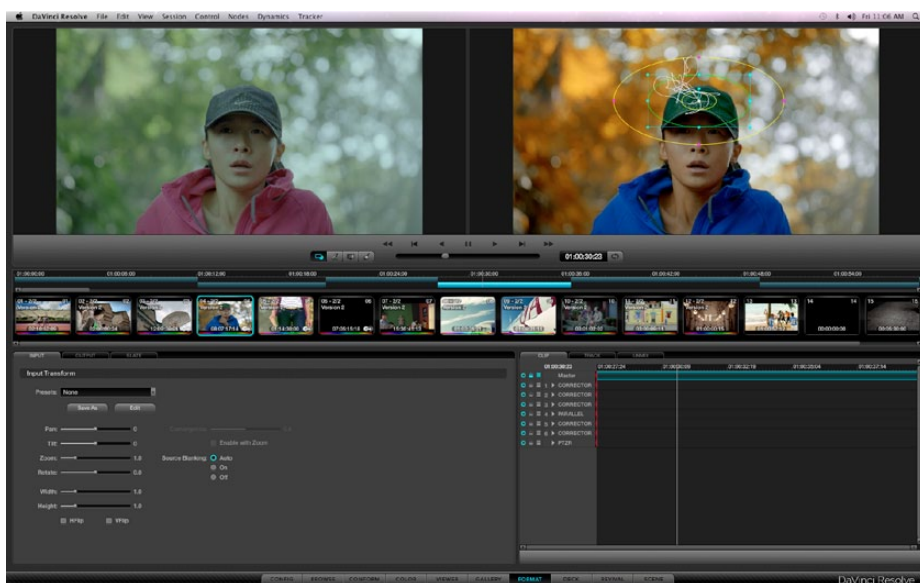
Viewer

When you capture or import stills, they are all displayed in the Gallery screen. Here you can move them between different folders and name them as you like.



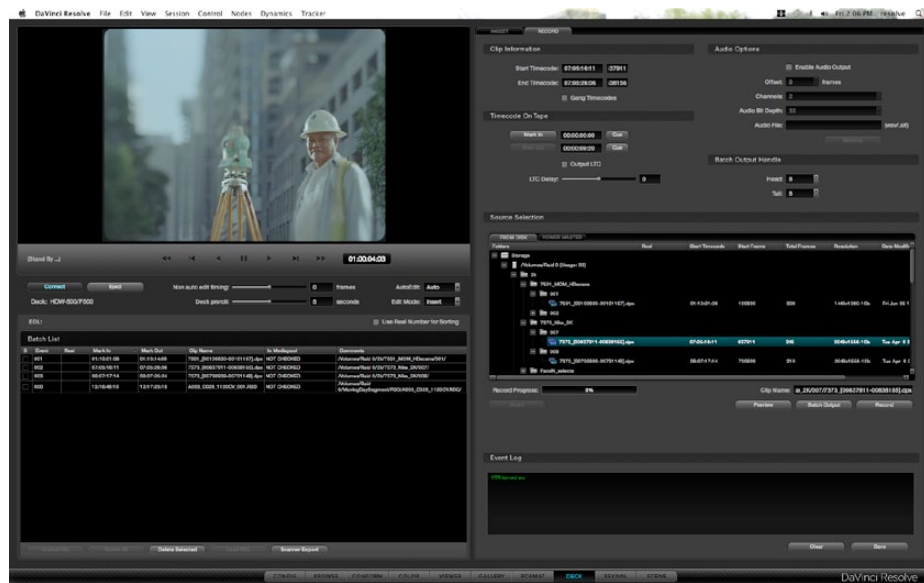
Gallery

The DaVinci Resolve Format screen interface makes it simple to format an image. You can adjust input and output image formats and size, pan and tilt the image, even zoom and rotate, all while seeing your changes in the viewer in real time.



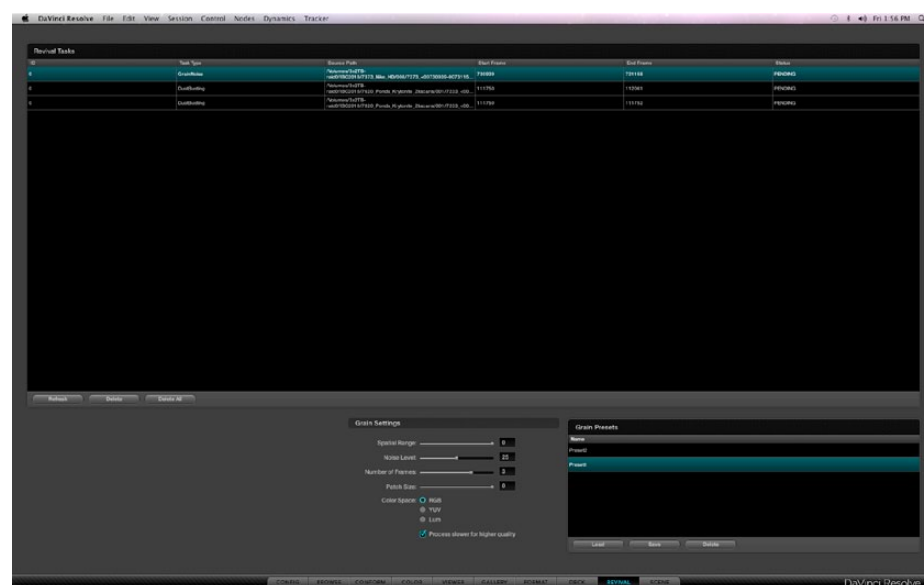
Format

Ingest from, or record to videotape all your SD and HD images using the Deck screen. There is also a batch capture option to speed up those otherwise cumbersome ingests from a long list of clips.



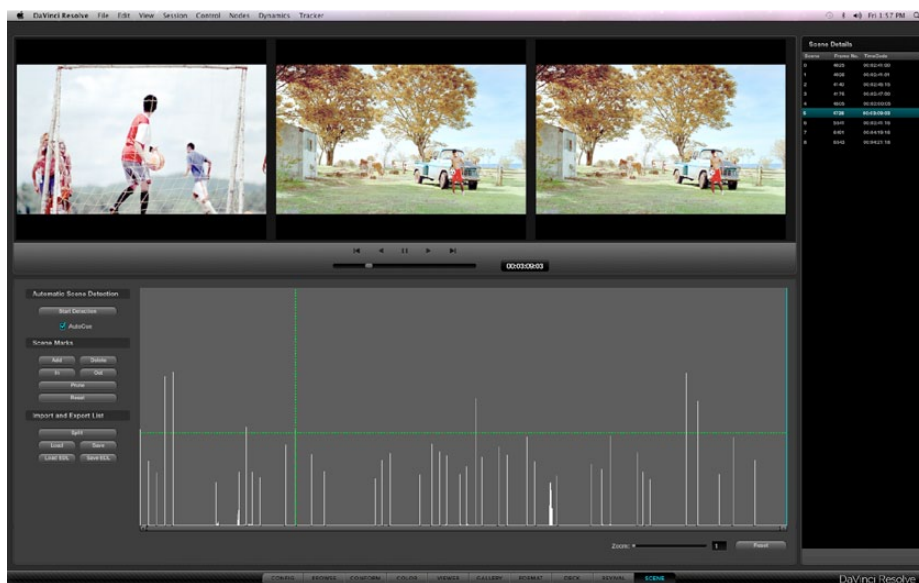
Deck

If your DaVinci Resolve is connected to a DaVinci Revival image restoration system you can use the Revival screen shown below to manage interaction between the systems.



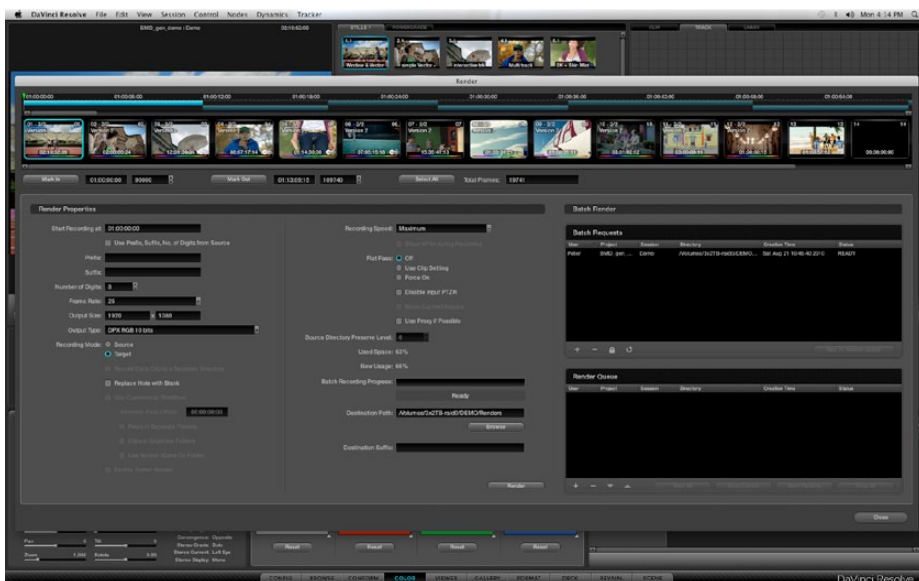
Revival

Sometimes you have images to grade but no EDL to split them into clips. No problem; just use the Scene Cut Detector to find those scene cut points automatically and split the source clip. It works five times faster than real time so you can start grading faster.



Scene Cut

The Render screen is used to set up the configuration and initiate rendering of the timeline images. Many systems limit the render of clips to the settings used in the timeline. Resolve is not restricted by this limitation and this provides you with significant workflow advantages unmatched in the industry.



Render

Quick Start Project

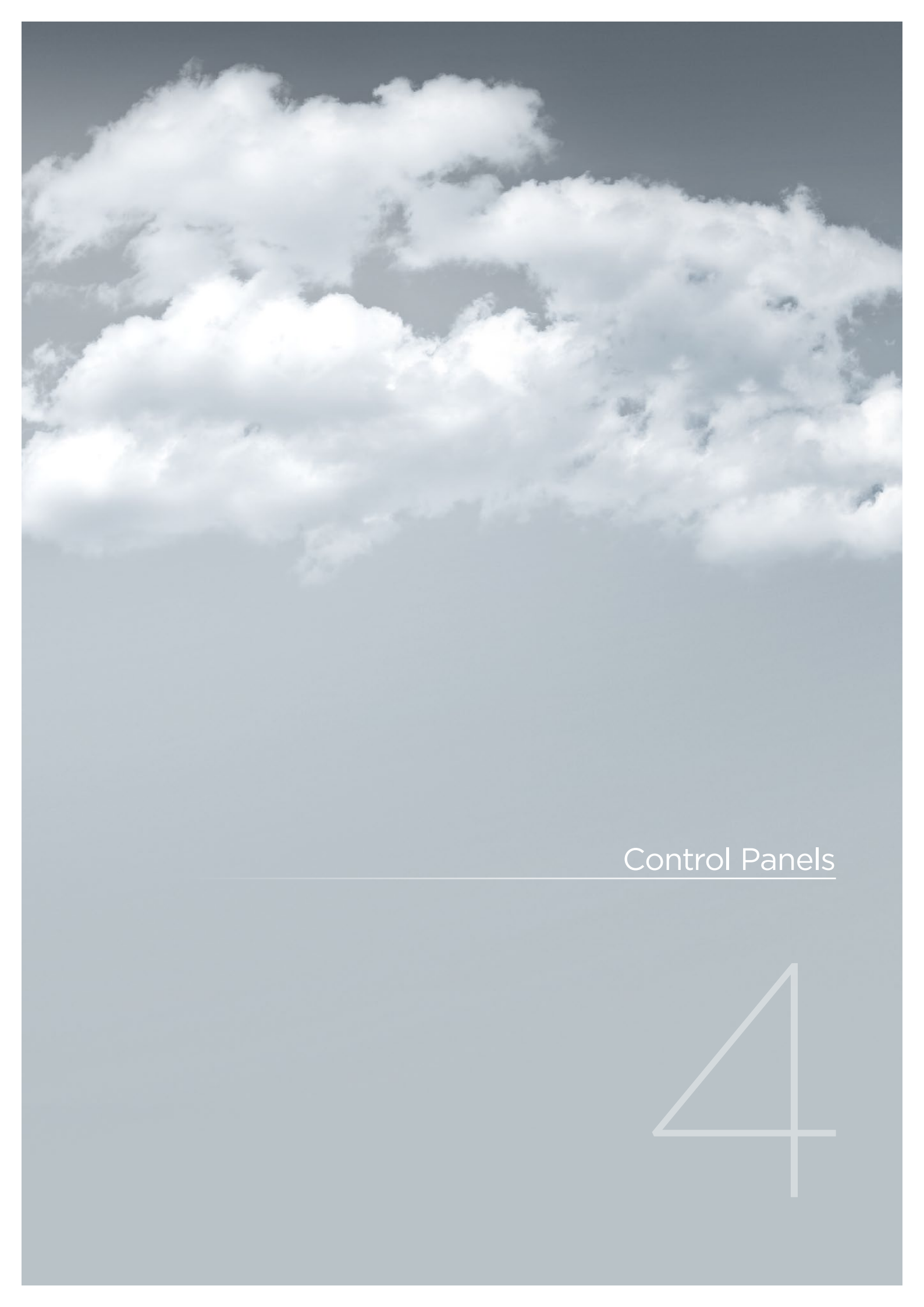
This Quick Start overview is designed to skip past much of the detail and get you quickly to the Color screen so you can learn how to login, configure and load a project, select clips, create a master timeline and start grading. Once you have these basics understood, you can continue learning the details of DaVinci Resolve operation as you reference each of the chapters in this User Manual.

Assuming you have installed the DaVinci Resolve application and used the Preferences menu, as detailed in Chapter 2, to set up your media storage, video capture hardware, and control panel type, the final preparation step is to put some images on your media storage drives.

On the DaVinci Resolve application DVD there is a folder called 'Sample Images.' Use Mac Finder or your Linux Browser to copy this folder and contents to your media storage.

- 1: Start DaVinci Resolve. At the Login screen double click on the Guest icon.
- 2: The Configuration screen will automatically open after the login. Select the 'Add' button on the bottom left of the screen in the Project List display. In the window enter the new project name, 'Sample Project' and 'Save.'
- 3: Using the navigation buttons, select the Browse screen and look for your media storage at the top left. Expand the folder view, if necessary, and select the folder 'Sample Images' that you copied from the DVD. Now right click on the folder and select the second item in the options list, 'Add Folder Into Media Pool.' You will see the Media Pool populated with a few files.
- 4: Select the Conform navigation button and, on the left in the Timeline Management display, select 'Create Default' and confirm 'OK.' At the bottom you will see the EDL display list the events, which will show as clips on the Master Session timeline.
- 5: You are ready to switch to the Color screen. The timeline will be populated and the Viewer will show the first frame of the first clip. You can jump to clips by selecting them on the Thumbnail Timeline or use the transport controls under the Viewer.
- 6: Within the Primary tab, click and drag the red, green or blue slider within the Lift, Gamma, or Gain display. To the left of these is the Luminance Gain. Click and drag the Luminance Lift a little lower and the Luminance Gain a little higher.
- 7: To add a PowerWindow, click on the Windows tab and select the circular window, turn it on, and note the window cursors on the Viewer. Select a cyan anchor point and click and drag to change the size or aspect. Now adjust the primary controls or curves and note that the grade you apply is inside the window.

Follow the rest of this User Manual to learn the full power of DaVinci Resolve.



Control Panels

4

Control Panels

While DaVinci Resolve can be operated with a mouse and keyboard, the full creative power of the system is unleashed when used with the DaVinci Resolve Control Surface.

The DaVinci Resolve Control Surface consists of three panels. The center Trackball panel is used for most grading operations and includes a slide-out keyboard and trackballs. The two side panels are interchangeable for left- and right-handed operation. The Transport panel includes a jog/shuttle control and is often placed on the right (for right-handed colorists) with the T-bar panel on the left. The panels are usually located some distance from the Resolve workstation, however it is very simple to connect them together with a USB2.0 cable.



Details of the panel operation and menus are found later in this guide.

DaVinci Resolve also supports the Tangent Devices 'Wave' and the JL Cooper 'Eclipse CX' panels. These panels offer significantly improved creative control compared to using a mouse, however there are a number of features offered with the DaVinci Resolve Control Surface that are not possible on the third party panels.



Tangent Devices Wave





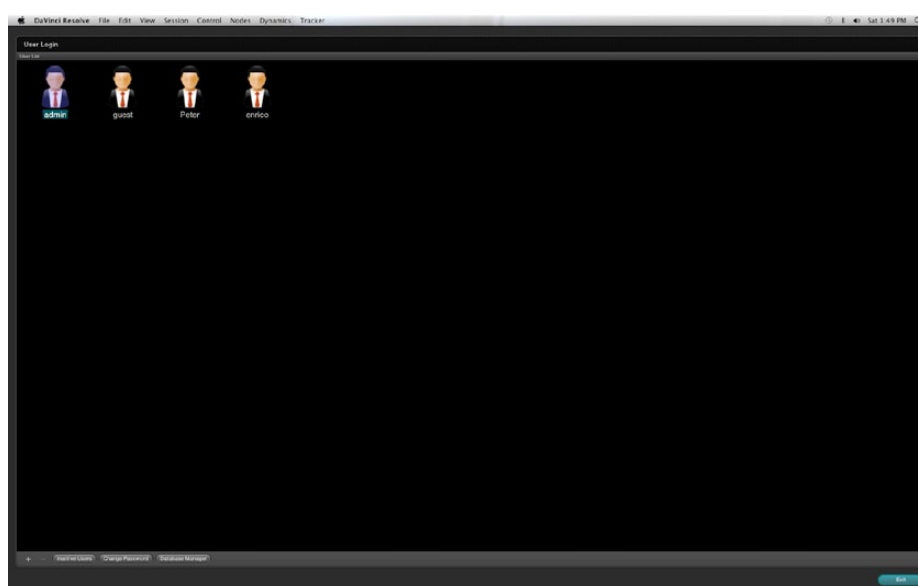
Getting Started

5

Getting Started

Starting DaVinci Resolve

Click the DaVinci Resolve icon to start the application. As the system is starting the launch window opens and each of the software modules reports its loading status. When the start-up is complete the User Login screen will appear. You can close DaVinci Resolve using the 'Exit' button, which is on the User Login/Exit page.



Colorist Login

User Login Screen

DaVinci Resolve uses a database to store grading information for each project and each user. Each user's file contains stored color corrections and system configurations for your projects.

Login To An Existing User

The User Login screen displays an icon for Admin, Guest, and all other users. To login without a password, simply double click on the Guest icon. If you double click a password protected user, just enter the password and continue. If needed, easily create a new user as indicated below. As all projects require pre-configuration prior to grading, once the login is successful, DaVinci Resolve will automatically switch to the Configuration screen.

Exiting Resolve

When you have completed your work, save the project, use the log out button on the Configuration screen and then Exit on the User screen.

Creating A New User

To set up a new user select the Admin icon and then the + button on the bottom left of the screen. .

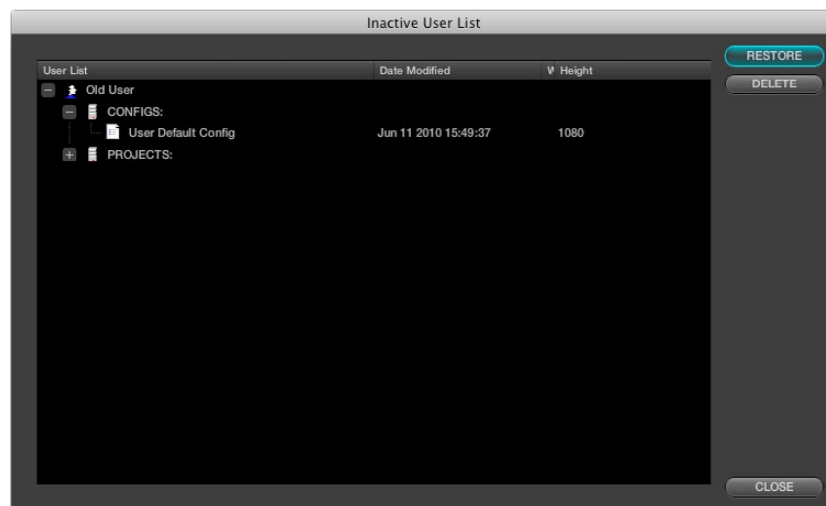
The administrator can use password protection to lockout the New User function. When DaVinci Resolve is first installed the Admin password is left blank. If the Administrator has protected the operation with a password please see your Admin to gain access.

You may also change the graphic for each user by right mouse clicking on the icon and selecting 'Change Picture'.

Deleting An Existing User

To delete a user select the user's icon and then the - button at the bottom of the screen. Confirm the Admin password and then a prompt will appear asking you to confirm the user deletion. Don't worry if you have done this accidentally as DaVinci Resolve stores the old user information in an Inactive User file so you can recall the data whenever you need to.

By clicking on the 'Inactive Users' button at the bottom of the Login screen (you must have Admin privileges), the Inactive User List will appear and allow you to either reactivate or permanently delete the users listed.



Inactive Users List

This permanent deletion of the user is final! Be sure you really want to delete the user and their projects, stills, configurations, etc.

Changing A User Password

Change your user password by simply selecting your User Icon to make it active and then the 'Change Password' button. In the Changed User Password window enter your old and new passwords and confirm.



Change User Password

Multiple Database Support

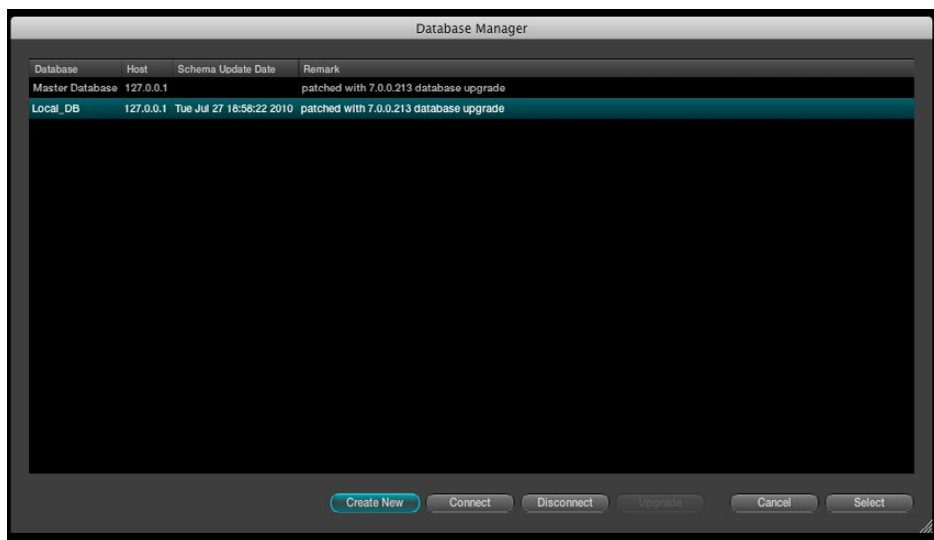
DaVinci Resolve works from an internal database server so it's possible to have multiple databases for maximum flexibility in organizing your projects. You can create a database for each year, or whatever timeframe you desire. Keeping the database size small makes loading and saving faster.

Facilities with multiple systems can implement a shared Remote Database Server.

Selecting the Database

You don't need to do or know anything about databases to use DaVinci Resolve. It's all set up for you when you install the software.

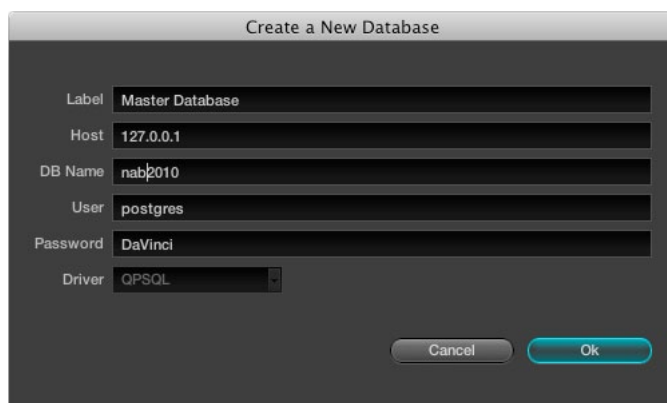
To make a database your active working database, click the 'Database Manager' button on the Login screen. Select a database from the list and confirm with the Select button. This database will now be used for saving all new projects. The other databases that are connected, the internal and also remote databases, will continue to appear in the list and you can import projects from those databases. However when you save a project, regardless of its origin, it will save into the active working database you selected.



Database Manager

Creating a New Database

On the Database Manager window select 'Create New' to create and add a new database to your available database list. Enter a label name to help identify the database in DaVinci Resolve and a unique database name, in lower case. If you are using the database on this workstation leave the other items unchanged and confirm OK. This new database is now available and you can add your user as detailed above. All of the old projects are still available. How to import them is found later in this guide.



New Database Popup

Create a New Database Image

If you are connecting to a Remote Database Server, change the IP address from the local machine address, which we show as default to your Remote Database Server. Enter the remote database name and select 'postgres' for all new databases with full read/write access or 'MySQL' for read only access to legacy DaVinci databases.

Remote Database Server

Multiple DaVinci Resolve systems can also work on the same project at the same time using the shared database. For example an assistant could be working with the colorist to prepare files for the next reel by conforming shots, managing the VFX replacements or using the system to do dust busting repairs, etc. Resolve automatically prevents two users working on the exact same item by opening a copy of a project if one is already in use and will advise you when the other session is closed.

We highly recommend the use of a separate workstation to operate as the Remote Database Server for facilities with more than two DaVinci Resolve systems. By selecting 'Connect' in the Database Manager you can enter the information relating to the remote database. Just fill in each item and confirm OK.



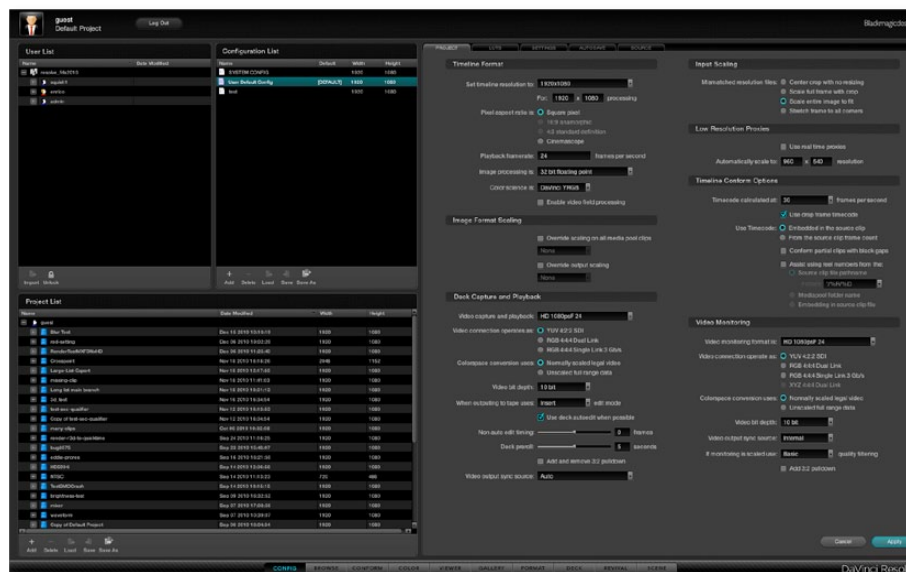


Configuration

6

Configuration

At the commencement of every project a number of user, project, deck and monitor configurations should be set to provide the correct environment for your color-grading project. You can open the default or an existing project and/or may change the various settings to accommodate the project needs. You can also assign a name to the project. These tasks are performed on the Configuration screen which is the first screen always opened by DaVinci Resolve after you log in.



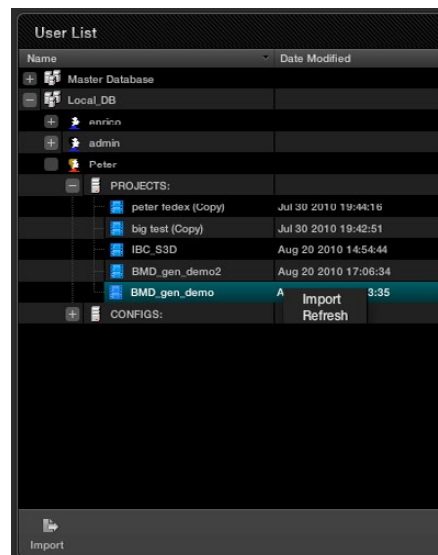
Configuration

At the commencement of every project a number of user, project and operational configurations should be set to provide the correct environment for your color-grading project. You can open the default or an existing project and/or may change the various parameters of the configuration in order to accommodate the project needs. You can also assign a name to the project within this page. These tasks are performed on the configuration screen which is the first screen always opened by Resolve.

The User List

This screen lists all available databases with the users and their associated projects and system configuration files. Note that you will not see your user ID within the current database. This list allows you to simply import projects from other database or from other users into the current database and user.

Expand the list to find and select the project or configuration and select the 'Import' button. DaVinci Resolve will import that project or configuration and place it in your active database.



User List

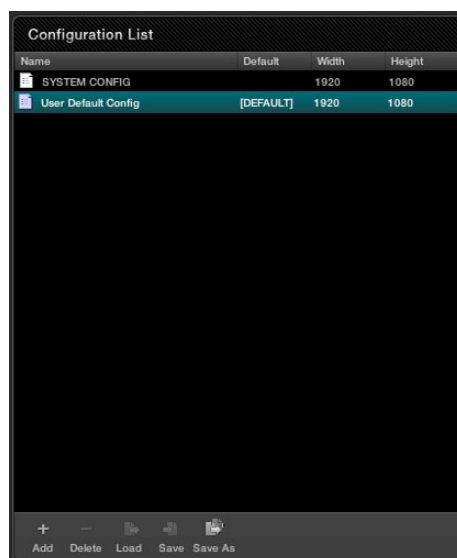
The Configuration List

The Configuration List will show all configurations saved within the current database for the current user. As the Admin you can define a User Default Config that can be used as a default system configuration for all new projects.

Modifying and Saving an Existing Configuration

To modify an existing configuration, highlight the configuration and make the changes, or modify the project configuration. Save these settings to the configuration or cancel to revert to the original.

Further details on the Configuration screen tabs and their operation follow later in this section of the guide.



Configuration List

Within the Configuration List window you can:

- Add:** This allows you add a new config with the current settings.
- Delete:** To delete an existing config, select the config with your mouse and then the 'Delete' button.
- Load:** This will load the selected configuration file.
- Save:** Any changes that have been made into the existing (i.e., highlighted) configuration file are saved.
- Save As:** To save configurations with an alternate name and thus create a new configuration file use Save As.

Creating a Facility Default Configuration

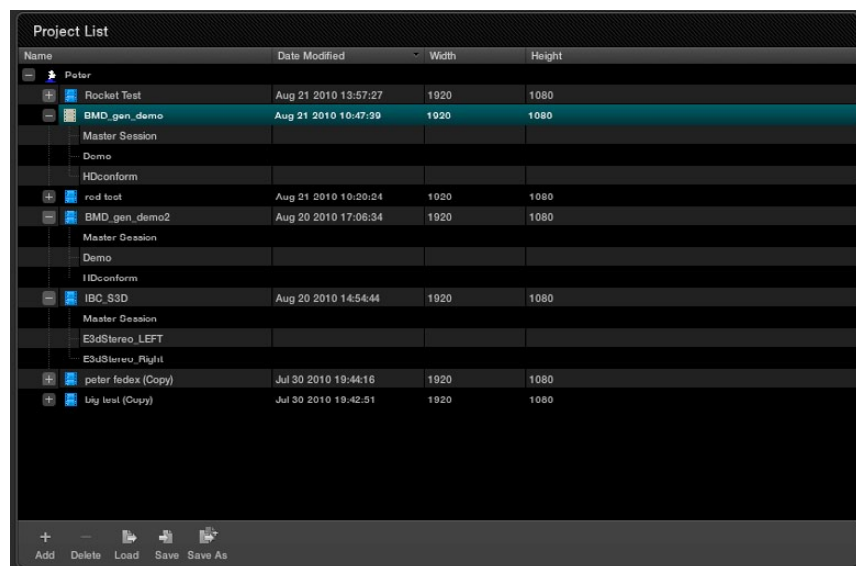
There are two default configurations in DaVinci Resolve: a User Default and a System Configuration. To modify a System Configuration and save it as the default configuration for all new users, first login as Admin, then select 'System Config' within the Configuration List, make the changes to the project and user configurations and select 'Save'. All new users that are added to the system will automatically inherit these User default settings which can then be modified by the individual users and saved on a per project or configuration basis.

Projects List

The logged in user has a Project List to show all projects associated with that user. Clicking on the '+' located to the left of the User ID will reveal the projects associated with that user. It also shows the date on which the project was modified and the project resolution. By selecting the '+' that is located to the left of the project name, the project file and any associated sessions (EDLs) are also revealed.

There are a number of user controls in this window.

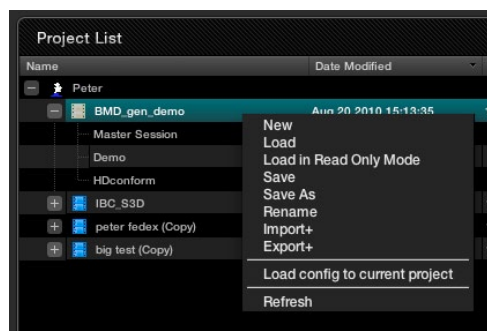
- Add:** Create new project.
- Delete:** When you select a project, then delete, that project will be deleted from the database. Please be sure you wish to delete the project.
- Load:** The selected project in the project list will be loaded.
- Save:** Any changes that have been made into the selected project file are saved.
- Save As:** To save a project with an alternate name and thus create a new project file use Save As.



Project List

There are also a number of features available via a right mouse click within the Project window. If you select a project and right click the pop-up display will provide the following options, depending on the status of the current project.

New:	Opens a window to create a new project name for the new project.
Load:	Will recall the project configuration and sessions, but only after checking if the current project has been saved. If it has not been saved, it will give you that option.
Load in Read Only Mode:	Like Load, this will recall the project and load it into the system. This feature is used for loading a locked project when in a shared database environment. You are not permitted to save any changes to the project in this mode.
Save As:	You can save a project with a new name. Often ideal for creating multiple versions of projects or versions for export.
Delete:	Allows you to delete a project.
Rename:	Use this to rename an existing project.
Import +:	DaVinci Resolve allows you to Import and Export projects and will package all the project metadata, EDLs, LUTs and audio material into a compressed file which may be easily imported or exported between systems. If the project images are not on a shared SAN, you must manually manage the required images. Use Import + to bring projects into this database.
Export +:	If you wish to create a backup of this project with the grading metadata, or export it for use elsewhere use Export +.
Load config to current project:	Uses the configuration selected in the configuration list to replace the current project's configuration. A simple way to make sure your project uses the correct settings.
Refresh:	To refresh the display simply right click and select Refresh.

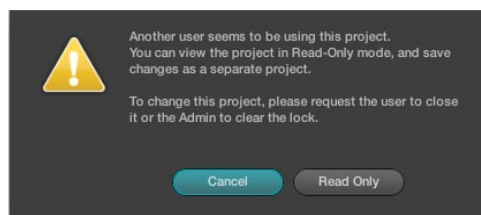


Project List Options (Right Click)

Shared Database and Locked Projects

If you are using a shared database with other DaVinci Resolve systems some of the projects will have a lock icon to the left of the project name. A locked project is loaded in read-only mode and changes must be saved to a new file name. Once a shared project is loaded, it is automatically locked in order to prevent multiple users from accessing the project at the same time. To unlock the project, login as Admin and then click on the 'Unlock' button.

For large projects that are being worked on in parallel, often the project is split into logical segments so users can work simultaneously in different suites. For example, a feature film may be split into reels, or the film separated from the trailer and video press kit. Each segment can use grades from the other segments as required to keep the shots in balance.



Read-Only Confirmation Dialog

Configuration Screen Tabs

Using the five tabs on the Config screen you can make changes to the configuration to suit your project or files. In each case, the 'Apply' and 'Cancel' buttons located at the bottom of the tabs save or cancel any changes made.



Config page tabs

The tabs are:

- | | |
|------------------|--|
| Project: | Provides the main configuration settings for DaVinci Resolve to process your images. The first step in setting up the configuration for any project is to determine which resolution you will use. You may also choose to change the standard for monitoring as well as Deck standards for importing and exporting material. |
| LUT's: | Select, trim and generate look up tables and define where they are used. |
| Settings: | Selections for many user and project variables, including the default dynamic profile and automatic dynamic ripple features, are made in the Settings tab. |
| Autosave: | Displays the auto project backup information. |
| Source: | While DaVinci Resolve's default file format is the SMPTE standard dpx file, many other formats are processed natively within Resolve. This tab provides system based configuration and adjustments for the RED camera r3d files. Other formats will be added in the future. |

Project Tab

Timeline Format

The Timeline Format section defines the parameters used for image processing during grading. For example, if you use a HD grading monitor, setting the system resolution to 1920x1080 provides automatic up or down sampling of the source images on the grading display. When you render the files, the render resolution can be set to any other parameter so this system resolution is just to set the working specification for the system while grading and it does not limit the settings for deliverables.

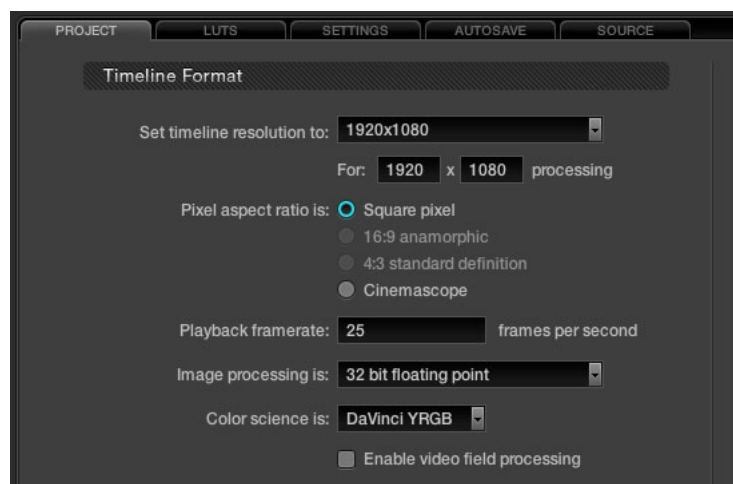
You can customize the timeline format settings or use the templates provided. The controls are:

Timeline Resolution selects from a preset list and then displays the resolution selected for image processing while grading. You can change the setting for resolutions not found in the presets. The Pixel Aspect Ratio is used to select other than the normal square pixel format. You can apply a 16:9 anamorphic pixel aspect, a 4:3 for SD images or Cinemascope ratio.

Playback framerate is often based on the setting of the grading monitor so a 50Hz monitor will need a 25 fps playback speed for a synchronous display without dropping frames. If you want to see the playback at a slower rate set it here and DaVinci Resolve will make the appropriate calculations and drop or repeat frames as necessary. This can be handy to see how images look in slow motion.

DaVinci Resolve uses 32 bit floating point processing for all grading calculations and this currently is the only option available as is the legendary and unique DaVinci YRGB color science.

Resolve is a frame based system but it can process interlace video material. If your source format and record format are the same, for example HD in and HD out, you may use Resolve in its native frame based configuration, even for projects that have 100% interlace material. If however you use the image resizing engine to change the image size, including resize a HD to SD image, or to make significant image sharpening or blur processing you may wish to 'Enable video field processing'. Resolves interlace image processing consumes significantly more GPU power to maintain the high picture quality so enabling this checkbox will result in a slower playback speed or a reduced number of nodes at real time.

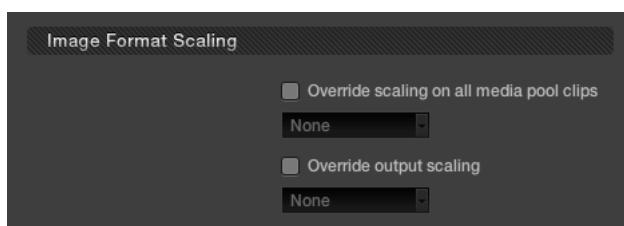


Project Tab

Image Format Scaling

You can set Input and Output Format Presets that can be used with session clips or for a complete timeline. These presets may be applied as Global presets from the Configuration screen or a Clip preset within the Media Pool which you will find on the Browse screen. Presets may also be applied from within the Format screen or even by right mouse clicking on a thumbnail within the Color or Format screens. There are more details on presets later in this guide.

These user-defined presets are settings for various image sizes and are very useful, for example, when a film has been over scanned. Instead of having to resize every clip independently you can resize a clip and use the preset to apply to all. If you select 'None,' this will indicate that no settings have been applied. Within the 'Image Format Scaling' selections, if the check boxes are activated next to each option, the programmed settings will be overwritten with the newly selected presets.



Format Preset Selection

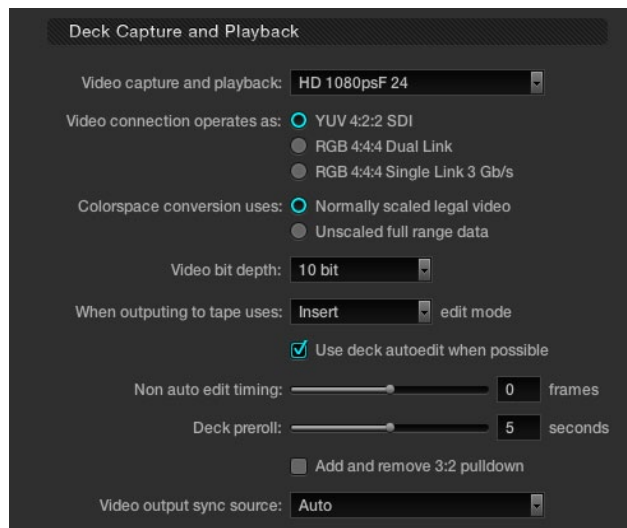
Common use of Input Format Preset

If your project originated on film it will have been scanned at some time prior to editing and grading, and often to make sure all the image area is captured the image is slightly over-scanned. This means you will see the full open gate image and depending on the scanner, some of the edges around the image, or even sometimes the round corners or distortion in the corners of the image.

To avoid the time prohibitive process of manually resizing every shot so that it matches every other, simply create a resize of a reference image. Save this new image size as an Input Format Preset and select this preset. The optical quality zoom and positioning controls will produce outstanding results, on the fly, so you don't need to pre-render and you can always make further adjustments during your grading session. To create an Image Format Preset, simply make a size change with the formatter on the Format screen, click on the 'Save As' button, enter a preset name, and save.

Deck Capture and Playback

The deck window is used to select the format of video that will be either imported or exported from the system when using a video tape recorder. You should set these parameters before selecting the Deck screen and once set, select the 'Apply' button at the bottom of the Config screen.



Deck Capture and Playback

The Deck Capture and Playback controls are as follows:

Video capture & playback:	Selects video standard from the pulldown list.
Video connection:	Selects between the available connections: YUV 422 SDI, RGB 444 Dual Link and 444 single link using 3 Gb/s. Note these options depend on which video capture card you are using and are all available with the Blackmagic Design DeckLink HD Extreme 3 and 3D.
Colorspace Conversion:	DaVinci Resolve normally uses computer RGB levels internally and so the normally scaled legal video option will perform a color mapping conversion to and from the SMPTE video levels when ingesting from or recording to tape. By selecting the Unscaled full range data no scaling will be performed in either ingest or playout.
Video Bit Depth:	10 bit is the current option.
Edit mode for recording:	Select whether to record the material to tape in Insert, Assemble, or Crash record edit mode.
Auto Edit:	If your deck supports it, this is the best method to record video to the deck. If deselected, a basic the Edit On/Off mode can be used.
Non Auto Edit timing:	Adjusts the edit synchronization for the deck when auto edit is not selected.
Deck Preroll:	Set the number of seconds for preroll depending on the performance of your deck.
Add and remove 3:2 pulldown:	Enable for working with NTSC/59.94i-based material. This will remove the 3:2 sequence on ingest or will add 3:2 on export to tape.
Video output sync source:	With the Decklink this is set to Auto, but with some other capture cards you may wish to set the sync source to 'Reference' for playout and 'Input' for ingest.

PowerMastering – Grading and Formatting Directly To Tape

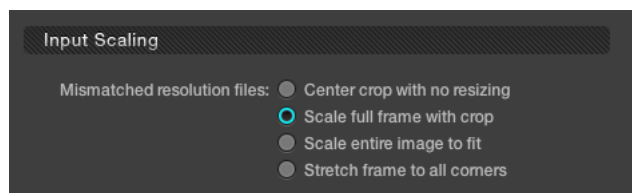
PowerMastering is intended for creating tape deliverables quickly without the need to render. It can also be used for dailies operations. To output a color corrected and resized timeline or clip directly to tape you must be in the PowerMastering mode which is selected in the Settings tab. PowerMastering can be enabled at the beginning of a new project or for existing projects. You will see a message alerting you that the output sizing will be disabled in this mode. Resizing requires significant GPU processing and for a system with just a single GPU it's common to inhibit output sizing to PowerMaster. If you have a number of GPUs or if you need output sizing and PowerMastering, first preselect the option to use the high quality GPU for output sizing on the Settings tab. Then apply to save the configuration.

After enabling Power Mastering some thumbnails on the Color screen timeline will have a small red square icon to the left-hand side of the timecode indicating that this clip may need caching prior to PowerMastering. This is because the clip has a complex grade or a high resolution, or both, and your hardware configuration is not likely to be able to process the clip in real time for the tape output. You should check the playback of each of these clips and select the clip for render cache, right click option, if it needs caching.

A key feature of PowerMastering is the ability to work on 2K files or mixed resolution and then output an HD and SD master without the need to render saving not only valuable time but also a lot of disk space. There is more information about PowerMastering in the Deck screen section of this guide.

Input Scaling

When your source images are of a different size or aspect ratio to the grading timeline you need to select how DaVinci Resolve will scale the images so they all match.



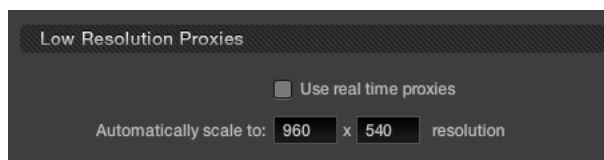
Input Scaling

The options available are:

Centre crop with no resizing	This option makes no attempt to resize the image to fit the aspect ratio selected. A simple crop is used from the center of the source image if it's larger than the timeline format.
Scale to full frame with crop	Automatically inserts blanking within the image area to compensate for a difference in the source to timeline aspect ratio.
Scale entire image to fit	The image will be resized in order to completely fill the frame. In some cases, a part of the image will be cut from the left and right sides of the source image or the top and bottom. You can reposition the image using the Input Format sizing controls within the Format screen.
Stretch frame to all corners	When you select this option, DaVinci Resolve will fit the frame to the output aspect ratio. In this mode, the frame edges will be stretched to the corners and no information will be lost. However, this option can also result in squeezing or stretching of the image in order to fit the output format.

Low Resolution Proxies

The proxy mode can be enabled from the Project tab or on the DaVinci Resolve control surface. When using the Low Resolution Proxies section of the Project tab, select the resolution for the proxy, which is often exactly half the system resolution. Proxies on DaVinci Resolve are made with our optical-quality resizing engine and have been used for major-budget film outs. There are two types of proxies. The traditional pre-generated proxies which are managed from the Browse screen and often used for 4K projects where the system hardware only permits real time 2K performance and the advanced 'On the Fly Proxy (OFP)' which DaVinci Resolve generates in real time.



Low Resolution Proxies

Proxies are generally used when a complex color correction is created and the system begins to run a little slower than real time. When this occurs, the proxy mode can be activated in order to see the results running in real time. Alternatively, you can cache the clip to gain real time performance again.

The Low Resolution Proxies display shows the resolution of the generated proxy and the 'Use real time proxies' checkbox allows the operator to activate the Proxy mode.

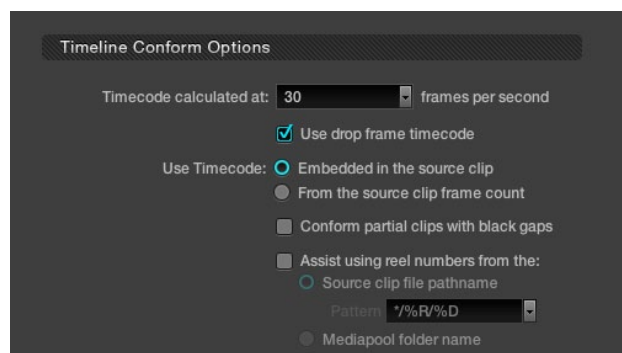
Timeline Conform Options

DaVinci Resolve will make a conformed timeline of the selected clips using a number of parameters to make it easy to deal with missing timecodes or conflicting reel names. It is important to select the conformed frame rate of the clips and how the header or file metadata will be used. These parameters must be set PRIOR to selecting source clips in the Browse screen as they impact speed and frame rate calculations used in DaVinci Resolve when establishing metadata for the grades.

SMPTE-standard DPX files contain both image and metadata for every frame independent to every other frame. This permits DaVinci Resolve to generate complex metadata and reference the source clips via the timecode in the DPX header. Many other formats have options for timecode and other metadata to be recorded with each frame and DaVinci Resolve uses these on a number of occasions.

Use timecode 'embedded in the source clip' for most projects, especially those that have DPX files, so that conforming and applying grades to the material will be automatic. You can re-conform shots, or even completely change the image material, and as long as DaVinci Resolve can reference the header metadata (i.e., the timecode) for that clip, the grading metadata will automatically re-align to the new and correct position in the timeline. If the source clips frame count is all that is available, select the 'From the source clip frame count' option.

The 'conform partial clips with black gaps' option will allow you to conform a clip that may not contain all the required frames. When this option is selected you will be alerted in the Conform screen by seeing a 'P', representing a partial clip, within the thumbnail of the clip that it is lacking frames .



Timeline Conform Options

Sometimes you will also need assistance in conforming using reel numbers. When this checkbox is enabled DaVinci Resolve offers a number of options. To obtain reel number information from the Clip's Path name, Media pool Folder Name, or from the DPX Header select the appropriate option. This is particularly helpful when working with projects that have a large number of source reels or when the source clip file path is complex.

Conforming by Reel Number

DaVinci Resolve can conform clips by reel identification. There are three options for this operation.

- 1) **Use reel number from the source clip file pathname:** The reel number is derived from the information in the directory path or the name of the file.
- 2) **Use reel number from the Media Pool's folder name:** The conform operation will use the folder identification within the Media Pool.
- 3) **Use reel number embedded in source clip file:** When this option is selected the system will search for the reel number in the 'Input Device Name' field in the header of the DPX file. It is important to note that the reel numbers retrieved from the header should match the reel numbers within the EDL.

If you use the source clip file pathname for extracting the reel number, be sure to define the search pattern that enables DaVinci Resolve to extract the reel name. This pattern consists of a series of text characters and "wild cards" that are unique to your facility. The extraction pattern is interpreted from right to left.

Here are a series of search characters that may be used.

- ? This will look for matches of any single character.
- * This wildcard will create matches for any sequence of zero or more characters.
- %R Use this option in order to specify the reel number's location. It is important to note that reel numbers may contain any character, but should not contain any directory separators. The reel number extraction pattern %_R is used to extract reel numbers and strip out the r3d file name underscore for FCP EDL's.
- %D This will match any directory name or file name. It will not include a forward slash.

To test the extraction path select the pulldown arrow next to the current path and a dialog will open. Enter your test pattern using the search characters and then the path to a clip you wish to extract. Press the 'Test' button to view the result of the extraction test. If the reel number information extracted proves correct, select the apply button to place the pattern into the 'Timeline Conform Options' display.

Examples of Reel Number Path Extractions

In order to better understand how this process works, there are several examples showing the various methods of reel number extractions. The / is used as the separator between control parameters.

Example 1: This example shows the reel number stored within the parent folder name of the clip.

Pattern: */%R/%D
Clip Name: vol0/MyMovie/Scans/004B/Frame[1000-2000].dpx
Reel number: 004B

Parsing takes place from right to left so to analyze this pattern start at the right end. In this case the %D matches to the file name "FrameNNNN.dpx" where NNNN is the frame number in each file of the clip. Moving left of the file name, the /%R/ section of the string is next. This specifies that the reel number will be the entire name of the parent directory immediately above the file. Then the * at the beginning of the string says match any pathname in front of the directory name that has the reel number. This string would find the parent directory regardless of how many levels deep it is nested on the directory path.

Example 2: Here we see the reel number stored in the parent folder name of the clip along with being prefixed by reel number.

Pattern: */????%R/%D or alternatively */Reel%R/%D
Clip Name: /vol0/MyMovie/Scans/Reel1234/Frame[1000-2000].dpx
Reel number: 1234

In this example both of these extractions patterns produce the same result. They are also similar to the first example. The reel number is still in the parent directory name but in this case it will have the fixed characters "Reel" prefixed in front of the reel number. The first pattern with ???? would actually match with any 4 character in front of the reel number. The second pattern is more specific and would only match the word "Reel" in the directory name.

Example 3: This example will show the reel number stored within the parent folder name two directory levels up.

Pattern: */%R/%D/%D
Clip Name: /vol0/MyMovie/Scans/004B/134500-135000/Frame[1000-2000].dpx
Reel number: 004B

This example is again similar to example 1. The difference is that the reel number is the directory name two levels above the clip. In the example 1, the reel number was in the directory name only one level up.

Example 4: Finally, we see the reel number that is embedded within the clip name of the material.

Pattern: */Reel%R_.*
Clip Name: /vol0/MyMovie/Scans/Reel004B_[1000-2000].dpx
Reel number: 004B

This example shows a method for extracting the reel number for the file name of the clip. Again, starting at the right the two pattern characters ".*" match any series of characters up to the first underscore character. Which in this case will pick up the file extension (.dpx) and the frame number portion of the file name. Next, the "/Reel%R" characters indicate the reel number is the characters between the "/Reel" and _ character. The * at the beginning of the pattern will match a file path any number of directories deep in front of the file name.

Reel Number Support from Final Cut Pro EDLs

To be able to handle larger than 8 character reel numbers from Final Cut Pro EDLs, DaVinci Resolve supports extraction of the reel name using the comments.

On the settings tab of the config screen, select the option called “Extract Reel Names from EDL comments”.

e.g. Consider the following event in the CMX EDL

```
001 REEL02_T V C 01:02:54:24 01:02:50:24 01:00:54:24 * FROM CLIP NAME: REEL02_TEST.MOV
```

DaVinci Resolve will read the reel name as REEL02_TEST

This option is especially useful for conforming CMX EDLs generated with reference to RED r3d clips, which have longer than 8 character reel numbers.

Changing the Conform Frame Rates

As mentioned, it is important that you apply the correct frame rate for the material within the Conform Options display prior to adding material into the Media Pool or creating a Master Session within the Conform page.

If you enter an incorrect frame rate in the Timeline Conform Options display, the resulting source timecodes that are calculated will be incorrect. Once information is added into the Media Pool or a Master Session is created, this control within the Configuration screen will become unavailable.

To change the value within the Timeline Conform Options display you must delete the Master Session and remove any information in the Media Pool.

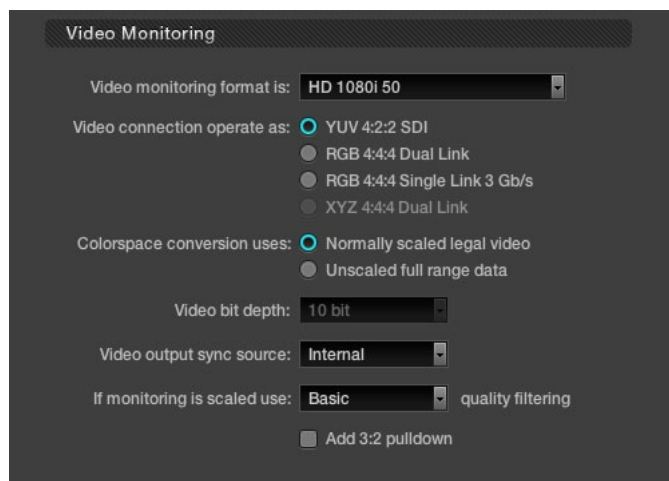
Video Monitoring

The Video Monitoring display should be adjusted to reflect the monitor you use for color correction. The settings here have frame rate and screen refresh implications, so making the correct selection is important.

For example, if you are working with 2K files in a 2K environment but color correcting using a high definition monitor, you should select the appropriate HD standard for that monitor.

There are many options for the video monitoring format, so first select one from the pulldown list. Then select the video connection to operate as YUV 422, RGB444 dual or single link; or the XYZ option.

The Colorspace conversion selection will perform a color mapping conversion to work with data to video level translations. Remember your images are often stored in full 0-1023 data but the monitor is generally expecting, and can process, the 64-940/960 video levels as specified by SMPTE. If you wish to monitor the full 10-bit data range (0- 1023) of the monitoring output, simply change the colorspace conversion to unscaled full range data. If the Colorspace conversion is set to the normally scaled legal video then the data range is scaled down to video range (64-940/960).



Video Monitoring

With some video I/O and monitoring cards there is an option for 12-bit monitoring. If applicable to your system, you may select the 12-bit option. This is often used when monitoring through a projector capable of accepting a 12-bit HD-SDI input.

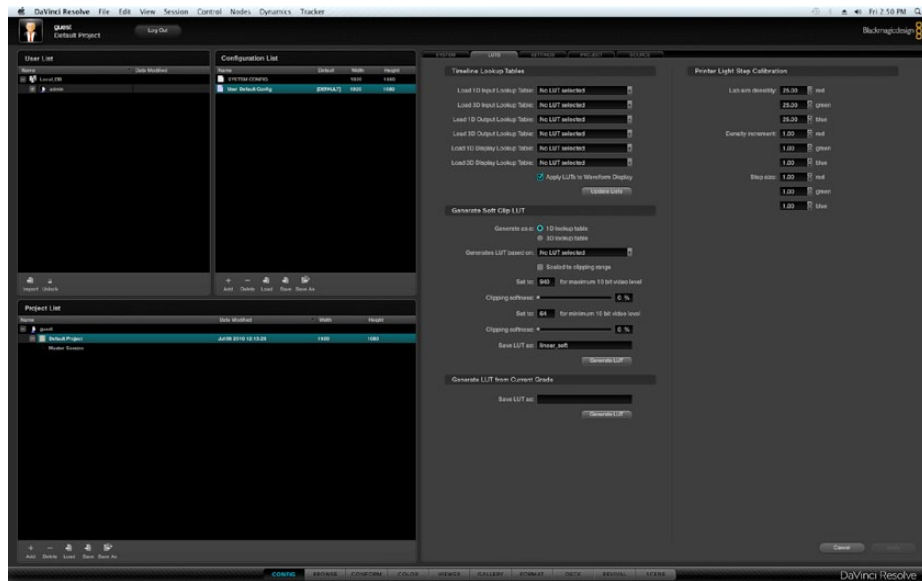
The output video sync source control is used with some video I/O cards but not required with all. It will select between internal and external bi-level or tri-level synchronization. This is particularly relevant when two NVidia SDI optional cards are installed for Stereoscopic 3D grading as they both must have the same physical input sync, as the 3D processor and display device.

The filter selection for monitor scaling is usually set to basic and only enabled to smooth edges when viewing with a video projector and a very large screen. These settings minimize any high frequency artifacts that may be seen. This may also be noticeable if you have a 2K or HD project but are monitoring on a SD monitor. Normally this should be in the basic mode. The other options, Bilinear, Bicubic and Bspline will have different impact depending on your display device so you may need to test each to verify which is best for your facility.

The 3:2 Pull down switch can be utilized for monitoring in NTSC while the user grades 24fps material. If you have selected NTSC, 59.94i or a playback rate of 24fps will automatically activate this option.

LUTs Tab

From the LUTs tab on the Configuration screen you may select various Input, Output, or Display look-up tables or LUTs. There is also an option to 'Apply LUT to Waveform', when checked, will apply the selected LUT to the DaVinci Resolve Waveform display. This can be useful when working in Video grading mode when a 3D LUT has been applied.

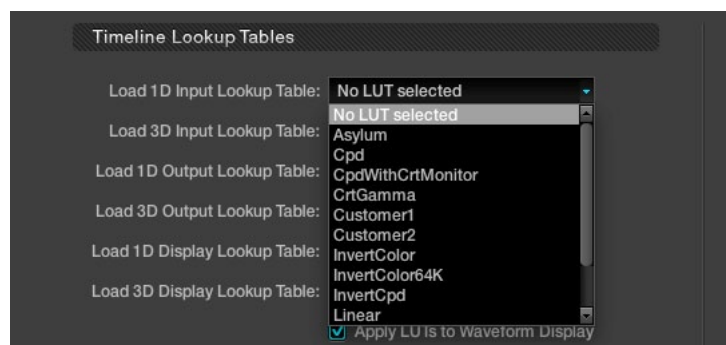


LUT Tab

Timeline Lookup Tables

Within the Timeline Lookup Tables display are the factory preset lookup tables along with those that have been generated or imported into DaVinci Resolve. If new lookup tables are imported into the system, the Update lists button should be clicked to refresh the contents of the pull down menus. Resolve uses both 1D and 3D LUTs.

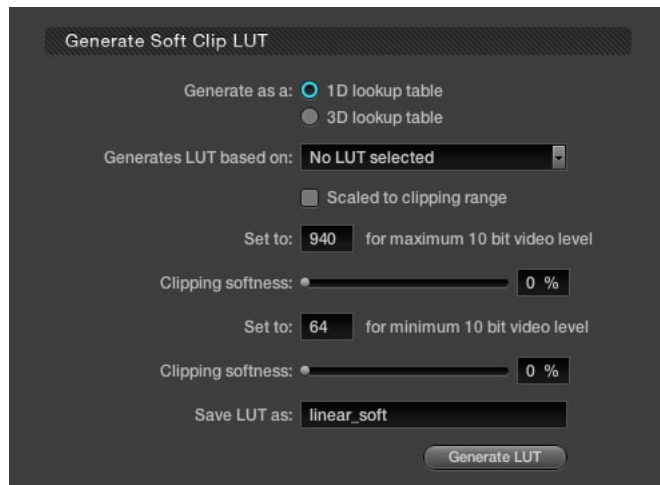
3D LUTs that are generated in DaVinci Resolve are in the .cube format and are configured as 33x33x33 cubes in 32 bit floating point. DaVinci Resolve can also read and use LUTs in the Cinespace format.



LUT Table

Generate Soft Clip LUT

To edit an existing LUT by adding soft clipping to it, select either the 1D LUT or 3D LUT option then the original LUT from the pulldown list. You can then scale the new LUT to a clipping range (i.e., 940) for the maximum 10-bit video level as well as the minimum clipping level. The clipping softness controls allow you to apply soft ramps to the high and low clip level. Type in a name for the new LUT, and generate by click on the 'Generate LUT' button. The new LUT will be available the next time you update the LUT list.

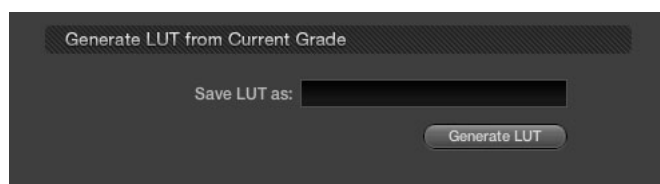


Generate Soft Clip LUT

Generate LUT from Current Grade

DaVinci Resolve offers a LUT generation and trimmer tool that you can use to tweak existing LUTs or build new LUTs. These LUTs can be used internally or for other LUT management products as "Looks". The 3D LUT generated is in the .cube format, which is readable by the Blackmagic Design HDLinkPro. The 3D LUTs you generate are stored at /Library/Application Support/Blackmagic Design/DaVinci Resolve/LUT/CineSpace

Before you can use this feature, you need access to a unique DaVinci Resolve Trim_LUT0.DPX image, which is located at /Library/Application Support/Blackmagic Design/DaVinci Resolve/trim_lut0.dpx



Save LUT as

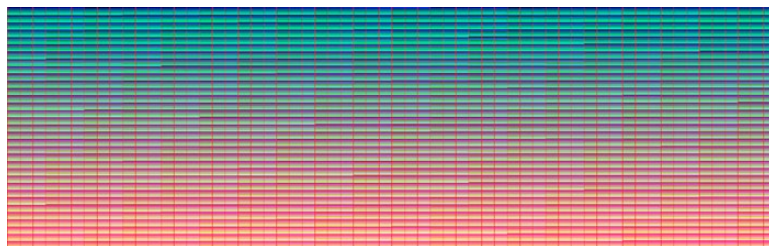
There are two workflows for generating the LUT:

- | | |
|-------------|--|
| Workflow A. | Using the color correction controls and the Trim LUT DPX image within Resolve to generate the LUT. |
| Workflow B. | Using an external software/product capable of applying a color correction effect which you want to capture as a LUT. |

Workflow A:

1. Set your resolution to High Definition within the Config screen.
2. Load the trim_lut0.dpx file located at /Library/Application Support/Blackmagic Design/DaVinci Resolve/trim_lut0.dpx into the Browse screen's media pool. Within the Color screen you will now see the Trim LUT file within the thumbnails.
3. Select a normal image clip on the timeline and color grade the desired offset or effect. You can grade this image like any other. Once done, select the Trim LUT clip on the thumbnail timeline with your mouse to make it the current clip.
4. With the Trim LUT file as the current clip, using the center mouse button, click on the clip you just graded with the desired offset grade. This offset grading will now be applied to the Trim LUT file. (This is a standard DaVinci Resolve copy grade operation).
5. Then, within the Config screen LUT tab, assign a name to the new LUT to be generated using the 'Save LUT as' window.
6. Clicking on the Generate LUT button will create the new LUT that is an offset grade. It's the grade you made to the original image. This LUT can now be selected like any other.
7. Update the LUT list that's at the top of the LUT tab and select as an input, output or display LUT as required. You can also use the LUT on the color page in any node.

The new LUT will appear in the 3D LUT options and can be used in any of the places DaVinci Resolve normally uses 3D LUTs. It is also possible to capture an external Trim LUT or generate one with the Resolve LUT configuration and resolution by placing this Trim LUT Clip into an external device that applies a LUT.



Trim LUT Clip (One Frame)

Workflow B:

1. Load the trim_lut0.dpx file located at /Library/Application Support/Blackmagic Design/DaVinci Resolve/trim_lut0.dpx into the external device or feed the external device the image via an HD-SDI connection.
2. Make sure the external device is outputting HD in 'Full data levels' mode.
3. Connect the output video from the external device to the input video of DaVinci Resolve.
4. Using the deck Input interface on DaVinci Resolve, crash record or capture a few frames. You only need a few.
5. Use the captured frames as the test pattern in Workflow A above to generate the new LUT.

Apply LUT to Waveform

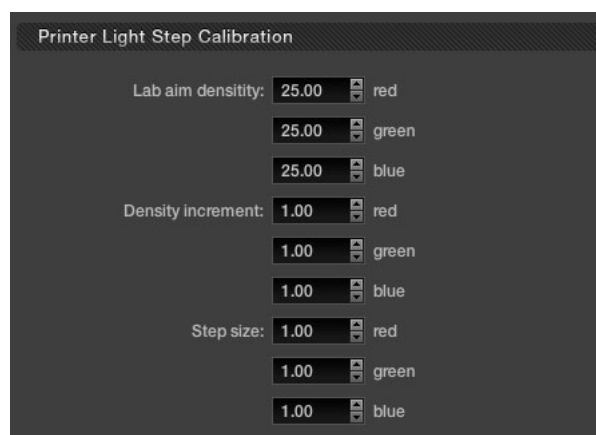
Often when grading feature films you will use a LUT in the grading monitor path to emulate the film recorder, film lab and print stock used for a film out to ensure the print shown in the cinema will appear the same as the image on your grading monitor. Physical and hardware exceptions apply, but the principle is that with the film out 3D LUT in the Display path, what you see is what you get.

Of course often you don't want this LUT to influence the waveform monitor displays as these are providing an accurate indication of the levels and phase, etc. of the image and are not subjected to the limitations of the grading monitor calibration or the film out/film lab/print stock limits. With DaVinci Resolve, you can select to apply or not apply the LUT to the waveform displays by using the checkbox.

☒ Apply LUTs to Waveform Display

Printer Light Step Calibration

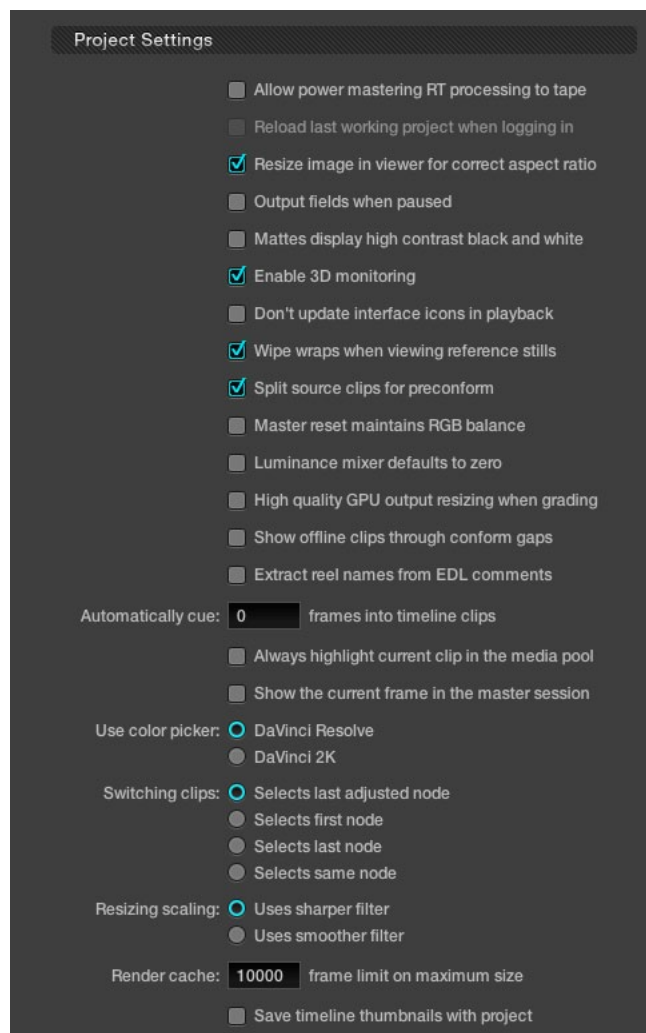
For film projects, when you have a tight integration with a film lab, it is possible to adjust the printer light calibration sets to match the lab you are using. You should work with your lab technician to set up the Lab Aim settings, the Steps adjustments, which is an incremental value, and the Density Increment adjustment, which is the amount of correction applied within each step. Generally the Step and Density values will be identical, but this will be up to your lab and your preference.



Printer Light Step Calibration

Settings Tab

The Settings tab displays a number of checkboxes used to customize the operations within DaVinci Resolve for the current project.



Project Settings

Project Settings

The first section within the Settings tab is for Project options.

Allow power mastering for RT processing to tape:

DaVinci Resolve is unique because of its PowerMastering feature, offering real time play out and recording to tape of grading material without the need to render cache, pre render or even render the final grades. The operation is dependent on the hardware being used and the image resolution as well as the grades applied to each clip.

Reload last working project when logging in:

With this box checked, the next time DaVinci Resolve opens and you log in, it will automatically launch the last project.

Resize image in viewer for correct aspect ratio:

This control will select between using a square or non-square pixel aspect ratio within the viewer. This is important when working with SD images which do not have a square pixel aspect ratio.

Output fields when paused:

This setting will reduce flicker when grading using a computer monitor or when working with interlaced material. When viewing interlaced material in stop or pause mode, field one is displayed followed by field two. Depending on the image, this can result in a flicker on the display. When enabled, field one will only be shown on the monitor in still mode, however both fields will be shown when the clips are played.

Mattes display high contrast black and white:

This option will show a black and white display (i.e., high contrast) rather than the standard grey matte when highlighting a secondary color correction isolation.

Enable 3D monitoring:

All DaVinci Resolve systems can generate a side by side display that can be sent to a Stereoscopic monitor via the DeckLink HD Extreme HD-SDI card. This provides you with a way to display a Stereoscopic 3D project without the expense of a full 3D system. In this mode there are no wipes or cursors available on the grading monitor, nor can you use output resizing.

Dont update interface icons in playback:

Selecting this option forces a priority to update the playback image at the selected frame rate by reducing UI updates. This mode is helpful when complex grades are used on low processing power systems or when working with higher resolutions.

Wipe wrap when viewing reference stills:

With this option the stills wipe mode will wrap around rather than stop at each side of the screen.

Split source clips for Pre-conform: Select to split the source clip in the Media Pool and the master session when using the “Preconform” operation.

Master reset maintains RGB Balance:

This control defines how the panel reset buttons reset the primary color correction. Normally, a reset will return the primary correction values to their default values. When this option is selected, reset will function as follows:

- 1) Clicking the master reset key will reset the YRGB values so that the overall values are kept and the ratio of YRGB to each other is maintained.
- 2) Clicking the RGB reset button will find the average value of RGB, and set the RGB to that value.

Luminance mixer defaults to zero: Selecting this option sets the Y of the YRGB value for all grades to zero. This is needed for export of an ASC-CDL and will have an impact on all your grades if you have used the Lum Mix control.

High quality GPU output resizing when grading:

With this deselected the graphics card is used for output sizing during the grade preview with occasionally noticeable artifacts. However when the images are rendered, high quality GPU processing is used to maintain maximum quality. When this option is selected, the GPU is used during grading preview and also rendering for output processing.

Show offline clips through conform gaps:

Normally, if there is a missing clip in a conformed timeline the position of the clip is shown on the thumbnail and viewer as black. This option permits the offline clip, with the appropriate timecode synchronization, to be displayed in place of the black or to ‘shine through’ the hole made by the missing clip.

Extract reel names from EDL comments:

Some file formats have reel names longer than eight characters, and also complex file name structures. The RED r3d file is an example. This option allows DaVinci Resolve to extract the reel names from the EDL comments, as often used in an FCP EDL.

Automatically cue number of frames into timeline clips:

Use this control to change from the default cue point operation, the first frame of the clip, to some number of frames after the first. This is handy if the source material has black or camera rollout flashes at the beginning of each clip.

Always highlight the current clip in the media pool:

If you select this option, any clips that are current on the Color or Conform screen will be automatically identified in the media pool within the Browse screen.

Show the current frame in the master session:

When selected, the current frame for the current session will automatically be identified on the master session. If you are in the Color screen with an EDL/timeline open and you switch to the master session, DaVinci Resolve will auto cue to the same frame within the master session. This is particularly helpful when working with multiple sessions and local versions of grades.

Use color picker:

The Color Picker Style setting changes the manner of selecting colors within the Secondary color correction controls. DaVinci Resolve is the normal and modern mode, however some colorists who are familiar with the legacy 2K prefer the DaVinci 2K mode.

Switching clips selects:

When switching clips, DaVinci Resolve can switch to the same or another node in the node graph. The four options below determine which node is selected:

- Last Adjusted Node:** Each clip retains its node settings. This is the normal setting.
- First Node:** The first node is selected as the current node.
- Last Node:** The last node is selected as the current node.
- Same Node:** The same node will be selected, if available.

Resize scaling uses:

When resizing images with DaVinci Resolve, particularly with SD images, you may want to change the resizing filter from the normal 'Sharper' setting to a 'Smoother' filter. Remember, if you have HD images and are making an SD playout to tape, that this is a resize of the image to SD. We advise that you review the 'Sharper' and 'Smoother' filter settings to select your preference.

Render cache frame limit:

Many storage supervisors manage the impact on the shared storage so that all users have good speed and capacity for their work. The Render Cache Limit setting is normally set at 10000 and the function of this is to limit the amount of images (frames) cached. If you need to make this setting higher be sure to leave room on your storage for these cached frames.

Save timeline thumbnails with project:

To minimize project size and maximize speed of your project Save and Load operations, you should leave this checkbox un-checked. If you select the checkbox, all of your timeline thumbnails will be stored with every project (Save and Auto Save). This provides a good history of the project, but takes much longer to complete and uses more hard disk space.

Dynamic Profiles

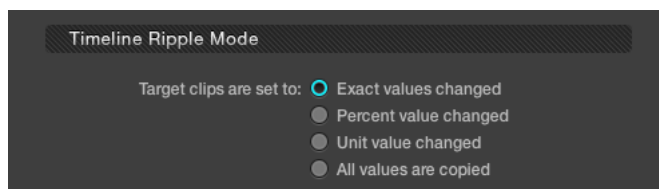
Using the slide controls you can adjust the default curve for the start and end parameters of for all dynamics. Individual adjustments for clips can be made in the dynamic timeline on the Color screen.



Dynamic Profiles

Timeline Ripple Mode

This section determines the default setting for a correction ripple, i.e., how to copy grades or ripple them from one clip to another.



Timeline Ripple Mode

In each case the target clips are set to:

Exact values changed:

Changes made to the current scene are rippled to the additional scene(s) using the exact control setting changes. For example, if Master Gain in the current scene is changed and set to 75 percent of its range, each scene rippled will then have a Master Gain setting of 75 percent. This is useful for setting consistent levels throughout the entire list.

Percent value changed:

Any change made to the current scene is rippled to the additional scene(s) by the same percentage of change. For example, if the current scene has a Master Gain level of a hundred units and is changed to ninety units, then each rippled scene will have a relative reduction of 10 percent in its Master Gain level. This modification is based on the Master Gain level in the rippled scene(s) before the change. So if a particular rippled scene originally had a Master Gain level of fifty units, the relative change of 10 percent would reduce the rippled scene's video gain level to forty-five units.

Unit value changed:

Any changes made to the current scene are rippled to the additional scene(s) by the same number of units of change. For example, if the current scene has a Master Gain level of eighty units and is increased to ninety units, each rippled scene's master gain level increases by ten units.

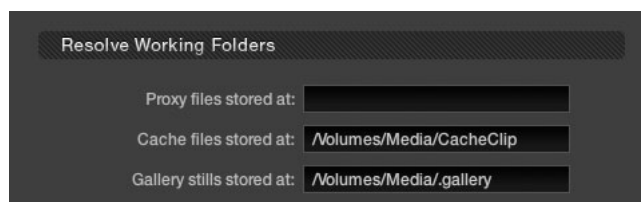
All values are copied:

The current scene grade is rippled, or copied, to other events. No comparison is made with the original scene memory, and all memory parameters are rippled.

Working Folders

These controls are used to change the file path for Proxy, Cache and Gallery storage data.

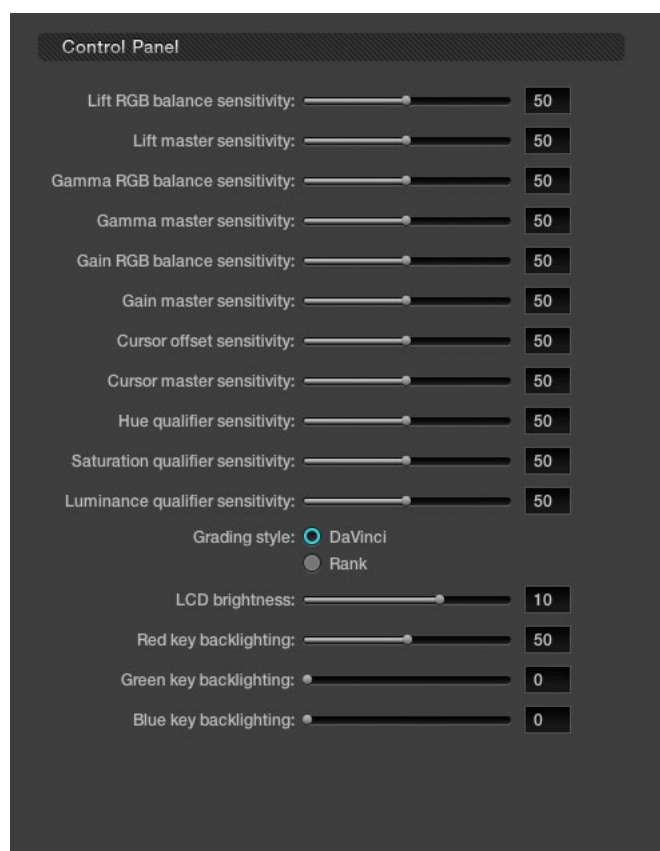
It is important that these settings are not set to the computer's system disk as it will quickly fill up with proxies/cache. If this happens it's likely your computer will not boot the next time you start.



Resolve Working Folders

Control Panel

These controls set the sensitivity of the primary grading controls for Lift, Gamma and Gain balance and master, the Cursor trackball offset and master, and also the Hue, Saturation, and Luminance qualifiers.



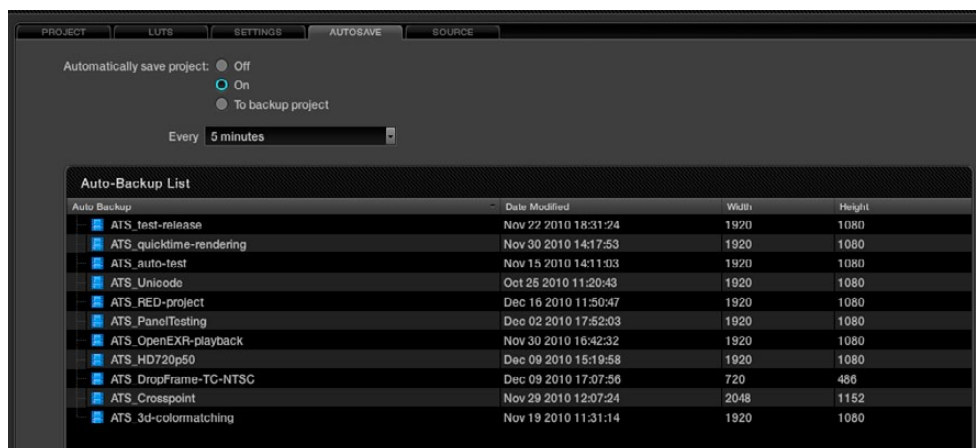
Control Panel Layout

There are two options for the trackball Grading style, labeled DaVinci and Rank. Most users will be familiar with the standard DaVinci controls as this mimics the Vectorscope. If you move the trackball to the right, and lower, a little, the image will become more blue; move to the top for more red and to the lower left for more green. The Rank settings are somewhat different, so this option is for users who are familiar with color controls that the Rank control system offered.

There are also settings on this screen for the DaVinci Resolve Control Surface LCD brightness and the color of the key backlighting.

Autosave Tab

Your project database is extremely valuable, so DaVinci Resolve has an Autosave feature that will make copies of your active database while you work. On the Autosave tab you will see the list of files that have been stored and you can set the interval for auto saves. Simply click on the 'Load' button to recall a project from this list.



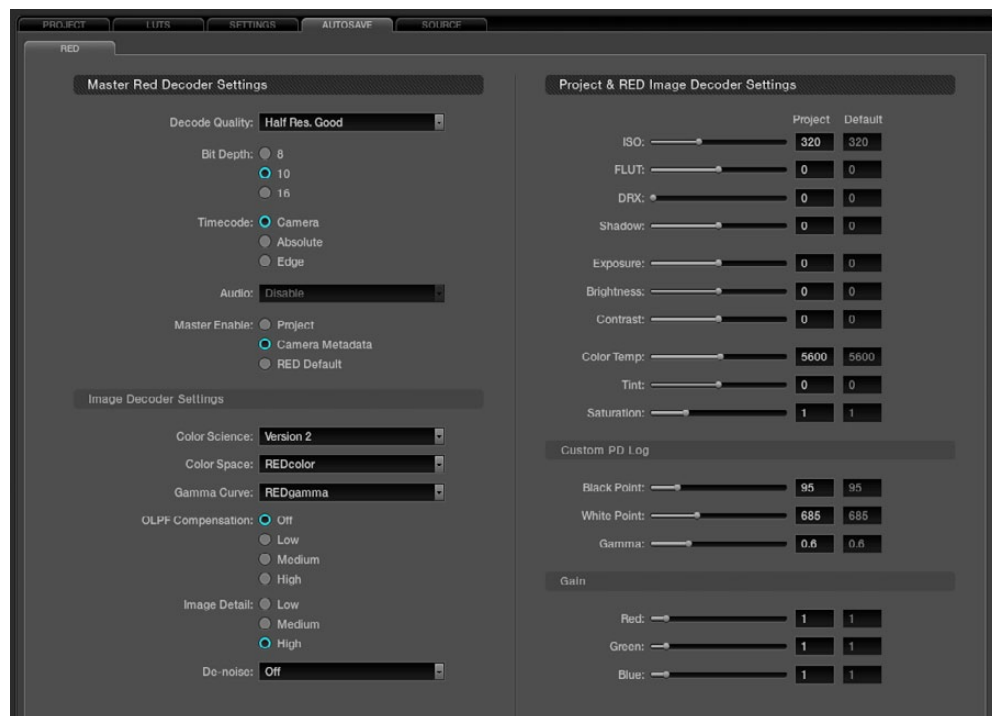
Autosave tab

Colorists can select the Autosave to 'On' for fast incremental saving of the current project or 'To backup project' for a full backup of the current project.

The incremental autosave mode emulates a manual save and is quite fast. While the full backup takes longer than the incremental autosave and is often used by colorists at the end of each workday or grading session.

Source Tab

DaVinci Resolve natively supports a number of file formats, some of which require you to set decoder parameters. When processing r3D files from the RED camera you can set the control variables from the RED sub tab within the DaVinci Resolve Source tab. Individual controls are also available for each r3d clip on the Color screen. You may also select a clip or number of clips in the Media Pool and access the settings that way. In the Media Pool you can select clips by various criteria and assign settings specific to a given camera, shoot day, etc. The same settings found on the Config page are available per clip on the timeline pop-up, and you can select the DaVinci Resolve config settings as well.



RED File Decode Settings

Master Decode Settings

DaVinci Resolve provides RED source clip settings in two ways: project and clip based. You can set the decoder for the entire project using these controls;

Decode Quality: The decode quality will have a direct impact on the performance of the system, so you may want to grade in a resolution which provides real-time playback, then use the config settings to switch to a higher quality/resolution for rendering. Performance will depend entirely on the hardware capabilities of your system.

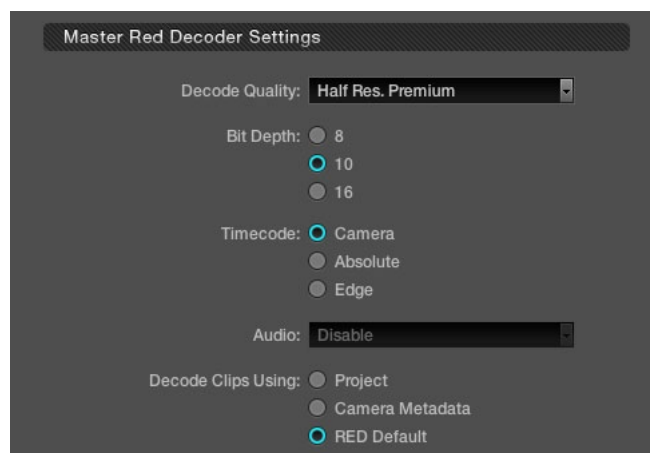
DaVinci Resolve offers RED decoding on all of its systems using the onboard CPUs and can also decode in 4K Premium quality on a suitably equipped system using the RED Rocket card.

Bit Depth: Resolve will decode the r3d files and generate an 8, 10 or 16-bit image file. Using 16-bit for maximum quality may impact playback performance on some hardware.

Timecode: You may set DaVinci Resolve to use either the Camera timecode, the Absolute code, which is the time of day timecode, or Edge code which is the timecode that defines each frame. Edge timecode is particularly valuable for off-speed recordings.

Audio: Enable or Disable audio playback. (This feature is to be implemented in a future release.)

Decode Clips Using: This is a key parameter to define. Decode the RED images using the project-based settings found on this screen (made active by choosing 'Project' here), or the metadata recorded by the camera when making the clip, or use the RED default settings.



Master Red Decoder Settings

Image Decode Settings

If you chose to modify the decoding parameters for your RED files by choosing the 'Project' option in the Decode Clips Using setting, the following controls become active.

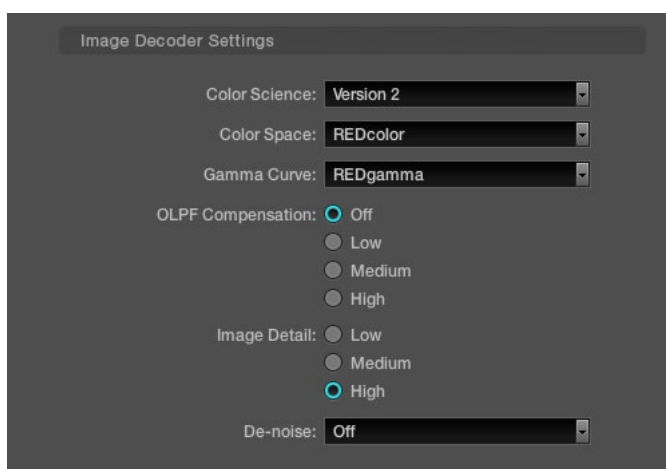


Image Decoder Settings

- Color Science:** The original REDone camera builds used a different color science to the more recent builds. Select here as appropriate.
- Color Space:** Red offers a number of color space options when decoding the RAW images: REDcolor, which is default color space; Camera RGB, which bypasses the matrix in the camera and uses uncorrected sensor data; REDSpace, which extracts a color space larger than REC.709, often used for film work; sRGB, which is a color space used for monitors, printers and the Internet and REC.709, which is the standard for HDTV.
- Gamma Curve:** The Gamma selections include: **Linear**, where no gamma adjustment is applied; REC.709, which is the standard HDTV gamma; **sRGB** which has the REC.709 color space with slightly different gamma; **REDSpace**, which is a higher contrast color space than REC.709; **REDlog**, which maps the native 12-bit RAW image data into a standard 10-bit Log curve and Custom PDLog, which offers users an alternative LOG curve, similar to Cineon, and also provides for custom adjustments as described below. The **PDLog 685 and 985** offer alternative white points for the gamma curve. The default is REDgamma, which is a log gamma with a smooth highlight roll off.
- OLPF Comp:** The OLPF compensation sets a low pass filter to reduce color moiré. There are four options with Off being the default.
- Image Detail:** Select from the low, medium or high sensor detail extraction options.
- Denoise:** There are seven settings from mild to maximum to adjust for the best noise reduction without image degradation.

Project Image Decoder Settings

If you have set the Decode Clips Using parameter to decode clips using 'Project' settings, the following controls become active. The RED default values are shown on the right hand column for your reference and each control is adjustable to establish the project-based decoder values. Just like the other project settings these can be set for each clip in the Color screen and also in the Media Pool.

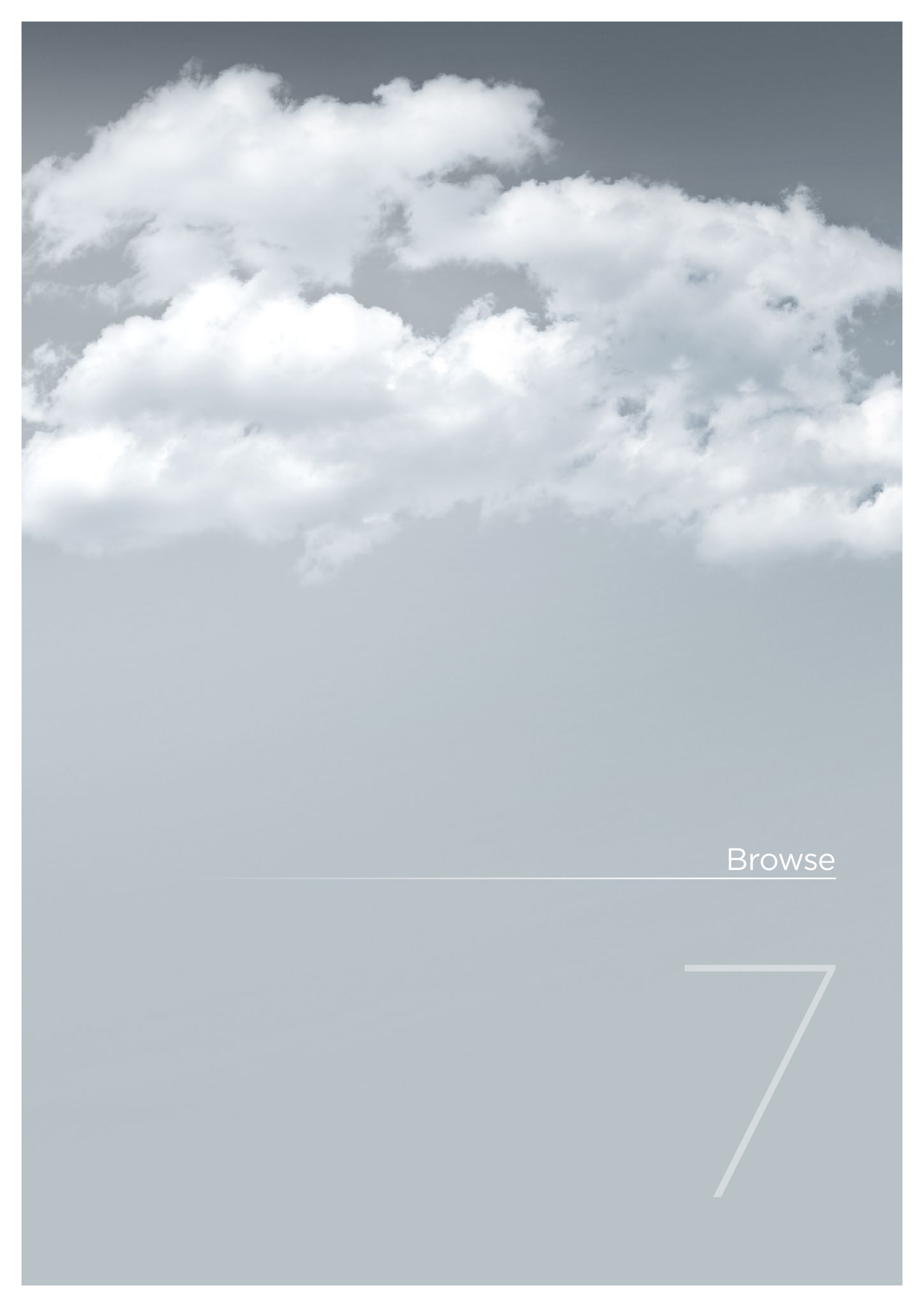
	Project	Default
ISO:	320	320
FLUT:	0	0
DRX:	0	0
Shadow:	0	0
Exposure:	0	0
Brightness:	0	0
Contrast:	0	0
Color Temp:	5600	5600
Tint:	0	0
Saturation:	1	1

	Project	Default
Black Point:	95	95
White Point:	685	685
Gamma:	0.6	0.6

	Project	Default
Red:	1	1
Green:	1	1
Blue:	1	1

Project Image Decoder Settings for RED Files

ISO:	Similar to exposure, this control adjusts gain from the black point to white in a linear manner. 320 is the default.
FLUT:	The Floating Point Look-Up Table controls operate within the new color space to give cleaner and finer ISO and mid grey variation without introducing clipping. Use in conjunction with ISO.
DRX:	DRX is a dynamic range control that takes into account Color Temp (degrees Kelvin) and Tint.
Shadow:	Provides adjustments at the toe of the FLUT.
Exposure:	Calibrated to replicate industry standard f-stops, Exposure increases or decreases the image lightness and clips the data levels at each end.
Brightness:	This also adjusts the image brightness by changing the black level, but unlike Exposure, this control will compress the image at each end of its range.
Contrast:	With the midtones maintained, the Contrast control adjusts the number of discreet steps in the grey scale by changing the slope of the response curve.
Color Temp:	Sometimes referred to as Kelvin, the color temperature adjusts the RGB matrix to consider the blue/red ratio. Common values are 3200 for Tungsten lighting and 5600 for daylight.
Tint:	Use the tint control to adjust the yellow parameters of the RGB matrix. Ideal to correct fluorescent or sodium vapor lamp problems.
Saturation:	Color Saturation is varied from monochrome at 0 value, to the default (or unity) of 1, up to very over saturated at 5.
Custom PDLog:	The Custom PDLog parameter, Black Point, White Point and Gamma are adjustable from their respective default values of 95, 685 and 0.6 gamma.
Gain:	The Red, Green and Blue Gain controls adjust each color channels gain with 0 being the reference point. One (1) is unity gain and the maximum 10 is ten times greater amplitude than unity.



[Browse](#)

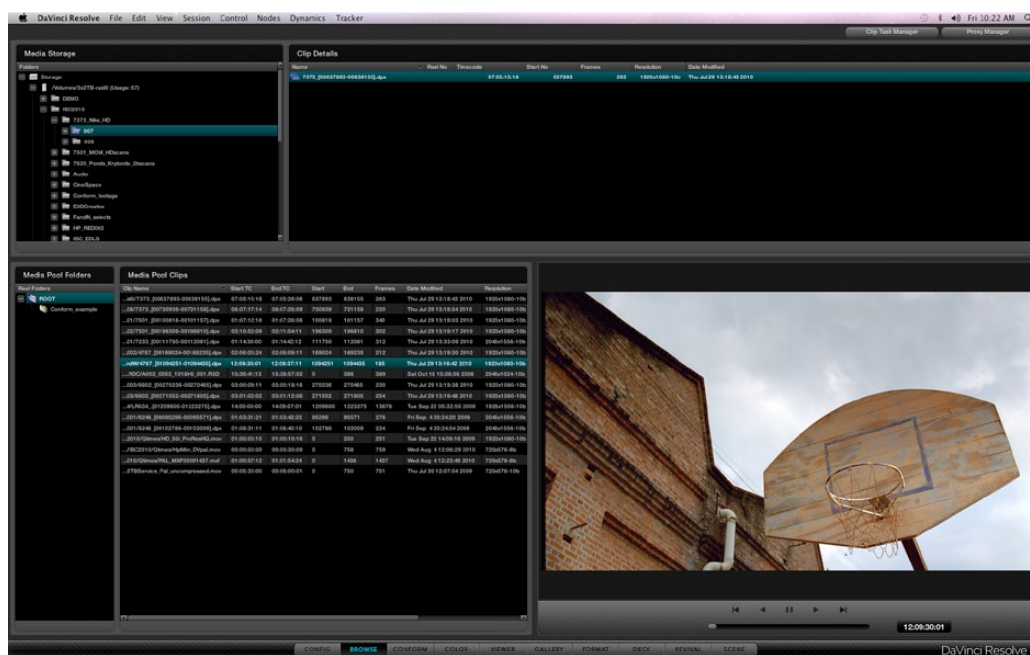
7

Browse

One of the fantastic features of DaVinci Resolve is that clips can be in any folder or volume that is connected to the system.

Simply identify each clip (or folder of clips) and place it via a smart link into the active image storage area called the media pool. The files are not physically moved or copied into the media pool. A virtual path to each clip is created so it's easy to identify all the clips needed for the project.

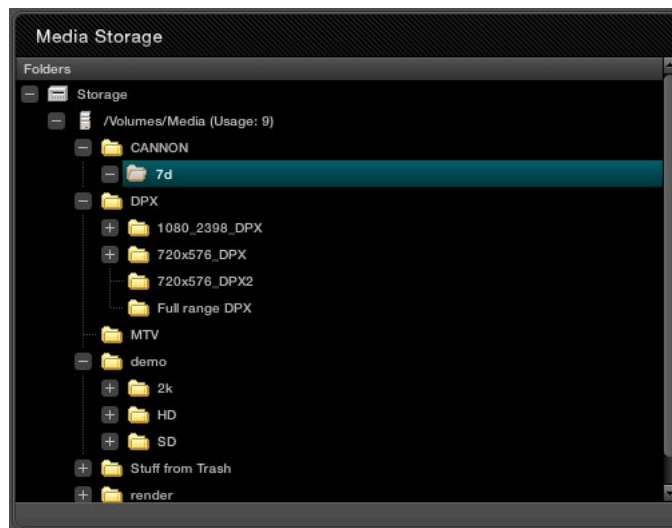
All clips that are to be graded must be in the Media Pool as they are used to form the Master Session that is used to associate all color grading decisions within the DaVinci Resolve database. The Browse screen gives you a number of ways to manage what clips are placed in the media pool and then to configure them for grading, if required.



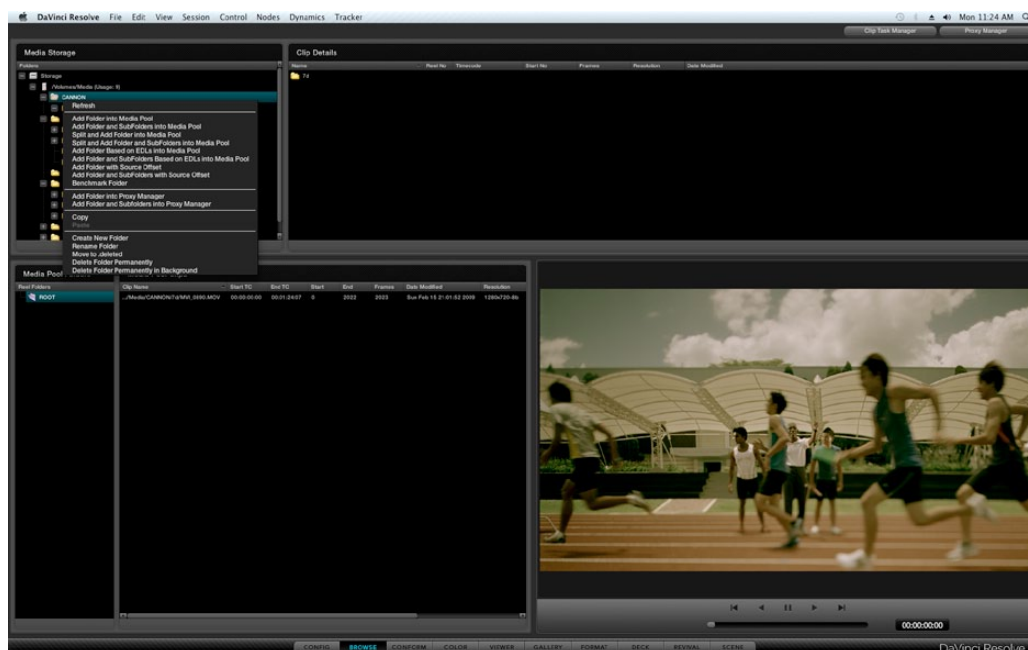
Browse

Media Storage

The upper left of the Browse screen displays all the media storage drives and folders within the storage that you selected using the Preferences window. You can expand the folder structure to display folders within folders. The sub folders or clips within folders will be visible on the Clip Details window directly to the right of Media Storage display. Click on each folder to expand and view the clip metadata and the actual content in the Viewer display. Or simply double click and the clip is then placed into the media pool that will make it available for grading.



Folder Tree Expanded



Browse Right Click over Folder Window

A right mouse click within the Media Storage display reveals a number of options.

Splitting Clips Based on an EDL

To split a clip based upon an EDL so that only the required material is placed within the Media Pool, right mouse click on the desired clip or folder and select 'Split and Add Folder and Sub-Folders into Media Pool' or 'Split and Add folder into the Media Pool' from the pop-up menu. Then from File Browser window select an EDL to use for splitting the source material and click on 'Open'. When prompted, select the handle size you need to be added to the clips: 5 frames, or 15 or 30, and 'Confirm' to split the clips. You will now see them in the Media Pool.

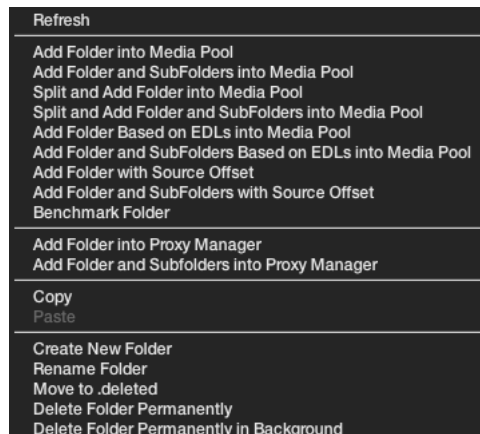
Add Material into the Media Pool Based on an EDL

Similar to the 'Split and Add' function above, you can automatically add material into the Media Pool based upon an EDL, however with this selection you can use multiple EDLs and many source folders.

Click on the directory where the required material is located and right click to select 'Add Folder and SubFolders Based on EDLs'. Specify one or more EDLs. DaVinci Resolve searches the entire directory tree starting from the selected directory for any clips referenced by source timecode and the reel ID in the EDLs. Reel number sourcing is controlled in the same manner as Reel number conforming.

This automation does away with having to manually find and add clips to the Media Pool; a laborious task for large conforms.

The EDLs will reference clips via their timecode and sometimes Reel name and path. It is these settings and the conform frame rate that you made in the Configuration screen previously that are now utilized to place images correctly into the Media Pool.



Close up view of Browse screen right mouse click over the folder window

Offsetting the Source Timecode from a Clip

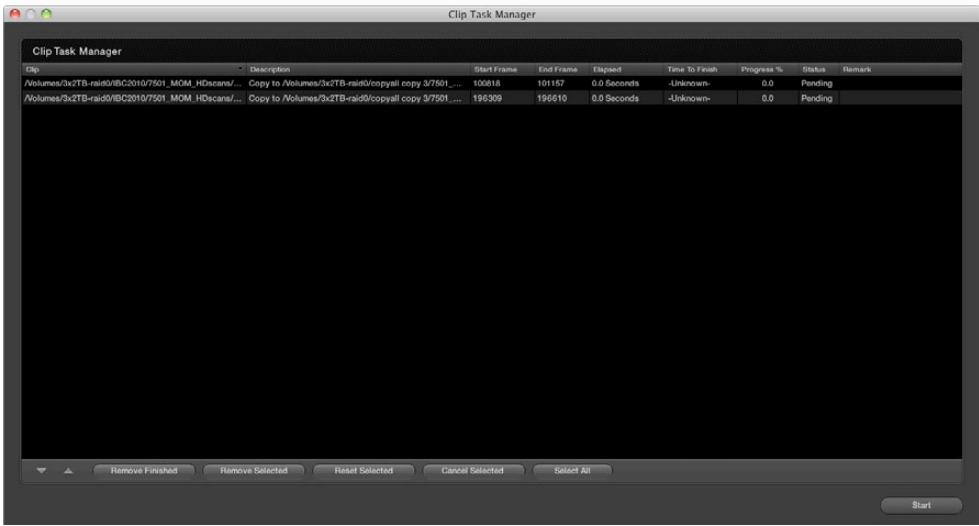
Sometimes source clips have an offset timecode due to a mistake made prior to introducing the images to DaVinci Resolve. You can select 'Add Folder with Source Offset' and then used the pop-up dialog to enter the required frame count/timecode to offset the clips prior to loading into the Medial Pool. Highlight the desired clip within the Media Pool and right mouse click. Select 'Offset Source Timecode' and then the desired offset timecode value within the display. Click on 'Apply' to confirm.

Copy and Paste Function For Clips

You can create new folders, rename them, move folders and their clips to the deleted bin or permanently delete the files with the Browse screen using the Clip Task Manager.

To Copy a clip, right mouse click on the clip or folder and select the 'Copy' function. Locate the destination folder, right mouse click select 'Paste'. The Clip Task Manager will open and allow you to start or prioritize the Copy procedure. You may start the process by clicking on the 'Start Processing' button or Cancel, Remove or Move items within the display by using the editing tools on the right hand side of the display.

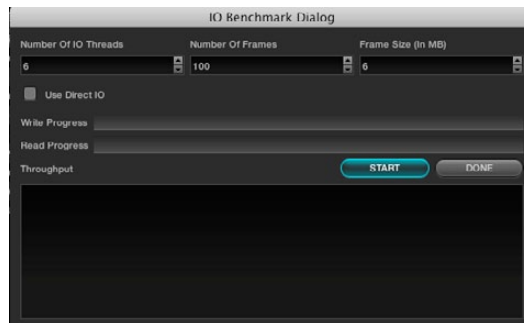
If changes are made in the folder structure, or files and folders are added to the storage you may need to right click on the Media Storage display to 'Refresh' the list.



Clip Task Manager Dialog

Disk Speed Benchmarking

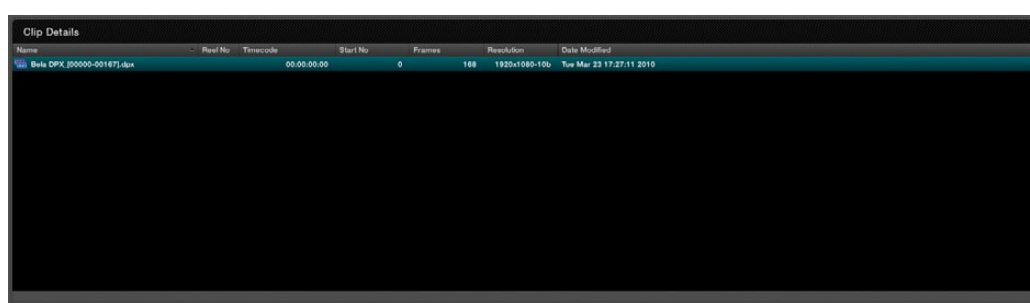
On Linux systems, if you right click within the Media Storage display, you can select the 'Benchmark Folder' tool that will benchmark the speed of the storage/SAN for either new or existing clips. This tool may be used to ascertain whether fragmentation may be causing playback problems or if the storage is fast enough. The 'Use Direct I/O' check box should be checked for CXFS/XFS/NFS file systems and should not be checked for ADIC file systems.



The I/O Benchmark Dialog Display

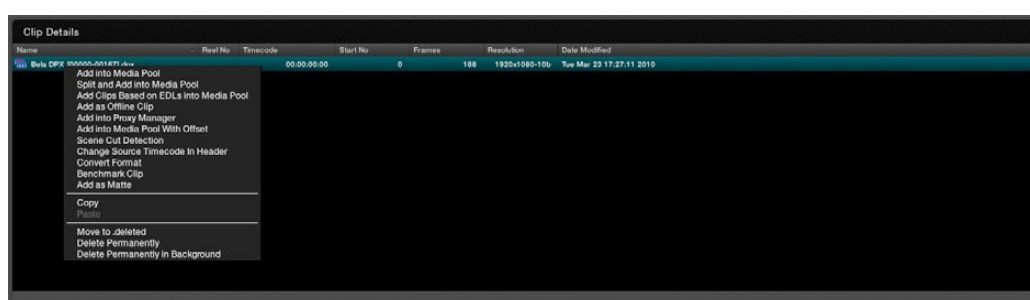
Clip Details

When you select any folder within the Media Storage window the folders and clips within that folder will be visible in the Clip Details window. Clips will be identified by the film icon on the left-hand side of the file name. When an individual clip is displayed in the Clip window you will also see metadata extracted from the clip relating to timecode, the starting frame number and count, resolution, bit depth and the date the file was modified. The file name will also include the post-fix identification of the file type. (DPX, MOV, r3D, etc.).



Clip Window

The purpose of the Browse screen is to identify clips to place into the Media Pool. At any time a double click on a clip will put it in the Media Pool. You may select multiple clips by holding down the shift key on the keyboard and selecting the desired clips. While some of the options here are the same as the right click over the Media Storage display, there are some extra functions found in Clip Details.

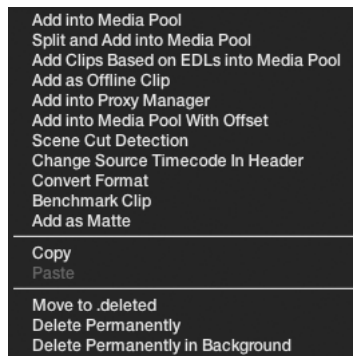


Clip Window Options

Add as an Offline Clip

Selecting a clip to add to the Media Pool as an offline clip makes an important distinction to these clips. A DPX or MOV clip can be added to the Media Pool as an Offline clip and it will be designated by a Magnifying Glass icon.

Identifying an Offline Clip, will allow DaVinci Resolve to treat this clip differently in the Conform screen where you want to compare the high-resolution Online clips with the Offline, to establish that the EDL matches the Offline clip.



Clip Window – right mouse click

Add into Proxy Manager

The Proxy Manager can also be accessed from the Media Pool and the Proxy Manager button; which is at the top of the Browse screen. As this functionality is considerable, please review the operation details later in this chapter.

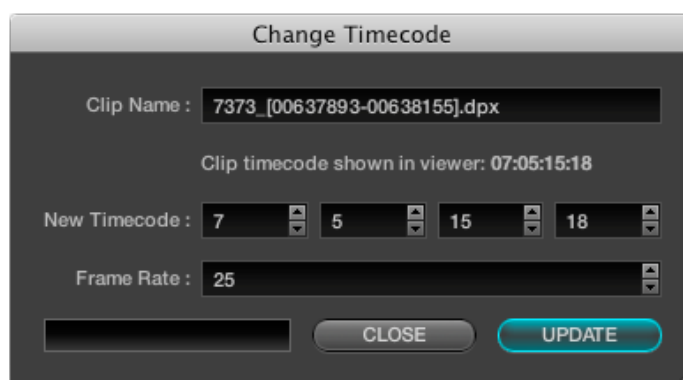
Scene Cut Detector

All color corrections in the DaVinci Resolve database are related to individual source clips and their timecode (and as selected file name and path). If you have imported a clip with numerous scene changes and it does not have an EDL, the fastest way to split the clip is with the Scene Cut Detector. By selecting this option the clip will be loaded into the Scene Cut Detector screen and be ready for processing. Please review the Scene Cut Detector feature details in the Scene chapter.

Changing the Source Timecode in Header

Previously, we discussed the option to add clips to the Media Pool with a frame offset. While that is a commonly used feature, quite often you will find that your clips have no timecode or the wrong timecode. DaVinci Resolve is capable of changing or assigning a different timecode to a clip. If there is no timecode present in the clip header you can insert the timecode of your choice, or you can alter the existing timecode to whatever number may be required.

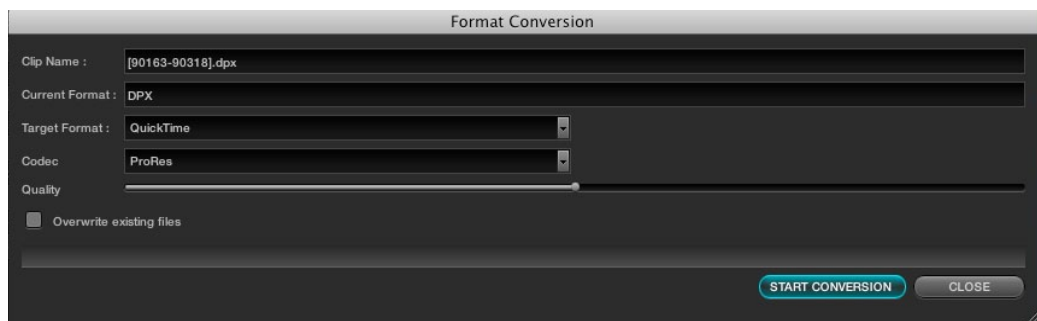
First select the file, then right mouse click and choose the 'Change Timecode' option. In the 'Change Timecode' window select the new timecode for the first frame of the clip and also the frame rate, then click 'Update.'



Change Timecode In Header

Converting a Clip to another File Format

You may find that clips come in a file format that DaVinci Resolve does not play natively in the timeline. The Format Conversion pop-up allows you to change the file type. Simply select the clip within the Clip Details display, right mouse click and select Format Conversion. In the new window select the Target format for the clip and 'Start Conversion.'



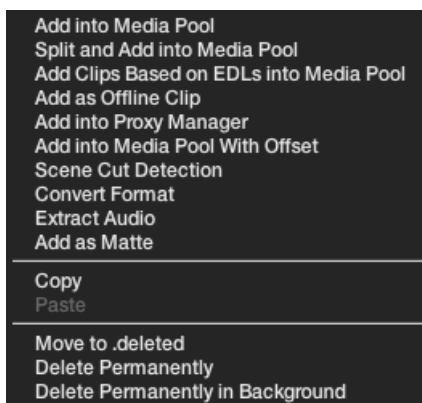
Format Conversion

Add as Matte

If you have a clip from a VFX system there is occasionally an associated matte file. By using the 'Add as Matte' you place the file in the Media Pool with the correct identification, shown as a Mask icon so that DaVinci Resolve can use the file as a Matte. After you have placed the main image clip into the Media Pool, highlight the clip. Then find the matte in the Clip Details display, right click on that matte and select 'Add as Matte.' In the Media Pool, the main clip will have a cyan box just before the clip name and if you double click the main clip, the associated matte will be shown with the Mask icon; it is linked to the main clip.

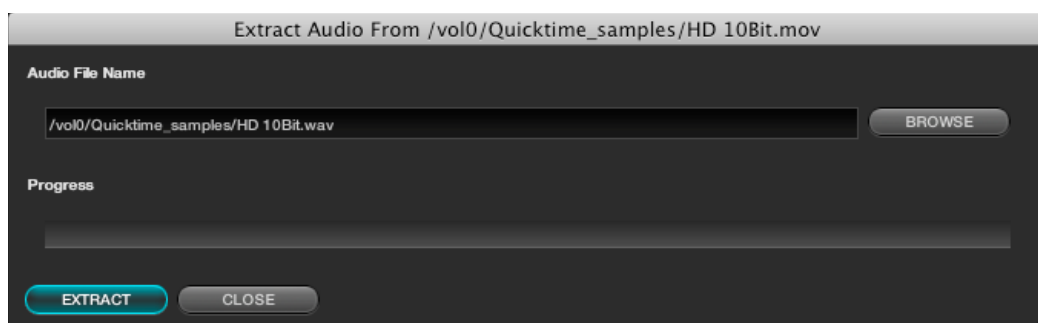
Extract Audio from QuickTime

DaVinci Resolve is a color correction and enhancement system, but it also offers synced audio playback of .wav or AIFF audio files. To extract audio from a QuickTime file into a separate .wav file for synced playback, right click on any QuickTime file in the browse screen and select 'Extract Audio' to bring up the Audio Extraction window.



Clip window – right mouse click over QT file

Specify where the extracted audio file should be stored and then select the 'Extract' button to start audio extraction. If the QuickTime audio track is encoded with incompatible audio codec, an error message box will be displayed to notify the user. After audio extraction is complete, you can attach the extracted .wav to a session in the Conform screen.



Audio Extraction from QT files.

The Media Pool

Media Pool Folders

As previously noted, all clips that are destined for color grading must be in the Media Pool, so all grading metadata can be associated to the clips with clip timecode on the frame reference. The Media Pool display is in two parts: Folders, which actually is the top level of the Media Pool structure, and Clips.

The Media Pool Folders display allows you to place clips into the Media Pool in one or many layers of virtual folders. These virtual folders could be associated with the clip's reel names or numbers, segmented by images for the trailer, feature or video press kit, used to manage the workflow transition from VFX wireframes to VFX shaded and then fully rendered VFX images, or in the case of a Stereoscopic project, separated into left and right eyes.

Adding folders is easy. Right mouse click within the display and select 'Add New Folder' or 'Rename Folder' to change the name of an existing folder. When you have your folders set up, just select the specific folder to which you wish to add clips.

Another key benefit of separating source files into virtual folders within the Media Pool will be seen later when we are on the Conform screen. We can apply an EDL to all clips in the Media Pool to create a new timeline (Session) or to only those clips in one of the virtual folders.



Media Pool Folder Display

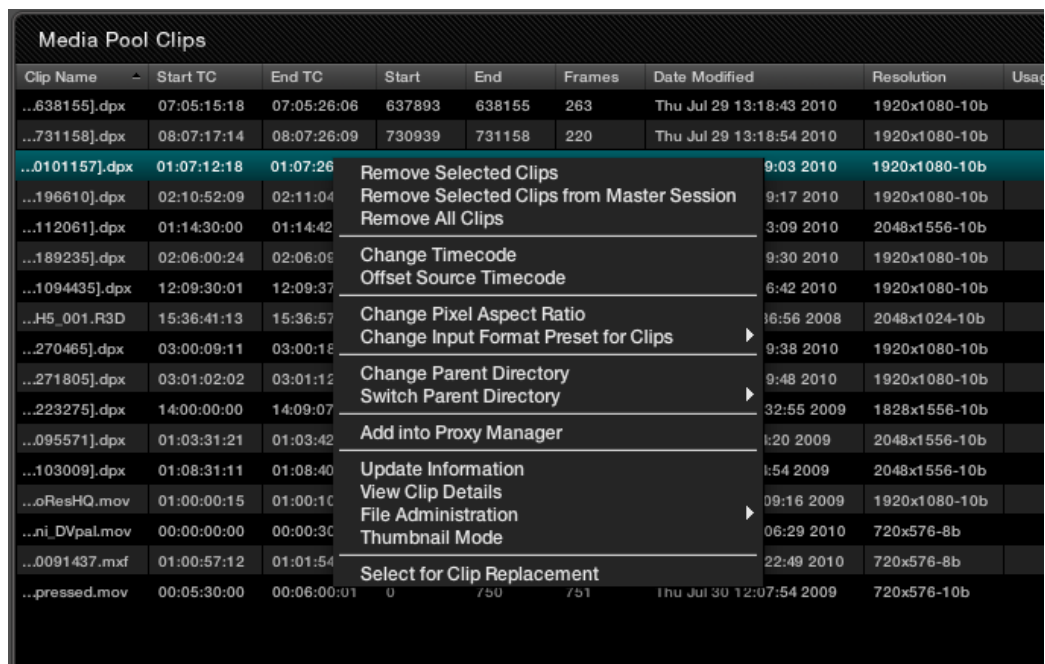
Media Pool Clips

The Media Pool Clips display shows each clip with its name, start and end timecode, start and end frame number, actual number of frames, the date the file was modified, its resolution and bit depth, and the file name itself, identifies the type of file. The last two columns are PAR (Pixel Aspect Ratio) and Start KeyCode. Not all files are from film scans, and even then not all have KeyCode, so this column may be blank.

You will also notice a column labeled Usage. This column will display how many times a clip is used within the EDL. After you have loaded the EDL on the Conform screen, you must right click over this window and select 'Update Information' for the Usage information to be valid. While this may seem redundant, it does allow you to verify that all the clips in the Media Pool, and thus, the master Session timeline, actually need to be there and can therefore, reduce the render and playout time if you are rendering all the source clips. Just as there are right-click pop-ups on the other windows, the Media Pool has its own, shown on the next page.

Media Pool Folders		Media Pool Clips									
Clip Name	Start TC	End TC	Start	End	Frames	Date Modified	Resolution	Usage	PAR		
ROOT											
Conform_example											
...638155].dpx	07:05:15:18	07:05:26:06	637893	638155	263	Thu Jul 29 13:18:43 2010	1920x1080-10b		Square		
...731158].dpx	08:07:17:14	08:07:26:09	730939	731158	220	Thu Jul 29 13:18:54 2010	1920x1080-10b		Square		
...101157].dpx	01:07:12:18	01:07:26:08	100818	101157	340	Thu Jul 29 13:19:03 2010	1920x1080-10b		Square		
...196610].dpx	02:10:52:09	02:11:04:11	196309	196610	302	Thu Jul 29 13:19:17 2010	1920x1080-10b		Square		
...112061].dpx	01:14:30:00	01:14:42:12	111750	112061	312	Thu Jul 29 13:33:09 2010	2048x1556-10b		Square		
...189235].dpx	02:06:00:24	02:06:09:11	189024	189235	212	Thu Jul 29 13:19:30 2010	1920x1080-10b		Square		
...1094435].dpx	12:09:30:01	12:09:37:11	1094251	1094435	185	Thu Jul 29 13:16:42 2010	1920x1080-10b		Square		
...H5_001.R3D	15:36:41:13	15:36:57:02	0	388	389	Sat Oct 18 15:36:56 2008	2048x1024-10b		Square		
...270465].dpx	03:00:09:11	03:00:18:16	270236	270465	230	Thu Jul 29 13:19:38 2010	1920x1080-10b		Square		
...271005].dpx	03:01:02:02	03:01:12:06	271552	271005	254	Thu Jul 29 13:19:40 2010	1920x1080-10b		Square		
...223275].dpx	14:00:00:00	14:09:07:01	1209600	1223275	13676	Tue Sep 22 05:32:55 2009	1828x1556-10b		...aScope		
...095571].dpx	01:03:31:21	01:03:42:22	95296	95571	276	Fri Sep 4 20:24:20 2009	2048x1556-10b		Square		
...103009].dpx	01:08:31:11	01:08:40:10	102786	103009	224	Fri Sep 4 20:24:54 2009	2048x1556-10b		Square		
...oResHQ.mov	01:00:00:15	01:00:10:16	0	250	251	Tue Sep 22 14:09:16 2009	1920x1080-10b		Square		
...ni_DVpal.mov	00:00:00:00	00:00:30:09	0	750	759	Wed Aug 4 12:06:29 2010	720x576-0b		PAL		
...0091437.mxf	01:00:57:12	01:01:54:24	0	1436	1437	Wed Aug 4 12:22:49 2010	720x576-8b		PAL		
...pressed.mov	00:05:30:00	00:06:00:01	0	750	751	Thu Jul 30 12:07:54 2009	720x576-10b		PAL		

Media Pool



Media Pool – right click options

Remove selected Clips

This action will remove these clips from the Media Pool. The Master Session Timeline will display the clip position and duration, but with a blue cross over the clip indicating that the clip is no longer in the Media Pool. This can be helpful when changing source images with the same timecode.

Remove from Master Session

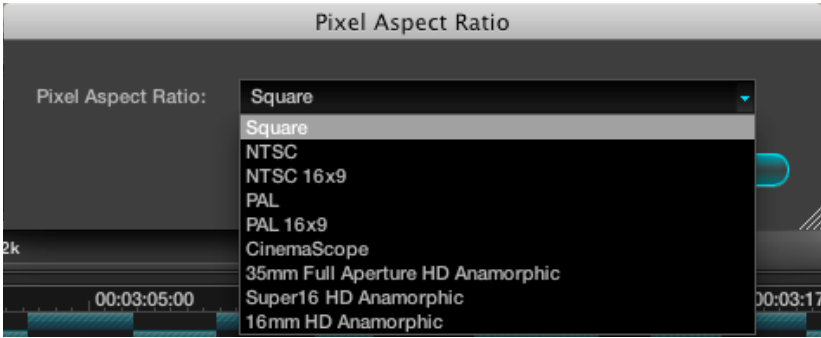
This operation will remove the clips from the Media Pool and also remove them from the Master Session.

Remove all Clips

This operation will remove all of the clips from the Media Pool but not from the Master Session.

Change Pixel Aspect Ratio

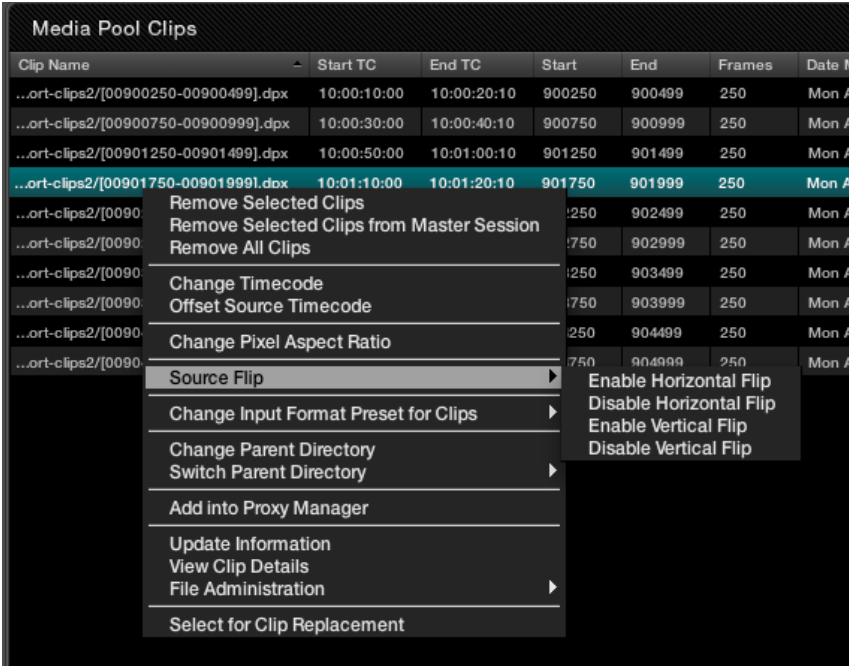
You can change this for any clip with the right-click option, then select the appropriate PAR.



Change Pixel Aspect Ratio

Source Flip

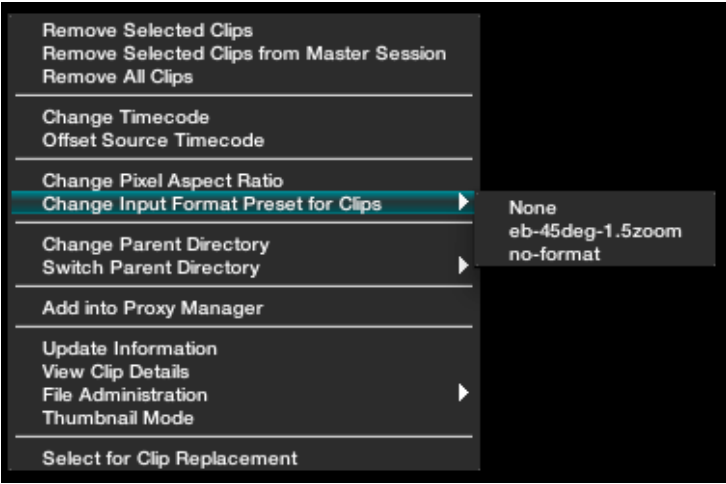
DaVinci Resolve supports the horizontal and vertical image flip camera metadata for r3d clips, which is very helpful for stereoscopic 3D projects to flip the eye that is shot through the mirror rig. This technical flip can be manually set, or overridden, using the Source Flip option in the Media Pool and is different to the creative HFlip and VFlip colorists set in the Format screen.



Change Input Format Preset

Change Input Format Preset

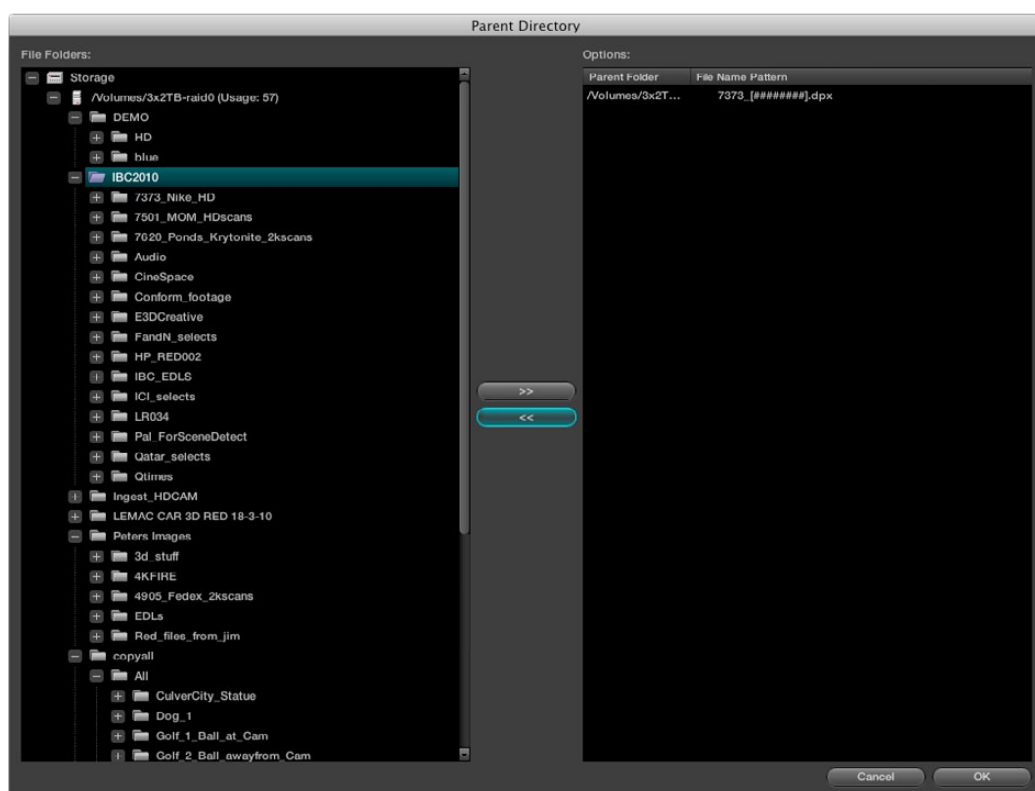
The Media Pool right-click allows the selection of the Input Format Preset to be changed. On the Config screen tab you can set the default Input and Output format presets. Within the Media Pool you can set the Input format for each specific clip. Place your mouse over the clip and right click to show the options and then select 'Change Input Format Preset for Clips' and select from the preset formats you made in the Format Screen.



Change Input Format Preset

Change Parent Directory

When the location of the source clips has changed, use the 'Change Parent Directory' option to relink to the new clip location. This will automatically search for the new parent location of the clips that have been placed into the Media Pool. Highlight one or more clips within the Media Pool and right click to select 'Change Parent Directory of Clips.' A window will display the original path for the material and let you enter or browse to the new path. Select the Change button to start the relink. If there is no match found, no change will occur.



Customize Parent Directories Dialog

Switch Parent Directory

With a pre-conform workflow, there are often different versions of edits that are in separate folders. DaVinci Resolve allows easy toggling of different versions of conform using switchable parent directories from the right-click menu in the Media Pool. In the Parent Directory window, browse to the pre-conform directory folder and click the right arrow button to add the selected directory into the Parent Directory List. Click the left arrow button to remove the selected directories from the directory list. Confirm your selection with the 'OK' button.

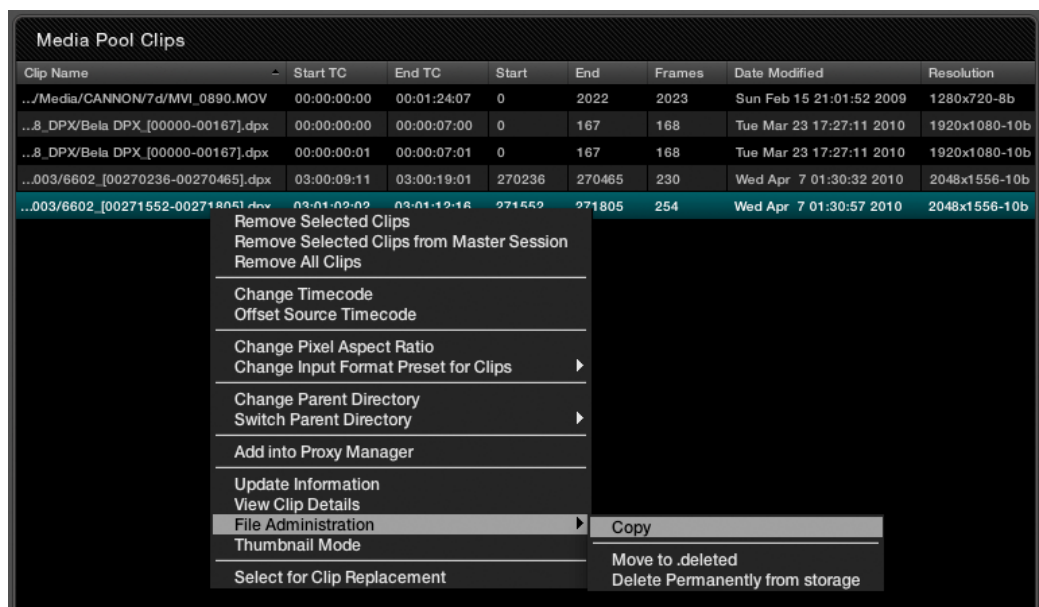
The .deleted Folder

To move a clip to the .deleted folder, right mouse click on the file and select the option 'Move to .deleted' from the File Administration menu. A prompt will ask you to confirm or to Cancel the operation.

If you wish to remove a file or files from the .deleted folder, open the .deleted folder and highlight the clip. Right mouse click and select 'Restore Clip.'

To permanently delete a clip or folder, select 'Delete Permanently' when right mouse clicking upon the clip within the .deleted folder or within any of the other files or folders.

You may select the option of deleting material in the background without the user interface being locked during the delete process. During this operation the clips or folders will be deleted in the background and a prompt will appear to inform you when the process is complete.

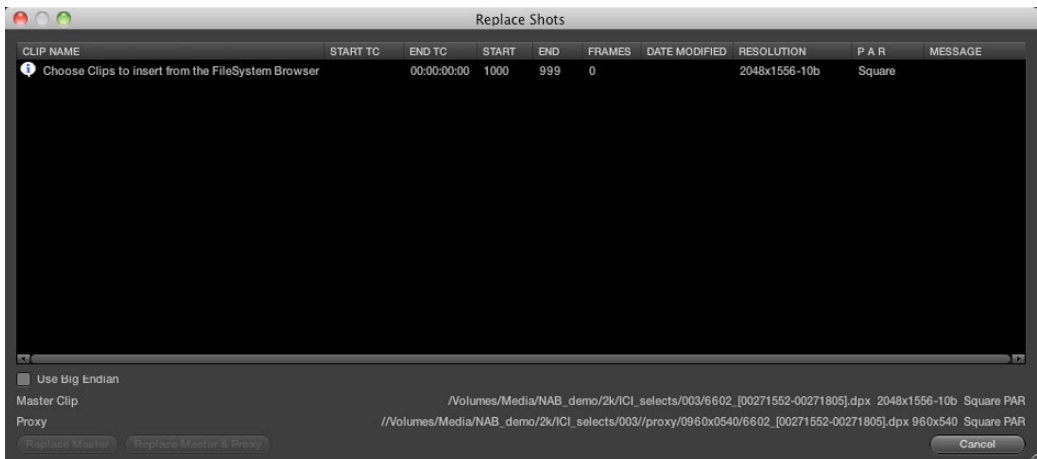


File Administration within the Media Pool

Clip Replacement and Automatic Proxy Generation

To replace sections of a master clip with frames from another location or to automatically generate proxies for the selected frames, use the Replace Shots tool. This option comes in handy when you modify a subset of a clip using different tools and want to merge their modifications in the current clip.

First, right mouse click on the master clip within the Media Pool and select 'Select for Clip Replacement.' Next, build a replacement shot list by right mouse clicking on the required clips and select the 'Add to Replace List' option. Then, either select the 'Replace Master' button or the 'Replace Master and Proxy' button.

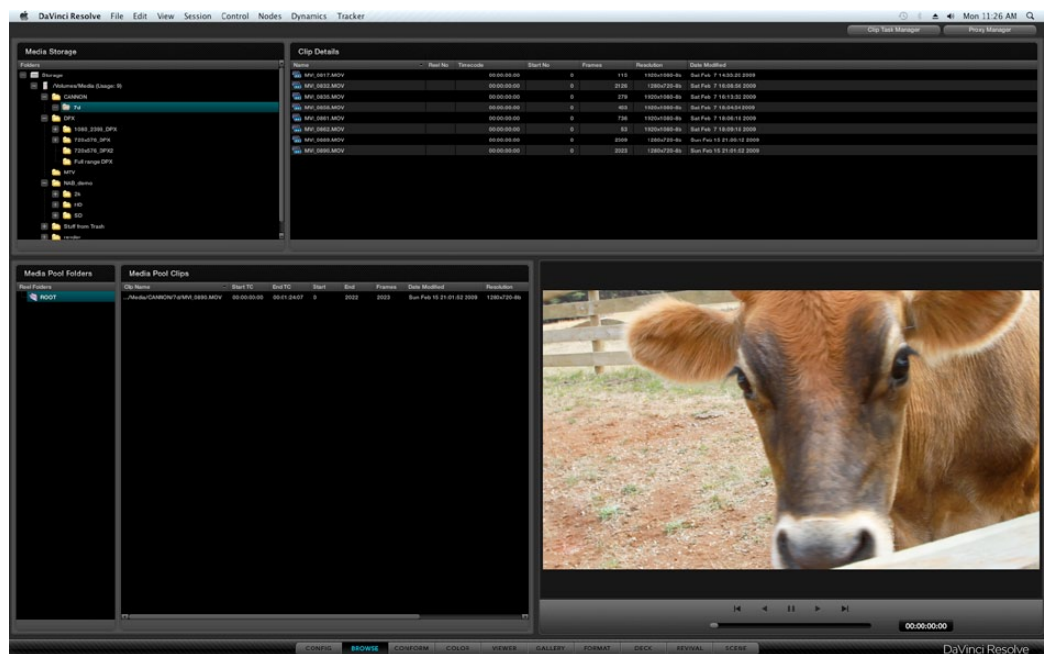


The Replace Shot Display

Viewer Window

The Viewer window is used to preview clips located either in the storage area or within the Media Pool. The bottom of the window has transport controls for Stop, Forward, Reverse, Fast Forward and Fast Reverse. Below the transport controls is a slider bar that can be dragged with the mouse to scroll through the clip area. This slider will display the relative position of the frame within the full clip.

The clip's timecode is also displayed. If you right mouse click on the image you can superimpose KeyCode information if it is in the file.



Viewer Window

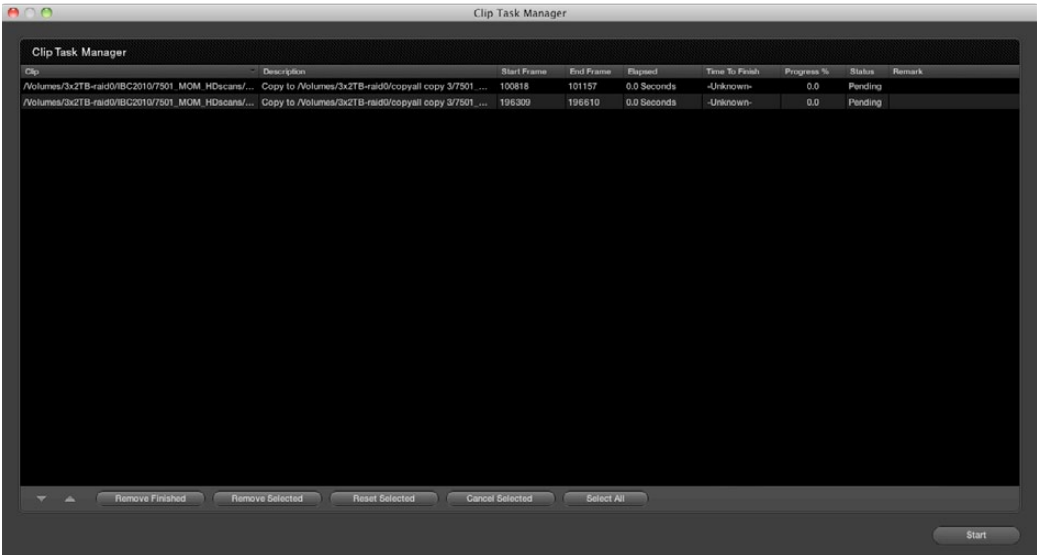
Browse Screen Buttons

Located at the top of the Browse display are two buttons used to select either the Clip Task Manager or the Proxy Manager.



Clip Task Manager

The Clip Task Manager can be selected from the Browse screen buttons, or via the Proxy generation config, or if a clip Copy and Paste operation is initiated. To close the Clip Task Manager display, simply click on the 'Close Dialog' button.

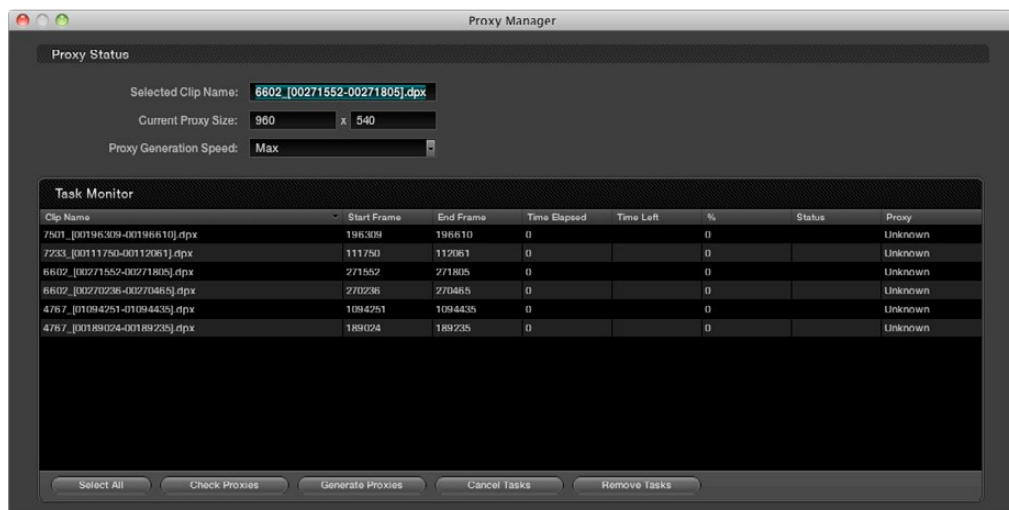


Clip task manager

Proxy Manager

The Proxy Manager lets you control the proxy generation process. To send a clip to the Proxy Manager right click on the selection from the Folder and Clip Windows, or Media Pool, then select 'Add Into Proxy Manager.' To add the entire contents of a folder into the Proxy Manager, right click within the Media storage section and select 'Add Folder Into Proxy Manager' from the options.

If you prefer, proxies may be pre-generated before a session. If generating proxies, a half or quarter of the resolution is recommended for maximum speed.



Proxy Manager Display

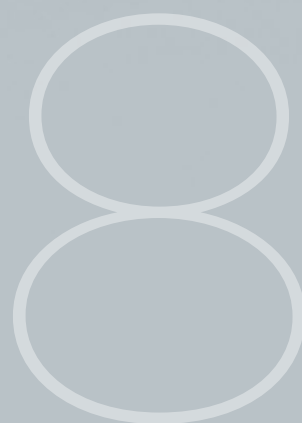
The Proxy mode may be activated by checking the 'Use Real Time Proxies' option that is located in the Configuration screen or by pressing the 'Proxy' button on the Resolve control panel. The use of proxies is generally required when a highly complex color correction causes the system to run slightly slower than real time. If there are pre-generated proxies, DaVinci Resolve will use them automatically, otherwise, DaVinci Resolve will generate them on the fly.

The Proxy Manager display has five buttons to manage the generation of proxies. 'Check Proxies' looks for the existence of the generated proxies. 'Check Selected Proxies' will check for the existence of only the selected files. 'Generate All Proxies' will generate proxies for all files within the Task Manager window and 'Generate Proxies' will generate proxies for the files within the Task Manager that have been highlighted. The 'Cancel Tasks' button will cancel all proxy-generating processes, and 'Cancel Selected Tasks' will cancel only the selected proxy generation. 'Remove Tasks' will clear all clips that are present within the Task Manager window.

Just as DaVinci Resolve allows throttling of render speed, you can throttle proxy generation speeds. This enables you to control SAN bandwidth utilization and select the speed of proxy generation your storage system can manage. Located at the top of the Proxy Manager window, the Proxy Status shows the name of the selected clip. Also shown, is the current proxy width and height.



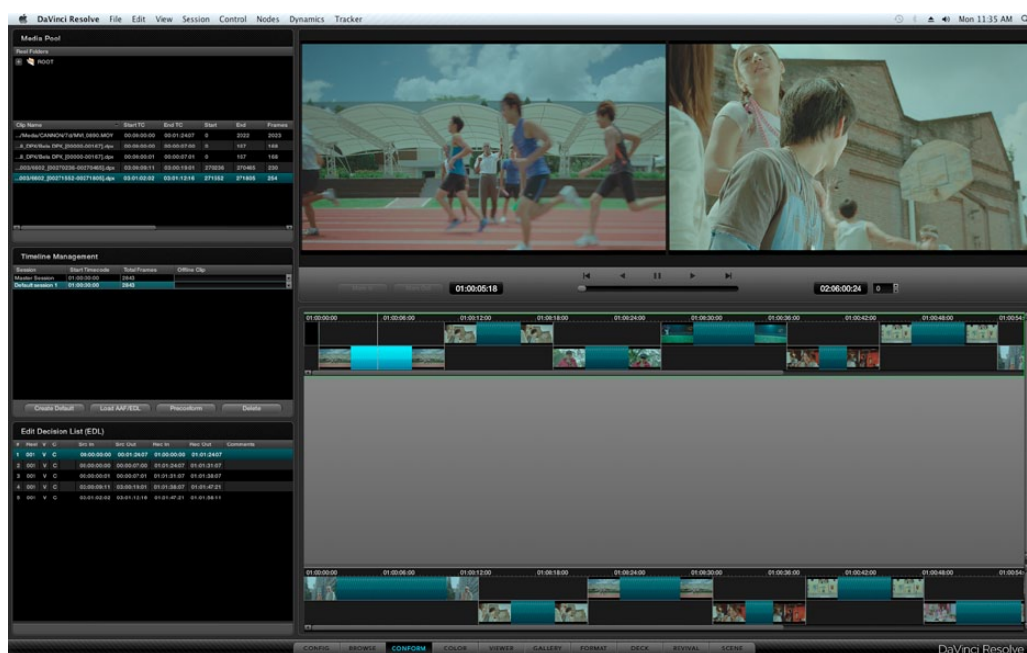
Conform



Conform

The Conform screen is used to establish your Master Session or master timeline, to organize clips into a numbered order designated by an edit decision list (EDL), and to confirm the edit via an offline video. With DaVinci Resolve, you may load as many EDLs as required for the project and also load offline clips that may be used for comparison. All clips required for your timeline must be in the Media Pool and there are various ways to conform the clips to suit different EDLs.

The Conform screen has a number of windows and each have multiple operations, some of which reference the Browse and Configuration screens. In this chapter we will be referring to those screen settings with the understanding that you are familiar with them. Also, note that the conform frame rate set for the Project in the Configuration screen is used for calculations in the Browse and this Conform screens; so ensure it is set correctly for your current project.



Conform

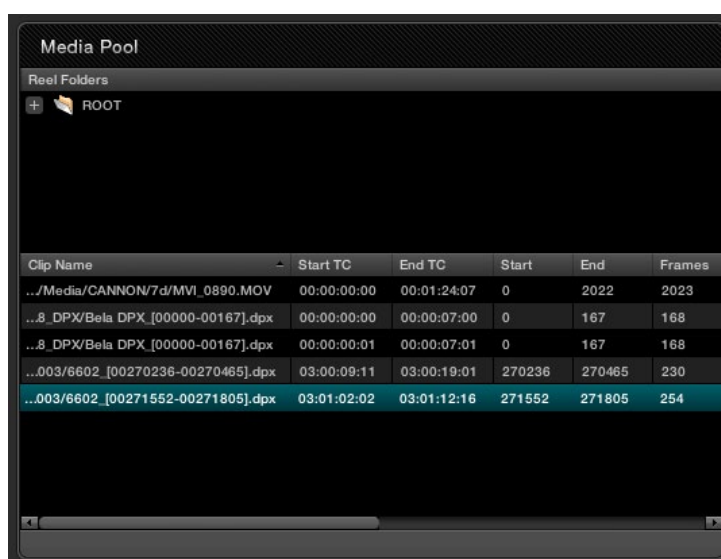
Reel Folders

Media Pool Folders and Clip Displays

The top left of the Conform screen displays the Media Pool Folders tree and the list of Clips as per the Media Pool Clip folder.

The display and functionality found on this screen, including right-click menus, are the same as for the Media Pool on the Browse screen. You can also select a clip to preview in the viewer.

One additional operation of the Media Pool Clip Folder is a fast way to add new clips or replacement clips to a session. Simply, select a clip by highlighting it and drag it to the Conform timeline. This operation can only be performed when 'Editing' is enabled for the timeline. You can also create virtual folders in the Reel Folders section and add new clips there to make finding the new clips easy.

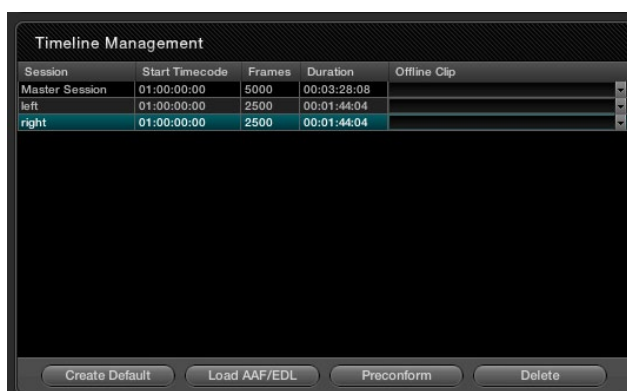


The Media Pool Reel and Clip Folder

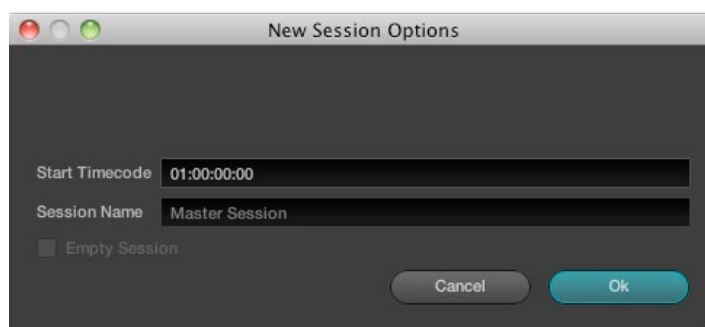
Timeline Management

Session Selection

Directly below the Media Pool display, you will see the Timeline Management display, which includes four buttons and a list of the Sessions that are open and active for the current project. DaVinci Resolve's operation is based on saving clip metadata into a database. The hierarchy for information is: Database at the top, then the User login, Project Name, Session, Clip, Timecode, Version, and then metadata relating to the PTZR and color correction. You have already connected to the Database, logged in as a User, and opened or started a Project. You will now use this window to create a Master Session. Subsequently you can load EDLs to create any number of new Sessions.



Timeline Management



New Session Dialog

After creating a Master Session, the Viewer window will display the first clip in the timeline. (More details on this window later in this manual when we review the Viewer operation.) A green outline surrounds the Master Session in the Timeline window, indicating that this is the Current Session. DaVinci Resolve enables you to have many open sessions, so this box outline indicates which is current. If you use 'Create Default' to open a new session, the green box will automatically switch to the new session and display the first clip in the viewer. To reselect the Master Session, just click on it in the timeline, or in the Timeline Management window.

Create Default

When you select the 'Create Default' button for any new Project, all the clips within the Media Pool are conformed or sorted in an ascending order of timecode. The exception is the offline and matte clips you may have added to the Media Pool. These clips are displayed as an EDL in the display directly below and as a timeline in the Timeline window at the bottom right of the Conform screen. EDL and Timeline displays will be detailed later in this chapter.

The first session you create using these Media Pool clips is called the Master Session. It is key to the operation of DaVinci Resolve as the grading metadata always relates to this Master Session. When you subsequently select 'Create Default' DaVinci Resolve recognizes that it already has a Master Session so it then opens a new default session. In each case, you can name the session and enter the starting timecode, which will default at one hour if you do not alter the window. After the Master Session has been created you can also create a default timeline and select the checkbox to open an Empty Session, which will allow you to click and drag clips manually from the Media Pool into the session timeline.

Load AAF/EDL

Many grading projects start without an EDL. DaVinci Resolve permits color grading to begin as soon as you have the source images. Grading metadata is associated to the source clip timecode, so you can bring in an EDL later and move all the clips, and DaVinci Resolve will move all the grades to match. If you have one long clip, but do not have an EDL, you can manually split the clip or send it to the Scene Cut Detector. This operation is covered in the Scene chapter later in this manual.

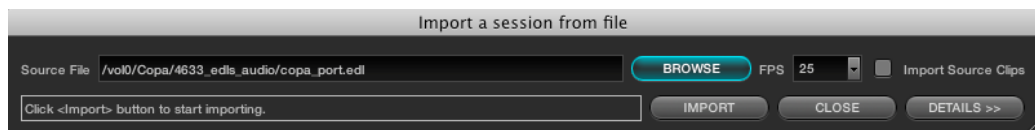
It is common, however, to have an EDL for your project and the 'Load AAF/EDL' button lets you use the EDL to sort the clips to 'Conform' the source clips duration and position on the timeline to the EDL.



Conform Settings Dialog

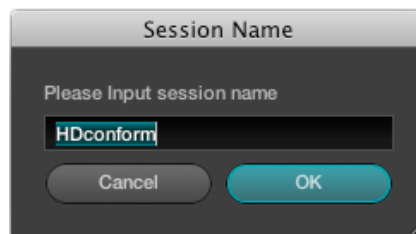
When you select the 'Load AAF/EDL' button within the Timeline Management display, a dialog will ask for confirmation that the conform parameters are as you expect. If the parameters are not as you need, go back and change the settings on the Config screen before proceeding. If you respond 'OK' the next prompt is to locate an edit decision list (EDL) or, alternatively, an AAF file. Select the appropriate file by using the 'Browse' button to search your computer. When you find the EDL, confirm the frame rate for that EDL and select 'Import.'

When loading an EDL you can convert the EDL frame rate from 30 to 24fps if you have set the system frame rate to 24fps and if the EDL frame rate is chosen as 30. This is useful when the offline/edit was done at 30fps with 3:2 added. Please note that 25fps to 24fps is not currently supported.



Selecting an EDL and Importing a Session

Next, enter a Session name. The EDL file name will be shown as a default, but it can be changed by typing a new name. The EDL will be used to cross-reference the clips in the Media Pool and generate the new timeline. This EDL is also loaded into the EDL viewer at the bottom left of the Conform screen (more details follow later in this manual). If you have no more EDLs to load, close the Import Session window. The Session name has been loaded into the Timeline Manager and the conformed clips are at the top of the Timeline Viewer window. There will be a green box surrounding the timeline indicating it's the current Session and the Viewer will display the first clip in the timeline.



Session Name Dialog

Pre-Conform

As mentioned earlier, you may have a single long clip - a finished project or maybe just the offline. With DaVinci Resolve you can still grade this material. If you have an EDL you can use the Pre-Conform feature to split and load the clip automatically into the Master Session.

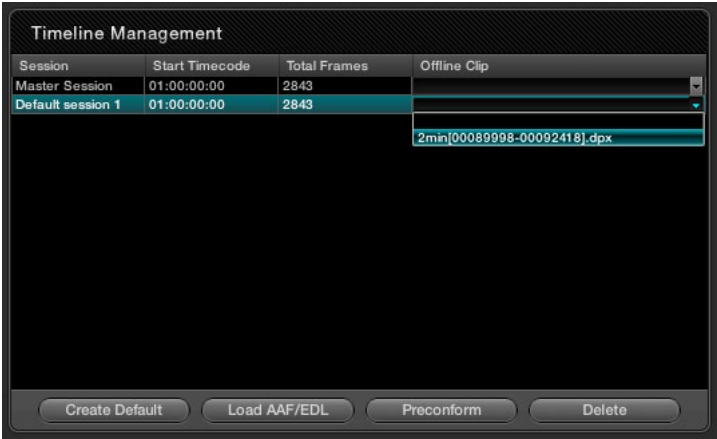
Select the 'Pre-Conform' button within the Timeline Management display and you will be prompted for an EDL associated with the project. Browse, select, and load the EDL.

Delete

The 'Delete' button, also within the Timeline Management area, will delete the selected Session. It will remove the Session from the timeline, but before doing so will prompt you to either Save or Not Save the stills for the Session. Often you want to delete the Session but maintain the stills for later reference. You also have the opportunity to save any Session changes.

Offline Clips

The Timeline Management window also provides the option to associate an Offline Clip for comparison to the EDL and Online images. Using your mouse, select the Session you wish to compare to the Offline. Then select the Offline Clip label, pulldown arrow, and select the correct clip to associate. When you select the Offline clip, it displays the first frame within the right side Viewer window. Please refer to the Viewer Display section later in this chapter for details on reviewing the Offline Clips.

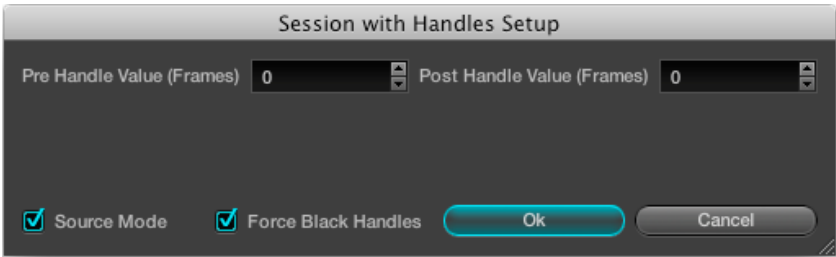


Offline Clip Selection

Creating a Conform with handles

You can create a version of a timeline with handles. This is particularly helpful if you plan to record the timeline to tape and need pre-roll time.

First, right mouse click on the Conform Session to which handles should be added (it can be the Master Session too!). From the list of options select 'Create Session with Handles.' Select the length of handles to be added, enter a value for the Pre and Post Handle size (frames), and click 'OK' to confirm. Within this window, you may also select 'Source Mode' to apply handles to the clips and then sort them in source timecode order. You can also 'Force Black Handles' rather than use the clips images.



Session with Handles Setup display

After you confirm the handle size, a Conform Settings window will ask you to confirm the conform settings are correct. If so, select 'OK' to proceed or 'Cancel' to abort.



Conform Settings Confirmation Dialog

EDL Display

The EDL display, located at the bottom left of the Conform screen displays the conformed EDL in a simple column-separated format. The columns are: Event Number; Source Reel Number; Video/Audio designator where 'V' indicates video transition; Event Type (Cut, Dissolve, etc.); the Dissolve Length if there is a Dissolve. SRC In is the source image in-point timecode and SRC Out is the source image out-point timecode. REC In is the record timeline in-point timecode and REC Out is the record timeline out-point timecode. The final column, Comments, is useful for conforming when Reel Names are longer than 8 characters (e.g., from RED).

#	REEL	V	C	SRC IN	SRC OUT	REC IN	REC OUT	COMMENTS
1	002	V	C	07:04:01:12	07:04:03:00	00:59:59:24	01:00:01:12	* FROM CLIP NAME:
2	001	V	C	05:13:08:22	05:13:10:17	01:00:01:12	01:00:03:07	* FROM CLIP NAME:
3	001	V	C	04:01:54:24	04:01:57:03	01:00:03:07	01:00:05:11	* FROM CLIP NAME:
4	002	V	C	08:02:00:00	08:02:03:00	01:00:05:11	01:00:08:11	* FROM CLIP NAME:
5	001	V	C	04:16:48:14	04:16:50:00	01:00:08:11	01:00:09:22	* FROM CLIP NAME:
6	001	V	C	02:12:40:21	02:12:42:18	01:00:09:22	01:00:11:19	* FROM CLIP NAME:
7	001	V	C	05:10:56:19	05:10:58:24	01:00:11:19	01:00:13:24	* FROM CLIP NAME:
8	002	V	C	10:03:46:03	10:03:47:22	01:00:13:24	01:00:15:18	* FROM CLIP NAME:
9	002	V	C	06:04:57:24	06:04:59:13	01:00:15:18	01:00:17:07	* FROM CLIP NAME:
10	002	V	C	07:00:01:07	07:00:05:15	01:00:17:07	01:00:18:15	* FROM CLIP NAME:


```

/vol0/Copa/4633_edls_audio/copa_port.edl
TITLE: ( no title )

001 002 V C 07:04:01:12 07:04:03:00 00:59:59:24 01:00:01:12
* FROM CLIP NAME: 007A
* COMMENT:

002 001 V C 05:13:08:22 05:13:10:17 01:00:01:12 01:00:03:07
* FROM CLIP NAME: 005B
* COMMENT:

003 001 V C 04:01:54:24 04:01:57:03 01:00:03:07 01:00:05:11
* FROM CLIP NAME: 004A
* COMMENT:

```

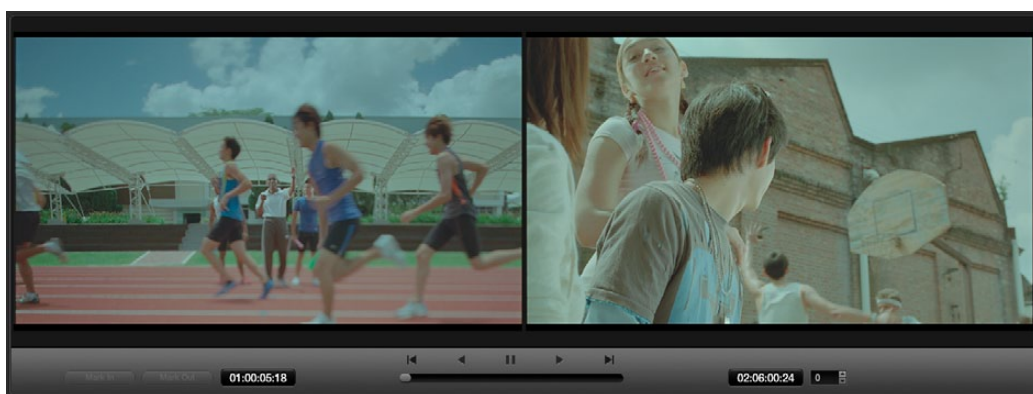
EDL Display above and raw EDL text below

If you right-click on this event and select 'Locate in Master Session' or 'Locate in Media Pool' you can cross reference source clips all the way from the Storage volume and folder and file name, to the Master Session, EDL session and the actual EDL event that uses the clip.

Editing features will be covered later in this chapter, but if you decide to use the Edit functions to modify the Conform, those changes will also be reflected within this EDL display. When you are in any Session other than the Master Session, the material may be re-conformed from information contained in other Reel folders. This can be done by right mouse clicking within the Conform Timeline display and selecting 'Re-conform from Reels.'

Viewer Displays

The Viewer display at the top of the Conform screen has two main modes. One compares the Offline and Online images to make sure the EDL that was used to generate the conformed timeline matches the Offline video. The second mode, Source Clip View, is for selecting and reviewing clips and subsequent marking of In and Out points.



The Conform Page Viewer Display

Under the Viewer images in the display is the control panel with timecode indications, clip transport controls with Step Reverse, Play Reverse, Stop, Play Forward and Step Forward buttons. There is also a scroll bar which you can operate with a mouse or use as feedback indicating the position of the displayed frame within the full clip. Also below the Viewers, there is a 'Mark In' and 'Mark out' button for selecting clip In and Out points. These buttons are used in the second mode of the Viewer Display.

Online and Offline Comparison Mode

The standard setting will show the two images side by side, however if you right click within the Viewer you can select one of the options. Most times the Offline comparisons are shown in Side-by-Side mode with the Online on the left and Offline on the right. Additional modes are: Horizontal Wipe, Vertical Wipe, Mixed Wipe with Align by width, height or automatic alignment for the best comparison. You can find these selections by placing your mouse over the Viewer display and right-clicking. Sometimes the other wipe comparison modes show errors more apparently.

Note: If the Offline does not display it could be because the timecode is completely unmatched to the EDL. Refer to the instructions later in this section as to how to fix Offline mismatches.



Side-by-side comparison

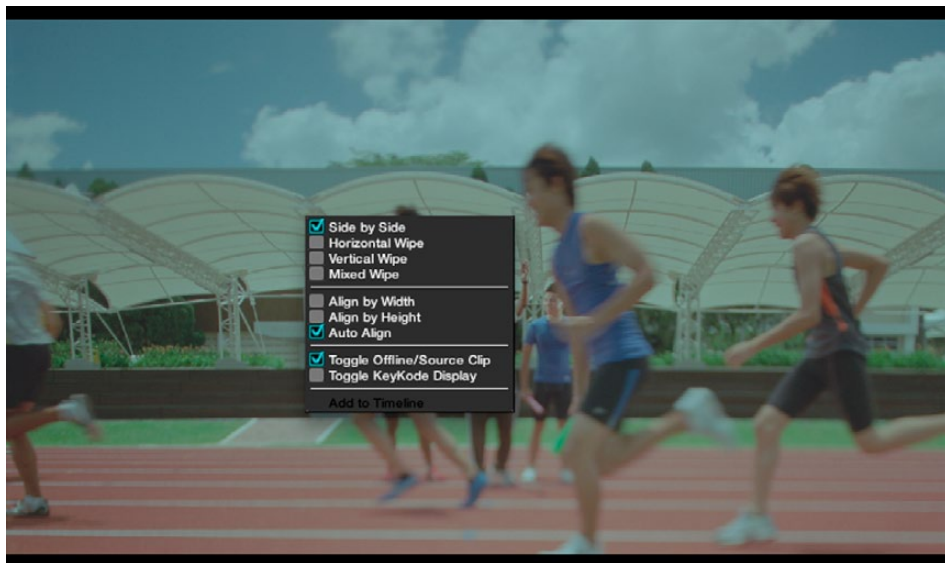


Horizontal Wipe Comparison

Fixing Offline and Online Offsets

Occasionally, you may receive an Offline recording which may have a timecode offset. This traditionally happens when the Offline clip is recorded to tape and the tape operator did not accurately set the VTR timecode. When this occurs, first play the conformed material to find an easy scene change, then inch forward to the first frame of that scene change. Adjusting the frame slip indicator below the Offline display will compensate for the timecode offset to get to the same scene change. You can use the arrow up and down buttons below the offline window or type in a value in the display to the left of the up and down arrow indicators to find the first frame of the scene which matches the scene in the conformed material viewer display on the left.

If the timecode is completely in error, go back to the Browse screen clip window and initiate a 'Change Source Timecode in Header' to make the timecode correct.



Viewer Display – Right Click Options

Source Clip Editing

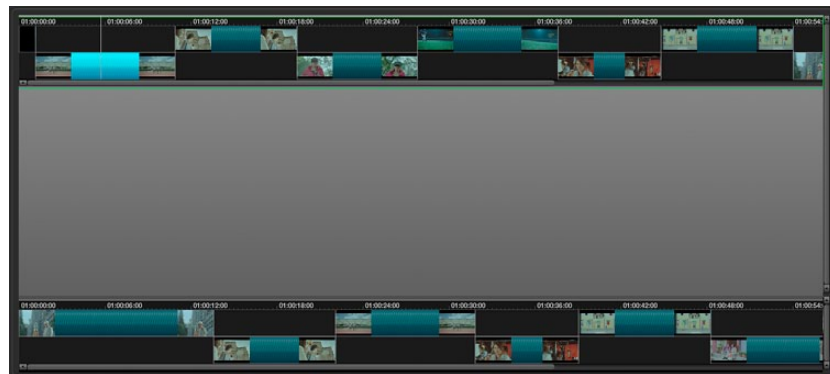
Instead of showing your Online and Offline side-by-side, you can select the right Viewer to display selected clips from the Media Pool. Use the right-click option labeled 'Toggle Offline/Source Clip.' The source clip that will be displayed, is the one selected in the Media Pool and selecting any clip there will update the Viewer. You may also edit or select the In and Out points of a clip in this mode. Use the Transport controls to move the clip to the In point and select 'Mark In'; the Scroll Bar display will show a white mark indicating that a Mark has been selected. Play the clip to the desired Out point and press the 'Mark Out' button. Another white mark will appear on the status line showing the Out point. Right mouse click within the Viewer display and select 'Add to Timeline' from the options available.

Timeline Displays

The Master Session is located at the bottom of the Timeline display, and as previously mentioned, it shows the clips that are in the Media Pool in ascending timecode order. A green outline on the timeline indicates the current Session and it will be displayed in the Viewer window and have the EDL listing to match. If you click once with the mouse on another thumbnail timeline, the green outline will move to that timeline and that version will be seen in the Viewer window. It's this active timeline that is also used in the Color screen.

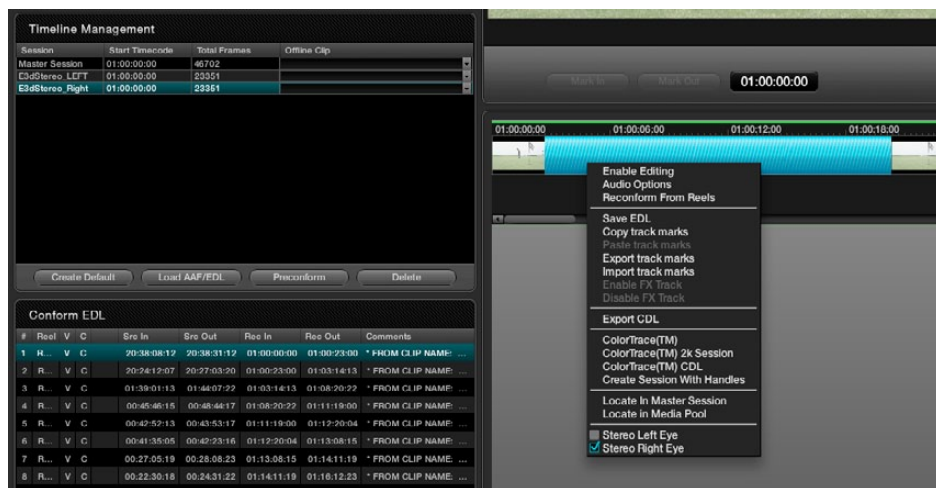
The white vertical line in the thumbnail timeline shows you the position displayed in the Viewer. The mouse, keyboard short cuts, or the control panels may also jump from one clip to another within the Conform display. On the control panels just press the 'Previous' and 'Next' keys to change clips.

You can change the timeline scale by selecting the scroll bar at the bottom of the timeline and, while holding, scrub to the right or left. Alternatively, the scroll wheel on the mouse can be used. This permits you to identify a single frame with great accuracy even if the Session is hours in length.



Conform Timeline

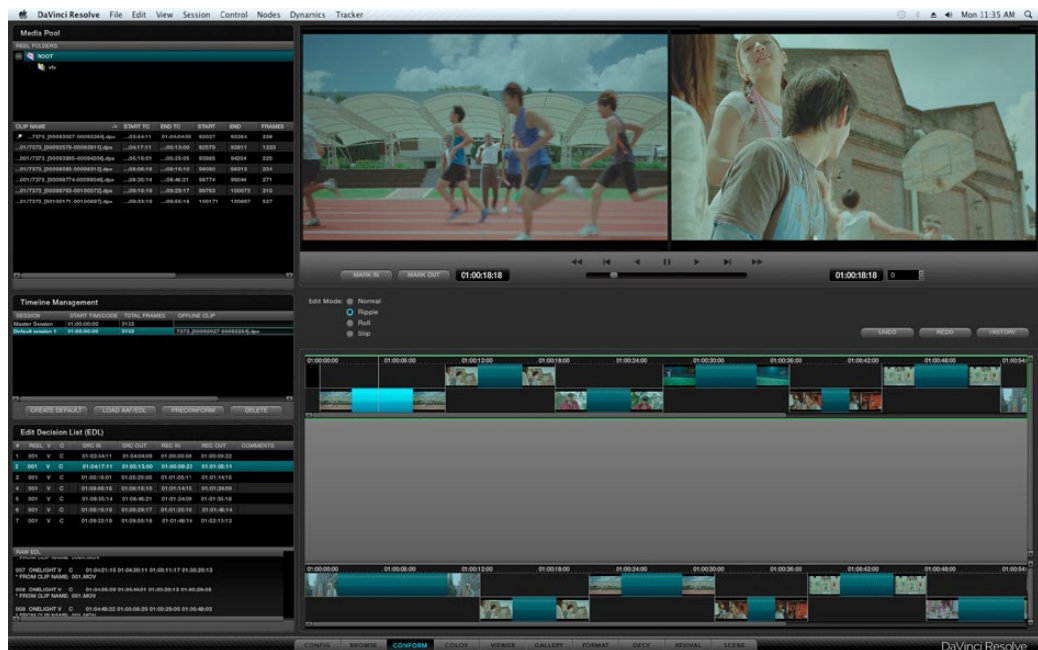
There are also a number of right-click options for the Timeline display. Most are applicable for both the Master Session and the Default and EDL sessions.



Conform Timeline Right Click Options

Editing

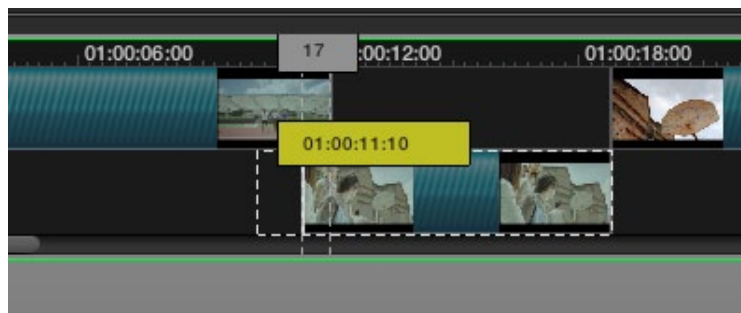
DaVinci Resolve is a color correction and enhancement system, but sometimes you just need to replace or trim a shot and it is easier to do that here than generate a new EDL. When you right click on a timeline in the Conform screen, other than the Master timeline, a pull-down menu will appear which will allow you to select the 'Enable Editing' option.



Conform With Editing Controls Exposed

The Edit mode you select via the radio buttons will manage how your editing operations are performed. 'Normal' selects the default editing operation for moving clips. Select a clip with your mouse and slide it left or right within its position on the timeline. 'Ripple' will also permit clips to be slid along the timeline but will also slip all clips on the right along with the controlled clip. Under the normal Ripple function moving a clip to the right will join the out point to the next clips in point and then ripple all the clips along the timeline. Moving it to the left ripples all the clips to the left. The exception is when 'Ripple with Holes' is selected from the options and in this case the Ripple still occurs for all clips but instead of the respective out and in points joining the black hole that is between shots will remain.

To Roll an In or Out point, select the transition point and when you see the white dotted outlines on the timeline you can roll the edit point within that outline. This will change the Out point of the preceding clip and the In point of this clip without changing the clip's position on the timeline. You can also slip a clip forward or backward within the same edit boundaries with 'Slip.' When the timeline has a clip that has in and/or out points that are not the extent of the clip (i.e. handles), a white dotted box will appear to indicate the available slip parameter while maintaining the image within the handles. Just select the clip and slip it along.



Timeline Editing - The dotted line around the clip identifies the total clip length for the selected clip.

Once you begin to edit a clip length or position, the cursor will change reflecting the operation being carried out. In each case the EDL will be updated to reflect the changes made.

There are also three buttons on the editing panel: Undo, Redo and History. 'Undo' and 'Redo' will reverse an editing decision or redo an editing decision, and the 'History' button will open a dialog to show all editing history so you can quickly see changes that have been made.

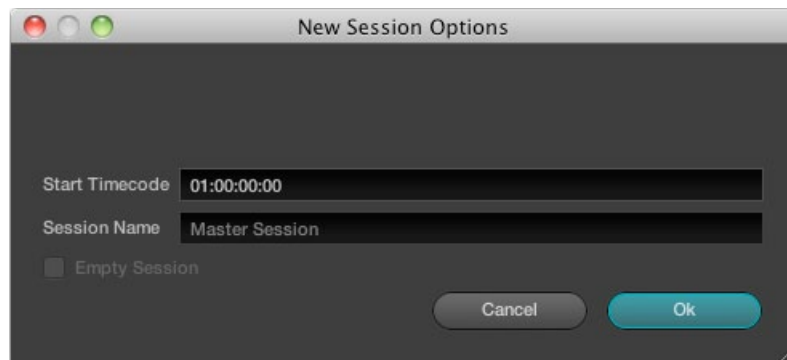
Editing An Existing Timeline

Editing and/or adding a new clip to a conformed Session is simply done with the mouse. How the other clips within the timeline are changed depends upon which edit mode has been selected.

To edit an existing EDL, load the EDL and enable editing. Choose edit mode – Normal, Ripple, Roll, or Slide, and make your edits. Speed changes can be introduced or changed by right-clicking on a clip, and choosing the 'Change Speed' option. After editing, the edited EDL can be saved to the disk using 'Save EDL,' which you will find in the right click list.

Building Your Own Timeline

It is easy to make your own timeline. If the timeline was created as a Default and Empty Session then all clips selected in the Media Pool can be added to create your own EDL. Dissolves may be added by overlapping the transitions from one clip to another. To start building a timeline without a supplied EDL, create an empty timeline by using the 'Create Default' function, check the Empty Session checkbox, then enable editing. Drag and drop clips from the Media Pool into the timeline as you wish. If a sub-selection of the clip needs to be added to the timeline, the Offline Viewer can be toggled to a Source Viewer, the Mark In and Mark Out buttons used to choose a sub-section, and the 'Add to timeline' function chosen.



Empty Session Check Box

Locks

When editing you may wish to lock the position of a clip so other editing operations will not change key clips. The 'Lock' and 'Unlock' and 'Clear all Locks' options are on the Timeline right-click list.

Enable Snapping

The 'Enable Snapping' option will assist in joining two clips by snapping the clips together when the boundaries are close. You can push the clip past the snap to make a dissolve with equal ease.

Deleting Clips – Adding Black

To delete a selected clip and leave a hole in the timeline, right click and select 'Delete.' There is also the option to add black by right mouse clicking and selecting 'Add Black Clip' from the options available. If this is overlapped with another clip, a fade to black will result.

Speed Changes

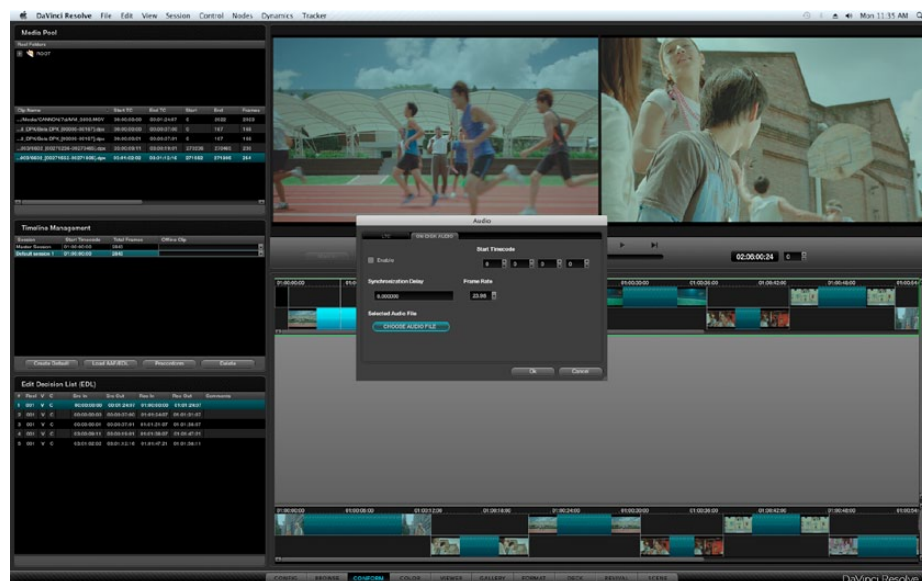
DaVinci Resolve will handle speed changes from EDLs, but sometimes you may just want to add your own. When you select 'Change Speed of Clip' a dialog box will appear reporting the current speed and letting you change the frame rate for this clip.

Audio Conform Tools

Within the Conform screen you can play an audio file and also set the audio synchronization. The Audio can be on a separate audio playback device, like a DAT machine, or can come from the internal hard drive. Right mouse click on the Timeline display and select 'Audio Options.'

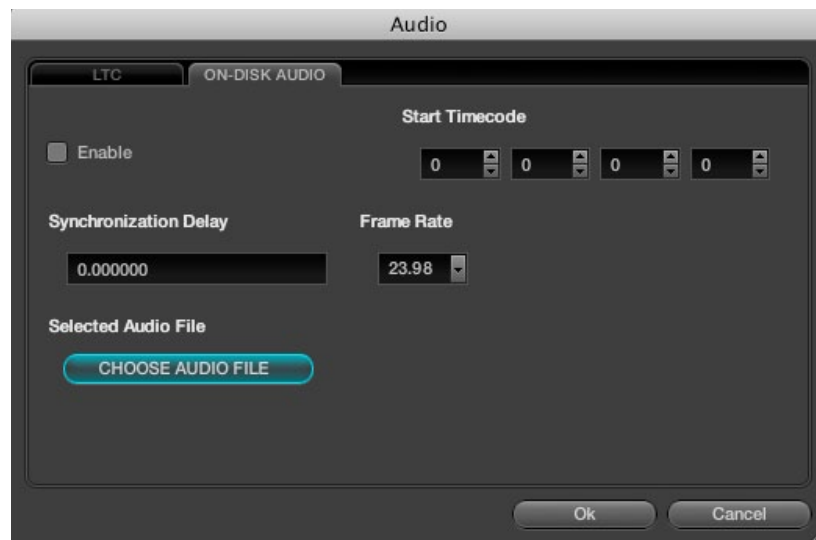
When working with external devices such as a DAT machine, select the LTC tab and enter the timecode into the 'Start Timecode' box. Then select any Synchronization Delay and the proper frame rate. Check the 'Enable' box when you are done and confirm the settings with 'OK.'

LTC is available from the video I/O card to lock and synchronize the external machine. Be careful that the audio frame rate is set correctly or there will be a video/audio sync slippage.



Audio Sync Setting Popup

If you are using On-Disk Audio, select the On-Disk Audio tab and load an audio file with which to sync. The file types supported are: 24-bit, 48 KHz, AIF, AIFF and WAV. Once the file or 'Start Timecode' selection is completed, check the 'Enable' box, select 'OK' to apply, and close the window.

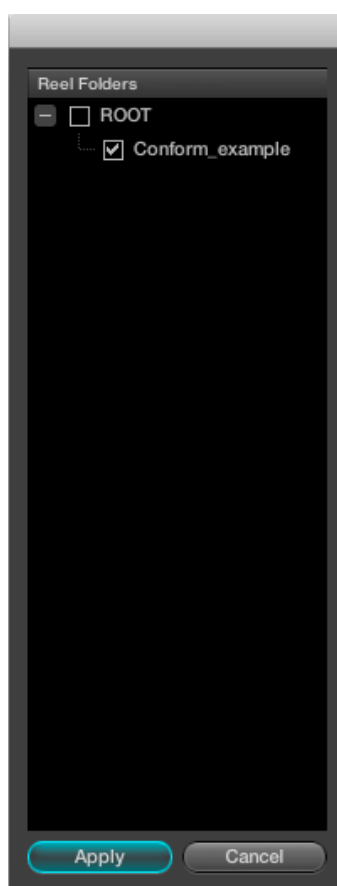


Audio Synchronizing Popup

Re-conform from Reels

If you have been grading a project with changing source shots, one of the ways to manage which shots are used, is to place them in different folders. 'Re-conform from Folders' is another right-click selection that will open a dialog allowing you to select and deselect different source clip folders.

If the VFX shots were just wireframes to begin and you used these shots to keep the timeline in context, you can simply put the new shaded shots into a new folder. Then, when the finished VFX shots are ready, put them in another folder, each time re-conforming with the appropriate selection to automatically change the source images. Of course the timecodes need to match for the replacement to drop right in, but otherwise this is a very fast and simple way to update shots.



Reel Selection

Saving EDLs

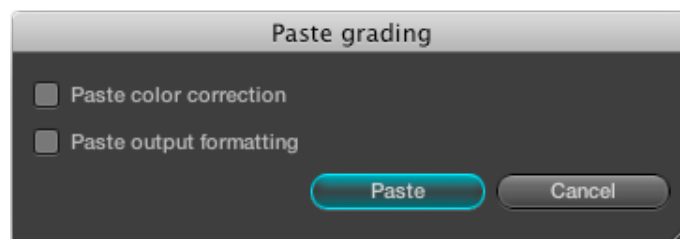
Once your editing is completed, a right mouse click will reveal the menu option 'Save EDL.' If selected, a prompt will appear asking you to assign a name for the EDL.

This EDL can be exported to other systems so if you trimmed the edit in the grading suite you can now supply this to the editors and VFX guys so they too can conform and see the new timeline.

Track Marks

Sometimes there are Track grades that you need to copy from one Session to another. See the Track section in the Color chapter for a detailed explanation of Track Marks and their use.

To copy track grades, use the right-click 'Copy Track' and then select the new Session to make it current. Simply right-click on the new Session timeline and the Paste Grading dialog will appear. Select the active components you need and the 'Paste' button.



Paste Grading Selection

Export CDL

The industry standard, Color Decision List (CDL), permits grading information, like EDLs, to be passed from one system to another. DaVinci Resolve saves standard CDLs for export and can also import sessions with CDLs.

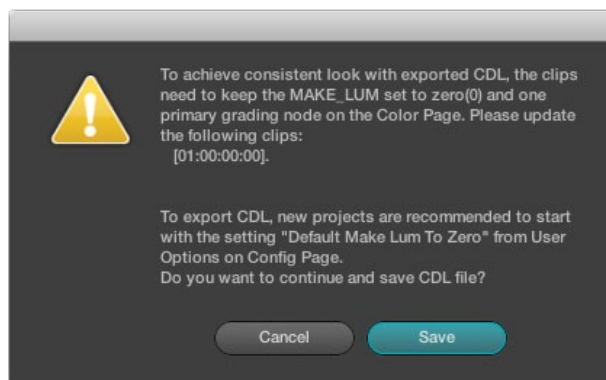
Grades to be saved for Export into other tools supporting ASC CDLs must conform to the industry standard. There are a few things to note while using this feature:

- Only the primary grades on the first node of every clip are exported. If marks are present, only the parameter values at the beginning of the clip are used. Track nodes are not used during the export.
- If there is a qualifier or window in the first node, the grade is exported as if the window or qualifier was not present.
- The 'Make LUM' parameter should be set to 0, or the export will not be accurate. For convenience, there is a 'Luminance Mixer defaults to zero' option in the Configuration screen settings tab which can be enabled when creating the Project.
- The CDL is exported in the format of an EDL with embedded SOPS values. An example of this is shown here:

```
020 001 V C 03:02:49:13 03:02:53:00 01:01:28:11 01:01:31:22
```

```
*ASC_SOP (1.109563 1.717648 0.866061)(-0.238880 -0.390357 0.353743)(0.672948 1.384022 0.889876)
```

```
*ASC_SAT 1.000000
```

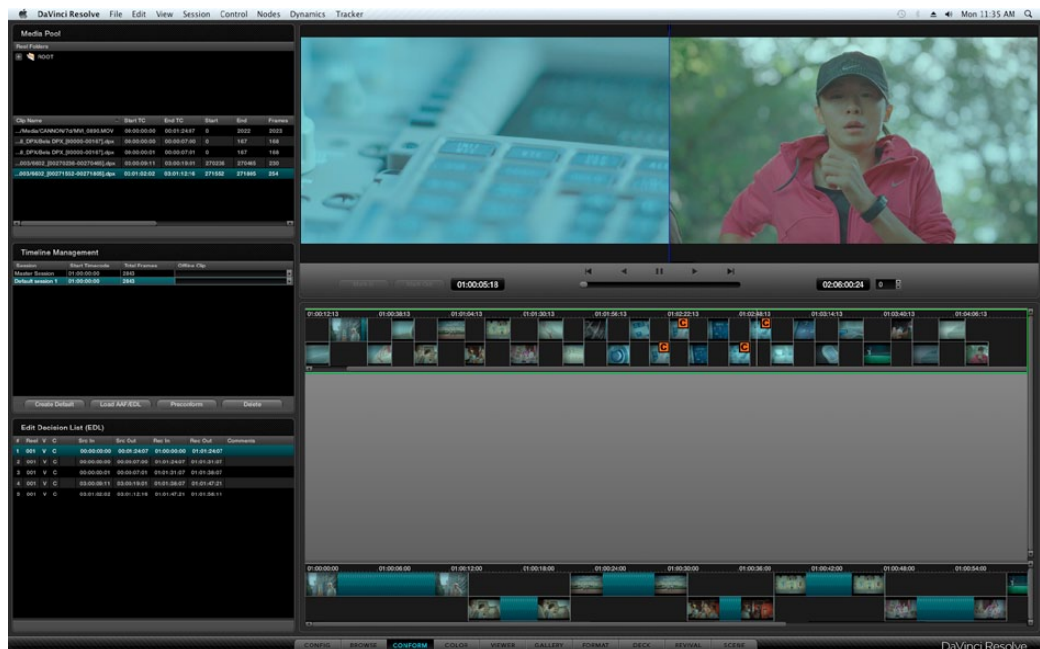


CDL Export Prompt

To export the CDL, right click on the active timeline in the Conform page, and select 'Export CDL,' follow the prompts to name the file and choose the Export path.

Conflicts

Sometimes when an EDL is used to create a new Session there is a conflict in timecodes. This occasionally occurs when shots are added to the Media Pool incorrectly or when replacement shots are added but the original shot still exists. As DaVinci Resolve uses the clip timecode for reference when generating the grading metadata, it's not valid to have two clips with the same timecode within the same folder. It's the same concept that prevents you having two files in the one computer folder with the same name. Of course the same timecode often occurs in the normal course of our work, but this should be managed by having these clips in a different folder or with a different Reel name.



Timeline with four clips indicating Conflicts in Timecode

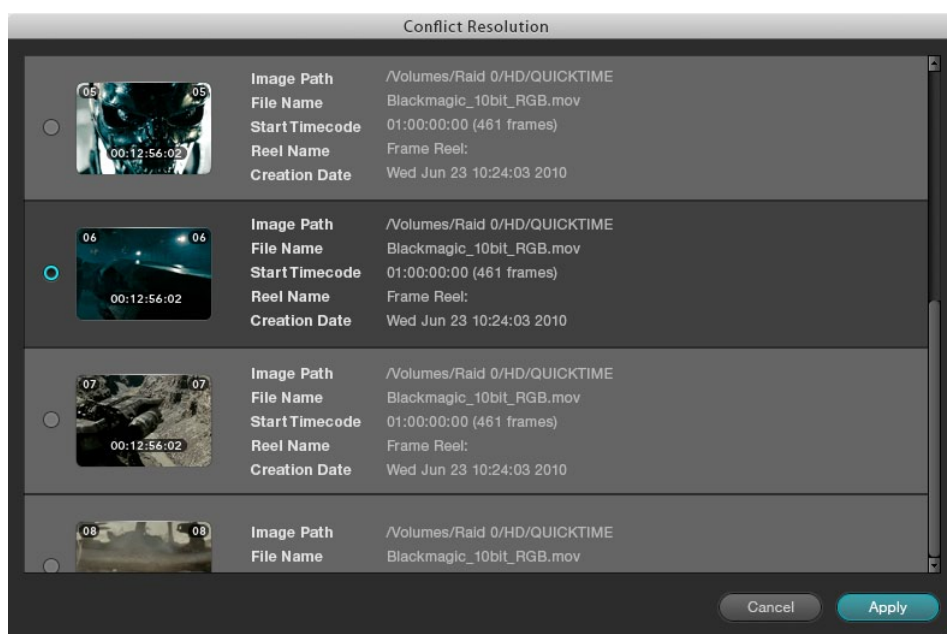
So if you do have a conflict it will show up in the Session timeline with a 'C' within the clip. To resolve the conflict right mouse click on the 'C' indicator within the thumbnail.



C Indicates Conflicting Timecodes Between Two Source Clips

If you select the Master Session timeline and right mouse click on the 'C' indicator, it will show the conflicting information within a Conflict window and you have the opportunity to copy the correction from the Master Session clip to the conflicting clip in the other timeline.

If you perform the same action on the other conformed timeline, the same Conflict window will open except that it will allow you to choose the clip within this Conform Timeline to act as the Master by clicking on the thumbnail.



Resolving Conflicts

Upon successfully completing this operation, the 'C' indicator will be replaced with an 'R,' indicating that the conflict has been resolved.

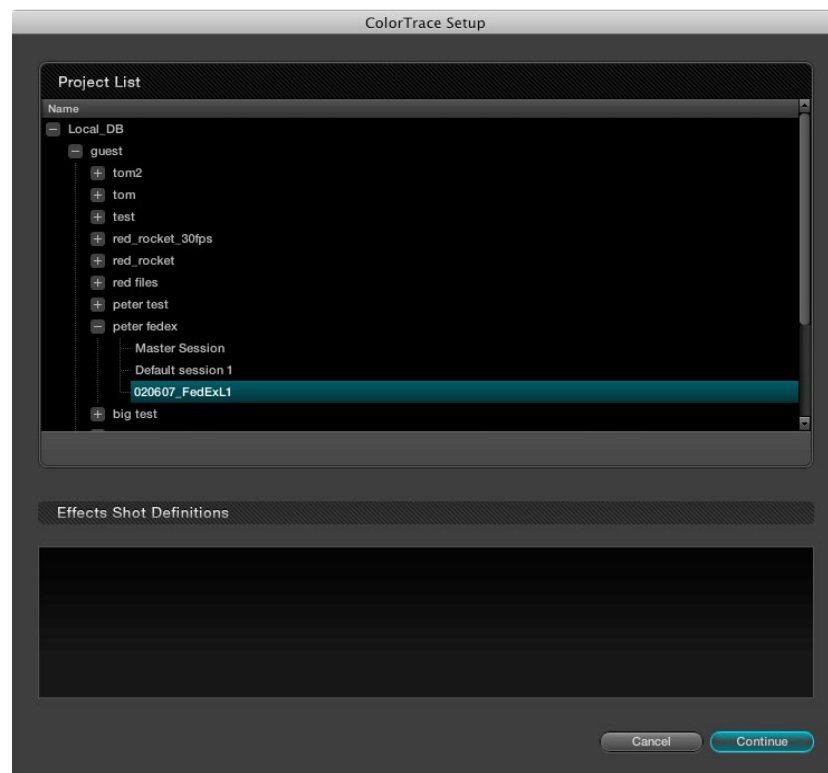


R Indicates the Conflict has been Resolved

ColorTrace

ColorTrace is one of the leading features of DaVinci Resolve. It allows you to copy color corrections quickly and easily from one Project or Session to another based upon a source timecode, or even the name of the clip when in Automatic mode.

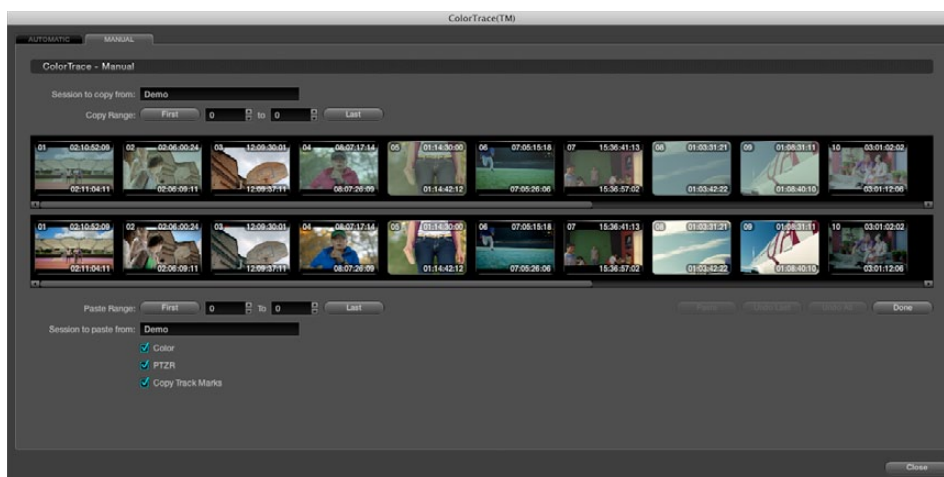
To use ColorTrace, right mouse click on any timeline within the Conform screen and select the ColorTrace option. Within the ColorTrace Setup window, select the Project or Session that will be used with the current Session, then the 'Continue' button to open the ColorTrace window or 'Cancel' to abort.



ColorTrace Setup

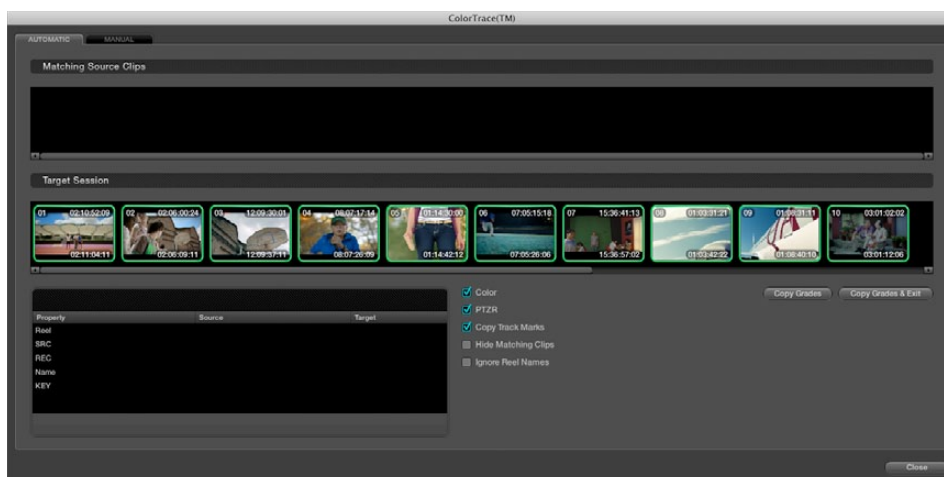
At this point, you may select to work in either Manual or Automatic mode. When in Manual mode, the corrections can be moved by the Copy and Paste procedure or by dragging and dropping with the mouse. The source and target projects must have the same number of clips in order to successfully perform the Copy and Paste functions. The range of clips selected to be copied or pasted may be selected either with the mouse or by using the Range controls. Once the grades have been copied they may be pasted by clicking on the 'Paste' button. The 'Finished' button will complete the operation.

The 'Undo Last' button allows you to undo the last action and the 'Undo All' button will undo all actions which have been done in Manual mode. The 'OK' button will exit the ColorTrace mode and close the display.



ColorTrace Manual

If you decide to use Automatic mode, ColorTrace will automatically search for matches between the selected Project and the current Project. It will then outline the clip with a color depending on the information available.



ColorTrace Automatic

Three color-coded outlines surround clips. A green outline indicates that a perfect match has been found. Yellow indicates that multiple choices have been found and the user must select the appropriate one, and the Red outline indicates that no match was found.

If you have the 'Hide Matching Clips' option checked, this will hide all clips which have been successfully matched and only show the clips with multiple or no matches. Once the desired matches have been found, click on 'Copy Grades & Finish' to complete the ColorTrace operation.

ColorTrace CDL

When you right mouse click within the Conform timeline, three ColorTrace options will appear. The 'ColorTrace CDL' option will allow the importation of ASC CDL file formats.

Here are the supported file formats:

CMX EDL:	This has comments with CCC/CDL XML files or even Slope, Power and Offset information within the comment area.
CCC and CDL XML:	A file that can contain various color correction looks, or even references.

In order to use this option, select 'ColorTrace CDL' from the menu which will appear, when right mouse clicking within the Conform timeline display.

ColorTrace will operate as mentioned in the previous ColorTrace section, except that the user will be prompted for an EDL and then to select the corresponding CDL and CCC files. If there are no CDL or CCC files, as may be the case if there are comments inline within the EDL, this prompt may be cancelled.

In order to import the CDL/CCC XML correction looks, select the 'Import Stills' option when right mouse clicking within the Gallery section of the Color page. Then, import the CDL/CCC files. When these are imported into the Gallery, an ASC logo will appear along with them.

For formatting reference, here are examples of CMX, CCC and CDL files.

Example CMX EDL file:

```
TITLE: Final EDL
FCM: NON-DROP FRAME
010 001 V C 01:19:28:16 01:19:28:16 01:00:41:18 01:00:42:18
*ASC_CC_XML test_cc.102
011 001 V C 00:00:00:00 01:19:28:16 01:00:42:18 01:00:43:18
*ASC_SOP (0.9 1.2 0.5)(0.4 -0.5 0.6)(1.0 0.8 1.5)
```

Example CCC file:

```

<ColorCorrectionCollection xmlns:"urn:ASC:CDL:v0.5" >

  <InputDescription>
    test corrections for ref_input_image.1920
  </InputDescription>
  <ViewingDescription>
    for mathematical analysis only
  </ViewingDescription>

  <ColorCorrection id="test_cc.100">
    <SOPNode>
      <Description> for ref_output_image.0100 </Description>
      <Slope> 1.0 1.0 1.0 </Slope>
      <Offset> 0.0 0.0 0.0 </Offset>
      <Power> 1.0 1.0 1.0 </Power>
    </SOPNode>
  </ColorCorrection>

  <ColorCorrection id="test_cc.101">
    <SOPNode>
      <Description> for ref_output_image.0101 </Description>
      <Slope> 1.0 1.5 0.6 </Slope>
      <Offset> 0.0 -0.1 0.01 </Offset>
      <Power> 1.0 1.5 0.5 </Power>
    </SOPNode>
  </ColorCorrection>

</ColorCorrectionCollection>

```

Example CDL file:

```

<ColorDecisionList xmlns="urn:ASC:CDL:v0.5">

  <InputDescription> GeneralProducts M1 std thru GP M1 LUT4 </InputDescription>
  <ViewingDescription> GP P1, DCI P3, Pathe color emul </ViewingDescription>
  <ColorDecision>
    <MediaRef ref="some/Project/frame%250900-0954%5B.dpx"/>
    <ColorCorrection id="cc03340">
      <SOPNode>
        <Description>change +1 red, contrast boost</Description>
        <Slope>1.2 1.3 1.4</Slope>
        <Offset>0.3 0.0 0.0</Offset>
        <Power>1.0 1.0 1.0</Power>
      </SOPNode>
    </ColorCorrection>
  </ColorDecision>
</ColorDecisionList>

```

ColorTrace 2K Session

With the appropriate version of DaVinci 2K Plus software, it is possible to export primary color correction grades from the DaVinci 2K Plus and import them into DaVinci Resolve. When you export the file from the 2K Plus, the resulting file will contain a ".2kg" extension. The file contains thumbnails, source timecodes, Reel number information and the grades. To import this file, right mouse click within the Conform timeline and select the 'ColorTrace 2K Session' option.

As with other ColorTrace modes, you will have the opportunity to use ColorTrace in either Automatic or Manual mode. It is important to note that the input for DaVinci Resolve and the 2K Plus should be the same. If there are differences, a LUT may need to be applied.



Color

9

Color

The Color screen is essentially the heart of the DaVinci Resolve system.

In addition to basic color correction you also have the option of applying a PowerWindow or even Blur, Pro-Mist and Aperture Correction Effects to each clip. The color enhancement process is clip based and centers on the usage of nodes. Each corrector node can be considered a full featured color corrector and multiple nodes can be applied in either Parallel or Serial, depending upon the desired correction.

The Color Enhancement screen has a number of areas of display that all work together. From left to right they are: the Viewer with Transport Controls, Stills display, and Node graph. Under these displays is the track timeline and the thumbnails timeline. Below that are the primary controls, secondary controls, and the dynamics timeline.



Color screen

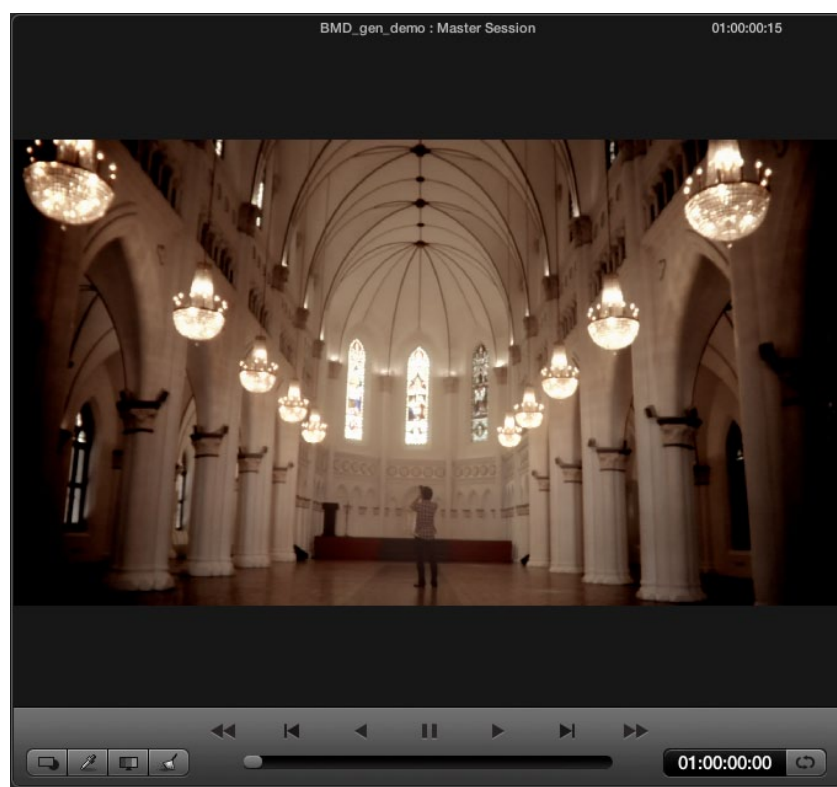
Most of the controls are active by both mouse and control panel operation. For example, clicking and dragging the controls with the mouse within the Primary Color Correction window will carry out color enhancement adjustments. The DaVinci Resolve control surface provides concurrent control over many functions.

Viewer

Located at the upper left of the Color screen, the Viewer displays the current clip and the current frame. At the top of the Viewer in the center of the window bar, the Project and Session names are shown. To the left of this is a GPU status display and the Playback Speed display in frames per second. DaVinci Resolve uses GPUs for image processing, so the GPU status indicates the percentage of use that the current color correction demands of the GPU. A full green indication shows there is plenty of GPU headroom. As the GPU processing resources are used by additional color correction the green bars will reduce. A flashing red indication means that the GPU is unable to consistently process the correction in real time. Ultimately, as you add a larger number of corrections, you will reach the real time limit of the GPU and DaVinci Resolve will then play back at a slower than selected playback speed.

You can continue with the slower than real time operation, select 'On the Fly Proxy' so DaVinci Resolve can generate proxy source images in real time, or, you can select Render Cache to cache the clip. In cache mode, once the clip has been played once it will be cached for real time playback. More information on Render Cache options appears later in this chapter.

On the bottom right of the Viewer window is the primary timecode display for the clip being played. Just like with the top display, you can change the information shown in the timecode section of the Viewer area by clicking on the timecode display with the mouse to toggle the display between the five options as described above. To the right of the primary timecode display is the 'Clip Loop' selection button. Enable this for looped clip playback. Click again to disable. You can also select 'Loop' from the DaVinci Resolve control surface.



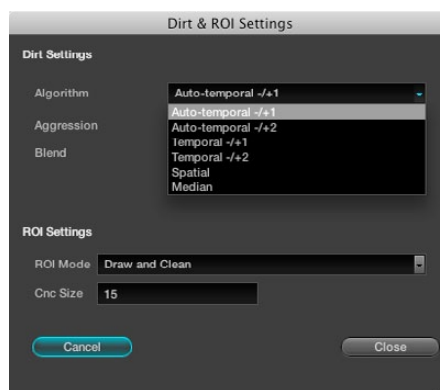
Viewer

Located at the bottom of the Viewer display are controls for playing the clip Forward, Reverse, Fast Forward, Fast Reverse, Step Forward, and Step Reverse. These are accessed by clicking on the appropriate control with the mouse or by using the Transport Controls on the DaVinci Resolve control surface, or a standard keyboard. Below the transport controls, is a scroll bar for scrolling through a clip by dragging the bar back and forth using a mouse.

At the bottom left of the Transport Controls there are four buttons. These viewing options alter what is being displayed on the Viewer. The button on the left will select and deselect the PowerWindows overlay. The next button will change the cursor into the Color Picker mode for selecting a specific color from the viewer image. When the third button is activated the Gallery Wipe will be visible to show Stills. The right button is used to activate the interactive Dirt and Dust tool.

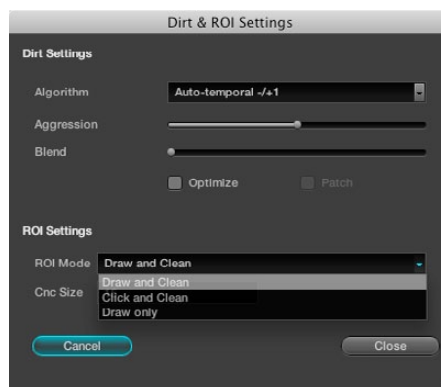
Interactive Dirt & Dust Removal Tool

DaVinci Resolve provides an interactive Dirt and Dust Removal tool which may be accessed from either the Viewer or Color screens by clicking on the Dirt Removal Tool icon, located at the left of the Viewer display. A right mouse click on the button will open the setup window.



Dirt and dust set up widget

Within the Dirt Settings section you can adjust the Algorithm section to select the filtration being used for the correction and also the Aggression and Blend sliders depending on the degree of correction to be applied. The ROI Settings allows you to select the correction method. If you choose the Click and Clean mode, this will apply the correction once you click on the object. If you select the Draw and Clean mode, you can highlight the dirty area with the mouse and then the correction will be applied. If you are unhappy with your correction select, undo to return to the original image.



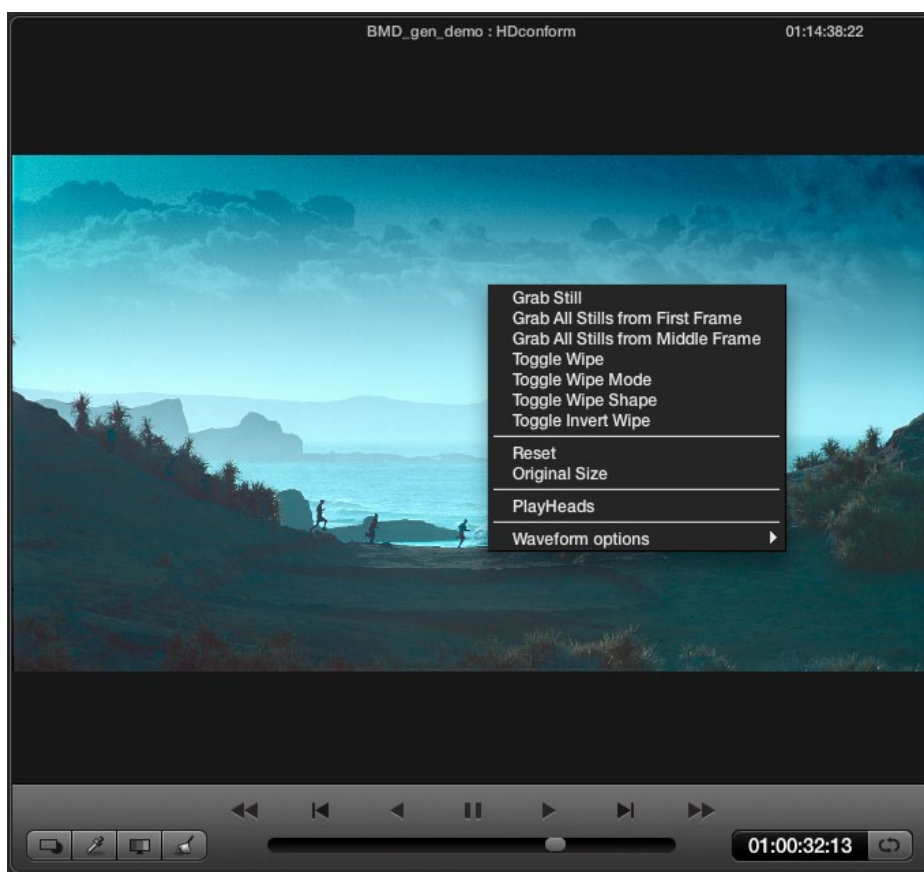
Dirt and dust set up widget

Viewer Window Options

There are a number of center and right click mouse options for the viewer.

You may Zoom In and Out of the image within the Viewer by using a rotary control within the center mouse button. You may also Zoom In and Out of the image within the Viewer display by using the + and - keys on the computer keyboard. If you hold down the center mouse button and drag the mouse, it will move the image position within the Viewer display. To reset the Viewer display to the original size and position, right mouse click within the Viewer window and select 'Reset' from the menu that appears.

A right-click on the mouse while it's over the Viewer will pop-up an options window.



Color screen right-click options

Viewer Stills Display

The first few of the pop-up options relates to stills. 'Grab Still' will simply grab the current frame to make a still and place it in the Gallery Stills display. This still can then be used as a reference for comparison in other scenes. 'Grab all stills from first frame' will grab a still from every clip on the timeline using the first frame of each clip.

'Grab all stills from Middle Frame' will perform the same function except use the middle frame of each clip as the source of the still. Once this procedure has started, it will continue until completed, which could take some time.

The 'Toggle Wipe' selection will turn the wipe on and off. This function on the DaVinci Resolve control surface is called 'Play Still.' The Toggle Wipe mode will select to compare the current timeline clip to either the Gallery Still, the matching Offline frame or another clip on the timeline. To use, select a clip on the timeline, toggle the mode to Timeline and then use the mouse to select the thumbnail of the reference clip. Right click on the thumbnail to select 'Wipe Timeline' and the reference clip will be highlighted in yellow when you move to the clip to compare.

Alternatively, to compare the current clip to the Offline, select the 'Still/Timeline' button on the DaVinci Resolve control surface until the Offline label is seen on the status display. (More on the Status display later in this chapter.) You will then be able to perform a wipe with the offline recording in conjunction with the clip.

The Toggle Wipe Shape option switches between Vertical Wipe, Horizontal Wipe, Mix, or a Key or Alpha control. (More on this later when we look at green screen keying and display.) Toggle Invert Wipe will swap the reference and current images in the Wipe display so you can see the other side of the images.

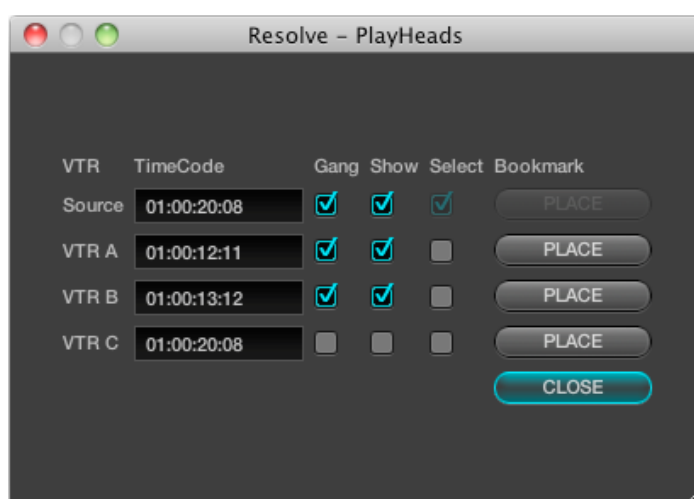


Wipe between the current clip and the still

The Reset option will set the image to the normal display for the viewer. The original setting will display the image pixel for pixel so it is usually used for getting quick zooms to the source image size to look for imperfections in the original image.

PlayHeads

The PlayHeads selection is most commonly used to compare a reference clip with others playheads and allow you to play up to four clips and display them at the same time.



Playheads control

Once the PlayHeads window appears, you may establish which playhead is attached to which clip. Selecting the clips and 'Place' will link the clip to the appropriate playhead. Gang them together for synced playback. The 'Show' checkbox will turn the display of the clip Off and On. On the DaVinci Resolve control surface, playhead and VTR linking is performed directly on the panels. Use the 'Modes' button and then select 'PlayHeads' to display the VTRs or use the VTR buttons on the Transport panel.



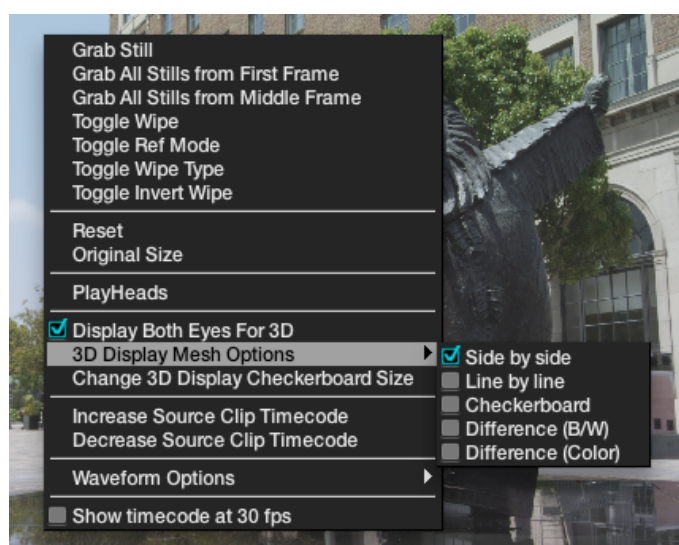
Color screen viewer with four playheads active

When the playheads are in use, you will see the letters 'SABC' at the bottom of the Viewer display. These color coded indications are for Source, VTR A, VTR B and VTR C. The color codings are: Red for the current playhead which has all color corrections and formatting; Green for a playhead with an assigned link; Blue indicating a playhead with an assigned link that is also ganged, and Dark Grey for no link assigned to this playhead.

The Timeline display within the Color screen will also show the position of each linked VTR that has been created by the user. It is possible to switch between playheads by using either the PlayHeads window or by using the Job/Shuttle control panel. The currently selected playhead will receive all color correction and formatting you apply.

3D Display Modes

For Stereoscopic 3D projects, enable the 3D monitoring option in the Config screen settings tab and then using the selection “Display Both Eyes for 3D” to see both eyes on the SDI output. The format of the display can be selected from the various display types. Side-by-side, Line-by-Line, Checkerboard and Difference (B&W) and Difference (Color).



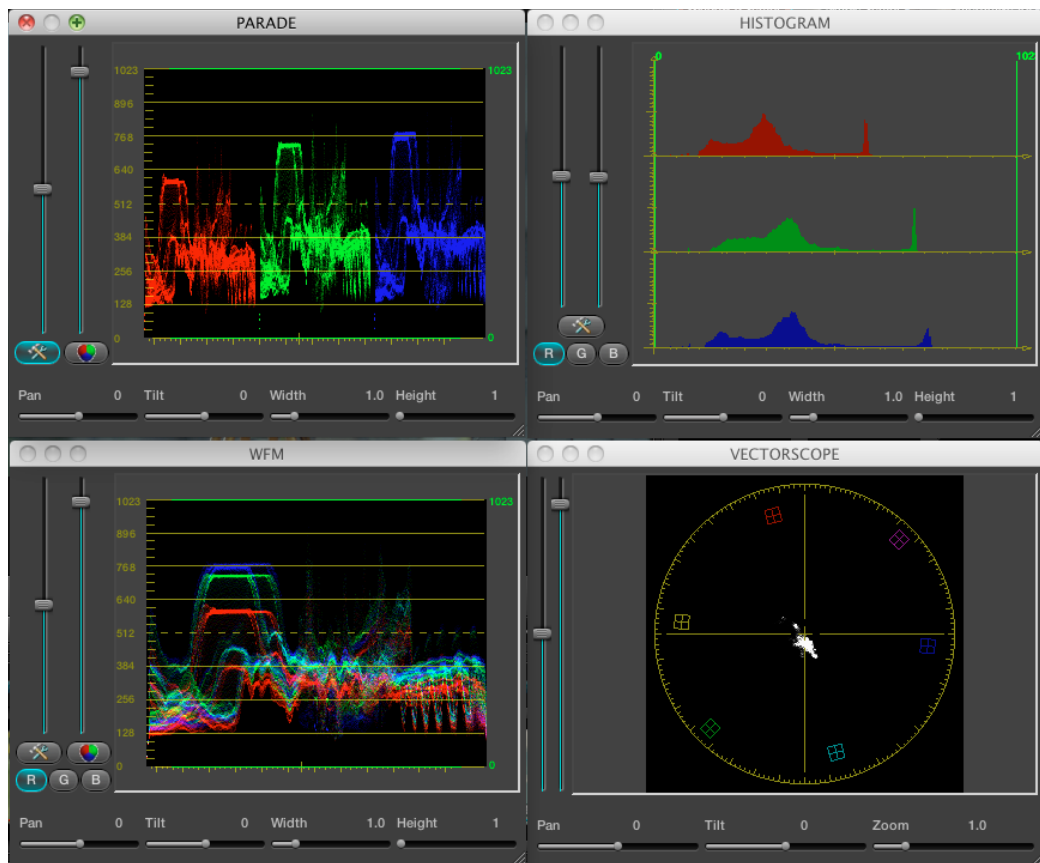
Color screen viewer with four playheads active

Stereoscopic 3D images are often produced out of sync and the ‘Increase and Decrease Source Clip Timecode’ selections move the active clip one frame at a time to permit visual resyncing.

Waveform displays

DaVinci Resolve offers a number of built in waveform displays, all of which work at the native resolution of the system rather than at the video standard selected for clip playout. This means you can see the full data range of the source image with the correction applied, regardless of which video standard you wish to master.

The displays Waveform, Parade, Vectorscope and Histogram allow you to monitor the levels of the correction that are being applied to the image. Within each display, there are the controls that allow you to vary the brightness of the scale and information displayed.



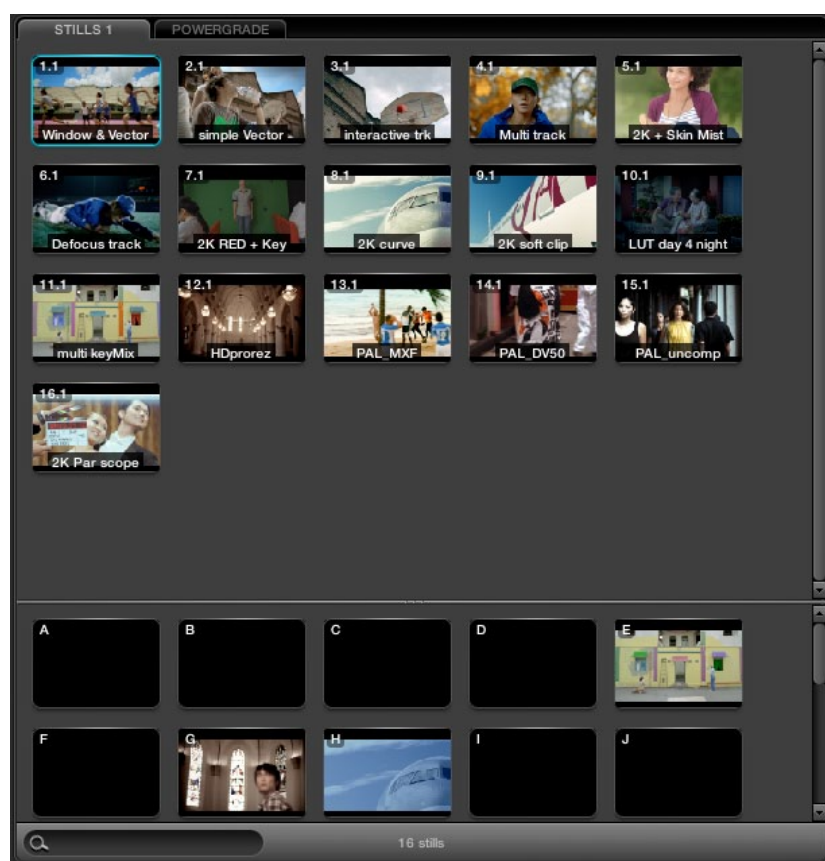
Waveform Display

Stills, PowerGrade and Memories

In the center top of the Color screen are the Stills, PowerGrade and Memories tabs. While all of these are managed on the Gallery screen, they are displayed on the Color screen for quick selection and are used for color matching during the grading session.

As described in the Viewer section, you may compare the stored images to those being graded by using a Wipe or Mix. This provides a simple and fast method of matching grades between scenes.

There can be multiple Stills and PowerGrade tabs. The Memories are shown in the lower section of this window.

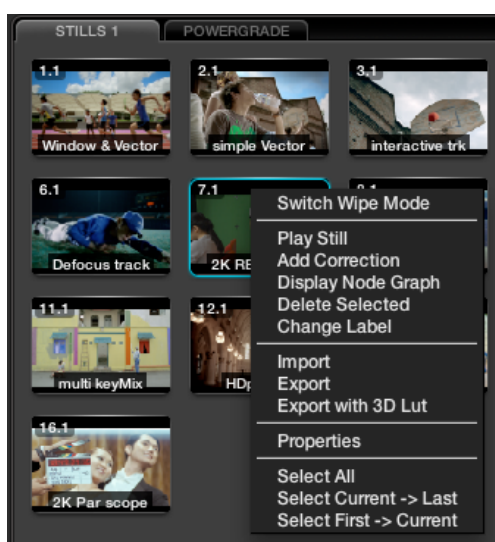


Stills, PowerGrade and Memories

Stills

By selecting the 'Grab Still' button on the Control Panel, or right clicking 'Grab Still' on the Viewer, you are capturing a high resolution still image of the frame currently displayed on the timeline and at the same time capturing the grading metadata information relating to that grade. This means the still can be used for both visual reference and also for direct grade Copy and Paste operations. The still will be added to the current Still tab on the Color screen and also the Gallery screen. You can also Delete stills using the right click option. One or a number of stills can be deleted at once. Right click and use the 'Select Current -> Last' or 'First -> Current' selection, or hold the Shift key while selecting multiple stills for an operation to impact more that one still at a time.

Stills display a Still Number in the upper left corner that is in the scene number/clip number format. Multiple stills for one scene will be displayed adjacent to each other for quick reference.



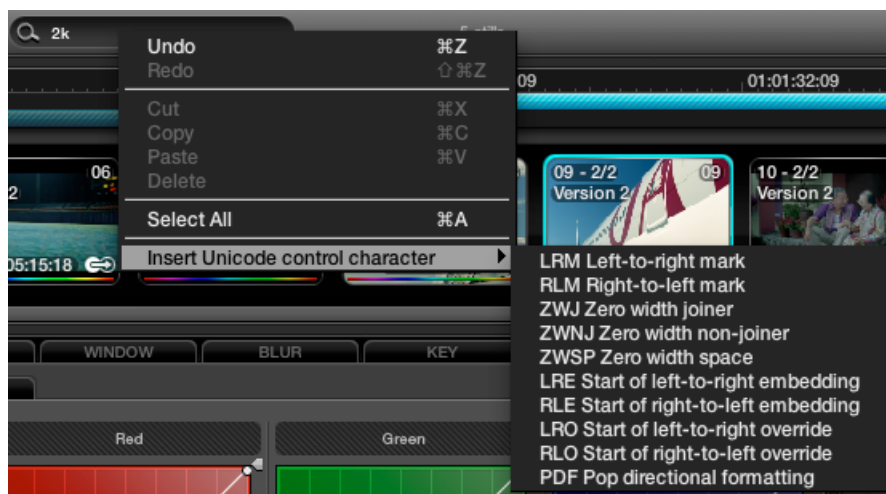
Individual Still Right Click Options

Stills can be named/renamed by placing the cursor over the still, right clicking, and choosing the pull down option 'Change Label'. If your system has Unicode language options loaded you can add names in different languages.



Japanese is one of the many
languages supported

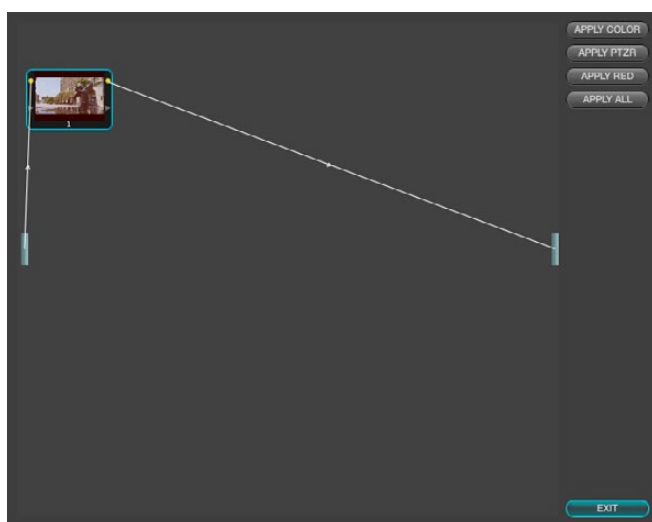
Selecting 'Play Still' via right click on the still, or on the control panel will display the still on the Viewer with a wipe to the current scene/frame. The Wipe mode can be a Horizontal or Vertical Wipe, or a Mix; these options are select from the panel directly or via the mouse on the Viewer using the right-click pull-down 'Switch Wipe Mode.' If you double click on a stored image, the Viewer will automatically enter into Wipe mode and you may adjust the wipe by using the fader bar. You can also place your mouse over the wipe on the Viewer and click and drag to move the wipe position.



Unicode Name Controls

The 'Add Correction' selection will apply the color correction parameters from the still to the current clip. This will include the structure of the grade with each channel, or layer or node of correction. When DaVinci Resolve grabs stills or Memories, it also captures the node graph structure. More details on node Graphs are later in this chapter, but the key feature is that you can copy the complete grade using 'Add Correction,' or 'Display Node Graph' and then select all or any node from this node graph.

Just select the node with your mouse, click and drag it to the Node Graph display on the right of the main screen, and place it where you would like the correction applied in the image correction path.



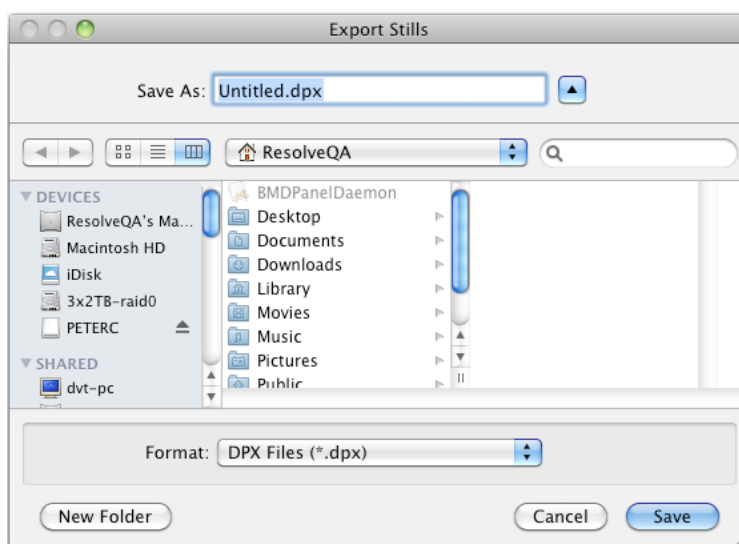
Display Node Pop-up

Alternatively, you can select just the color parameters or just the PTZR parameters from the still, or from this window, you can select all. 'Exit' to close the window when you have finished.

Stills Import and Export

To import and export images in a number of formats simply select the still and right click for the Import, Export or Export with Display LUT option. The Display LUT used in this case is the one selected on the Configuration screen.

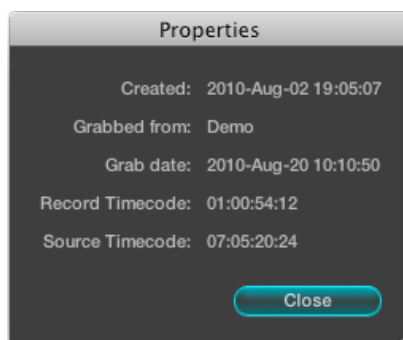
The supported file formats for importing and exporting are: dpx, cin, tiff, jpeg, png, ppm, bmp and xpm.



Export Still Pop-up window with file options displayed

Sorting Stills

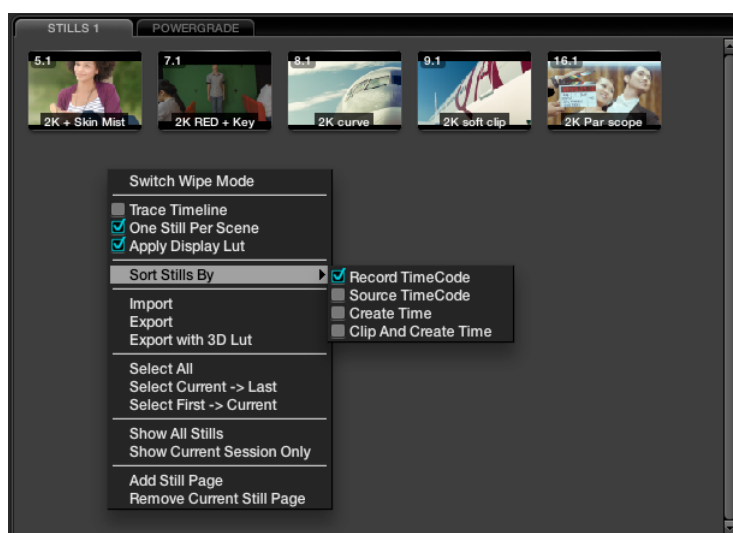
These parameters are used by DaVinci Resolve for sorting the stills using the options that are selectable with a right mouse click.



Stills Properties

When stills are added to the Still tab they are placed next to other stills from the same scene and generally in record timecode order. You can also select the stills to be sorted and displayed in the order of the source timecode or the creation date and time, or by the clip order with the creation date and time.

If you have multiple sessions in your project you can also select to display stills from just this Session or stills from all Sessions.



Stills Right Click Options

Other Still Options

Images can be stored in multiple Still pages to make it easier to find or switch between stills. These pages are configurable and while the Gallery screen offers the full suite of still management tools, on the Color screen you can add or remove a Stills tab.

Just click and drag a still to the Memories section, if you use this still often. This will give you a one key selection for even faster operation.

You will note that there is an option to 'Trace Timeline.' With this selected, the still that's highlighted will always match the scene selected on the main timeline.

The 'One Still per Scene' selection will force a single still to be saved for each clip. Any clips with multiple stills will retain those stills until you capture another for that clip.

Searching For Stills

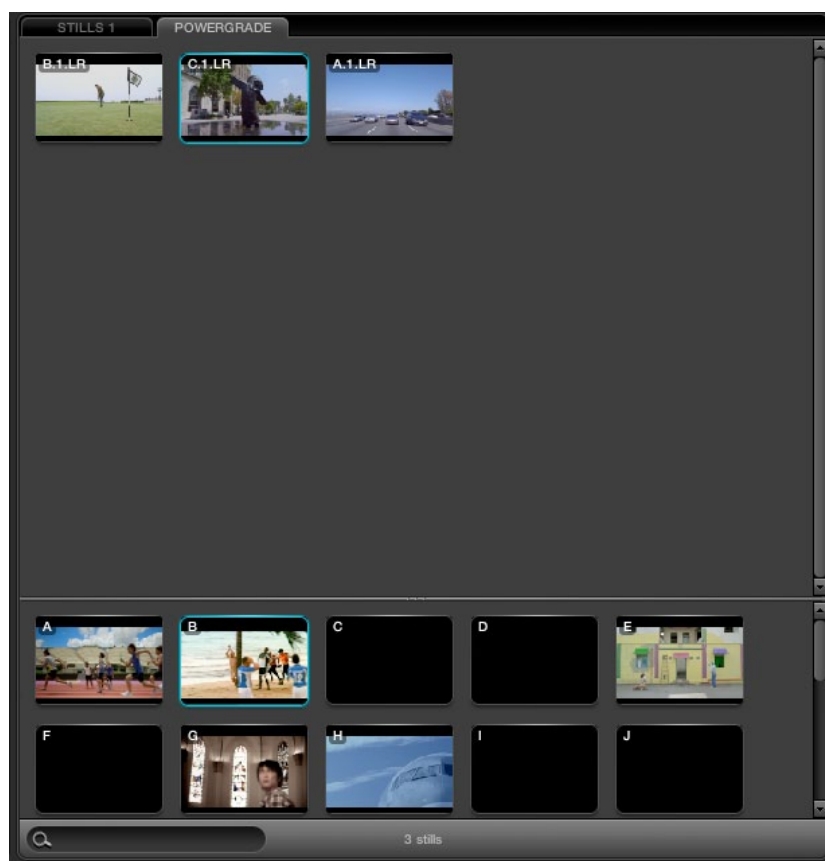
You can search for stills within the selected tab by using the Search window at the bottom left of the Stills display. Simply place your cursor in the Search window and click, then type the name or description you are searching for and DaVinci Resolve will automatically show the results in the tab above. Note there is also a still count, which will show how many stills are in this tab, or how many are shown based on the search.

PowerGrade

The PowerGrade tab shows stills that are always available and referenced to the User Name no matter which Project you have open. Normally stills relate to Sessions within a particular project. You can always copy stills from other Users and other Projects, but this is a manual process and there are times when you may just want to have specific stills, with their Node Graphs, that are always available to you no matter which project you have open.

The PowerGrade stills are the same as all others in most respects. The ability to see these stills when you open another Project provides a simple way to copy grading information between Projects. As the Node Graph is saved with the PowerGrade still, complex multilayer grades with LUTs can be saved and recalled with ease.

This also makes them ideal for specific 'looks' that a colorist makes for later use. You can drag stills into the PowerGrade tab from your Memories, or save directly to the tab.



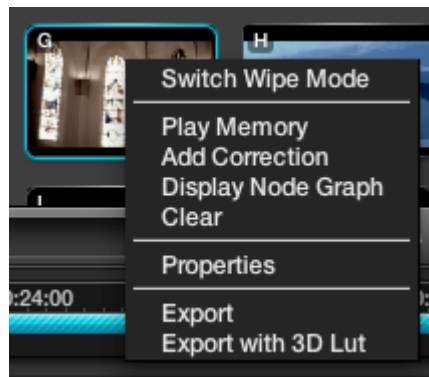
PowerGrade

Memories

Within DaVinci Resolve, every scene has a grade that is stored in an active Memory. Colorists consistently refer to this current Memory and compare it to the stills to match grades. You can always clear this Memory to get to a default Memory by using the Base Mem control. Comparison of the current Memory and Memories that are used very often, is easily done using the A to Z Memories, which you will find at the bottom of the Still section. These stills are in most respects the same as the others in the Stills or PowerGrade tab with the exception that you can save and recall the stills from the control panel with great speed.

On the DaVinci Resolve control surface, simply select 'Current' and then one of the A to Z Memory keys to save the current scenes grade to that Memory. The 'Current' and A to Z keys are on the fader and also the Transport panel. In each case, the Memory is seen in the Memory display with a small letter that identifies to which Memory it was saved. To recall a grade from the Memory, simply select that Memory with a one button selection.

A key feature for the stills is the capture and display of the Node Graph which will show you how the grades were constructed. This also applies to the Memories. Right mouse click on an image within the Stills display, and the 'Display Node Graph' option to display the Node Graph. Various sections of the correction can be copied to the current correction by dragging the appropriate nodes to the current Node Graph display, or select the 'Apply Correction' button to copy the entire correction into the current clip. The Still Nodes may be dragged on top of an existing node to replace that node's enhancement or a node can be dragged and inserted independently into the Node Graph line.

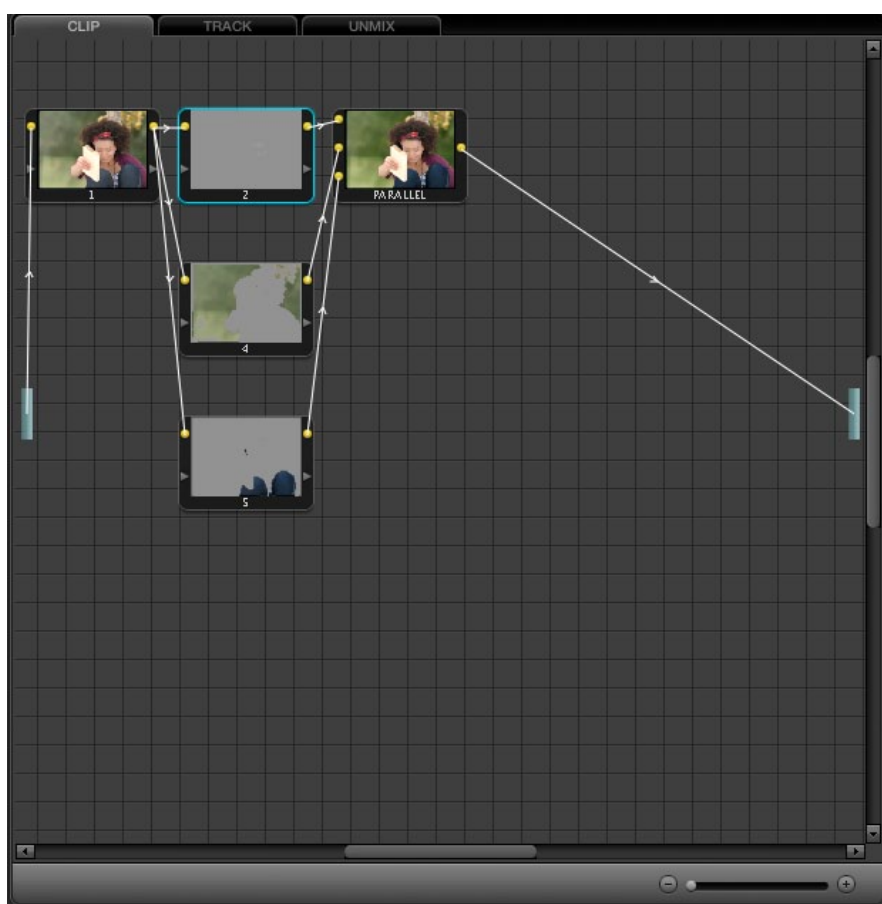


Memory Right Click Options

Node Graph

Whenever a color correction or enhancement is performed on DaVinci Resolve, it must be carried out within a node. The Node Graph, found in the upper right of the Color screen, provides a visual representation of the image processing path and node/layer priority for every correction for each clip. The Viewer display and the grading monitor present the output from this Node Graph. There are three tabs in this window: Clip, Track, and Unmix.

Functionally, the Node Graph works the same for each tab, however, each shows a different perspective of Resolve's image processing. Detail of this will be covered later in the Dynamics Timeline section of this chapter. On the left and right hand side of the Node Graph is a blue rectangle. Consider these points the Input and Output, respectively. By default, DaVinci Resolve draws the Node Graph with a single 'Correction' node from the Processing Input box and the node's output connected to the Processing Output box.



Node Graph

The nodes have a yellow dot for the image Input and Output hooks, and a yellow triangle for the Key or Matte Input and Output hooks. It is important that the connecting line from the processing input on the left through the various nodes via the image hooks, is connected to the output on the right. If the connection path is not complete the nodes will not display images, but instead will show an icon and the correction will not be visible on the Viewer or Grading monitor.

With the path complete, the image shown in each node within the graph will give you a visual indication of the correction that is taking place within that node. The Node Graph display may be zoomed by using the rotary center mouse button, and moved by dragging the mouse while holding down the center mouse button.

Managing Nodes

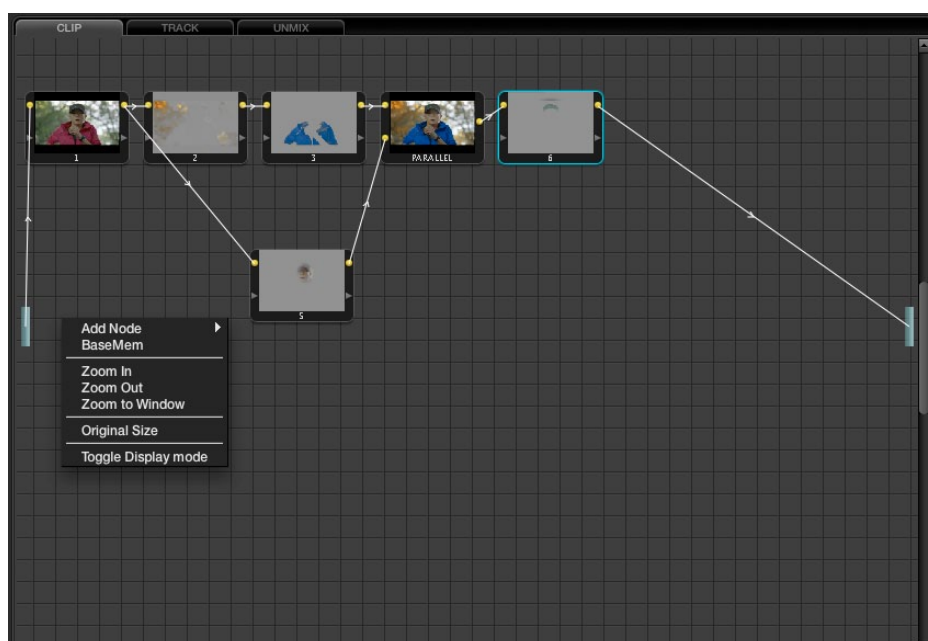
The current node will be highlighted with a border. Select nodes with a double click of the mouse or on the control panels. On the DaVinci Resolve control surface, select the node number (e.g. 3), then 'Select Node' on the Job/Shuttle panel, or use the 'Previous Node' or 'Next Node' keys to toggle through the nodes.

To add a node, right click on the Node Graph and select 'Add node.' Or use the control panels to add a Serial or Parallel node. A node may be deleted by simply clicking on the node image, right mouse clicking, then selecting 'Delete' from the pull-down menu. The order that nodes are linked may be changed by first right clicking on the links connecting the node and deleting them, then re-positioning the nodes to place them in the new order. And finally, reconnecting the nodes by selecting the node connector with a left mouse click and dragging the link from one node to another.

The nodes may also be re-arranged within the graph in order to view them better by simply dragging them with the mouse to the required area.

Two nodes can be linked together to provide a PowerWindow inside/outside operation. With a PowerWindow in the first node and the image and key outputs linked to the inputs of the next node, the second node will use the key input and automatically invert, so you can grade inside the window in node one and outside in node two. More details on PowerWindows are found later in this chapter.

All of the node corrections in the Node Graph can be bypassed by using the keyboard Up and Down keys and an individual node bypass by simply clicking on the left of the number located at the bottom of each node.



Right-click over the node graph

Corrector Node

The 'Corrector' node has two inputs and two outputs, one each for the image and the key (Alpha or Matte) respectively. The Image Path is via the yellow dots and the Key Path via the yellow triangles, which are greyed out if not active.

A Corrector node can best be compared to a full-featured layer or channel of color correction. The node can be utilized for primary and secondary color correction and can include PowerWindows, Tracking, Blurs, etc. and can work in Serial mode (otherwise known as cascade), or Parallel mode, depending on the correction required.

There is no limit to the number of nodes on a Node Graph and so it is common to use a new node for each layer or element in the image that you wish to enhance.

Parallel Mixer Node

When nodes are connected one after the other this Serial or Cascade configuration effectively links the output of the first node to the input of the next and so on until the last node, which finally links to the Node Graph output. This is the point where the Viewer and Grading monitor is connected.

As each node modifies the image it changes the range of data available to the next node. An example would be a node one that removes all the color in the image. Its output is a black and white image and the following node only has this black and white image to work with. You can not add color on node two by increasing the gain for any color channel as there is no color at the input as supplied by node one.



Parallel Mixer

An alternative way to work is to put the nodes in parallel rather than in series. The nodes can then have a common input, the full range data, and each can produce the individual enhancement and output to a Parallel Mixer node.

The Parallel Mixer node is a multiple input and single output node for images. (There is a Key Mixer node we will cover later.) When you add a Parallel node to an existing node, DaVinci Resolve will automatically add one Corrector node below the current node and will also add a Parallel Mixer node. The current node and the new Corrector node will have the same input source, which can be the original file source or the output from another node. Both the current and the new Corrector nodes will have their outputs connected to an input on the Parallel Mixer. If you add one more Parallel Corrector node the Mixer will add another input.

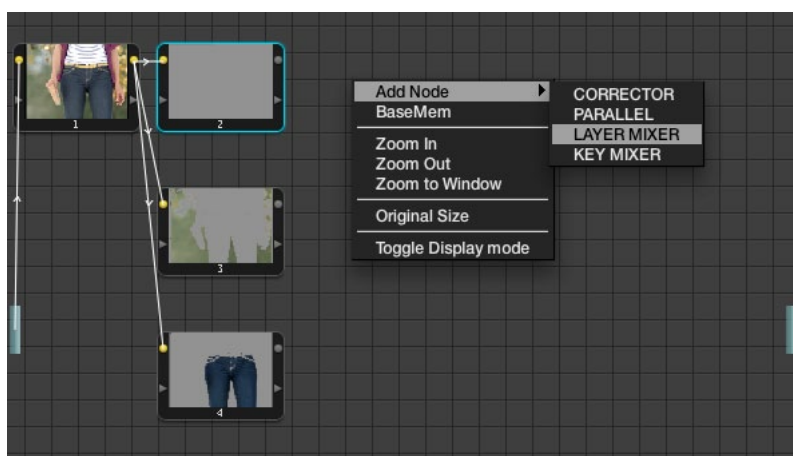
A Parallel Mixer node will mix all the inputs with equal processing priority.

Layer Mixer Node

The Layer Mixer node appears at first sight to be similar to the Parallel Mixer in that it allows for multiple Corrector node outputs to be mixed into one node. While the Parallel Mixer processes all the inputs with equal priority, the corrections in a Layer Mixer are prioritized from top (least priority) to bottom (greater priority). As you add additional Corrector nodes to the Layer Mixer they are placed with a higher priority on the Node Graph below the preceding node.

Changing the position of the links that are connected to the Layer Mixer node inputs will change the priority. You may also add additional inputs to the Layer Mixer node with a right mouse click on the Layer Mixer node and selecting 'Add Input.'

Layer node operation is ideal when you have multiple inputs to the mixer and you want some to mask others or have a greater influence over the mixed image.



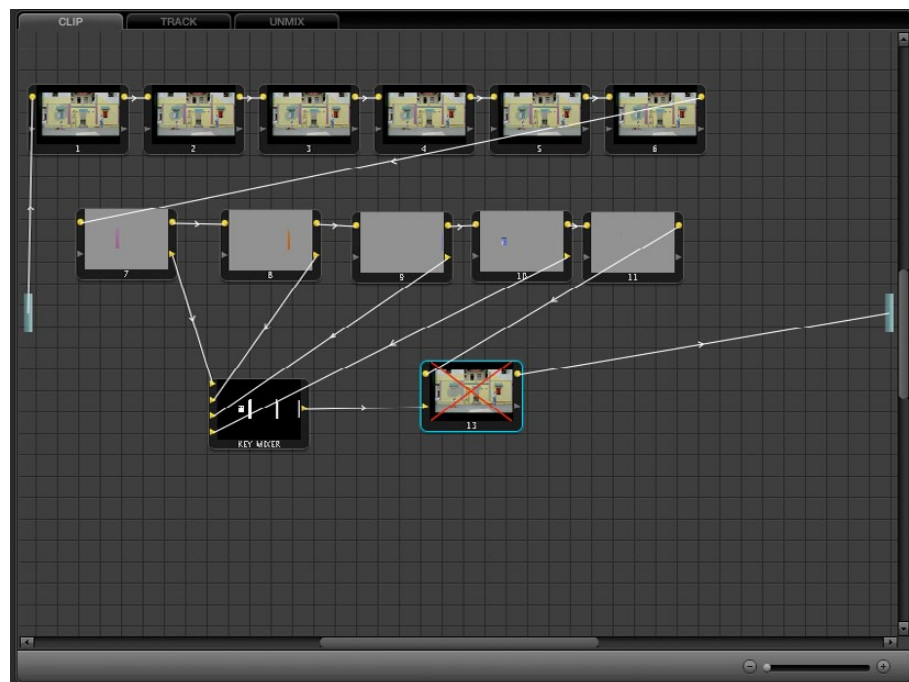
Layer Mixer

Key Mixer Node

The Key Mixer node allows you to mix the key outputs from multiple nodes and combine them within the Key Mixer node in order to produce a composite key signal. To create a Key Mixer node, right mouse click within the Node Graph display and add a Key Mixer node by selecting the option within the 'Add Node' section of the menu.

The Key Mixer node comes with two inputs when first created, but additional ones can be added with a right mouse click within the Node Graph display and choosing the option 'Add One Input.'

To adjust the parameters of each node, which is fed into the Key Mixer node, use the Input section of the Key tab. The Gain Control within the Post Mixing section can be extremely useful for adjusting the amount of effect the final correction will have within the image.

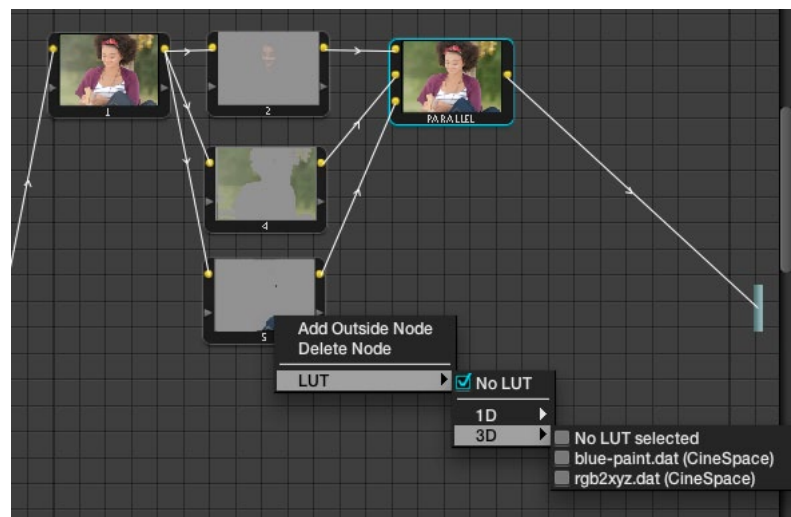


Key Mixer Node

LUT applied within a node

You can apply look up tables (LUTs) to nodes within the DaVinci Resolve Node Graph display. Simply right mouse click on the desired node and apply either a 1D or a 3D LUT from within the options available in the menu. Applying LUTs in this fashion allows you to emulate various effects and can also be used with the qualifiers.

The LUT list used here is the same as found on the Config screen.



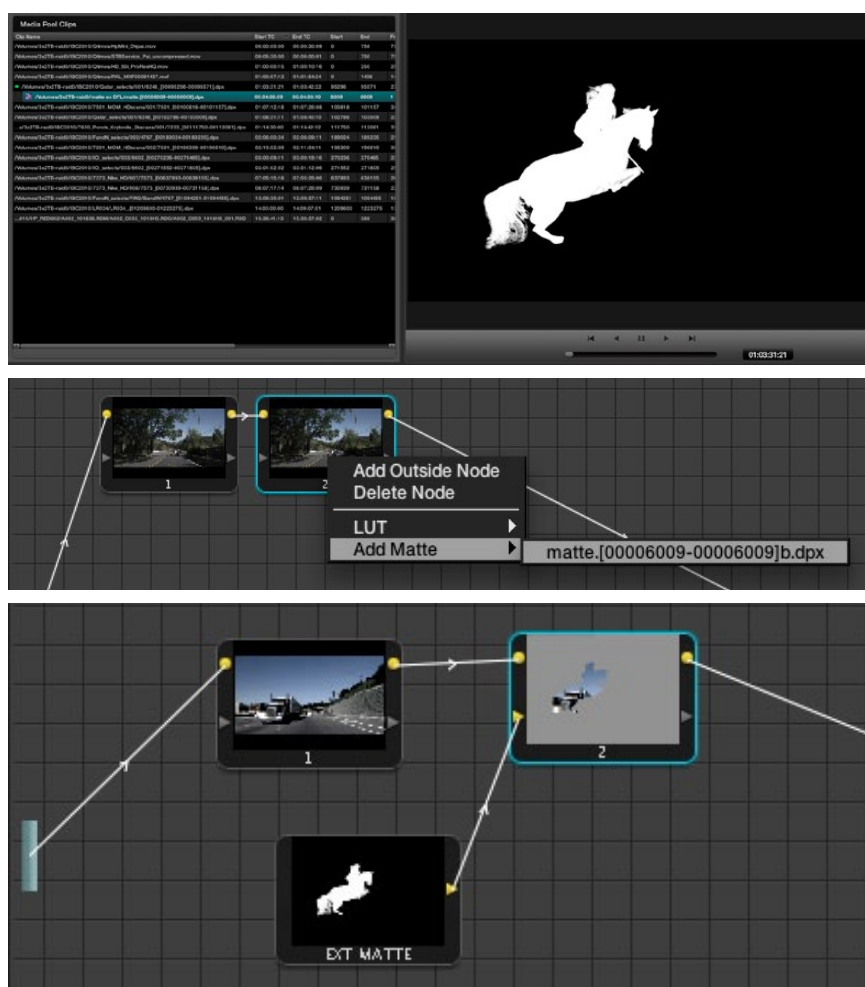
Adding a LUT to a Node

External Matte Support

DaVinci Resolve supports unlimited external mattes within a clip. These external mattes must be linked to the associated image within the Browse screen Media Pool. To recall the external matte within the Color screen, right mouse click on the node within the Node Graph display and select the associated matte file or press the M key on the DaVinci Resolve control panel keyboard.

Once the external matte has been associated you may apply a grading inside the defined area. If you select the 'Ext Matte' node with the mouse, a new series of controls will appear on the DaVinci Resolve control surface.

These controls allow you to adjust the matte for optimum results. A second key tab in the UI allows further adjustments to position and size.



External Matte Support

Timeline

Directly below the Viewer, Stills, and Node Graph display is the timeline which shows all the clips in timecode ascending order. The timeline can be sorted in Source (C-Mode) or Record (A-Mode) order. In Source mode, no EDL is considered as all clips are placed one after the other in timecode ascending order, complete with holes in the continuity of the timecode.



Timeline with clip thumbnails

In Record timecode order (A-Mode), the EDL defines which clip is placed first and the following clip order. Each clip is not only sorted for order, but the in and out points of each clip are used to define the clip length. If there is a dissolve between two clips this is also displayed in the timeline. Change the sort mode of the timeline by selecting the 'Command Page Down' button on the keyboard to select the Record or A-Mode. Select the 'Command Page Up' button on the keyboard to display a source or C-Mode order of clips. If Source mode is selected, the word 'Source' will be displayed on the right hand end of the timeline.

The white vertical line shows the current position along the timeline and this matches the frame displayed in the Viewer. When you select 'Play' on the control panel, or mouse on the UI, or use the space bar on the keyboard, you can then play the various clips one after another within the Project. The current clip is highlighted for easy identification.

If you are in Loop mode the timeline will also display in and out markers and a highlight showing the frames that are in loop play. You can also scroll through the various clips by dragging the vertical white line back forth across the timeline or jump to another clip by clicking on the timecode portion of the timeline. The vertical white line will jump to that location.

Below the timeline is a scroll slider that is used to expand and contract the timeline so you can zoom in to review a single scene or expand to see the whole Project.

Clip Thumbnails/VSRs

Located directly below the timeline scroll slider are the Clip thumbnails. The current clip will have an outline. When the Project has more than 15 clips, the current clip will be positioned in the center of the clip thumbnail display with thumbnails either side, indicating the clips on either side of the current clip, regardless of the length of those clips. If you click with the mouse on a thumbnail, this will automatically cue, or jump, to this clip.

Correction Management with the Thumbnail Timeline Display

When any type of correction is applied to a clip, metadata for the change is automatically saved for the clip into the clip thumbnail. You can copy any corrections from one clip to another by recalling a Memory, a clip number or even by scrolling to another clip, making it current, and copying the correction to the new clip using the center mouse click.

Clip Thumbnail Indicators

In addition to displaying the color corrected image in the clip thumbnail, each thumbnail has a number of other valuable indicators of the clip and operational status.

The clip number can be seen on the upper left of the thumbnail. If there are multiple versions of the grade for this clip the numbers to the immediate right of the clip number will show the current version number and how many versions there are. In the screen capture below there are two versions of grade and version two is current. Under these numbers is the version name. If you have entered one, in this case "DOP's", this same location would also indicate a local or default version if alternatives are made. See Versions later in this chapter for additional details.



Clip Thumbnail

On the upper right of each thumbnail, you will see the EDL event number followed by frame number of the current frame if anything other than the first frame is shown. In the case shown above, we are seeing frame 420. If you click and drag the mouse back and forth over the thumbnail, you can view the contents of that clip within the thumbnail and even leave it parked on a specific frame. This is particularly helpful to locate the key frame, or move off the first frame if its black, or does not represent the key element of the scene. The frame indicator will update accordingly.

At the bottom of each thumbnail, DaVinci Resolve displays the timecode for that frame of the clip. This timecode updates as you scrub over the clip. Below the timecode there may be a white box. This is displayed if the colorist selects the Render Cache mode and it indicates the progression of the render cache for this clip. You may also see a colored rainbow line at the bottom of the thumbnail. This line indicates that the clip has had some alteration from the raw default settings. The rainbow is a quick and clear indication of those clips not at default, and will therefore need attention.

The clip thumbnails may also have a red outline. This indicates that these clips are in a group and grading changes to one are automatically made to the others.



Red outline indicates grouped clips

Normally, Colorists compare the current shot to a Gallery Still or to the offline video, but you can select any clip on the timeline to be the reference.



Orange outline indicates the clip used for reference wipe

When you are working on material that has been conformed based on an EDL, certain clips may be re-used within the EDL. For example, part of the whole clip may contain material which is needed for one part of the EDL conform, however, another part of the same clip may contain material that is required for later parts of the EDL conform. When this occurs, you will see a small red box located at the upper center of the clip thumbnail. Whichever clips contain this red block will share the same correction as it is the same clip.

Local versions of this clip can be made at any time by the right-click selection 'Local Version.' See 'Versions' later in this section for a description of adding new and switching versions.



Common Source Clip Indicator

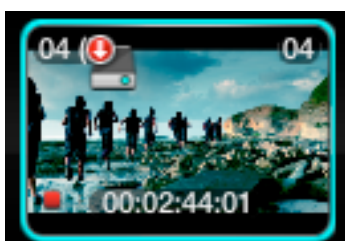
Just to the left of the timecode you may also see a red or green box. This identifies clips selected for restoration by a DaVinci Revival system. The red box is shown when the clip is selected, at the same time the Revival screen lists the actions requested.

The green box indicates that the Revival repair has been completed. You can check and verify the repair or return the image to the Revival operator for further work. Details of this operation and interaction with DaVinci Revival are found later in this guide.



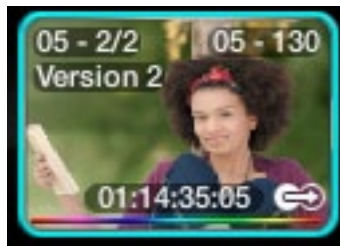
Red marker indicates clips/frames
sent to the
Revival repair list

If you have selected a clip for render cache, a disc icon will be placed on the top left of the thumbnail.



Render Cache Indicator

On the right of the thumbnail you will occasionally see the Tracker indication. This identifies that this clip has Object Tracking. If you have modified the clip length it is a useful reminder to check that the track now covers the complete clip.



Tracker Indicator

Local and Remote Versions

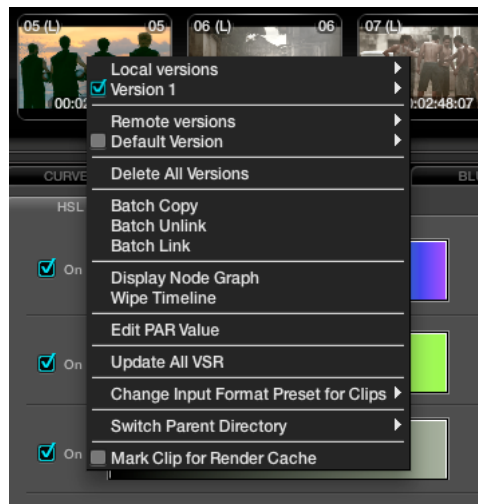
There are a number of time saving right-click options within the clip thumbnail.

When the project images in the Media Pool are first conformed, you generate a default session or default timeline, called the Master Session, using the 'Create Default' button on the Conform screen. If there is an EDL, that is loaded afterwards, the EDLs will be listed by their names after the Master Session in the EDL file label section on the Conform screen. When you work with the Master Session within the Color screen, any color corrections that are made to any clip will be automatically applied to the other conformed sessions (other EDLs), regardless of the order of the clips in those EDLs. This will save you quite a lot of time as you can grade many different versions of the EDL automatically, and when changing EDLs using the same clips, all of your grading metadata is automatically applied to the new session/EDL.

When you are working on the Master Session but want to create an alternate version of a color correction, the new version is called a new Local Version (i.e., you want to keep the original version but also have another). As this is the Master Session, these versions are also available for use within the other conformed sessions (other EDLs), but are listed as Remote Versions in those EDLs. This allows you to keep a Master Session grade which is valid for most sessions but also have one that is just for a specific session (e.g., for the Trailer).

If you are on a session other than the Master Session, you can make Local Versions that will be available only for that session, or Remote Versions that will be available for all the other sessions (except for the Master Session where it will listed it as another Local Version).

Every Remote Version of a grade made on every session relates to the Master Session, so if you render each Master Session grade you will have the graded versions for all the various sessions.



Timeline right-click option

When you access the New Local Version option from the timeline thumbnail pull-down menu, it will first prompt you for a name for this version. Versions of grades can be loaded, deleted, named and selected using the right-click pull-down menus.

You can create additional versions of corrections that have been made for a particular clip. Each version will be available by right mouse clicking on the clip and selecting the version. You may also de-select a batch version of a conformed list that can then contain an alternate version of corrections. These additional versions can be named and the names are displayed in the clip thumbnail.

Group Versions

If you have multiple clips that share the same color correction, you can define a Group by right clicking on a clip and selecting 'Add Into A New Group.' Enter the Group Name and you will see it in the group list at the bottom of the pull-down menu. To add multiple clips, hold down the Ctrl key on the keyboard and select the various clips. Once the last clip is selected, use 'Add Into Current Group' from the pull-down display.

When there are changes to the correction that are to be applied to the Group, you can select how the correction will be rippled to the various clips within the Group. Right mouse click on a clip within the Group, then within the pull-down menu choose the appropriate Group Name and move the mouse to the 'Change Ripple' selection. Once this has been done, another menu joining these menus will appear. This menu will give you the opportunity to change the ripple type, to make the target clip the exact changed value, or make the change by percentage or unit value, or to have all values copied, as defined in the Configuration screen settings tab.

Batch Versions

When you begin to color correct using the Master Session, all corrections are automatically applied to the other conformed versions. This means that the Master Session is Batch Linked to all the other conformed versions. If you wish to create a different version of the color correction in another timeline, simply select the desired version, right mouse click on a thumbnail, and select 'Batch Unlink.' This conformed version will not share the same color corrections as the Master Session or any of the other conformed versions. If you select 'Batch Link,' the corrections within this conformed version will revert to the corrections seen in the other conformed versions.

Batches may also be copied using this right-click option.

Display Node Graph

Just as you selected to display the Node Graph from Stills or PowerMaster Stills, you can do so from the timeline Thumbnail.

Wipe Timeline

The thumbnail will display an orange border indicating it is the active reference. When you deselect the clip the Gallery becomes the reference.



Orange outline indicates the clip used for reference wipe

Update All VSRs

To update the thumbnail images select 'Update All VSR'.

Edit PAR Value (Pixel Aspect Ratio)

The PAR (Pixel Aspect Ratio) setting in the Media Pool will always have an indication, either square or one of the other many PAR formats offered. To change the PAR for any clip, select the Thumbnail with the right-click option, then select Edit PAR Value and then select the appropriate PAR from the pop-up box.

Change Input Format Preset for Clips

To set Input and Output Format Presets that can be used with Session clips and apply as global presets, make the changes from the Configuration screen or for Clip presets, within the Media Pool. Presets can also be applied from within the Format screen, or as identified here, by right mouse clicking on a thumbnail within the Color or Format screen.

These are pre-defined settings for various image scans and are useful, for example, when a film has been over scanned. Instead of having to resize every clip independently, the user can resize a clip and use the preset to apply to all. If you select 'None,' this will indicate that no settings have been applied.

Switch Parent Directory

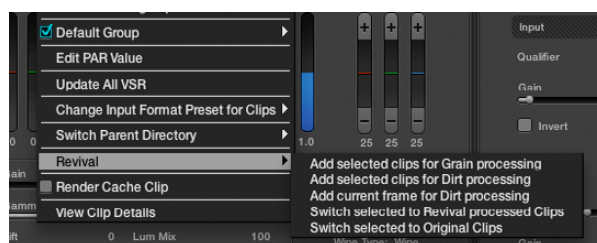
With a pre-conform workflow, there are often different versions of conform available on the SAN in separate folders. DaVinci Resolve allows easy toggling between different versions of conform using switchable Parent Directories.

The function can be accessed using 'Switch Parent Directory' from right-click menus in the Media Pool and the Conform Panel, and also from the Color screen timeline.

DaVinci Revival

DaVinci Resolve image storage and its database can be shared with a DaVinci Revival system. In this configuration the Resolve operator can select a clip for action by the Revival operator.

The options are: Add selected clips for Grain processing, Add selected clips for Dirt processing, Add current clips for Dirt processing, Switch selected to DaVinci Revival processed clips, and Switch selected to original clips. Revival will only process DPX images so to send images to DaVinci Revival for processing you need to render non-DPX images first.



Timeline Right Click – Revival Options

When the DaVinci Resolve operator sends a clip to DaVinci Revival for Grain or Dirt processing, a red indication on the thumbnail to the left of the timecode will indicate the request has been sent. The DaVinci Revival screen on DaVinci Resolve will list this and all other requests.

When the DaVinci Revival operator has fixed the images and marked them as repaired a green indication is shown on the thumbnail. You can select 'Revival Processed Clips' or switch back to the original clips if you are not happy with the repair. Further information on DaVinci Revival operation is available from the DaVinci Revival User Guide and there is more information on the interface with DaVinci Resolve in the DaVinci Revival chapter later in this guide.

Render Cache Clip

DaVinci Resolve has a number of Background Render Cache options and one of these options is where the user selects to render cache a clip.

The user may flag clips that should be render cached within a Project. This can be done by right mouse clicking on the clip and selecting the 'Mark for Render Cache U' option from the menu. The hard disk icon will appear on the top left-hand side of the thumbnail when the clip is selected by the user to be cached.

When the cache process is started by the user, a status indicator at the bottom of each thumbnail will show the progress of the cache generation process. The bar will first appear in white and the length of the bar represents the amount completed. Clips marked for 'Render Cache U' will render if 'Cache U' or 'Cache +' or 'Cache All' is selected.



A clip that has been flagged
to be Render Cached

View Clip Details

DaVinci Resolve maintains metadata relating to all clips in the Media Pool. This info is accessible using the View Clip Details option.



Clip Info

Audio Timeline

While DaVinci Resolve is a color correction and enhancement system, it does play back guide audio. When a .wav or AIFF file is selected in the Conform screen to play with an EDL, the audio can be displayed on the Color screen by right clicking on the timeline and selecting 'Show Audio Waveform.'



Timeline with Thumbnails and Audio

The waveform for the audio track can be slipped in time to sync the audio to video by using the control key (Command in Mac) and the mouse to drag the clip up and down the main timeline. Alternatively, you can select the 'Audio Offset' dialog box with a right click on the audio waveform and enter the offset you need.

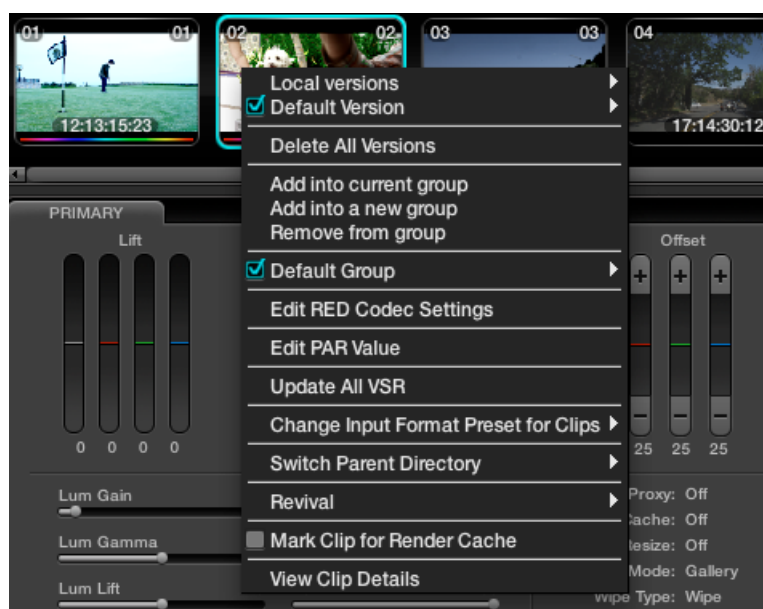


Audio Offset

RED r3d Clip Decoder Control

DaVinci Resolve offers native RED r3d decoding. In the Configuration screen Source tab you can select to use the RED Default decoder settings, the camera metadata, or set project based decoder parameters for DaVinci Resolve to decode and debayer the r3d files. On the Color screen you also have an extra layer of control, a clip-by-clip control.

If your timeline has RED files, right click on the thumbnail to reveal the option 'Edit RED Codec Settings' and this will open the decoder control window.

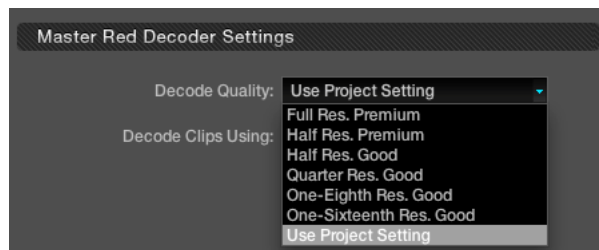


Color screen Thumbnail Right Click to select Edit RED codec settings

Master RED Decoder Settings

There are three sections to the decoder window. The first is on the top left of the RED Settings window; the configuration here sets the operation for the balance of this window.

The Decode Quality setting can be set to use the Project setting as selected on the Configuration screen, Source tab for RED, or you can select one of the other debayer and resolution settings. These settings include Full Resolution with Premium Debayer, to Half Res Premium (as often used for grading), down to the One-Sixteenth Res with Good debayer, which is often used when grading RED files on a MacBookPro.

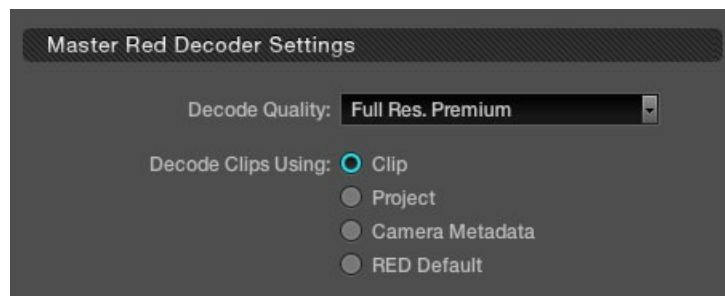


Color screen Thumbnail Right Click to select Edit RED codec settings

As you assign the decode quality you will have a direct impact on the performance of the system, so you may want to grade in a resolution which provides real-time playback, then use the config settings to switch to a higher quality/resolution for rendering. This will depend entirely on the hardware capabilities of your system.

The second setting in this area is to select the source of the RED metadata for all the other decoder settings. If you leave this setting on 'RED Default' then DaVinci Resolve will use the decode settings supplied from RED. If you select 'Camera Metadata,' DaVinci Resolve will extract the controlling metadata from the r3d file as it was set by the camera. The 'Project' setting will use the DaVinci Resolve configuration you set on the Source tab.

On the right of the window the Red Default, Camera Metadata, and Project settings for this clip are displayed adjacent to the slider controls for the Clip settings. The 'Clip' option provides you with significantly greater control for each clip. Selecting 'Clip' will make all the other controls on this window active and you can set them as you prefer for this particular r3d clip.



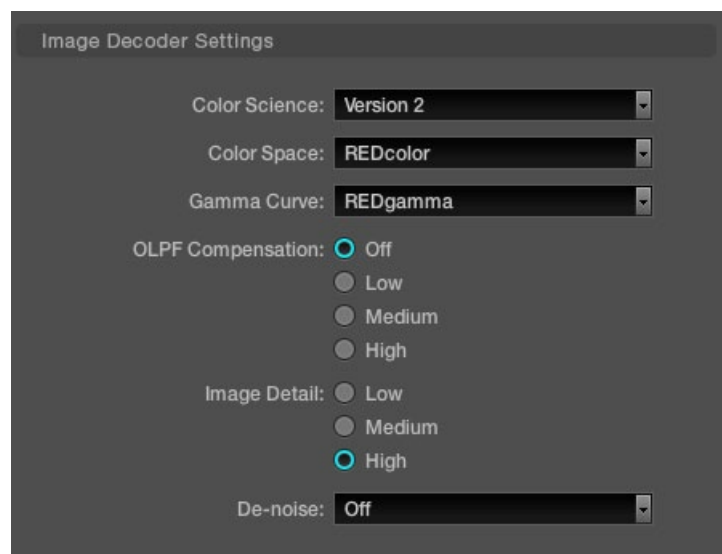
Master Red Decoder Settings - Clip Selection

Once you have selected the 'Clip' option there is also a 'Reset' button that is highlighted at the bottom of the window. If you make any changes to the clip decoder settings and you wish to revert to the settings that existed when you first opened the window, use the 'Reset' button. The 'Cancel' button will close the window with no changes and the 'Apply' button will save the changes made and close the window.

Image Decoder Settings

Once you have selected the Clip option in the Master RED Decoder Settings, all parameters in the Image Decoder become active.

- Color Science:** The original REDone camera builds used a different color science to the more recent builds. Select here as appropriate.
- Color Space:** RED offers a number of different color space options when decoding the RAW images: **REDcolor**, which is default color space; **Camera RGB**, which bypasses the matrix in the camera and uses uncorrected sensor data; **REDSpace**, which extracts a color space larger than REC.709, often used for film work; **sRGB**, which is a color space used for monitors, printers and the Internet and REC.709, which is the standard for HDTV.
- Gamma Curve:** The Gamma selections include: **Linear**, where no gamma adjustment is applied; **REC.709**, which is the standard HDTV gamma; **sRGB**, which is a color space used for monitors, printers and the Internet; **REDSpace**, which is a higher contrast color space than REC.709; **REDlog**, which maps the native 12-bit RAW image data into a standard 10-bit Log curve, and **Custom PDLog**, which offers users an alternative LOG curve, similar to Cineon, and also provides for custom adjustments as described below. The **PDLog 685** and **985** offer alternative white points for the Gamma Curve. The default is REDgamma.
- OLPF Comp:** The OLPF compensation sets a low-pass filter to reduce color moiré. There are four options, with Off being the default.
- Image Detail:** Select from the low, medium, or high sensor detail extraction options.
- Denoise:** There are seven settings, from mild to maximum, to adjust for the best noise reduction without image degradation.

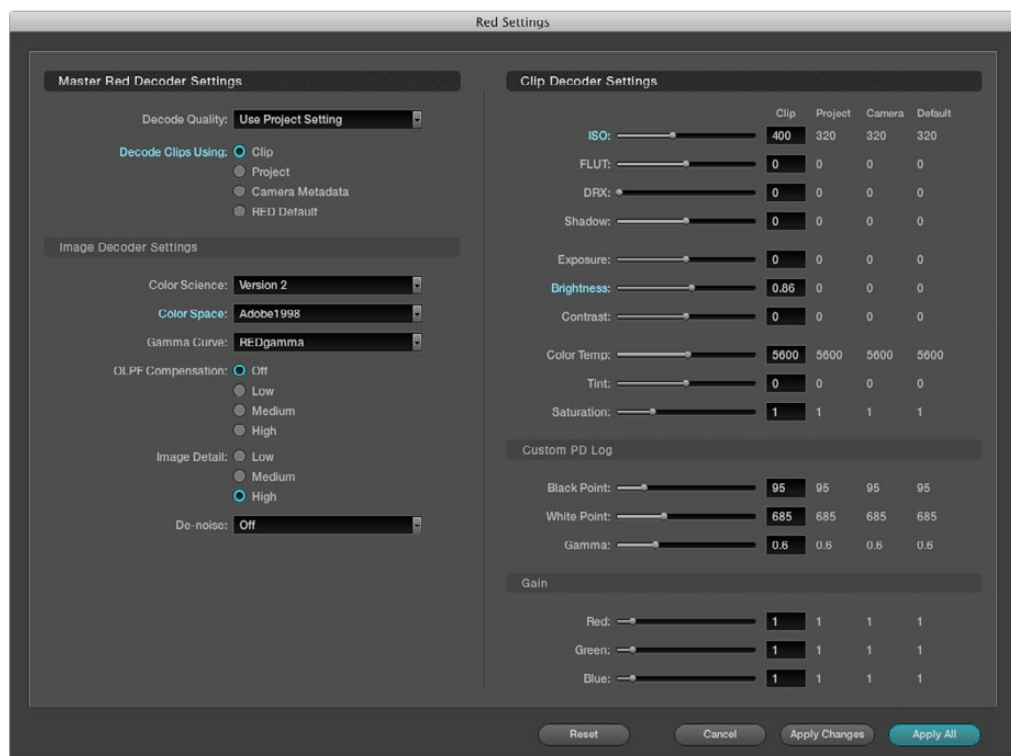


Color screen Thumbnail Right Click to select Edit RED codec settings

Clip Decoder Settings

Just as the Source Tab on the Config screen offered Project-based RED Clip Decoder settings, this window offers the same controls for each clip. You can easily compare the values of the clip settings to the Project, Camera, or RED Default metadata as these are listed on the right-hand side of the clip sliders.

ISO:	Similar to exposure this control adjusts gain from the black point to white in a linear manner. 320 is the default.
FLUT:	The Floating Point Look-Up Table controls operate within the new color space to give cleaner and finer ISO and mid-grey variation without introducing clipping.
DRX:	DRX is a dynamic range control that takes into account Color Temp (Degrees Kelvin) and Tint.
Shadow:	Provides adjustments at the toe of the FLUT.
Exposure:	Calibrated to replicate industry standard f-stops, Exposure increases or decreases the image lightness and clips the data levels at each end.
Brightness:	This also adjusts the image brightness by changing the black level, but unlike Exposure, this control will compress the image at each end of its range.
Contrast:	With the mid-tones maintained, the Contrast control adjusts the number of discreet steps in the grey scale by changing the slope of the response curve.
Color Temp:	Sometimes referred to as Kelvin, the Color Temperature adjusts the RGB matrix to consider the blue/red ratio. Common values are 3200 for Tungsten lighting and 5600 for daylight.
Tint:	Use the Tint control to adjust the yellow parameters of the RGB matrix. Ideal to correct fluorescent or sodium vapor lamp problems.
Saturation:	The color saturation is varied from monochrome at 0 value, to the default, or unity, of 1, up to very over saturated at 5.
Custom PDLog:	The Custom PDLog parameter, Black Point, White Point and Gamma are user-adjustable from their respective default values of 95, 685 and 0.6 gamma.
Gain:	The Red, Green and Blue Gain controls adjust each color channels gain with 0 being the reference point. One is unity gain and the maximum ten is ten times greater amplitude than unity.



Color screen Thumbnail Right Click to select Edit RED codec settings

RED clips can be ganged together and adjustments to the decode settings applied to all the ganged clips. Simply select the clips in the Media Pool or Color screen timeline, select Edit Red Codec Settings. Now adjust the decode parameters and watch the changes in real time. The decode parameter that you adjust will now display its title in cyan rather than normal grey indicating that you have modified that particular setting. You can select 'Apply Changes' to apply just the changed decode parameters to the selected clips, or, 'Apply All' to apply all the settings to the selected clips, or, reset to return the settings to the status when you opened the window.

This new feature is ideal for making ISO or Gamma or Color Space changes to all the clips while maintaining the camera metadata or project metadata settings for all the other parameters.

Primary Tab

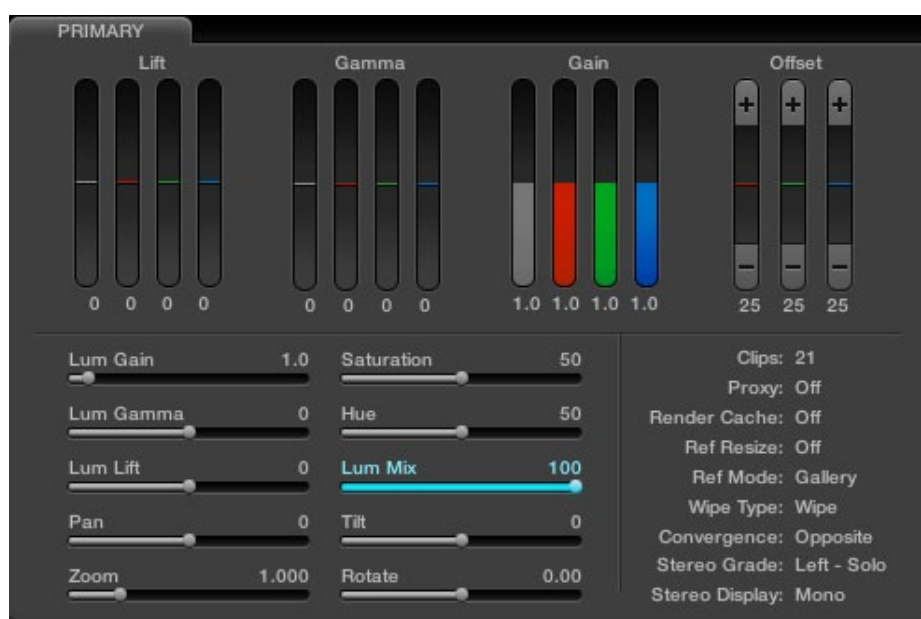
The Primary tab is located at the bottom left of the Color screen. This area displays the settings for the Lift, Gamma and Gain controls, Offsets, Saturation and the Pan, Tilt, Zoom and Rotate controls for each clip. There is also a status display providing a variety of system status indications.

Primary Slider Controls

Typically, colorists use a control surface for grading as it permits multiple controls to be adjusted simultaneously. No mouse, pen, or touch screen allows concurrent, simple and intuitive control of a dozen parameters with just two hands.

For interactive feedback, these control panel adjustments are reflected in the interface of this Primary tab, but you can also use your mouse to select any of the sliders or color bars to adjust individual parameters.

Generally, the first node in every scene is used to balance the primary values of the source clip and subsequent nodes are used for effects, but this is, of course, a user preference. The Primary Color Correction display will show the corrections that are being applied, using, from left to right, the Lift, Gamma and Gain trackballs on the DaVinci Resolve trackball control panel.



Primary Tab on the Color Page

The trackball Lift, Gamma, and Gain controls are displayed as vertical colored bars with Red, Green and Blue values for each. Adjacent to the colored bars is the Luminance value grey bar. These controls are on the left of the panel trackballs, one each for Lift, Gamma, and Gain Luminance level. They are also available as horizontal slider controls for the Luminance Lift, Gamma, and Gain.

On the right side of the right most trackball there are also three controls. The first pot adjusts the Saturation of the isolated area, the second pot is a Hue control and the third pot adjusts the Luminance mix control. Each of these controls mirror the horizontal sliders on the Primary tab. You can select them with your mouse and adjust or reset any control with a mouse click on the value adjacent to the slider.

To the right of the Color Level displays are the Offset controls and display. You can grade material by using printer light steps using the offset up and down buttons.

Input Sizing Controls

DaVinci Resolve has an optical-quality image resizing engine that can be used to position or resize images with such high precision that you can resize the image using dynamics and see the changes in real time.

At the bottom left of the Primary tab, the Input sizing controls, Pan, Tilt, Zoom and Rotate, mirror those found on the Control Panel.

Primary Tab System Status

On the right side of the Primary tab there is a system status display showing the operational status of DaVinci Resolve.

Clips	The number of clips in the timeline will be displayed.
Proxy	If the 'On the Fly Proxy' mode is selected, or proxies are enabled on the Config screen, this indication will be On.
Render Cache	There are five modes to toggle for render cache: Off , do not perform any cache; Cache All to cache all clips; Cache D to cache all dissolves; Cache U to cache individual clips marked by you for caching, ; and Cache + to cache dissolves plus user-selected clips.
Ref Resize	When On, the reference clips can be resized and repositioned.
Ref Mode	The reference for grading can be the Gallery stills, any clip on the Timeline or the Offline clip.
Wipe Type	The available wipe modes are Horizontal, Vertical, Mix, and Key.
Convergence	In Stereoscopic 3D operation, when you adjust the convergence of the two eyes there are two modes: Oppose , where the convergence control moves each eye away or towards each other, and Linked Zoom , where there is insufficient image to fill the screen due to the convergence adjustment and the images will automatically zoom to fill the screen.
Stereo Grade	Resolve 3D projects can be graded in Solo mode when only one eye is adjusted by the grade or Gang mode when both eyes are graded together. The active eye is also indicated here.
Stereo Display	The display output can be a single eye, i.e. Mono or both eyes, Stereo, as required.

Primary and Qualifier Control Sensitivity

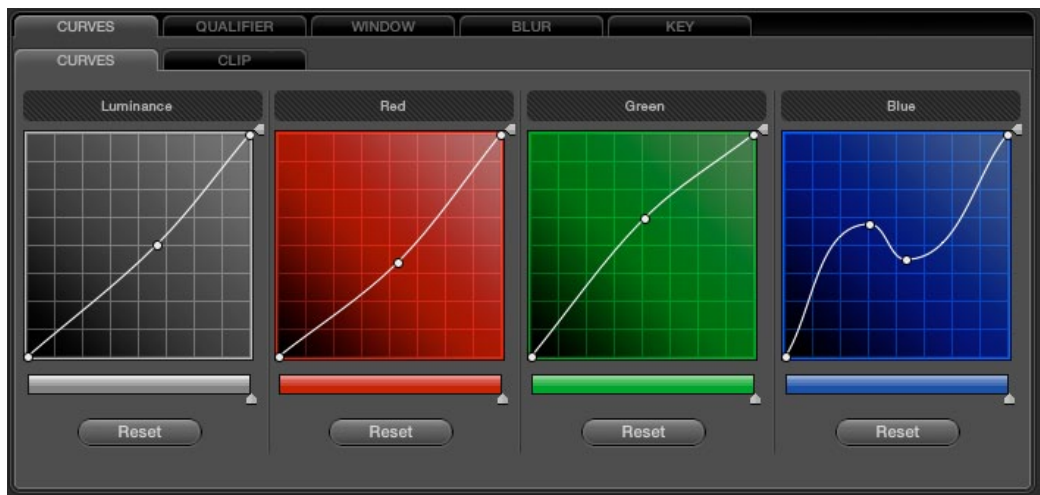
A right mouse click within the Primary Color Correction window will pop up a menu allowing the user to either reset the primary values or open the Controls dialog for panel control sensitivity. Within the Panel Control window, the user may set the sensitivity for the Lift, Gamma and Gain trackballs on the DaVinci Resolve control panel as well as the sensitivity of the Qualifier controls for the secondaries. When the desired amount is applied, click on 'Save' and then close the window.

Curves Tab

Curves

DaVinci Resolve's Curves tab is in the lower center section of the Color screen and resides with a number of other tabs used for grading; quite often for every clip. Select a tab with your mouse or via the control panels.

Within each primary or secondary color correction node, you can add a custom curve or even invert the curve to create an effect comparable to the YSFX feature on the DaVinci 2K Plus. There are also Hi-Clip and Lo-Clip control tabs available.



Custom Curves

DaVinci's famous Custom Curves are very simple to use and provide clean adjustment of the Y, R, G, and B levels within each clip.

The slider bar at the bottom of each curve is a control to mix in the full influence of the curve (the highest level), to a lower influence.

All curves can be adjusted separately, but you can also copy a curve from one to another. Center mouse click on the Source Curve, hold the center button down, move the mouse over the other curve (the destination), and then release.

The Reset buttons below each curve will completely reset the curve. To delete all Custom Curve settings, simply right mouse click within the Tab background and select 'Reset Custom Curve.'

YSFX

Also contained within the Custom Curve display is the YSFX operation which allows you to invert the chrominance and luminance to create special effects within the image.

The YSFX is controlled by clicking and moving the slope markers on the right of each channel on the Custom Curve display. As with Custom Curve effects, YSFX may be combined with Power Windows to further enhance the correction by creating effects such as vignettes.

Clip Tab

To adjust the highlight and lowlight clipping on a clip-by-clip basis, and also to apply soft clipping for either the blacks or the whites within the image, use the Clipping Curves controls on the Clip tab.

The vertical slider control adjusts the curve clipping point for the high clip on the right and low clip on the left of each color graph. The bottom sliders adjust the slope of the curve transition. Soft clipping can be extremely useful for retrieving details that may be lost when adding extra brightness to the image.

Secondary Color Correction

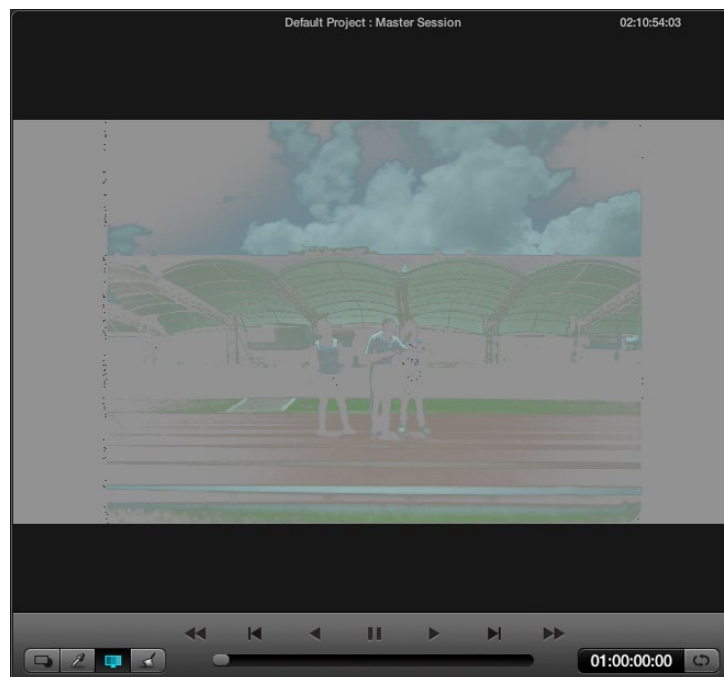
Once the primary color correction has been completed, it's very common to create a secondary color correction by adding another node so that the first node, used for the overall primary balance of the scene, can remain 'clean' of special grades. It can now be used as a source of images for future nodes.

Secondaries are adjustments to a section of the image as qualified by various parameters, where Primary grades are for the whole image. In effect, you are making a live key control to cut out the old image and replace it with new. In this case the old and new image are the same, but with a different grade. To make a secondary grade, first select the Qualifier tab on the user interface.

Hue, Saturation and Luminance Qualification

To change the grade on a specific section of an image, you must first select the portion you want to change. One selection type is the Hue, Saturation, and Luminance (HSL) qualifier. Select the HSL sub tab, place the cursor over the area of the image you wish to qualify, and select with the left mouse button. You can adjust the qualification for the secondary color correction isolation immediately, but a simpler way to view the selected area is by pressing the 'Highlight' button on the secondary tab.

The image on the Viewer and Grading monitor will now only display the image that is qualified; everything else will be replaced with gray. There is a high contrast mode set in the Config settings tab to make this a black and white rather than gray contrast. Under the 'Highlight' button on the UI, the Invert button will invert the Image and Qualifier controls, so instead of using the Qualifier controls to select the area to make a change, you are in fact selecting the areas you will not change.



Highlighting the Qualified Areas

Next adjust the Hue, Saturation, and Luminance Qualifiers to get a cleaner qualification. First, start with the Hue Qualifier, which is shown as a rainbow colored bar to indicate the range of Hue values available.

When you select a color on the image to qualify with the cursor or mouse, the selected color will be indicated within a white border on the Hue display. Adjusting the 'Center' control, will make the white border move up and down the display. 'Width' is used to narrow or broaden the range of the hues selected. You will see the result on the Grading monitor as well as on the Hue display.

The 'Soft' control will change the attack angle of the qualified hue selection from the normal hard edge to a softer ramp. The 'Symmetry' control changes this softness parameter at either side of the hue range. Balanced symmetry has the soft slope even on each side, or one side of the control range can be hard while the other soft.



HSL Qualifier

The next color band shows the Saturation range of the hue selected. Again, the white border is displayed around the pixel value selected. The 'Low' and 'High' controls adjust the respective Saturation level and 'Soft' controls the slope to adjust the ramp on either side of this range. The same group of controls are available for the Luminance settings, with the Luminance bar showing a black to white range.

Once you have finished with the Qualifier adjustments, press the 'Highlight' button once again and the picture will return to a Normal view. Now that you have qualified an area by its Hue, Saturation and Luminance values you may use the Trackballs and other grading controls to adjust the color within the qualified area.

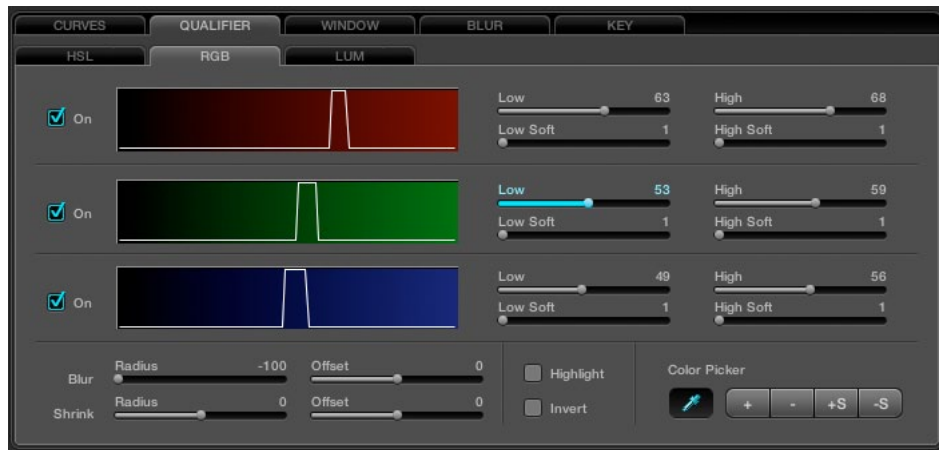
You will notice the Node Graph display of this node and the thumbnail under the timeline will update to indicate that a secondary grade is being made in this node.



Color Screen Qualifier

RGB Qualification

If you select the RGB button within the Qualification window the qualifiers will be changed from Hue, Saturation and Luminance qualifiers to Red, Green and Blue qualifiers. When this mode is activated, the cursor position will read the Red, Green and Blue values rather than the Hue, Saturation and Luminance values for the selected color. These have the same general control operations with Low, Low Soft, High and High Soft adjustments.



RGB Qualifier

Luminance Qualification

The next tab is for Luminance qualification. Its adjustments are the same as the Luminance parameters on the HSL tab and have the same function, however in the LUM tab only Luminance values are used to qualify the image.

Qualifier Blur

Within the Qualifier tabs there are a number of other controls, including the Qualifier Blur parameters. At the bottom left of the Qualifier tab, the first control is for Blur and there are two parameters: Radius and Offset. The blur range is quite large and the radius of the elements and their horizontal and vertical offset range is equally large.

The second set of sliders is for Shrink and Grow. The qualifier, once set, can be shrunk a little or grown a little, and again, you have a Range and Offset control.

Color Picker Mode

The Color Picker in DaVinci Resolve has a number of trim adjustments to assist in getting the right selection of pixel values to use for the qualification. The controls are at the bottom right of the Qualifier tab. The standard picker mode has the Color Picker icon selected. The other options change the Picker's selection of pixel values to modify the qualifier.

When selected, '+' will change the Picker mode to add new values to the qualifier range.

The '-' is used to remove some values from the qualified range. If you select a Hue, for example, and remove a similar but different hue, the width range will decrease as fewer hues qualify.

The '+S' can add values with softness and the '-S' can remove values with softness.

Be sure to return the Color Picker to the standard mode after making the trim adjustments to the qualifier values.

Power Windows

DaVinci Resolve has the famous DaVinci Power Windows, which provides a number of shapes to use for Matte and Masking of image sections. Once you have made the Power Window, adjusting the grade within the window area, or outside if invert is selected, is as easy as moving the trackballs. You will see the result of the window and the correction applied within it on the Viewer display, and the final result is the image that is seen on the Grading monitor. There are four window types: Circle, CPW; Linear, LPW; Polygon PPW; and Curve, PCW (Bezier).

Power Windows may be used to isolate a primary or a secondary color correction. They are often used with secondaries to permit fine qualification of the image and in Matte or Mask mode, depending on the type of correction required. Using a Power Window in Mask mode is generally used when the window is intended to mask out a portion of another Power Window or a Qualification.

DaVinci Resolve's object tracking will be discussed later in detail, but it's clear that windows placed on an object to permit grading within or outside the window edge will only work if the object does not move. The object tracker will allow you to create keyframes automatically for the windows to track moving objects, making DaVinci Resolve Power Windows even more valuable.

Adjusting PowerWindows

Windows can be selected in a number of ways. On the UI, select the Window tab, then select the desired window style. This also selects the settings controls for that window type. To see the window and adjust, turn it on, select to grade Inside or Outside, and then choose whether to use the window as a Matte or Mask. Change to a Matte or Mask to see the window on the UI display.



Window Tab

All Power Windows have a center point and a rotation handle. Rotation, or moving the window, is managed using the rotation handle or the axis point. The center axis of the Power Window may be moved using the control panel or by holding down the Ctrl key on the keyboard and dragging the vertical rotation line to the area where you would like the rotation axis to be relocated to. To reset the rotation axis to the image's center position, simply hold down the Control key on the keyboard and mouse click on the center rotation point.

To alter the size parameters of the Power Window, click on the cyan colored points that can be seen in the Power Window cursor lines in the Viewer display and drag them with the mouse, or alter the softness of the window, the aspect, size and even the rotation.

Inside and Outside Window Grades

It is common to grade inside a Power Window to change the image in a particular area. However, if you wish to adjust the grade both inside and outside the window independently, this is performed in DaVinci Resolve with two nodes with a Link Control that sends the key signal from one node isolation to another node.

You can manually add and link a node, or with the DaVinci Resolve Control surface, select 'Add Outside Node' on the Windows Soft menu to Add another node automatically and link the Alpha channel. You can then select the first node and grade the image inside the window and select the second node and correct outside the window. To add a Matte Link to a second node manually, connect the nodes by clicking on the Arrow icon located to the right of one node, and then drag the mouse to the Arrow icon located to the left side of the next node.

Circular Power Window



Circular Power Window

The Circular Power Window (CPW) can have its Horizontal and Vertical Position, Size and Aspect changed as well as the Softness of the window's impact on the underlying image. Quite often, the CPW is used to make a vignette. DaVinci's Circular Power Window changed the industry as it permits very small to large size settings with what seems to be infinite softness.

Use the CPW in a large wide aspect to make a grading impact on the entire top or bottom of the image. Or, use it on a single eye of the talent to change the look.

Linear Power Window

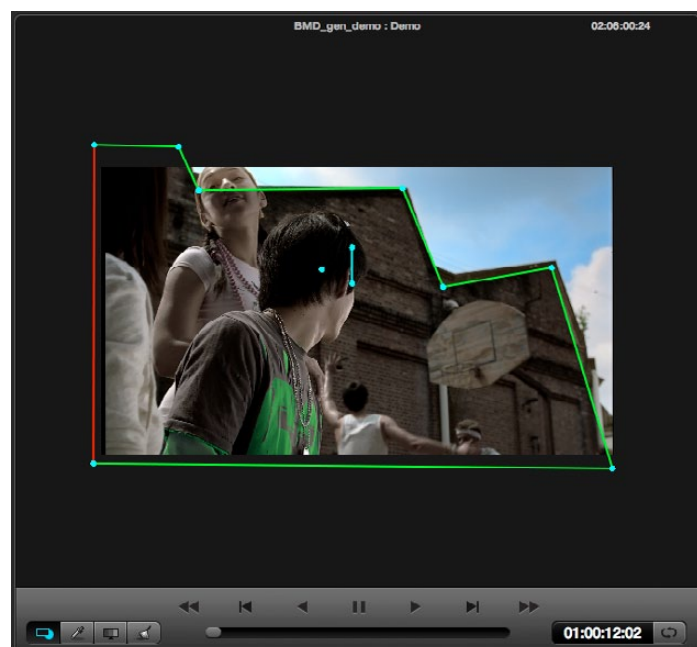
The Linear Power Window (LPW) first comes up as a square, however you may alter the position of the corners and vary the softness for each side. This gives you the ability to create very unusual shapes with LPW; these are often used for masks over circular windows.

Polygon Power Window

The Polygon Power Window (PPW) is a window with a maximum of 128 points. As with the other two forms of Power Windows, you may apply softness to the shape and even apply auto tracking. The Polygon Power Window also has individual softness for inside and outside the shape, as well as overall Softness controls.

To add more points, move the mouse to the desired part of the shape and left mouse click on the window line at the position where you need the point. Move the point by selecting the point and dragging it with the mouse. To delete a point, select the point then center mouse click.

To change the center of rotation for the shape, press the Control key on the pull-out keyboard and drag the cyan colored center graphic to the desired location. Apply separate inside and outside softness to the shape by accessing the Isoft or Osoft controls with the mouse on the Window tab.



Polygon Power Window

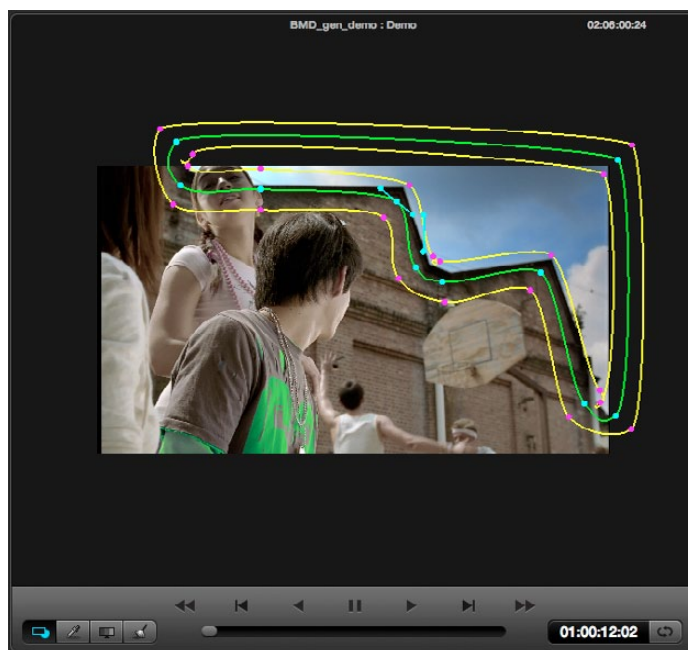
Power Curve Windows

To add a Power Curve Window (PCW), or Bezier window as some colorists call it, selection of the window style is no different to others for the UI or the DaVinci Resolve control panel. Unlike the other available windows, there is no default points or shape for the Power Curve Window. Once the PCW is enabled, the “Curve” may be created by clicking in the Viewer using the left mouse button. To complete (close) the curve, press the middle mouse button or press the left mouse button on the first point of the curve. You can adjust the curve using the control panel or the mouse.

Additionally, the inside and outside softness may be altered on a point-by-point basis by dragging any of the magenta reference points to the desired position. As with all of the Resolve Power Windows, the axis of rotation may be changed by holding down the control key on the DaVinci Resolve keyboard and dragging the center reference point to the desired position.

You may change the “Power Curve” shape using the mouse. To add points, left mouse click on the curve; to delete points, use the center mouse button over a point. To change the curvature, select one of the handles attached to a curve point and adjust the curvature by keeping the left mouse button pressed while moving the pointer. The curvature handles move opposite to each other in a locked fashion. To move a single handle at a time you must keep the ‘Shift’ key pressed while moving the handle.

If you want to straighten an edge, double click on the corresponding curve point. When the edge is straight, the curvature handles for that point are collapsed. To rotate a curve, select the central handle of the curve (similar to other windows) and rotate. You can also select the central handle and Pan/Tilt the entire curve.



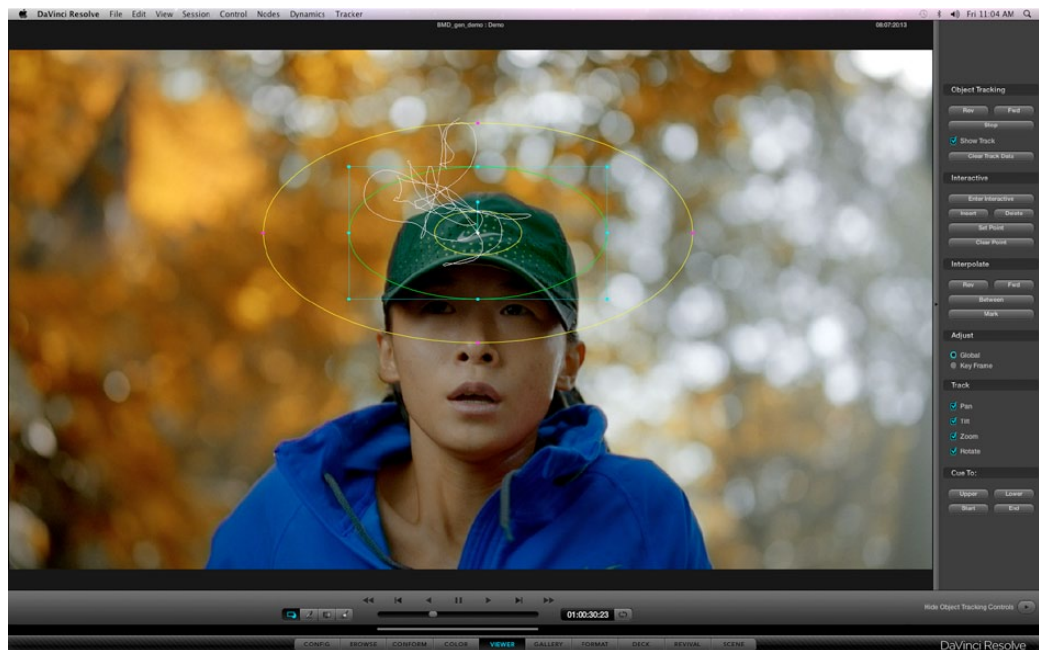
PowerCurve Window

Power Window 3D Object Tracking

Whether it is a Circular, Linear, Polygon, or even a Power Curve Window, you will eventually need to change the position of the window to follow a moving object within a clip. Fortunately, DaVinci Resolve has a very powerful automatic tracking tool that can be used for tracking the position of an object within a clip.

The Object Tracking operation is covered in detail within the Viewer screen description, but here are some basics for the simple operation. Place the window over the object, switch to the Viewer screen and open the Tracking menu on the right. If DaVinci Resolve loses the object at any point, press the 'Stop' button, make the necessary window reposition, and enter a mark using the 'Mark' button on the control panel. Start the track again from that point.

After the tracking procedure is finished you can still move the window, apply softness or change the aspect and size. The tracking functions can also be selected by pressing the 'T' key on the keyboard for forward tracking or 'Shift-T' for reverse.



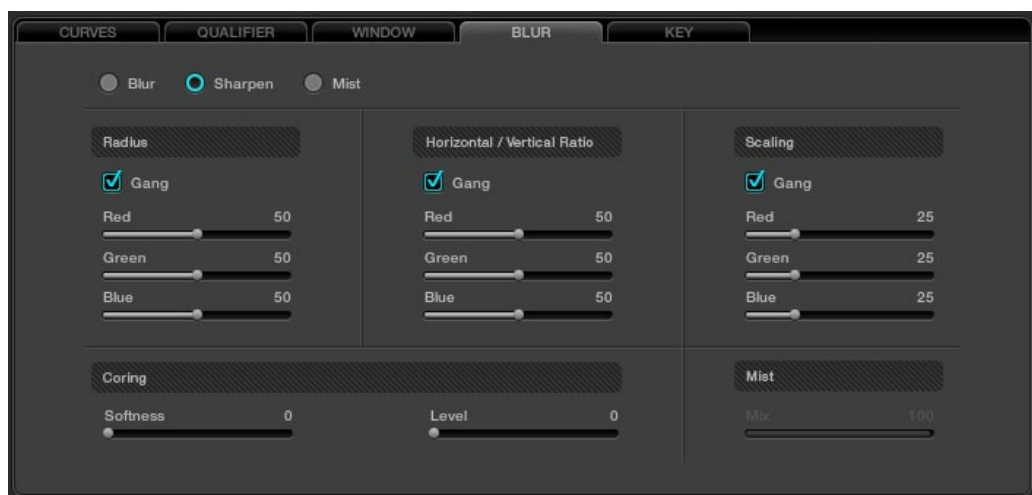
Object Tracking

The next tab on the Color screen is Blur, which holds the controls for Blur, Sharpen and Mist. The algorithm for calculating this effect is a precision Gaussian filter, so very high quality adjustments can be made. These controls share a common set of parameters and in fact Blur is the inverse of Sharpen so the same control will give you one effect at one end of the range and another affect at the other.

Blur

When Blur is enabled, DaVinci Resolve will blur or defocus the image in real time. The two main adjustments for blur are the Radius control which changes the size of the image area used by the Gaussian algorithm to calculate the defocus effect, and the Horizontal/Vertical Ratio control which changes the balance between the horizontal and vertical influence.

Each of these parameters are normally in Gang mode, which means the Red, Green, and Blue channels are all affected evenly. You can deselect Gang mode and make individual adjustments on the UI or on the control panels by selecting the 'Master/Color' button on the Primary soft menu to toggle between Gang and individual color controls.



Blur Tab

Sharpen

The Sharpen control can be adjusted via the Resolve control panel or with the mouse within the window on the user interface.

The Sharpen control will enhance the image and the filters may be adjusted individually for Red, Green, or Blue or, if Ganged is checked (which is typical), the change will be for all. Sharpen also has a scaling control, again with a ganged and individual RGB values. The scaling adjustments change the recursive filter within the Gaussian algorithm.

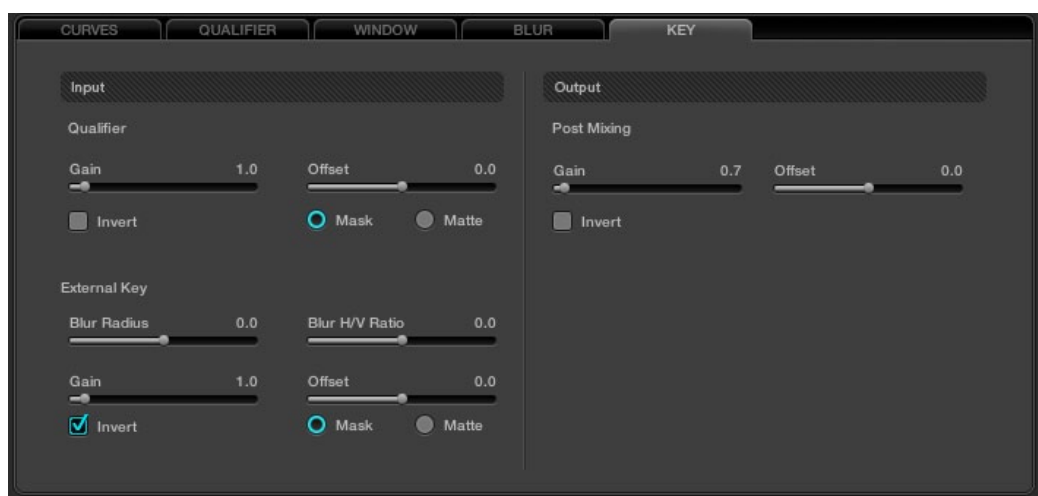
Finally, there is also a Coring control that makes this filter behave like an Aperture Correction control. The Coring control will sharpen the image when adjusted counter-clockwise or at the low end of the scale. If the control is adjusted in the opposite direction, the image will not be sharpened at all.

Mist

Mist makes a mix between sharpness and blur based on the luminance value within an image. This control can be used to create Pro-Mist effects.

Key

The Key Tab on the Color screen provides controls for adjusting the behavior of the key signals used within the current node. These controls are also available from the keyboard control panel, accessed by hitting the 'More' key on the menu and choose the 'Key Mode' option. One of the common uses of this node is used to tone down the color correction effect applied in this node by tweaking the "Gain" control in the "Post Mixing".



Key Tab

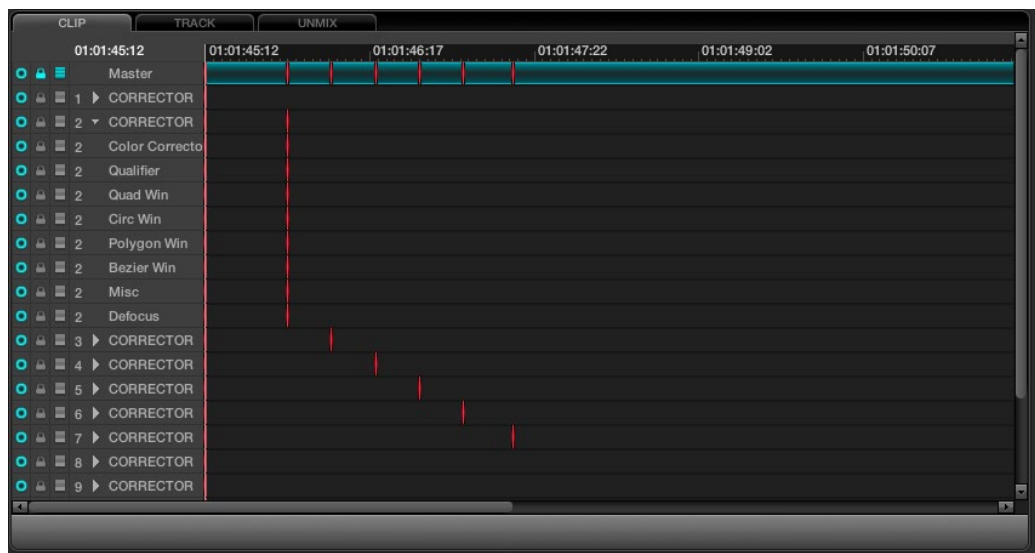
Dynamics Timeline

On the bottom right of the Color screen is the Dynamics Timeline. This timeline displays and offers control of keframed events such as dissolves or transitions of grades during a clip or for the whole timeline. This display has also been referred to as the List Timeline or the Events Timeline. Principally, this graphical display shows the all the events for every grade change for every clip, one clip or one track at a time. The Node Graph display above the Dynamics Timeline also displays the Clip, Track, and Unmix tabs in sync with the Dynamics Timeline.

There are three tabs in this section.

- Clip:** Once the timecode reaches the next clip, the correction within this clip will be displayed.
- Track:** This mode relates to the whole timeline and is useful when you wish to create an overall color trim to all the graded material.
- Unmix:** Unmix is essentially the same as the Clip mode, however no effects such as dissolves or speed changes will be displayed. Note: the Node Graph display above the Dynamics Timeline also displays the Clip, Track, and Unmix tabs synchronized with the Dynamics Timeline.

Many of the operations here are via the UI and a mouse, but there are number of display changes automatically made in this area as each clip is graded and as the timeline plays. If for example, you wish to insert a dissolve within a clip, this operation can be performed within the Dynamics Timeline display.



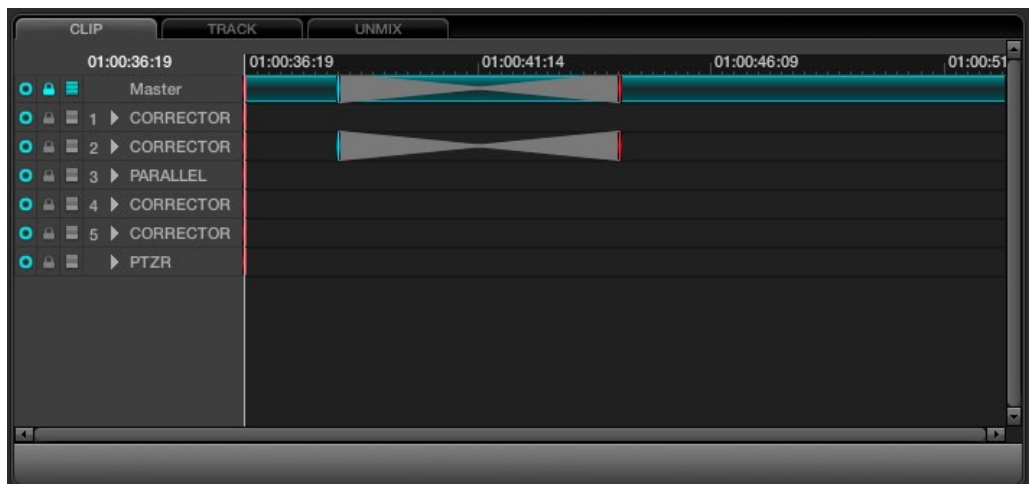
Dynamics Timeline

Dynamics Indicators

At the top of the tabs, on the left, the current timecode matches the timeline position. To the immediate right is the clip, or track, timeline, and timecode display. You will see the first of what can be many lines of information, with the first being the master channel with three icons to the left of the channel name as indications of the selected state possible in the channels below.

Under the Master, each corrector node or mixer node will have an indication of grading changes and at the bottom of the list you will see the PTZR channel. The white vertical line through all the channels indicates the current frame, matching the timecode, and within each channel display, markers will show dynamic transition keyframes.

At the far left of the Dynamics Timeline display, for each of the channels, the radio button will indicate that the channel is active or de-activated. This matches the DaVinci Resolve Control Surface 'Disable Current' key and also performs the same function as clicking on the left of the node number on the Node Graph. The 'Lock' function directly to the right will lock any changes to the grade for this channel when the padlock icon is activated. If you seem to be adjusting the grade and nothing is happening, check this icon in case it is selected.



Dynamics Timeline

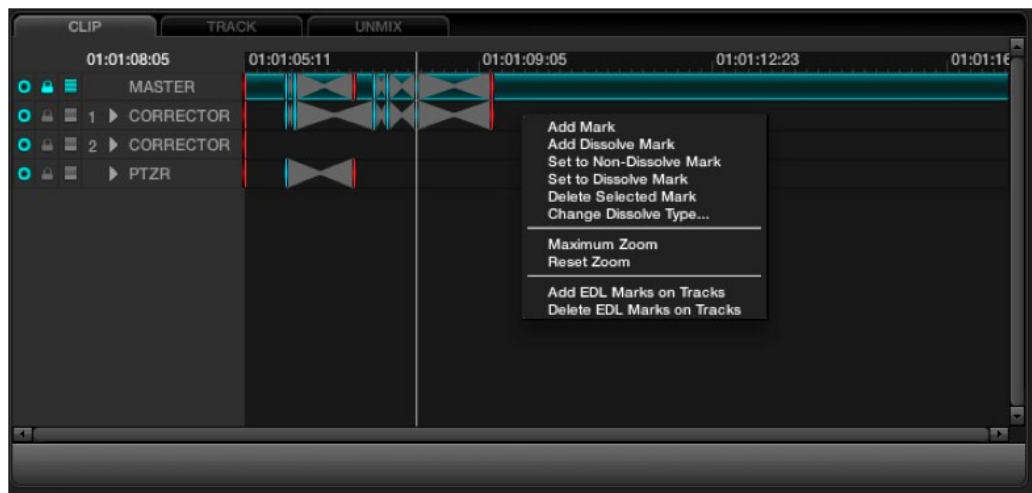
The next icon to the right indicates that the Auto Keyframing tool has been activated. When activated, each time you adjust the grade the channel indicator will be automatically updated to reflect the correction change. This mode is typically off. While useful, it can also be distracting to some people.

To the right of the Auto Keyframing icon you may see a channel number indicating the correction channel (the node) to which this line of display refers. To the right of these, the arrow normally points right, but if you select the arrow with your mouse, the corrector (or PTZR channel) will expand to show a number of more lines of grading and sizing parameters. Each is keyframable.

Marks are made for the individual channel elements, and with a large Node Graph this list can be quite long. Every variable is captured here for every clip and stored with the Project metadata.

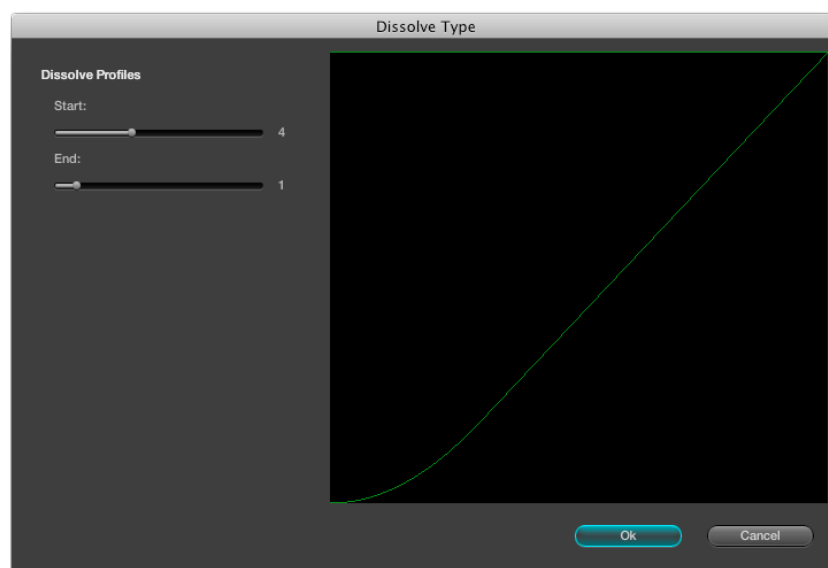
Adding Dynamics

Dynamics can be added in a number of ways. With the UI, right mouse click and select the appropriate function from the pull-down menu that appears within the Event Timeline display.



Dynamics Timeline Right Click

- | | |
|---------------------------|--|
| Add Mark: | Will enter an event mark into the timeline, or simply press the 'Mark' button on the DaVinci Resolve control panel and a mark will appear in the Dynamics Timeline display. |
| Add Dissolve: | Simply play the clip to the point where the dissolve should start and right click select to add the dissolve mark. Then play the clip to the point where the dissolve should finish and add Mark. The dissolve will then appear within the Event Timeline display. |
| Set to Non-dissolve Mark: | If you have an existing dissolve mark you can change it to a standard mark |
| Set to Dissolve Mark: | This will change an existing mark to a dissolve mark. |
| Moving a Mark: | To change the position of an event or dissolve, simply highlight the event by left mouse clicking on the event and then drag it to the desired location. |
| Delete Selected Mark: | To delete an event, left mouse click on the event in the Dynamic Timeline display which will highlight this event. Then right mouse click and select 'Delete Selected Mark' from the options. |
| Change Dissolve Type: | When right mouse clicking within the Dynamics Timeline display and selecting 'Change Dissolve Type' from the menu, you can adjust the start and end profiles of a dynamic or dissolve event. There are a number of different variations for the start and end profiles available. The default values may be established within the Configuration page. |



Dissolve Type

Render Cache Options

When working with dissolves from one clip to another, or complex corrections, you may want to generate a Render Cache, as sometimes the two streams of full bandwidth images can not be played or processed in real time. If you select the Cache D mode and play through the clip transition once, the frame rate will play slower than normal the first time. Afterwards, the Cache file will be created and then the clip will play at full speed.

There are four Render Cache Options.

- Cache A:** This will cache all material.
- Cache D:** This will cache only the dissolves.
- Cache +:** This will enable the background render cache process.
- Cache U:** This will cache a clip that has been flagged by the user in the Resolve Color page Thumbnail display.

You may also pre-render all dissolves within a project by pressing 'Cntrl-R' when in the Cache D mode. This feature is very useful when you are playing a project for a client and don't want to see any slow downs in the system during image dissolves. The function will stop at the end of the timeline or when you press 'Stop.'

DaVinci Resolve can also automatically perform a Background Render Cache whenever the system is idle. If you touch any controls or play a clip, the caching process will automatically stop. Background Render Cache is automatically enabled and will commence in the vicinity of the current clip in the timeline. It will then search for user-selected Render Cache clips, and finally for image dissolves within the Project. If there are marks within a clip and only new changes occur within that area, DaVinci Resolve will then regenerate the cache information for only that section of the clip.

Other Color Screen Features

Switching Between Conforms within the Color Page

To switch between sessions (i.e., EDLs) within the Color page, simply press the 'Mode' button on the DaVinci Resolve control surface and then 'Switch Session.' On the Legacy 2K panel use the Orange diamond button and then 'A/C Mode' button on the DaVinci Resolve Keyboard control panel.

The timeline will immediately change to the new session.

Scroll Mode

In the Color screen, there are various ways of copying grades into the current clip by recalling from Memory, Gallery Stills, timeline thumbnail clip numbers, or scrolling through the clips.

The Thumbnail Timeline display provides one mechanism to allow the copying of grades into the current clip by traversing reference clips and frames through the timeline.

The enhanced Scroll Mode is controlled on the trackball panel of the DaVinci Resolve control surface by selecting the 'Modes' button above the RHS trackball and then 'Scroll Mode.' The mode also provides backward panel support for the legacy 2K panels with deck control and soft knobs.

In addition to allowing you to select a reference clip via [Scene Number], [Prev Scene], [Next Scene], and the Jog wheel. On the Legacy 2K panels, the [Red Diamond] + [Scroll/Deck] toggles the option to use the transport controls to traverse the reference clips in the thumbnail timeline in addition to the soft buttons. (Default Off)

The Panel menus can be set to Scroll mode after pressing the [Scroll/Deck] button on the Jog/Shuttle control panel. Exiting the Scroll Mode menu would bring the panel menu back to the Secondary menu.

On the thumbnail timeline, a thumbnail border highlight (yellow) indicate the current reference clip for the scroll operation. While scrolling through the timeline, the reference clip stays visible in the thumbnail timeline and is brought (cued) into visibility when the clip is out of the thumbnail view.

On the timeline, the current scrolled frame is indicated with a yellow line, which is different from the current PlayHead cursor position (White line).

Scroll Controls

[Step Fwd] Step to next scene

[Step Rev] Step to previous scene

[Play] Plays (scrolls) forward through the scenes at 1 scene per second

[Rev] Play (scrolls) the scenes in reverse at 1 scene per second

[Fast Fwd] Shuttles (scrolls) forward through the scenes at 4 scenes per second

[Fast Rev] Shuttles (scrolls) reverse through the scenes at 4 scenes per second

[Slow Fwd] Shuttles (scrolls) forward through the scenes at 1 scene per 3 seconds

[Slow Rev] Shuttles (scrolls) forward through the scenes at 1 scene per 3 seconds





Viewer

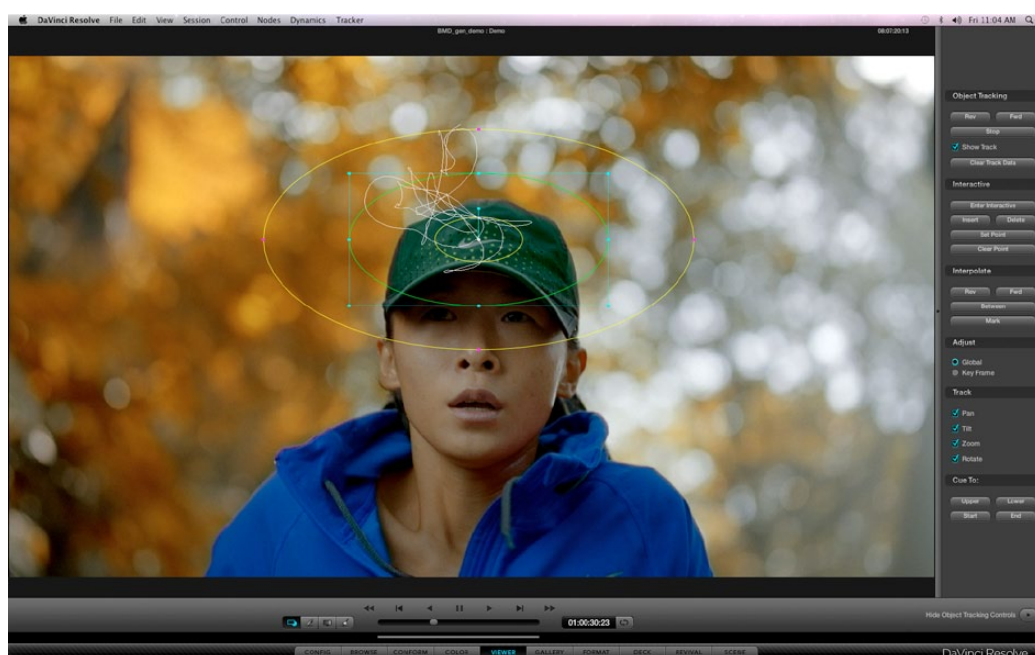
10

Viewer

The Viewer screen provides a full screen view of the current frame with transport controls, timecode indications and other features as seen in the Color screen viewer display.

You can zoom even further into the image by either using the '+' and '-' keys on the keyboard or by using the rotary center mouse button on the mouse. You may also reposition the image in the Viewer by holding down the center mouse button and dragging the image to the desired position. To reset the Viewer size, simply right mouse click and select either 'Reset' or 'Original Size' from the options within the pull-down menu.

There are two screen display modes within the Viewer. The main is a full screen display, as indicated above. The second, which will be covered in detail later in this chapter, includes a right hand slide window that provides controls for object tracking.



Viewer Page

Full Screen Viewer

At the top of the Viewer, in the center window bar, is the name of the Project and Session. To the left of this is a GPU status display and the playback speed display in frames per second. The GPU status indicates the percentage of use that the current color correction demands of the GPU. A full green indication is good, indicating there is plenty of GPU headroom. As the GPU processing resources are used by additional color correction, the green bars will reduce. A flashing red indication shows that the GPU is unable to consistently process the correction in real time. Ultimately, as you add a greater number of corrections, you will reach the real time limit of the GPU and DaVinci Resolve will play back at a slower than selected speed.

There are a number of operational options in this situation to continue with the slower than real time operation. If you select 'On-The-Fly Proxy,' DaVinci Resolve can generate proxy source images in real time, which will allow the GPU sufficient headroom to process the image, or you can select Render Cache to cache the clip.

This display will show either Record or Source timecode, Record or Source frame number, and, if available in the DPX header, KeyCode. On the bottom right of the Viewer is the primary timecode display for the clip being played. Just like the top display, you can change the information displayed by clicking on the timecode display with the mouse to toggle the display between the five options, as indicated above.

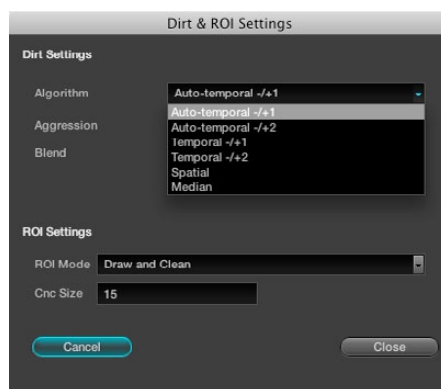
To the right of the primary timecode display is the Clip Loop selection button. When enabled, the current clip displayed in the timeline will turn blue so you can play the clip in a Loop mode.

The button on the left-hand side will select and deselect the PowerWindows cursors. The next button will change the cursor into the Color Picker mode for selecting a specific color from the Viewer image. When the third button is activated, the Gallery Wipe will be visible. The right button is used to activate the interactive Dirt and Dust tool.

Interactive Dirt & Dust Removal Tool

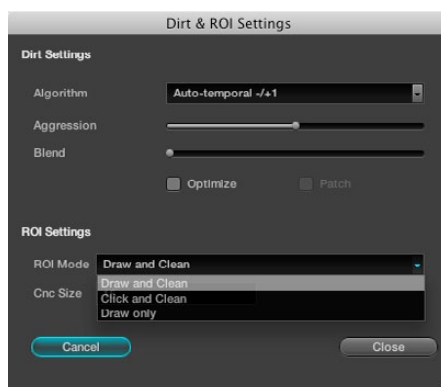
DaVinci Resolve provides an interactive Dirt and Dust removal tool which can be accessed from either the Viewer or Color pages by clicking on the Dirt Removal tool icon located at the left of the Viewer display.

Within the Dirt Settings section of the setup widget, you may adjust the Algorithm section to select the filtration being used for the correction. There are also adjustments for the Aggression and Blend sliders, depending on the degree of correction to be applied.



Dirt Settings

The ROI Settings allows you select the correction method. If you choose the Click and Clean mode, this will apply the correction for clicks on the object with the mouse. If the Draw and Clean mode is selected, highlight the area with the mouse and the correction will be applied. If you are unhappy with your correction, select 'Undo' to return to the original image.



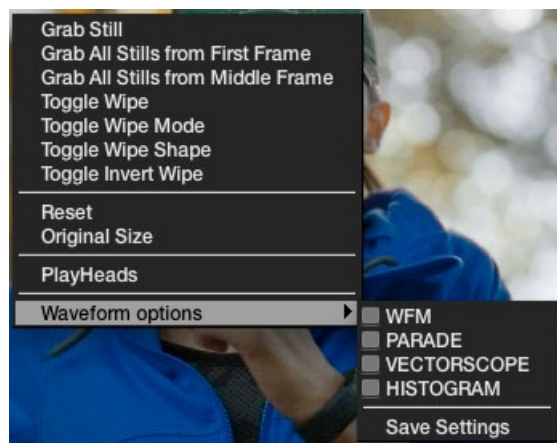
ROI Settings

Viewer Window Options

There are a number of centre and right click mouse options for the viewer.

You may zoom in and out of the image within the Viewer by using a rotary control within the center mouse button and also zoom in and out of the image within the Viewer display by pressing the '+' and '-' keys on the computer keyboard. If you hold down the center mouse button and drag the mouse, it will move the image position within the Viewer display. To reset the Viewer display to the correct size and position, right mouse click within the Viewer and select 'Reset.'

If the user right clicks the mouse while it's over the Viewer a pop-up window provides a number of options.



Viewer Window Right Click Menu

Viewer Stills Display

The first section of these right click options relates to Stills. 'Grab Still' will simply grab the current frame to make a still and place it in the Gallery Stills display. 'Grab All Stills from First Frame' will grab a still from every clip on the timeline using the first frame of each clip. 'Grab All Stills from Middle Frame' will perform the same function, except use the middle frame of each clip as the source of the still. Once this is started, it will work in the background and grab a still for each clip within the timeline. It is important to note that once this procedure has started, it will continue until completed.

The Toggle Wipe selection will turn the wipe on and off. This function on the DaVinci Resolve panels is called 'Play Still.' The Toggle Wipe mode will select either to compare the current timeline clip to either the Gallery Still, the matching offline frame or another clip on the timeline.



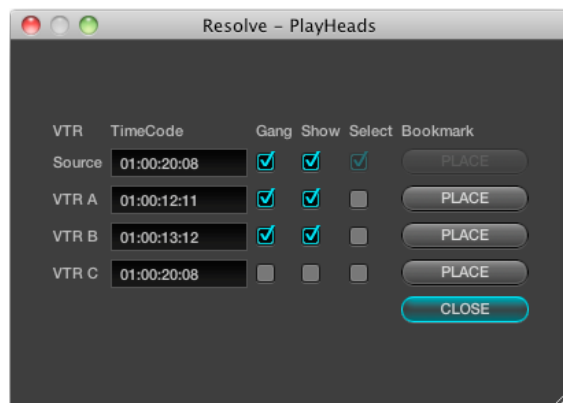
Viewer with Play Still enabled

You can select another clip to wipe against by selecting the still on the Still, Memory, or PowerGrade tab. Toggle Wipe Shape switches between vertical wipe, horizontal wipe, mix or a key or Alpha control. Toggle Invert Wipe will swap the reference and current images in the Wipe display so you can see the other side of the images.

The next section of the pop-up menu includes the Reset and Original Size options. Reset will set the image to the normal display for the Viewer. Original Setting will display the image pixel-for-pixel so it is usually for getting quick zooms to the source image size to look for imperfections in the original image..

PlayHeads

The next section of the pop-up menu is the PlayHeads selection. Most commonly used to compare a reference clip with others, playheads allow you to select and play up to four clips and display them at the same time. Within the PlayHeads window you can set which playhead is attached to which clip. Selecting the clips and 'Place' will link the clip to the appropriate playhead. Gang them together for synced playback. The 'Show' checkbox will turn the display of the clip off and on.



Playheads

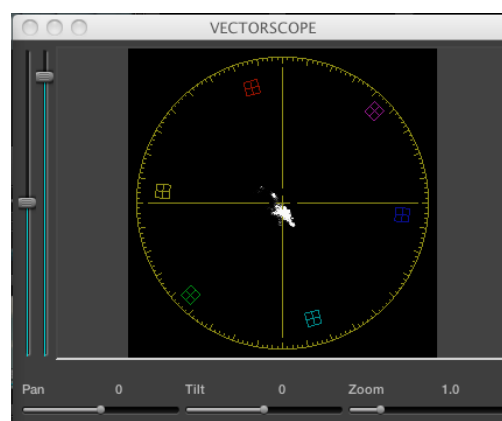
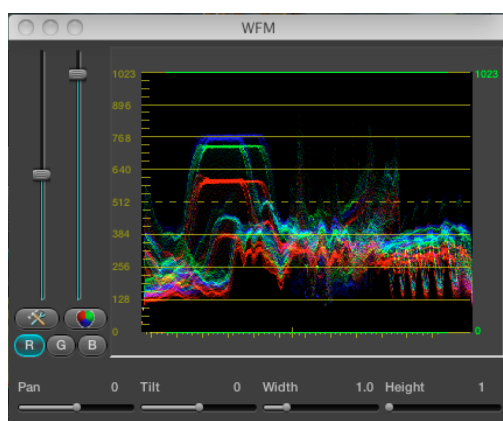
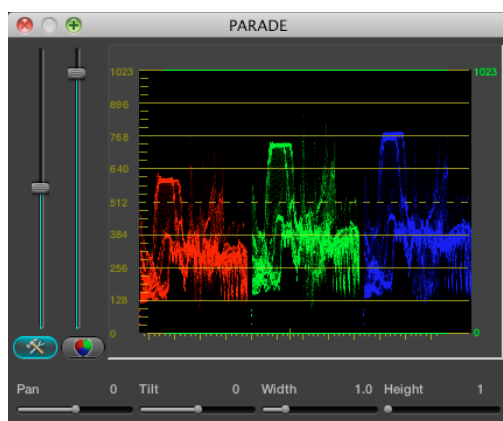
Refer to the PlayHeads section of the Color chapter for more details on PlayHeads.



Waveform displays

DaVinci Resolve offers a number of built-in waveform displays, all of which work at the native resolution of the system rather than at the video standard selected for clip payout. This means you can see the full data range of the source image with the correction applied, regardless of which video standard in which you master.

The display options are: Waveform, Parade, Vectorscope, and Histogram. They allow you to monitor the levels of the correction that are being applied to the image, and within each display there are the controls to vary the brightness of the scale and information displayed.



Object Tracking Screen View

The second mode for the Viewer screen includes the Viewer, but on the right there is a control panel for the Object Tracking controls.

Whether it is a Circular, Linear, Polygon, or even a Power Curve Window, you will eventually need to change the position of the window to follow a moving object within a clip. In the past, you were required to create dissolve corrections to gradually change a window's position or to mark every keyframe with a reposition of the window. Fortunately, DaVinci Resolve has a very powerful automatic tracking tool that can be used for tracking the position of an object within a clip.



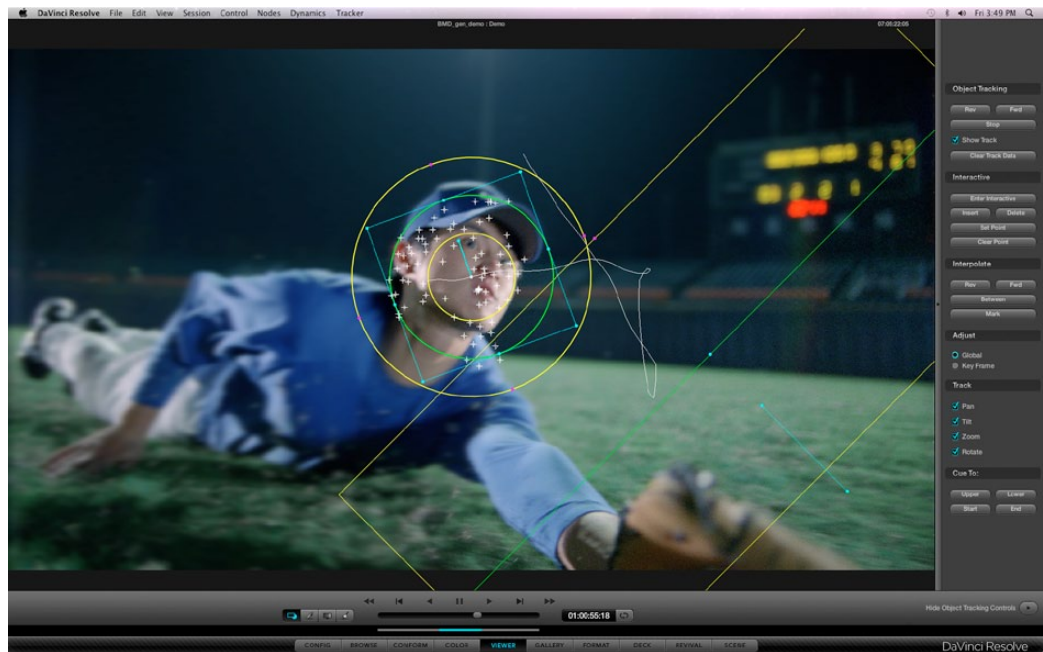
Viewer screen with 3D Object Tracking controls

On the right side of the Viewer screen, there is a control arrow that extends the 3D Object Tracking controls.

With a PowerWindow placed over any part of the image, select either 'Track Fwd' or 'Track Reverse' buttons, or use the 'Soft' buttons on the DaVinci Resolve control panels. If DaVinci Resolve loses the object at any point, press the 'Stop' button, make the necessary window reposition, enter a mark using the 'Mark' button on the control panel, and start the track again from that point. Alternatively, you may correct the shape position by pressing the 'Shift' key and moving the shape to the desired location.

If you want to track the shape in reverse play, press the 'Track Rev' button to track the shape backwards. It's useful to note that it is better to track the window with minimum edge softness. After the tracking procedure is finished, the required softness may be applied and will be carried automatically through the tracking procedure.

The Tracking functions can also be selected by pressing the 'T' key on the keyboard for forward tracking or 'Shift T' for reverse. You may stop the tracking at any time by pressing the 'Stop' button on the DaVinci Resolve Keyboard control panel or by pressing the 'Stop' button within the Object Tracking graphic user interface.



Object Tracking

To view the 'Track' of a PowerWindow in the Viewer, toggle 'Show Track' and a white line will display the complete path of the movement of the corresponding Power Window's center point. Each mark and the current frame is represented by a dot on the 'Track.'

Interactive Tracking Controls

The Interactive Object Tracking mode allows you to view and edit the feature vector points that are used for achieving the auto tracking.

To eliminate unwanted points, enter the Interactive mode by pressing 'Control TF' on the computer keyboard, or by clicking on 'Enter Interactive' button on the Viewer screen tracking panel. Then highlight the vectors which you would like to delete by drawing a box around the area by holding down the left mouse button and dragging the mouse from the upper left to the lower right of the area. By pressing the 'D' key on the computer keyboard or the 'Delete' button on the UI, the points within the selection area will be deleted.

Once complete, press 'Control TF' or 'Exit Interactive.' Alternatively, to add points, create another highlight area and press the 'I' key on the computer keyboard or click on 'Insert within the UI' and DaVinci Resolve will insert vector points within this area.

Single Tracking Points

While in Interactive Object Tracking mode you may also add a single feature point. First, activate the cursor and move it to the area of interest and press the 'Set Point' button within the Tracker window. This will add the tracking point at the point selected. Press the 'Exit Interactive Mode' button to revert to normal operation.

Interpolation Between Keyframes

Sometimes you may want to interpolate a PowerWindow between two points within a clip. To do this, first mark the upper and lower frames within the clip by pressing the 'Mark' button. These points will be represented as white lines within the user interface timeline. Once these points are established you have three interpolation options.

- Interpolate Forward – sets the position from the current window, then performs linear interpolation forward to the upper mark
- Interpolate Reverse – sets the position from the current window, then performs a linear interpolation in a reverse direction to the lower mark
- Interpolate Between – performs a linear interpolation from lower to upper marks

You may also adjust the PowerWindow position manually while in Object Tracking using either the Global or Keyframe modes. When in the Global mode, adjustments will affect the window position throughout the whole clip. In Keyframe mode, changes will only affect the window position for the current frame.



Gallery

11

Gallery

DaVinci Resolve has a database for projects and also for stills or scene grabs that you can use to compare with the current scene. This way, reference or important shots can have their grades replicated in other scenes. You may compare the stored images to those being graded by using a wipe or mix. The Gallery displays the database to search for other projects stills and other users stills as well as the A-Z Mems or Memories that offer one key selection on the DaVinci Resolve control surface.

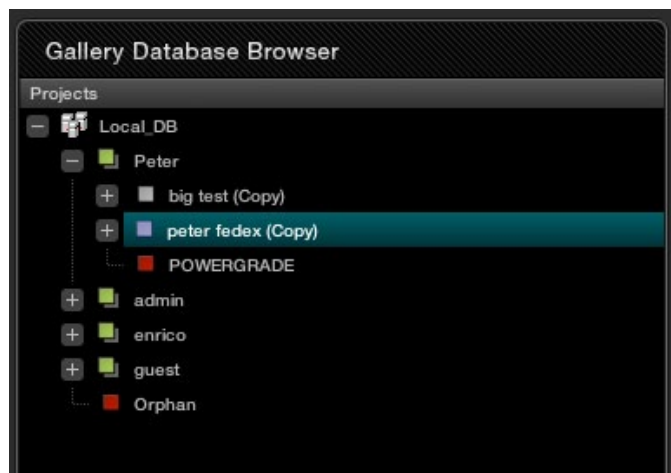


Gallery Screen

The Gallery screen has four sections. The top half displays the Gallery Database Browser and the tabs selected for Stills display within that browser. The bottom half of the screen displays the Memories and Stills that relate to the current project. Stills can be copied between sections by simple click drag and drop mouse operations.

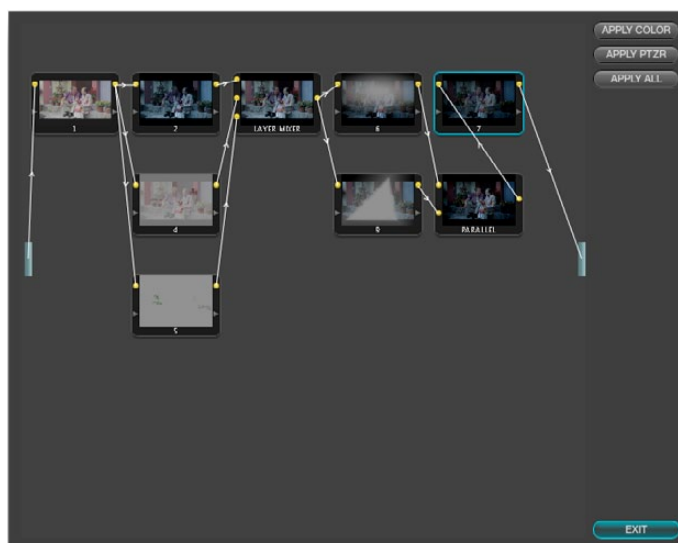
Gallery Database Browser

At the top of the Gallery screen is the Database Browser and to the right you will see the tabs as selected by this browser. Each of the databases connected to this DaVinci Resolve system will be visible and within each the user names and their projects.



Gallery Database Browser

If the user has stored any stills as PowerGrades, these appear in every project for that user, making it easy to select and use reference stills or grades from other projects, or just to keep the 'looks' you like to use. Remember, each still that is captured also stores the Node Graph, displaying how the grade was constructed and helping you to copy the whole grade or just the PTZR or just the color corrections, or individual nodes to the new shot.



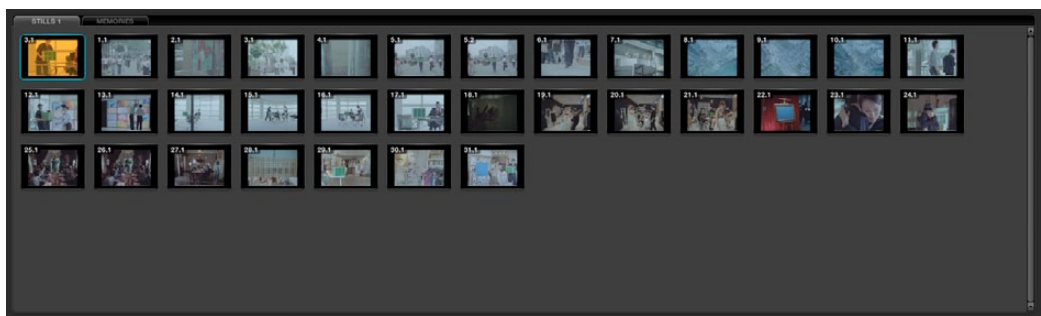
All stills saved include the Node Graph showing the clips grade construction

Gallery Database Tabs

Stills

To the right of the Gallery Database Browser are the Stills tabs which reflect the selection made in the browser. This can include stills from the project and Memories. By selecting the 'Grab Still' button on the control panel, or right-clicking 'Grab Still' on the viewer, you are capturing a high resolution still image of the frame currently displayed on the timeline and at the same time capturing the grading metadata information relating to that grade. This means the still can be used for both visual reference and also for direct grade copy and paste operations.

The still will be added to the Current Still tab on the Color screen and on the Gallery screen. You can also delete the stills by using the right-click option. One or a number can be deleted at once. Use the 'Select current to Last' or 'First to Current' options or hold the keyboard shift key while selecting multiple stills.



Stills Browser

Stills display a still number in the upper left that is in the scene number/clip number format. The pull-down options 'Change Label' allows you to create or change the still label/name. If your system has Unicode language options loaded, you can also add names in different languages. The 'current' still will display a cyan border.

Memories

Within DaVinci Resolve, every scene has a grade that is stored in an active Memory. Colorists consistently refer to this current memory and compare it to the stills to match grades. You can always clear this memory to get to a default memory, the no grade applied memory, by using the Base Mem control, which is a right-click selection on the Node Graph or Panel control.

Comparing the current memory and memories that are used very often is easily done using A to Z Memories, which you will find at the bottom of the Still section. These stills are in most respects the same as the others in the Stills or PowerGrade tab, with the exception that you can save and recall the stills from the control panel with great speed.

On the DaVinci Resolve control surface, simply select 'Current' and then one of the A to Z Memory keys and the current scene grade is saved to that Memory. The 'Current' and A to Z keys are on the fader and also the Transport panel. In each case, the Memory is seen in the Memory display with a small letter that identifies which Memory it was saved in. To recall a grade from the Memory, simply select that Memory with a one-button selection.



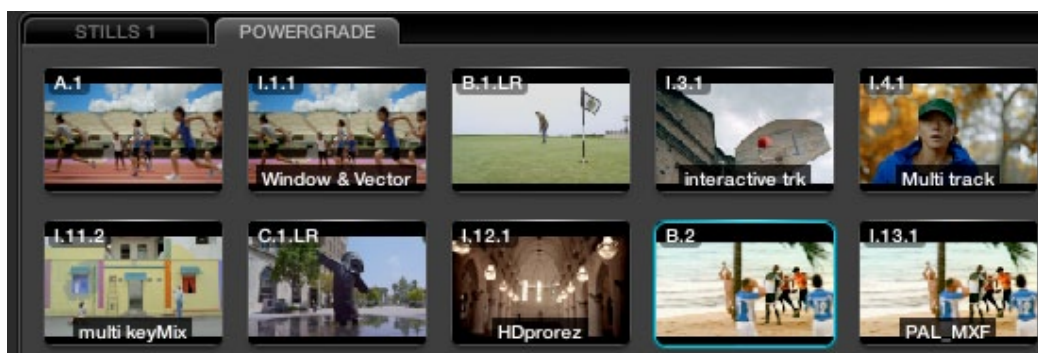
Memories Browser

A key feature for the stills is the capture and display of the Node Graph which will show the user how the grades were constructed. This also applies to the Memories. A right mouse click on an image within the Stills display lets you select the option 'Display Node Graph.' Various sections of the correction may be copied to the current correction by dragging the appropriate nodes to the current Node Graph display or selecting the 'Apply Correction' button to copy the entire correction into the current clip. The still nodes may be dragged on top of an existing node and replace that node's enhancement or a node can be dragged and inserted independently into the Node Graph line.

PowerGrades

The PowerGrade tab shows stills that are always available to the individual user, no matter which project they have open. Typically, stills relate to Sessions within a particular Project. You can always copy stills from other users and other projects, but this is a manual process and there are times when you may just want to have specific stills, with their Node Graphs, that are always available to you no matter which Project you have open.

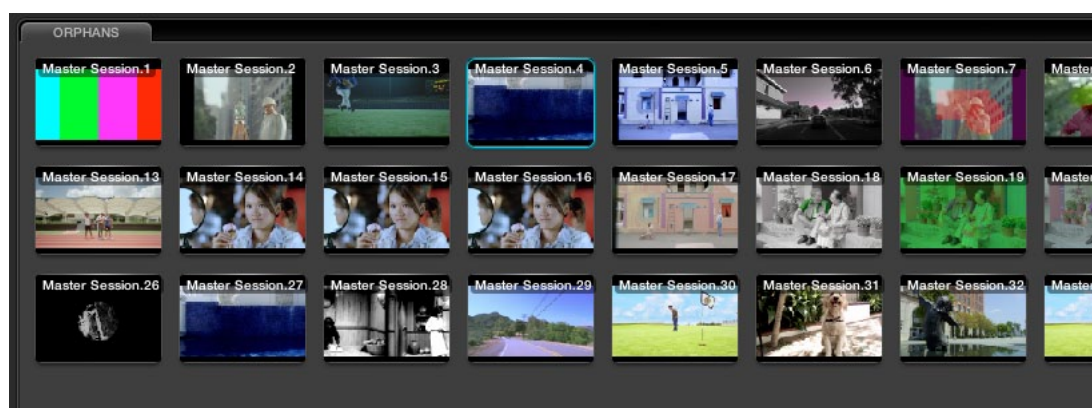
The PowerGrade stills are the same as all others, in most respects, but the ability to see these stills when the user opens another Project provides a simple way to copy grading information between Projects. As the Node Graph is saved with the PowerGrade still, complex multilayer grades with LUTs can be saved and recalled with ease. This also makes them ideal for specific 'looks' that a colorist makes for later use. You can drag stills into the PowerGrade tab from your Memories, or save directly to the tab.



PowerGrade Tab

Orphan Stills

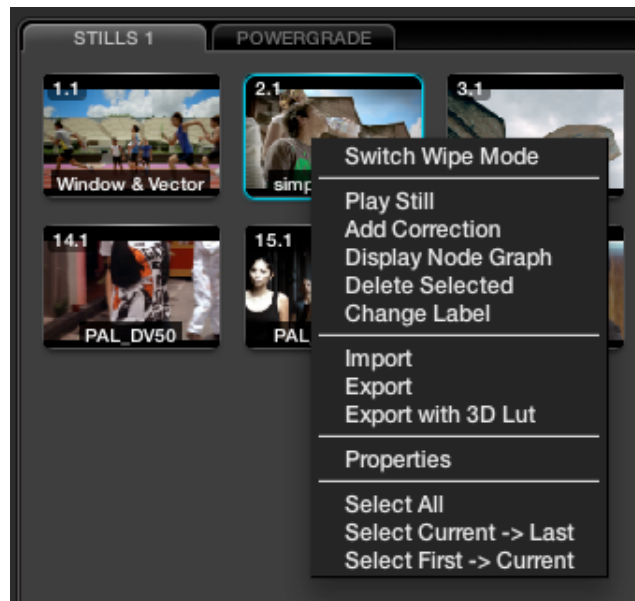
Occasionally, you may delete a Project or the links between the Project and Gallery database become disconnected. In this case, the stills are not lost, they just become Orphans and are displayed in a tab for you to delete or move as you like.



Orphans Stills Tab

Current Project Stills

The bottom half of the Gallery screen displays the stills related to the current Project. On the left are the Memories and to the right the Stills and PowerGrades. There are number of right-click options found in the Stills display. Many mirror the operations from the Color screen, however there are some specifically for the Gallery.



Current Project Stills (Right Click)

Switch Wipe Mode

The Switch Wipe mode will select the current timeline clip to compare to either the Gallery still, the matching offline frame or another clip on the timeline.

In order to match parameters from a Gallery still with that of the actual grading being done, you should activate the Reference Wipe mode or select 'Play Still.' You may select another clip to wipe against by selecting the 'Still/Timeline' button on the panels and then pressing the 'Previous' or 'Next' buttons on the DaVinci Resolve Panels to get to the selected clip, or, just use the mouse. When this is done, the clip being wiped against will be highlighted in yellow. When this function is de-activated, the current clip will wipe against the image loaded in the Gallery.

If you wish to compare with the Offline video, toggle the Reference Wipe mode until the 'Offline' label is seen on the status display. 'Toggle Wipe Shape' switches between vertical wipe, horizontal wipe, mix, or a key or Alpha control. 'Toggle Invert Wipe' will swap the reference and current images in the Wipe display so you can see the other side of the images.

Trace Timeline

With the option to 'Trace Timeline' selected, the still that is highlighted will always match the scene selected on the main timeline. This mode of operation is not always desired, but can be handy if there are a very large number of shots and multiple stills for each.

One Still Per Scene

The 'One Still Per Scene' selection can ease workflow if you prefer to automatically erase a previous still for a scene when a new one is grabbed. As you grab a still, it replaces the previous still for a scene. Should you have more than one still for any scene before selecting this option, DaVinci Resolve will only delete the extra stills when a new grab is made for that scene. This feature, used in conjunction with the 'Grab All Stills from the First (or Middle) Frame' is an ideal way to recapture reference stills for a completed project.

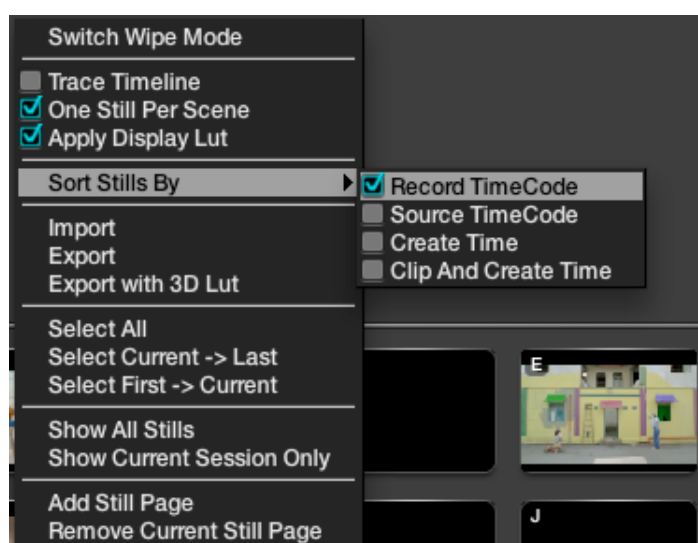
Apply Display LUT

If you have a Display LUT selected on the Config screen LUT tab, this LUT will be applied to the Grading monitor output, and also the Viewer display. When you grab a still, you would not want this display LUT burnt into the still as it's a display LUT, not a 'Look' LUT. The stills will appear in the Gallery with the correct non-LUT influenced image. The 'Apply Display LUT' feature is used to apply the same LUT to the still when it is used for a reference comparison and it is automatically added only during this display, so the actual still is not affected.

Sorting Stills

To sort stills there are a number of options that are selectable with right click pop-ups. When stills are added, they are placed next to other stills from the same scene and generally in record timecode order. You can also select the stills to be sorted and displayed in the order of the source timecode, or the creation date and time, or by the clip order with the creation date and time.

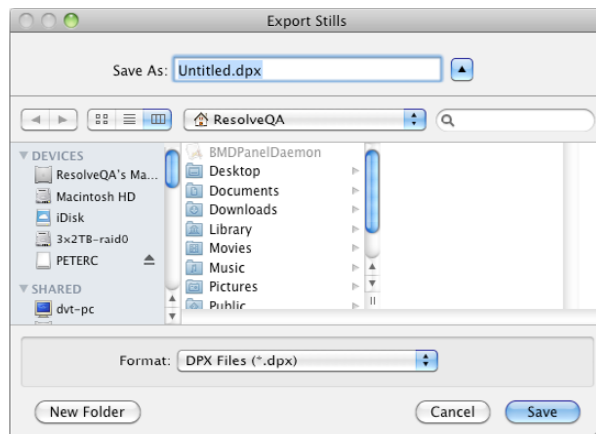
If you have multiple sessions in your project you can also select to display stills from just this session or stills from all the sessions.



Current Project Stills (Right Click > Sort Stills Options)

Stills Import and Export

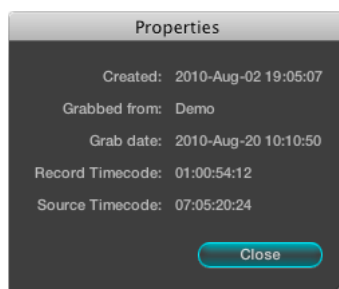
You can import and export images in a number of formats simply by selecting the still and right clicking the Import, Export, or Export with Display LUT option. The Display LUT used in this case is the one selected on the Configuration screen. The supported file formats for importing and exporting are dpx, cin, tiff, jpeg, png, ppm, bmp and xpm.



Finder Window to Name File and Location
for Exporting Stills

Still Properties

Properties of the still image can be sourced from the right click 'Properties' option. These parameters are used by DaVinci Resolve for sorting the stills.



Stills Properties

Adding Gallery Pages

You can add more Gallery pages to the Gallery stills section by right mouse clicking and selecting 'Add Still Page.' Additionally, if you wish to see a LUT applied to a stored image, this option may also be selected with a right mouse click.



Format

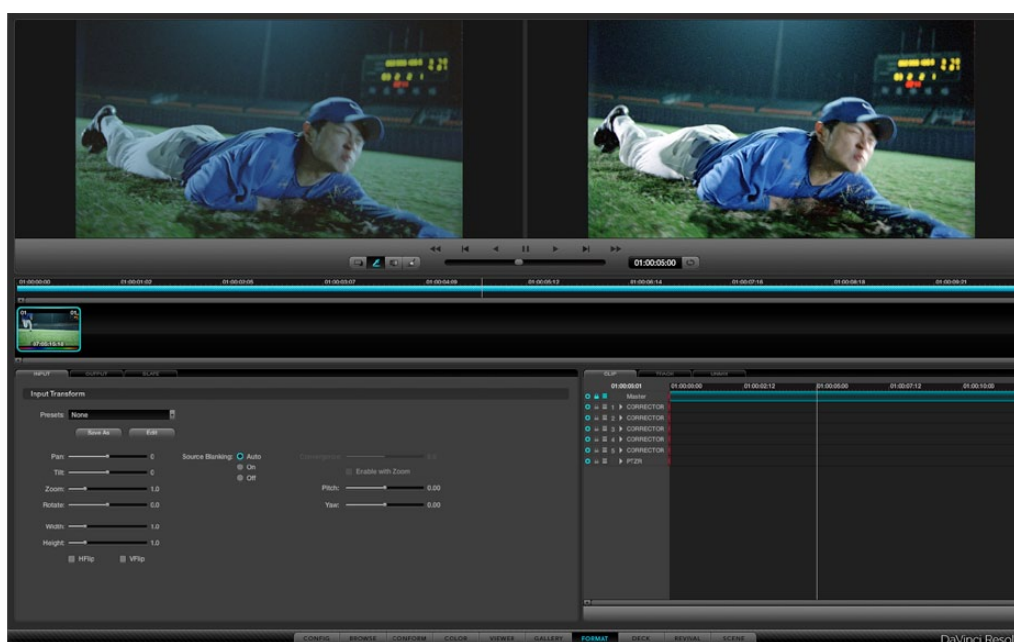
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Format

The Format screen is split into a number of sections. The top half shows the Source image on the left and the Output image on the right, which will also display the resizing adjustments you make. Under these viewers you will see the Transport Controls, the timecode of the current frame, and to the left of the Transport Controls, the same Configuration buttons as found on the Color screen.

These, once again, are as presented on the Color screen. On the lower right is the Dynamic Timeline, and the Clip, Track, and Unmix tabs for the keyframable dynamics. This allows you to program image reposition marks and dynamic events and is also a duplicate of the Dynamics Timeline on the Color screen.

Functionally, these all match the Color screen however on the Format screen they all interact with the controls on the Input, Output, and Slate tabs.



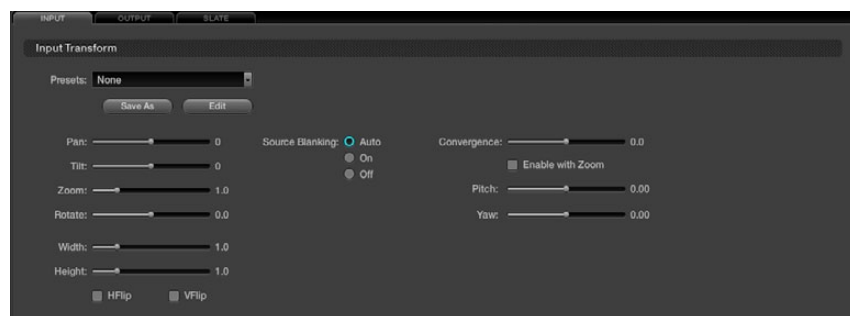
Format Screen

Input

All controls on the Input tab refer to the individual clip being adjusted, so the Clip tab is also automatically selected to show the Dynamics Timeline for the current clip. Select another clip and the settings will match the dynamics set for that clip. If you have no input adjustments (i.e., no Pan or Size or Rotation, etc.), the controls will show no variation between clips. However, a simple Pan on the slider control, or panels, will be displayed on the Input tab and also on the top right image of the Output image.

Input Transform

When you adjust the image format using the Input Transform controls, these changes may also be programmed within the Clip tab of the Dynamic Timeline as Input Transform settings are all on a clip-by-clip basis and are keyframable.

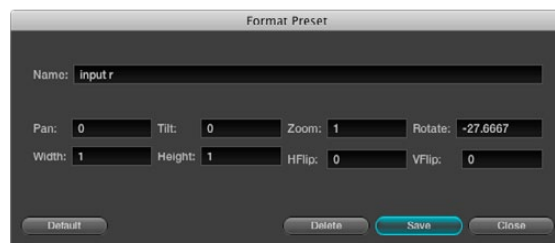


Input Format Tab

Presets

You can create and save custom sizing presets that can be selected and recalled on the Config screen and also the Browse screen. These presets may be applied as global presets from the Configuration screen or a Clip preset within the Media Pool. When the Clip tab is selected, the presets may also be applied from within the Input tab on the Format screen or even by right mouse clicking on a thumbnail within the Color or Format screens.

To create a Format preset, simply make a size change with the formatter and then click on the 'Save As' button. A window will open showing the values to be saved. Enter a name for your preset, and if you like, trim any adjustments. 'Save' to close, close without saving, or select 'Default' to reset the values. You will then see in the Input Transform Presets list the new preset name.



Input Format Preset Values

You can edit or delete an existing preset by selecting the 'Edit' button and editing the popup.

Input Transform Controls

The first four Input Transform controls mirror the display on the primary tab of the Color screen. Pan, Tilt, Zoom and Rotate adjustments made on the control panel, on the Color screen, or on this tab, will be reflected in the Settings display. Under this group is the input image Width and Height controls. While typically set at Default, they are sometimes helpful for resizing images that are not correctly scanned. The next two check boxes are for Horizontal Flip and Vertical Flip of the image.



Input Preset Selection

Source Blanking

The Source Blanking selection will allow you to either switch the source blanking to On, Off, or Auto. This control will add anti-aliasing to the image blanking. Select 'Off' if you prefer no anti-aliasing or 'On' if you wish to force it on at all times.

Convergence for Stereoscopic 3D

If you have a stereoscopic 3D session active, the Convergence control will also be enabled to permit the relative horizontal position of the left and right eye to be adjusted.

The check box is to enable the Convergence With Zoom option. This ensures that when you pan the images to change the convergence, the picture area will always be filled and there will not be black frames to the left and right edge.

The mirror rigs used for Stereoscopic 3D production may introduce geometric distortion to the image that can be trimmed using the Pitch and Yaw controls. Rotational adjustments are made around the horizontal and vertical axis respectively.

The controls are active for 2D projects so that they can be used for creative looks.

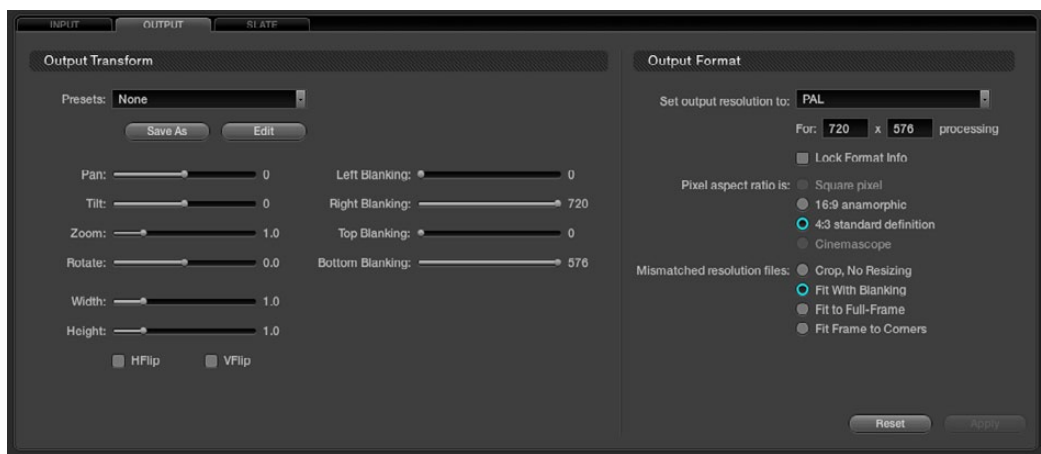
Reference Still Resize and Reposition

To reposition images that have been stored within the Gallery on the DaVinci Resolve control surface, select 'Modes,' 'Wipe Mode,' and then 'Ref Sizing.' The Gallery image reposition functions will be revealed. You can flip and resize the gallery still, the reference image, and also pan and tilt it to position in the best location for grading comparison.

Output

If you switch the Dynamics Timeline display to Track mode, this will display the Output tab. By selecting the Output Tab you will also see the Dynamics Timeline switch to the Track tab as these two are related. The Output/Track section is designed to create an overall format change for the entire project.

Within the Output tab there are two sections: Output Transform and Output Format.



Output Format Tab

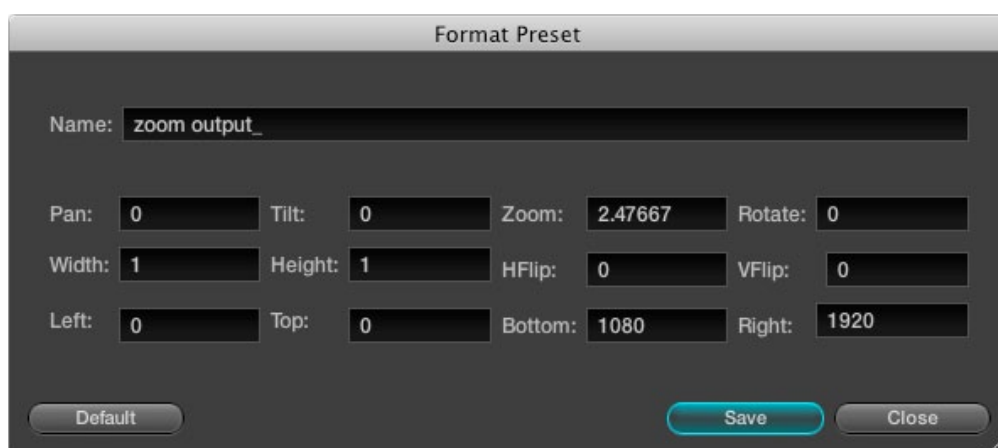
Output Transform

When you adjust the image format using the Output Transform controls these changes may also be programmed within the Track tab of the Dynamic Timeline as Output Transform settings are all on a overall timeline basis and are keyframable.

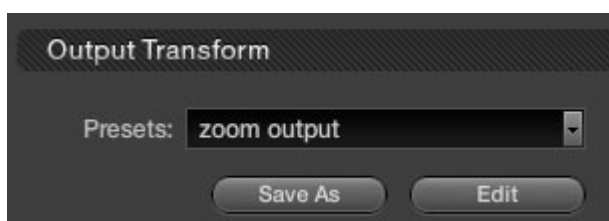
Presets

Just as with input presets, you can create and save custom output sizing presets that can be selected and recalled on the Config screen and also the Browse screen. These presets may be applied as global presets from the Configuration screen. When the Track tab is selected, the presets may also be applied from within the Output tab on the Format screen, or even by right mouse clicking on a thumbnail within the Color or Format screens.

To create a Format Preset, simply make a size change with the formatter and then click the 'Save As' button. A window will open showing the values to be saved. When the Format Preset window pops up you should enter a name for your preset, and if you like, trim any adjustments. Choose 'Save' to close, close without saving or select 'Default' to reset the values. You will then see in the Output Transform Presets list the new preset name.



Output Format Presets



Output Format Preset Selection

Transform Controls

Like the Input Transform controls, the first eight Output Transform controls are Pan, Tilt, Zoom and Rotate adjustments, followed by Width, Height, HFlip and VFlip. These controls are available on the DaVinci Resolve control surface and on the Output tab on the Format screen. Unlike the Input Controls, they do not appear on the Color primary tab display.

Output Blanking

The Output Blanking controls are automatically set by the format of the timeline to match the resolution selected. You can trim the Left, Right, Top and Bottom blanking. These controls can be selected on the DaVinci Resolve control panel.

There are preset blanking adjustments for various aspect ratios and you can also store custom blanking settings for the logged-in user. One page will allow you to store the various settings and the next page will allow the recall of various settings.

Output Format

This section is used to define the timeline formats and most of the controls match the functionality of those on the Config screen, System tab. While some control the management of the source files, they all set the configuration for the timeline, which directly influences the output image format.

You can set the timeline or output resolution from a preset list, which will display the resolution selected for image processing. To change the setting for resolutions not found in the presets, enter the Width and Height directly into the text box.

The 'Lock Format Info' is available only on this tab and it is used to prevent accidental switching of the timeline resolution. With this box checked, no format changes can be made on the Config or Format screens.

The Pixel Aspect Ratio (PAR) is used to select other than the normal square pixel format. You can apply a 16:9 anamorphic pixel aspect, a 4:3 for SD, or Cinemascope ratio.

For mismatch source clip resolutions you can have DaVinci Resolve process the images with the following options:

Center crop with no resizing

This option makes no attempt to resize the image to fit the aspect ratio selected. A simple crop is used from the center of the source image if it is larger than the timeline format.

Scale to full frame with crop

This option will automatically insert blanking within the image area to compensate for a difference in the source to timeline aspect ratio.

Scale entire image to fit

This option will resize the image in order to completely fill the frame. In some cases, a part of the image will be cut from the left and right sides of the source image or the top and bottom. You also have the ability to reposition the image using the Input Format sizing controls within the Format screen.

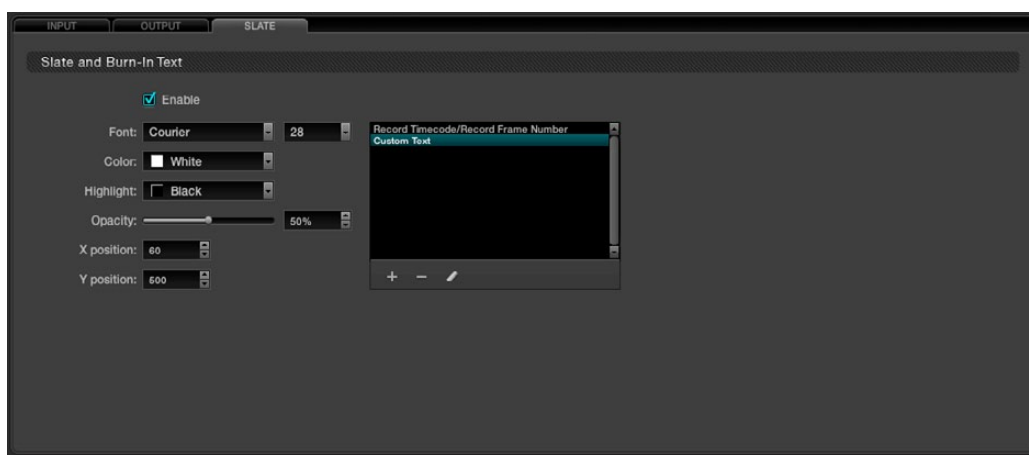
Stretch frame to all corners

When you select this option, DaVinci Resolve will fit the frame to the output aspect ratio. In this mode, the frame edges will be stretched to the corners and no information will be lost. However, this option can also result in squeezing or stretching of the image in order to fit the output format.

Use the 'Reset' button to reset any values which were entered to the settings as you found when you opened the tab. To apply the adjustments, select 'Apply.'

Slate

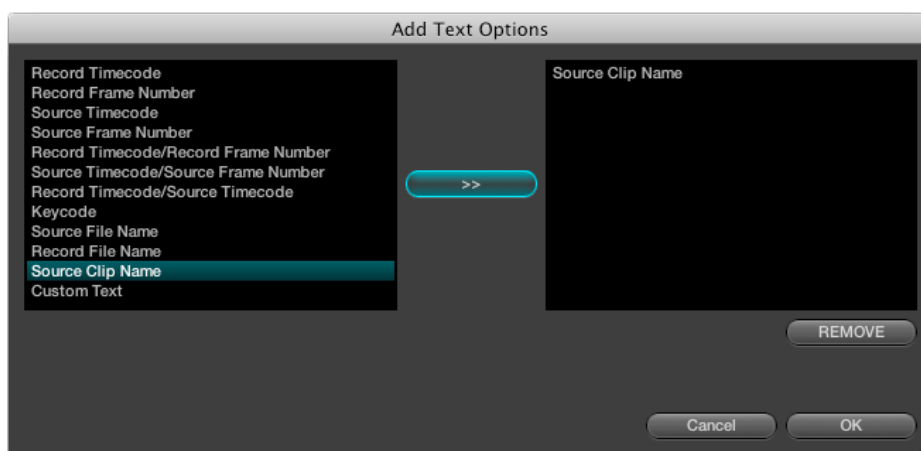
The third tab of the Format screen is called Slate. It provides control over a simple text character generator used to burn into the image timecode, frame numbers, and simple custom text. To activate this function, click on the 'Enable' check box in the Slate and Burn-In Text section. The controls then become active.



Slate Tab

Under the window you will see a +, -, and chalk icon. Click on the '+' button and a window will pop up to display options for text. Selecting an existing item and clicking on the '-' button will eliminate that text from the burn-in.

Within the pop-up window, select items for display on the left and move them to the right list with the arrow button. 'Remove' will delete selected items from the list.



Slate Text Selection

After you have chosen which items will be burnt-in, select 'OK,' or select 'Cancel' to close the dialog box with no change. When you close the pop-up, the items selected will appear in the Slate tab window.

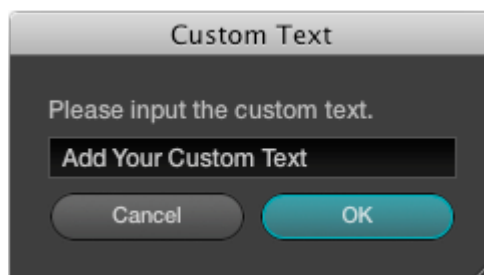
There are a number of controls available that affect the display of the complete list of items. These include Font, Color, Size, Background Highlight, and Opacity controls to make the text viewable on your images. Use the X and Y position controls to move each item individually. First select the item in the window, and type in position values, think of the image size, or use the up and down buttons. Then, go to the next item and move it.



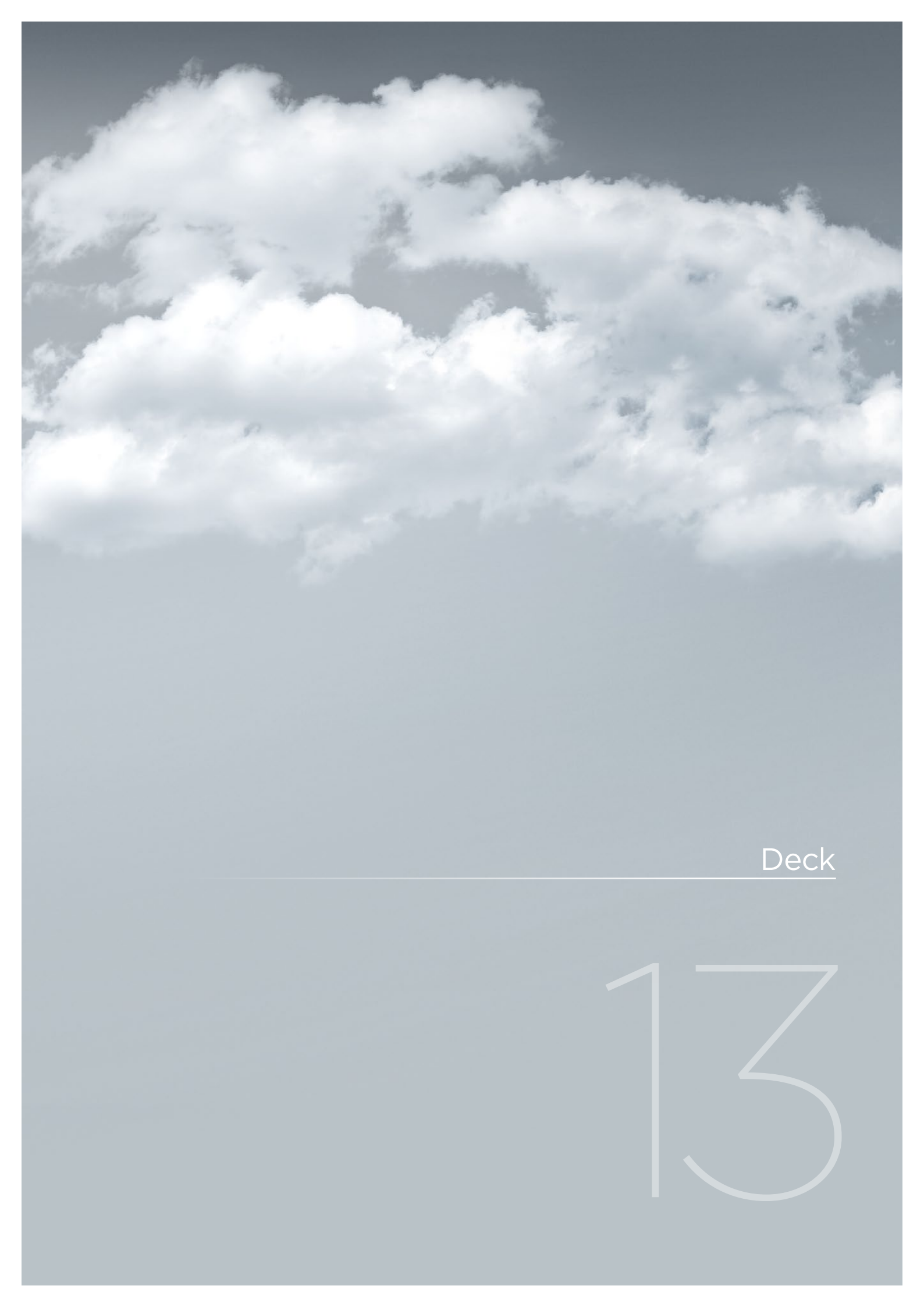
Viewer with Slate Text Enabled

Custom Text

If you selected 'Custom Text' when adding items for display in the pop-up dialog you can add your own descriptions to a Project. On the main Slate tab, select the chalk icon under the window listing the text messages.



Custom Text Dialog

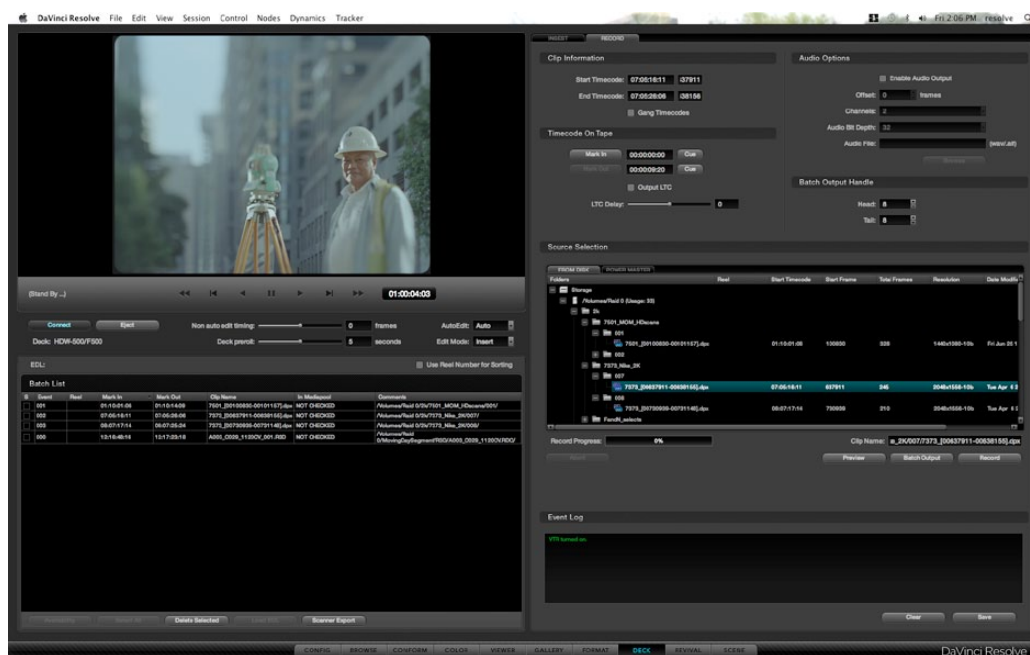


Deck

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Deck

DaVinci Resolve offers video and audio I/O under the control of the Deck screen. There are four main sections of the screen. The right-hand side has two tabs, one for Ingest control and the other for Record to tape. The left top section features a Viewer of the DaVinci Resolve or Deck Video output, depending on mode and transport controls. Below this resides the Batch File Manager.

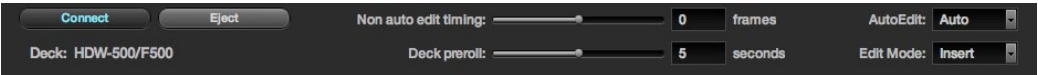


Deck Screen

Deck Viewer

The deck viewer displays the video DaVinci Resolve is sending to the deck when in Record mode, or the video being ingested from the deck when Ingest mode. If you have a deck connected to DaVinci Resolve, video with embedded audio and RS422 control, then select the Connect button on the left of the screen just under the viewer and DaVinci Resolve will initiate a connection to the deck. You can verify that the connection is made when the deck type is displayed, under the Connect button, and by the status message displayed to the left of the transport controls.

There is an Event Log on the lower right of the screen, which keeps a log of all DaVinci Resolve to deck communications so you can review this if connection is not established or is dropped. This Event Log may be saved using the 'Save' button under the Log window or cleared by using the 'Clear' button.



Deck Connection and Edit Controls

Once connected, you can utilize the transport controls to Shuttle, Play, Step or Stop the videotape. Directly below the transport controls, on the panel with the 'Connect' button and the Deck ID label, you will also see a number of other adjustments, all relate to the deck control.

- Eject:

Will eject the tape that is in the deck.
- Non Auto Edit Timing:

As also set on the Config screen Project tab, some video I/O cards perform automatic edit timing and in this case the slider will be grayed out. For other video cards, adjust this control to ensure accurate edit timing. Once set for a particular deck it should not need to be changed.
- Deck Preroll:

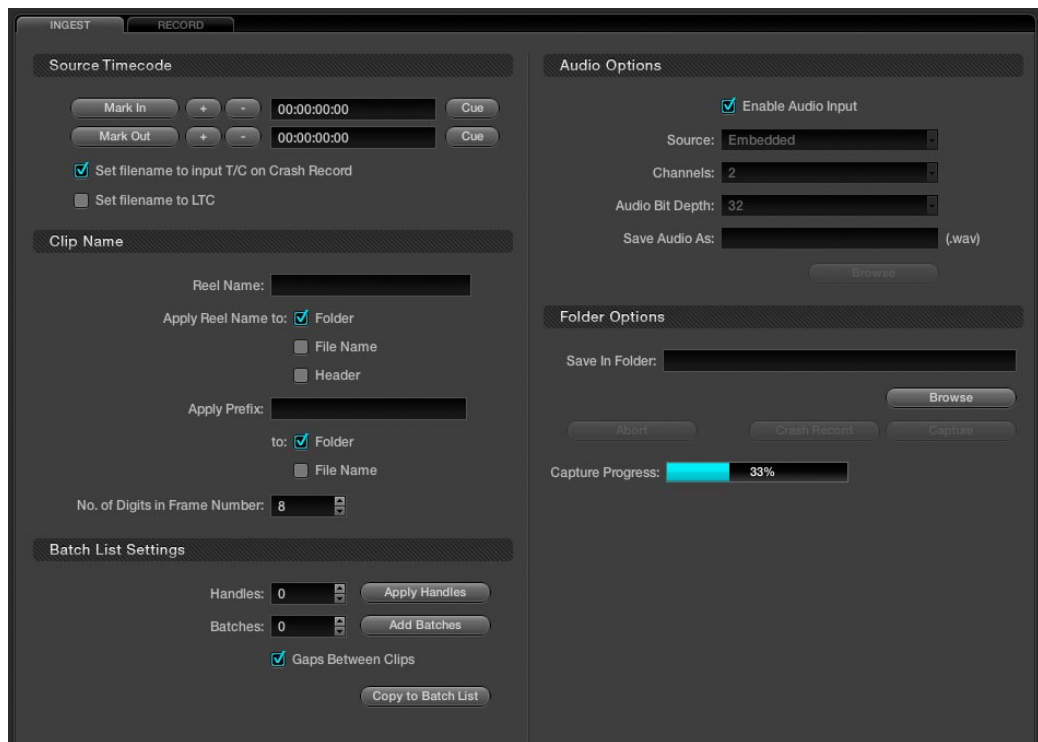
The Preroll selection allows the user to change the deck preroll (i.e., the position on the tape prior to the edit point where the deck will start playing). This control mirrors the setting on the Config screen. The default is five seconds, which is usually long enough for most decks to lock.
- Auto Edit:

This selection is the same as on the Config screen System tab, 'Use auto edit if possible' allows the user to activate the non-auto mode for older decks that do not support auto edit.
- Edit Mode:

This selection will toggle between Insert, Assemble, and Crash modes, depending on record operation.

Ingest

Using the settings on the Ingest tab you can ingest material for color enhancement or as an offline reference to check the EDL conform of the hi-res material. DaVinci Resolve stores these ingested images as dpx files. To ingest material into DaVinci Resolve, first verify that the deck I/O settings within the Configuration screen match the standard for the deck and videotape that has been connected. You should also verify that the conform rate set on the Config screen is also set to match the incoming video rate. Next, on the Deck screen, select the Ingest tab and then click on the 'Connect' button found just under the Deck viewer.



Ingest Tab

If you are using the DeckLink HD Extreme 3 or 3D, you should also make sure the deck you connect to has the Reference Sync operation set correctly. If you are using an HD deck, set the deck to the 'Auto' sync mode. In this mode the deck will use 'external' sync reference while in playout, or if you don't have an external reference generator like the Mini Converter Sync Generator, it will default to the internal sync; when the deck is in record mode it will automatically switch to 'Input' sync. For an SD deck which does not have an 'Auto' mode, we suggest you provide an external sync source and set the reference to 'External.'

Source Timecode

To ingest just a section of the tape, simply go to the selected areas by using the transport controls under the Viewer, or use the controls on the DaVinci Resolve control surface. Once the correct location has been found, locate the 'Mark In' button on the Deck Screen Ingest tab and click to select the start point, then find the appropriate out point on the tape and select the 'Mark Out' button to select the end point. There are Timecode Trim buttons to step the in and out points forward or back a few frames and you can quickly cue to these points to verify they are as you like. Or, simply enter the timecode numbers for the in and out points, if you know them.

You should then define the path in your media storage where the ingested files are to be stored. This may be typed directly into the 'Save In Folder' area, or if you would like, use the Browse button to locate a folder on the storage. DaVinci Resolve always makes SMPTE standard .dpx files on ingest.

At this point you may click on the 'Capture' button to start the ingest. If you have manually entered an In and Out point, the deck will cue to the In point, plus the defined preroll and begin ingesting material. Once the Out point has been reached, the process will stop and the clip can be seen within the directory where it is to be stored.

There are two check box options in the Source Timecode section. When 'Set filename to input T/C on Crash Record' is checked, the timecode from the tape when performing a crash record will be used to update the filename. If you check the 'Set filename to LTC' option with some video I/O cards, this will use an external LTC timecode source connected to DaVinci Resolve as the initiator for the filename.

Clip Name

The clip that you ingest to DaVinci Resolve can have a number of different metadata fields attached that can assist in workflow and file management during your project. You can apply a Reel Name to a Folder, File Name, or the dpx header of the recorded file, depending on which options are checked. There is a field to enter a Reel Name that will also add the text when transferring the ingest settings to the Batch List.

You may apply a prefix to a File Name or a Folder. Simply checking the boxes next to each prompt and adding the desired information will activate both items. There is also a setting for the number of digits in the Frame Number.

Batch List Settings

The Batch List Settings on the lower left of the Deck screen can be used for controlling image ingest based on an EDL. The events listed within the Batch List can be loaded using an EDL, or loaded from the information on the Ingest tab, including the timecode and reel name from above. Within the Batch List Settings display there are also controls for managing the batch list operation.

To add handles to the ingested material use the 'Apply Handles' button and set a value. This will direct DaVinci Resolve to ingest additional material on the beginning and end of the edit points as required. The value may be entered using the number window located to the left of the button. Select the 'Add Batches' button to append additional entries to the Batch List display. The amount is selected by the value to the left of the button.

If there is a gap between adjacent clips, this may be retained by checking the 'Gap Between Clips' option. The 'Copy to Batch List' button will incorporate the manually entered information into the EDL, allowing the user to modify the EDL information. Further information on the Batch List section can be found later in this chapter.

Audio Options

While DaVinci Resolve is a color grading and enhancement system, it will record and play audio, principally to be used as a guide track during grading or for preview of the completed Project. To ingest audio, first select the 'Enable Audio Ingest' checkbox. Then, using the pull-down menu, select the Source of the audio and then the number of audio Channels. You should also select the audio file Bit Depth and then a file name and location to record the .wav file. Use the 'Browse' button to select a location.

Folder Options

To select the location for storage of the images to be ingested, use the Browse button in the Folder Options section, or just type in the path. The individual frames of video will be labeled with their source timecode or the code you select, with the appropriate metadata as you selected in the other sections of this tab.

Capture

By selecting 'Capture,' DaVinci Resolve will start the ingest procedure. You can monitor the progress on the viewer and the Capture Progress bar and abort the operation by selecting the 'Abort' button.

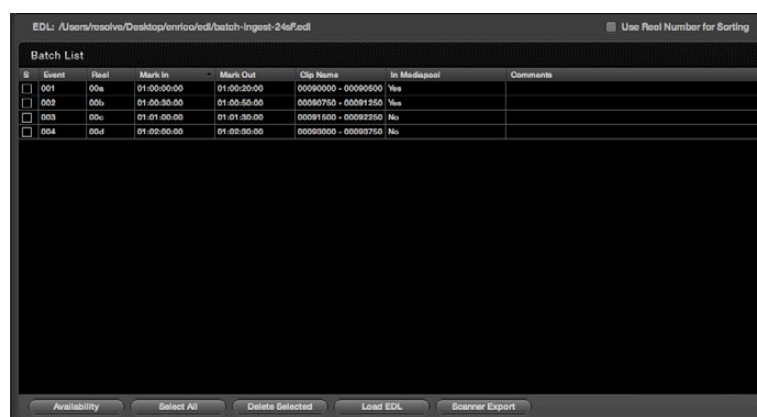
For simple limited settings and no preroll recording, the 'Crash Record' button will record material without a preroll. Once the ingest process is complete, the clips will be available in the folder you set within your media storage. You can quickly check these within the Browse screen.

Disconnect

To leave the Deck screen you should disconnect the deck by once again selecting the 'Connect' button. You must disconnect from the Deck to leave this screen.

EDL Ingest

When you have an EDL, you can use the 'Load EDL' button located at the bottom of the Batch List display. Selecting this button will open a Browse window so you can select the EDL to load, and once loaded, you will see the EDL file name listed at the top of the window and all the events in the Batch List. To the right of the EDL name is a check box, 'Use Reel Number for Sorting' which you should check if you would like the EDL to be sorted by reel number, otherwise it will be sorted by source timecode.



Batch list for Ingest

The Batch List display shows, by event, the Reel Name, the 'Mark In' and 'Mark Out' points, and the Clip Name that will be ingested into DaVinci Resolve. The check box on the left of each item in the display will indicate when each event has been successfully ingested by displaying a white check in the box. On the right-hand side of the display, the user will see if the images are available within the Media Pool and comments, if any. At the bottom of the Batch List display along with the 'Load EDL' button there are a number of control buttons.

If you load an EDL and some images for that EDL are already in the Media Pool, there is no reason to ingest them again so this offers a quick check to help reduce your ingest time. Using the active EDL, DaVinci Resolve will show you the missing clips, making ingest of the remainder quite a lot faster than the complete list.

Clicking on the 'Select All' button will highlight all edits within the Batch List display. If you click on the 'Delete Selected' button, this will delete the highlighted edit information. This gives you the opportunity to remove events from the batch and ingest only the selected sections from the EDL.

You can also ingest material using multiple EDLs. Particularly helpful for a TV commercial project. First place all the EDLs within the same directory folder. When you initiate the 'Load EDL' function, browse to the directory that has the EDLs and use the 'Shift' or 'Ctrl/Command' buttons to select the EDLs.

Scan list export

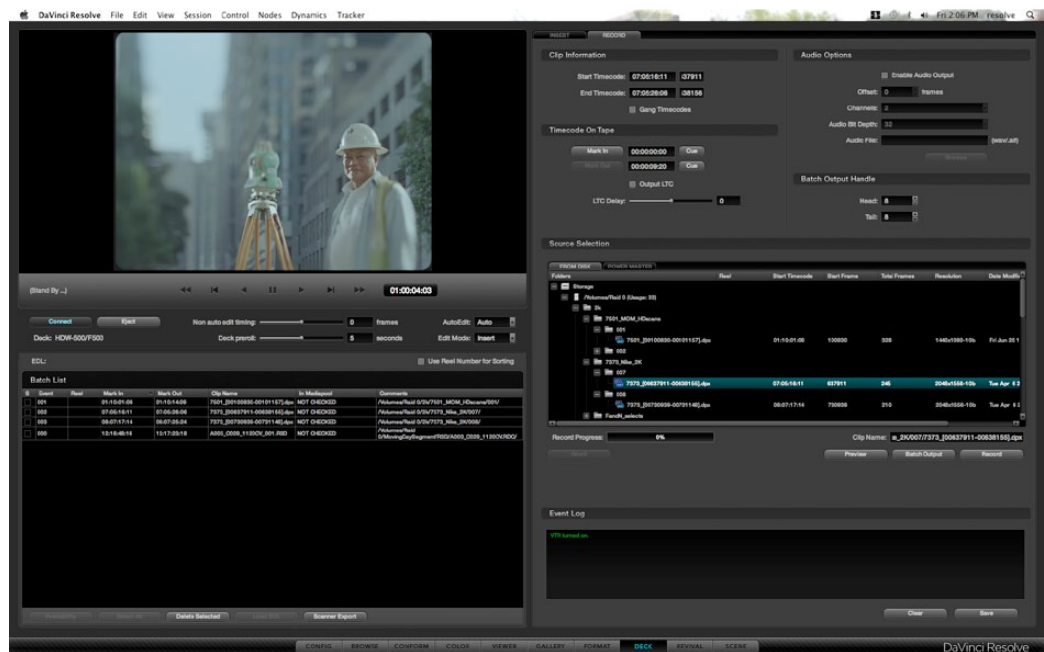
Lastly, at the bottom of the Batch List display is a 'Scanner Export' button. This button will export the events within the Batch List in a format that can be utilized automatically by an Arri scanner. The scanner can then scan the film and place the frames you need into the Media Pool with the correct naming convention.

DaVinci Resolve can also optionally populate the Media Pool with the clip entries so you can continue working as the scan is in progress. The images will appear automatically as soon as the scan has finished.

Record

The Record tab provides controls to record images from the media storage disks to a video tape deck. If you have a PowerMaster project it also offers control over the clips to be recorded from the timeline. Select the appropriate clip from disk browser in the 'Source Selection' tab. Then acquire the deck by clicking on the 'Connect' button and position the tape to the location where you want to record the images, clicking on the 'Mark In' button within the Timecode on Tape section. Or, simply choose the appropriate section where to record the material on the tape by typing in a timecode.

Check the Assemble/Insert/Crash setting under the Viewer to make sure it's as you require. Note: When DaVinci Resolve is performing a Batch Output operation you can only select between recording the clips with an Assemble edit or a Crash record. Click on the 'Record' button to start the process of exporting the material to the tape. Once finished, you can check the recording using the transport controls or click on the 'Connect' button once again to release control of the machine. You will need to disconnect prior to exiting the Deck screen.



Deck Screen

Clip Information

Within the Clip Information display you will see the timecode for the start and end of the clip, as defined by the clip's metadata. Trim the start and end points; the + and - buttons will either add or subtract frames from the values displayed.

The Gang Timecodes checkbox allows synchronization of the timecode from the tape with the timecode on the clip. If you want the tape timecode to match the timecode of the clip, select this box and also make sure your deck is configured to accept incoming VITC (Vertical Interval Timecode) and to record this to tape with the matching frame.

Timecode on Tape

The Timecode on Tape display shows the In point and Out point where the images will be placed on the tape. You may manually mark the start point by pressing the 'Mark In' button or mark the out point by pressing the 'Mark Out' button.

Under the timecode display there is a check box for LTC. With a DeckLink HD Extreme 3 or 3D, the longitudinal timecode is available on track 16 of the HD-SDI video signal so you can use a Mini Converter de-embedder to extract this analog audio signal and feed it to a recording device. This is particularly helpful if you have a downstream noise reducer that does not pass the VITC timecode. You can use the LTC and bypass the noise reducer, compensating the delay using the LTC delay slider, making sure the image and timecode reach the deck at the same time. With the DVS card there is a separate timecode output.

Audio Options

With Audio Options, when the 'Enable Audio Output' is selected, DaVinci Resolve will play a .wav or aif audio file with the images so both can be recorded on tape. Select the appropriate audio file, then select the appropriate settings for the Channels, Offset, and Bit Depth sections. Use the 'Offset (frames)' control to sync the audio and video.

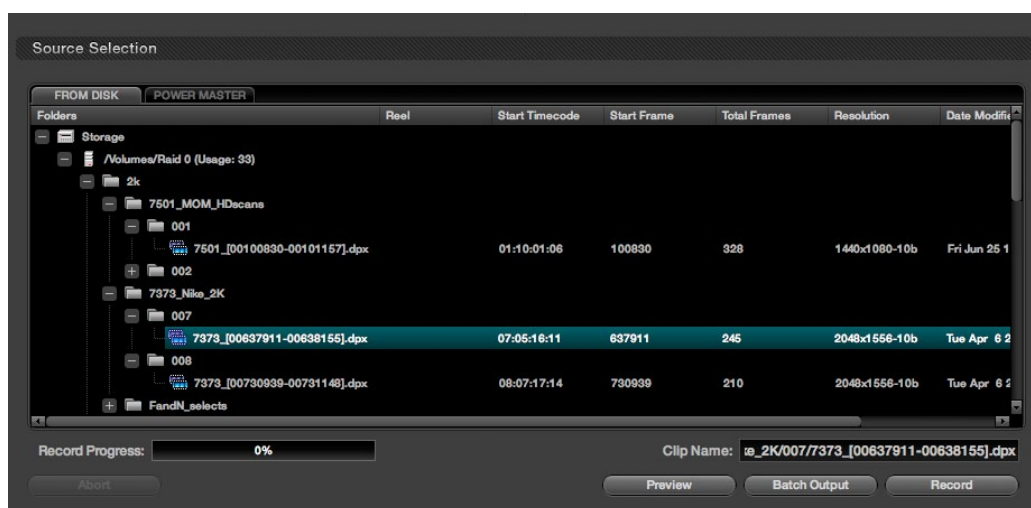
Batch Output Handles

If you are recording a number of clips to tape rather than a single timeline you can set up a batch list of events, somewhat similar to the ingest process, and DaVinci Resolve will automatically control the recording to tape with the correct timecode.

Often these are source clips and so to make later ingest easier, you can add black handles to each of the clips. The Batch Output Handle display allows you to set Head and Tail Handles to the material being recorded to tape. It will automatically add black before and after the clip material.

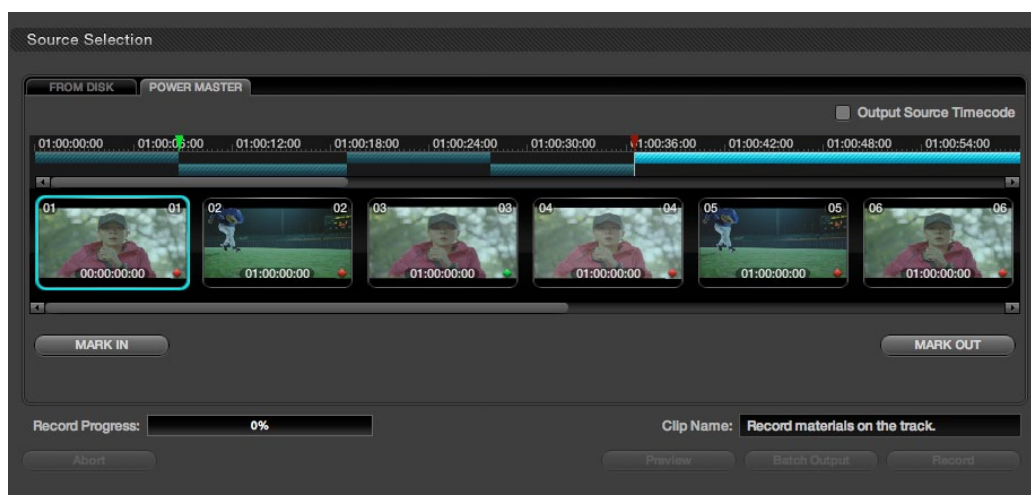
Source Selection

There are two tabs within the Source Selection display which allow you to switch between 'From Disk' and 'Power Master.' You can select clips from within the media storage to be recorded to tape when in the From Disk tab. Use the mouse to navigate to the folder with the clip you need and select. It will then be displayed in the 'Clip Name' window, which you can find just above the Preview, Batch Output and Record buttons.



Source Selection from Disk

Selecting the PowerMaster tab will open the PowerMaster clip selection display, which allows you to select a series of clips or a whole timeline that may be recorded to tape while simultaneously applying the color grading metadata. In this mode you do not have to first render the material to a dpx file before recording to tape. You save time and disk space with Power Mastering and all the images are at full quality.



Source Selection from Timeline for PowerMastering

Recording

Once you have located the file to record and set up the other configurations, select the 'Record' button to start the recording. A Record Progress bar will show the amount of the total clip transferred. If you wish to stop the recording process, click on the 'Abort' button.

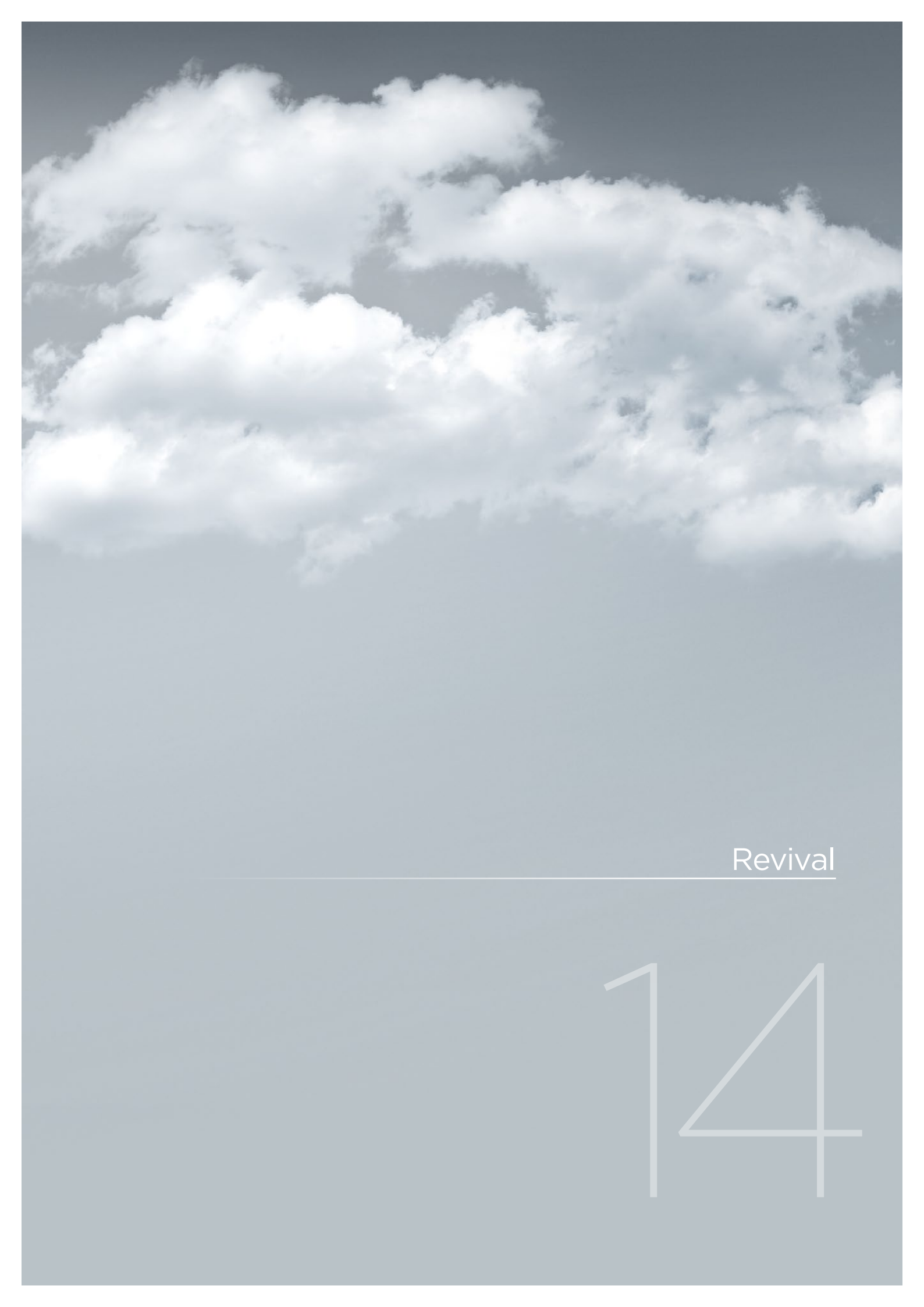
To check the recording operation prior to actually recording, use the 'Preview' button as this will preview the recording process without actually recording any material.

Batch Output

The 'Batch Output' button is used to record multiple files to tape. Use the batch list on the left-hand side of the screen, along with the amount of handles applied as set by the 'Batch Output Handle' controls.

To make a Batch Recording of multiple clips to tape, select the clips in the 'From Disk' browser and right mouse click on them. From the pop-up list select the option 'Add For Batch Record.'

A Batch Record of all the clips in the Batch List can be started by clicking the 'Batch Output' button. DaVinci Resolve will make a crash record of the clips to tape with the timecode from the source clip being recorded to tape.



Revival

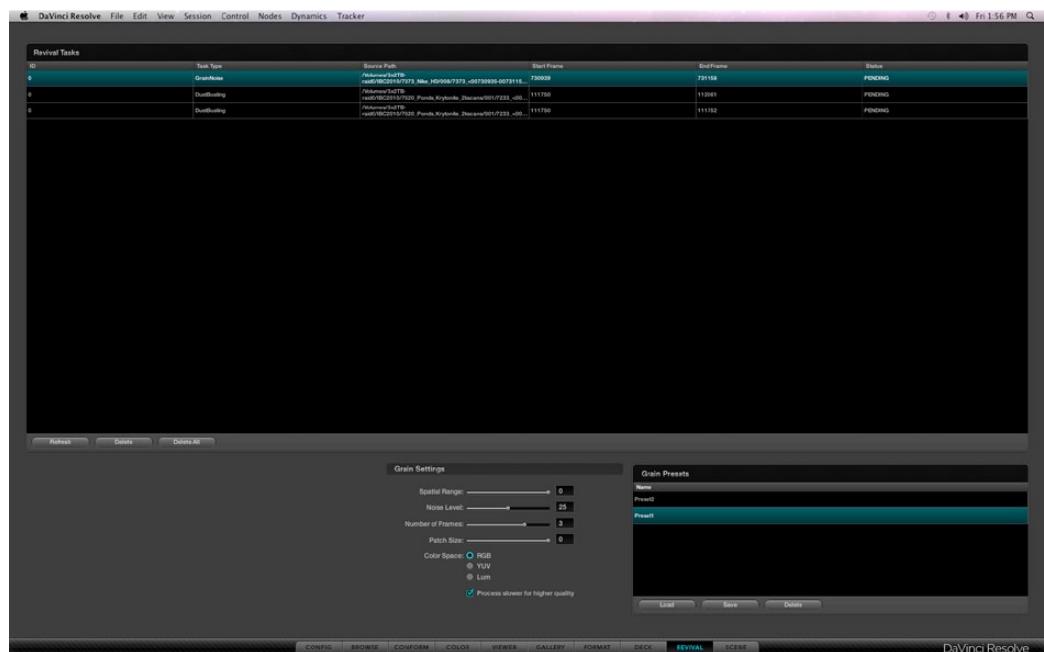
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DaVinci Revival

As the leading color correction and image enhancement system, DaVinci Resolve also works with the DaVinci Revival, the leading system for film restoration. DaVinci Revival has been used to repair thousands of films over the last ten years, and remains the backbone of many film restoration facilities. DaVinci Resolve and DaVinci Revival are operated in very different ways because the end product is quite different. Grading is very creative and flowing, whereas restoration work is often detailed on one frame for some time. Within DaVinci Resolve, the colorist can make simple Dirt and Dust touchups using the repair brush, but more complex repairs, major dust busting, grain reduction, deWarp, deFlicker, stabilization, deStain, etc., tasks are better performed in DaVinci Revival; which is a purpose-built restoration system.

Other than the manual Dirt correction, DaVinci Resolve does not perform image restoration, but it does provide details to a DaVinci Revival system for that repair. The Revival screen provides a list of clips and frames, marked by the colorist, that the Revival operator can review.

There are three buttons in the main display that permit you to Refresh the list, Delete a selected clip from the processing set or Delete All clips from the processing set. Also, on the lower right-hand side of the DaVinci Revival display are the Grain Settings controls and presets. This area is used by the colorist to establish grain settings, which are used by the DaVinci Revival system for grain reduction.

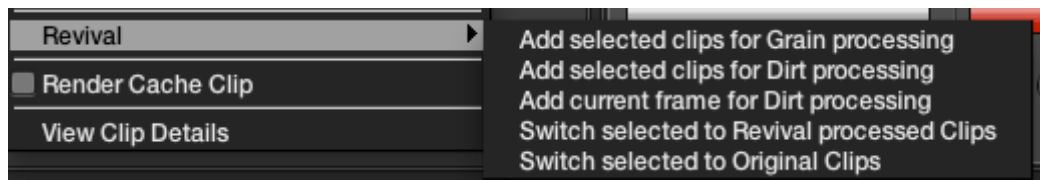


Revival Page

Marking clips for Revival restoration

Clips are marked for restoration using the DaVinci Resolve control panels or via the right click pull-down list on the Color screen timeline thumbnail for the current clip. The options, as described in the Color chapter of this guide, are to Add the Current Frame for Dirt Processing, Add the Selected Clips for Dirt processing, or Add the Selected Clips for Grain Processing. As each selection is made, the request will join the queue listed on the DaVinci Revival screen.

Selecting DaVinci Revival on the control panels will display the control panel soft keys, giving you the options for marking the frame or scene just as the mouse selection does on the Color screen thumbnail.



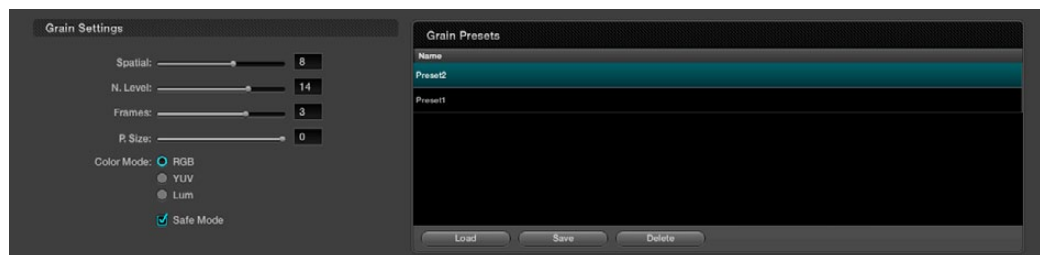
Resolve Timeline Thumbnail (right click selection for Revival restoration)

Revival Grain Settings

On the Revival screen within the Grain Settings area, you may set and save recommended settings for grain reduction. These can be recalled later, adjusted to suit the new image, and saved again.

When you select one of the clips marked for grain reduction, the Grain Settings will become active. They display the current status of the user controls for grain reduction. You can use these as is, or adjust them. You can also save the settings as a preset.

Each time you select the same clip, the settings will refresh to show the values for that clip. Use the 'Load' button to apply other presets to one or many clips.



Revival Grain Settings

The user controls are:

Spatial (0-20):

This control provides a blending of pixels with adjacent pixels on a single frame. The edges are softened a bit in order to reduce the fine grain noise. Since this is a spatial control, processing of one frame does not affect adjacent frames. A value of zero "0" will turn off spatial processing.

Noise Level (0-50):

This control is used in temporal processing of the image. This value represents a ratio of noise to motion. Higher levels may tend to cause artifacts on some motion. For grain, a value of 10-20 is a good starting point. When zero "0," there is no temporal or frame-to-frame processing.

Number of Frames (0-20):

This value represents the number of frames plus and minus of the processed frame in which averaging will take place. This too, is a temporal control and a value of zero "0" turns off temporal processing. Since it is a plus and minus value, setting to 3 (typical) will process and average 7 frames (-3, +3 and the current frame).

Patch Size (0-50):

This control represents the size of the grain or noise pattern to be processed. A setting of zero or one would indicate pixels or grains, and should be used as such. Higher settings like 40-50 could be used for a lower frequency type of noise. A typical use for this would be some light form of flicker in the dark areas. Note: High settings of Noise Level and Low settings of Patch Size can cause motion artifacts with some images, so use caution with extreme values for these controls.

Color Space:

This is normally set to RGB to process noise and/or grain in RGB space. It's the recommended mode, especially if the grain or noise has color. This is the highest quality setting, but takes slightly longer to process. Processing in YUV mode will process faster than RGB, however a color space conversion is performed with this mode. The Lum mode is for luminance-only processing and is recommended only for black and white material. A color space conversion is also performed for this process.

The checkbox 'Enable for slower and better quality processing' is normally selected to provide the best image motion preservation and will take longer to process the grain reduction than when deselected.

Here are some recommended starting settings for grain reduction:

Spatial Filter - 0 (Off for no spatial blurring); 2 (Low) for low resolution images; 5 (Medium) for high-resolution images (will potentially soften the image)

Noise Level - 20

Number of Frames - 3

Patch Size - 0-1

RGB Mode

Safe Enabled

Here are some recommended starting settings for noise reduction:

Spatial Filter - 0 (Off)

Noise Level - 20-30

Number of Frames - 4-8

Patch Size - 20-40

RGB Mode

Safe Enabled

Settings are very subjective and it is highly recommended some testing be done prior to committing a large amount of work.



Scene

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Scene

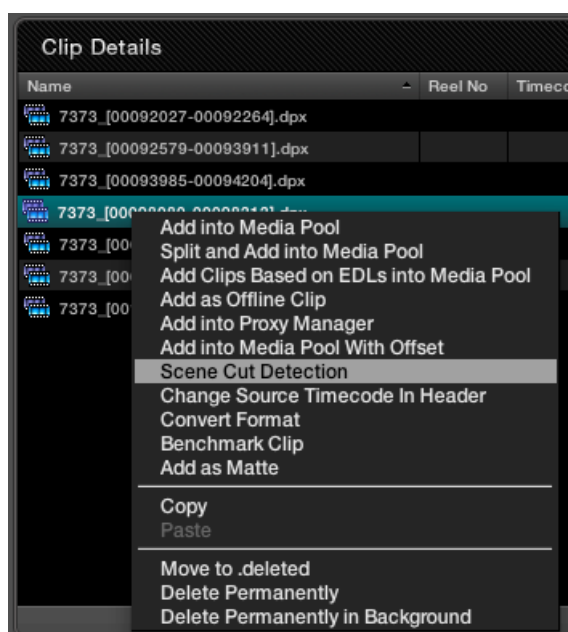
Scene Cut Detector

Often images are supplied in continuous recordings or single streams of files without an EDL to split the clips. As DaVinci Resolve associates color grading metadata to each clip based on source clip timecode, any long media files which include a number of clips must have either an EDL or be split into individual clips so the grade can be applied.

Splitting clips can be done manually on the Color screen or automatically in the Scene Cut Detector.

Loading Clips for Scene Cut Detection

Within the Browse screen, Clip Details, area highlight a clip, and right mouse click to select 'Scene Cut Detection.' This will automatically load the selected clip into the Scene Cut Detector and switch to this screen. Select 'Start Detection' to begin processing.

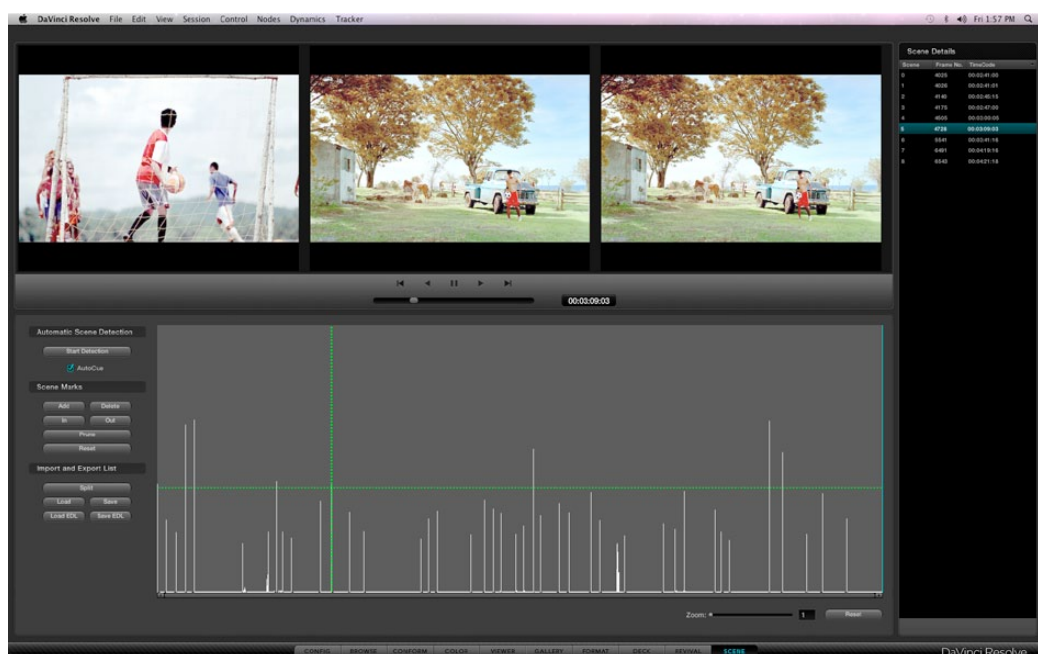


Browse Screen Clip Window (Right Click)

Scene Cut Viewers

The top of the screen displays three images. The left image is the last frame of a detected clip. The center image is the first frame of the next clip and the right image should be the following frame. Logically, the last frame of a clip will be different from the first frame of the next, and so this timecode represents the scene cut. The second frame of a clip is very likely, unless they are one frame edits, to be similar to the first frame.

If the left and center image look similar, the Scene Cut Detector has mistakenly identified this as a cut point. See the description below for guidance to resolve these false positive points.



Scene Window

Scene Cut Detector Controls

Below the left image are the controls for the Scene Cut Detector. There are three main groups of controls for the Scene screen and their operation is as follows.

Automatic Scene Detection

Start Detection:	This will start the scene cut detection process.
Auto Cue:	When activated, the current frame cursor will jump to the new scene cut, when detected, and the scene cut will become immediately visible within the Viewer.

Scene Marks

Add:	When you click on this button, it will manually add a scene cut at the position of the current frame indicator within the Scene Cut Detector graph.
Delete:	This will delete the scene cut located at the position of the current frame indicator within the graph.
In:	This will insert a red vertical line into the graph for the purposes of eventually performing a Prune function.
Out:	Selecting the Out button will insert a vertical blue line into the graph to indicate an out point for the purposes of eventually performing a Prune function.
Prune:	Once you have selected the 'In' and 'Out' points within the Scene Cut Detector graph by clicking on the In and Out buttons, the next step is to click on the Prune button to eliminate any scene cuts between these points.
Reset:	This will clear any In and Out points.

Export/Import List

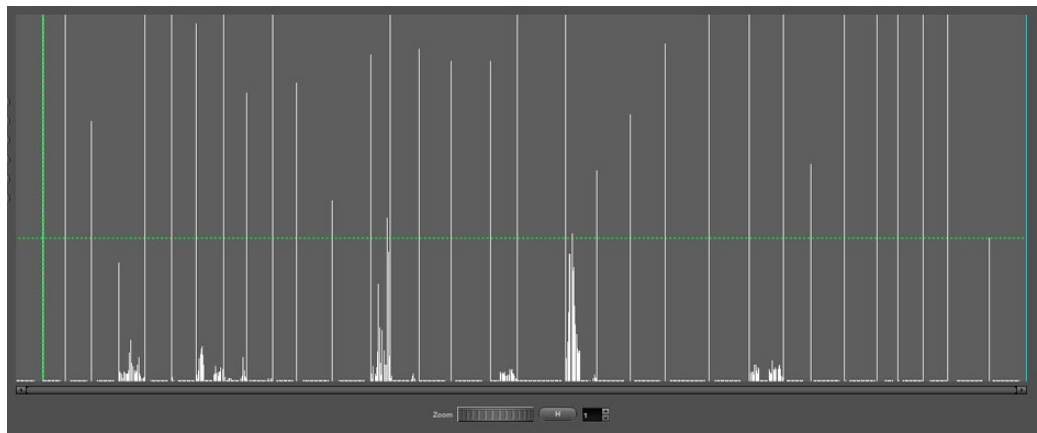
Split:	Once the scene cut detection process has been completed selecting "Split" will split the clip into individual clips based upon the scene detection information and load these clips into the Media Pool.
Save:	The scene cut detection information including the probability metadata will be saved to disk. These files are recognizable as they end with a ".sc" and are useful to later re-cut a clip.
Load:	You can select an existing .sc file and load it into the cut list.
Save EDL:	Export the scene detection information in a CMX-style EDL format.
Load EDL:	This will load a CMX-style EDL and allow you to use the cut information from the EDL in the Scene Cut Detection process.

Scene Cut Detector Graph

The bottom half of the screen is dominated by the graph used to display the results of the Scene Cut Detector's analysis of the images. As the Scene Cut Detection process is taking place you will see a visual graph forming. Once the process is completed, the scene changes are listed in the column to the right of the Scene Cut Detector graph.

The horizontal green bar within the Scene Cut Detector graph represents the sensitivity level for the detector. If you click and drag it upward, it will lower the sensitivity, and if you lower the bar, it will increase the sensitivity. When either of these functions are performed, the calculations of where scene cuts occur will immediately be updated on the cut list.

DaVinci Resolve enables you to adjust the sensitivity of the detection process even after the analysis has been performed. This is a significant time save in reducing false positive selections and also permits dynamic review of the cut list.



Scene Graph

Cut List

The right side of the Scene screen displays scene and frame numbers with their timecodes and represents the cut list as generated from the Scene Cut Detection. This list can be saved, recalled, or just used to split the clip and load the files into the Media Pool.

SCENE	FRAME NO.	TIMECODE
0	89999	00:59:59:24
1	90029	01:00:01:04
2	90054	01:00:02:04
3	90083	01:00:03:08
4	90143	01:00:05:18
5	90173	01:00:06:23
6	90200	01:00:08:00
7	90231	01:00:09:06
8	90257	01:00:10:07
9	90286	01:00:11:11
10	90312	01:00:12:12
11	90352	01:00:14:02
12	90395	01:00:15:20
13	90414	01:00:16:14
14	90417	01:00:16:17
15	90449	01:00:17:24
16	90485	01:00:19:10
17	90529	01:00:21:04
18	90559	01:00:22:09
19	90613	01:00:24:13
20	90620	01:00:24:20
21	90648	01:00:25:23
22	90685	01:00:27:10
23	90724	01:00:28:24
24	90773	01:00:30:23
25	90818	01:00:32:18
26	90856	01:00:34:06
27	90887	01:00:35:12
28	90924	01:00:36:24
29	90961	01:00:38:11
30	90984	01:00:39:09
31	91012	01:00:40:12
32	91040	01:00:41:15

Cut List

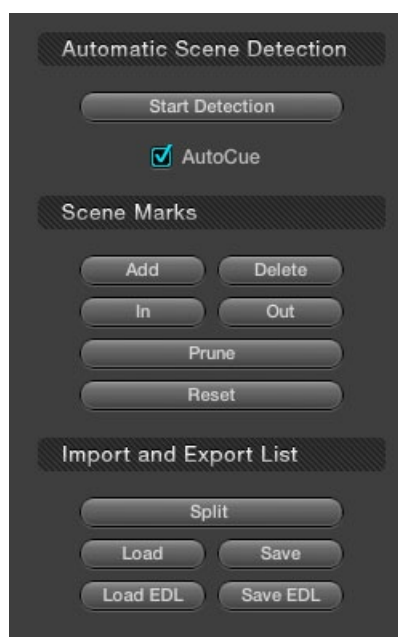
Reviewing the Detected Cuts

During or after the Scene Cut Detection process you can begin reviewing the Detector's analysis of the image to make sure your cut list matches the actual scene cuts. While the Detector is efficient, it can be confused by motion, camera flashes, or even the rolling up to and down from full film speed where the shutter can give multiple 'flashes.' The analysis is looking for large changes in the image.

The simple method, and fastest way to check to see that the scene cuts are accurate is by pressing the "N" and "P" keys on the computer keyboard to view the "Next" and "Previous" scene cuts. Look for the left image to be different from the center and right image. If they are, this is likely to be a scene cut.

As each correct cut point is confirmed, select 'N' to jump to the next prediction. If the spikes on the graph are very close together or no cuts are detected, you may need to modify the position of the horizontal green sensitivity bar and start the cut review again.

If the material which is being scene cut detected, contained certain types of motion which confused the Scene Cut Detector, you might encounter a group of spikes within the graph that may contain numerous false positive scene cuts. To delete this information, use 'Prune' to trim out scene cuts which are grouped between the marked "In" cursor point and the marked "Out" cursor point. Once the marked In and Out points are marked, and the 'Prune' button is selected, these scene cuts will be deleted.

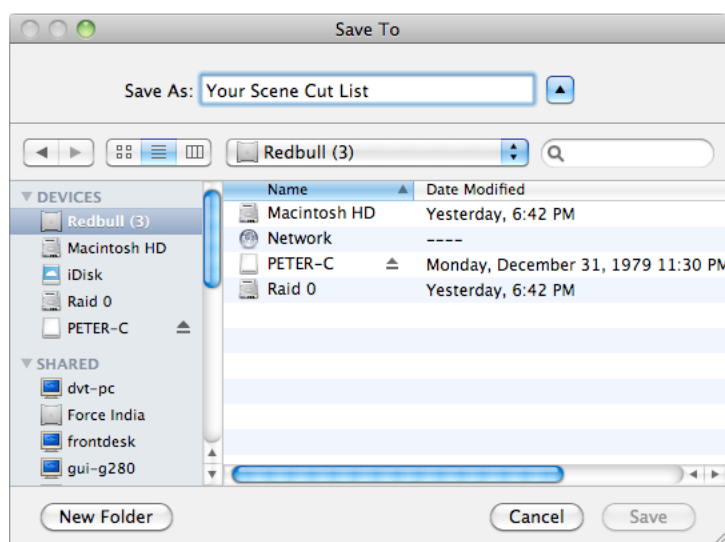


Scene Cut Detection Controls

Splitting and Saving Cut Lists

Once you are satisfied that the scene cut information is correct, the next step is to press the 'Split' button. This will create separate clips based upon the Scene Cut Detection information, the cut list, and will load these clips into the Media Pool. From there you can begin your Project by creating the conformed timeline and start grading.

If you have used the Scene Detector to create a cut list for exporting to another device you can save a CMX-style EDL format list that most professional editing systems can use.



Save the cut list





Render

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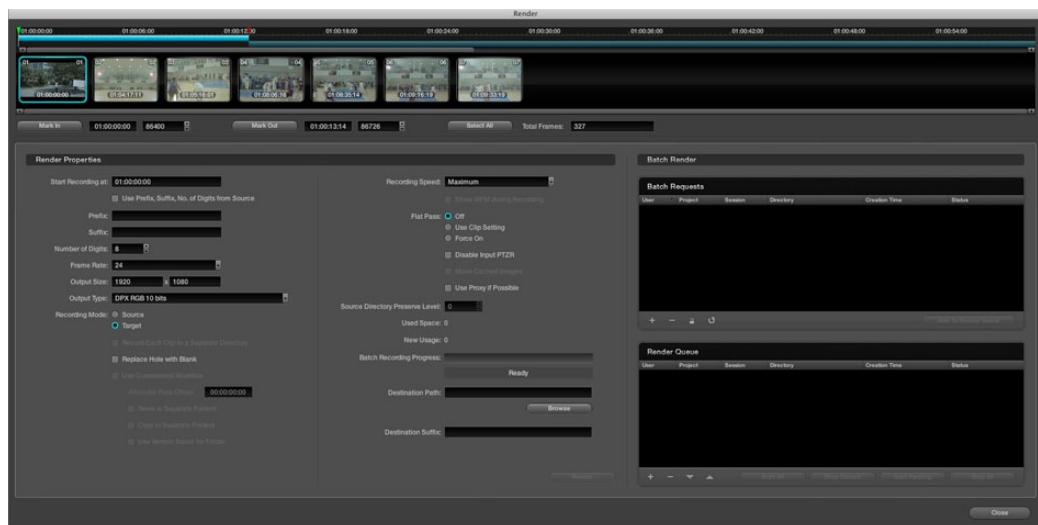
Render

The Render screen is used to set up the configuration and initiate rendering of the timeline images. DaVinci Resolve is not restricted by this limitation and this provides you with significant workflow advantages.

A simple example of this is using 2K source material and an HD image processing timeline and then setting DaVinci Resolve to render in ProRes 444, and then render in MXF Avid DNxHD, and then 2K DPX. All the settings are configurable and permit mastering in all the formats you need without having to change the timeline processing resolution.

These renders are always performed at the highest resolution possible. If the source clip is 2K and you have an HD timeline but wish to render in 2K, no problem. DaVinci Resolve will use the source clip and apply the metadata for that clip as directed by the color correction list with a single resize of the image.

You can open the Render display from within the Color or the Format screens by pressing the 'Command' and 'R' key on the Mac keyboard, or using the menu bar pull-down. On the DaVinci Resolve control surface you can also select the 'Render' button, which is found near the jog and shuttle control or use 'Control R' on the pullout keyboard.



Render Window

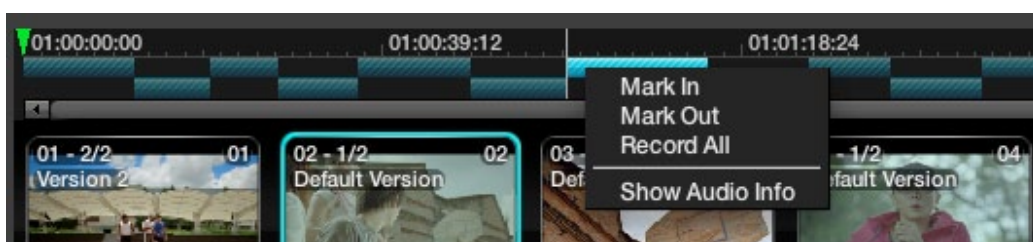
Render Timeline

The Render Timeline displays the same clips as shown on the Color screen. If you have different versions of clips to render, make sure they are selected on the Color screen timeline.

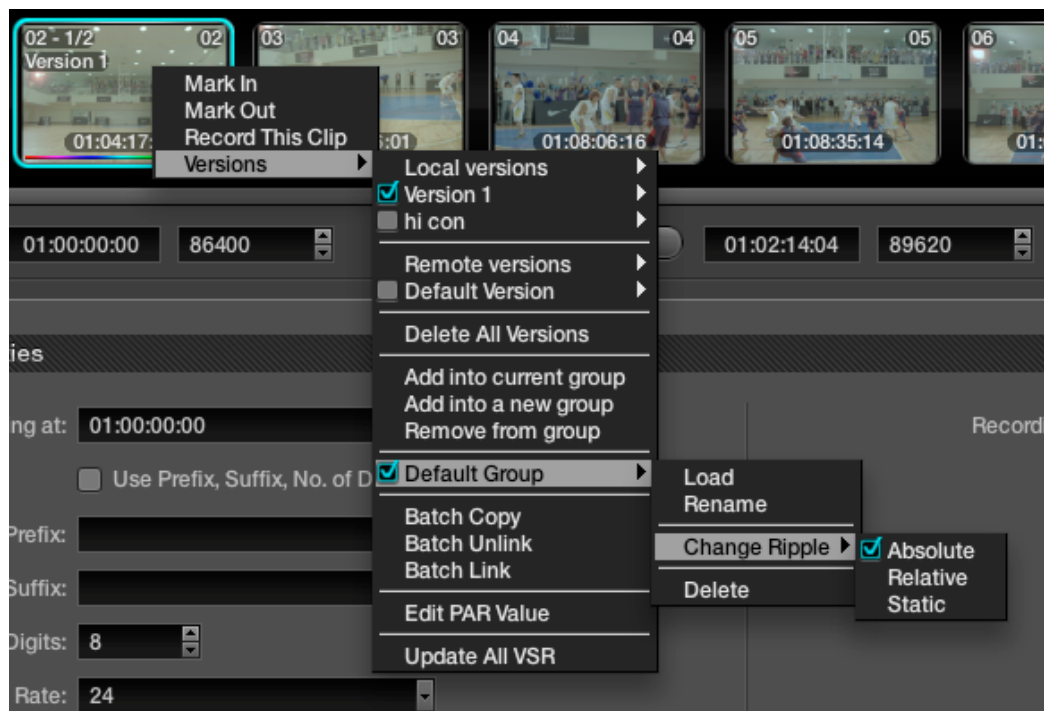


Render Timeline with Mark In and Out Controls

Using your mouse you can select a position on the timeline with the cursor and then select 'Mark In' or 'Mark Out' via a right click, or the buttons below the thumbnails. The timeline will display a green marker at the selected In point and red at the Out Point. You can also select 'Record All' from the timeline right-click option. In each case, the in and out times and the total frame count will be updated.



Render Timeline (Right Click)

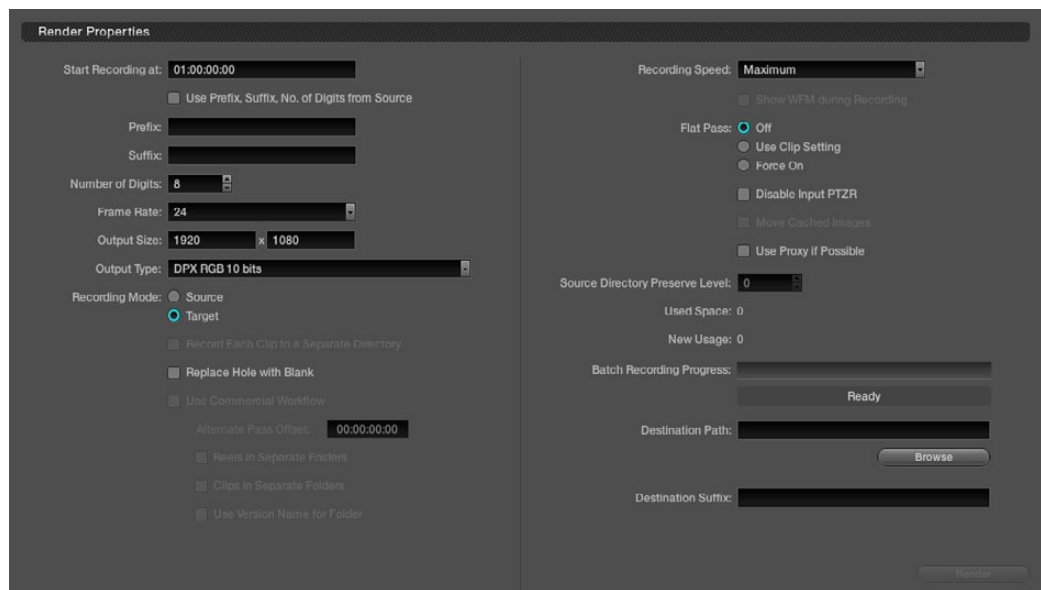


Render Thumbnail (Right Click)

There are a number of options in this thumbnail right-click menu and almost all are the duplicates of options in the Color display. One noticeable difference is the 'Render this Clip' selection.

Render Properties

All the settings in the Render Properties section of the Render screen are important when configuring DaVinci Resolve to render files. They provide great flexibility and workflow efficiencies, so they will be described in detail below.

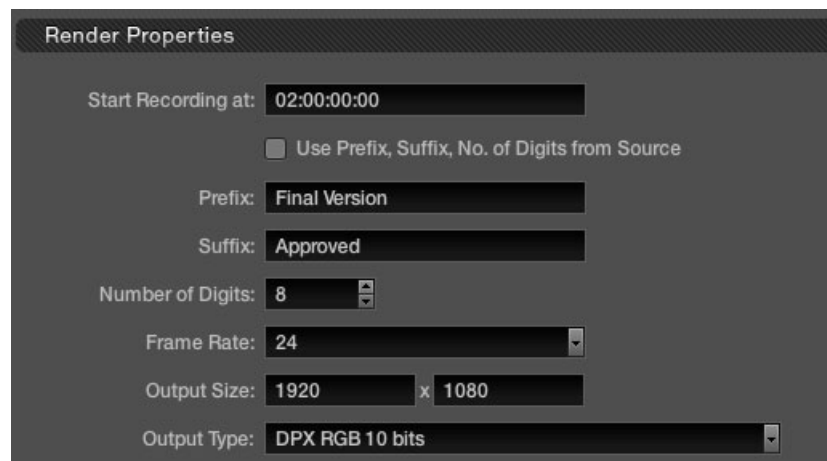


Render Properties

'Start recording at' indicates the timecode that will be recorded into the dpx file header and this number is also used to label the file, as a frame count. When rendering a timeline there is a logical count of the frame numbers, permitting simple clip playback on other devices. While typically set to hour one, you may find it useful to start each reel for a feature film with an increment of the hours. Reel two, for instance, would start at 02:00:00:00.

Typically, image files are rendered using no Prefix or Suffix and a standard eight-digit length of the File Name. You can type your own prefix and suffix labels to be used in the file path when rendering or by checkbox selection use the Source Prefix, Suffix, and number of Digits.

The Number of Digits selection allows the user to enter the amount of digits required for the recorded file. This is particularly useful to make the rendered files immediately readable by another manufacturer's system.



Render Properties (Detail)

The next setting is the Frame Rate of the render. This number is typically the same as the 'Conform' frame rate as selected on the Config screen, but on occasions you may wish to set this to a variation of this conformed rate. This will adjust the metadata recorded within the file and is again to aid playback for the range of systems available in the market. Use the pull-down to select from the available options.

Output Size settings are simply the resolution for the finished rendered file. Just like the Frame Rate described above, the width and height as defined within the Config screen are automatically displayed but are still editable. This setting is also guided by the Output Type set in the pull-down just below the Output Size. Some file formats require specification of the resolution by file type and in this case the Output Size settings will revert to the fixed format as defined by the standards.

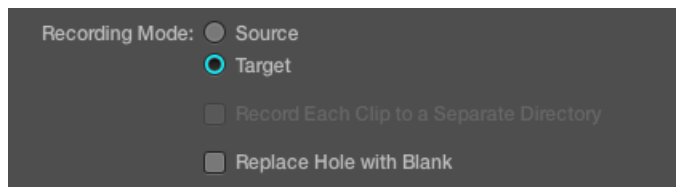
Output File Formats

This list defines all file formats and resolutions currently available on your system. What is shown will depend on whether you have the Final Cut Pro QT and ProRes libraries and the Avid File Support License. Other render file formats will be added over time, so be sure to check each new version for the latest supported formats.

Recording Mode

The next section of the Render Properties display manages the selection of the Clips, Versions and Timecodes. There are two recording modes: Source mode will render the clips in ascending source timecode order with the timecode of the source clip, not the timeline timecode. Target mode will render the clips in the order of the Default or Master Timeline, or of the session selected. The timecode recorded in each frame will be the timeline timecode.

The one check-box option in Target mode is to Replace Holes in the timeline with blank frames, rather than to render with the clips rippled along to close the gap.



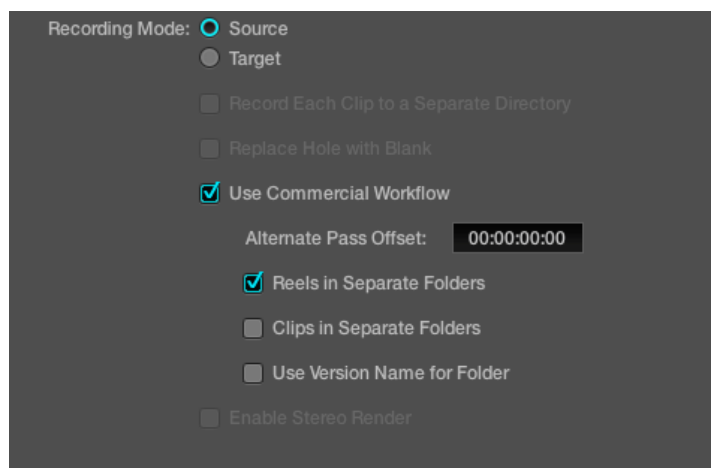
Selecting Source or Target Recording Mode

When Source mode is selected there are two main options to consider. You can select to Record Each Clip to a Separate Directory, remembering these are source clips with their timecode. This is commonly used when rendering VFX shots for further post work to allow the VFX department to identify clips quickly and distribute the work.

Commercial Workflow

DaVinci Resolve's 'Use Commercial Workflow' setting will dramatically simplify working with versions of grades and provide graded versions in a format that is easy for the other departments in a post house to use.

With the 'Use Commercial Workflow' checked, DaVinci Resolve will automatically render alternate passes pertaining to different versions of grades. This is typical of TV commercial work where you have two or more versions of the grade for each scene. As the source clip has one logical timecode, regardless of how many graded versions are made, you can't simply render this clip five times and put it in the same folder. All of the timecodes and file names would be the same, so you would end up with one version - the last you rendered.



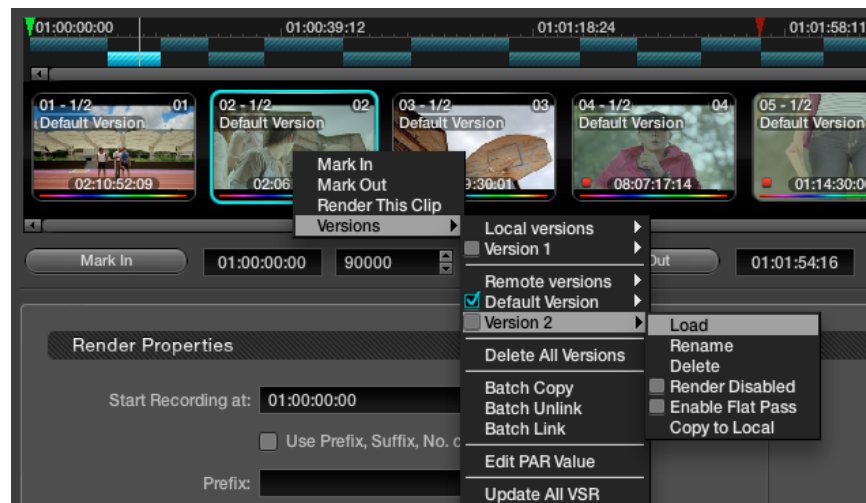
Commercial Workflow Options

The 'Alternate Pass Offset' time control allows you to separate the versions timecode via an offset. For example, the default version will be at 01:00:20:00, and you select a 10 minute offset in the Alternative Pass Offset timecode entry, the second graded version of the clips will be at 01:10:20:00 and the third version at, 01:20:20:00, etc.

You can offset the clips by whatever value you like, but the idea is to make it easy for the editor and VFX guys to find the versions of the grade. If the clips are shared to the finishing artist, they know the alternative pass (the other versions) will be 10 minutes apart, or whatever you set. It's easy for them to change the clip version just by adding 10 minutes to the time. To further simplify the workflow, you can put the separate source reels in separate folders.

The 'Clips in Separate Folders' option will automatically place alternate grades of clips into separate folders when checked. The 'Use Version Name for Folder' option will label the folder with the name assigned to the alternate version. On the Color or Render screen you can select a thumbnail with a right click and rename the version. Again, this is to assist in the facility workflow while sharing material between suites and applications.

If you wish to exclude a version to be rendered, simply select the 'Render Disabled' option when right mouse clicking on a clip within the Thumbnail Timeline display on the Color screen.



Selecting Versions to Render or Disable

Stereoscopic Render

DaVinci Resolve offers stereoscopic 3D operation with all systems, and with the appropriate hardware, real time grading and playback of two streams of images; the left and right eye.

When it comes to rendering these projects there are two options. For the highest quality render each timeline separately (i.e., each eye). Alternatively, use the checkbox 'Enable Stereo Render' and DaVinci Resolve will render a side-by-side image with the left eye on the left-hand side and the right eye on the right. Or alternatively select the line-by-line mode for the render.

Other Render Properties Settings

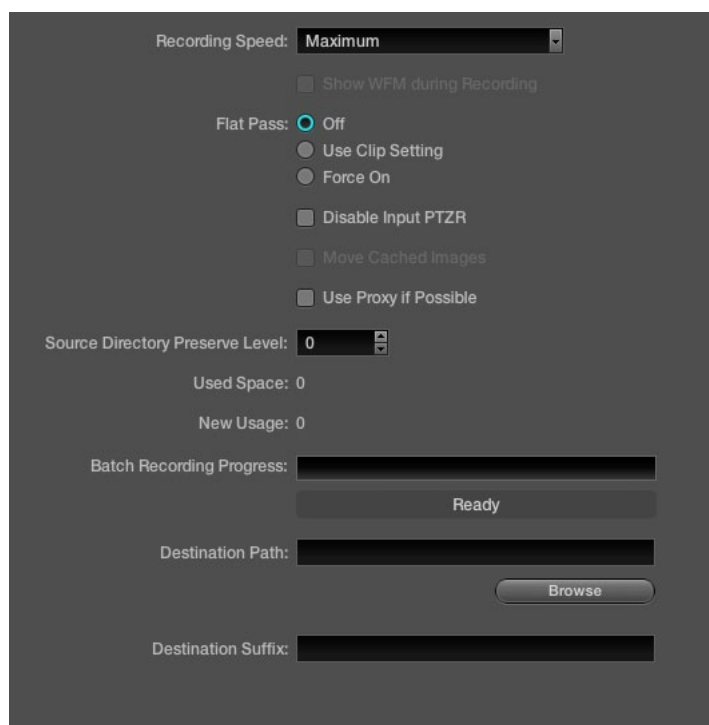
Some storage systems are shared by multiple applications in a facility and often these storage area network (SAN) based systems have sufficient bandwidth for only a single stream of images to each user. With DaVinci Resolve's super fast render speed this may cause playback problems with other users on the SAN if the storage bandwidth is insufficient. You can set the Render speed, which is typically set to Maximum, or throttle down the render speed to limit SAN bandwidth usage to between 1 to 50 fps.

The 'Show WFM during Recording' mode will update the Waveform display during recording when you have a separate DaVinci Resolve waveform server. This option is applicable to Linux systems.

During rendering to disk using 'Commercial Workflow', you have three options regarding flat pass control. The settings are:

- 1) If you select the option 'Off,' the system will always apply color correction for all versions of all clips before rendering to disk.
- 2) The option 'Force On,' when checked, will force the system to always disable color correction for all versions of all clips before rendering to disk.
- 3) If the user selects option "Use Clip Setting" for each version of a clip, the system will check that version's pass flat flag which is set with a right click on the thumbnail. If it is turned on, the system will disable color correction for that version of the clip. Otherwise, it will apply color correction for that version of the clip.

When you check the 'Disable Input PTZR,' any Pan, Tilt, Zoom or Rotations will not be rendered with the material.



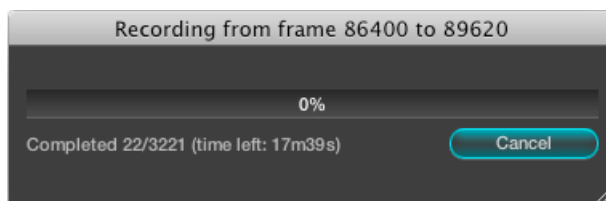
Additional Render Properties

Render Path Settings

The remaining items in this window relate to the Render Path settings. The 'Source Directory Preserve Level' selection will retain the source file directory structure when rendering material. It will automatically create sub directories to match the source files. This is followed by an indication of the storage use showing the amount of space available within the target storage area and the new usage based on the selected timeline or clip for rendering.

Should you use Batch Recording, there is a progress bar and status display showing the Batch Render progress, covered later in this chapter. Use the Browse button to select the location, or type it in directly. If you like, also define a 'Destination Suffix' that will be applied to the recorded file.

The 'Render' button will initiate the render process based on all the settings in the Render Properties display. This will bring up a prompt, in place of the Render window, that shows you the progress of the render. You can watch the Viewer as DaVinci Resolve is rendering and note the render speed on the top left of the Viewer. A Render Progress window will also be displayed on the Color screen during the render. Should you wish to interrupt or cancel the recording process and close the Record Properties window, select the 'Cancel' button.

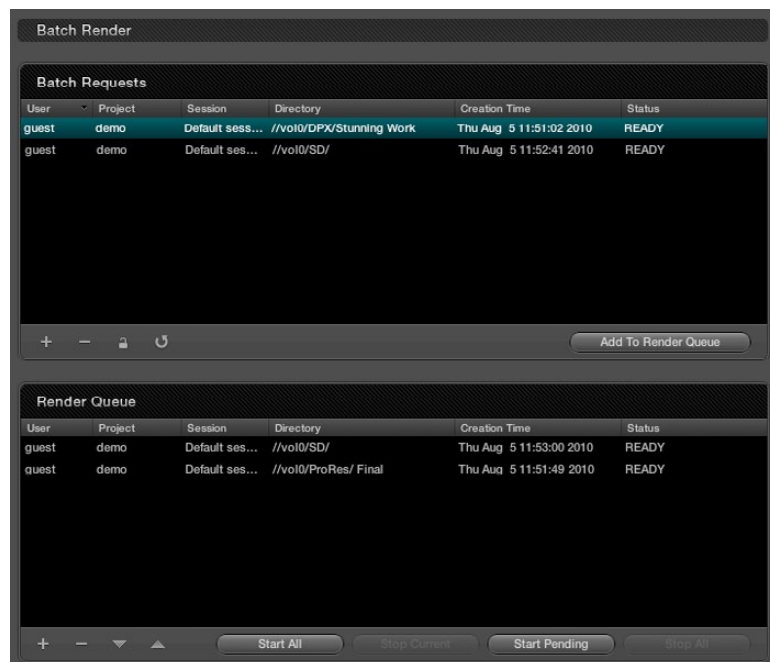


Render progress dialog as seen on the color screen during the render

Batch Render

DaVinci Resolve offers the ability to set up multiple render configurations and make a Batch Render list. No renders are actually made from this list, however it is useful for render management and allows you to set up different resolution, file type, and path settings as batch requests.

The Batch Render list shows configurations set in the Render Properties display. After you have made all the settings for a render, instead of starting the render, using the 'Render' button, you can add these settings to the 'Batch Request' list. Use the + to add requests and - to delete them. The lock symbol is used to avoid accidental changes to the settings of requests in the list and the refresh symbol to update the list.



Batch and Render Managers

If you select and highlight an event within the Batch Request list you will notice that the properties on the left side of the screen, the Render Properties, will all update to those saved in that batch request. If you have selected an item in the Batch list you can then start a render using the Render button, or use 'Add to Render Queue' to put this configuration into the Render Queue just below the Batch Requests list. This will remove the item from the Batch list.

Render Queue

The Render Queue allows you to create a queue of configurations to be rendered. Clicking on + will add the information into the queue from the 'Render Properties' display and - will remove it from the queue. As described above, using the 'Add to Render Queue' button will move a Batch Request items into the Render Queue.

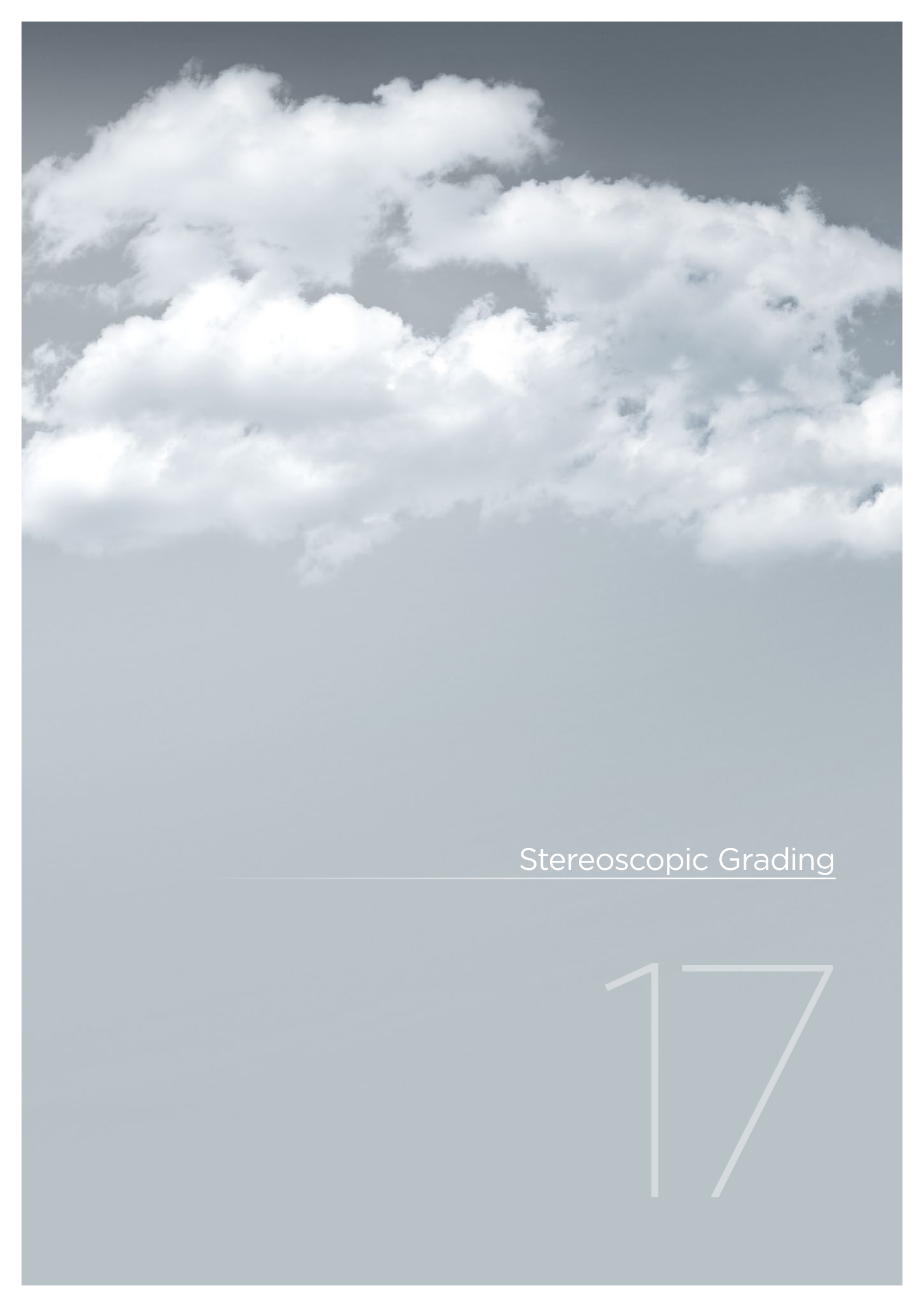
All items added to the queue are placed at the bottom of the list. Use the up and down arrows to move the priority of the event in the list. You can select queued items, which update the Render Properties display, and then select the 'Render' button, or you can initiate the Render Queue. Selecting 'Start All' will begin rendering of all the items, one at a time, in the Render Queue. The status display on the right of the Render Queue window will show you the status of each event.

The 'Start Pending' button will initiate a render of all clips in the queue that have not already been rendered. This is slightly different to the 'Start All' function which will re-render all clips in the queue, regardless of if they have already been rendered or not. You can stop the current event from rendering and DaVinci Resolve will then proceed automatically to the next event, or you can select 'Stop All' to cancel all renders. The list will remain active so you can start again later, or modify and start again.



Render Queue





Stereoscopic Grading

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Stereoscopic Grading

With DaVinci Resolve on Mac systems, monitoring of Stereoscopic images is via the HD-SDI output where you can select a Side-by-Side or a Line Mesh output to be fed to your Stereoscopic 3D monitor. Of course there are bandwidth from disk issues, and a limited GPU count for processing, but principally you can grade and review a Stereoscopic project on the MacPro platform.

On single chassis Linux systems performance is similar to the MacPro, and just like the MacPro, the HD-SDI from the DeckLink provides the stereoscopic monitoring feed. On both platforms you select the 'Enable 3D Monitoring' option on the Config screen Settings tab and then your 3D mesh type to match your display.

The larger stereoscopic Linux systems with the appropriate hardware, supports 4:2:2 and 4:4:4 RGB or XYZ monitoring at HD resolution for each eye. You can also configure these systems with multiple GPUs for 20+ nodes of grading in full Stereoscopic 3D with real time performance.

Creating a Stereoscopic Project

You can create a Stereoscopic timeline by either using Pre-Conform or a conformed workflow. Either way, in the Browse screen Media Pool folders, make a folder for each eye. Place your left eye material in the left folder and right eye in the right. Even a non-3D project may be converted to a 3D project at any time, just by adding the second eye in its own folder.

With your source images in the two separate folders in the Media Pool, create the default timeline in the Conform screen. Next, load an EDL or use Pre-Conform and create the timeline using the images only from the one eye. Select the appropriate Media Pool Folder when loading the EDL. Right mouse click on that eye on the Conform timeline and assign it to either the left or right eye as appropriate.

For the second eye, the process is repeated using a corresponding EDL and choosing the alternate eye for this timeline. The result is you have a master timeline with all the clips and two EDL based timelines with each associated with an eye.

Grading Stereoscopic 3D

On the Color screen you can easily switch between viewing mono and stereo grading at any time by right mouse clicking within either the Viewer area or the Thumbnail Timeline. A right mouse click within the Viewer area allows you to switch between mono and stereo. A right mouse click within the thumbnail display area gives you the added flexibility of selecting either the left or right eye to be viewed.

Within the Thumbnail Timeline, a right mouse click will also reveal the Ripple Link function. When the you select Solo mode via the Ripple Link option, the selected eye may be graded separately. When Gang is selected, the grading is automatically applied to both eyes. There is also the ability to Copy and Swap corrections between eyes. Additionally, Local Versions created with one eye are automatically copied to the other eye.

There are various Batch modes that are used for stereoscopic grading that are available when you right mouse click within the Thumbnail Timeline:

Stereo Batch Copy: This function will copy all grades from one timeline to the other.

Stereo Batch Sync: This will copy grades when the Node Graphs match.

Repositioning the image can be in either Solo or Gang mode. When adjustments are made in Solo mode, they will be applied to only the selected eye. Alternatively, when an adjustment is made in Gang mode, the adjustment is automatically applied to the other eye.

There are also various Pan modes that can be used for image adjustment, as explained below:

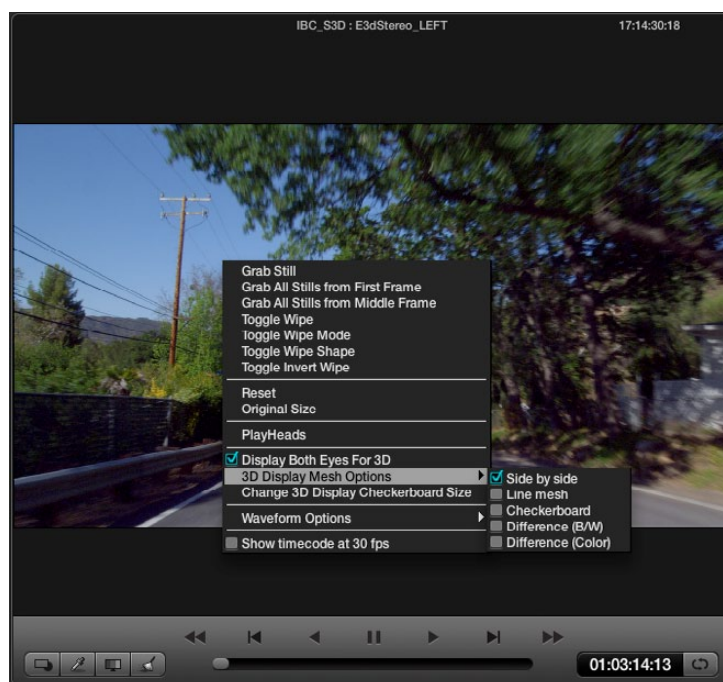
Opposite: When selected, the convergence control will move the images left and right to change the convergence point

Link-Zoom: With Link-Zoom selected, the image will always fill the screen, regardless of the convergence setting by zooming the left and right eye images.

Color Screen Viewer Stereo Display Options

To Display both eyes for Stereoscopic 3D projects you first need to have the 'Enable 3D Display' check box selected on the Configuration screen. Then, on the Color screen viewer, the Stereo Display options are available.

'Display Both Eyes for 3D' will turn on and off the dual eye display and then you can select from the mesh options, Side-by-side, Line mesh, Checkerboard and Difference. The Side-by-side and Line Mesh are designed for your 3D display and the Checkerboard and difference for your 2D display. You can also set the Checkerboard size to assist in match grading each eye.



Stereoscopic Viewer Right Click Options

Color Screen Status Display

There are four status display items for Stereoscopic grading.

Convergence:

The two modes are Opposite and LinkZoom. When in Opposite mode the convergence control will move the images left and right to change the convergence point. With Link-Zoom selected, the image will always fill the screen regardless of the convergence setting by zooming the left and right eye images.

Stereo Grade:

The two stereo sessions can be graded in Gang mode, where both eyes have the same grade applied or Solo mode where the two stereo sessions are graded separately. Grading change in one eye would not affect the other eye.

Stereo Current:

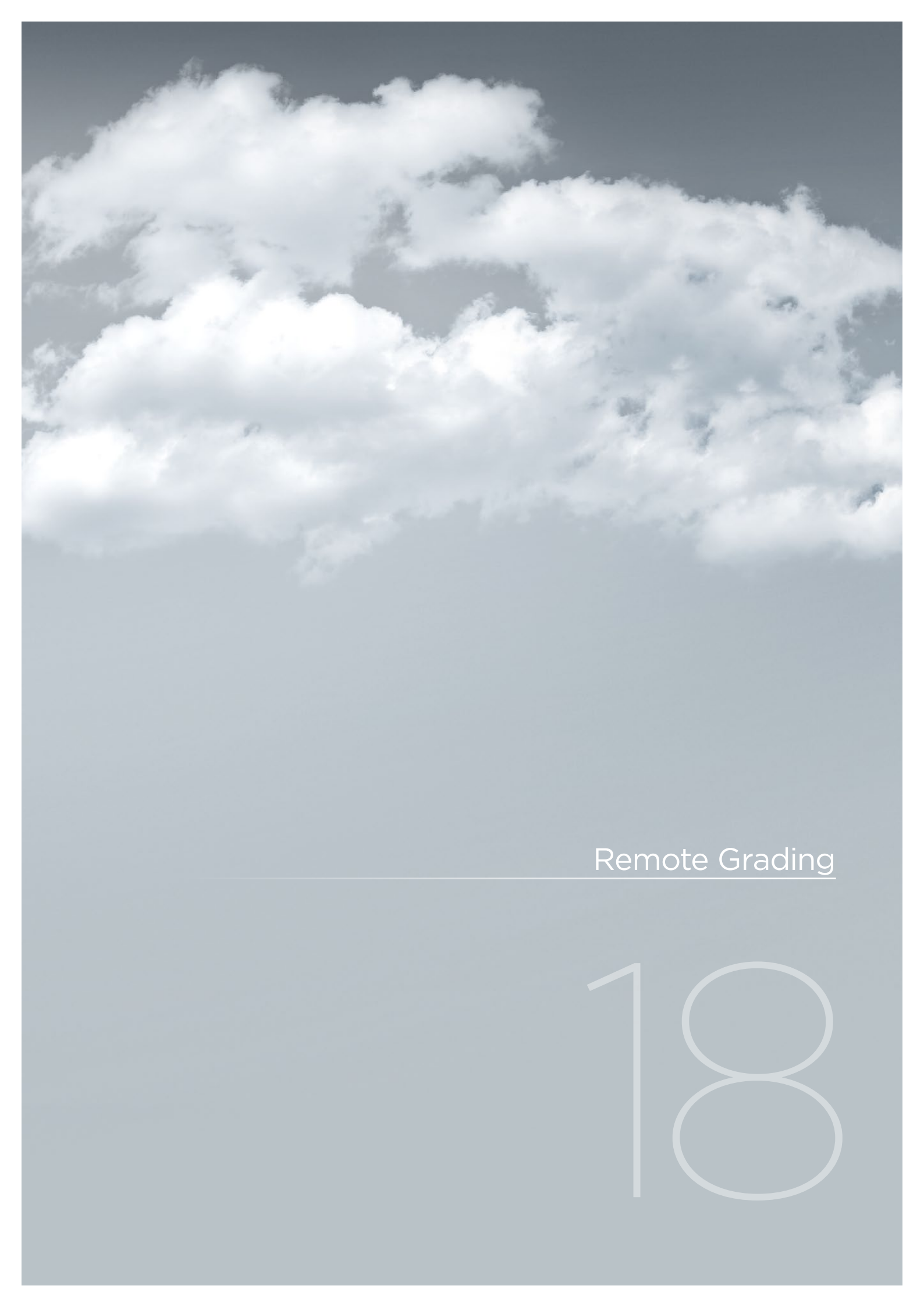
This indicates which eye is being displayed in the viewer and for the HD-SDI output if a single eye display is selected.

Stereo Display:

If you have enabled the 3D display in the viewer options, or via the panel, this indication will be Stereo, alternatively it will show Mono.

Thumbnail Timeline Menu Options

Stereo Batch Copy:	Will copy the grading of the clips in the current session to the corresponding clips in the other eye session.
Stereo Batch Sync:	Clips in the current session may have different Node Graphs from their corresponding clips in the other eye session. This operation checks though the clips and detects the difference in Node Graphs. If Node Graphs are different in corresponding clips, the grading of the clip from the current eye would be copied to the corresponding clips in the other eye. This results in the clips in the two sessions with the same graph and same grading.
Stereo (sub menu)	
Grade Copy L/R or R/L:	In Clip/Unmix session mode, this copies the grading from selected clips to corresponding clips in the other eye. In Track session mode, this copies the output grading for the current track to the corresponding track with the other eye.
Grade Swap L/R:	In Clip/Unmix session mode, this swaps the grading from the selected clips to corresponding clips in the other eye. In Track session mode, this swaps the output grading for the current track to the corresponding track with the other eye.
Swap Output:	Swaps eyes to the output on a clip-by-clip basis. This parameter is retained in the list to compensate for editing/conform errors. There is a visual indication when this is enabled, in the form of an orange outline around the VSR in both eyes. This would only be effective when there is only a cut transition to and from the clip in question in a parse pre-conform workflow, but would support all transitions in a conforming workflow.
Ripple Link	
Gang:	The two stereo sessions are graded together. At the same time, the delta between the two eyes is preserved and incremental changes are applied relatively.
Solo:	The two stereo sessions are graded separately. Grading change in one eye would not affect the other eye.
Left/Right:	The two stereo sessions are graded separately. Grading change in one eye would not affect the other eye.
Switches to the selected eye:	The viewer image and timelines would be updated for the new session. Grading changes are made to this eye only when in solo mode.



Remote Grading

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Remote Grading

To enable colorists to work interactively with their clients across the globe, DaVinci Resolve offers a remote grading option. It allows two matching DaVinci Resolve systems to be synchronized via an Internet connection such that changes made on the colorist's system are immediately sent across and applied on the client DaVinci Resolve.

Cue commands are also synchronized to ensure that both systems are always on the same frame in the timeline. Starting/stopping playback on the colorist's DaVinci Resolve would do the same on the client system. While a remote grading session is in progress, inputs from the user at the client DaVinci Resolve will be ignored.

Currently, the remote grading feature supports only color correction and does not allow editing or conforming during a session. The two DaVinci Resolve systems must have matching sessions and the number of clips, clip durations and system resolutions must match. The requirements and limitations of a remote grading session are summarized below.

Requirements

- The DaVinci Resolve version of software must be the same on both systems
- The system resolution must be the same on both systems
- The timeline must be setup prior to the start of the remote grading session.
- The number of clips and the duration of each clip must be identical.
- During the session, the active session and versions on the client system are updated. Creating/deleting a session or switching a session on the colorist's DaVinci Resolve is not allowed. Doing so would terminate the remote grading session.
- On the client's DaVinci Resolve you cannot adjust anything until the remote grading session has ended.

Setup

- To start a remote grading session, the client DaVinci Resolve should be able to connect to the colorist's system using TCP/IP.
- On the client's DaVinci Resolve you need to press Ctrl + G on the keyboard. A window is displayed with text fields to enter the IP address and port number of the colorist's system.
- Set the IP address field to the IP of the colorist's DaVinci Resolve. If the colorist's system is on a public IP, the port number can be left at the default value (15000). If the colorist's system is on a private network, the port number should be set to the port on the public IP that is internally routed to port 15000 of the colorist's DaVinci Resolve.
- Once the client clicks on the "Connect" button, the client DaVinci Resolve will try to establish a connection with the colorist system.
- When the connection is established, a popup appears on the colorist's screen asking for permission to accept the Remote Grading connection.
- To accept, click "OK," minimize the popup, and continue grading normally.

The Remote Grading session will remain active until one of the users chooses to disconnect or when an error occurs causing DaVinci Resolve to automatically terminate the session.

Restrictions

To allow operation over low bandwidth and potential long latency Internet connection there are some restrictions to remote operation.

- Grabbing stills on the colorist's DaVinci Resolve will not have any effect on the client system so no stills will be grabbed on the client system.
- Wipes on the colorist's system will have no effect on the client DaVinci Resolve. At any time, the client system will display the same frame as the colorists but without the wipe (or with whatever wipe was enabled before the remote grading session was started).
- When playback is started, the playback speeds on the two DaVinci Resolves may differ. The frame positions will only be synchronized when playback is stopped.
- Input/output/display LUTs applied from the config page on the colorist DaVinci Resolve will not have any effect on the client system. LUTs selected on the client DaVinci Resolve will be applied instead.
- Presets applied from the config/color pages on the colorists system will not have any effect on the clients. Presets selected on the client DaVinci Resolve will be applied instead.



DaVinci Resolve Control Surface

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DaVinci Resolve Control Surface

The DaVinci Resolve Control Surface panels feature workflow ergonomics and ease of use so Colorists can quickly and accurately construct simple or complex creative grades. The panels feature high-resolution liquid crystal displays (LCD) and backlit hard keys to accommodate a darkened grading environment. The color and intensity of the keys and the LCD panel brightness are user programmable so each Colorist can set up his/her personal panel configuration.

There are three panels in the control panel set. The center panel is the Trackball panel. The majority of controls and feedback for the Colorist is found on this panel, including a slide-out keyboard.



DaVinci Resolve Control Surface

On either side of the Trackball panel are two interchangeable panels, the position of which is determined by operator preference. The T-bar panel, shown above on the left, has a T-bar mix/wipe control and a number of menu and function keys. The Transport panel, shown above on the right, has the timeline transport controls and a jog/shuttle control as well as a numerical keypad and associated function keys.

All panels have soft keys and variable control pots within the LCD panel, which provide an accurate visual reference to the control without the risk of parallax errors. Given that so many of the controls are menu based, this User Manual will describe each of the hard keys and controls and then, separately, the menu structure and controls of the soft keys and variable pots.

A key feature of the panel design is the feedback given to the Colorist. The LCD panels provide a color and value indication based on the last control adjusted. The hard keys also reflect the last button pushed and, in some cases, other keys on the panel are illuminated or dimmed based on the menu options available for the operational mode selected.

Shift Key Convention

Before describing the hard key operation, it is important to understand two keys on the left and right panels. These shift keys, Shift Up and Shift Down, provide access to potentially two more functions on each of the next key selected.

For example, on the Fader panel, next to the shift up key is the Base Mem key. If you select 'Shift Up' and then 'Base Mem,' the operation is to Base Mem ALL, as designated on the upper left corner of the Base Mem key. To select Base Mem Current, first select 'Shift Down,' then 'Base Mem.' To permit a fast and single-handed operation, this function does not require you to hold the 'Shift Up' or 'Shift Down' key while selecting the second key, just select them sequentially, first the 'Shift' key, then the function.

T-Bar Panel

The T-Bar Panel, typically located on the left for a right-handed Colorist, has a LCD display with four variable controls and nine soft keys. The lower section of the panel houses the T-bar and six groups of hard keys.

While the soft menus, keys, and variable pots will be covered in a later section of this chapter, here is a description of the groups of keys and the individual key function.

Mode Control Group

The Mode Control group provides navigation to many of the UI screens and also a few commonly used functions.

Config:	This key selects the configuration UI screen where you will set up DaVinci Resolve for each project.
Browse:	On the Browse screen you can review files on the attached storage, or if you have a storage area network, you can directly access the SAN. You can see details of each file, play the clips for verification, and then associate them to the Project by putting them into the Media Pool.
VSR (Shift Down Browse):	This selection is reserved for future use.
Conform:	Selects the Conform screen. After placing the Project's clips into the Media Pool, you will generate a default timeline and associate EDLs in this screen.
Deck (Shift Up Revival):	The Deck key selects the screen for deck I/O. This same screen is used to control a batch capture of clips from some film scanners.
Revival:	This key opens the DaVinci Revival screen to show the files selected to be sent to a DaVinci Revival system for Grain reduction or Dust busting.
Scene (Shift Down Revival):	To select the Scene Cut Detection screen select the shift down key followed by the Revival key.
Current ~ Viewer:	This key toggles between the screen you are on and the Viewer screen so it's a quick way to see the image at full screen on the UI display.
Object Track Mode:	The Object Tracker is best viewed on the Viewer UI. This key selects this screen and also opens the Object Tracking menus.

Clip/Track/Unmix:

This is a toggle key. The color corrections in DaVinci Resolve are generally associated to each individual clip and so most of the time you will be in 'Clip' mode. Occasionally, you may wish to make a grade or correction, enhancement, or even add a matte to the whole timeline. In this case, select 'Track.' The 'Unmix' function allows pre-conformed clips with dissolves to be un-mixed when using an EDL. Then each clip can be graded separately as though there were two clips.

User (Shift Up Cache Mode):

Will mark a clip for render cache.

Cache:

This key is a toggle function to select one of the cache modes. Cache All will background cache all clips.

This operation is performed when you move from the current clip to another. Dissolve will cache clips with dissolves. User will cache clips as marked by the colorist. User & Dissolve will cache clips that you have marked for cache and also dissolves.

Editor:

The Editor key is reserved for future use.

Proxy On/Off:

DaVinci Resolve has three proxy modes to permit real time playback in the event that the correction or resolution is too high for the selected playback speed. With 'Pre-generated Proxy' the system will use the pre-generated proxies (obviously you need to have made the proxies first). The last mode is 'OFP' or 'On-the-fly-Proxy.' OFP provides a high-quality real time input image resize. The 'Proxy On/ Off' key selects between Off and the other of the two modes, depending on whether you have or have not pre-generated the proxies.

Auto Color:

This is a popular key. Using this key, DaVinci Resolve will automatically make a basic primary color correction to balance the blacks and whites of your image.

Page Up (Shift Up Gallery):

In larger projects you may have a number of gallery pages holding stills and this key will change the Gallery screen to the next higher page number.

Gallery:

Used to select the Gallery UI screen where you can manage your stills.

Page Down (Shift Down Gallery):

The inverse of the Shift Up Gallery function as this selects the Gallery screen one page lower than the current.

A/C Mode:

This toggle key will display the clips in the timeline in the order of the EDL (the record order and often referred to as C Mode), or the ascending order of the source clip timecode called A Mode.

Handles Mode:

This selection is reserved for future use.

Session Management

When making a grade to clips, colorists often try different looks. This group of keys offers a quick way to navigate through these versions and also to split and join clips on the timeline.

Split (Shift Up Undo):	This key will split the clip at the position of the cursor on the timeline.
Undo:	Undo is one of the favorite keys of colorists. Try any grade, and if you don't like it, simply Undo. In fact, you have an almost endless tree of undo operations by using this key.
Join (Shift Up Redo):	The reverse of split. Place the timeline cursor on the junction of two clips and select Join to make just one clip.
Redo:	Sometimes you hit Undo once too many times. Redo will put back into effect the last item you undid. Like Undo, there are multiple levels.
Restore Point:	This selection is reserved for future use.
Save:	Remember this key. It's your friend. Save often, and consider the autosave function as well; found in the config screen.
Add Version:	When you make a grade on any clip, DaVinci Resolve stores the parameters for that clip. If you want to try different grades, don't loose your good grades, just 'Add Version.' Use this key to make a second, third, or more version of the grade for that clip.
Default Version:	If you have multiple versions of grades for a clip, this key is used to select the default version, regardless of which version is currently displayed.
Previous Version:	This will select the grade one version lower in order. For example, you are on version three, select "Previous Version" to get to version two. Once the default version is reached, selecting 'Previous Version' again will select the highest version.
Next Version:	Use this key to select the next higher version of the grade. Once the top version is reached, selecting 'Next Version' again will select the default version.

Marking Dynamics

On the bottom right of the Color screen is the Dynamics Timeline display for the current clip in the timeline. The Marking Dynamics group of keys is used in association with the Dynamics timeline and controls the selection of keyframe points for the start and end of dynamic transitions of the grade.

Start Dynamic:	This key is used to select the first keyframe in a transition, a Dynamic. The transition may be a grade change, a sizing, and the addition of a matte or any number of 100 variables, all of which are associated with the Node Graph and the Clip or Track Dynamics Timeline.
Ripple Value:	If you have a grade, or effect, or just an adjustment and you would like to ripple this effect over another or a large number of other clips, use Ripple Value.
Delete:	This key deletes the dynamic.
Lift Mark:	If you place a mark in the wrong spot, put your cursor on the mark and use 'Lift Mark' to remove it.
Trim:	This key is used with the numerical keypad to trim a mark position.
Mark:	Like the Start Dynamic key, Mark is a major key. It places a keyframe on the clip timeline and between the Start Dynamic and Mark, or between multiple Marks where you can change the grade.
Scene (Shift Down Mark):	This selection is reserved for future use.

Memory Access

DaVinci Resolve has a number of hot keys where you can store a grade for quick reference of use, called Mems. In fact, every time you make a grade for a clip, a memory of the grade is kept. (facilitates 'Undo' and 'Redo'). While you can obviously save a still for each clip, having 1000s of stills to scroll through can take time, so there are 26 quick and easy memory locations to store a grade, called A-Z Mems.

As every clip has its own metadata for the grade, this is stored by DaVinci Resolve as a Memory too. There are a number of keys to select or revert to these stored metadata memories, or to clear the metadata to revert to a base grade, or no grade, state.

All Base Mem (Shift Up Base Mem):	This is used to clear the current color correction of every node in the Node Graph for the current clip, but it leave the nodes in place.
Base Mem:	Used to clear the grade of the current node.
Current Base Mem (Shift Down Base Mem):	Will clear all the grades and all the nodes of the current clip.

There is an exception to rule to clear the Base Mem. It is possible, in fact very helpful sometimes, to have a preset to a clip that is not cleared when you select Base Mem. The simple example is when a film is over scanned and the frame edges are shown as well as the image. Instead of making an input resize adjustment for every clip to remove the framing, a preset resize can be made and stored, with a label, and this preset is not deleted when using Base Mem.

Preview Mem:	To preview one of the memory grades on any clip, select the clip on the timeline, select preview memory and then the memory. This key is a toggle so if you do not like the grade on the memory for that clip, select preview mem again and the clips grade will revert to the original.
Original Mem:	Each clip, by default, has a memory of its grade, sizing, etc. The metadata for every clip is saved in reference to the source timecode. If you are grading a clip and move from it to another clip, the grade is saved in a memory for that clip automatically. If you come back to the clip and make a change to the grade, then decide you don't like the change, select Original Mem to return to the grade status you found when returning to the clip.
Scroll:	When you select Scroll you can navigate up and down the timeline to find and select a clip, and its grade, to recall to the current clip.
View(Shift Up Current):	The Color screen has two display modes. The normal mode includes the Viewer, Stills and Node Graph on the top of the screen. Selecting 'View' toggles to the alternate screen with a wide Node Graph view and Stills but no Viewer. Select 'View' again to toggle back to the normal mode.
Current:	Select Current prior to selecting a Mem key (A, B, C to X) and the current grade on the active timeline clip will be stored in the memory selected.
Shift Up:	The Shift Up key permits the operator to select the upper secondary function of keys on the control panel. This operation does not require you to hold the shift up key, just select it prior to the second key.
Shift Down:	The Shift Down key permits the operator to select the lower secondary function of keys on the control panel. This operation does not require you to hold the shift up key, just select it prior to the second key.
Macro:	This key is not yet implemented.
Memory Keys:	The A, B, C to X keys, selected directly or with the appropriate shift up or shift down pre-selection will recall the grade stored in this memory and will apply it automatically to the clip that is active on the timeline.

Menu Navigation and Node Control

DaVinci Resolve is a nodal-based color enhancement system. All grades are not stored in layers, but in nodes. In operation they can appear to be in layers, if you select the serial nodes, but greater grading flexibility is available by using the parallel and layer nodes.

This group also gives you quick access to the main operations to control primaries, secondaries known here as Vectors, image sizing and windows.

- Primary:** The first grade for every clip will be a primary. This is where you balance the clip and correct for offsets in the black and white balance. Selecting Primary switches DaVinci Resolve from other grading modes and automatically selects the primary menus for the LCD displays.
- Vectors:** When you select and isolate a particular color, and change that color, you are making a secondary correction. The Vectors key updates the menus to provide all the secondary controls including the Kilovector hue selection and control.
- Sizing:** The input and output image resizing engines are controlled using the menus selected by Sizing.
- Windows:** The Windows key opens the menus for Circular, Linear, Polygon and PowerCurve windows that can be used as a matte or mask for primary and secondary grades.
- Outside Node:** Selecting the Outside Node key will add another node after the current node and automatically link both image and key paths. If the original node has a grade within the matte shape the new Outside Node would control the grade in the inverse (i.e., outside the matte).
- Add Matte:** If there is a matte clip associated with the clip, by selecting this key the matte node will be displayed on the Node Graph.
- Disable Current:** This key is a toggle key and it disables or enables the grade on the current node.
- Delete Current:** To delete the current node. Remember Undo if you had the wrong node selected.
- Node+ CPW:** Adding a serial node is a one button selection, Add Serial, however to also add a window requires a number of extra key selections. The Node + CPW key adds a node after the current node on the node graph and also adds a circular Power Window at the same time, thus reducing the number of keystrokes.
- Node + LPW:** As above, adds a serial node after the current node with a linear Power Window .
- Node+ PPW:** The Polygon Power Window is also selected when adding the serial node.
- Node+ PCW:** This key, like the others above, adds a serial node after the current node and also sets up the PowerCurve Window to permit the marking of freeform shape points and Bezier spline curves on the Viewer to construct a freeform window.
- Add Serial:** The most common node to use on the Node Graph is a serial node. A Serial node is a full-featured color correction system offering primaries, secondaries,

windows, tracking, image sharpening and blur, matte blur, etc. Serial nodes are added one after the other in a cascade mode similar to adding one layer of correction on top of the last. All grades in a preceding node(s) will impact the source image and therefore the grades in following nodes.

Add Parallel: Unlike adding serial node, adding a parallel node actually adds two nodes. One behaves like a Serial node with full color correction capabilities. The second is a Parallel Mixer node. This mixer accepts the image from the original Serial node and from the new Serial node and the output is a mix of these two. If the current node is one of these Serial nodes immediately preceding the Parallel Mixer node and you select 'Add Parallel' again, another input to the mixer will be created as will another preceding Serial node. In each case, the input to these Serial nodes will be common, effectively making them in parallel to each other. The key advantage here is that the source image is available to many nodes whereas in a straight Serial Node Graph, each time you restrict a color in a node the following nodes have little ability or limited range to use that color.

Add Layer: The Layer node is similar to the Parallel node in that it accepts the image inputs from more than one node. The key difference to a parallel is that the mixing of the inputs is prioritized towards the latest additions to the input list of the Layer node. As an example, select Add Layer and DaVinci Resolve will add a node in parallel to the current node and link the output of the current and the newly made Parallel node to the two inputs of the Layer node. The previous current node will have the lowest priority in the mix, and the newly made Parallel node the highest priority. Add one more Layer node, a third input node will be created with a higher mix priority than the first two nodes.

Append Node: Often when navigating around the Node Graph and making correction trims, the Colorist decides he/she needs an additional node for more correction. Using the 'Append Node' key will always add a Serial node to the very end of the Node Graph, regardless of which node in the graph is the current node.

Reference Configuration

This area of the fader panel include six keys and the fader T-Bar. It is primarily used for control of stills display with and without reference wipes. The fader bar controls the mix or wipe position when the appropriate mode is active.

Key:	This key is not yet implemented.
Circle:	This key is not yet implemented.
Wipe:	The Wipe key selects a wipe for reference comparison with the current image.
H/V:	This key toggles the wipe between horizontal and vertical.
Box:	This key is not yet implemented.
Mix:	To mix in preference to wipe select this key.
Still:	The Still key permits comparison of the current clip with the selected still.
Memory:	Use this key to compare the current clip with a memory.
Hilite:	When in the Vector menus making secondary qualifiers, it's common to select the Highlight key to show a high contrast separation of the qualified color and all other parts of the image. Toggle this key to turn off. Highlight is used so often it's also on the fader panel and when in vectors on the Trackball panel.
Mode(ShiftDownHighlight):	Used to toggle the highlight mode from grey to high contrast.
Timeline:	Select the Timeline key when you wish to compare the current to the Timeline image.
Offline:	Select the Offline key when you wish to compare the current to the offline image.
Reference On/Off:	This toggle key will turn the reference view on or off. When On you can see the current clip in comparison to a reference.

Trackball Panel

The center panel has the traditional four trackballs, each with a surrounding control ring and no end stop in either direction. Three variable controls are on each side of the panel, three keys above the trackballs, three below the left and right most trackballs, and on the LCD panel, three LCD displays, each with eight variable controls and four keys. The LCD screens are menu-driven and thus the controls, soft keys, and the display itself depends on the current mode. The menu structure will be covered later in this User Manual.



DaVinci Resolve Control Surface

The center panel also offers a slide-out keyboard for naming files, as well as for a number of other operations. The shortcut keys are covered later in this User Manual.

The right most trackball operates similar to a mouse and can also double as an Offset Control. The other three trackballs are in the traditional DaVinci format (from left to right): Lift, Gamma, and Gain configuration (Lowlights, Mid-tones, and Highlights).

The far left trackball is Lift control, which provides RGB balance adjustment in the darker range the image. The next trackball to the right is Gamma control, which provides control over the mid-range values of the image. The third from the left is the Gain control, which effects the brighter portions of the image.

The control ring surrounding these trackballs provides amplitude control of the associated Luminance, Lift, Gamma, or Gain range of the image.

On the left side of the panel are three Luminance knobs. From top to bottom they are Luminance Gain, Luminance Hue, and Luminance Lift.

On the right side there are three more controls, from top to bottom: Saturation, Hue (has the effect of hue rotation), and Luminance Mix. Above the three left most trackballs you will see these three keys:

- RGB:** This key resets the RGB balance only to detent.
- All:** To reset both RGB and level.
- Level:** If you wish to reset the level while maintaining RGB differential.

Above the right most trackball the three keys are:

- Adjust Window:** Selection of this key brings up the shape cursors for the current node, and allows the trackball to position the current window.
- Modes:** This key allows access to a number of menus and acts as an on/off toggle.
- Shift Up Cursor:** This shift function changes the cursor views on the main monitor. The user can select the cursor display including windows on the GUI, but not the main monitor, or both, as they prefer.
- Cursor:** The Cursor is used for the Color Picker when in Vector mode. This key also controls the window display.

Under the left and right most trackballs there are three keys. Operation for the keys under the left-hand side trackball is not yet implemented.

The keys under the right-hand side trackball provide left, center, and right mouse buttons. The right-hand side trackball functions as a mouse when the left mouse button is selected, while not in Cursor mode, and can also double as an Offset Control.

Transport Panel

Reference Configuration

Located at the top left-hand side of the Transport panel are the Deck and Still Select keys. These are all related to controlling the deck, virtual decks when in multi-playhead mode, and the grabbing and selection of stills. There is also an Undo and Redo key, a Shift Up and a Save key.

Split (Shift Up In):	DaVinci Resolve associates grading information based on source timecode and as it's also possible to have source clips with the same timecode (sorted with file name and/or path, etc), it's important to have each source clip identified as a different clip to all the others. The Split key will split one clip into two on the frame selected. Each can therefore have their own grade.
In:	When marking a transport (virtual or deck) in point you can use the GUI or this key.
Join (Shift Up Out):	Join is the reverse of the Split key. Place the Viewer on the first frame of a clip and select Join to merge the preceding clip.
Out:	The Out key is used to select an out point on the transport.
Duration:	To define a duration, first select the time using the numerical keypad (the colon separates the hours, minutes, seconds and frames), and then select Duration.
Gang:	The Gang control permits the user to gang multiple clips so they will play back from the first frame in synchronization. This is particularly helpful for checking the impact of a grade on a couple of key shots when using the PlayHeads feature of DaVinci Resolve.
Undo:	The Colorist's friend. DaVinci Resolve has virtually unlimited undo steps available.
Redo:	If you want to redo a step, use Redo. Ideal when used with undo to compare two grades quickly.
Source (L):	This key selects the source.
Place (Shift Up A (R)):):	When using playheads this key selects deck R
A (R)):	When using playheads this key selects deck A
F:	This key is not implemented
Place (Shift Up B):	When using playheads this key selects the location for the playhead on the UI.
B:	When using playheads this key selects deck B
G:	This key is not implemented
Place (Shift Up C):	When using playheads this key selects the location for the playhead on the GUI.
C:	When using playheads this key selects deck C
H:	This key is not implemented

D:	When using playheads this key selects deck D
I:	This key is not implemented
E:	When using playheads this key selects deck E
J:	This key is not implemented
Shift Up:	Use the Shift Up key as a pre-selector for the keys with an upper option. Select the keys sequentially and do not hold the Shift Up key while selecting the second key.
Preroll:	The Preroll key is used in conjunction with the numerical keypad to select a preroll time.
Cue:	Selecting Cue will force the transport to the preroll position.
Previous Still:	If you have a still selected the Previous Still key will select the one preceding.
Next Still:	The next still is selected if this key is used.
Play Still:	When the user selects this key, DaVinci Resolve will automatically display on the Viewer a wipe between the current scene and the current still. You can use the fader T-bar to move the wipe position and in the reference wipe menus change the reference image as required by moving or resizing. Selecting Play Still a second time will toggle this mode off.
Save:	The most important key on the panel. Besides having an auto-save feature you can and should consistently save your project with this key. It only takes a few seconds and can save you hours.
Grab Still:	At any time when you are grading selecting the Grab Still key will automatically grab a full resolution frame from the timeline and attach the node graph metadata for later display and use.

Transport Control Keys

Most colorists will use the Transport Control keys every minute of every grade, so they are located for quick and easy access. While not technically within this key group, the Job and Shuttle knob is directly above these keys.

Jog:	Rotate the jog control to step forward or backward a few frames at a time.
Shuttle:	On the outside of the Jog rotary control is the shuttle knob. This knob has a detent at the null position and is turned clockwise or counter-clockwise to shuttle the transport/timeline forward or reverse at the rate selected by the rotation of the shuttle knob.
Loop:	You may wish to repeat a review of a grade of a clip, or a selection of clips on the timeline; this Loop toggle key selects or deselects the loop operation.
Render:	Once you have finished your grade the Render key selects the UI screen used for configuration of the render parameters for your project.
Rec:	(Shift Down Render) This key is not yet implemented.
Previous Node:	Within the Node Graph on the Color screen you are likely to have a number of nodes. These are numbered based on the order that you added them, which may not be the logical image flow order. DaVinci Resolve Node Graphs are completely user configurable, so you can add nodes anywhere and in any order you like. Thus, the previous node key will select the node one lower in numerical order.
Next Node:	Similar to the Previous Node key, this selects the node adjacent to the current node, in this case the next higher numerical position.
Highlight:	When in the Vector menus making secondary qualifiers, it's common to select the Highlight key to show a high contrast separation of the qualified color and all other parts of the image. Toggle this key to turn off. Highlight is used so often it's also on the fader panel and when in vectors on the Trackball panel.
Mode:	(Shift Down Highlight) Used to toggle the highlight mode from grey to high contrast.
Shift Down:	This is the pre-selection key for functions indicated on the lower portion of the second keys legend.
First Frame:	Selects the first frame of the current clip.
Last Frame:	This key selects the last frame of the current clip.
Step Reverse:	To step the viewer one frame in reverse along the timeline.
Step Reverse Keyframe:	(Shift Down Step Reverse) This key steps backwards one keyframe on the clip/Track timeline display.
Step Forward:	A single frame step forward for each key press.

Step Forward Keyframe:	(Shift Down Step Forward) For keyframe steps forward on the clip/Track timeline display.
Previous Scene:	Selects the first frame of the previous scene.
Next Scene:	Selects the first frame of the next scene.
Rewind:	The rewind key places the transport, or timeline in rewind.
Reverse:	To play the clip/timeline in reverse select this key.
Stop:	You guessed it. This stops the current transport operation.
Forward:	The forward key will play the clip/timeline forward.
Fast Forward:	The inverse of the Rewind key, fast forward shuttles along the timeline/transport.

Memory Access Keys

For fast and direct access to memories, the A to Z Memories, or Mems, use this section of the Transport panel. This is an extremely powerful feature. With any clip selected on the timeline, with a single key press, for example "A," the grading parameters stored in memory A, including the node structure, sizing, etc. will be automatically applied to the current clip.

O (Shift Up A):	Selects memory O
A:	Selects memory A
I (Shift Down A):	Selects Memory I
R (Shift Up B):	Selects memory R
B:	Selects memory B
J (Shift Down B):	Selects Memory J
	And so forth
All (Shift Up Base Mem):	This function will return all grades for all nodes on the clip to the default grade/settings and clears dynamic marks. Note: There is an exception to the rule. If a 'Preset Size' has been set for the clip the Base Mem sizing will default to this preset size.
Base Mem:	The Base Mem key clears the current node of all its grades and marks. Again, with the preset exception noted above.
Reset (Shift Down Base Mem Crnt):	This key deletes all nodes in the clip with the exception of the first node and resets the grades to default and clears the marks.
Preview Mem:	To preview one of the memory grades on any clip, select the clip on the timeline, select Preview Memory and then the memory. This key is a toggle so if you do not like the grade on the memory for that clip, select Preview Mem again and the clips grade will revert to the original.
Original Mem:	Each clip by default has a memory of its grade, sizing, etc. The metadata for every clip is saved in reference to the source timecode. If you are grading a clip and move from it to another clip, the grade is saved automatically in a memory for that clip. If you come back to the clip and make a change to the grade, then decide you don't like the change, select Original Mem to return to the grade status you found when returning to the clip.
Scroll:	The Scroll key selects a soft menu on the Trackball panel so clips or frames can be scrolled via the rotary control in the soft menu.

Numerical Entry Key Group

On the center right-hand side of the Transport panel is the Numerical Entry key group. Here you will find numbers 0 to 9 and associated keys for entering timecode and clip numbers. You will notice the numbers you type are displayed in a scratchpad area to the right of the menu bar on the bottom of the GUI.

Current:	To store a new grade in any memory, first select the Current key and then the memory of your choice.
All Color PTZR:	This key is a toggle that selects the parameters that will be copied when updating a grade. Generally, all aspects of the grade are copied, including PTRZ, but on occasion you may wish to copy only the grade and not the sizing parameters. In this case use the Copy Mode to select grade/no PTRZ or grade with PTRZ. You can see the clip timeline toggle between the node selected and the input PTRZ parameters.
Select Node:	Use this key in conjunction with the numerical keys to select any node on the current Node Graph. First select the node number, and then 'Select Node.' The current node will change to the selected node.
Backspace:	The backspace key moves you one item left in the numerical scratch pad display. This permits correction of your numerical entries.
0 to 9:	You guessed it. These are the numbers!
, (Comma):	The comma is used just prior to the frame count if you wish to indicate a drop frame timecode.
: (Colon):	When typing in timecode, the convention is to type the hours followed by a colon, then the minutes, a colon, the seconds, a colon, and finally the frames. DaVinci Resolve does not need to have leading numbers entered where they offer no value and the default value is 0, so to type one hour, three minutes, zero seconds and sixteen frames, you do not need to type 01:03:00:16. Simply type 1:3:16 and then press 'Enter.' This speeds timecode entry.
Clear:	Will clear the scratchpad number.
- (Minus):	Select the minus key prior to the number to reduce the number.
+ (Plus):	The Plus key selected prior to a number adds the number.
Take/Enter:	To accept or enter any input select this Take/Enter key.

List Marking

The List Marking keys are on the bottom right hand side of the Transport panel. The functions are replicated on the Fader Bar panel. The List Marking group of keys is used in association with the timeline and controls the selection of keyframe points for the start and end of dynamic transitions of the grade, called Dynamics.

Delete:	This key deletes the Dynamic.
Start Dynamic:	This key is used to select the first keyframe in a transition, a Dynamic. The transition may be a grade change, a sizing, the addition of a matte, or any number of 100 variables all of which are associated with the Node Graph and the clip or Track timeline.
Trim:	This key is used with the numerical keypad to trim a mark position.
Ripple Value:	If you have a grade, or effect, or just an adjustment and you would like to ripple this effect over another or a large number of other clips, use Ripple Value.
Mark:	Like the Start Dynamic key, Mark is a major key. It places a keyframe on the clip timeline and between the Start Dynamic and Mark, or between multiple Marks you can change the grade.
Scene (Shift Down Mark):	To quickly switch to the Scene Cut Detection screen select Shift Down then Mark.
Lift Mark:	Often you may place a mark in the wrong spot so place your cursor on the mark and use Lift Mark to remove it.

Menus, Soft Keys and Soft Pot Controls

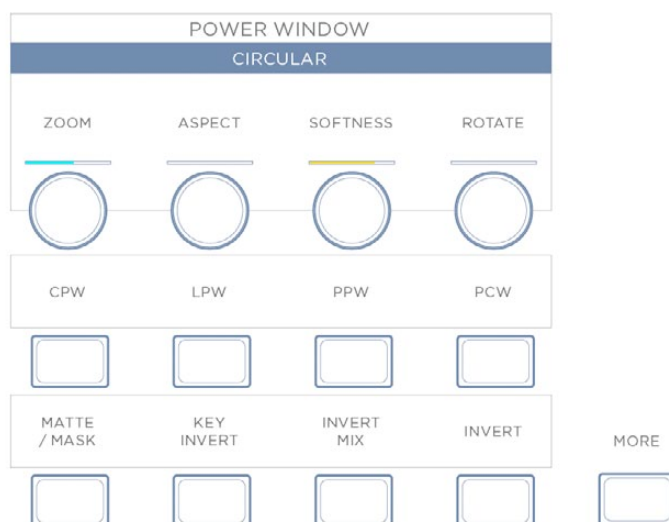
All three panels have liquid crystal displays (LCDs) and within this display, a selection of soft keys and soft pots for variable control of different parameters. The functionality of these keys and pots is based on the menus displayed on the LCD and changes dynamically with the operation of DaVinci Resolve.

The soft menu structure is designed to offer simultaneous control over multiple functions and a fast, logical and efficient way to move between the menus. Each of the menus with the applicable control functions is described below.

The LCD has a two-line title description of the menus main function and there are two lines of text above each pot or switch describing the control. The Fader and Transport panels can have quite independent controls compared to the Trackball panel. For example, the Fader panels default menu is for Windows adjustment while the default menu for the Transport panel is Sizing. This allows users to control windows or sizing full time, regardless of Trackball Panel mode and eliminates the need to change the work surface to adjust window position or input sizing.

Soft Key and Soft Pot Control Conventions

Below is a typical soft menu from the Fader panel. The title bar shows the menu mode, in this case Circular Power Window. The top row of legends refers to the soft pots beneath it, in this case the window position (Pan and Tilt), Zoom and Softness controls. A “more” key to the right of these controls (not shown) allows you to access a second level of soft pots for Aspect and Rotation. Both side panels have a ‘More’ key, which provides another layer of menus, if applicable.



Stereoscopic Viewer Right Click Options

The second row of legends refers to the soft keys beneath them, which in this case select the desired window for adjustment. The bottom row of legends refers to the bottom row of soft keys, which control the state of the window and allow you to enable the windows as desired. The controls are always located very close to the label, so there are no parallax errors and learning the panel is an easy task.

In this mode, the Fader panel soft menus are used for window control. When windows are selected on the Trackball panel, these menus do not change. This allows the user, for example, to select PowerCurve windows on the Trackball panel and adjust its parameters simultaneously with a Circular PowerWindows on the Fader panel.

The Transport panel soft menus are used to control input or output sizing, which provides a way to set sizing without changing the main work surface. These menus can also be used simultaneously with sizing menus on the Trackball panel, offering a full suite of controls at your fingertips.

Soft menus use full-color LCDs that allow users to set the brightness and color of the displays to suit their taste and working environment. The panels offer feedback to let you know at a glance the relative settings of these controls, and also highlight the last control touched. For example, if a control is out of Base Mem, the panels show this with a selectable color highlight.

In the image shown above, Aspect and Rotate are in Base Mem, while Softness is the last control touched, signified by the yellow setting indicator, and Zoom is not at Base Mem, signified by the cyan color of the setting indicator.

The panel LCD and key brightness and color settings are adjusted in the Resolve Configuration screen on the Panel Tab.

Menu Layouts

The DaVinci Resolve Control surface has a number of menus and many are selectable via different paths to match the operational workflow of colorists. Selection of a key on one panel may update the menu and soft keys and soft pots on one or more panels.

Often the update is to a section of the panel display so you can quickly switch back and forward to different modes as you grade. The menus are shown here identified by their core functionality.

PRIMARY

PRIMARY CHANNEL OFFSET / CUSTOM CURVES			
MASTER OFFSET	RED OFFSET	GREEN OFFSET	BLUE OFFSET
LUM CURVE	RED CURVE	GREEN CURVE	BLUE CURVE
NODES	SIZING	PRIMARIES	VECTORS

PRIMARY YSFX			
LUM YSFX	RED YSFX	GREEN YSFX	BLUE YSFX
TRACK- BALL OFFSET			POTS

VECTOR QUALIFIERS HSL PARAMETERS / QUALIFIER BLUR			
HUE SHIFT	SAT GAIN	LUM LIFT	LUM GAIN
		BLUR	
		OFFSET	
CLIPS	CURVE MONITOR	KEY MODE	PRINTER LIGHTS

PRIMARY / POTS

PRIMARIES LUM / GREEN POTS			
MASTER OFFSET	LUM BLACK	LUM GAMMA	LUM GAIN
GREEN OFFSET	GREEN BLACK	GREEN GAMMA	GREEN GAIN
NODES	SIZING	PRIMARIES	VECTORS

PRIMARIES RED / BLUE POTS			
RED OFFSET	RED BLACK	RED GAMMA	RED GAIN
BLUE OFFSET	BLUE BLACK	BLUE GAMMA	BLUE GAIN
MAIN			

PRIMARIES HSL PARAMETERS / QUALIFIER BLUR			
HUE SHIFT	SAT GAIN	LUM LIFT	LUM GAIN
		BLUR	
		OFFSET	
CLIPS	CURVE MONITOR	KEY MODE	PRINTER LIGHTS

PRIMARY / CLIPS

PRIMARIES SCENE WHITE CLIPS			
MASTER CLIP	RED CLIP	GREEN CLIP	BLUE CLIP
MASTER SOFT	RED SOFT	GREEN SOFT	BLUE SOFT
NODES	SIZING	PRIMARIES	VECTORS

PRIMARIES SCENE BLACK CLIPS			
MASTER CLIP	RED CLIP	GREEN CLIP	BLUE CLIP
MASTER SOFT	RED SOFT	GREEN SOFT	BLUE SOFT
TRACK- BALL			POTS

PRIMARIES HSL PARAMETERS / QUALIFIER BLUR			
HUE SHIFT	SAT GAIN	LUM LIFT	LUM GAIN
		BLUR	
		OFFSET	
CLIPS	CURVE MONITOR	KEY MODE	PRINTER LIGHTS

PRIMARIES			
CHANNEL OFFSET / CUSTOM CURVES			
MASTER OFFSET	RED OFFSET	GREEN OFFSET	BLUE OFFSET
LUM CURVE	RED CURVE	GREEN CURVE	BLUE CURVE
NODES	SIZING	PRIMARIES	VECTORS

PRIMARY / KEY MODE

KEY PROCESSING			
KEY PARAMETERS			
	POST MIX GAIN	POST MIX OFFSET	
QUALIFIER GAIN	QUALIFIER OFFSET	EXT KEY GAIN	EXT KEY OFFSET
MATTE / MASK	INVERT	MATTE / MASK	INVERT

PRIMARIES			
HSL PARAMETERS / QUALIFIER BLUR			
HUE SHIFT	SAT GAIN	LUM LIFT	LUM GAIN
		BLUR	OFFSET
POST MIX INVERT			PRINTER LIGHTS

NODES	SIZING	PRIMARIES	VECTORS

PRIMARY / KEY MODE

EXTERNAL MATTE SIZING			
PAN	TILT	ZOOM	ROTATE
		X - SIZE	Y - SIZE
H - FLIP	V - FLIP		LOCK

PRIMARY / PRINTER LIGHTS

OUTPUT SIZING			
STANDARD PRESETS			
MASTER +	RED +	GREEN +	BLUE +
MASTER -	RED -	GREEN -	BLUE -
			MORE

MORE

VECTORS / IMAGE MODE OR QUALIFIER MODE

IMAGE BLUR			
GAUSSIAN IMAGE BLUR			
IMAGE BLUR	H / V RATIO		QUALIFIER BLUR
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
HUE CENTRE	HUE WIDTH	HUE SOFTNESS	HUE SYMMETRY
SAT LOW CLIP	SAT LOW SOFT	SAT HI SOFT	SAT HI CLIP
PRESETS	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

IMAGE BLUR			
COLOR IMAGE BLUR			
RED BLUR	GREEN BLUR	BLUE BLUR	
RED H/V RATIO	GREEN H/V RATIO	BLUE H/V RATIO	
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
HUE CENTRE	HUE WIDTH	HUE SOFTNESS	HUE SYMMETRY
SAT LOW CLIP	SAT LOW SOFT	SAT HI SOFT	SAT HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

IMAGE SHARPENING			
IMAGE SHARPENING		CORING	
SHARP AMOUNT		SCALING	SOFTNESS
			LEVEL
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
HUE CENTRE	HUE WIDTH	HUE SOFTNESS	HUE SYMMETRY
SAT LOW CLIP	SAT LOW SOFT	SAT HI SOFT	SAT HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

IMAGE SHARPENING			
IMAGE SHARPENING		CORING	
RED SHARPEN	GREEN SHARPEN	BLUE SHARPEN	SOFTNESS
RED RATIO	GREEN RATIO	BLUE RATIO	LEVEL
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
HUE CENTRE	HUE WIDTH	HUE SOFTNESS	HUE SYMMETRY
SAT LOW CLIP	SAT LOW SOFT	SAT HI SOFT	SAT HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

MIST EFFECT			
MASTER MIST			
MASTER	H / V RATIO	SCALING	MIX
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
HUE CENTRE	HUE WIDTH	HUE SOFTNESS	HUE SYMMETRY
SAT LOW CLIP	SAT LOW SOFT	SAT HI SOFT	SAT HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

MIST EFFECT			
COLOR MIST			
RADIUS	H / V RATIO	SCALING	MIX
RED RADIUS	GREEN RADIUS	BLUE RADIUS	MIST PARAMETER
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
HUE CENTRE	HUE WIDTH	HUE SOFTNESS	HUE SYMMETRY
SAT LOW CLIP	SAT LOW SOFT	SAT HI SOFT	SAT HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER			
KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

IMAGE SHARPENING		CORING	
SHARP AMOUNT			SOFTNESS
			LEVEL
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER KILOVECTOR HSL QUALIFIERS			
RED LOW CLIP	RED LOW SOFT	RED HI SOFT	RED HI CLIP
GREEN LOW CLIP	GREEN LOW SOFT	GREEN HI SOFT	GREEN HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER KILOVECTOR HSL QUALIFIERS			
BLUE LOW CLIP	BLUE LOW SOFT	BLUE HI SOFT	BLUE HI CLIP
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

VECTORS / IMAGE MODE OR QUALIFIER MODE

IMAGE SHARPENING		CORING	
SHARP AMOUNT			SOFTNESS
			LEVEL
NODES	SIZING	PRIMARIES	VECTORS

VECTOR QUALIFIER KILOVECTOR HSL QUALIFIERS			
LUM LOW CLIP	LUM LOW SOFT	LUM HI SOFT	LUM HI CLIP
SIX VECTOR	COLOR PICKER	IMAGE MODE	MASTER / COLOR

VECTORS QUALIFIER KILOVECTOR HSL QUALIFIERS			
S & G OFFSET	S & G RADIUS	QUALIFIER BLUR	H / V OFFSET
QUALIFIER MODE	HIGH LIGHT	INVERT	KEY MODE

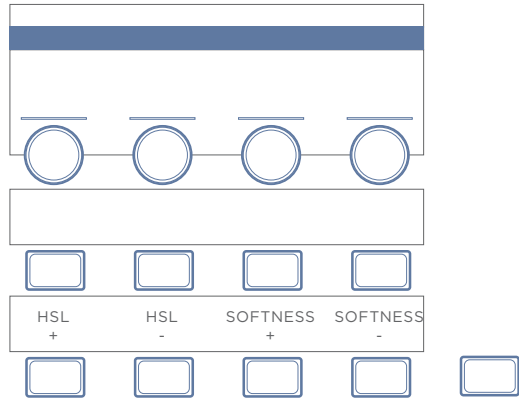
VECTORS / PRESET

HIGH LUM	LOW LUM	HIGH & LOW LUM	

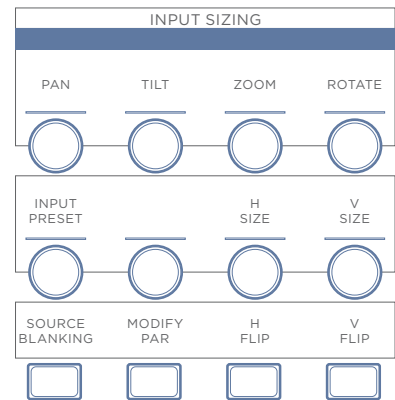
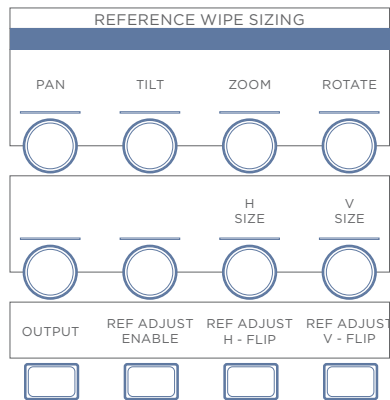
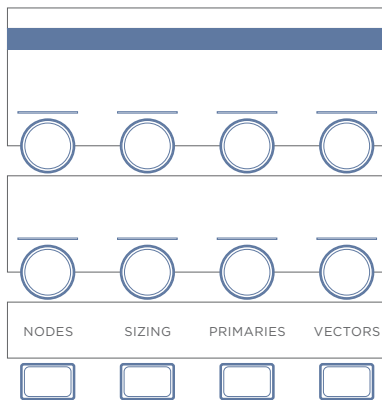
BACK		GREEN	YELLOW

RED	MAGENTA	BLUE	CYAN

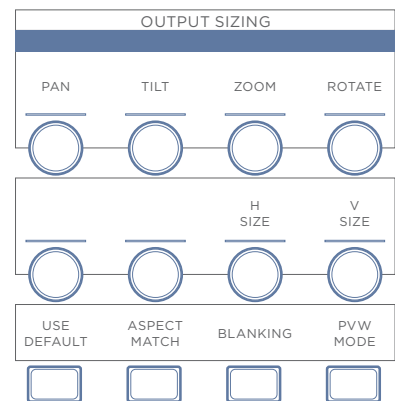
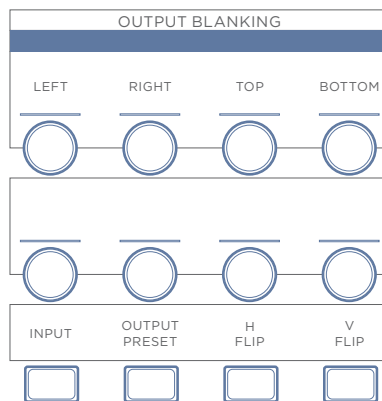
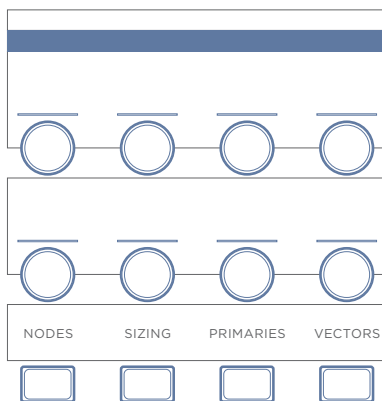
VECTOR / COLOR PICKER



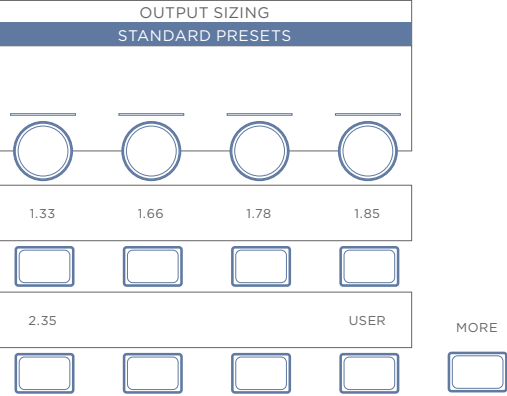
SIZING



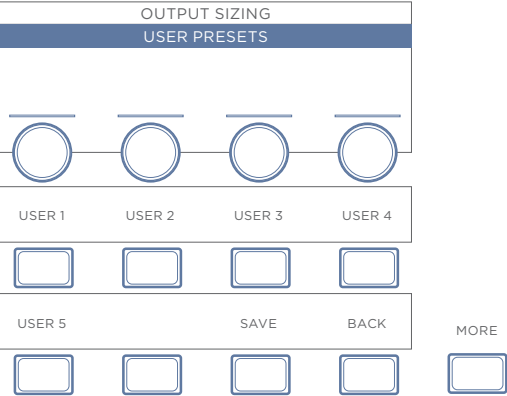
SIZING / OUTPUT



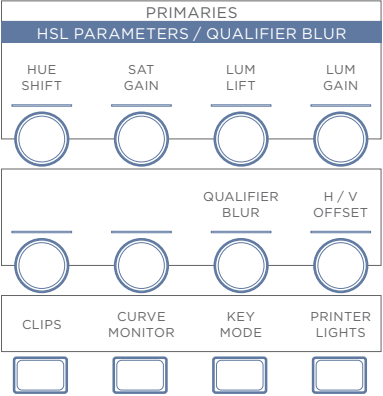
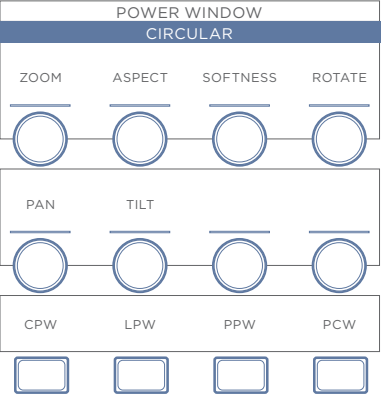
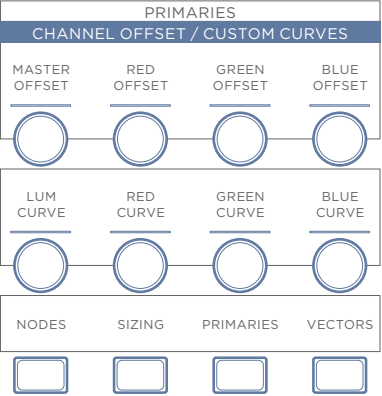
SIZING / OUTPUT / BLANKING



SIZING / OUTPUT / BLANKING



WINDOWS / CPW



WINDOWS / LPW

PRIMARIES

CHANNEL OFFSET / CUSTOM CURVES

MASTER OFFSET

RED OFFSET

GREEN OFFSET

BLUE OFFSET

LUM CURVE

RED CURVE

GREEN CURVE

BLUE CURVE

NODES

SIZING

PRIMARIES

VECTORS

POWER WINDOW

LINEAR

ZOOM

SOFTNESS

ROTATE

PAN

TILT

RESET

CPW

LPW

PPW

PCW

PRIMARIES

HSL PARAMETERS / QUALIFIER BLUR

HUE SHIFT

SAT GAIN

LUM LIFT

LUM GAIN

QUALIFIER BLUR

H / V OFFSET

CLIPS

CURVE MONITOR

KEY MODE

PRINTER LIGHTS

POWER WINDOW

CIRCULAR

ZOOM

ASPECT

SOFTNESS

ROTATE

CPW

LPW

PPW

PCW

MATTE / MASK

KEY INVERT

INVERT MIX

INVERT

MORE

POWER WINDOW

CIRCULAR

PAN

TILT

SOFTNESS

ROTATE

CPW

LPW

PPW

PCW

MATTE / MASK

KEY INVERT

INVERT MIX

INVERT

MORE



Glossary

20

Glossary

10-Bit:	The identification for 1023 levels within the digital signal.
24p:	This is a 24 frame progressive format.
16 X 9:	This is a term that describes a wide screen television format that has the measurements of 16 X 9.
2K:	A color correction system developed by DaVinci Systems. It is also a data file with the resolution of 2048 X 1556.
2K Plus:	A color correction system developed by DaVinci Systems.
4K:	An abbreviation for a data file with the resolution of 4096 X 3112.
4:2:2:	This refers to a digital signal with half chrominance resolution and full luminance resolution.
4:4:4:	This refers to a digital signal with full levels of luminance and chrominance information.
A	
Access Time:	This term refers to the amount of time that is needed to load information from a data storage device.
ACE:	This is an abbreviation for the American Cinema Editors.
Anamorphic:	A term which refers to a squeezed or anamorphic image which is either unsqueezed with a lens during projection or by using a special video monitor. In regards to motion picture applications, the term is generally applied to wide-screen formats such as CinemaScope, Panavision or SuperScope.
Archive:	This generally refers to the storage of information. This can apply to either film or data storage.
ASA:	A measurement of film sensitivity developed by the American National Standards Institution.
ASC:	An abbreviation which is short for the American Society of Cinematographers.
Assemble Edit:	This refers to a video edit which picks up after the completion of previously recorded material on the tape.
Aspect Ratio:	A term that refers to the height to width of an image.
ATSC:	An abbreviation for the Advanced Television Systems Committee.
B	
Background Processing:	A term that is applied to a computer operation which is performed at the same time when another operation is being carried out.

Best Light:	This generally refers to a color correction which is not quite a scene-by-scene color correction and not a one-light color correction. It's generally a correction which is designed to be finished later in a tape-to-tape correction.
Bit:	A name which is applied to one fragment of digital data.
Buffer:	This term refers to data storage within RAM.
Byte:	A name which pertains to a group of eight memory bits.
C	
CinemaScope:	A trademarked name for an anamorphic wide screen process originally developed in France by Professor Henri Chretien. The rights to the format were later purchased by 20th Century Fox Film Corporation in 1952. The basis for the process involved shooting material with special optics that recorded a squeezed or anamorphic image on the film. When the image was projected, another lens was applied to the projector which un-squeezed the material and displayed a wide screen image.
Cineon:	A term which is generally applied to a data file with a ".cin" extension. It is a 10-bit log file.
Clapperboard:	A term which is applied to a board which is shown at the beginning of each uncut film scene. It is used for the purpose of identification and manual sound synchronization.
Clip:	A term which is applied to a single file or scene within a non-linear timeline.
Clipped Whites:	A term which is associated with a luminance correction that is so high that the detail is cut off or clipped.
Color Balance:	The overall adjustment of the scene's color information.
Clipping:	Refers to a method of retaining levels within legal limits.
Color Bars:	A test signal made up of eight color bars which is recorded on a tape to ensure the levels remain consistent when played on other equipment.
Color Depth:	A term which pertains to the image's range of color.
Color Correction:	The process of adjusting an image's color balance
Color Correction Computer:	A device used for adjusting and storing color corrections.
Color Grading:	This generally refers to the process of balancing the image's color balance.

Color Temperature:	A term which refers to the measurement of a light's color. Warmer colored lights measure out to a lower color temperature, while bluer illumination measures out to a higher color temperature. The measurement is carried out on a scale known as Kelvin.
Color Timing:	A name which is applied to the balancing of image and color in motion picture laboratories by a color timer.
Crushed Blacks:	When the image is balanced so that the black or lift control causes the detail within the black information to be lost, this is referred to as crushed.
Conform:	The method of assembling scenes or clips in an order defined by an Edit Decision List.
Compression:	A term which is applied to the reduction in file size by the removal of un-needed information.
CPU:	This is an abbreviation for Central Processing Unit.
CRT:	A term which is short for Cathode Ray Tube.
D	
Daily:	A name which is applied to a positive film print which has been made in order to see the results of the day's shoot.
Data:	A term which is applied to computer or digital information.
DDR:	A name which is applied to a Digital Disk Recorder.
Default Setting:	A term which is applied to a setting which has been pre-defined by the manufacturer.
Densitometer:	The name of a measuring device that shows the object's amount of transmitted light.
DIN:	A term which is short for Deutsche Industrie Norm. It is used for measurement of film speeds.
DP:	A term which is short for Director of Photography.
DPX:	A file format which is short for Digital Moving Picture Exchange and developed by the SMPTE. The file has the extension of ".dpx" It is similar to the Cineon file format except that it can be either a log or linear.
Drag and Drop:	A term which is applied to the method of moving information within an application by using the mouse to drag it to the desired location and letting go of the mouse button which drops it into the area.

E

EBU:	A term which is short for European Broadcasting Union.
EBU Color Bars:	A color bar signal which was created by the European Broadcasting Union.
EBU Time Code:	A 25 frame per second time code standard which was created by the European Broadcasting Union.
Edit Decision List:	This is a list of in and out points which has been created by an editing system; it is also known as an EDL.
EDL:	This an abbreviation for Edit Decision List
EIA:	An abbreviation for television and audio standards listing association, Electronic Industries Association.
EIA Color Bars:	A seven color bar test chart which was created by Electronic Industries Association.

F

FCC:	An abbreviation for the Federal Communications Commission.
Field:	Within an interlaced signal, a video frame is comprised of two fields. One field contains even numbered lines, while the other contains odd numbered lines.
File Extension:	A term which refers to the last part of a data file such as .cin or .dpx.
Film Recorder:	A device which is used to recording image data files back to film.
Film Scanner:	A device to transferring film to data formats in high resolution.
Fps:	A term which refers to Frames per Second.
Frame Grab:	A term which generally applied to storing a frame for comparison.

G

Gain:	A term which is applied to the luminance information within an image.
Gigabyte:	A type of measurement which is one thousand million bytes.
Gauge:	A term which is applied to the width of a film stock.
Global:	A correction which is applied to a series of clips or events.
Grains:	The individual grains within the structure of a film stock.

GSN:	This term is short for Gigabyte System Network and is a high speed network standard.
GUI:	A term which is short for Graphic User Interface.
H	
Handles:	A term which is applied to additional material which is required beginning and end of each clip. It is usually required when effects such as dissolves are to be added.
HDTV:	A general term which applies to High Definition Television.
Head:	This refers to the beginning of a roll of film.
Histogram:	A display which shows the dynamic range and contrast of an image. The X axis within the display shows the luminance of the pixel, while the Y axis displays the amount of pixels.
HSDL:	A term which short for High Speed Data Link.
I	
Illegal Video:	A term which is applied to signal levels which do not fall within a broadcast standard range.
Import:	The process of importing data into an application.
Insert Edit:	An editing mode which records audio and/or video onto a pre-stripped videotape.
Interlace:	A term which is applied to when the image contains two fields, one with lines which are even numbered and the other with lines which odd numbered.
Internegative:	A negative which is produced in a laboratory and made from an Interpositive for the expressed purpose of eventually making release prints.
Interpositive:	A positive image on a negative like film stock which is made directly from the original negative for the expressed purpose of creating an Internegative.
IRE:	This refers to a unit of measurement developed by the Institute of Radio Engineers.
ISO:	A term which is applied to an Isolation Reel. It is also an abbreviation for the International Organization for Standardization.
ITU-R 601:	This is standard definition component digital video standard created by the International Telecommunications Union.

J

JPEG Compression:

This refers to a lossy compression algorithm method. JPEG is an abbreviation for Joint Photographic Experts Group.

K

Kelvin:

The name for a scale that measures the color of a light source.

Key frames:

A term which generally refers to events or marks within a clip or scene.

L

Leader:

A section of film at the beginning of a film roll. Leader can be in the form of blank film, a countdown or even a clock.

Letterbox:

The method of displaying the entire contents of a wide screen image on a television monitor. This will show the entire image within the center of the display and there will be black borders on the top and bottom.

Lossless compression:

A method of file compression which performs the function without losing any information.

Lossy Compression:

A type of data compression that discards information in order to complete the function.

Lousy Compression:

Unwanted compression.

LTC:

An abbreviation for Longitudinal Time Code.

LUT:

Otherwise known as a Lookup Table. It is essentially a conversion table. It can be used to perform a conversion between color spaces.

M

Macro:

A button or key which is programmed to carry out a task which was normally done by pressing a series of buttons

Mask:

A method of masking or isolating a region within an image by using a source such as a Power Window.

Matte:

A signal which cuts a section of the image for the purpose of replacement with other information.

Moiré:

An effect which is caused by lines within the material that conflict with the scan lines.

Monochrome:

Another term for black & white film stock.

MOS:	An abbreviation for “mit out sound”, meaning “with out sound”.
MPEG:	This is an abbreviation for Moving Picture Experts Group and is associated with a group of compression standards.
N	
Nitrate:	A term which refers Cellulose Nitrate film stock. A stock which was used until the mid 1952 and was highly flammable.
Node:	A channel of processing within a non-linear color enhancement system which can be used for primary or secondary color correction.
Non-Drop Frame Time Code:	An NTSC 30 frame per second time code developed by the SMPTE.
Non-interlaced Video:	A term which is also known as progressive scan video. Each video frame contains one field of full resolution information.
NTSC:	A term which is an abbreviation for the National Television Standards Committee. It is a 525 line system which is used in the United States, Canada, Japan and in some areas of South America.
O	
Off-line Editing:	An electronic edit which creates a pre-edit or rough cut of the program. An EDL is produced upon completion which allows the user to assemble the program in the on-line suite.
One Light:	A term which is applied to a single color correction which is used throughout the film.
P	
PAL:	This is an abbreviation for Phase Alternate Line and is a 625 line interlace system which is utilized throughout Europe and Australia.
Panchromatic:	A term which refers to monochrome or black and white film stock with is sensitive to all color.
Parade Display:	A display which shows separate red, green and blue channels on a waveform monitor display.
Primary Color Correction:	The act of adjusting the overall color correction for the entire image by adjusting the lift, gamma and gain balance and level.

Primary Colors:	A term that is applied to the three primary colors, red, green and blue.
Progressive Scan:	A scanning method which has each video frame with one field of full resolution information.
Q	
Quality Control:	The act of inspecting a program to ensure that it is free from defects or problems.
R	
RAM:	This also known as Random Access Memory. It is computer memory which is unsaved.
Real Time Effects:	A term which is applied to effects which can be utilized without rendering.
Release Print:	A positive film print which is created for the express purpose of being projected in a theatre.
RF:	An abbreviation for Radio Frequency.
RGB:	An abbreviation for the three primary colors, Red, Green and Blue.
S	
Safety Film:	A film stock which is either Polyester or Acetate base.
Saturation:	A term which refers the amount of chroma information.
SECAM:	A 625 line system which is short for "Sequential Couleur Avec Memoire".
Secondary Color Corrector:	The method of adjusting a one particular color within the image without changing the image's overall color.
Sepia:	A term which is generally applied to a brown wash that is applied to a black and white image. It is generally associated with old images.
SMPTE:	An abbreviation for the Society of Motion Picture and Television Engineers organization.
Soft:	A term which is applied to an image which is not in focus or un-sharp.
Squeezed:	A name that is generally applied to the anamorphic squeezing of an image such as with CinemaScope or Panavision.
Storyboard:	A series of drawings which depict each scene within a project.

T

TAF:	An abbreviation for "Telecine Analysis Film". It is a test film used widely in telecine suites.
Tail:	A term which is applied to the end of a roll of film.
Technicolor:	A trademarked color process for motion pictures.
Telecine:	A machine which is used for transferring motion picture film to video.
Theatrical Release Print:	A positive film print which is created for the express purpose of being projected in a theatre.
Three Color Meter:	A meter that measures color temperature.
Tint:	A name which is applied to an image's color cast or even a wash which may have been applied to the image.

U

V

VCR:	An abbreviation for Video Cassette Recorder.
Vector:	This generally pertains for a color which has been defined for correction with a secondary color corrector.
Vertical Interval Time Code:	A form of time code which is also known by many as VITC. It is time code which is recorded in the vertical blanking area of the signal.
VGA:	A term which is applied to a graphics display format, also known as Video Graphics Array.
Vignette:	A term which is applied to a dark circular mask.
VITC:	This term stands for Vertical Interval Time Code.
VTR:	An abbreviation for Video Tape Recorder.

W

Waveform Monitor:	An offshoot of the standard Oscilloscope and is used for monitoring a video signal.
Widescreen:	A format for displaying an image with wide horizontal dimensions such as CinemaScope or Panavision.
Window Dub:	A videotape which has time code recorded visibly within the picture.
Work Print:	A term which is applied to a one light print that is to be used for editing.
WYSIWYG:	A term which is short for "What You See Is What You Get".

X

X-axis: This refers to the horizontal repositioning of an image or shape.

XGA: An abbreviation for Extended Graphics Array.

Y

Y-axis: A term which is applied to the vertical adjustment of an image or shape.

YCM: An abbreviation for the colors, Yellow, Cyan and Magenta.

YCrCb: This is also known as YUV. The Y is the luminance information and the Cr and Cb are the chrominance information.