Project Settings and Preferences

3

Project Settings and Preferences

This chapter covers the settings used for defining the properties of each individual project. It's a good idea to familiarize yourself with the information in this chapter prior to setting up your first project.

Opening and Editing Project Settings

Once you've opened a project, all of the various project settings, deck capture and playback settings, LUT settings, and application preferences that are available in DaVinci Resolve can be found in the Project Settings window.

To open the Project Settings window:

Click the gear button at the bottom right on any page.
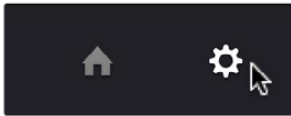
Project Manager and Project
Settings buttons

The Project Settings open in the middle of the screen.

Project Settings window

The Project Settings window is divided into a series of panels which can be selected from a sidebar to the left. Each panel contains a collection of related settings that affects some category of Resolve functionality.
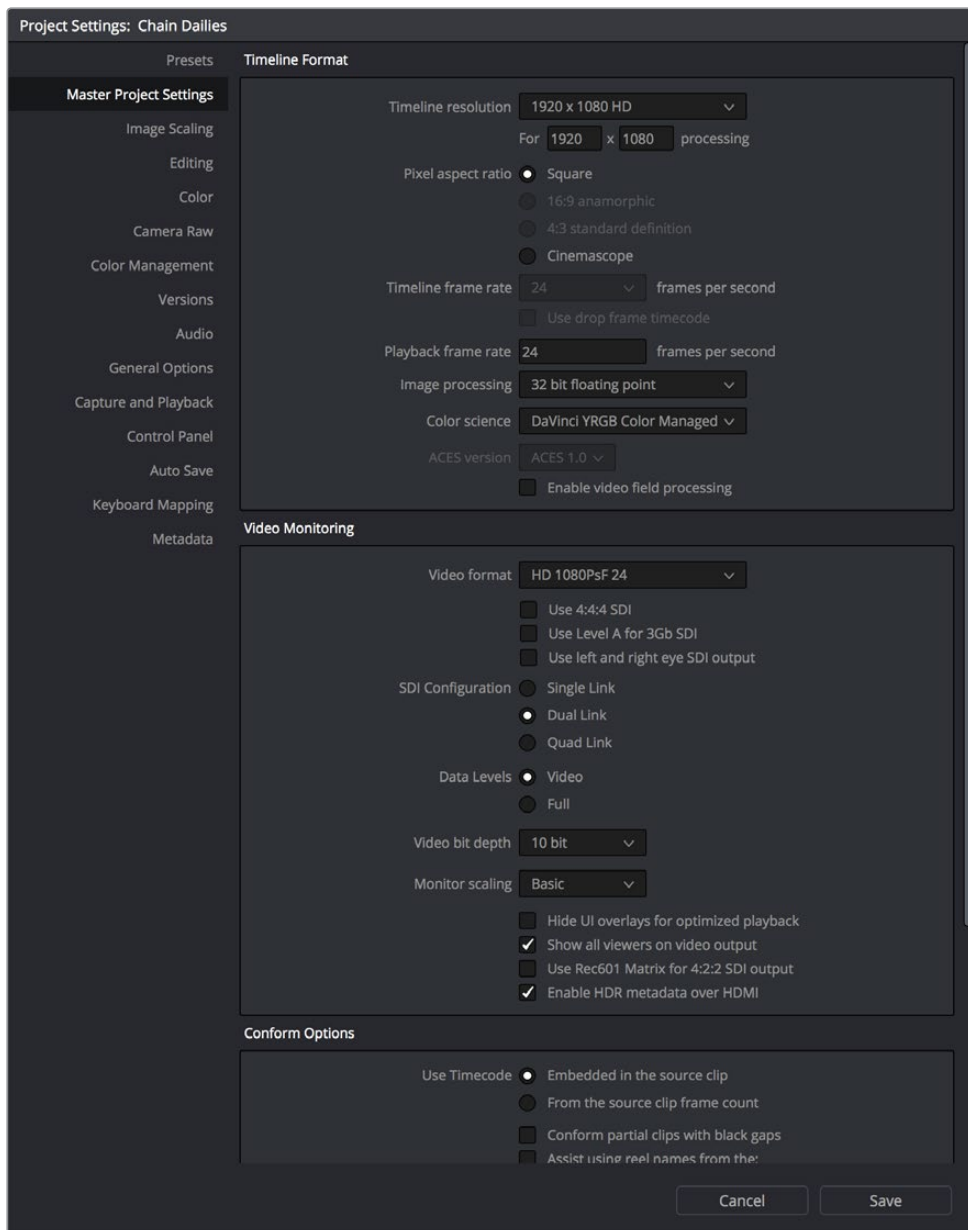
To alter any project settings:

1 Click on the name of any group of settings in the sidebar at the left to open that panel.

2 Change whatever settings you need to change.

3 Do one of the following to apply your changes:

- Click Apply to apply the changes you've made and close the Project Settings.
- Option-click Apply to apply the changes you've made and keep the Project Settings window open, so you can make other changes.

It may be necessary to keep the Project Settings window open in order to continue making changes that may visibly affect the clips and timelines in your project.

Presets

The Presets panel lets you save customized collections of Project Settings for future recall. Presets can save the state of nearly every parameter and setting in every panel of the Project Settings window, and make it easy to switch among different setups for different tasks, or to accommodate different types of projects.

There are three default items in the Presets list:

- Current Project: This is the current project's settings. After you've loaded a preset, the current project becomes selected, showing that the preset you loaded has been applied to the current project.
- System Config: The default configuration that's applied as the User Default Config for all new users that are added to the Login screen.
- User default config: The default configuration for all new projects created by the currently logged in user. The actual name of this config reflects the current user name. Changing this config alters the default settings that are selected whenever this user creates a new project.

If you like, you can add your own presets, as many as you need to accommodate the kind of work you do.

To Create a New Preset:

1 Alter whichever settings in whatever panels you need to, using the different panels of the Project Settings window. In each panel you alter, click the Apply button to retain your changes.

2 Open the Presets panel and click Save As.

3 When a dialog appears asking "Apply Current Configuration to System?", click Yes to apply these changes to the current project.

4 When the Preset Name dialog appears, type a name into the field and click OK.

The new preset appears as an item in the Presets list.

Once you've created one or more custom presets, you can load them at any time.

To Load and Use a Preset:

1 Click an item in the Presets list.

2 Click Load.

If a dialog appears saying either "Do you want to replace current project's config with this selected Preset" or "Apply Current Configuration to System?", click Yes.

If you want to change the default configuration that new users and new projects are automatically created with, you can edit the System Config or the User Default Config.

To modify a System or User Configuration:

1 Exit to the Login Window, and do one of the following:

Log in as admin to modify the System Configuration.

Log in as a user to modify the User Default Configuration.

2 Open a new or existing project, then open the Project Settings.

3 Open the Presets panel, and do one of the following:

If you're logged in as admin, select "System Config" in the Presets list.

If you're logged in as a user, select "User default config" in the Presets list.

4 Make whatever changes you need in the different panels of the Project Settings. Click the Apply button for each panel to keep your changes.

5 When you're finished making changes, open the Presets panel again, and click the Save button immediately underneath the Presets list.

If you edited the System Config, then all new users that are added to the system automatically inherit these settings. If you edited the User Default Config, then all new projects created by that user will inherit those settings.

Finally, if there's a custom preset that you've created that has outlasted its usefulness, you can delete it.

To Delete a Preset:

1 Click an item in the Presets list to select it.

2 Click Delete.

3 When the Confirm Delete dialog appears, click Yes.

Master Project Settings

This panel is project specific, and lets you set up and adjust the most essential properties of a clip, including the timeline format, video monitoring method, and conform options. In many workflows, you'll want to adjust these settings before getting started with your project.

Timeline Format

This group of settings affects the geometry and image processing of the current project.

- Timeline resolution: A pop-up menu that lets you choose a frame resolution preset to use for image processing while grading. DaVinci Resolve is resolution independent, so you can change the resolution at any time and all windows, tracks, sizing changes, and keyframe data will be automatically recalculated to fit the new size. For example, you can work on a 4K project while monitoring at HD resolutions if your room is only

set up with an HD monitor, and then render the finished project at 4K resolution for final delivery. Alternately, you can downsize an HD project to an SD resolution to create another set of deliverables. For more information on Resolve's resolution independence, see Chapter 29, "Color Page Effects."

- **Frame size (Labeled "For X x Y processing"):** Lets you set resolutions not found in the "Timeline resolution" pop-up menu.

- **Pixel aspect ratio:** Used to select PAR settings for image formats that don't use the default square pixel format. You can apply a 16:9 anamorphic PAR, a 4:3 PAR for SD projects, or a Cinemascope ratio.

- **Timeline frame rate:** Determines the primary frame rate used by the project. If you're importing an AAF or XML file, this setting is automatically set via an option in the Project Import dialog. Ideally, you should choose a frame rate before importing media into the Media Pool. However, the first time you import media into an empty Media Pool, you're prompted if the incoming media frame rate doesn't match the Timeline frame rate set here, and you have the option of automatically updating this setting to match that of the media you're importing. Once one or more files have been added to the Media Pool, this setting cannot be changed.

- **Use drop frame timecode:** Enables or disables drop frame timecode for the current project. Off by default.

- **Playback frame rate:** Usually based on the frame rate of the external display connected to your video interface and the "Timeline Frame Rate" setting. For example, a 50Hz monitor requires a 25 fps playback frame rate for synchronous display without dropped frames. If you want to see the playback at a slower rate, type the frame rate in this field and DaVinci Resolve will make the appropriate calculations to drop or repeat frames as necessary to match it. This can be useful for seeing how clips look in slow motion.

- **Image processing:** The only option is 32-bit floating point, which is how all image data is processed within DaVinci Resolve's image processing pipeline.

- **Color science:** There are four options. The default is the well established DaVinci YRGB color science. DaVinci YRGB Color Managed enables the Resolve color-managed workflow (RCM) for grading. Alternately, you can choose DaVinci ACES or DaVinci ACEScc color science, a standardized color management scheme that's available for facilities using ACES workflows. For more information about Color Management and ACES, see Chapter 6, "Data Levels, Color Management, ACES, and HDR."

- **ACES version:** This pop-up only appears if you choose one of the DaVinci ACES options from the Color science pop-up menu. Lets you switch between different versions of the ACES specification. This lets you choose the appropriate older version of ACES whenever you open an older project.

- **Enable video field processing:** Interlaced media is supported throughout DaVinci Resolve. The "Enable video field processing" checkbox forces Resolve to process all operations internally using separated fields. A corresponding checkbox in the Format settings of the Deliver page, "Field rendering," lets you enable and disable field rendering when rendering file-based output. In addition, each clip in the Media Pool has a Field Dominance pop-up menu in the Video panel of the Clip Attributes window that lets you specify whether clips are upper- or lower-field dominant; an Auto setting makes this choice by default.

    If you're working with progressive-frame media, it is *not necessary* to turn this checkbox on. Furthermore, if you're using interlaced clips in a progressive-frame project and you're intending to deinterlace those clips using the Enable Deinterlacing checkbox in the Clip Attributes window, then you *must* turn "Enable video field processing" off. Otherwise, the Enable Deinterlacing checkbox will be disabled for all clips. For more information about deinterlacing clips, see the "Changing Clip Attributes" section of Chapter 9, "Working With Media."

Whether or not it's necessary to turn field processing on to maintain the field integrity of interlaced clips in your program depends on what types of corrections you're applying to your clips. If you're mastering your program to an interlaced format, and you're applying any adjustments that would cause pixels from one field to move or bleed into adjacent fields, then field processing should be enabled; effects requiring field processing include filtering operations such as blur, sharpen, and OpenFX operations, as well as sizing transforms that include pan, tilt, zoom, rotate, pitch, and yaw.

On the other hand, regardless of whether you're outputting interlaced or progressive-frame media, if you're not filtering or resizing your clips, and you're only applying adjustments to color and contrast, it's not necessary to turn on field processing for interlaced material, and in fact, leaving it off may somewhat shorten your project's rendering time.

Video Monitoring

The settings available in this group control the signal that's output by the video output interface that's connected to your workstation, and let you specify what standard of signal is output, and via which signal path.

By default the frame size and frame rate match those in the Timeline resolution and Playback frame rate options. However, if necessary you can change these settings to match those of the external display you're using to monitor your work. For example, if you're working with 2K files for 2K output, but you're color correcting using a high definition monitor set to 1080 resolution, you can select the appropriate HD standard for that monitor without changing the Timeline Resolution settings.

- Video format: Lets you choose a video standard combination of frame size and frame rate to be output via your connected video output interface.
- Video connection checkboxes: Lets you choose the signal standard to output from your connected video output interface to the video monitor. Make sure to choose a standard that's supported by both your video interface and your monitor. The options are:
  - Use 4:4:4 SDI: A signal path for monitoring image data to monitors that support 4:4:4 chroma sampling via dual SDI connections.
  - Use Level A for 3Gb SDI output: A signal path for monitoring image data via a single 3 Gb/s or 6 Gb/s SDI connection.
  - Use left and right eye SDI output: All DaVinci Resolve systems can generate a side-by-side display that can be sent to a Stereoscopic monitor via the HD-SDI output of an UltraStudio 4K or DeckLink card. When dual SDI 3D monitoring is enabled, each eye is output separately at full resolution. In this mode, split-screen wipes and cursors will not be visible on the grading monitor.
- SDI Configuration: Lets you choose from among Single Link, Dual Link, and Quad Link SDI.
- Data Level: This setting only affects the data levels being output via the video interface that connects the Resolve workstation to your external display. It has no effect on the data that's processed internally by Resolve, or on the files written when you render in the Deliver page. It is imperative that the option you choose in Resolve matches the data range to which your external display is set. Otherwise, the video signal will appear to be incorrect, even though the internal data is being processed accurately by DaVinci Resolve. There are two options:
  - Video: This is the correct option to use when using a broadcast display set to the Rec. 709 video standard.
  - Full: If your monitor or projector is capable of displaying "full range" video signals, and you wish to monitor the full 10-bit data range (0- 1023) while you work, this is the correct option to use.

For more information about data levels, see Chapter 6, "Data Levels, Color Management, ACES, and HDR."

- **Video bit depth:** Choose the bit depth that corresponds to the capability of your display. You can choose between 8-bit and 10-bit. Monitoring in 10-bit is more processor intensive, but preferable to avoid the appearance of banding that may not in fact be in the image data being processed by Resolve.

- **Video output sync source:** This setting, when displayed, lets you select between internal and external bi-level or tri-level synchronization, which is used with some video interfaces, but not required by all.

- **Monitor scaling:** Defaults to basic, and is only enabled to smooth the edges of video being viewed on a projector with very large screens. These settings minimize high frequency artifacts that may be seen. This may also be noticeable if you have a 2K or HD project but are monitoring on an SD monitor. The other option, Bilinear, has different effects on the monitored image depending on your display device, so you may need to check to verify that it's appropriate for your environment.

- **Add 3:2 pulldown:** When outputting 23.98 or 24 fps media to an external display that can only sync to 29.97, 59.94, or 60 fps signals, this option lets you output with a 3:2 pulldown pattern inserted into the signal.

- **Hide UI overlays for optimized playback:** When using a single GPU for both display and CUDA or OpenCL processing, or if your display GPU is underpowered, or if you lack the PCIe bandwidth required for the currently specified resolution or frame rate, you may be able to improve real time performance by turning this option on. When enabled, on-screen controls such as the cursor, Power Window outlines, and split-screen views are disabled and hidden during playback. When playback is paused, all onscreen controls reappear.

- **Show all viewers on video output:** When this setting is disabled, video output is locked to the Color page viewer only. When this setting is turned on, other elements of the GUI that have focus in the Media, Edit, and Deliver pages are also output to video.

- **Use Rec601 Matrix for 4:2:2 SDI output:** Don't use this checkbox unless you know what it does.

- **Enable HDR metadata over HDMI:** (only available in Studio version) Turning on this checkbox outputs the metadata necessary to send High Dynamic Range signals over HDMI 2.0a and have it correctly decoded by an HDR-aware video display. When this checkbox is enabled, it's recommended to also enable the "HDR mastering is for X nits" checkbox in the Color Management page, and set the "nit" level (slang for cd/m2) to whatever peak luminance level your HDMI connected HDR display is capable of.

Conform Options

The settings in this group determine how clips are conformed to match imported project files with source media on disk by extracting timecode, reel names, file names, file paths, and so on.

- **Use Timecode:** Determines how DaVinci Resolve extracts timecode from referenced media files. There are two options:

  - **Embedded in the source clip:** The preferred setting for most projects to conform automatically and apply grades to the resulting clips. As long as DaVinci Resolve can reference the timecode in either a media file's timecode track, or in the header metadata of the frames in a DPX sequence, you can use timecode to re-conform clips, or even completely change the media file to which a clip refers.

  - **From the source clip frame count:** This setting is useful if the source media lacks timecode metadata, and all that's available is a frame count that identifies frames via sequentially numbered integer values.

- **Conform partial clips with black gaps:** Inserts black frames whenever you conform a clip that doesn't contain all the required frames. When this option is selected, partial clips are flagged in the Edit page with a P in the thumbnail of the clip that it is lacking frames.

- **Assist using reel names from the:** When this checkbox is turned on, DaVinci Resolve uses reel numbers when conforming clips to match any imported project. This setting must also be turned on if you want to choose different reel name extraction methods for individually selected clips using the Clip Attributes window. Turning this checkbox off forces DaVinci Resolve to identify clips using file names when conforming XML and AAF projects. File names can only be used for conforming XML or AAF files, or when importing a DaVinci project. There are four options:

  - **Source clip file pathname:** Obtains the reel number by extracting it from each media file's path. This makes it possible to extract a reel number from all or part of the file name, or from all or part of the name of any folder in the path that encloses that file. This extraction is defined using the Pattern field.

  - **Pattern:** A code that defines how a reel number should be extracted from the source clip path name. For more information about creating patterns, see "Using the Pattern Field" in Chapter 22, "Importing Projects and Relinking Media."

  - **Media Pool folder name:** The reel number is obtained from the name of the bin in the Media Pool that encloses that clip. This option is often used for stereo projects, deriving the reel number from "Left" and "Right" named directories. It's also useful for projects that are inheriting new VFX clips on a daily basis.

  - **Embedding in source clip file:** Useful for file formats where the reel number is embedded within the media file itself. QuickTime files created by Final Cut Pro, DPX frame files, and CinemaDNG files are all formats that are capable of containing reel number header data.

  - **Source clip filename:** If there is no defined reel number, often it's easy to just use the source clip filename. This is a safe option to use in situations where you want to manually choose different reel name extraction methods for individual clips using the Clip Attributes window.

- **Extract reel names from EDL comments:** Media file formats such as R3D have reel names, obtained from the file names, that are longer than the eight characters that are allowable in a standard EDL. This option allows DaVinci Resolve to extract reel names from appropriately formatted EDL comments, such as those output from Final Cut Pro 7.

- **Show offline reference for timeline gaps:** If there's a missing clip in a conformed timeline that results in a gap in the Timeline Editor, turning this option on sets Resolve to show the corresponding frames of an "offline reference movie," if one has been assigned to that timeline, instead of black. This can be helpful in emergency situations when you're missing timeline clips right before a screening or review session; this feature lets you play or output the missing frames using the corresponding media from the offline reference movie, instead of outputting black. For more information on using and assigning Offline Reference Movies, see Chapter 22, "Importing Projects and Relinking Media."

- **Show offline reference for non-conformed edits:** If there's missing media in a project that results in an unlinked clip in the Timeline Editor (represented by a red exclamation point overlay on that clip), turning this option on sets Resolve to show the corresponding frames of an "offline reference movie," if one has been assigned to that timeline, instead of black. This can be helpful in emergency situations when you're missing source media right before a screening or review session; this feature lets you play or output the missing frames using the corresponding media from the offline reference movie, instead of outputting black. For more information on using and assigning Offline Reference Movies, see Chapter 22, "Importing Projects and Relinking Media."

- **Sort timeline using reel number and timecode:** Lets you change the behavior of C mode sorting in the Timeline. With this checkbox turned on (the default), all clips in the Timeline are sorted by reel number first, and then by source timecode. This way, clips with similar timecode from the same reel will appear next to one another in C mode. If you turn this checkbox off, reel number is ignored, and all clips in the Timeline are sorted only by source timecode. This may result in clips from multiple sources being mixed together, but it is useful in specific situations.

- **Mixed frame rate format:** (Only available prior to importing media into a project) This pop-up menu lets you choose the method used to conform mixed frame rates for rendering and playback. When none is selected, Resolve conforms and processes all clips in the Timeline to play at the frame rate that's selected in the "Timeline frame rate" pop-up menu. For example, 23.98, 29.97, 30, 50, 59.94 and 60 fps clips will all play at 24 fps if that's what "Timeline frame rate" is set to in the Master Project Settings. How clips in mixed frame rate timelines are rendered out depends on whether the Render Settings are set to render individual source clips or one single clip. When you render the Timeline as individual source clips, all clips are rendered individually at their original frame rate. If you select 'single clip,' all clips are converted to the "Timeline frame rate" frame rate and rendered as a single media file.

  You can choose the "Final Cut Pro 7" or "Final Cut Pro X" methods of conform, while for projects imported from Premiere Pro, Smoke, or other NLEs, you should choose "Resolve." Which option you choose dictates the accuracy with which retimed clips in Resolve match the same clips retimed in other editing applications.

  You should also choose "Resolve" if you're editing from scratch in DaVinci Resolve, and your source clips are at different rates than the timeline rate and you would like each of the clips to be speed changed to the timeline rate by default. This option uses the Retime selection you can find on the editing tab. This pop-up menu also appears in the Load AAF or XML dialogs when you import a project.

Image Scaling

The Image Scaling panel contains settings that determine how and when clips are resized for various reasons.

Image Scaling

These settings affect the methods used to resize clips in various situations.

- **Resize Filter:** The first group of settings lets you choose the mathematical method used to resize clips:
  - **Optimize for playback:** When this option is enabled, bilinear image scaling will be used during playback and sharper image scaling will be used while playback is paused, enabling low-performance workstations to play with better frame rates, albeit not at full quality.
  - **Sharper:** Usually provides the best quality in projects using clips that must be scaled up to fill a larger frame size, or scaled down to HD resolutions.
  - **Smoother:** May provide higher quality for projects using clips that must be scaled down to fit an SD resolution frame size.
  - **Bilinear:** A lower quality setting that is less processor intensive. Useful for previewing your work on a low-performance computer before rendering, when you can switch to one of the higher quality options.

- **Use optimized sizing for proxy mode:** When this checkbox is turned on, Resolve uses the highest-quality scaling method for reducing the size of media.
- **Override input scaling:** Checking this box lets you choose an Input Sizing preset to apply to the project.
- **Override output scaling:** Checking this box lets you choose an Output Sizing preset to apply to the project.
- **Anti-alias edges:** A second group of settings lets you choose how to handle edge anti-aliasing for source blanking.
  - **Auto:** Adds anti-aliasing when any of the Sizing controls are used to transform the image. Otherwise, anti-aliasing is disabled.
  - **On:** Forces anti-aliasing on at all times.
  - **Off:** Disables anti-aliasing. It might be necessary to turn anti-aliasing off if you notice black blurring at the edges of blanking being applied to an image.
- **Debayer quality:** A third group of settings lets you choose whether to apply sharpening when debayering raw media formats such as CinemaDNG.
  - **Optimize for playback:** When this option is enabled, a simple debayer will be used during playback and a sharper debayer will be used while playback is paused, enabling low-performance workstations to play with better frame rates, albeit not at full quality.
  - **Uses sharper filter:** The default setting. Uses a debayer-specific, high-quality sharpening operation to improve the appearance of debayered media.
  - **Uses smoother filter:** Choosing this setting disables sharpening, providing access to the unaltered debayering result.
- **Deinterlace quality:** (only available in Studio version) A fourth group of settings lets you choose the quality/processing time tradeoff when deinterlacing Media Pool clips using the Enable Deinterlacing checkbox in the Clip Attributes window. There are two settings:
  - **Normal:** A high-quality deinterlacing method that is suitable for most clips. For many clips, Normal is indistinguishable from High. Normal is always used automatically during playback in Resolve.
  - **High:** A more processor-intensive method that can sometimes yield better results, depending on the footage, at the expense of slower rendering times.

Input Scaling Preset

Contains one setting, Mismatched resolution files, that lets you choose how clips that don't match the current project resolution are handled. There are four options:

- **Center crop with no resizing:** Clips of differing resolution are not scaled at all. Clips that are smaller than the current frame size are surrounded by blanking, and clips that are larger than the current frame size are cropped.
- **Scale full frame with crop:** Clips of differing resolution are scaled so that the clip's shortest dimension is fit to match the frame. Excess pixels are cropped.
- **Scale entire image to fit:** The default setting. Clips of differing resolution are scaled so that the clip's longest dimension is fit to match the frame. The shorter dimension has blanking inserted (letterboxing or pillarboxing).
- **Stretch frame to all corners:** Useful for projects using anamorphic media. Clips of differing resolutions are squished or stretched to match the frame size in all dimensions. This way, anamorphic media can be stretched to match full raster, or full raster media can be squished to fit into an anamorphic frame. An added benefit of this setting is that it makes it easy to mix anamorphic and non-anamorphic clips in the same project.

Output Scaling Preset

These settings let you optionally choose a different resolution to be output via your video output interface, for monitoring, outputting to tape, or rendering. If you set the resolution in the Render Settings list of the Deliver page to something other than the Timeline Resolution, these settings are used to make the change. This can be used in situations where you're working on a high resolution 4K project, but you want to monitor using an HD display and output HD resolution media for approval.

- **Match timeline settings:** Turned on by default, so that these settings mirror the Timeline Resolution, Image Scaling, and Input Image Scaling settings described above. Turning this checkbox off lets you choose different settings for monitoring, outputting to tape, or rendering, using the other settings in this group.
- **Output resolution:** Lets you choose an alternate resolution.
- **For:** Lets you specify a different custom alternate resolution.
- **Pixel aspect ratio:** Lets you specify an alternate pixel aspect ratio to match the alternate timeline format.
- **Mismatched resolution files:** Lets you choose an alternate way of handling mismatched resolution files given the alternate resolution you've chosen. These options work identically to those of the "Input Image Scaling" group.

Editing

The settings in this panel affect keyboard shortcuts and editorial default values.

General Settings

- **Standard generator duration:** Defines the default duration of generators you edit into the Timeline, in Seconds or Frames. The default value is 5 seconds.
- **Standard transition duration:** Defines the duration of transitions, in Seconds or Frames, that you add to an edit point in Resolve. The default value is 1 second.
- **Standard still duration:** Defines the duration of stills that you import such as TIFF, PNG and other supported graphic file formats, in Seconds or Frames. The default value is 5 seconds.
- **Pre-roll time:** Determines how much of the Timeline before the current position of the playhead to play when using the Play Around command.
- **Post-roll time:** Determines how much of the Timeline after the current position of the playhead to play when using the Play Around command.
- **Default handles length:** The value used when creating a timeline with handles. The default is one second worth of frames.
- **Default fast nudge length:** The number of frames that are nudged when you use the Shift-comma (,) and Shift-period (.) keyboard shortcuts.
- **Pre-playhead shadow length:** The number of frames in the Timeline prior to the playhead covered by the Playhead Shadow, if enabled by choosing View > Show Playhead Shadow.
- **Post-playhead shadow length:** The number of frames in the Timeline after the playhead covered by the Playhead Shadow, if enabled by choosing View > Show Playhead Shadow.
- **Timeline overlay retains the last performed action:** Turn this checkbox on if you want Resolve to always remember the last edit type you used in the Timeline Viewer Overlay, and highlight it on this Overlay whenever you drag another clip over the Timeline Viewer to let you know that the last edit you performed is the new default edit if you drop clips to the left of the overlay.

Frame Interpolation

These settings determine the default state for all retiming and speed change effects including when clips are in mixed frame rate timelines.

- Retime Process: This pop-up menu lets you choose a default method of processing clips in mixed frame rate timelines and those with speed effects (fast forward or slow motion) applied to them, throughout the project. Since each clip in every timeline defaults to "Project Settings," changing this setting will change the way most speed effected clips will be processed, except for those that have custom settings selected. There are three options:

  - Nearest: The most processor efficient and least sophisticated method of processing; frames are either dropped for fast motion, or duplicated for slow motion.

  - Frame Blend: Also processor efficient, but can produce smoother results; adjacent duplicated frames are dissolved together to smooth out slow or fast motion effects. This option can provide better results when Optical Flow displays unwanted artifacts.

  - Optical Flow: The most processor intensive, but highest quality method of speed effect processing. Using motion estimation, new frames are generated from the original source frames to create slow or fast motion effects. The result can be exceptionally smooth when motion in a clip is linear. However, two moving elements crossing in different directions or unpredictable camera movement can cause unwanted artifacts.

- Motion estimation mode: When using mixed frame rate timelines with Optical Flow retiming selected or Optical Flow speed changes, this pop-up menu lets you choose between higher speed (Faster) or higher quality processing (Better).

- Motion range: When using mixed frame rate timelines with Optical Flow retiming or Optical Flow speed changes, this pop-up menu lets you choose small, medium or large motion for all speed and motion related calculations to improve the result by matching the type of motion in the source media.

Color

The settings in this panel govern different behaviors in the Color page.

Timeline Settings

These settings affect clip versions and timeline interactions when working in the Color page.

- Use local version for new clips in timeline: Automatically sets all new clips that are added to existing timelines, or all clips that are added to new timelines that are imported via AAF, EDL, or XML, to use local grades by default. If you want all clips added to new timelines to use remote grades instead, as with DaVinci Resolve version 9 and earlier, you can turn this checkbox off.

- Automatically match master timeline with media pool: If you turn on this option before importing any media into the Media Pool, or importing any timelines that will in turn import media into the Media Pool, you can create projects with a Master Timeline. When enabled, clips are added to and removed from the Master Timeline as they're added to and removed from the Media Pool, so that the Master Timeline always contains all media in the Media Pool. Once media has been imported into a project, this setting cannot be changed.

- Save timeline thumbnails with project: To minimize project size, and maximize the speed of saving and loading projects, you should leave this checkbox unchecked. If

you select the checkbox, all of your Timeline thumbnails will be stored inside every project, instead of in the default directory that's ordinarily dedicated to stills, during both Save and Auto Save operations. This provides a good history of the project, but takes much longer to complete and uses more hard disk space.

- **Automatically cue x frames into timeline clips:** This setting affects the operation of the NEXT SCENE and PREV SCENE commands in the Color page. The default cue point when moving from one clip to the next is the first frame of each clip. Entering a value, in frames, in this field sets the default cue point to the specified number of frames after the first frame of each clip you move the playhead to. This can be convenient if the source material has black or camera rollup flashes at the beginning of every clip while you're trying to grade dailies.

- **Next scene switches to visible track:** When grading a project with multiple tracks, you can use this option to alter the "next scene" command to work better in projects with multi-clip composites. With this option turned off, pressing NEXT SCENE on the DaVinci control panel, or using the Down Arrow keyboard shortcut, moves the playhead to the very next clip in the Thumbnail timeline, regardless of whether it's in front of or behind another clip. Turning this option on causes the NEXT SCENE command to move the playhead to the clip in the highest track if the next clip is part of a multi-clip composite with multiple clips stacked over one another.

Ripple Mode

This setting determines the behavior of the Ripple command that's initiated when using the RIPPLE VALUE button on the DaVinci control panel.

- **Target clips are set to:** The Ripple mode that's used when you press the RIPPLE VALUE button on the DaVinci control panel. For more information on using this function, see Chapter 28, "The Gallery and Grade Management."

  - **Exact values changed:** Changes made to the current clip are rippled to the specified clips using the exact parameters that were changed. For example, if the Master Gain level in the current clip is changed to 0.75 of its range, each clip you ripple will have a Master Gain level of 0.75. Only parameters you adjust are rippled.

  - **Percent value changed:** Changes made to the current clip are rippled to the specified clips by the percentage of change you made to the altered parameters. For example, if the current clip has a Master Gain level of 1.00 and is changed to 0.90 units, then the Master Gain level of each clip you ripple will have a relative reduction of 10% relative to its previous value.

  - **Unit values changed:** Changes made to the current clip are rippled to the specified clips by the same delta of change, using whichever units make sense for the affected parameter. For example, if the current clip had a Master Gain of 0.80 and you increased it to 0.90, each rippled scene's Master Gain level increases by 0.10.

  - **All values are copied:** The current clip's grade is rippled to the specified clips in its entirety. No comparison is made with the original clip's parameters, and all memory parameters are rippled.

Dynamics Profile

Defines the default transition from one dynamic keyframe to the next for keyframed effects in the Color page. By default this transition is linear, with the "Dynamic profile start" and "Dynamic profile end" parameters set to 1. However, if you need to alter the acceleration of the interpolation of values from one dynamic keyframe to the next, then you can change that keyframe's Dissolve Type in order to "ease" the effect transition you're creating.

The values in these settings correspond to the graph curves found in the Dynamic Attributes dialog when editing keyframes in the Color page. For more information, see "Changing Dynamic Attributes" in Chapter 31, "Keyframing in the Color Page."

General Settings

Affect a variety of behaviors while working in the Color page.

- **Luminance mixer defaults to zero:** Selecting this option sets the Y channel of the YRGB parameters for all grades to zero. This is required to be able to export a compliant ASC-CDL, and will impact all grades that use the Lum Mix control.

- **Master reset maintains RGB balance:** Defines how the DaVinci control panel trackball/ ring reset buttons reset primary color adjustments. When this option is turned off (the default), pressing the ALL Reset button returns the primary correction values to their default values. When this checkbox is turned on, then pressing the ALL Reset button (a) resets the YRGB values so that the overall values are kept and the ratio of YRGB to each other is maintained, and (b) pressing the RGB Reset button sets the three color channels to the average of what they were previously set to.

- **High-Visibility Power Window Outlines:** Turning this on sets power window outlines to be drawn as green (for the center shape) and yellow (for the softness shapes), to make these windows easier to see in certain circumstances, instead of the default white and gray.

- **Use legacy Log grading ranges and curve:** DaVinci Resolve 12.5 introduced a modification to the Log grading controls that provides smoother, more pleasing results using the same controls. To maintain backward compatibility with older projects, a "Use legacy Log grading ranges and curve" checkbox in the Color panel of the Project Settings lets you switch your project between the older Log control behavior and the newer one. Older projects that are opened in Resolve have this checkbox turned on by default, while new projects have this turned off by default.

- **Use S-curve for contrast:** On by default, this checkbox sets the contrast control in the Color Wheels palette to apply an "S-curve" to the image, such that the shadows and highlights of a signal will not be clipped when you increase the value. If you would prefer for these contrast adjustments to be made linearly, and for the signal to be allowed to clip when you reach the upper and lower boundaries of the video signal, you can turn this checkbox off.

- **Enable HDR Scopes for ST.2084:** (only available in Studio version) If you're doing an HDR grade and monitoring with the built-in video scopes in Resolve, you can turn this checkbox on to replace the 10-bit scale of the video scopes with a scale based on "nit" values (or cd/m2) instead.

- **Color picker:** Changes the way that colors are selected when using 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:** (this setting can also be changed from the Option menu in the Node Editor) 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:
  - **Selects last adjusted node:** The default setting, where each clip in the Timeline retains its own independent node selection that's remembered whenever you move back to that clip.
  - **Selects first node:** The first node is always selected when you move to another clip.
  - **Selects last node:** The last node is always selected when you move to another clip.
  - **Selects same node:** If the clip you've moved to has as many or more nodes as the last clip, the node of the same number will be selected. If the clip you've moved to has fewer nodes than the last clip, the next highest node will be selected.

Printer Light Step Calibration

For film projects, when you have 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. Usually, the Step and Density values will be identical, but this will be up to your lab and your preference.

Camera Raw

This panel contains groups of parameters that correspond to every camera raw media format that's supported by DaVinci Resolve. Using these parameters in the Camera Raw panel, you can override the original camera metadata that was written at the time of recording, and make simultaneous adjustments to all camera raw clips using the "project" raw settings.

These settings are covered in detail in Chapter 4, "Camera Raw Settings."

Color Management

The various options found in the Color Management panel let you configure DaVinci Color Management (RCM) or ACES if you have either enabled, and they also allow you to pre- or post-process the DaVinci Resolve image processing pipeline using LUTs and Broadcast Safe settings, in order to accommodate a wide range of different color workflows.

Color Management Settings

If you've selected DaVinci YRGB Color Managed or ACES in the Color Science setting of the Master Project settings, then the pop-up menus in this section become enabled. For more information about Resolve Color Management and ACES, see Chapter 6, 'Data Levels, Color Management, ACES, and HDR." If you're new to color or color management, you're strongly recommended to read this chapter.

Resolve Color Management (RCM) Settings

These settings give you deep control over how color is transformed, starting with individually choosing the proper color settings for the source media in your project (via the Input Color Space), through choosing how you want your grading controls in Resolve to behave (via the Timeline Color Space), and then specifying how the final color will look on your monitor and output device (via the Output Color Space).

As powerful as this method of color management is, it's also incredibly simple to use. All you have to do is choose Input Color Spaces for your clips, a Timeline Color Space (although most will probably default to the standard Rec.709 Gamma 2.4 setting), and an Output Color Space that's suitable for creating the deliverables that are requested of you, and Resolve takes care of the rest, making all necessary color transforms automatically and in real time.

The three global controls and one checkbox available for Resolve Color Management (RCM) are:

- Input Color Space: The default color space that all clips in the Media Pool to which you've not assigned an Input Color Space will default to.
- Timeline Color Space: The working color space that affects how effects and grading controls work.
- Output Color Space: The color space that you'll be monitoring and outputting as you work. The Viewers in DaVinci Resolve show you the image as it's transformed into the Output Color Space.
- Use Separate Color Space and Gamma: If this checkbox is turned off (the default), the Color Management panel of the Project Settings exposes one pop-up each for the Input, Timeline, and Output color space settings, and each setting simultaneously transforms the gamut and gamma, depending on which option you choose. If you turn this checkbox on, then the Color Management panel changes so that the Input, Timeline, and Output color space settings each display two pop-ups. The first pop-up lets you explicitly set the gamut, while the second pop-up lets you explicitly set the gamma.

ACES Settings

- ACES IDT (Input Device Transform): When Color Science is set to ACES, this pop-up menu lets you choose which IDT to use for the dominant media format in DaVinci Resolve.
- ACES ODT (Output Device Transform): When Color Science is set to ACES, this pop-up menu lets you choose an ODT with which to transform the image data for monitoring on your calibrated display, and when exporting a timeline in the Deliver page. For more information on ACES workflows using these settings, see Chapter 22, "Importing Projects and Relinking Media."

Use Mac Display Color Profile for Viewers

If you're using DaVinci Resolve on Mac OS X, this checkbox enables all Viewers in Resolve to use whatever display profile is selected in the Displays panel of the System Preferences. This lets Resolve use ColorSync on Mac OS X so your Viewer image should better match your output display.
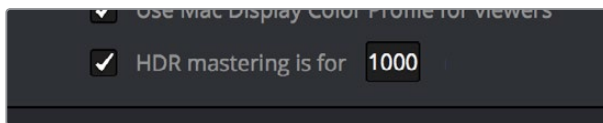
HDR Mastering Is For

(Only available in Studio version) If you have a DeckLink 4K Extreme 12G or an UltraStudio 4K Extreme video interface, then DaVinci Resolve 12.5 and above can output the metadata necessary to correctly display HDR video signals to display devices using HDMI 2.0a when you turn on the "Enable HDR metadata over HDMI" checkbox in the Master Project Settings.
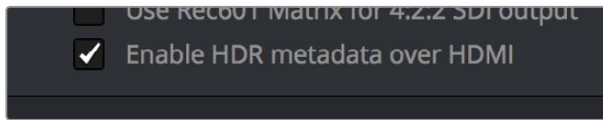
The Enable HDR metadata over HDMI option in the
Master Project Settings lets you output HDR via HDMI 2.0a

When you do so, a setting in the Color Management panel of the Project Settings, "HDR mastering is for X" lets you specify the output, in nits, to be inserted as metadata into the HDMI stream being output, so that the display you're connecting to correctly interprets it. The output you specify should match what your display is expecting.

The HDR mastering is for setting lets you insert
metadata for HDR output via HDMI 2.0a

Adding Lookup Tables to Your DaVinci Resolve Installation

The pop-up menus in the Color Management panel include a series of factory preset LUTs that were installed with Resolve, along with any LUTs that have been generated by Resolve, or that you've imported into the proper directory for your operating system.

- On OS X: Library/Application Support/Blackmagic Design/DaVinci Resolve/LUT/
- On Windows: C:\ProgramData\Blackmagic Design\DaVinci Resolve\Support\LUT
- On Linux: /home/resolve/LUT

NOTE: If you downloaded Resolve from the Apple App Store, LUTs are saved in a different location in order for Resolve to remain totally self-contained. In this case, you can click the "Open LUT Folder" button in the Lookup Tables panel of the Project Settings, to open up a Finder window at the location these LUTs are stored. You can use this window to copy LUTs that you want Resolve to have access to, or delete LUTs that you no longer need.

If you add a LUT to one of these directories after Resolve has been opened, you can click the Update Lists button to refresh the contents of the pop-up menus.

TIP: Resolve uses both 1D and 3D LUTs. 3D LUTs that are created by DaVinci Resolve are in the .cube format, configured as 33x33x33 cubes with 32-bit floating point processing. DaVinci Resolve can also read and use LUTs in the Cinespace and Shaperlut formats.

Lookup Tables

This group of controls lets you add LUTs to the Resolve image processing pipeline that affect every timeline in the entire project all at once. These LUTs can be used for a wide variety of functions, such as to trim Timeline grades, apply Log to Linear conversions, simulate film output, and limit the signal to accommodate Broadcast Safe requirements. Different options let you insert image processing to different stages of the pipeline as seen in the following diagram:
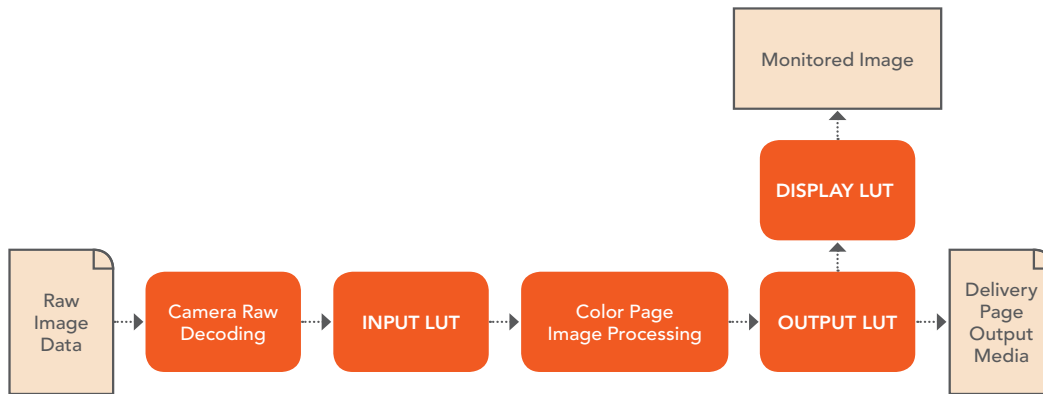
Keep in mind that since you can apply both 1D and 3D LUTs simultaneously, 1D LUTs at each step are always applied before 3D LUTs.

- **1D/3D Input Lookup Table:** Two pop-up menus let you add 1D and/or 3D LUTs that process the current Timeline before every other image processing operation in DaVinci Resolve.

- **1D/3D Output Lookup Table:** Two pop-up menus let you add 1D and/or 3D LUTs that process the current Timeline after the operations applied in the Color page, but before the temporarily applied Display LUT.

- **1D/3D Video Monitor Lookup Table:** Two pop-up menus let you add 1D and/or 3D LUTs that process the current Timeline after every other image processing operation in DaVinci Resolve. However, Display LUTs are only temporarily applied for purposes of monitoring; they're never applied to rendered media, or to the signal that is output to tape using the controls in the Deliver page. Display LUTs are particularly valuable for applying a film print emulation LUT in a Log workflow, or for applying a monitor calibration LUT if you're outputting to a single display and you don't have dedicated outboard calibration hardware.

  Here's an example. It's common, when grading for film output using a Log workflow, that you'll use the Display LUT pop-up menu to apply a film emulation LUT that simulates the image as it will be output from the film recorder, taking into account the film lab and print stock used, in order to make sure that the image you're grading will appear as close as possible to what the eventual release print will look like in the cinema.

- **1D/3D Color Viewer Lookup Table:** Two pop-up menus let you add 1D and/or 3D LUTs that process the image shown in the Viewer on your computer display, independently of the Display LUT that's used to output to your broadcast display. By default, this follows the Video Monitor LUT setting, but you can also use this option to apply a specific calibration transform for your computer monitor. Alternately, you could use it to desaturate the GUI Viewer to be able to specifically evaluate image contrast, or if you don't want to have to argue with your client over which display looks correct.

- **1D/3D Scopes Lookup Table:** Ordinarily, Resolve's internal software video scopes provide an unbiased analysis of the actual video data levels within the Resolve image processing pipeline. However, you can choose to have the software scopes use the Video Monitor LUT selection, or any other LUT installed on your system, to transform this analysis to reflect the monitored output.

- **3D Lookup Table Interpolation:** 3D Lookup tables (LUTs) are 3D tables of red, green, and blue values that specify an output color value for each input color value, thereby providing a method of making color transformations using pre-calculated data. While powerful, 3D LUTs have finite detail; for example, one might have a 17x17x17 LUT that specifies 4913 individual color transforms. When applied to a floating point image that contains more data than the LUT specifies transforms for, color values falling between the 17x17x17 color transforms specified by the LUT need to be interpolated. You can choose from two methods that trade off processing efficiency for higher quality:

  - **Trilinear:** Trilinear is backward-compatible with grades that use LUTs from previous versions of Resolve and matches the look of LUTs being applied in other applications.

  - **Tetrahedral:** Tetrahedral is slightly more processor-intensive, but results in higher image quality, with reduced color-banding. Tetrahedral is recommended for projects that don't need to match grades from previous versions of Resolve, or LUTs created in other applications.

  - **Update Lists button:** Refreshes the LUT pop-up menus if you've added new LUTs to your system since DaVinci Resolve has been opened.

  - **Open LUT Folder:** This selection opens the master folder in your file system, as described in the list of DaVinci Resolve LUT paths shown above.

Broadcast Safe

Broadcast Safe settings can be enabled while you grade to limit both the luma and chroma of the video signal to one of three levels of acceptable overshoots and undershoots.

- **Broadcast safe IRE (mV) levels:** A pop-up menu for choosing one of three levels of aggressiveness when limiting the signal. Choose the range that corresponds to your QC requirements.

- **Make Broadcast Safe:** A checkbox that turns broadcast safe limiting on and off.

> **NOTE:** The clipping imposed by Broadcast Safe itself does not have an inherently soft roll-off. For best results, Broadcast Safe should be used in conjunction with the Soft Clip controls in the Color page, or a Soft Clip LUT (described in the following section).

Generate Soft Clip LUT

Similar to the Soft Clip mode of the Curves, a Soft Clip LUT lets you create an image processing LUT that applies a timeline-wide "knee" to any clipping that occurs at the upper or lower extremes of the image. Soft clipping in this context is used to quickly ease off any unpleasantly harsh loss of detail occurring as a result of blowing out the highlights or crushing the shadows too aggressively.

To be effective, a Soft Clip LUT should be ideally applied using the 3D Output Lookup Table pop-up menu in the Look Up Tables panel, so it's the very last operation in the image processing pipeline.

- **Generate:** Lets you choose whether you create a soft-clip LUT as a 1D or 3D LUT. 1D

LUTs are more accurate for this operation, using 1023 data points, as opposed to the 33x33x33 cube of the 3D LUT.

- **Generates LUT based on:** Defaults to "No LUT selected," which generates a soft clip LUT using only the settings within this panel. Choosing another LUT from the list lets you concatenate the calculations you specify in this panel with the selected LUT, thus outputting a single LUT that applies both sets of calculations all at once.
- **Scaled to clipping range:** Enables the Maximum and Minimum settings below to work.
- **Maximum video level:** Sets the maximum value that will be output. All image data above this value will be clipped.
- **Upper Clipping softness:** Sets the threshold, as a percentage below the clipping point, at which highlights in the image data begin to compress before hard clipping. At 0, no soft clipping occurs. As you raise this value, more of the clipped highlight values are compressed, rather then clipped, resulting in softer, more pleasant "glowing" highlights.
- **Minimum video level:** Sets the minimum value that will be output. All image data below this value will be clipped.
- **Lower Clipping softness:** Sets the threshold, as a percentage above the minimum clipping point, at which shadows begin to compress before hard clipping. At 0, no soft clipping occurs. As you raise this value, more of the clipped shadow values are compressed, rather then clipped, resulting in a softer, more pleasant rolloff in the toe of the shadows.
- **Save LUT as:** A field into which you can enter a name for a Soft Clip LUT you want to save.
- **Generate LUT button:** Click this button after entering a name in the Save LUT as field to save a Soft Clip LUT.

Here's a procedure for creating a Soft Clip LUT using the controls in this area.

To create a Soft Clip LUT:

1 Open the Project Settings and open the Look Up Tables panel.

2 Choose the settings for the Soft Clip LUT you want to create.

3 Type a name for the new LUT in the "Save LUT as" field, click "Generate LUT."

The new LUT is saved in the default directory for your system, and is now available in the LUT pop-up menus of this panel.

Generate LUT From Current Grade

This somewhat cryptically named command allows you to analyze a special test pattern in order to derive a LUT from whatever adjustments were made to that image. It relies on the use of the "trim_lut.dpx" file that's located in one of the following directories:

- **On Mac OS X:** Library/Application Support/Blackmagic Design/DaVinci Resolve
- **On Windows:** C:\ProgramData\Blackmagic Design\DaVinci Resolve\Support
- **On Linux:** /home/resolve

This procedure is most useful when you want to reverse-engineer an adjustment that's being made via a third-party application. Be aware that it's only useful for analyzing primary adjustments, such as lift/gamma/gain style adjustments, saturation adjustments, or curve adjustments. Secondary adjustments and filters such as blurs or sharpen operations cannot be analyzed, and in fact may cause an incorrect analysis.

To use Generate LUT From Current Grade:

1   Import a duplicate of the trim_lut.dpx file into an application in which to make an adjustment.

2   Make a primary color adjustment of some kind, and save the file. Don't overwrite the original file.

3   Import the altered trim_lut.dpx file into Resolve, edit it into a timeline, open the Color page, and select that clip.

4   Open the Color Management panel of the Project Settings, type a name for the LUT you're about to create into the Save LUT as field at the bottom of this panel, and click Generate LUT.

A LUT is generated and saved into the LUT directory of your workstation. To see this LUT's effect on another clip, select another clip, right-click a node in the Node Editor, and choose the LUT you created from the 3D LUT submenu.

Versions

Ten text fields provide a way for you to designate automatic names for the versions of grades that you select in the Color page. To the right of each text field, a pop-up menu lets you add a name from a handy list of predefined terms that's been provided. Alternately, you can simply click any field and type your own custom name.

When you change the name of a version in the Color page, the names you define in this list are available from a pop-up menu in the Version Name dialog.
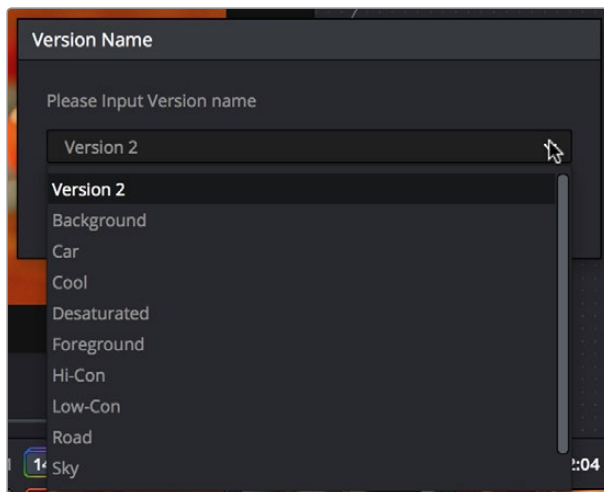

Using the named pop-up when editing the name of a version

Using a predefined list of names for your different versions avoids typos that can later create folder naming issues when you use the "Commercial Workflow" options for rendering your media in the Deliver page.

Audio

This panel contains options that control audio playback in DaVinci Resolve.

- **Enable Audio:** Turns audio playback on and off throughout Resolve.
    - **High Meter Level:** Defines the threshold at which the audio meter displays red, to warn you of high audio levels. Defaults to –6 dB, and can be adjusted in 1 dB increments.
    - **Low Meter Level:** Defines the threshold at which the audio meter displays yellow, to indicate strong audio levels. Defaults to –20 dB, and can be adjusted in 1 dB increments.
- **Audio Meter Alignment Level:** Turning the checkbox on redraws the dBFS scale shown in all audio meters in Resolve so that 0 represents the reference level, with positive dBFS above indicating acceptable headroom. When this setting is enabled, the 0 dBFS position defaults to –20, but can be adjusted from –24 to –15 to better match the reference alignment standard for your region.
- **Audio Meter Ballistics:** Setting this option to Peak sets the audio meters in Resolve to display peak levels only. Setting this to VU sets all audio meters to simulate the ballistic characteristics of a mechanical VU meter to show the average levels of the audio. In this mode, peak levels are shown simultaneously via a one-pixel indicator.
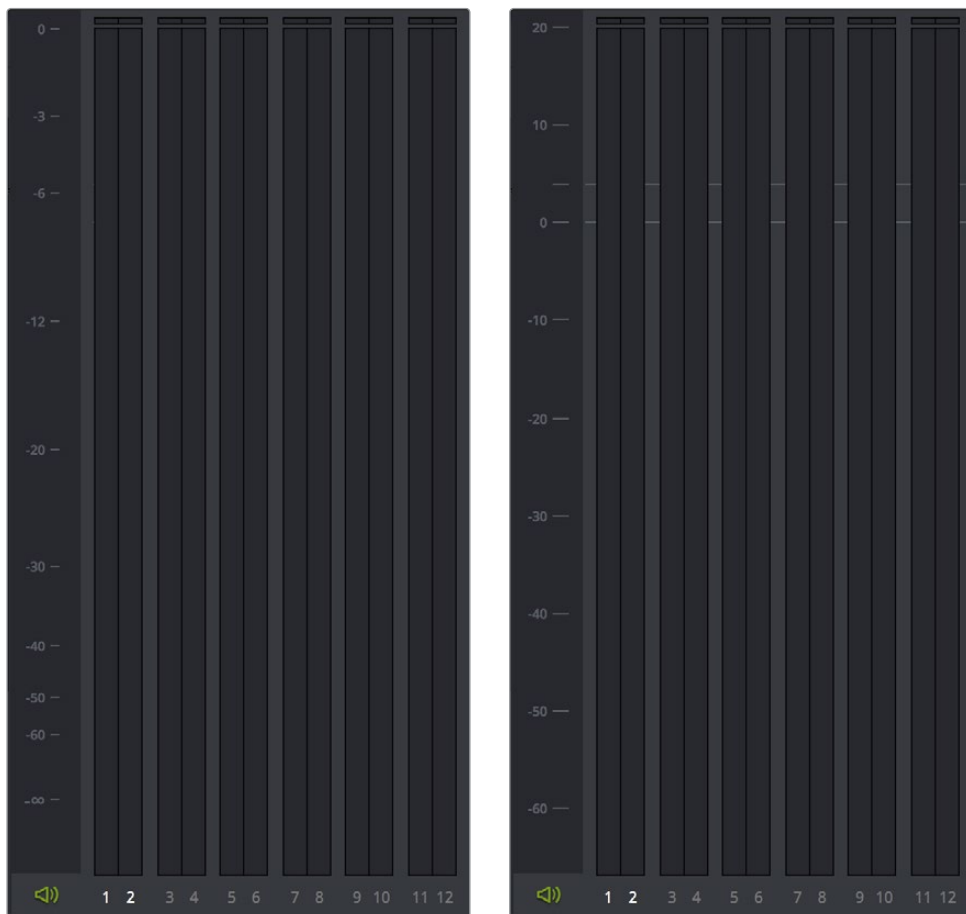
(Left) The default audio meter, (Right) the audio meter with Audio Meter Alignment Level turned on in the Audio panel of the Project Settings

General Options

This panel presents a selection of general preferences that affect the interface and operation of DaVinci Resolve.

General Options

A collection of operational preferences.

- **Reload last working project when logging in:** Automatically reopens the last project a user had open whenever that user logs back into Resolve. This checkbox can only be enabled when editing a preset configuration in the Presets panel, so that it's always on no matter which project you open as long as you're using that particular preset. Ideally, enable it for your User config (if you're using a multi-user configuration of Resolve) or your Guest Default config (if you're using a single-user configuration).

- **Output single field when paused:** This setting will reduce flicker when grading using a computer monitor or when working with interlaced material. Ordinarily, 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 this option is enabled, only field one will be shown on the monitor when playback is paused; however both fields will be shown when the clips are played.

- **Wipe wraps when viewing reference stills:** Turning this on (the default) lets stills wrap around the edge of the screen while you're adjusting the wipe using the mouse, rather than stopping at the screen's edge. If you find this behavior awkward when trying to quickly create full-frame comparisons with stills to flip on and off, it can be disabled.

- **Cache frames in:** Specifies the format in which render cache files will be written. You can choose from among a variety of Uncompressed, ProRes, and DNxHD formats, depending on your requirements.

- **Enable background caching after X seconds:** Specifies the duration of inactivity after which automatic background caching will begin.

- **Use BGR pixel order for DPX v2:** Lets you choose a different pixel order for projects using DPX version 2 media.

- **Embed timecode in audio output:** When turned on, directs Resolve to output LTC timecode that's embedded in channel 16 of the SDI stream and channel 2 of the analog audio output from your video interface.

- **Release video I/O hardware when not in focus:** When turned on, Resolve releases control of the video output device whenever you switch to another application.

- **Delay viewer display by X frames:** When turned on, you can enter a number of frames to delay the Viewers in Resolve, so that they better sync up with external displays that are delayed due to various signal processing processes.

More information on background render caching appears later in this chapter.

Optimized Media

These settings govern the resolution and codec of optimized media that DaVinci Resolve can generate in order to facilitate greater real time performance. There are two settings.

- **Resolution:** Radio buttons let you choose whether to generate optimized media at each clip's Original size, or at Half, Quarter, One-Eighth, or One-Sixteenth the resolution of the original media.

- **Format:** Specifies the format in which optimized media files will be written. You can choose from among a variety of Uncompressed, ProRes, and DNxHD formats, depending on your requirements.

UI Settings

A collection of visual preferences, some of which affect real time performance.

- 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.

- Mattes display high contrast black and white: When enabled, the HILITE command, which displays the current key, shows a black and white matte (i.e., high contrast) rather than the standard gray matte. For more information on this setting, and on use of the HILITE command, see Chapter 27, "Secondary Grading Controls."

- Minimize Interface updates during playback: When enabled, gives priority to real time performance during playback by reducing user-interface updates. This is helpful when you're creating complex grades on systems with low processing power, or when working on projects at high resolutions.

- Always highlight current clip in the media pool: When turned on, any clips at the position of the playhead on the Edit or Color pages will be automatically highlighted in the Media Pool.

- Sync the Master Timeline to the current frame: If you turned on "Automatically match master timeline with media pool" in the Color settings, then this option lets you make sure that whenever you open the Master Timeline, the playhead is at the same clip and frame that it was in the previous Timeline you were working on.

- Use Timelines Bin: This option is only available to be changed before you add clips to the Media Pool; after you've added clips, it's no longer available. Turning Use Timelines Bin on creates a dedicated Timelines bin in the Media Pool, at the top of the Bin List. When enabled, the Timelines bin contains all timelines in a project, and you're prevented from putting timelines into any other bin in the Media Pool. Whenever you create or import a new timeline, it automatically appears in the Timelines bin. You can add subfolders to the Timelines bin for more specific organization.

- Create Smart Bin for Timelines: Turning this option on automatically creates a Smart Bin in the Bin List of the Media Pool that filters out all timelines in your project. Unlike the "Use Timelines Bin" option, this smart bin doesn't move where these timelines are actually stored in the Media Pool. Instead, it preserves your original organization of timelines and clips, and gives you a way of quickly finding them all at once.

- Use grey background in viewers: When turned on, sets the background of all Viewers to gray, making it easier to evaluate image blanking or minor sizing adjustments than with the default dark background.

Working Folders

Three fields let you specify which folders proxy, cache, and gallery files are written to.

- Cache files location: All render cache files that you create are saved in the directory path specified by this field. This path defaults to a hidden "CacheClip" directory that's created at the location of the first Media Storage Volume you specify in the DaVinci Resolve Preferences window.

- Gallery stills location: By default, all stills you save are saved in the DPX format, and are placed in the directory path specified by this field. This path defaults to a hidden ".gallery" directory that's created at the location of the first Media Storage Volume you specify in the DaVinci Resolve Preferences window.

NOTE: If the volume you've selected to use for the cache becomes unavailable, Resolve will warn you with a dialog.

Capture and Playback

All settings in this panel let you define the functionality of capture and playout to tape using device controlled VTRs connected to your Resolve workstation via the connected video capture and output interface. For more information on deck capture, see Chapter 11, 'Ingesting from Tape." For more information on video output to tape, see Chapter 37, "Delivering to Tape."

Capture and Playout

These settings affect both capture and playback when using the tape ingest options of the Media page, or the tape output options of the Deliver page.

- **Video capture and playback:** You can choose the video format (frame size and frame rate) with which to output to tape from this pop-up menu. HD timelines can be downconverted to SD, and SD timelines can be upconverted to HD using the format conversion of your DeckLink card.

- **Use left and right eye SDI:** A checkbox that enables supported video interfaces to ingest and output muxed stereoscopic video when used with supported VTRs, such as HDCAM SR decks with 4:2:2 x 2 mode. (When muxed stereoscopic signals are ingested, each eye is separated into individual left-eye and right-eye image files.) This parameter only appears when your hardware is set up appropriately.

- **Video connection operates as:** Selects between the available signal options: Use 4:4:4 SDI and Enable Single Link. Which options are available depend on which video capture card you are using.

- **Data Level:** Lets you specify the data range (normally Video or Full) that's used when ingesting from or outputting to tape. This option switches the data range of the signal output by your video capture card, but only during capture from tape in the Media page, or output to tape in the Deliver page. When capture or output is not currently occurring, your video capture card goes back to using the identically-named data range setting in the Master Project Settings pane, which governs how you monitor the signal being output on an external broadcast display or projector.

- **Video bit depth:** Choose the bit depth that corresponds to the capability of your deck. Depending on your workstation's configuration, you can choose between 8-bit and 10-bit. Outputting to 10-bit is more processor intensive, but higher quality for compatible devices, and is the default setting.

- **Use deck autoedit:** If supported by your video deck, this is the best method to record video to the deck, as it enables the deck to roll the edit using the specified preroll, and control the edits via serial device control. If this checkbox is turned off, a basic edit On/Off mode is used by the deck, with the potential for frame inaccuracies if the "Non auto edit timing" setting is not properly adjusted.

- **Non auto edit timing:** Adjusts the edit synchronization of the connected deck when auto edit is turned off.

- **Deck preroll:** Sets the number of seconds for preroll. How much is appropriate depends on the performance of your deck.

- **Video output sync source:** When using a DeckLink card this is set to Auto. Other capture cards may require you to set the sync source to "Reference" for playout and "Input" for ingest. This setting is only available if you have a DVS card installed on your system.

- **Add 3:2 pulldown:** Inserts or removes the 3:2 pulldown required to record or play 23.98 fps media to or from a 29.97 tape format.

Capture

These settings are used when you use the Capture mode in the Media page to capture clips from tape into the Media Pool.

- Video Format: The format that scanned film frames are saved as. When capturing from tape, the available options are DPX and QuickTime. When capturing from the Cintel film scanner, this is restricted to Cintel Raw Image (CRI), which is a raw data format that DaVinci Resolve automatically debayers as a Cineon log-encoded image for grading.
- Codec: The codec used to write captured media. When capturing from tape, these include the various type of Apple ProRes, 8- and 10-bit YUV 422, 10-bit RGB, and the various types of DNxHD. Cintel Raw Image files default to rgb.
- Save clips to: A field that displays the directory path to which media files captured from tape are written. You want to choose a volume that's fast enough to accommodate the data rate of the media format you're capturing.
- Browse: Click this button to choose a directory to write captured media to. The directory you choose appears in the field above.
- Save in this folder path: A series of checkboxes let you specify what other information to use to define the directory hierarchy that will hold the captured media. Every checkbox you turn on adds an additional directory with a name defined by that checkbox's metadata. You can choose any or all of the following: Program name, Clip number, Reel number, and Roll/Card.
- Apply reel number to: Lets you choose how to write the reel name. Two checkboxes let you write the reel number to the file's name, and/or to the Header data.
- Use prefix: A field lets you type in a prefix to be used in the media file's name. This lets you add text identification that will make the media more easily identifiable and searchable.
- Apply prefix to: Two checkboxes let you choose to use the prefix you typed in the file name, and/or in the folder name.
- Use frame number with: When capturing to image sequences, you can choose how many digits to use when writing the frame number into the name of each frame file.
- Set batch ingest handles to: When capturing to image sequences from a batch list, defines how many frames of additional handles to ingest along with each logged clip.
- Enable audio input: Turn this checkbox on to capture audio along with the video. If you're capturing QuickTime or MXF files, the audio will be written as additional tracks inside each file. If you're capturing to a DPX image sequence, then a broadcast .wav file is recorded separately.
- Input: Lets you choose how many tracks of audio to capture, from 2 to 16.

Playout

These settings only affect the video signal that's output when you use the Edit to Tape mode of the Deliver page.

- Output Source Timecode: Turn this checkbox on to output each individual clip's source timecode. This option is only applicable when assemble editing to tape.
- Output LTC: With a Blackmagic Design DeckLink or UltraStudio device using HD-SDI, longitudinal timecode (LTC) is available on track 16 of the HD-SDI video signal, making it easy to use a Mini Converter de-embedder to extract this analog timecode audio signal and feed it directly to a recording device. This is particularly helpful if you have outboard video processing equipment such as a noise reducer or format converter that does not pass through the VITC timecode.

- **Delay LTC by x frames:** When outputting LTC to bypass outboard processing gear, such as a noise reducer or format converter, you can compensate for the processing delay by delaying the timecode by a matter of frames to ensure that the processed image and timecode reach the deck at the same time. With a DVS card there is a separate timecode output.
- **Enable audio output:** When this checkbox is enabled, DaVinci Resolve will play audio during output.
- **Offset audio by x frames:** Lets you specify an offset between the audio track and video to achieve proper A/V sync in cases where the video is being delayed by outboard processing hardware.
- **Output x channels of audio:** Choose the number of audio tracks to output to tape.
- **Set batch playout head handle to x seconds:** When batch outputting multiple clips, you can specify a number of frames before the In point of each clip to be output as well.
- **Set batch playout tail handle to x seconds:** When batch outputting multiple clips, you can specify a number of frames after the Out point of each clip to be output as well.
- **Apply gaps between clips:** This checkbox lets you add a black gap, of the specified duration in frames, between every clip in a timeline when outputting in batch mode.

Control Panel

The parameters in this panel let you customize the functionality of the DaVinci control panel. Some, but not all, of these settings apply to third party panels.

- **Lift RGB balance sensitivity:** Controls how quickly adjustments made to the Lift trackball (on the left) will adjust the Lift Color Balance parameters in the Color page. This setting affects third party panels.
- **Lift master sensitivity:** Controls how quickly adjustments made to the Lift ring (surrounding the leftmost trackball) will adjust the Lift Contrast parameter in the Color page. This setting affects third party panels.
- **Gamma RGB balance sensitivity:** Controls how quickly adjustments made to the Gamma trackball (second from the left) will adjust the Gamma Color Balance parameters in the Color page. This setting affects third party panels.
- **Gamma master sensitivity:** Controls how quickly adjustments made to the Gamma ring (surrounding the second trackball from the left) adjust the Gamma parameter in the Color page. This setting affects third party panels.
- **Gain RGB balance sensitivity:** Controls how quickly adjustments made to the Gain trackball (third from the left) will adjust the Gain Color Balance parameters in the Color page. This setting affects third party panels.
- **Gain master sensitivity:** Controls how quickly adjustments made to the Gain ring (surrounding the third trackball from the left) will adjust the Gain Contrast parameter in the Color page. This setting affects third party panels.
- **Cursor offset sensitivity:** Controls how quickly adjustments made to the fourth trackball affect the cursor, window position, log-mode offset, and other controls that can be manipulated via this trackball.
- **Cursor master sensitivity:** Controls how quickly adjustments made to the fourth ring affect log-mode master offset, and other controls that can be manipulated via this ring.
- **Hue/Saturation/Luminance qualifier sensitivity:** Controls the sensitivity of the HSL panel control knobs.

- **Grading style:** Controls the orientation of the trackballs relative to the corrections they make. There are two options:
  - **DaVinci:** 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.
  - **Rank:** The Rank settings are somewhat different, so this option is for users who are familiar with color controls that the Rank control system offered. In this mode, the orientation of red and green are reversed.
- **LCD brightness:** Controls the overall brightness of the lit buttons of the DaVinci control panel.
- **Red/Green/Blue key backlighting:** Three sliders let you adjust the color balance of the lit buttons of the DaVinci control panel. The default is red.

Auto Save

DaVinci Resolve's Autosave feature can save you from the heartache of lost work resulting from an unexpected problem. Resolve 12.5 has significantly improved save times, so using Auto Save is highly recommended to prevent the loss of work in the event you have a problem.

- **Automatically save project:** Enables auto saving. There are three options.
  - **Off:** Disables auto saving.
  - **On:** Automatically saves the current project every few minutes, as defined by the pop-up menu below that has options for 5, 10, 20, and 30 minute, or 1 hour intervals. If you're using an PostgreSQL database, you have the additional option of saving over 1 minute intervals, as PostgreSQL database saving is considerably faster. If Resolve unexpectedly quits before you have a chance to save, you'll see all autosaved changes the next time you reopen that project.
  - **To backup project:** Saves a full alternate copy of the active database while you work. While this full backup takes longer than the simpler incremental autosave option, it offers a complete backup, and is often used by colorists at the end of each workday or grading timeline.
- **Retain the last X backups:** Sets how many backup versions of the project to save. Backups are eliminated in a first in, first out fashion. The default is 8 backups.
- **Every:** A pop-up menu lets you define how frequently to execute the selected autosave behavior.
- **List Backups:** Shows a window listing all auto saved backup projects. This list can be sorted by name, date modified, width, or height. Buttons running along the bottom provide an interface to Load or Delete any item in the list, Delete all, or Refresh the list. When you load an autosave backup, the current project is lost, and completely replaced by the autosaved project. You are recommended to export the project first, before loading, if you want to preserve the current state of the project.

Keyboard Mapping

This panel lets you choose which set of keyboard shortcuts to use. Using the "Map keyboard to" pop-up, you can choose the default DaVinci Resolve set, or one of the other sets that mimic popular NLEs. You also have the ability to create your own custom sets of keyboard shortcuts. A hierarchical list of commands organized by the menu they appear within lets you select individual commands to remap.

Methods of creating and managing keyboard mappings:

- To create a new keyboard mapping: Choose a keyboard mapping from the pop-up to use as your starting point, click New, then enter a preset name in the dialog, and click OK.
- To change the keyboard shortcut for a particular command: Find the command you want to remap in the Keyboard Mapping list, double-click its keyboard shortcut, and type a new one using any combination of modifier keys you like. If you remap a key that was already assigned to another command, the previous command's mapping is cleared. When you're finished changing keyboard shortcuts, click the Save button at the bottom right of the Keyboard Mapping list.
- To export a keyboard shortcut file for use by another Resolve workstation: Click Export, choose a name and a location for the new file, and click Save.
- To import a keyboard shortcut file: Click Import, choose a DaVinci Resolve keyboard shortcut file, and click Open.
- To delete a keyboard mapping: Choose a keyboard mapping to delete, then click the trash can button.

Metadata

The metadata panel lets you create custom sets of metadata parameters that will be exposed in the Metadata Editor. Using this panel, you can create customized subsets of metadata that are focused on your needs. Presets that you create are available from the preset pop-up menu at the upper right-hand side of the Metadata Editor in the Media page. You can always switch to the full default presets in the same pop-up.

To create a new metadata preset:

1. Open the Metadata panel of the Project Settings and click New.
2. Click the checkboxes of every metadata tag you want to include in this preset, or click the checkbox of a group name on the list to include all metadata tags within it.

   Every single metadata tag available in DaVinci Resolve appears within one of several groups that appear as a list. To open any group to see its contents, move the pointer over that group's entry on the list, and click the Open button when it appears.
3. When you're finished, click the Save button.

To edit an existing metadata preset:

1. Select a preset from the list, and click Edit.
2. Turn checkboxes on and off to include or exclude whatever tags you need.
3. Click the Save button.

To delete a metadata preset:

Select a preset from the list and click Delete.

DaVinci Resolve Preferences

If you have a system that doesn't change very often, then you may only rarely use the Preferences window. On the other hand, if you're working with a mobile system with changing video interfaces, control panels, and scratch volumes, then you may use this window more frequently.

The DaVinci Resolve Preferences window has three main settings that you need to define, if you haven't already.
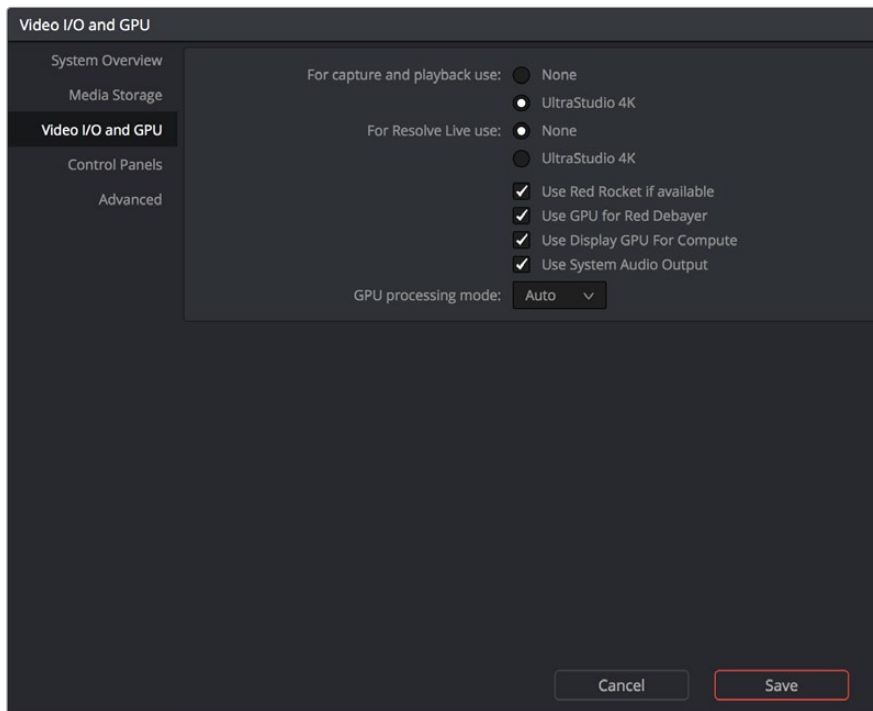
Hardware Preferences

System Overview

The bottom section of this panel provides an overview, for reference, of all hardware and computer characteristics that are relevant to DaVinci Resolve running smoothly, including listing of installed GPUs. Some other options are also available at the top:

- **Language:** A Language pop-up at the top lets you specify which language the DaVinci Resolve user interface displays. Resolve currently supports English, Chinese, and Japanese.
- **Pre-allocated System Memory:** Most users don't have to worry about this option, and should probably ignore it. To understand when this might be useful, DaVinci Resolve uses RAM to store images as they're being processed. By default, Resolve only pre-allocates 50% of the available RAM of your workstation for this purpose, which typically comes to the 4 GB listed in this field. Workstations with enormous amounts of RAM available (64 to 128 GB, for example), may find it desirable to raise this cap in order to improve performance when rendering 5K, 6K, or 8K resolution clips, although the maximum recommended pre-allocation is 12 GB of RAM.
- **Show multi-user login window:** Turning this checkbox on enables the multi-user "Login Window" to appear, enabling the multi-user environment of DaVinci Resolve. Turning this checkbox off restores Resolve to its single-user environment.

- **Use gray background interface:** By default, DaVinci Resolve uses a blue-gray UI background, intended to provide a more attractive experience for users focused on the less color-critical aspects of DaVinci Resolve, namely editing. Turning this checkbox on switches Resolve to a totally neutral, desaturated gray UI, which can be valuable as a point of reference for colorists concerned about the blue-gray UI's potential to bias the eye in the dark environment of the grading suite.
- **Use 10-bit precision in viewers if available:** This checkbox only appears on Mac OS X 10.11 (El Capitan) and higher installations of Resolve. Turning this checkbox on lets Resolve display 10-bit images in the Viewer.

Media Storage

The Media Storage Locations list lets you define the scratch disk of the system. The first volume in this list is where Gallery stills and cache files are stored, so you want to make sure that you choose the fastest storage volume to which you have access.

The "Automatically display attached local and network storage locations" checkbox lets Resolve access media on all temporarily and permanently mounted volumes, including SATA and eSATA, SAS, USB, FireWire, Thunderbolt, Gigabit Ethernet (GbE or GigE), Fibre Channel, and otherwise connected hard drives, without having to add them to this list. This is on by default.

Some versions of Resolve do not allow automatic display of attached volumes. In this case, you can right-click anywhere in the background of the Volume List on the Media page and choose "Add New Location" to open a dialog you can use to choose a volume you want to add.

If you're using the Apple App store version of DaVinci Resolve, turning on "Automatically display attached local and network storage locations" automatically prompts you via a dialog to add "Macintosh HD" as a storage location. Clicking Add Location prompts you to select the Macintosh HD volume with another dialog, and clicking Open then adds that volume to the Media Storage Volumes list. After you click Save to close the Preference windows, Resolve should now auto-mount any volumes attached to your computer in the Media Storage browser of the Media page. Don't do this until after you've added a fast storage volume to the Media Storage Locations list, because you don't want Macintosh HD as the first volume in this list – the very first volume in this list should always be reserved for your fast scratch volume.

Using Path Mapping to Access Volumes from other Operating Systems

Shared media path mapping support for Mac, Linux and Windows makes it easier for multi-system shops to share Resolve projects among different platforms that use different file path conventions.

To add a mapped mount string:

1 Open the Media Storage panel of the Resolve Preferences window.

2 Add the volume you want to map to the Scratch Disks list.

3 Double-click the Mapped Mount column of the drive you added to edit it.

4 Enter the alternate file path you want that volume to have. For example, if you're on a Windows workstation and you want to access a Linux volume, type the Linux file path into the Mapped Mount column.

> **NOTE:** If the volume you've selected to use for the cache becomes unavailable, Resolve will warn you with a dialog.

Video I/O and GPU

The preferences in this panel let you choose video interfaces and GPU hardware on your workstation.

- **For capture and playback use:** If you have a compatible video capture card, you should choose from the card options that appear here. Leaving this set to "None" disables external video output. Disabling video output can improve real time performance when external monitoring and output is not a priority. You can also choose "None" when you're using Resolve with another application open at the same time that's using your workstation's video output interface. When you've quit the other application, you can reselect the video output interface for use by Resolve.

- **For DaVinci Resolve Live use:** When using Resolve Live to monitor the live output from a camera, you must have a video interface that's dedicated to doing just that. If you have only one video interface connected to your computer, you'll need to disable it for capture and playback, and enable it for Resolve Live use. However, if you have two video interfaces connected at the same time, you can use one to monitor camera output, and the other to output to a video display for critical evaluation.

- **Use Red Rocket if available:** This checkbox lets you disable Red Rocket support if you need to force Resolve to use standard RED software CPU debayering to accommodate your specific workflow, or when troubleshooting. If you are required to debayer R3D media using your CPU, turn this checkbox off.

- **Use GPU for RED Debayer:** Lets you use your GPU to accelerate debayering of R3D media for systems without a RED Rocket installed.

- **Use Display GPU For Compute:** By default, a single GPU system uses this one GPU for the DaVinci user interface and also for image processing. As greater processing speeds are achievable with two or more GPUs, if two GPUs are installed for image processing this checkbox enables the shared use of the display GPU instead of dedicating it to just the DaVinci user interface. DaVinci Resolve users are restricted to the use of a single GPU, unless it is installed on a 2013 or later Mac Pro, in which case both installed GPUs will be used.

- **Use System Audio Output:** Lets you force Resolve to output audio via your workstation's built-in audio output, even if a compatible video I/O interface is enabled for capture and playback or for Resolve Live. If no video I/O interface is installed, audio is output via system audio output automatically.

- **GPU processing mode:** Lets you set Resolve to use either OpenCL or CUDA on systems that have both ATI and Nvidia GPUs installed, to make sure that you're using your most powerful GPU for processing. If you choose either OpenCL or CUDA from this pop-up menu, then a GPU selection mode pop-up appears below that gives you the option of choosing exactly which GPUs you want to either use or disable. If you're using a system that only has ATI GPUs, you should only use OpenCL. Most users can leave this set to Auto, and Resolve will use what's appropriate.

- **GPU selection mode:** Lets you choose between Auto, which lets Resolve choose which GPUs to use for processing, and Manual, which lets you choose which GPUs to enable or disable for processing from a list that appears below.

- **GPU selection list:** This list only appears when GPU processing mode is set to either OpenCL or CUDA, and when GPU selection mode is set to Manual. A list of every GPU installed in your computer appears, and you can use checkboxes to the left of each GPU to enable or disable specific GPUs from being used for processing.
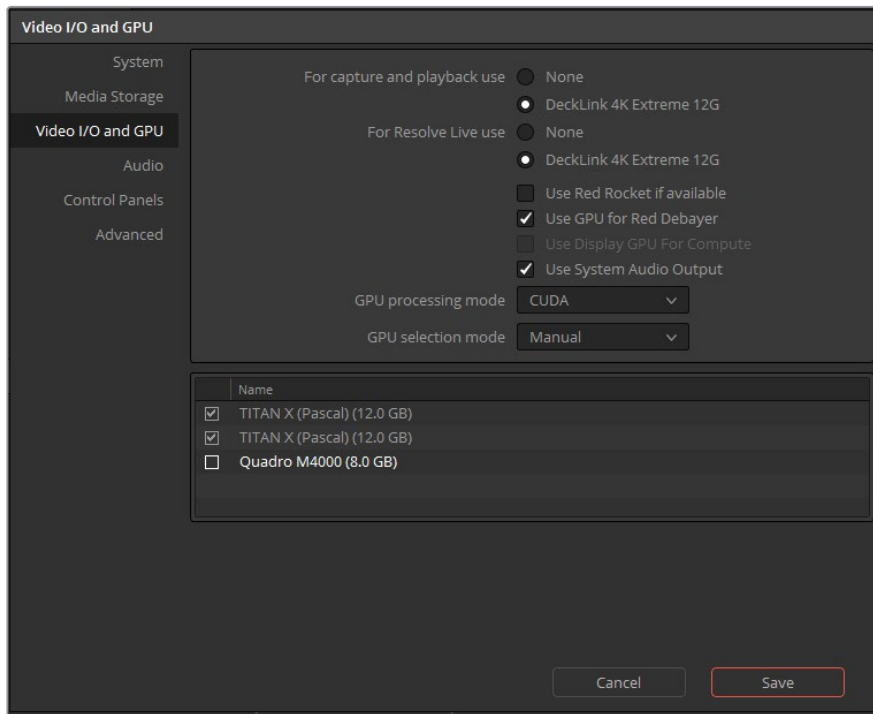
The GPU selection list that appears when GPU processing mode is set to either OpenCL or CUDA, and GPU selection mode is set to Manual

Audio

A list at top lets you manually add and remove VST plug-in effects directories, if necessary. VST effects aren't installed in a standard location, so it may sometimes be necessary to add a newly installed directory of VST plug-ins that you've just installed on your system.

Once you've added one or more VST directories to the list, a second list underneath shows all audio plug-ins that are available within these directories. Each plug-in on the list has a checkbox that shows whether or not it's currently enabled. Any VST plug-ins that cause Resolve to crash while loading them during startup will be automatically disabled. You can use this list to see which plug-ins have been disabled, for troubleshooting purposes, and to reenable such "blacklisted" plug-ins by turning their checkboxes back on.

Control Panels

Every control panel that DaVinci Resolve is compatible with appears in this list. Click the button corresponding to your panel, and if you're using a JLCooper Eclipse, enter the IP and Port number.

Advanced

This tab is used for special Resolve configurations and SAN parameters that are applicable to older file systems.

Saving Preferences and Restarting DaVinci Resolve

Whenever you change the preferences, you're required to restart Resolve in order for the new settings you've chosen to take effect.