

Cortex User Manual

Dated August 6th, 2026

For use with all Cortex Editions. All modules and features will be covered in this manual.
Please refer to the Cortex Editions section to determine which modules and features are available in your software package.

Table of Contents

Table of Contents 2
New and Enhanced Features in v7.0 9
VFX Pull Workflow Action 9
Dual-Stream & Comparison Playback 9
SDR to HDR Conversion 9
MTai Shot Detection and Shot Review 10
AI Matte Detection 10
Radiation Artifact Detection and Correction 10
Chapter 1: The VFX Pull Workflow Action 11
What the VFX Pull Workflow Action Does 11
Two Ways to Complete a VFX Pull 11
The traditional approach 11
The VFX Pull Workflow Action 11
Creating the VFX Pull Workflow 11
While setting up a new project 11
In the Project Manager 12
Adding Vendors to the Project 13
Assigning Deliverables to Vendors 14
Setting Up the Workflow Action 16
Import Options — how Cortex reads the EDL 17
Traceback Options — where Cortex looks for the source media 17
After Traceback — what happens to matched clips 17
Deliverables — what gets rendered and copied 18
Running a Pull: Dropping in the EDL 18
The Traceback Window 19
Reviewing and Confirming Matches 19
Reading the confidence colors 20
Reviewing an event 20
Reading the Source EDL 20
Confirming in Bulk 21
Choosing What Renders and Executing the Pull 21
Finding Your Delivered Files 22
Managing the Traceback Cache 22
Quick Answers 23
Chapter 2: Dual-Stream & Comparison Playback 24
Synchronized Timeline Playback & Split-Rack Viewing 24
Comparing Tracks with the Split V1/V2 Tab 24
When the Split V1/V2 Tab Appears 24
Using the Split V1/V2 Tab 25
Wipe Modes 26
Wipe Position and Shift-Drag 28
Aligning the Tracks: Zoom and Position 28
Labels and the Wipe Line 28
Other Comparison Behavior 29
Troubleshooting the Split V1/V2 Tab 29
Which SDI Cards Support Two Simultaneous SDI Streams 29
Two Streams From One Card 29
Two Streams From Two Cards 30
How the Second SDI Tab Appears 30

Enabling “Separate SDI” Comparison Mode..... 30
Related Behavior for Wipe Mode “None”..... 31
Which SDI Connectors to Use..... 31
AJA Kona 4 / Kona 5 / Corvid 88..... 31
Blackmagic DeckLink 8K Pro..... 31
The “SDI Channel” Dropdown in Deliverable Configuration..... 31
How It Affects the Dual-Stream Output..... 32
Dolby Vision Content Mapping per Track..... 32
Embedded Audio Delay..... 32
Additional SDI Output Fix in This Release..... 32
Chapter 3: SDR to HDR Conversion..... 32
1. What the Conversion Does..... 33
2. Converting a Shot in the Color Tool..... 33
Step 1 — Set up the composition and open the Dolby tab..... 33
Step 2 — Choose the output..... 34
Step 3 — Choose the peak band..... 35
Step 4 — Trim the peak, if you need to..... 36
Step 5 — Adjust CHROMA, if you need to..... 36
Step 6 — Save to every shot and run the Dolby Vision analysis..... 36
ADVANCED (reference only)..... 37
Without the SDR to HDR Option..... 38
3. Converting on Ingest with the SDR to HDR Workflow Action..... 38
Step 1 — Create the workflow..... 38
Step 2 — Set the options..... 40
Step 3 — Drop the media..... 41
What the action does, in order..... 41
4. Troubleshooting..... 41
Appendix A: v7.0 Release Notes — Tips and Tricks Reference..... 42
WORKFLOW ACTIONS inside the new V7.0 Project Manager..... 43
V7.0 Project Manager Interface..... 43
Workflow Action Configuration..... 45
Let’s start with MTai Slate Detect..... 46
How to use the New Video Restoration Tool Set..... 57
3D COMB Filter..... 58
DEHALO TOOL..... 59
DEINTERLACE TOOL..... 60
Welcome..... 62
Cortex Editions..... 62
Getting Started..... 64
Installing Cortex..... 64
Hardware Requirements..... 64
Download The Installer..... 64
Installation Wizard..... 65
MTai AI Engines and First Run..... 65
Licensing and Activation..... 66
How To License CORTEX..... 66
How does this work?..... 66
Upgrades and Support..... 66
Cameras, Codecs, and Outputs supported by Cortex..... 67
First a Few Definitions:..... 67

Clip....67
Composition....67
Deliverable....68
Print Status....68
File per Clip....68
File per Reel....68
Clips Reel....68
Composition Reel....68
Open Reel....68
Closed Reel....68
One to One Render....69
One to Many Render....69
Cortex Application Overview....69
The Project Manager....69
Assets Tab....70
Find Tab....71
Project Notes....71
Deliverable Configuration Editor....72
Codec and Color Properties....73
Audio Matrix....74
Burns Canvas....74
Cortex Tools - Brief Overview....75
The Copy Tool....75
The Color Tool....76
Primary Color Corrector....76
The Image Stores....77
Waveform, Vectorscope, Color Gamut Display....77
Functions....78
The Sync Tool....80
The Edit Tool....80
The QA Tool....81
The Render Monitor Tool....82
Utility Tools....82
Bins & the Media Player....83
Bins....83
The Media Player....84
The Edit Tool Media Players....84
Parts of the Source Single Media Player....84
Parts of the Composition Single Media Player....86
Examples of Marks....87
Media Player Shortcut Keys....87
The Project Manager....89
Advanced Project....89
Basic Project....90
Creating a Project....91
Advanced Project Information....92
Conventions....93
File Organization....94
Creating Episodes, Workflows and Deliverables....94
Episodes or Folders....94

Workflows..... 96
Deliverables..... 97
Creating a Job..... 118
Workspaces..... 118
ALL..... 118
Dailies..... 119
Editorial..... 119
QC..... 120
The Parts of the UI..... 120
The Master Clip Bin..... 120
The Bin Sidebar..... 121
Sub-Bins..... 121
“New” Menus..... 122
In the Copy Tool, New:..... 122
In the Color, Sync,and Render Monitor Tools, New:..... 122
In the QA tool, New:..... 122
In the Edit Tool, New:..... 122
Importing Media..... 122
“Import” Menu..... 122
Working with CORTEX Manifest Files..... 123
Clip Bin Views..... 127
The Text View..... 127
The List/Thumbnail View..... 128
The Thumbnail View..... 128
Exporting Reports..... 130
Project Actions and Reports..... 131
Color Trace EDL..... 131
Convert to UTF-8 (Unicode Transformation Format - 8 bit)..... 132
Delete..... 132
Edit..... 132
Export Database..... 132
Export Support Manifest..... 133
Import Database..... 133
Merge DCP or Merge IMF Packages..... 133
Filtering and Sorting Source Clips..... 133
Filter options:..... 133
Filtering and Sorting Composition Events..... 133
Sorting..... 133
The Timeline..... 134
The Edit Tool Timeline..... 134
The Master Track Controls..... 134
Timecode Bar..... 135
Lasso Drawing Area..... 135
Edit and Trim Controls..... 136
Audio Source and Record Monitor Controls..... 136
Individual Source/Record Track Controls..... 136
The Color and QA Tool Timelines..... 137
Editing and Monitoring Video Tracks..... 137
Zooming the Timeline..... 137
Timeline Shortcut Keys..... 138

Cortex Tools in Depth 139
The Copy Tool 139
Using The Copy Tool 139
Copy Task Setup 139
Copy Task Status 140
Copy Task Reports 141
Archive Tasks 141
Verify Tasks 142
The Color Tool 142
Color Pipeline Tabs 143
Camera Tab 143
ACES Input Tab 144
Framing 145
Input LUT 145
Primary Tab 145
Output LUT 145
Functions 146
Pipeline 146
Using the Framing Tool 146
The Primary Color Corrector 147
Using the GUI to Color Correct 147
Saving Color Settings 147
Using the Keyboard to Color Correct 147
Dissolves 148
Dissolve Timeline 148
Printer Lights GUI Controls 149
Image Stores 149
The Six Image Stores 149
Still Store 150
Timeline Store 150
Favorites Store 151
Imported Stills Store 151
LUTs Store 151
Imported CDLs Store 151
Filtering and Searching 153
Saving and Recalling Stills 153
Exporting Stills 154
Memories 155
The Functions Tab 156
Brickwall 156
Film Grain 156
Aperture Correction Settings 156
MTI HQ 157
MTI-Samsung 157
Creating Dolby Vision™ Level 1 HDR Metadata 158
Pipeline Tab 161
Wave Panel Button Functions 161
Keyboard Shortcuts 162
The Sync Tool 165
The Master Clips Bin 166

The Audio Bin..... 168
Audio Metadata..... 169
Metadata Input..... 169
Additional Metadata entry..... 170
Modifying Multiple Clips..... 170
Synchronization Tools..... 170
Timeline..... 170
Mark Window..... 170
Synchronizing Audio and Video..... 171
Auto-syncing a single clip..... 171
Using Timecode to search for Audio Sync Points..... 171
Using Timecode to search for Picture Sync Points..... 172
Adjusting Clip Synchronization..... 172
Changing Clip Play Speed..... 172
In and Out Points..... 172
AutoTrim..... 173
Tail Sticks Syncing..... 173
Sync Tool Shortcut Keys..... 173
The Edit Tool..... 174
Parts of the Edit Tool..... 174
The Sidebar..... 174
The Media Players..... 176
The EFX Palette..... 180
The Slate Generator..... 181
The Shot Review Window..... 182
Composition Timeline..... 183
Creating a Composition..... 187
Composition..... 187
IMF Composition..... 187
DCP Composition..... 189
AS-11 Composition..... 192
Composition Reel..... 193
Auto Compositions..... 193
3 Point Editing..... 194
Setting a Duration..... 194
Drag and Drop Editing..... 194
Graphical Trim Types..... 196
Gap Trim..... 196
Ripple Trim..... 198
Rolling Trim..... 200
Selecting, Repositioning, and Deleting Segments..... 202
Selecting a single segment..... 202
Selecting multiple segments..... 203
Repositioning Segments on the Same or to Like Tracks..... 203
Deleting Segments with or without a Ripple..... 204
The Lasso Area and Selecting Multiple Tracks or Edit Points..... 204
Creating a Dolby Vision™ / Dolby Atmos® Composition..... 206
Dolby Atmos® 206
Dolby Vision™Metadata..... 207
ScratchPad Audio and Creating Audio Configurations for Compositions..... 210

Adding Audio Tracks to the ScratchPad....210
Saving Audio Configurations....211
Move an Audio Configuration....212
Copy, Delete, or Edit an Audio Configuration....212
Sync Loss Indicators....213
Effects and Transitions....213
Navigating the Timeline....214
Zooming the Timeline....215
Matchframes....215
Edit Function Keys....216
The QA Tool....217
The Dead Pixel Module....218
Dead Pixel Module Function Keys....233
The Radiation Artifact Module....234
The Graphs Module....236
Scopes Module....247
Performance Module....251
IMF Validation....251
DCP Validation....252
Dolby Vision™ Metadata Validation....252
Rendering and the Render Monitor Tool....252
Definitions Worth Repeating....253
Render Methods....254
One to One Render....254
One to Many Render....254
Creating a Clips Reel or Composition Reel....254
Rendering a Composition....258
The Render Composition Dialog Box....258

New and Enhanced Features in v7.0

Cortex v7.0 continues to build on the Workflow Actions framework introduced in v6.0, adding two major capabilities requested directly by VFX and finishing facilities: an automated, intelligence-assisted VFX pull, and true dual-stream comparison monitoring with synchronized timeline playback. Both are summarized below and covered in full in their own chapters later in this manual.

VFX Pull Workflow Action

Automate visual-effects pulls from EDL to delivered vendor package

The new VFX Pull Workflow Action automates a visual-effects pull from start to finish. When an editorial EDL arrives, Cortex reads each event, traces it back to the matching source clip using confidence-scored intelligence matching, builds the reels, renders the configured deliverables, and — if vendor delivery is set up — copies each finished file to the right vendor folder automatically. A one-time setup per project keeps every subsequent EDL pull to a quick drag-and-drop, review, and execute. Full setup and operating instructions are covered in Chapter 1: The VFX Pull Workflow Action.

Dual-Stream & Comparison Playback

Synchronized timeline playback with split-rack viewing and multiple wipe options

Cortex v7.0 adds true dual-stream SDI output on supported hardware, driving two independent SDI streams at once for side-by-side monitoring on two decks or displays. Playback of both streams is synchronized to a single composition timeline, and the Split V1/V2 tab lets an operator wipe or compare two video tracks with a full set of modes — Horizontal, Vertical, Butterfly, two Diagonals, Box, Side By Side and Fade — or route each track to its own independent SDI output with no compositing at all using the new Separate SDI mode. A new SDI Channel tag on each deliverable configuration lets two different pipelines — for example a graded Rec.709 deliverable and a Dolby Vision / HDR deliverable — feed the two outputs simultaneously. Full hardware setup, connector guidance, and configuration steps are covered in Chapter 2: Dual-Stream & Comparison Playback.

SDR to HDR Conversion

MTI FILM's designed transform for expanding a finished SDR grade into HDR, with Dolby Vision and HLG delivery built in

Cortex v7.0 adds MTI FILM's SDR to HDR conversion, available both as a manual grade on the Color tool's Dolby tab and as an unattended SDR to HDR workflow action for batch ingest. A Create Auto Composition with SDR to HDR menu item sets up the Dolby Vision composition for a manual conversion in one step. The conversion is not a LUT — it is a tone and chroma expansion model targeted at a delivery peak of LOW (250 nits), MEDIUM (400 nits), or HIGH (600 nits by default, up to 2000), with Dolby Vision L1 metadata analysis run automatically on the expanded image. The Color tool and the workflow action call the same underlying preset code, so a shot graded by hand and a batch converted on ingest land on the identical transform. Once a composition carries Dolby Vision analysis, the expansion settings lock to protect the metadata until you explicitly unlock and re-analyze. LOW needs no additional option; MEDIUM, HIGH and the controls for fine-tuning a band require the SDR to HDR option. Full setup, the Color tool walkthrough, the workflow action's options, and troubleshooting are covered in Chapter 3: SDR to HDR Conversion.

MTai Shot Detection and Shot Review

Cortex v7.0 replaces its previous shot-change algorithm with a neural network model running on the GPU. It finds cuts more reliably on the material the old algorithm struggled with — dissolves, flash frames, heavily grained or noisy stock — and it underpins a good deal of the rest of the application: the Dead Pixels and SDR to HDR workflow actions, the Dolby Vision™ Level 1 analysis, and any composition built without an EDL all depend on knowing where the cuts are.

No automatic cut detection is perfect, so v7.0 also adds the Shot Review window: a thumbnail grid that shows the first and last frame of every detected shot alongside the first frame of the next one, so false positives and missed cuts can be spotted and corrected in a single pass. Both are covered in the Edit Tool section.

AI Matte Detection

The QA Tool can now measure the matte on every frame of a composition and graph it. A matte that drifts, a frame where the matte is missing, or a reel delivered at the wrong aspect ratio becomes visible at a glance rather than something an operator has to catch by eye. Discrepancies are listed against timecode, and can be written into the QA report or exported as a .csv. Matte analysis is available in the QA Tool, as an analysis task on a QC workflow action, and on an Analysis watch folder.

Radiation Artifact Detection and Correction

Radiation artifacts — the bright, single-frame speckle a camera sensor picks up from cosmic rays and from airport X-ray, and which is easily mistaken for dirt or a dead pixel — can now be detected and repaired. The new Radiation module in the QA Tool works the way the Dead Pixel module does: Cortex proposes candidates, the operator accepts or rejects each one against a before-and-after preview, and the accepted repairs are applied at render time by any Deliverable with Repair Dead Pixels / Radiation Artifacts enabled. Full details are in the QA Tool section.

We are confident that these new features and improvements in Cortex v7.0 will streamline your post-production processes, ensuring higher efficiency and quality in your projects.

For any questions or support, please do not hesitate to contact our team at support@mtifilm.com.

Chapter 1: The VFX Pull Workflow Action

What the VFX Pull Workflow Action Does

The VFX Pull Workflow Action automates a visual-effects pull from start to finish. When an editorial EDL arrives, Cortex reads each event in the list, traces it back to the matching source clip, builds the reels, renders your deliverables, and — if you have set up vendor delivery — copies each finished file to the right vendor folder.

Like the other Workflow Actions in Cortex, the work comes in two parts: a one-time setup, where you create the VFX Pull workflow, list your vendors, choose the deliverables to render, and set the workflow's default options; and a quick run for each EDL, where you drop the EDL onto the workflow, review the matches Cortex proposes, and execute the pull.

The setup is what keeps each run quick. The options you choose are saved with the workflow and pre-fill every pull, so when a new EDL arrives you review the matches and adjust only what that particular list requires, rather than configuring the pull from scratch each time.

You can have Cortex create the VFX Pull workflow for you while setting up a new project, or create it later in the Workflow module.

Two Ways to Complete a VFX Pull

When editorial sends an EDL, its events identify the source clips a visual-effects pull needs. Cortex can pull those clips two ways: with the traditional EDL import, or with the VFX Pull Workflow Action — an automated alternative to the traditional approach.

The traditional approach

You import the source media into the Master Clips Bin, then choose Import → EDL and select the list to merge it with a composition or conform an edit with the imported media. Cortex builds the edit from the media in the job, giving you full manual control. This is the same EDL import Cortex has always offered, and it remains appropriate when you are assembling or conforming an edit directly.

The VFX Pull Workflow Action

The VFX Pull Workflow Action performs the pull as an automated workflow. It traces each EDL event back to a matching source clip, lets you review and confirm the matches, and carries them through to rendered deliverables.

Creating the VFX Pull Workflow

A VFX Pull workflow can be created two ways: automatically while you are setting up a new project, or by hand in the Project Manager at any time. Either produces the same workflow; the automatic option simply saves a few steps when you already know a project will run VFX pulls.

While setting up a new project

When you create a new Advanced project, the setup includes a WORKFLOW ACTIONS list. Check VFX Pull in that list and Cortex creates a workflow named VFX Pull for the project automatically, ready to use with sensible default options that you can adjust later.

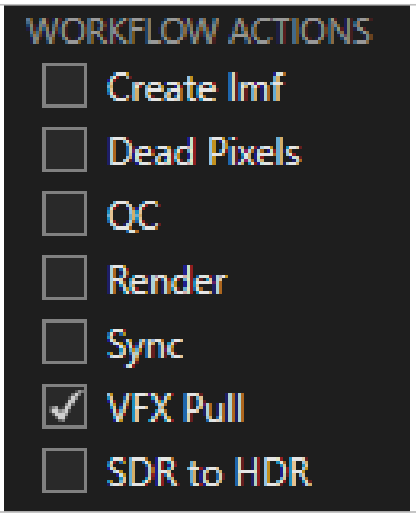


Figure 1.1 — The WORKFLOW ACTIONS list during new Advanced project setup, with VFX Pull checked.

In the Project Manager

You can also create the workflow yourself at any time:

- In the Project Manager, select your project.
- In the WORKFLOWS panel, click New.
- Enter a Workflow Name.
- Set the Action to VFX Pull.
- Optionally enter a Description. This is a note for the operators who run the workflow and does not affect the pull.
- Click Options to set the workflow's default settings, then click Create to save the workflow.

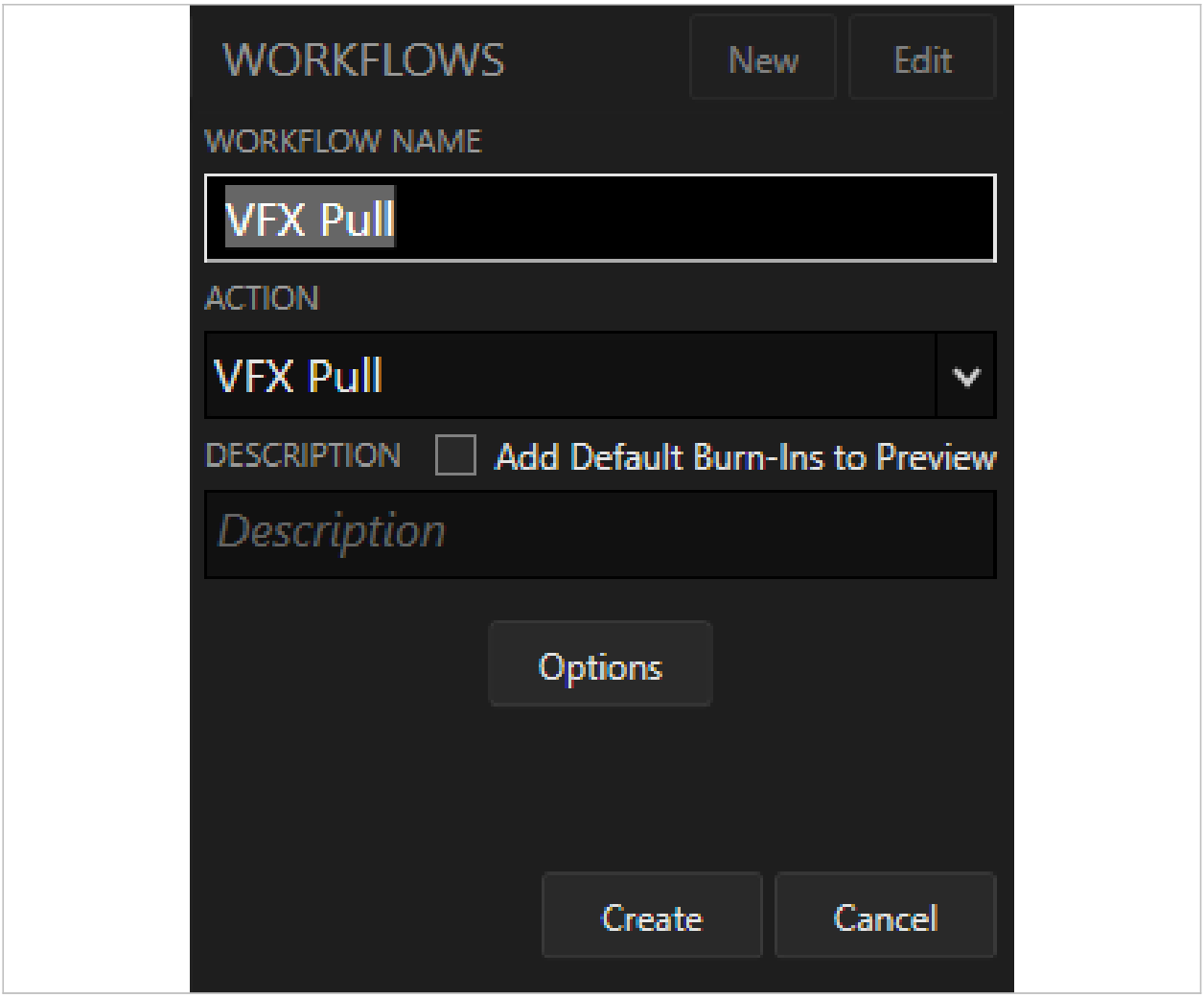


Figure 1.2 — The New Workflow panel with a Workflow Name entered, the Action set to VFX Pull, and the Options button visible.

To change a workflow's settings later, select it in the WORKFLOWS panel and click Edit.

Adding Vendors to the Project

When a render finishes, Cortex can automatically copy it into a folder you have designated for a given vendor, gathering that vendor's outputs in one place ready for you to hand off. To use this, list each vendor and the folder its files should be copied to. This step is optional — if you skip it, your renders still land in the project's normal deliverables location; setting up vendors simply tells Cortex which finished files to copy, and where.

Vendors are managed in the project setup dialog, so you can add them when you create a project or at any time afterward by editing it:

- Open the project setup dialog — create a new project, or select an existing project and click Edit.
- Find the VFX WORKFLOW VENDORS section. (This section is shown for Advanced projects.)
- Click Add Vendor. A new vendor row appears.
- Name the vendor — choose one you have used before, or type a new name. A new name is added to your shared vendor list when you save the project, so it becomes available on your other projects as well.

- Set its folder — the path where this project's files for that vendor should be copied. You can type the path, browse to it, or use tokens to build the path automatically.
- Repeat for each vendor. To remove a vendor from the project, click Remove on its row.
- Save the project.

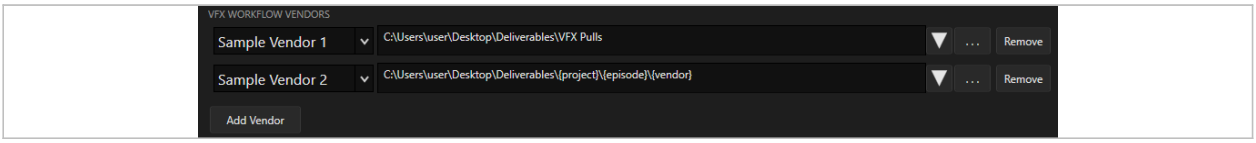


Figure 1.3 — The VFX WORKFLOW VENDORS section in the project setup dialog, showing a vendor row with its name field, folder path, and Remove button, plus the Add Vendor button.

The vendor's name is drawn from a list shared across all of your projects, while the folder you set stays with this project. Choosing which of a project's deliverables actually goes to each vendor is a separate step, covered next.

Assigning Deliverables to Vendors

Each deliverable your workflow renders can be copied to the folders you set up for your vendors, and you choose which vendors receive it from the same editor where you configure the deliverable. In the Project Manager, select your VFX Pull workflow, and in the DELIVERABLES panel click New to create a deliverable — or select an existing one and click Edit. Set the Deliverable Type, give it a Name, and set its options.

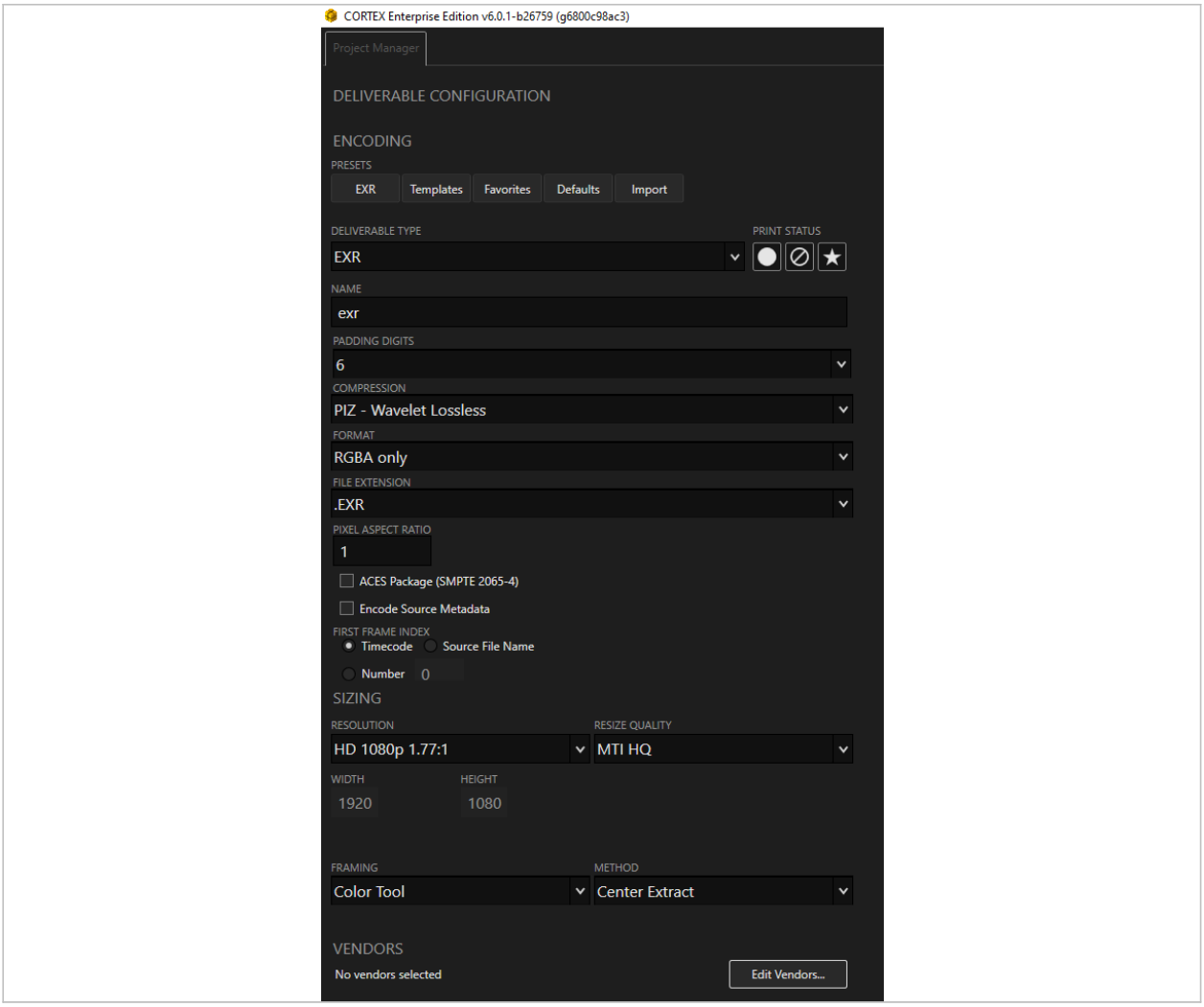


Figure 1.4 — The Deliverable Configuration editor with the Deliverable Type set to EXR.

In the deliverable's VENDORS section, click Edit Vendors… to open the Vendor Targets dialog, then choose a Mode:

- None — this deliverable is not copied to any vendor. It still renders to the project's normal location. This is the default.
- All Vendors — copy this deliverable to every vendor on the project, including any added later.
- Specify Vendors — copy this deliverable only to the vendors you check.

If you chose Specify Vendors, check each vendor that should receive this deliverable, then click OK. A vendor marked (missing from site vendor list) is one that is no longer in your shared vendor list.

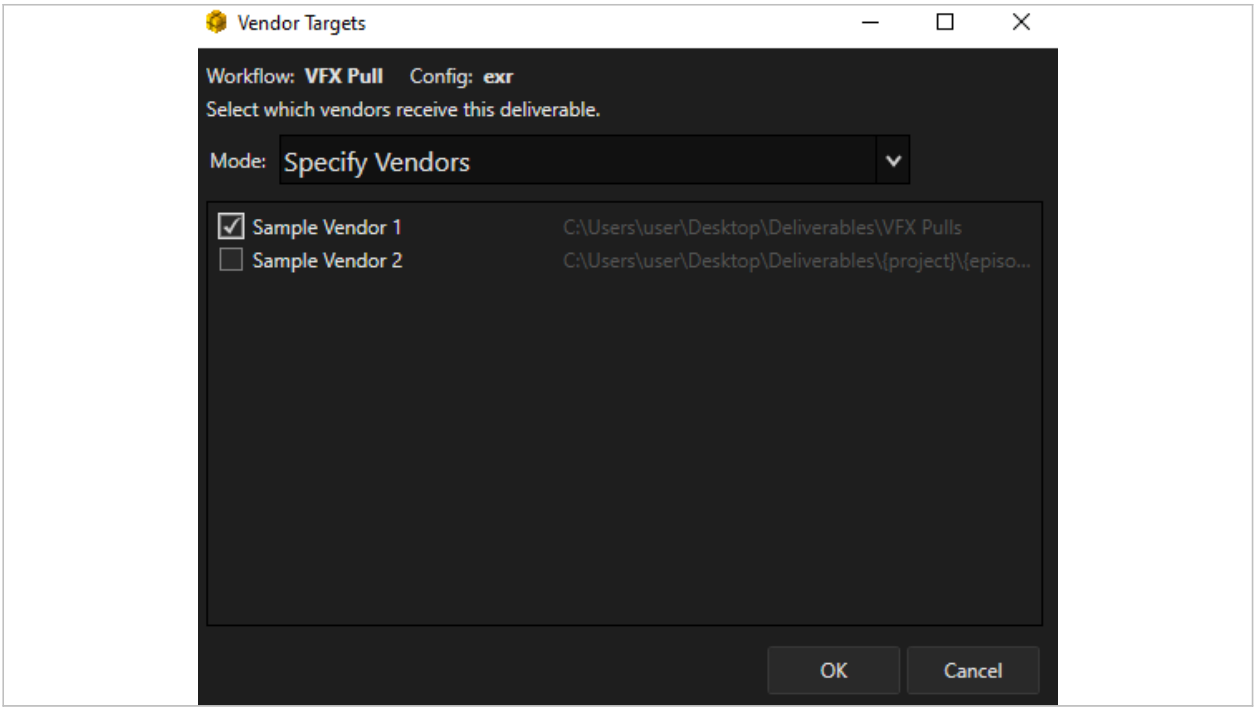


Figure 1.5 — The Vendor Targets dialog with the Mode set to Specify Vendors and vendors checked.

Do this for each deliverable that needs to reach a vendor. Deliverables left on None still render — they simply are not copied to a vendor folder.

Setting Up the Workflow Action

A workflow's options are its defaults: they pre-fill every pull you run against it. You set them here, and you can still adjust any of them for an individual EDL later — the same options reappear in the window that opens when you execute the workflow action, so you can change them for that run before going ahead. To set the defaults, click Options while creating the workflow, or select the workflow and click Edit.

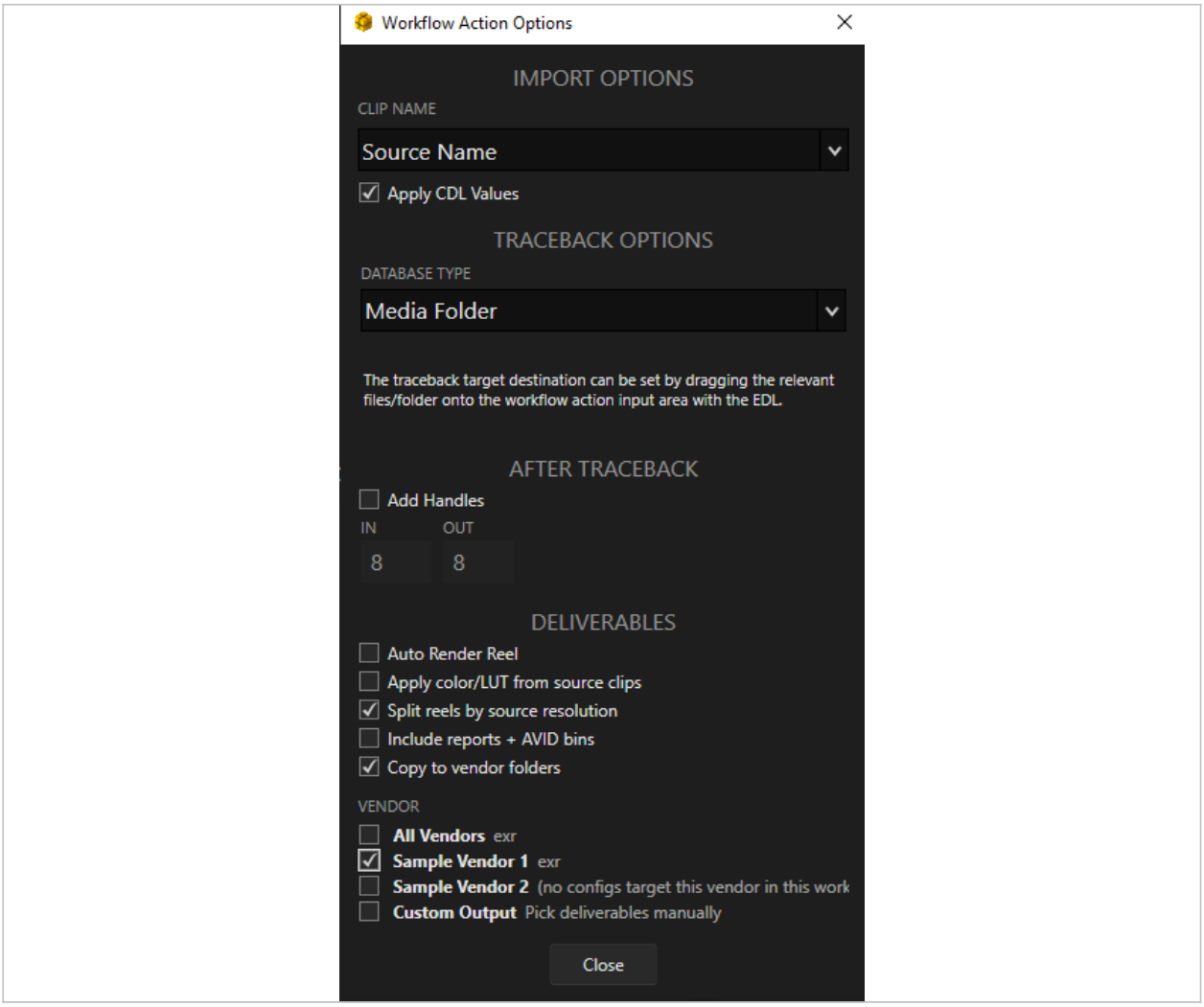


Figure 1.6 — The Workflow Action Options dialog for a VFX Pull workflow.

The options are arranged in four groups.

Import Options — how Cortex reads the EDL

- Clip Name — where each event's clip name is read from: Source Name, Comment, or Locator. If your matches come back empty later, this is the first setting to check.
- Apply CDL Values — bring in the CDL color values carried in the EDL.

Traceback Options — where Cortex looks for the source media

- Database Type — the source to search: the Current Project, Other Project, or a Media Folder. For Current Project you can narrow the search to a specific Episode and Workflow; for the other types you point Cortex at the source when you run the pull.

After Traceback — what happens to matched clips

- Add Handles — pad every matched clip with extra head and tail frames. Set the IN and OUT frame counts.

Deliverables — what gets rendered and copied

- Auto Render Reel — after matching, build and render the reels rather than only importing the matched clips.
- Apply color/LUT from source clips — carry each matched clip's color onto the pulled clip.
- Split reels by source resolution — group the matched clips into separate reels by resolution.
- Include reports + AVID bins — write the report sidecars and AVID bins alongside the renders.
- Copy to vendor folders — copy each finished deliverable to its vendors' folders, using the vendor assignments set on each deliverable.
- Vendor — choose which vendors this workflow serves by default; this selects the matching deliverables for you.
- Default Deliverable Configs — check which deliverables the pull renders by default. One-to-Many renders a deliverable once and copies the result to several outputs.

When the options are set, confirm the dialog and save the workflow. To change them later, select the workflow, click Edit, and reopen Options.

Running a Pull: Dropping in the EDL

To run a pull, you hand the workflow the EDL — and, when needed, the source to trace against — and execute it. The VFX Pull Intelligence window then opens for you to review the matches.

- In the Project Manager, select your project and the VFX Pull workflow.
- Drag the EDL onto the CORTEX logo — a single EDL, several EDL files, or a folder that contains EDLs. (Cortex picks up the EDLs in the top level of a dropped folder; it does not search subfolders.) If your workflow's Database Type is Media Folder or Other Project, drag the source folder onto the logo as well, so Cortex knows where to trace.
- Execute the workflow action: double-click the CORTEX logo, or right-click it and choose Execute Workflow Action.

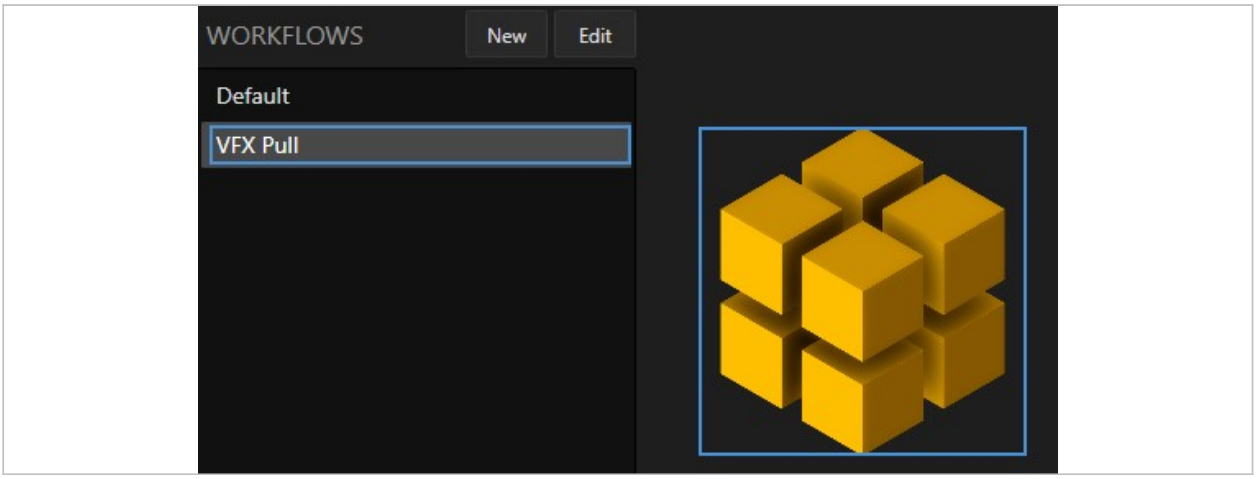


Figure 1.7 — The CORTEX logo in the Project Manager with an EDL queued.

The VFX Pull Intelligence window opens. If you close it without confirming, no job is created and nothing is changed. If more than one EDL is included, the window first shows an EDL Setup screen: select the EDLs you want to process, give each EDL a job name (EDLs that share a name are grouped into one job), and click Continue to start reviewing. A single EDL skips this screen and goes straight to the review.

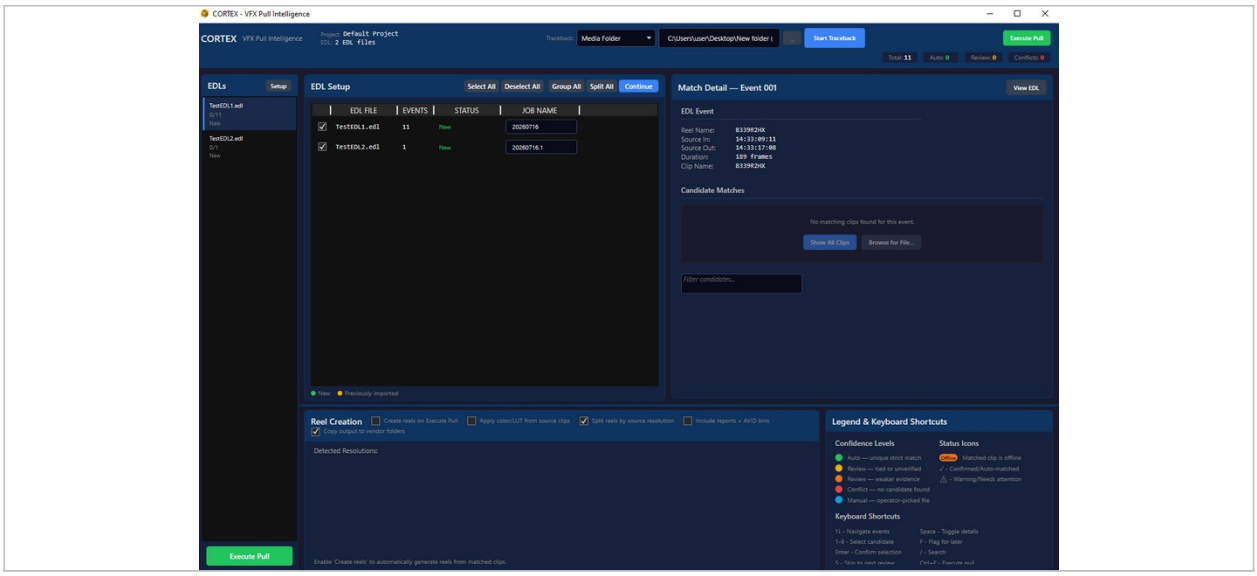


Figure 1.8 — The EDL Setup screen listing multiple EDLs with their job names and the Group/Split controls.

The Traceback Window

The VFX Pull Intelligence window — the Traceback window — is where you trace the EDL, review the matches, and start the render. It has four main areas: the header shows the project and EDL along with the traceback controls (Database Type and traceback target, plus Start Traceback and Execute Pull); the tally is a running count of Total, Auto, Review, and Conflict events; the events list on the left shows every event with its reel, timecode, matched clip, confidence, and status; and the match detail on the right shows the selected event's EDL details and candidate clips.

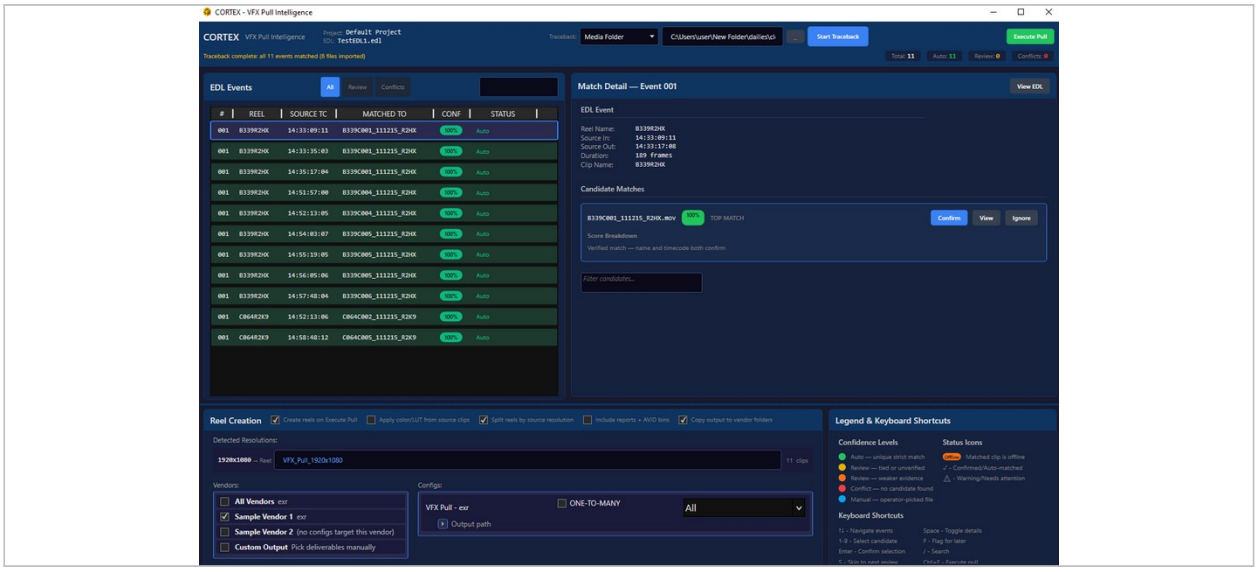


Figure 1.9 — The VFX Pull Intelligence (Traceback) window, with the header, tally, events list, and match detail areas labeled.

Reviewing and Confirming Matches

With the window open, confirm the source at the top — the Database Type and the traceback target — and click Start Traceback. Cortex parses the EDL, traces each event to a source clip, and fills in the tally as it works.

Reading the confidence colors

- Green — Auto. A unique, strict match; nothing to do.
- Amber — Review. A match that is tied or unverified — give it a look.
- Orange — Review. A match found on weaker evidence.
- Red — Conflict. No candidate was found; you will point it at the right clip.
- Blue — Manual. A file you pointed Cortex at that didn't fit its scoring metrics.

Use the All, Review, and Conflicts filter tabs and the search box to focus. A good rhythm is to filter to Review, work down the list confirming or correcting each event, then confirm the green ones together.

Reviewing an event

Click an event to see its details and the candidate clips Cortex found for it, each with a confidence badge — and an Offline badge if its media is not currently available. On the candidates you can Confirm (accept the best match — this button appears on the top candidate; lower candidates show Select instead), View (preview the clip), or Ignore (drop a candidate into the Ignored Candidates list; Restore brings it back). The top match also shows a Score Breakdown explaining why it scored as it did. When no clip matched — or you have ignored them all — use Show All Clips to pick from every traced clip, or Browse for File... to point at a file yourself; if it doesn't fit Cortex's scoring metrics, it comes in as a blue Manual match.

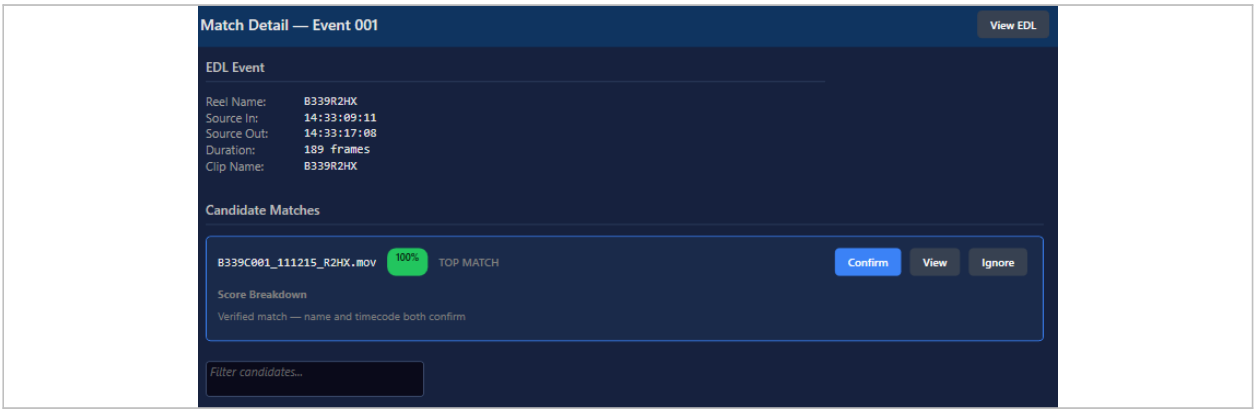


Figure 1.10 — An event selected in the events list, with its candidate matches and score breakdown in the match detail panel.

Reading the Source EDL

When two candidates are hard to tell apart, it can help to read the original cut list. In the match detail header, click View EDL to replace the candidate panel with the full text of the source EDL, with the current event highlighted — its reel name, timecodes, and any comments, exactly as they appear in the file. Selecting a different event moves the highlight to that event. Click Close to return to the candidates.

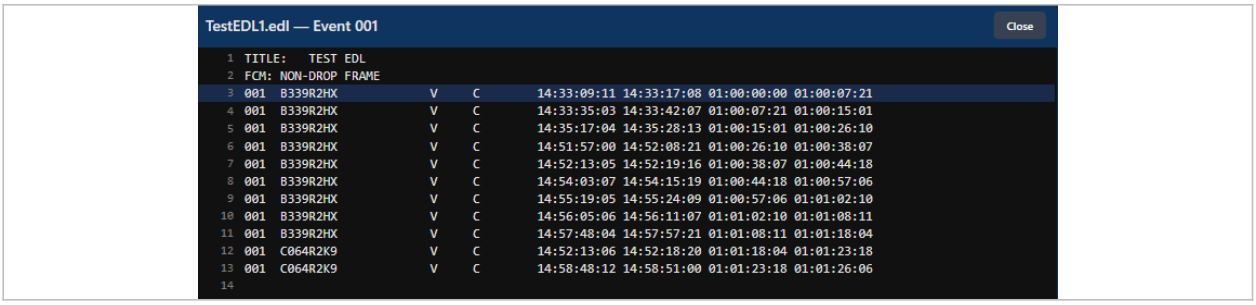


Figure 1.11 — The View EDL panel showing the source EDL text with the current event highlighted.

Confirming in Bulk

Rather than confirm every event one at a time, you can accept many at once. Right-click the events list for the bulk options:

- Confirm Selected — confirm just the rows you have highlighted.
- Confirm Auto Matches — confirm every green (Auto) event in view.
- Confirm Review Matches — confirm every amber or orange (Review) event in view, accepting its best candidate.
- Confirm Remaining — confirm both at once.

These act only on the events currently shown in the list, so you can filter or search first to limit their reach. They never change events you have already confirmed or matched by hand.

The Legend & Keyboard Shortcuts panel at the bottom of the window explains the confidence colors and lists the keyboard shortcuts for working the events list without the mouse — Ctrl+E, for example, executes the pull. Clips brought in by an earlier pull are marked Previously imported.

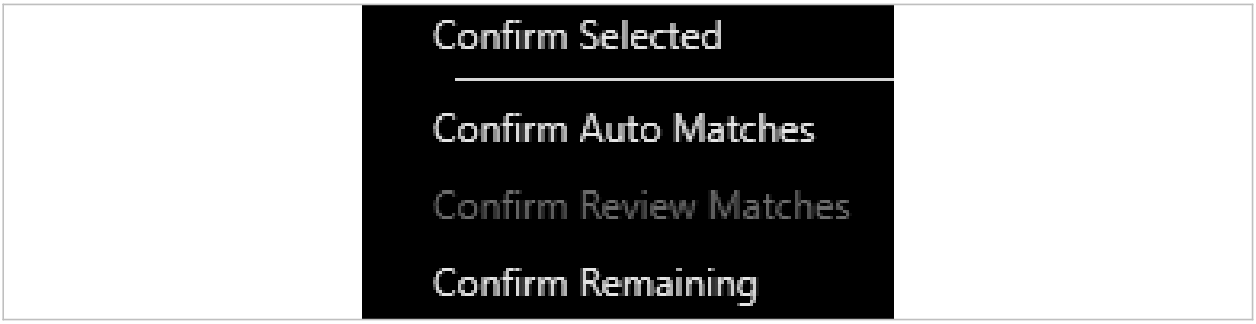


Figure 1.12 — The events-list right-click menu showing the bulk-confirm options.

Choosing What Renders and Executing the Pull

The Reel Creation panel at the bottom of the window confirms what the pull builds. It starts from your workflow defaults, and you can adjust it for this EDL:

- Create reels on Execute Pull — the master switch. With it off, the pull imports the matched clips only and renders nothing.
- Apply color/LUT from source clips, Split reels by source resolution, Include reports + AVID bins, and Copy output to vendor folders — the same options as in the workflow setup, here to override just for this run.
- Detected Resolutions — the source resolutions found and the reel each will create. Rename a reel here if you like; names are made unique within the job.
- Vendor Selection — check which vendors this EDL is for; this queues the matching deliverables. Custom Output lets you pick the deliverables by hand instead.
- Deliverable Config Selection — the deliverables that will render. Each can be given its own Output path, and can be restricted to reels of a chosen input resolution.

When you are satisfied, click Execute Pull. Cortex imports the confirmed matches, builds the reels, renders the selected deliverables, and copies each finished file into the vendor folders you set up.

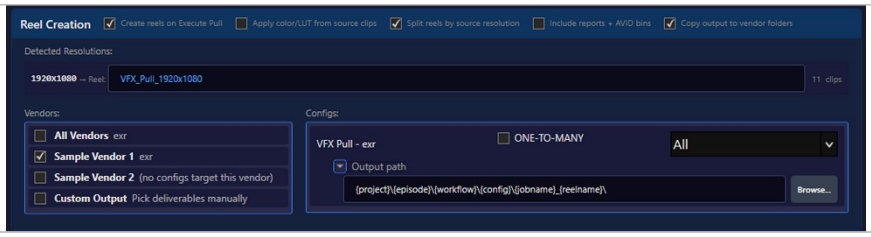


Figure 1.13 — The Reel Creation panel with the render options, Detected Resolutions, vendor selection, and the Execute Pull button.

Finding Your Delivered Files

When Copy output to vendor folders is on, each finished deliverable is copied into its vendors' folders automatically as the render completes — there is nothing more for you to do. A copy that cannot complete, for example if a folder is unavailable, is logged and does not stop the render.

Two shortcuts help you confirm and re-send, both on the right-click menu of a deliverable:

- Open Vendor Folders — a submenu listing the deliverable's vendors by name; choose one to jump straight to its folder and check that the files arrived. It is on the Render Monitor's open, closed and completed lists, and on deliverables in the loaded job.
- Export to Vendor Folders — copy a finished deliverable to its vendors now, using the deliverable's current vendor list. It is on the Render Monitor's Completed list. Use this if you turned the automatic copy off, or if you changed a deliverable's vendors after it rendered.

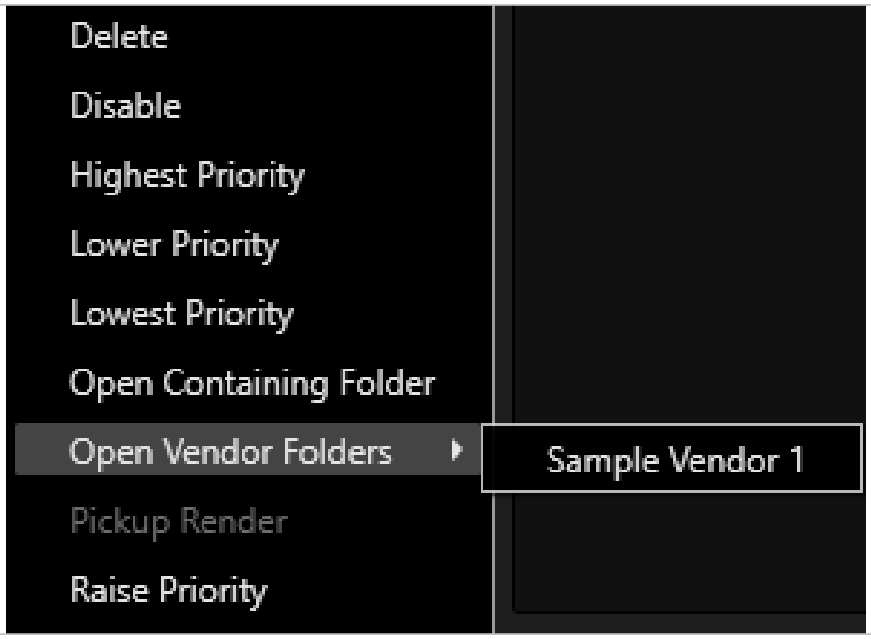


Figure 1.14 — The right-click menu on a finished deliverable, showing Open Vendor Folders and Export to Vendor Folders.

Managing the Traceback Cache

Tracing against a media folder caches that folder's clips, so later pulls against the same folder are much faster. To see and manage the cache, right-click a project in the Project Manager, or the bin in an open job, and choose Manage Traceback Cache…. The Traceback Cache Manager lists each cached folder with the date it was Last Traced, its number of Clips and its Status.

Precache Folder... imports a folder ahead of time, so even the first pull against it is fast. Refresh Selected re-scans a folder and imports any new files, and Delete Selected removes it from the cache. Cleanup Orphaned and Delete All clear out entries you no longer need.

Quick Answers

- My matches came back empty. Check the Clip Name setting in the workflow's Import Options. It must match where your editorial puts the clip name — Source Name, Comment, or Locator.
- An event is red (Conflict). Nothing matched it — usually the clip is missing from the source you are tracing against, or the names and timecodes do not line up. Point the event at the file with Browse for File..., or fix the source and run the traceback again.
- The clip I want isn't in the candidate list. Use Show All Clips to pick from every traced clip, or Browse for File... to point at a file yourself. If other candidates are in the way, Ignore them first.
- A render didn't reach a vendor. Three things have to line up: the deliverable's Vendors list includes that vendor, the vendor has a folder path on the project, and Copy output to vendor folders was on for the run. If the automatic copy was off — or you added the vendor after the render — right-click the finished deliverable in the Render Monitor's Completed list and choose Export to Vendor Folders.
- A vendor isn't in the list when I set up a deliverable. It has not been added to the project yet. Open the project setup dialog, go to VFX Workflow Vendors, and Add Vendor.
- I need a one-off set of deliverables that doesn't match a vendor's usual package. Choose Custom Output in the Reel Creation panel and pick exactly the deliverables you want.

Chapter 2: Dual-Stream & Comparison Playback

Synchronized Timeline Playback & Split-Rack Viewing

Cortex v7.0 introduces true dual-stream output on supported SDI hardware, letting an operator drive two independent SDI streams from a single composition at the same time — for example, to feed two client monitors, or to rack up a graded deliverable against its source for review. Both streams stay locked to one composition timeline, so playback, jogging, and marking always move both outputs together; there is no separate transport to manage for the second stream.

The Split V1/V2 tab builds on this synchronized playback to compare video track V1 against V2 directly on screen. Its WIPE MODE list offers Horizontal, Vertical, Butterfly, two Diagonals, Box, Side By Side and Fade, each blending the two tracks into a single composited image on the primary output for on-screen review; tick Show V1/V2 labels to mark each side of the comparison. For true two-monitor comparison with no compositing at all, the Separate SDI mode sends V1 and V2 to the two SDI outputs as independent, full-frame streams — each output keeps its own track regardless of which one is selected on the timeline. The Split V1/V2 tab is available in the Edit, Color and QA tools.

The sections below cover how to use the Split V1/V2 tab, the hardware dual-stream output requires, how to enable Separate SDI specifically, which physical connectors to use, and how to route different rendering pipelines to each stream.

Comparing Tracks with the Split V1/V2 Tab

The Split V1/V2 tab compares two video tracks of one composition — V1 and V2 — in the same picture, using a wipe, a side-by-side view, or separate SDI outputs. A typical use is QC: the original scan on V1 against the restored version on V2, at the same frame, during playback.

- It works on compositions with two or more video tracks. V1 and V2 are the two tracks compared.
- It is available in the Edit, Color and QA tools, and in the full-screen edit views (F11 modes).
- Each track keeps its own color pipeline, including camera RAW such as DNG and Sony RAW, so each side looks as it would on its own.
- Settings such as the wipe line and track labels are saved with the composition.

Note: earlier builds named this tab COMPARISON.

When the Split V1/V2 Tab Appears

The Split V1/V2 tab sits alongside the Vu, Loudness, Metadata and Shots tabs, and appears only once the composition has a second video track with media on it. To add the second track, use the V option in the timeline section of the Edit tool, then place media on the new V2 track. The tab is hidden for compositions with only one video track.

- **Edit tool** — the composition must be active.
- **Color and QA tools** — a composition bin must be selected. The tab does not appear when a single clip from the clips bin is selected.
- **F11 full-screen modes** — the tab and its settings carry across tool switches and F11 full-screen cycling.

Using the Split V1/V2 Tab

1. Open a composition that has media on both V1 and V2. If it has only one video track, add a second with the V option in the Edit timeline and place media on it.
2. Click the Split V1/V2 tab (Figure 2.1). Clicking the tab is what switches comparison on; leaving the tab switches it off again.
3. Choose a WIPE MODE from the pull-down (Figure 2.2). Choosing None keeps the tab open but plays the composition normally.
4. Drag the WIPE POSITION slider, or hold Shift and drag directly in the picture. Position 0% shows all V1; 100% shows all V2.
5. Optional: tick Show V1/V2 labels or Show wipe line. These options are shown only for modes where they make sense.
6. Optional: use the ZOOM, H POSITION and V POSITION sliders in the V1 and V2 groups to line up the two tracks. The Unity buttons reset framing.

The wipe can be moved while the composition plays.

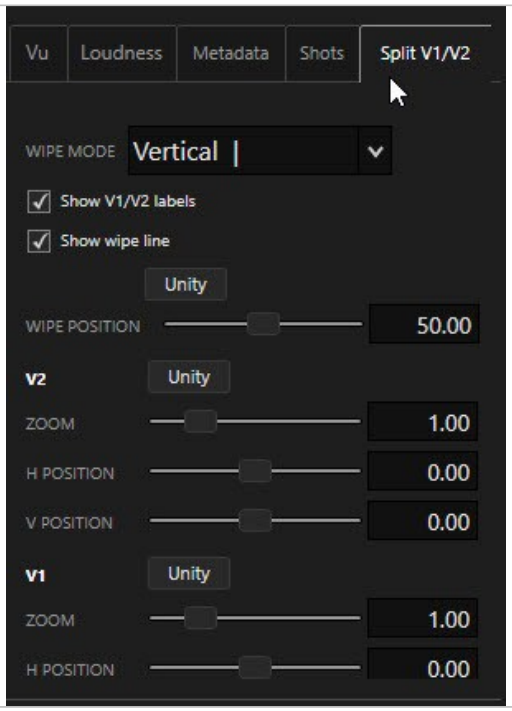


Figure 2.1 — The Split V1/V2 tab next to the Vu, Loudness, Metadata and Shots tabs, with WIPE MODE set to Vertical.



Figure 2.2 — The WIPE MODE pull-down with the wipe options available once the Split V1/V2 tab is selected.

Wipe Modes

The WIPE MODE list offers the following modes. Mode names are shown as they appear on screen.

Mode	What the viewer sees	Position slider	Labels and wipe line
None	Normal playback; the tab stays open	Disabled	Hidden
Horizontal --	Wipe edge runs left to right	Active	Both available
Vertical |	Wipe edge runs top to bottom	Active	Both available
Butterfly |	Vertical wipe with V2 mirrored about the line, so both sides show the same picture area. Mirrored columns past the frame edge are black.	Active	Both available
Diagonal \ and Diagonal /	Diagonal wipe, in two directions	Active	Both available
Box	Wipes in from the frame edges as a centered rectangle that grows or shrinks with the position; the border is drawn on one edge	Active	Both available
Side By Side	V1 and V2 displayed next to each other	Disabled	Labels available; no wipe line
Fade	Cross-dissolve between V1 and V2	Active	Neither shown
Separate SDI	No compositing; V1 goes to the primary SDI output and V2 to a second one (see Enabling “Separate SDI” Comparison Mode below)	Enabled, but no visible effect	Neither shown

The figures below show each compositing mode with the same shot on V1 and V2.



Figure 2.3 — Horizontal wipe with Show wipe line on. The wipe edge runs left to right across the frame at a WIPE POSITION of 50.

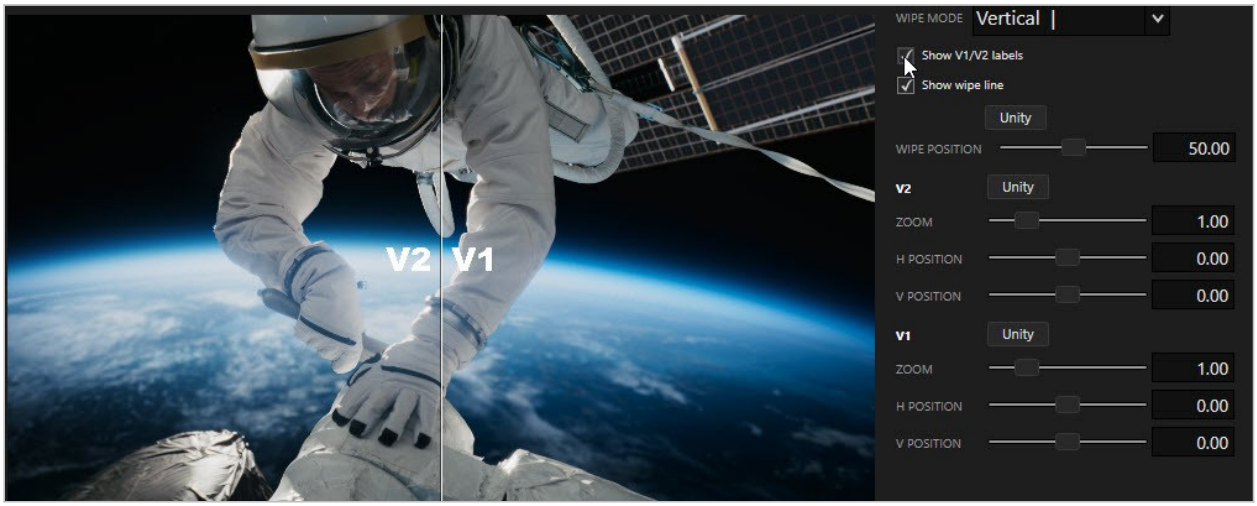


Figure 2.4 — Vertical wipe with Show V1/V2 labels and Show wipe line on, tagging each side of the wipe.



Figure 2.5 — Butterfly wipe. V2 is mirrored about the wipe line, so both sides show the same picture area.



Figure 2.6 — Box wipe with Show wipe line on. The centered rectangle grows or shrinks with WIPE POSITION.

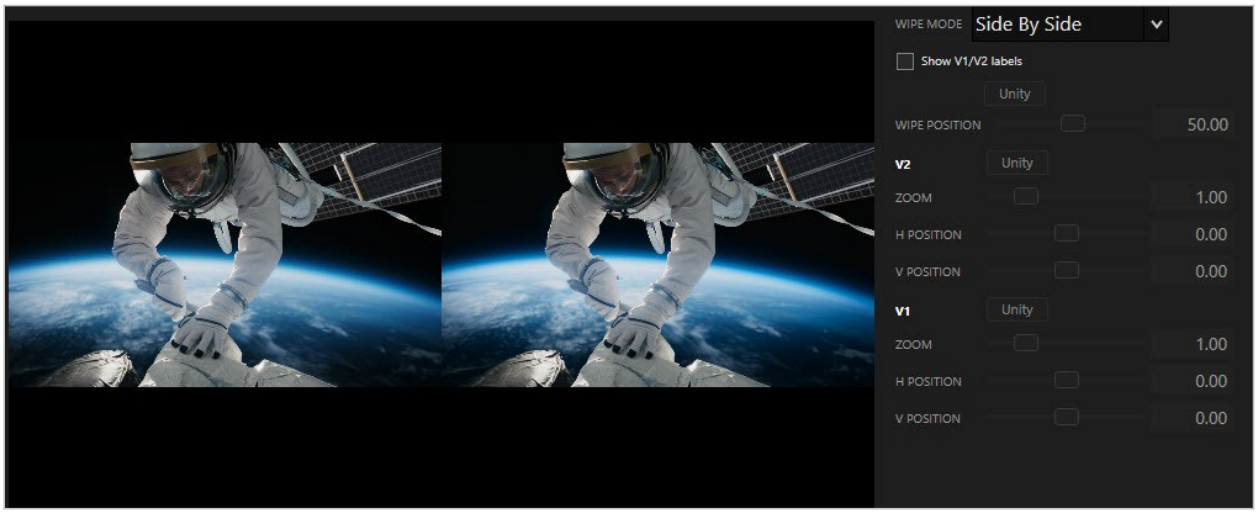


Figure 2.7 — Side By Side. V1 and V2 are shown next to each other; only Show V1/V2 labels is offered, and WIPE POSITION and the framing controls are greyed out.

Wipe Position and Shift-Drag

WIPE POSITION runs from 0% (all V1) to 100% (all V2). Set it with the slider, or hold Shift and drag directly in the picture. Shift-drag also works in the floating frame viewer window. When a zoom is applied, the drag distance is scaled so the wipe bar follows the cursor.

Each change of position re-renders the frame, so dragging the wipe during playback can cause playback to stutter. Dragging while paused is smoother.

Aligning the Tracks: Zoom and Position

The V2 and V1 groups (V2 is listed first in the panel) each have ZOOM (0.25 to 4.0), H POSITION (-1.0 to 1.0) and V POSITION (-1.0 to 1.0) sliders. Use them to line up the two tracks for comparison. These framing controls are temporary, per track, and a comparison aid only — they do not change the composition. The Unity buttons reset framing.

Labels and the Wipe Line

- **Show V1/V2 labels** draws a V1 or V2 tag on each side of the comparison.
- **Show wipe line** draws a black and white divider at the wipe position.

Both settings are saved with the composition. Which of them are available depends on the wipe mode (see the table above).

Other Comparison Behavior

- **Record monitors** — both the V1 and V2 record monitors are forced on (green) while comparing, because both tracks are always in use. In Separate SDI mode the track monitor buttons work again and select what the on-screen picture shows.
- **Stills** — playing a still while comparison is on turns the wipe off and shows the still full screen.
- **QA Performance tab** — accounts for both tracks while a wipe is showing.
- **Dolby Vision** — content mapping is set per track, not in the Split V1/V2 tab. See Dolby Vision Content Mapping per Track below.

Troubleshooting the Split V1/V2 Tab

Symptom	Likely cause and answer
No Split V1/V2 tab	The composition has fewer than two video tracks with media, or no composition bin is selected. In the Edit tool the composition must also be active.
Tab is open but playback shows only one track	WIPE MODE is None. Pick a mode.
Wipe slider greyed out	The mode is None or Side By Side, which have no wipe position.
Wipe disappears when playing a still	By design; the still is shown full screen.
Playback stutters while dragging the wipe during play	Each position change re-renders the frame. Dragging while paused is smoother.
Two-card SDI option missing	Requires a DeckLink primary card and at least one other DeckLink card; the Secondary Board setting only shows then.
Wipe lost after a tool switch	Fixed in current builds; update Cortex. Selection and state persist across tools and F11 modes.

Earlier builds had issues that have since been fixed: V2 appearing on both sides, mismatched side sizes, a clip-bin selection taking over the wipe, and J2K decoder collisions. If these appear, update to the current build.

Which SDI Cards Support Two Simultaneous SDI Streams

Cortex can drive two independent SDI streams at once. There are two ways to get the second stream, depending on your hardware.

Two Streams From One Card

The following cards can output both streams from a single physical board. On these cards the first stream uses the primary SDI connectors, and the second stream uses a different pair of connectors on the same board.

Card	Second Stream Options

AJA Kona 4	SDI 3 / SDI 4 (single-link), SDI 3+4 dual-link, plus 3G and quad-link variants.
AJA Kona 5	SDI 3 / SDI 4 (single-link), SDI 3+4 dual-link, 3G and quad-link variants, and HDMI.
AJA Corvid 88	SDI 3 / SDI 4 (single-link), SDI 3+4 dual-link, plus 3G and quad-link variants.
Blackmagic DeckLink 8K Pro	SDI 3 / SDI 4, or SDI 2 — depends on the Desktop Video profile.

Two Streams From Two Cards

Cortex can also drive the second stream from a second physical card. When two DeckLink cards are present, the second SDI tab appears regardless of whether either card is a multi-stream model, and a Secondary Board setting is shown on that tab so you can choose which card carries stream 2. The list offers only the DeckLink cards found at startup, excluding whichever one is already serving as the primary.

With Separate SDI, V1 then goes to one card and V2 to the other, which spreads bus traffic across the two cards.

Two-card mode is supported for DeckLink and DeckLink only. An AJA card can serve as the primary card, and an AJA Kona 4, Kona 5 or Corvid 88 can still produce both streams on its own as described above, but AJA is not offered as the secondary card in a two-card pairing.

Note: when a second SDI tab is present, the first tab is labeled SDI 1. When there is only one SDI stream, the tab is simply labeled SDI.

How the Second SDI Tab Appears

The second SDI configuration tab appears in either of two cases: when the selected card is one of the multi-stream models listed above, or when Cortex detects two DeckLink cards in the system. If neither is true, only a single SDI stream can be configured.

Enabling “Separate SDI” Comparison Mode

“Separate SDI” is a wipe mode on the Split V1/V2 tab that sends video track V1 to one SDI output and video track V2 to the other, with no compositing between them — each output carries its own full-frame track.

To set it up:

- Load a composition that has at least two video tracks (V1 and V2).
- In the Hardware tab, enable the primary SDI stream and the second SDI stream on a card (or card pair) that supports two streams. Assign each stream to its connector via its OUTPUT TYPE pulldown.
- Select the Split V1/V2 tab.
- Set WIPE MODE to “Separate SDI.”

Result: SDI output 1 shows track V1, SDI output 2 shows track V2 (each on its own connector). This holds regardless of which track is highlighted on the timeline — the two outputs keep their tracks. The media player (on-screen picture) follows the video track selected on the composition timeline: selecting V1 shows V1 in the media player, selecting V2 shows V2 — while both SDI outputs stay put. This mirrors how the media player behaves when the Split V1/V2 tab is not selected.

In Separate SDI mode the V1/V2 track monitor buttons work again and select what the on-screen picture shows, and the scopes measure the displayed picture. The WIPE POSITION slider stays enabled but has no visible effect, since nothing is composited.

Related Behavior for Wipe Mode "None"

With the Split V1/V2 tab selected and WIPE MODE set to "None," the two SDI outputs and the media player behave like normal (non-comparison) playback: SDI connector 1 follows track V1, the second connector follows track V2, and the media player follows the timeline track selection. Selecting a wipe mode other than "None" (Horizontal, Vertical, Butterfly, either Diagonal, Box, Side By Side, Fade) composites the two tracks together into a single blended image on the primary output.

Which SDI Connectors to Use

AJA Kona 4 / Kona 5 / Corvid 88

The SDI connector numbers are physical and meaningful. The primary stream uses SDI 1 / SDI 2; the second stream uses SDI 3 / SDI 4 (or the dual-/quad-link and 3G groupings listed in the OUTPUT TYPE pulldown). Connect to the BNC that matches the OUTPUT TYPE you selected.

Blackmagic DeckLink 8K Pro

The 8K Pro has four BNC connectors, and connector assignment depends on the Desktop Video profile:

- Two-sub-device (full-duplex) profile — each playback sub-device owns two BNCs. The second stream is offered as SDI 3, SDI 4, or SDI 3+4 dual-link. Use the BNC that matches your selection; the primary stream uses SDI 1 / SDI 2.
- Four-sub-device (half-duplex) profile — each sub-device owns one BNC. The second stream is offered as SDI 2.

Note: Previously, the 8K Pro's second stream was always labeled "SDI 2," even in the two-sub-device profile where SDI 2 is wired for capture and can never carry a playback signal. Cortex now counts only the playback-capable sub-devices, so it offers the correct SDI 3 / SDI 4 options in that profile. If the card's current profile does not expose enough playback sub-devices when you click Enable, Cortex attempts to switch it to a multi-output profile automatically.

On DeckLink cards, the SDI number attached to the second stream is primarily a routing label. If in doubt about which physical BNC is live, use the SDI Test Pattern (Bars) on that stream to confirm the connector before going live.

The "SDI Channel" Dropdown in Deliverable Configuration

Each deliverable / output configuration has an SDI CHANNEL setting with two values: Channel A and Channel B. This tag decides which of the two simultaneous SDI streams that deliverable's rendering pipeline (color, effects, resolution, Dolby Vision target display, etc.) feeds:

Channel	Routes To
Channel A	The first (primary) SDI stream.
Channel B	The second SDI stream.

How It Affects the Dual-Stream Output

- When you activate a deliverable configuration for playback, its SDI CHANNEL becomes the "playback channel." The config tagged with that channel is sent to its matching SDI output; a config tagged with the other channel is sent to the other SDI output.
- To drive both SDI streams with different looks simultaneously — for example, a graded Rec.709 deliverable on one output and a Dolby Vision / HDR deliverable on the other — create two deliverable configurations, tag one Channel A and the other Channel B, and enable both SDI streams in the Hardware tab.
- If every deliverable is left on Channel A (the default), only the primary SDI stream carries processed video; the second stream has no distinct pipeline assigned to it.
- SDI CHANNEL is only meaningful when two SDI streams are enabled. With a single SDI stream configured, leave deliverables on Channel A.

Dolby Vision Content Mapping per Track

When a composition carries Dolby Vision metadata, content mapping can be applied track by track. The dialog that opens when you add a video track offers Apply Dolby Vision content mapping to this track, and afterwards you can right-click a video track and toggle Apply Dolby Vision Content Mapping to This Track.

This is what makes a like-for-like HDR comparison possible: V1 can play with content mapping applied while V2 plays without it, or both can be mapped, whether you are wiping on the Split V1/V2 tab or sending the tracks to two SDI outputs. The option appears only for compositions that carry Dolby Vision metadata.

Note: the CMU TARGET drop-down that appeared in the comparison tab in earlier builds has been removed. Set content mapping per track as described above.

Embedded Audio Delay

When AUDIO TYPE is set to Embedded in the Hardware tab, an AUDIO DELAY (FRAMES) setting delays the embedded SDI audio by 0 to 5 frames. Use it to keep sound in sync with picture when a monitor or router in the chain adds video latency.

Additional SDI Output Fix in This Release

SDI Test Pattern refresh — In the Hardware control, when the SDI Test Pattern is switched from Bars or Black back to None, Cortex now re-renders the current frame immediately so the SDI output refreshes on its own. Previously, the board kept displaying the last bars/black frame until the user jogged or resumed playback.

Chapter 3: SDR to HDR Conversion

Cortex v7.0 adds MTI FILM's designed transform for expanding a finished SDR grade into HDR, with Dolby Vision and HLG delivery in mind. Two routes are covered: converting a shot by hand in the Color tool, and converting on ingest with the SDR to HDR workflow action. Both produce the same transform — the workflow action calls the same preset code the Color tool buttons do.

1. What the Conversion Does

Cortex expands a finished SDR grade into HDR and derives Dolby Vision metadata from the result. It is not a LUT — the expansion is a tone and chroma model with a target peak luminance, and the Dolby Vision L1 analysis runs on the expanded image afterwards.

You make one real decision: the delivery peak. Everything else follows from it, and the defaults are the values approved in testing.

Peak band	Peak range	Default peak	Behaviour
LOW	250–300 nits	250 nits	Gentle expansion, no diffuse-white anchor
MEDIUM	300–450 nits	400 nits	Three-anchor expansion (mids / diffuse / peak)
HIGH	450–2000 nits	600 nits	Three-anchor expansion, more highlight headroom. Presets are tuned up to 600 nits

Pick the band that matches the deliverable you were asked for. Do not pick a higher band hoping for a stronger look — a higher peak means more compression is demanded of any downstream display mapping, not a better image.

MEDIUM and HIGH require the SDR to HDR option, as do the controls for fine-tuning a band — the PEAK value, CHROMA, CONTRAST, LOW's chroma controls and ADVANCED. Without the option Cortex still converts, on the LOW band: the Color tool shows a read-only PEAK readout in place of the band buttons, and the SDR to HDR workflow action runs LOW. See Without the SDR to HDR Option later in this chapter.

2. Converting a Shot in the Color Tool

Step 1 — Set up the composition and open the Dolby tab

The SDR to HDR controls are on the Color tool's Dolby tab. That tab appears only while a Dolby Vision composition is selected, so the shot must be in a composition with Dolby Vision metadata turned on. A clip on its own, or a composition without Dolby Vision, does not show it.

The quickest way to set this up is from the clip bin. Right-click the SDR picture clip and choose Auto-Composition > Create Auto Composition with SDR to HDR, then the mastering display: Dolby V4 1000-nit Rec2020 or Dolby V4 1000-nit P3. Cortex creates the composition, turns on Dolby Vision v4 metadata for that mastering display, shows the composition event list and starts MTai shot detection. Vet the cuts as you would after any shot detection. The menu item does not apply the transform or run the analysis; the rest of this section does that.

Then open the Color tool and choose the Dolby tab. Two cards sit across the top, INPUT COLOR TRANSFORM and OUTPUT COLOR TRANSFORM, each with a one-line summary of its setting, such as No preset or HDR (Rec2020) · Expansion on. Click OUTPUT COLOR TRANSFORM: the tab opens on the input card.

Use OUTPUT COLOR TRANSFORM, not INPUT COLOR TRANSFORM. The input card opens an identical panel, but that transform sits at the head of the pipeline; the SDR to HDR conversion belongs on the output.

Save to All Shots, Save, Revert, Previous and Next sit above the cards. The ? button at the top left swaps the panel for the Dolby Vision analysis instructions; click it again to come back.

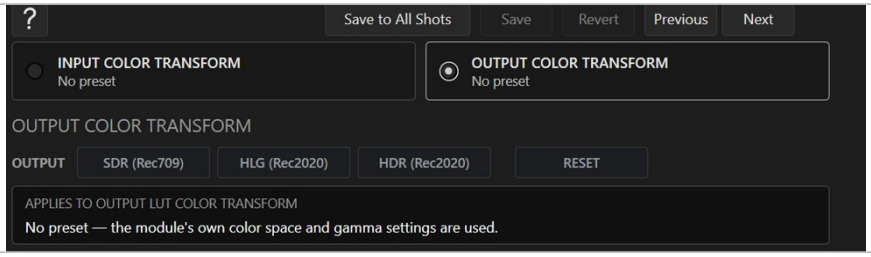


Figure 3.1 — The Dolby tab with OUTPUT COLOR TRANSFORM selected, before anything is set.

Step 2 — Choose the output

On the OUTPUT row, click HDR (Rec2020). That one click sets up both ends of the conversion:

- The output. Target colour space and gamma are set together — Rec.2020 primaries with the PQ transfer.
- The input. The expansion supports two sources, Rec709 and P3-D65, and the input is set to Rec709 with 2.4 gamma unless it already holds one of those two. An input gamma that could not belong to an SDR source — an HDR curve or Linear — is corrected to the right SDR transfer for the chosen primaries: 2.4 for Rec.709, 2.6 for P3-D65.

So in the normal case you do not touch the input at all. Check it in the summary box under the OUTPUT row, and change it only if it does not describe your actual source — for instance if you are converting a P3-D65 master. In that case set INPUT COLOR SPACE to P3-D65 and INPUT GAMMA to 2.6 on the Output LUT tab.

The exact color space and gamma dropdowns are on the Output LUT tab, which edits the same transform: INPUT COLOR SPACE, INPUT GAMMA, OUTPUT COLOR SPACE and OUTPUT GAMMA, each with its full list. Use them for outputs outside these three, such as XYZ for DCDM, in which case no OUTPUT button reads as selected.

The box under the OUTPUT row, headed APPLIES TO OUTPUT LUT COLOR TRANSFORM, reads the result back in one line: source, target and peak, for example Rec.709 / 2.4 → Rec.2020 / SMPTE ST 2084 (PQ) · 250 nits. RESET, at the end of the OUTPUT row, sets the source and target color space and gamma back to None / Linear.

Two things also happen as soon as the source is SDR and the target is HDR:

- SDR TO HDR EXPANSION appears under the summary box, checked and greyed out. This is not a control. A plain colorimetric SDR-to-HDR conversion is not a supported path, so the expansion is always applied; the checkbox is there to tell you so. Hover it for the detail.
- The PEAK panel appears below, seeded to LOW at 250 nits. Without the SDR to HDR option it appears as the read-only readout described in Without the SDR to HDR Option, and Steps 3 to 5 do not apply.

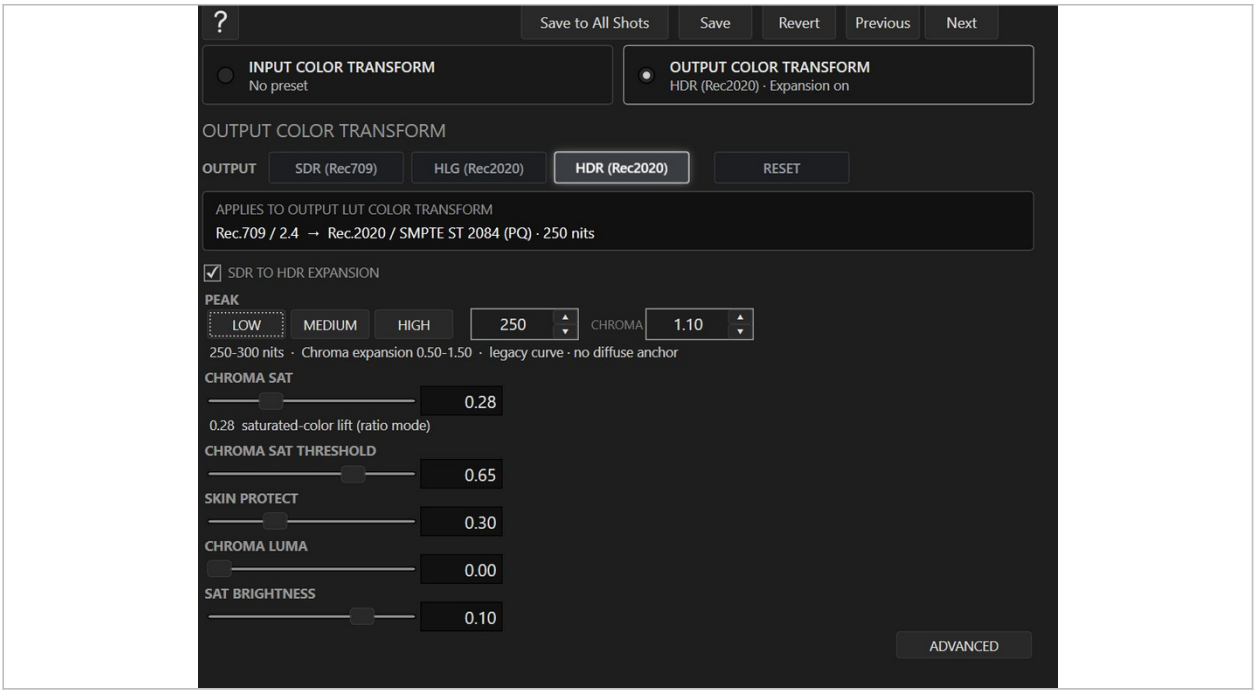


Figure 3.2 — HDR (Rec2020) selected: the summary box shows the input side filled in, and the PEAK panel opens on LOW with its chroma controls.

Step 3 — Choose the peak band

With the SDR to HDR option, click LOW, MEDIUM or HIGH. Each button is a preset recall, not a nits value. Pressing it sets the peak, the expansion curve, the diffuse-white anchor, the mid-grey target, chroma and saturation brightness in one go. Pressing the same button again re-applies the preset, which is how you get back to a known state after experimenting.

The PEAK value beside the buttons shows the peak in nits. The line under the buttons reads out, in order:

- The band's range, e.g. 250-300 nits — hover for which curve the band uses
- The ranges CHROMA can be set to and, at MEDIUM and HIGH, the range of CONTRAST
- The diffuse white, e.g. 280 nits diffuse white, or legacy curve · no diffuse anchor at LOW

legacy curve · no diffuse anchor at LOW is correct and expected. LOW deliberately runs the older curve with no diffuse anchor, which is the behaviour that was approved at NAB.

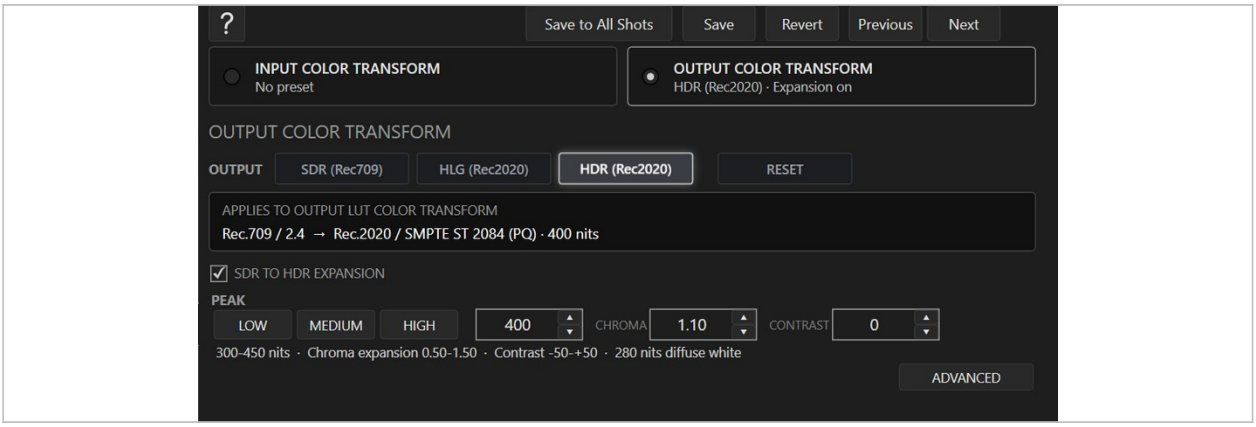


Figure 3.3 — The PEAK panel on MEDIUM: PEAK, CHROMA and CONTRAST on one row, the band range and diffuse white below, and the collapsed ADVANCED button.

Step 4 — Trim the peak, if you need to

The PEAK value beside the band buttons moves the peak within the selected band only. Type a value and press Enter (Esc cancels it), or use the arrows or the mouse wheel. Use it when a deliverable specifies something like 500 nits rather than a round 600.

Moving off a preset peak re-derives the diffuse white proportionally, so the relationship the preset established is kept.

HIGH runs from 450 up to 2000 nits, so a brighter deliverable such as 1000 nits is set the same way. HIGH's preset is tuned at 600 nits; above that the curve keeps HIGH's shape, but no preset has been tuned there, so check the result on a display that can show that peak.

Step 5 — Adjust CHROMA, if you need to

CHROMA scales the overall chroma expansion. Its value sits beside the PEAK value on the same row, and it defaults to 1.10 on every band; pressing a band button resets it.

Judge it on skin tones first. Lower it if colour reads heavy or over-expanded; raise it if the image reads flat. Small moves — 0.02 to 0.05 — are meaningful. PEAK and CHROMA are the only two controls most work needs. Apart from LOW's chroma controls, described below, everything else is under ADVANCED.

At MEDIUM and HIGH a CONTRAST value sits beside CHROMA. It sets mid-tone contrast around the band's preset: 0 is the preset, positive values darken the mid-tones for more contrast, and negative values lift them, across -50 to +50. LOW has no mid-tone anchor, so CONTRAST is not shown there. Pressing a band button resets it.

At LOW, five more controls sit below the PEAK row (Figure 3.2). They shape how LOW expands color; MEDIUM and HIGH do not use them, and they require the SDR to HDR option.

- CHROMA SAT — extra expansion for saturated colors, on top of CHROMA. Set CHROMA by skin tones first, then CHROMA SAT by the saturated colors. 0 to 1; LOW sets 0.28.
- CHROMA SAT THRESHOLD — the source saturation where the CHROMA SAT lift starts. Colors below it stay at the CHROMA base; raise it to keep more skin and foliage there. 0 to 0.9; LOW sets 0.65.
- SKIN PROTECT — keeps the CHROMA SAT lift off skin hues: 1 exempts skin fully, 0 turns protection off. 0 to 1; LOW sets 0.30.
- CHROMA LUMA — makes brighter colors expand harder. 0 keeps the expansion the same at every brightness. 0 to 1; LOW sets 0.
- SAT BRIGHTNESS — the brightness of saturated colors relative to the tone curve: negative darkens, positive brightens. -3 to 1; LOW sets 0.10.

Pressing LOW puts all five back to these values.

Step 6 — Save to every shot and run the Dolby Vision analysis

In a composition, each shot keeps its own color settings. Once the shot looks right, click Save to All Shots at the top of the Dolby tab: it saves this shot's color, expansion included, to every shot visible in the composition event list. It copies the whole color setup of the shot, not only the transform, and if the event list is filtered, only the shots it shows are changed.

Any change to the expansion invalidates existing Dolby Vision metadata. Re-run the L1 analysis after you settle the settings, not before.

Once the composition has analysis, the whole expansion section is locked: an amber banner reads "Locked — this composition has Dolby analysis. Editing the transform invalidates it." with an UNLOCK TO

EDIT button. Unlocking lets you edit but leaves the existing metadata in place and stale until you re-analyse.

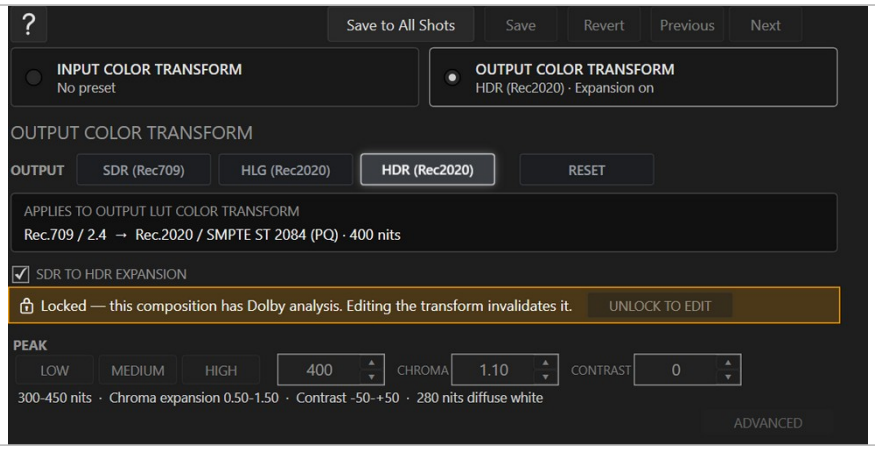


Figure 3.4 — The lock banner shown once the composition carries Dolby analysis.

ADVANCED (reference only)

The ADVANCED button, at the bottom right of the PEAK panel, opens the tuning controls in three groups: STAGE 4 / S-CURVE (knee nits, SDR white nits, diffuse nits, mids nits, mids sat comp, sat brightness, soft width nits, knee2 frac and knee2 soft width nits), STAGE 5 / CHROMA (chroma global) and STAGE 2 / PER-HUE ROTATION (nine hue angles, from R to M). RESET TO DEFAULTS returns all of them to factory values, then re-applies the current band's preset, so the shot stays in its band. ADVANCED requires the SDR to HDR option.

These exist for support and for tuning new presets. Normal delivery work should not need them, and changing one puts the shot off-preset — the band buttons will put it back.

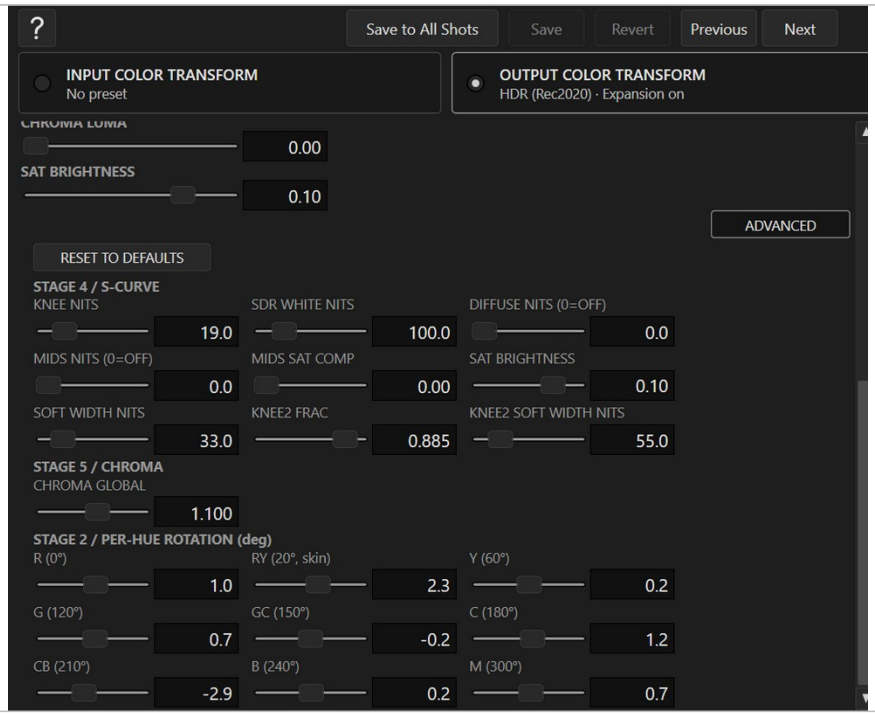


Figure 3.5 — ADVANCED expanded: STAGE 4 / S-CURVE, STAGE 5 / CHROMA and STAGE 2 / PER-HUE ROTATION.

Without the SDR to HDR Option

The full PEAK panel — the LOW, MEDIUM and HIGH buttons, the PEAK value, CHROMA, CONTRAST, LOW's chroma controls and ADVANCED — requires the SDR to HDR option. Without it the expansion still runs, on the LOW band, and the Color tool shows a read-only PEAK readout in place of the controls: the band, then the peak it is rendering at and the band's range, e.g. Low 250 nits · 250-300 nits.

MAX NITS is locked too while the transform is SDR to HDR, since the band sets the peak. It stays editable for any other HDR output.

A composition graded on a system that has the option keeps its band. If it was set to MEDIUM or HIGH, the readout shows that band and the composition renders exactly as graded — on this system and on any render node. Nothing is reset when the composition is opened; the band simply cannot be changed from here.

Steps 1, 2 and 6 apply as written: choose HDR (Rec2020) on the OUTPUT row, check the input side, save to every shot, then run the Dolby Vision analysis.

Evaluation licenses include the SDR to HDR option. To add it to a purchased license, contact your reseller or MTI Film.

3. Converting on Ingest with the SDR to HDR Workflow Action

Use this when you have a batch to convert rather than a single shot. The action creates the composition, applies the transform, makes the cuts, runs the Dolby Vision analysis, and optionally renders the HDR deliverable — unattended.

Step 1 — Create the workflow

In the workflow editor, set the import action type to SDR to HDR. The options dialog opens by itself the first time; afterwards, reopen it with the Options button next to the action.

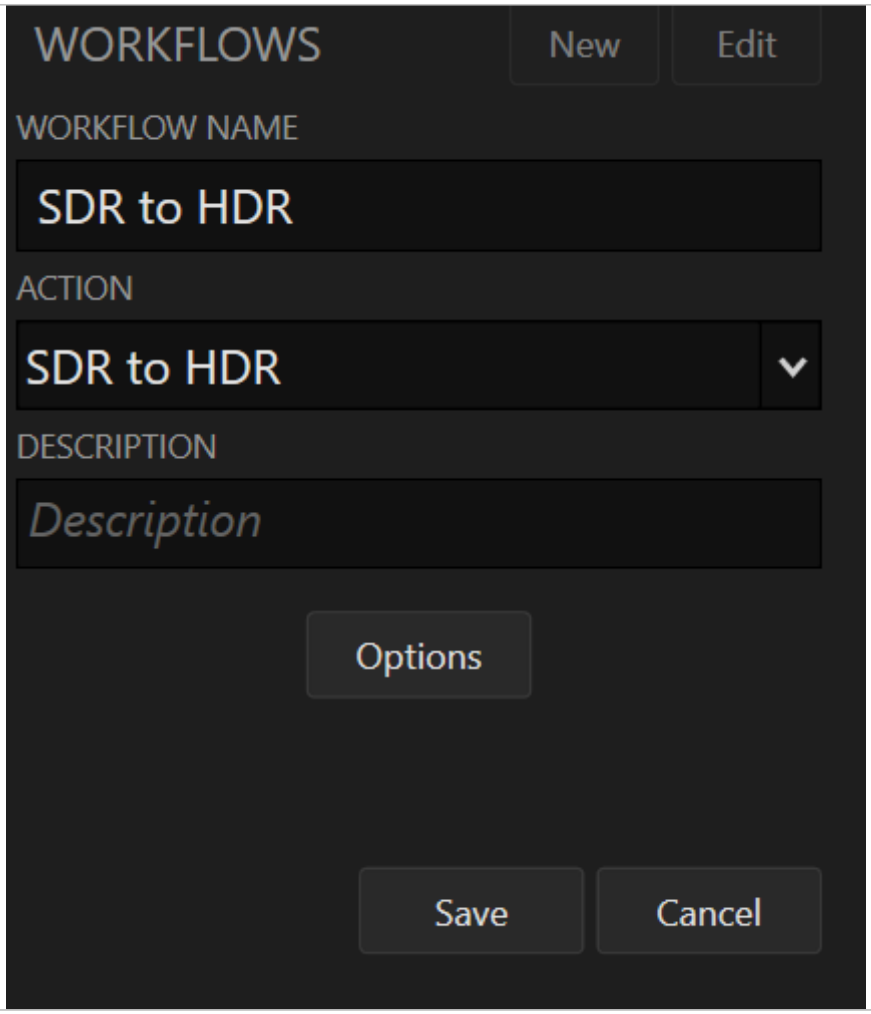


Figure 3.6 — The workflow editor with the action type set to SDR to HDR.

Step 2 — Set the options

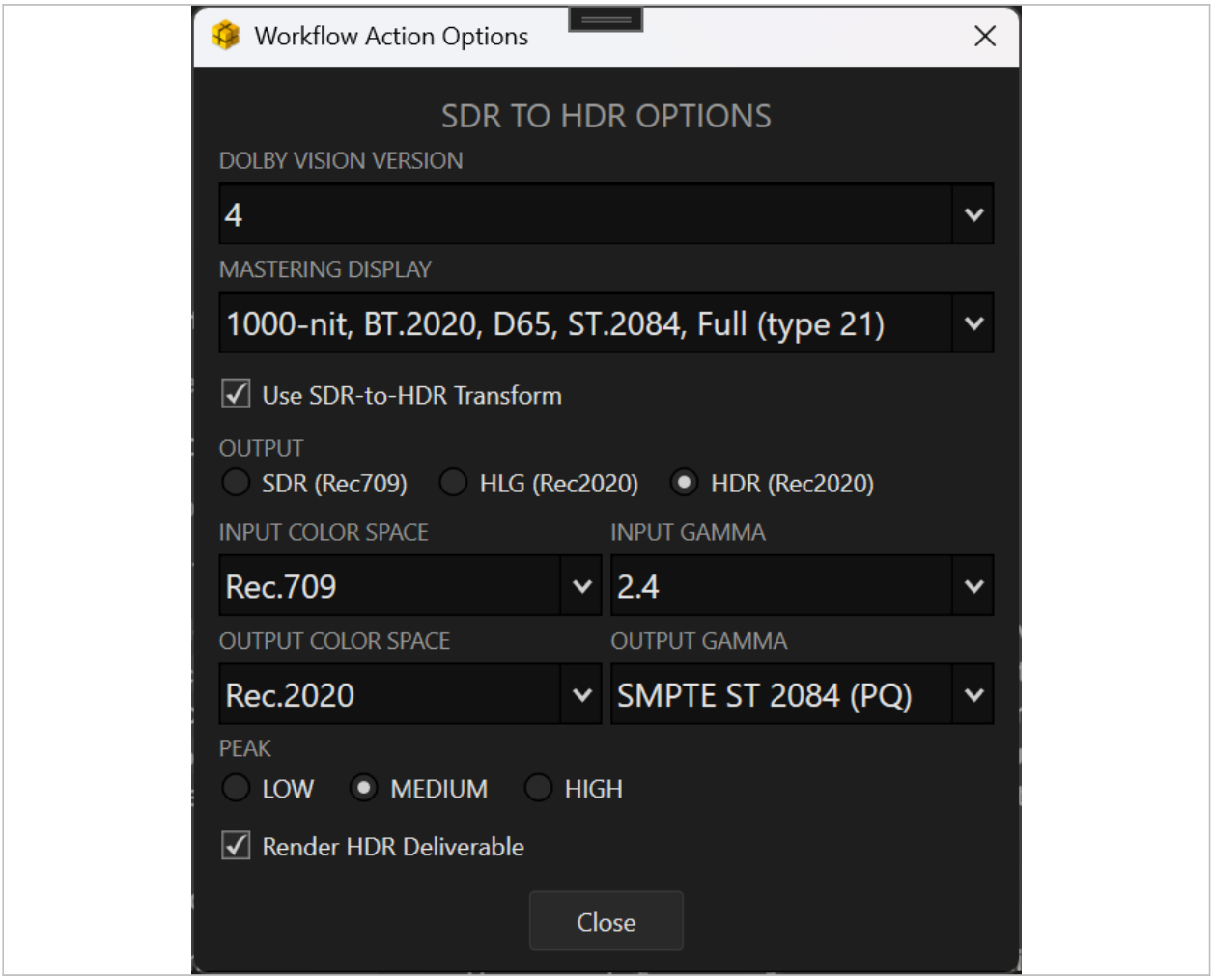


Figure 3.7 — The Workflow Action Options dialog for SDR to HDR.

Control	What it does
DOLBY VISION VERSION	Metadata version written by the analysis
MASTERING DISPLAY	Mastering display the metadata is authored against
Use SDR-to-HDR Transform	On: apply the expansion. Off: apply an output LUT instead, and an OUTPUT LUT picker replaces the controls below
OUTPUT	SDR (Rec709) / HLG (Rec2020) / HDR (Rec2020) — same three presets as the Color tool
INPUT COLOR SPACE / INPUT GAMMA	Describe the source. Set these yourself here — see the note below
OUTPUT COLOR SPACE / OUTPUT GAMMA	Exact target values; the OUTPUT buttons set these for you
PEAK	LOW / MEDIUM / HIGH — the same three bands, same presets. Without the SDR to HDR option PEAK shows LOW and cannot be changed

Render HDR Deliverable	Render automatically once the analysis finishes

The PEAK choice here means exactly what it means in the Color tool. There is no separate nits field: the band carries the peak, and picking a band applies the whole preset. Without the SDR to HDR option the action converts on LOW at 250 nits, whatever band the workflow was saved with. The saved band is kept, so the same workflow still runs MEDIUM or HIGH on a system that has the option — which matters when systems share a database.

Unlike the Color tool, OUTPUT here does not fill in the input for you. In the Color tool the OUTPUT buttons also default the source colour space and gamma; in this dialog they set the target only. Set INPUT COLOR SPACE and INPUT GAMMA to match your source — for a normal Rec.709 SDR master that is Rec709 and 2.4. Getting them wrong shifts the whole conversion and nothing downstream will warn you.

Step 3 — Drop the media

Drag the media onto the workflow action's drop area and run it.

If an EDL is in the drop — dropped alongside the media, or sitting in a dropped folder — the action uses it for the cuts. It merges the EDL instead of running MTai shot detection. If there is no EDL, the action runs MTai shot detection to find the cuts.

Either way, the Dolby Vision analysis follows automatically, and the HDR deliverable renders after it if you ticked that box.

What the action does, in order

- Imports the media and creates the composition
- Applies the SDR to HDR transform (or the output LUT) to the video event
- Makes the cuts — merging the EDL if one was dropped, otherwise MTai shot detection
- Configures the Dolby Vision metadata and runs the L1 analysis
- Renders the HDR deliverable, if requested

4. Troubleshooting

There is no Dolby tab. It appears only while a Dolby Vision composition is selected. Select the composition rather than a clip and check that Dolby Vision metadata is turned on for it, or create the composition with Create Auto Composition with SDR to HDR.

The panel is headed INPUT COLOR TRANSFORM. The Dolby tab opens on the input card. Click the OUTPUT COLOR TRANSFORM card.

The PEAK panel is not showing. It only appears when the source is SDR and the target is HDR. Confirm OUTPUT is set to HDR (Rec2020), and that INPUT COLOR SPACE and INPUT GAMMA still describe an SDR source — clicking OUTPUT sets them for you, but a value set by hand afterwards, or carried in from an older grade, is left alone.

Everything in the expansion section is greyed out. The shot has Dolby Vision metadata. Use UNLOCK TO EDIT in the amber banner, and re-run the analysis afterwards.

Only one shot has the expansion. Each shot in a composition keeps its own color. Click Save to All Shots on the Dolby tab, then re-run the analysis.

The diffuse readout says "legacy curve · no diffuse anchor". That is correct at LOW. LOW runs a curve with no diffuse anchor by design.

The Dolby metadata does not match what I am seeing. The analysis reflects the expansion at the time it ran. Any change since then leaves it stale — re-run it.

The workflow action finished but nothing was analysed. Check the log for "Workflow does not contain…" messages, and confirm the action type on the workflow is actually SDR to HDR.

There are no LOW, MEDIUM or HIGH buttons — just a PEAK readout. This system does not have the SDR to HDR option. The conversion still runs, on LOW; see Without the SDR to HDR Option.

MAX NITS is greyed out. With an SDR to HDR transform that also means the option is not licensed: the peak comes from the band. MAX NITS stays editable for other HDR outputs.

A workflow set to MEDIUM or HIGH ran on LOW. The system that ran it does not have the SDR to HDR option. The workflow's own setting is unchanged, and systems that have the option still run it as set.

Appendix A: v7.0 Release Notes — Tips and Tricks Reference

The walkthrough below is carried forward from the release-notes tips that have accompanied recent Cortex versions, illustrating the Project Manager, Workflow Actions, and restoration tools referenced in New and Enhanced Features. Screenshots and menu labels reflect the interface at the time of writing and are updated periodically as the UI evolves.

Using NOVA Paint to either insert a frame from the source or selectively paint in a region using the provided toolset and new side by side mode for viewing. All corrections made automatically update inside of CORTEX. NOVA Paint is an optional feature that supports DPX file only.

New Project Manager Preferences A new streamlined CORTEX Project Manager with Display Preferences Easily define how many Episodes or Days for a Project during set-up. Select which Workflow Actions will be displayed for an operator to select per Project. No need to create a JOB specific to a Workflow Action once created. Simply drag and drop and CORTEX will automate the JOB creation process.

Dolby Vision 5.0 now included in V7.0 Previously a paid option, DOLBY Vision 5.0 is now standard Full support for DOLBY Vision 5.0 Content Mapping and Dolby Atmos sound support have been bundled into v7.0 and is no longer an extra option but an included feature..

Full Compatibility with Latest Dolby Atmos Specifications Immersive Audio Integration CORTEX v7.0 offers full compatibility with v5.0 Dolby Atmos specifications, enabling seamless integration of immersive audio technologies.

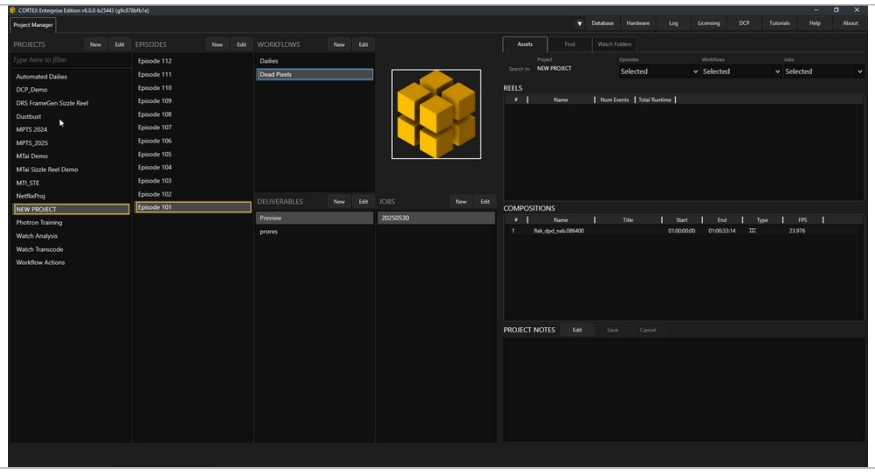
Automated IMF Validation with the new Create IMF Workflow Action Simplified Compliant Content Delivery IMF packages are automatically imported and validated after creation, simplifying the delivery process for compliant content distribution.

Expanded DCP Agency Ratings and Render Mode Selection Greater Flexibility and Control Enhanced support for Digital Cinema Package (DCP) agency ratings and render mode selection provides you with greater flexibility and control over your output formats.

We are confident that these new features and improvements in CORTEX v7.0 will streamline your post-production processes, ensuring higher efficiency and quality in your projects.

For any questions or support, please do not hesitate to contact our team at support@mtifilm.com.

V7.0 Release Notes: TIPS and TRICKS



WORKFLOW ACTIONS inside the new V7.0 Project Manager

V7.0 Project Manager Interface

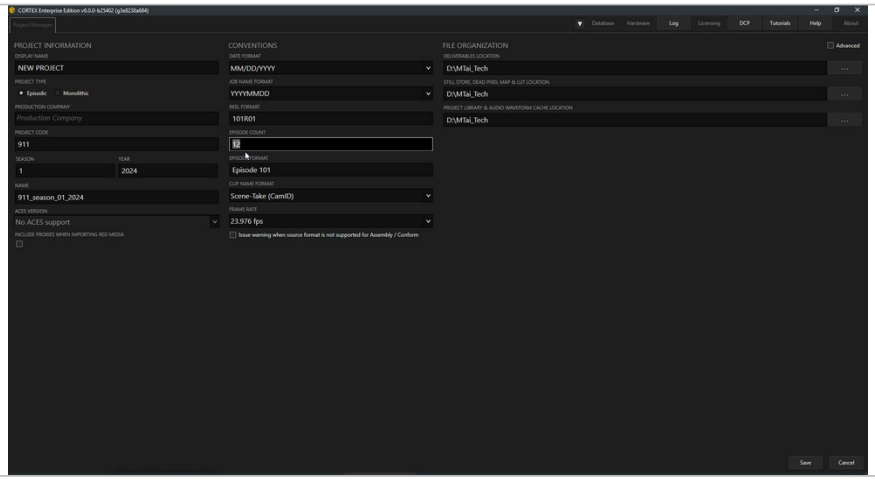
To create a new Project, simply click on NEW next to the PROJECT Tab

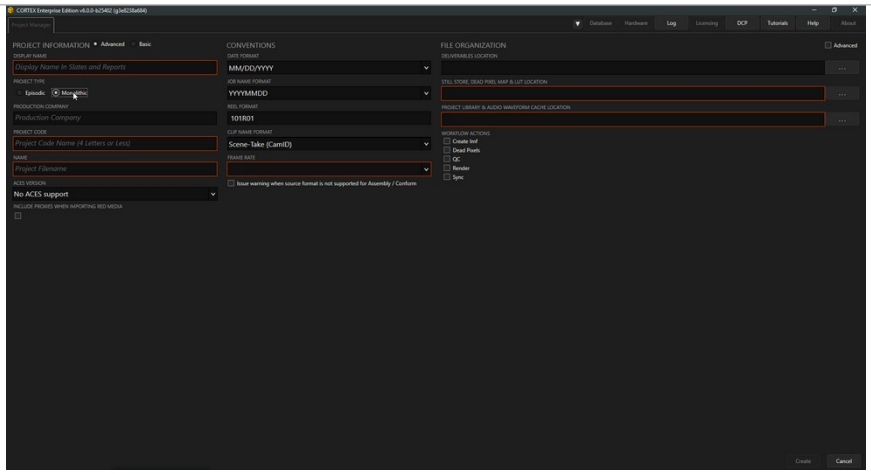
In version 7.0, a new Project Manager Interface is introduced that updates the process of creating jobs from past CORTEX versions. In V7.0, when a NEW project is created, there are two Project options to start with; ADVANCED or BASIC.

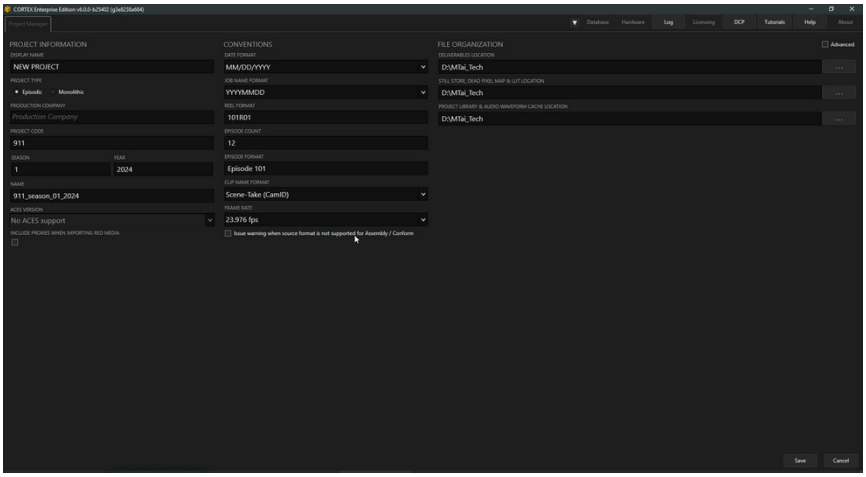
If ADVANCED is selected, the fields that are required to be completed are outlined in RED and allow the operator to easily step through the project creation process from the project Name to adding a shortcut project code name and most important, the project FrameRate. In addition the directory where the project deliverables will be directed to must be completed to properly SAVE the project and get to work on setting up a Workflow Action.

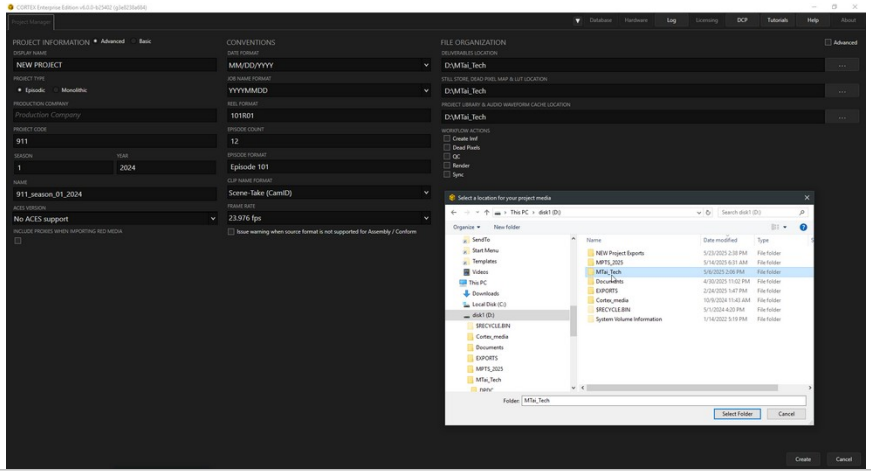
There are two modes for the ADVANCED project and that is Episodic (for TV workflows) and Monolithic (for feature film workflows). Each mode has different required fields outlined in red to complete that allows the user to step through the set-up project and SAVE the project.

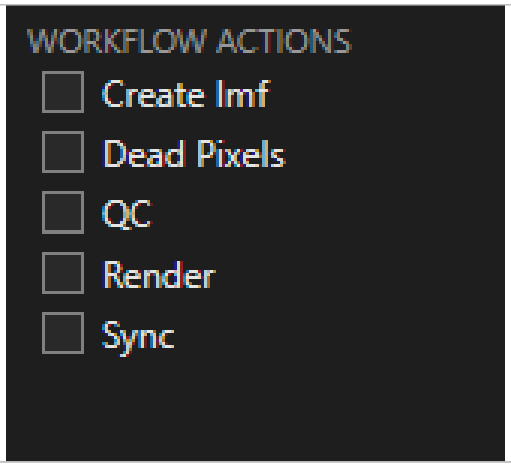
Episodic Mode with option to add # of episodes per Project Monolithic Mode for reel based projects




PROJECT INFORMATION
Advanced
Basic
DISPLAY NAME
Display Name In States and Reports
PROJECT TYPE
Episodic
Monolithic
PRODUCTION COMPANY
Production Company
PROJECT CODE
Project Code Name (4 Letters or Less)
NAME
Project Filename
ACES VERSION
No ACES support
INCLUDE PROXIES WHEN IMPORTING RED MEDIA
CONVENTIONS
DATE FORMAT
MM/DD/YYYY
JOB NAME FORMAT
YYYYMMDD
REEL FORMAT
101R01
CLIP NAME FORMAT
Scene-Take (CamID)
FRAME RATE
Issue warning when source format is not supported for Assembly / Conform
FILE ORGANIZATION
Advanced
DELIVERABLES LOCATION
STILL STORE, DEAD PIXEL MAP & LUT LOCATION
PROJECT LIBRARY & AUDIO WAVEFORM CACHE LOCATION
WORKFLOW ACTIONS
Create Inrf
Dead Pixels
QC
Render
Sync
Create
Cancel


PROJECT INFORMATION
DISPLAY NAME
NEW PROJECT
PROJECT TYPE
Episodic
Monolithic
PRODUCTION COMPANY
Production Company
PROJECT CODE
911
SEASON
1
YEAR
2024
NAME
911_season_01_2024
ACES VERSION
No ACES support
INCLUDE PROXIES WHEN IMPORTING RED MEDIA
CONVENTIONS
DATE FORMAT
MM/DD/YYYY
JOB NAME FORMAT
YYYYMMDD
REEL FORMAT
101R01
EPISODE COUNT
12
EPISODE FORMAT
Episode 101
CLIP NAME FORMAT
Scene-Take (CamID)
FRAME RATE
23.976 fps
Issue warning when source format is not supported for Assembly / Conform
FILE ORGANIZATION
Advanced
DELIVERABLES LOCATION
D:\MTai_Tech
STILL STORE, DEAD PIXEL MAP & LUT LOCATION
D:\MTai_Tech
PROJECT LIBRARY & AUDIO WAVEFORM CACHE LOCATION
D:\MTai_Tech
Save
Cancel

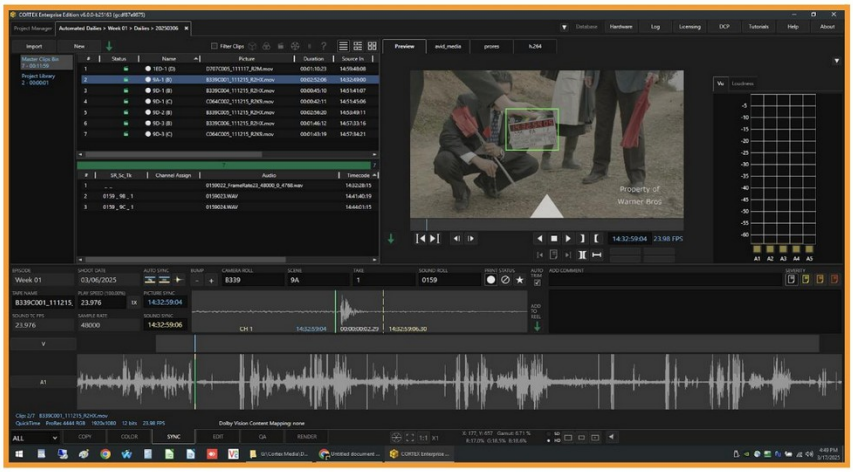

PROJECT INFORMATION
Advanced
Basic
DISPLAY NAME
NEW PROJECT
PROJECT TYPE
Episodic
Monolithic
PRODUCTION COMPANY
Production Company
PROJECT CODE
911
SEASON
1
YEAR
2024
NAME
911_season_01_2024
ACES VERSION
No ACES support
INCLUDE PROXIES WHEN IMPORTING RED MEDIA
CONVENTIONS
DATE FORMAT
MM/DD/YYYY
JOB NAME FORMAT
YYYYMMDD
REEL FORMAT
101R01
EPISODE COUNT
12
EPISODE FORMAT
Episode 101
CLIP NAME FORMAT
Scene-Take (CamID)
FRAME RATE
23.976 fps
Issue warning when source format is not supported for Assembly / Conform
FILE ORGANIZATION
Advanced
DELIVERABLES LOCATION
D:\MTai_Tech
STILL STORE, DEAD PIXEL MAP & LUT LOCATION
D:\MTai_Tech
PROJECT LIBRARY & AUDIO WAVEFORM CACHE LOCATION
D:\MTai_Tech
WORKFLOW ACTIONS
Create Inrf
Dead Pixels
QC
Render
Sync
Select a location for your project media
Folder:
MTai_Tech
Select Folder
Cancel
Create
Cancel



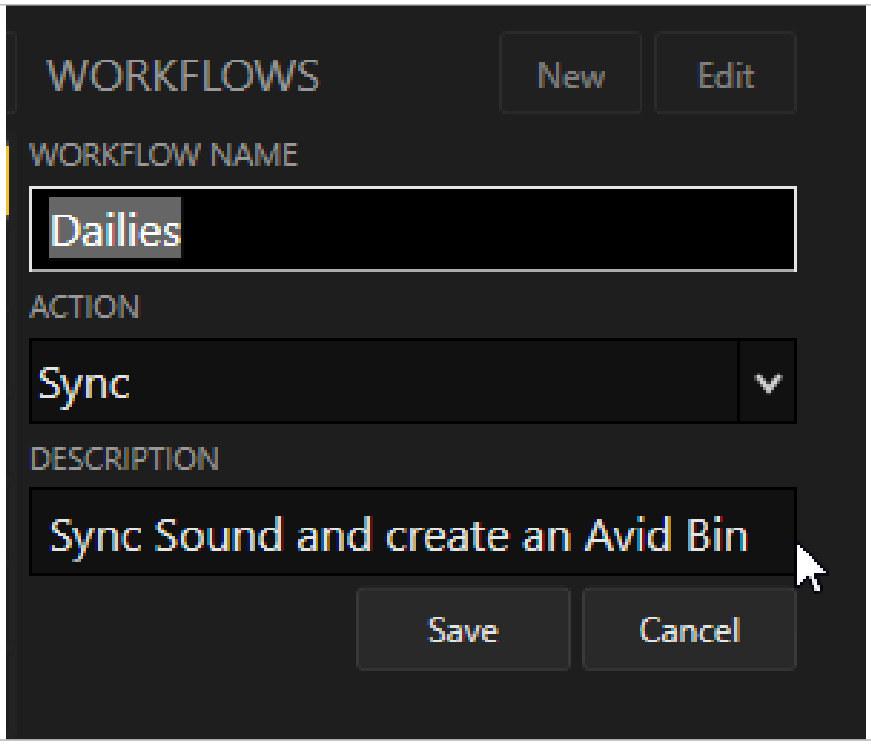
Define a project's Frame rate by selecting preset frame rates from the pull down menu. Browse to a select folder to point CORTEX to the exact location where project deliverables will be rendered and reports deposited into after a render is completed.

CORTEX V7.0 Project preferences also allow a user to choose what Workflow Actions templates are displayed in the WORKFLOW module for selection.

Workflow Action Configuration



CORTEX Dailies with MTai Slate Detection

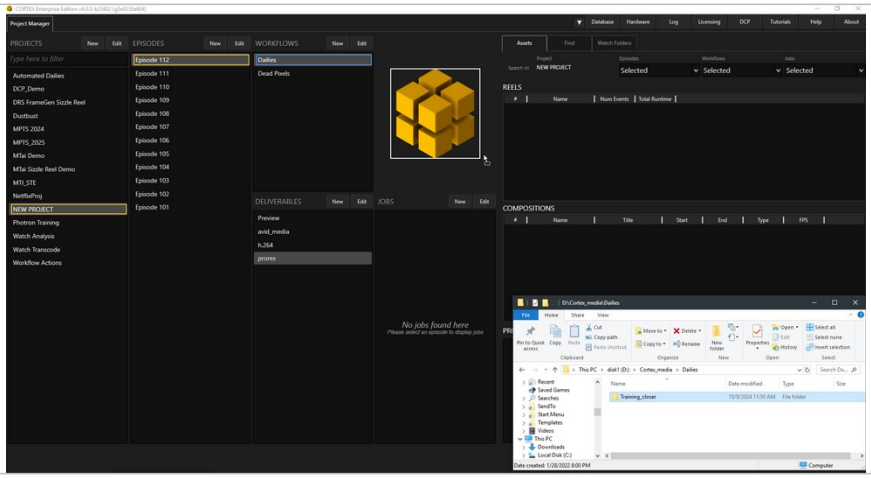


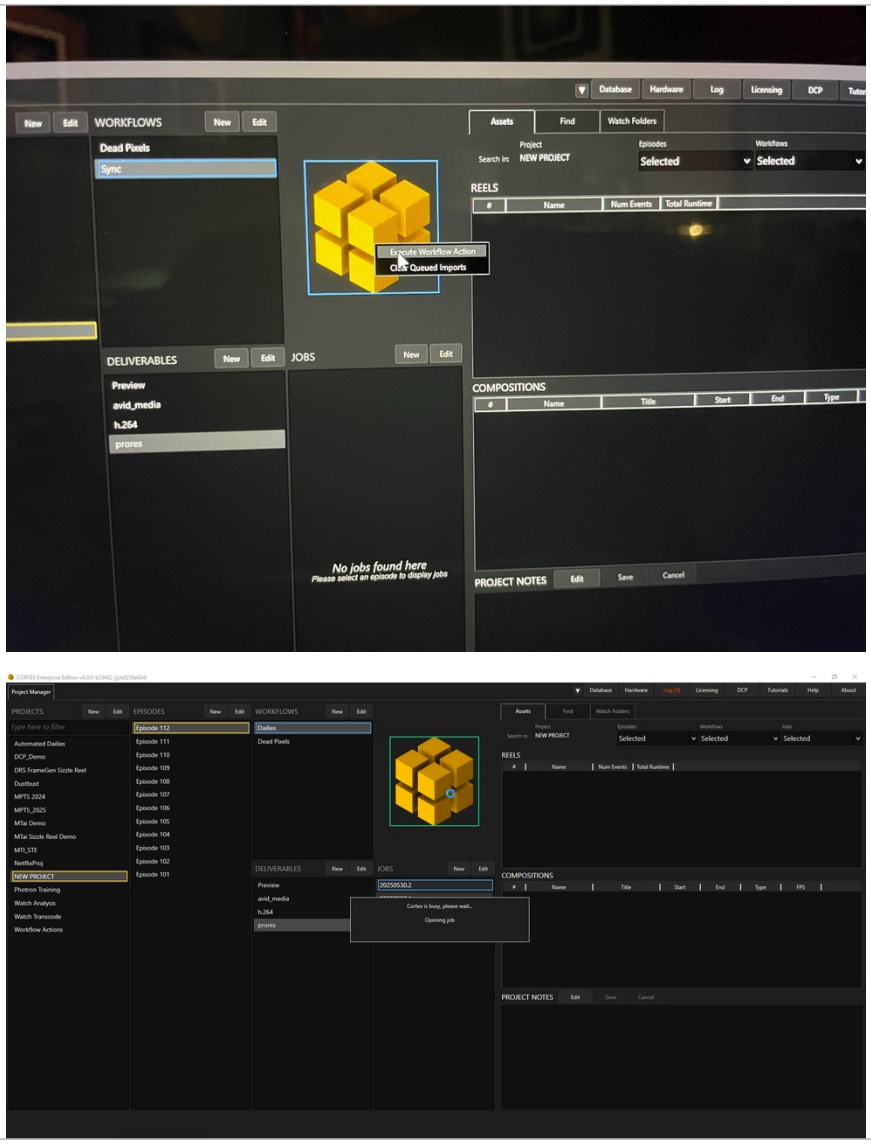
Let's start with MTai Slate Detect

MTai Slate Detect helps speed up the logging process during a Dailies session by using AI to assist the operator in locating the closed slate in a scene.

To use a Workflow Action for dailies, simply select a Project from the list in the Project Manager and under the Workflow column, type in the name you desire for the Workflow Action, such as Dailies, or Sound Sync, and then click on the pull down arrow next to the entry field and see the list of available of templatized Workflow Actions.

Select Sync for automated sound sync inside of a Project. You can optionally add a further description such as "sync sound and create an Avid bin". This field is purely reference for the operator(s) using Cortex.

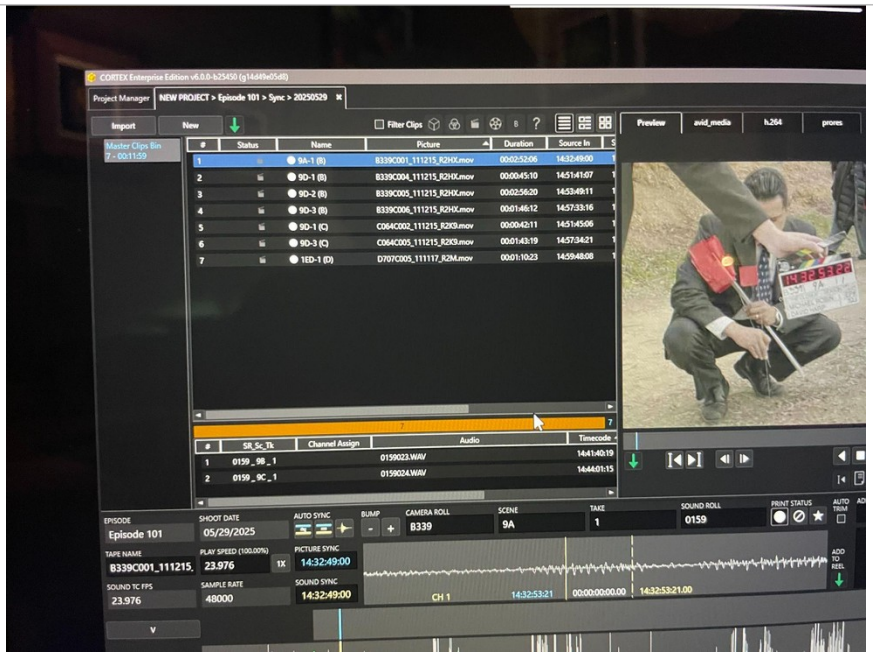


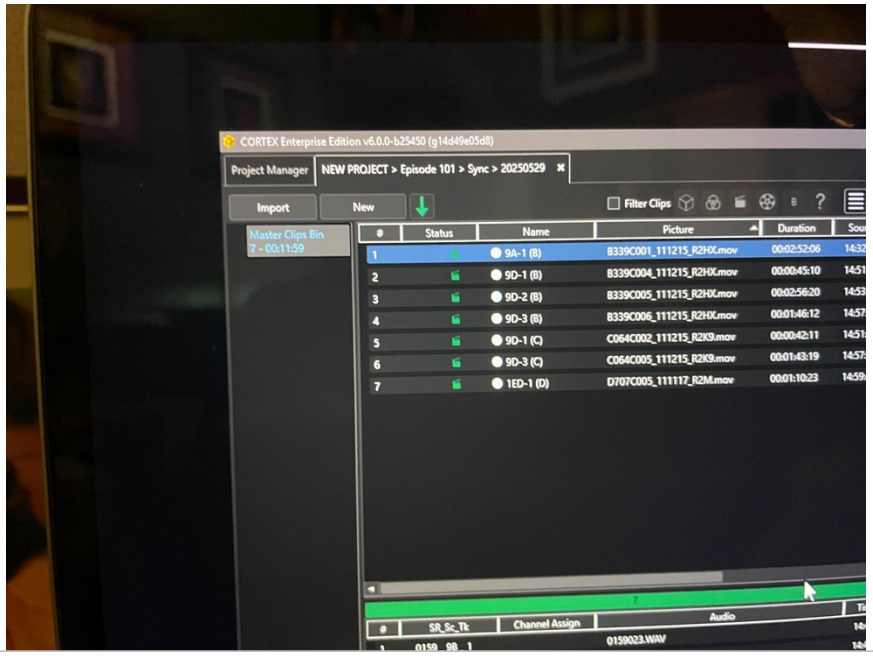


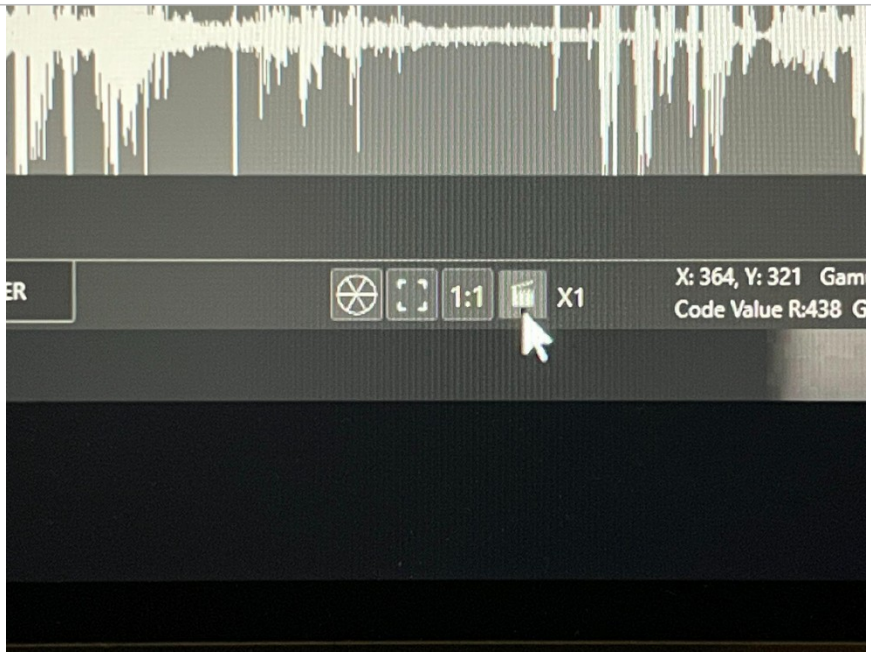
Then open up the File Manager and browse to the location of your dailies content. This folder can contain both OCN and Audio files and they do not need to be discreet files but they can contain a folder called OCN that may contain sub-folders for different camera rolls. The audio files can be in a separate folder as well called Audio for example.

The top level folder containing the picture and sound files can be selected and then dragged and dropped onto the CORTEX icon inside the project manager. The CORTEX logo initially when a project is created, has a WHITE bounding box surrounding the CORTEX logo. When media is added, it turns color states from WHITE to BLUE, alerting the operator that media has been added and that more content can be added if required. CORTEX will remain in this state until either the Enter key is clicked on or if the operator Right Clicks on the CORTEX logo and selects the text “Execute Workflow Action”.

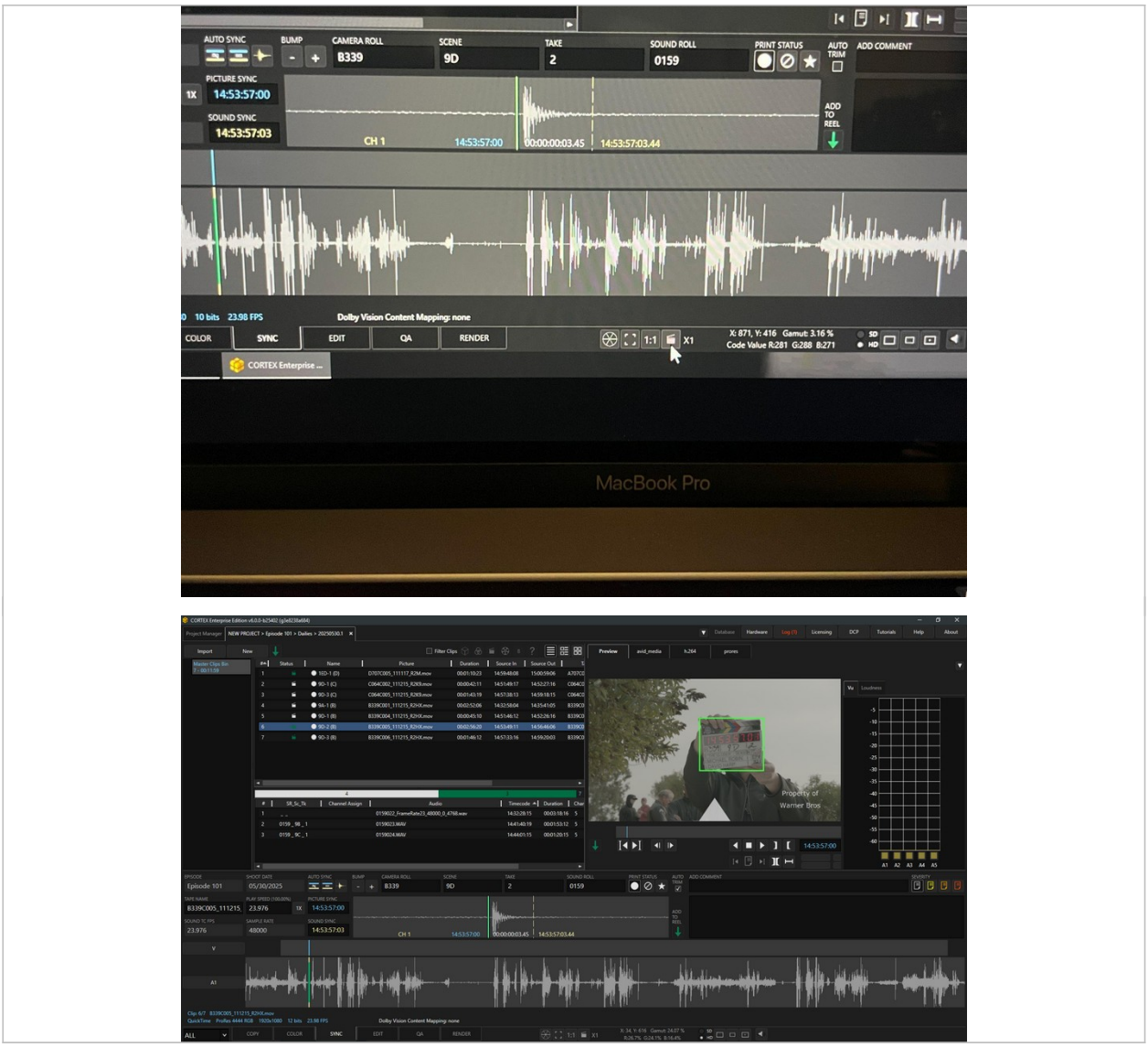
At this point, the CORTEX logo will change color states from BLUE to GREEN. CORTEX will then create a new incremental JOB, either a new date or version of the existing JOB and automatically launch the Workflow Action that was selected, which is Sync, and the new JOB will open and CORTEX, powered by MTai, will then automatically import the media into the proper video and audio bins. It will display the detected number of events loaded and then initiate the MTai Slate Detect to locate and identify the closed slate in each take.


CORTEX Enterprise Edition v6.0.0-b25450 (g14d49e05d8)
Project Manager
NEW PROJECT > Episode 101 > Sync > 20250529
Import
New
Filter Clips
Preview
avid_media
h.264
prores
Master Clips Bin
7 - 00:11:59
Status
Name
Picture
Duration
Source In
9A-1 (B)
9D-1 (B)
9D-2 (B)
9D-3 (B)
9D-1 (C)
9D-3 (C)
1ED-1 (D)
B339C001_111215_R2HX.mov
B339C004_111215_R2HX.mov
B339C005_111215_R2HX.mov
B339C006_111215_R2HX.mov
C064C002_111215_R2K9.mov
C064C005_111215_R2K9.mov
D707C005_111117_R2M.mov
00:02:52:06
00:00:45:10
00:02:56:20
00:01:46:12
00:00:42:11
00:01:43:19
00:01:10:23
14:32:49:00
14:51:41:07
14:53:49:11
14:57:33:16
14:51:45:06
14:57:34:21
14:59:48:08
SR_Sc_Tk
Channel Assign
Audio
Timecode
0159_9B_1
0159_9C_1
0159023.WAV
0159024.WAV
14:41:40:19
14:44:01:15
EPISODE
Episode 101
SHOOT DATE
05/29/2025
AUTO SYNC
BUMP
CAMERA ROLL
B339
SCENE
9A
TAKE
1
SOUND ROLL
0159
PRINT STATUS
AUTO TRIM
TAPE NAME
B339C001_111215_
PLAY SPEED (100.00%)
23.976
1X
PICTURE SYNC
14:32:49:00
SOUND TC FPS
23.976
SAMPLE RATE
48000
SOUND SYNC
14:32:49:00
CH 1
14:32:53:21
00:00:00:00.00
14:32:53:21.00
ADD TO REEL


CORTEX Enterprise Edition v6.0.0-b25450 (g14d49e05d8)
Project Manager
NEW PROJECT > Episode 101 > Sync > 20250529
Import
New
Filter Clips
Master Clips Bin
7 - 00:11:59
Status
Name
Picture
Duration
9A-1 (B)
9D-1 (B)
9D-2 (B)
9D-3 (B)
9D-1 (C)
9D-3 (C)
1ED-1 (D)
B339C001_111215_R2HX.mov
B339C004_111215_R2HX.mov
B339C005_111215_R2HX.mov
B339C006_111215_R2HX.mov
C064C002_111215_R2K9.mov
C064C005_111215_R2K9.mov
D707C005_111117_R2M.mov
00:02:52:06
00:00:45:10
00:02:56:20
00:01:46:12
00:00:42:11
00:01:43:19
00:01:10:23
SR_Sc_Tk
Channel Assign
Audio
0159023.WAV

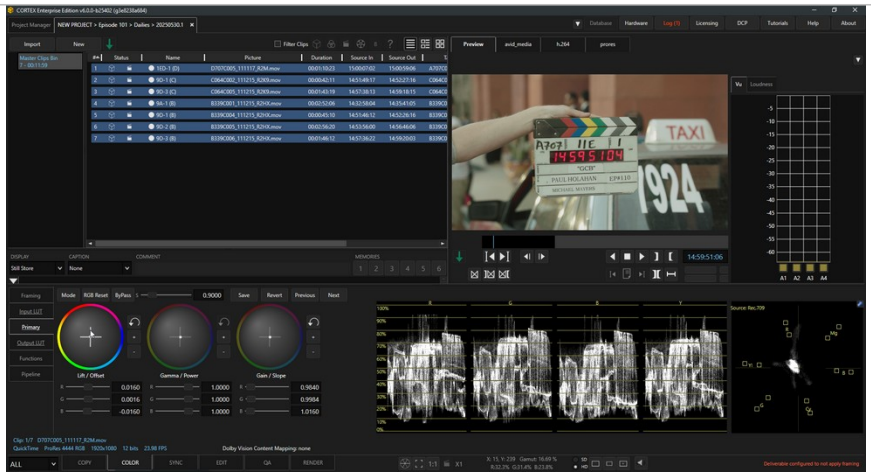

1:1
X1
X: 364, Y: 321
Code Value R:438

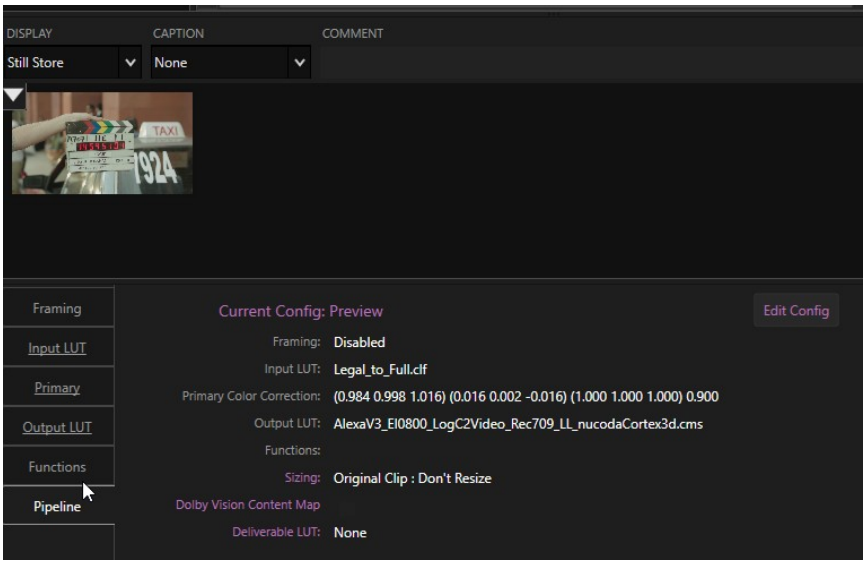

Preview
avid_media
h.264
prores
B339
9D
2
"THE CLOSER" – SEASON 7
MICHAEL ROBIN
DAVID HARP
EP#
721
14:53:57:00
23.98 FPS
TAKE
SOUND ROLL
0159
PRINT STATUS
AUTO TRIM
ADD COMMENT



The Status column, displayed at the top of the Video Bin, shows a series of Grey slates that turn Green as the MTai Slate Detect locates the Slate. If no Slate is found it will become the color Red. If a Slate is detected but not yet located at the closed position, the slate icon will turn Orange.

Once the operator confirms that the found location is actually the closed slate, the operator can hit the “D” key to auto-sync the picture and sound. The operator can vet the detection but toggling abc and forth with the “S” key to go back and the “F” key to go forward to confirm the slate is closed and to listen to the clapper sound for confidence. Once confident, the operators can use the Up and Down arrow keys to advance the next take to confirm the slate is closed, to hit the “D” key and sync the sound.







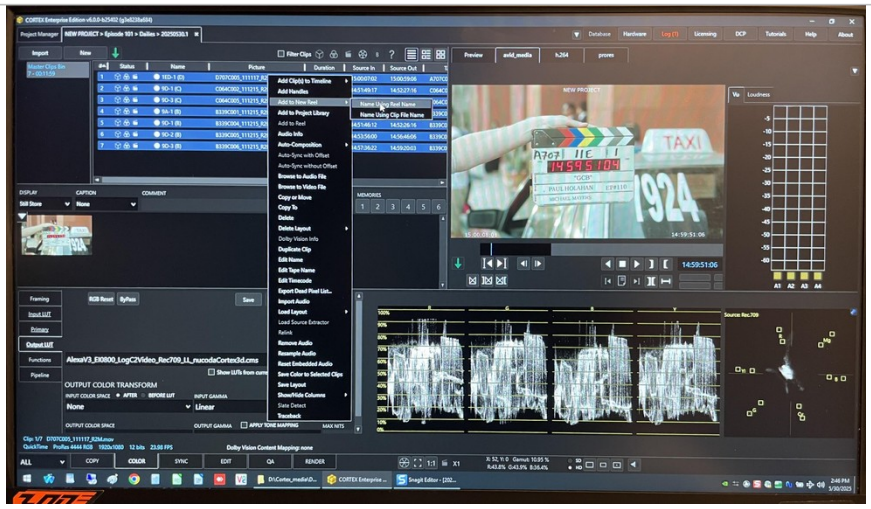
Once the sound is synchronized, the operator or an external colorist on another machine using CORTEX, can open the project and add color with a full Primary only color pipeline. Input file format decoder, input LUT, Primary only color correction as a CDL with LIFT/Gamma/Gain or Offset/Power/Slope and SAT. Output LUT and with the ability to add custom framing.

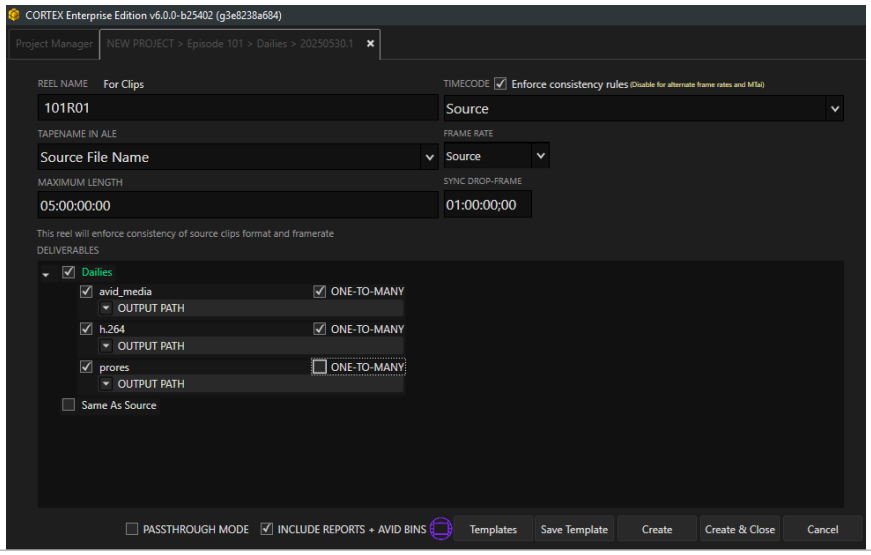
CORTEX also supports VIDEO Restoration and inside the COLOR tab, the FUNCTION module offers up additional tools for adding a 3D Comb filter, or apply a DeHalo filter, Deinterlace NTSC or PAL material, sharpen or add grain to a clip and use the MTI HQ UpRes tool inside this COLOR pipeline.

Within the project Master clips bin, an operator or colorist can select any clip or a range of selected clips and add these clips to a reel for rendering. To do this, the operator would select and highlight the clips

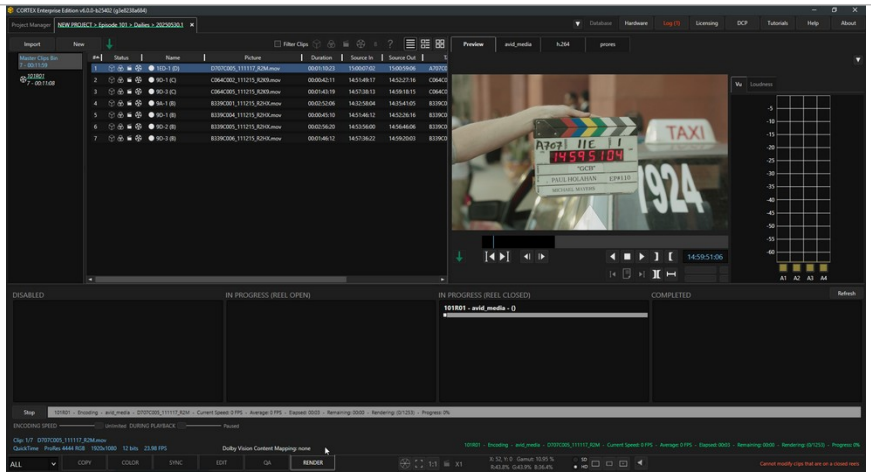
BLUE, then right click, select Add Clips to Reel, choose either using Clip Name or Reel Name and then select enter.

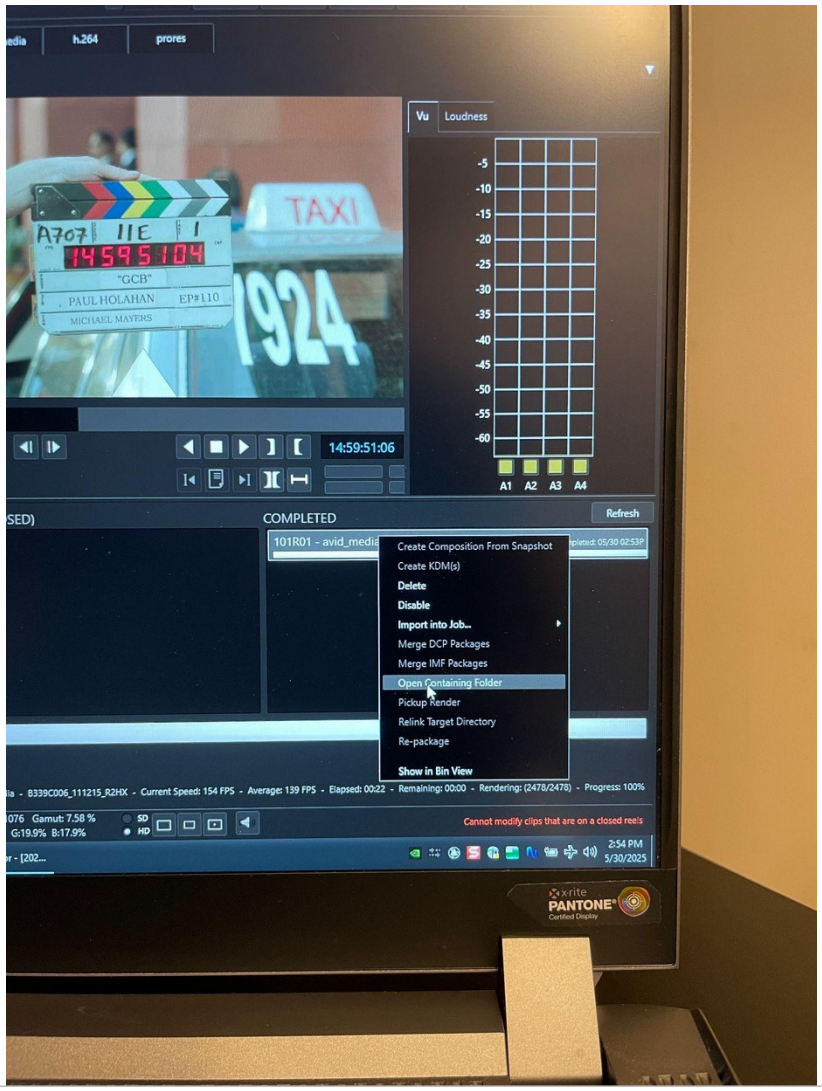
This will open up the Project Manager Render queue where an operator can name the reel, choose to select a different frame rate using MTai Frame Convert or NONE and render to one or all of the selected Deliverables listed. If the desired deliverable is not listed, the operator must go back to the project Manager and add a Deliverable of choice to the Workflow Action and then repeat the steps listed above to add the media to the render queue by adding it to a reel and then selecting the newly added Deliverables.

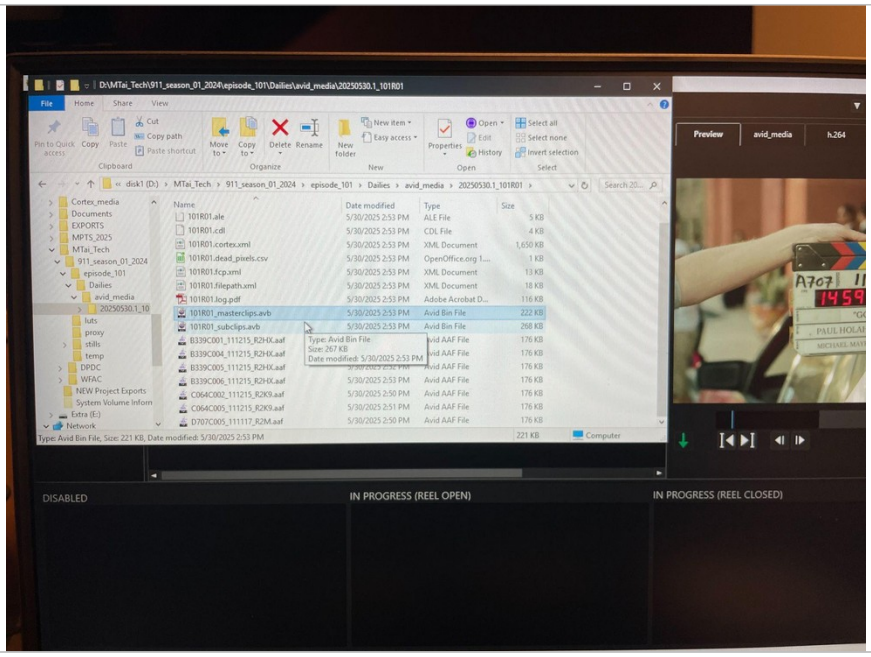




Deliverables can be rendered all at once by selecting the check boxes next to One-to-Many for each deliverable type. If one deliverable needs to be rendered earlier, then this item can be selected and rendered on its own without One-to-Many selected.




h.264
prores
Vu
Loudness
TAXI
A707 IIE 1
14595104
"GCB"
PAUL HOLAHAN EP#110
MICHAEL MYERS
1924
14:59:51:06
A1 A2 A3 A4
COMPLETED
Refresh
101R01 - avid_media
Create Composition From Snapshot
Create KDM(s)
Delete
Disable
Import into Job...
Merge DCP Packages
Merge IMF Packages
Open Containing Folder
Pickup Render
Relink Target Directory
Re-package
Show in Bin View
Current Speed: 154 FPS - Average: 139 FPS - Elapsed: 00:22 - Remaining: 00:00 - Rendering: (2478/2478) - Progress: 100%
Cannot modify clips that are on a closed reels
2:54 PM
5/30/2025
PANTONE

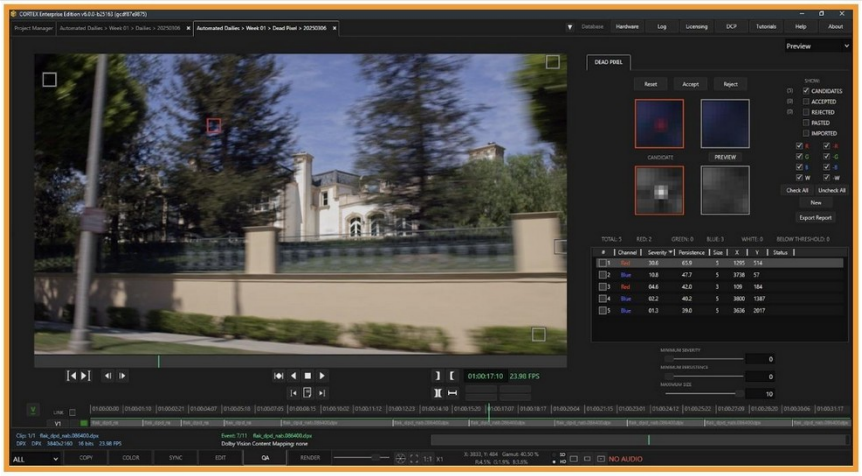


Once a render Reel is created, it can be left open or closed. If left open, other CORTEX operators or systems sharing the project can add additional clips to a reel that is open and it will continue to stay open until closed. Upon close it will finalize the render and display this in the RENDER tab.

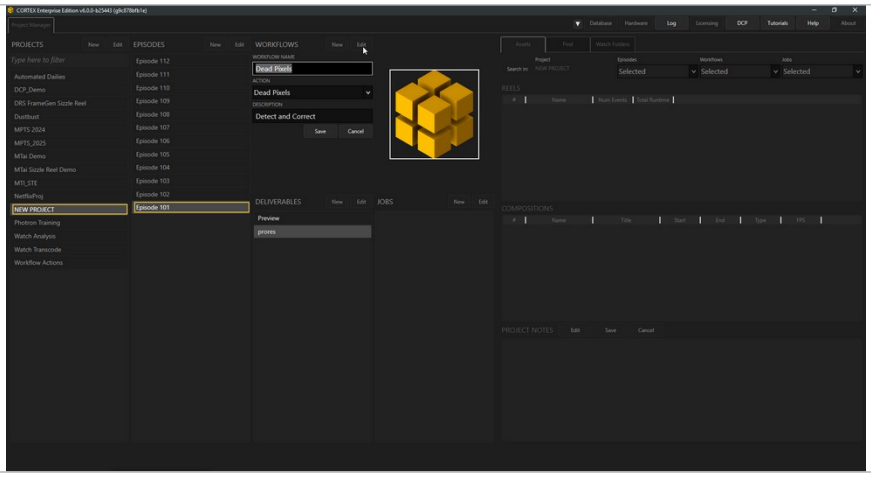
Once a render is COMPLETED, it will move into and display this information in the COMPLETED render column. By right clicking on this render, the operator can import back into the project for additional Workflow Action processing or for QC. The other option is to “Open the Containing Folder” to browse to the rendered media for quick review or copy to a shuttle drive or storage area file location.

For Avid MediaFiles, when setting up the Avid Deliverable, there is a Pathway to be defined for where the Avid Media Files will be located in the proper Avid MediaFiles/MXF/1 directory structure. The Avid Bins will be located in the root directory of the Project Deliverables folder.

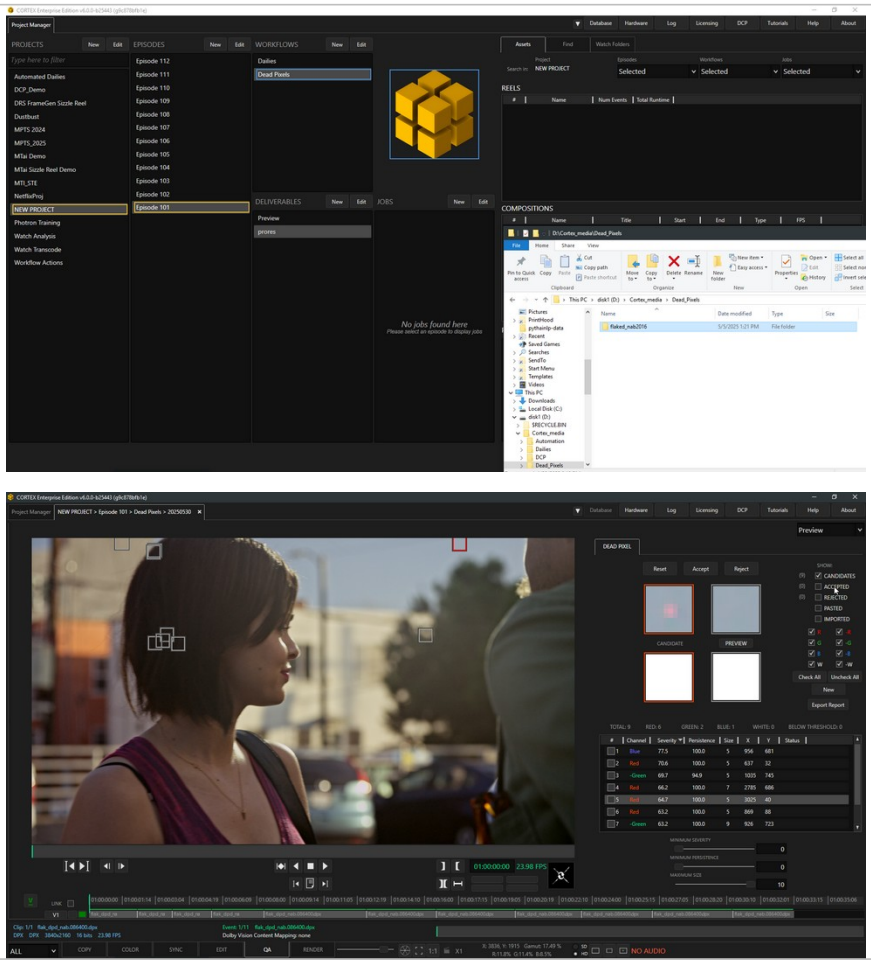
Let’s try Workflow Actions for Dead Pixel Detection



CORTEX Enterprise with automatic Dead Pixel Detection workflow action



Open the Project Manager and select the project you would like to QC for Dead PixelsCreating a Workflow Action for Dead Pixels requires choosing the Dead Pixels Workflow and then adding an Action for Dead Pixels and giving it a description.



Upon Execution of the Workflow Action, CORTEX will open a new job, run a MTai Shot Detection, Create a Composition timeline and automatically run an image analysis to detect where the dead pixels occur for RED, GREEN and BLUE dead pixels and display these events for review across the timeline.

An EDL can also be loaded for specific MTai shot detection instead of using CORTEX to do the MTai shot detection. However, with the v7.0 workflow action, this process is automated.

PAST Tips and Tricks added in later version of V5.6.1 and refined in V7.0 Watch Folders for Streamlined Automation - “How to Use”

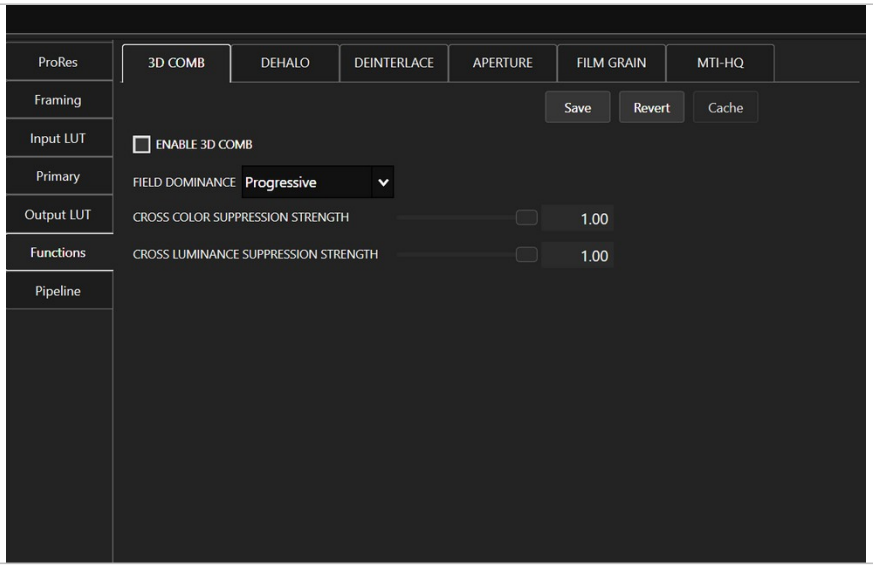
Set up a watch for as a Render Watch Folder A Windows folder(s) can be set up for automation, to serve as the source location for a Cortex render. The render will launch once triggered by the presence of either a complete source file or image sequence folder that is no longer changing in size.

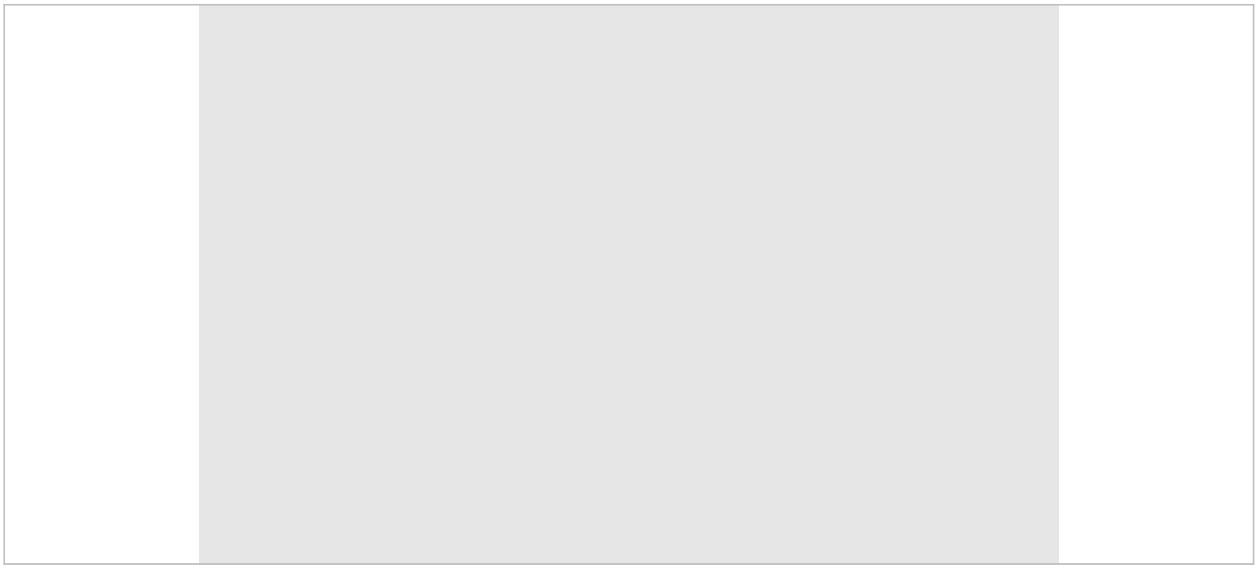
To create a new Render Watch folder: 1. Click the [New] button at the top of the UI from any of the Cortex Tools other than the Copy Tool. 2. Choose Automation in the drop-down menu. 3. Define a unique name 4. Choose Render for AUTOMATION TYPE. 5. Click the [...] button for WATCH FOLDER to browse to a folder to be the Watch Folder for media input. TIP: You may right-click in the folder selection window and create a new folder if needed. 6. Click the [Select Folder] button. 7. Click the [...] button for REPORTS FOLDER to browse to a folder to be the Reports Folder for reports output. Note that you may right-click in the folder selection window and create a new folder if needed. 8. Click the [Select Folder] button. 9. Select the desired DELIVERABLES in the list. (Note that a Deliverable Configuration must first be defined for this step.) 10. Optionally, choose a FRAME RATE and a FRAME RATE CONVERSION METHOD to convert each render as it is produced. 11. Click the [Create] button.

This will create a watch folder automation task for rendering that will remain active as long as Cortex is running the Job that contains it. To view the status and activity of the watch folder(s), navigate to the Render Tool and view it as an automation task that permanently resides in the column: IN PROGRESS (REEL OPEN)

Set up a watch for automated QA Analysis A Windows folder(s) can be set up for automation, to serve as the source location for a Cortex QA Tool. The analysis will launch once triggered by the presence of either a complete source file or image sequence folder that is no longer changing in size.

To create a new QA Analysis Watch Folder: 1. Click the [New] button at the top of the UI from any of the Cortex Tools other than the Copy Tool. 2. Choose Automation in the drop-down menu. 3. Define a unique name 4. Choose Analysis for AUTOMATION TYPE. 5. Click the [...] button for WATCH FOLDER to browse to a folder to be the Watch Folder for media input. 6. Click the [Select Folder] button. 7. Click the [...] button for REPORTS FOLDER to browse to a folder to be the Reports Folder for reports output. Note that you may right-click in the folder selection window and create a new folder if needed. 8. Click the [Select Folder] button. 9. Choose the desired Analysis tasks to be performed when new media triggers this watch folder. Select each analysis sub-type using the check-box on each tab, and select analysis parameters and report details in each sub-tab. 10. Click the [Create] button.





This will create a watch folder automation task for analysis that will remain active as long as Cortex is running the Job that contains it. To view the status and activity of the watch folder(s), navigate to the Render Tool and view it as an automation task that permanently resides in the column: IN PROGRESS (REEL OPEN)

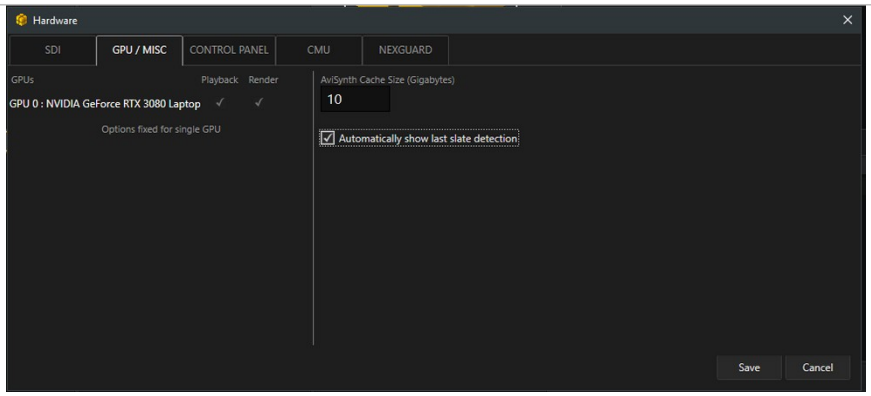
How to use the New Video Restoration Tool Set

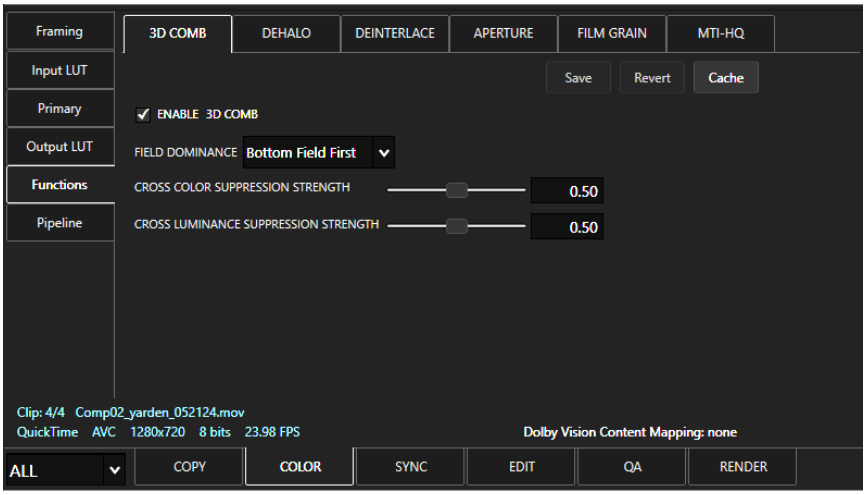
The New Video Restoration Tool stack is located under the COLOR Tab within CORTEX and can be accessed via the Functions and Effects tabs located in the lower left hand side of the COLOR module. Selecting each one of the corresponding Functions tabs such as 3D COMB, DeHalo, DeInterlace, Aperture,and Film Grain will present a series of simple to select tools that will provide the essence for the restoration processing of video images. The Tabs are stacked in a way that mimics the typical workflow to restore a video based image that suffers from temporal false color shifts, luminance halo effects that silhouette moving objects and that need to be deinterlaced before scaling the image. Additionally you may want to remove grain or resharpen an image after processing. All of these tools are presented in Cortex with the new 5.6 introduction of the restoration tool set.

The tool is configured with the starting default settings for each Function Effect in the stack.

TIP: Start by Enabling the checkbox using the default settings before any custom configuration to preview your results.

To test the result, CORTEX supports a Cache function. The Cache memory setting can be adjusted under the Hardware Setting page located at the top right of the CORTEX window near Licensing. This is where the operator or Admin can enable 1 or 2 GPUs and also set the amount of cache required for previewing the Video Restoration toolset.

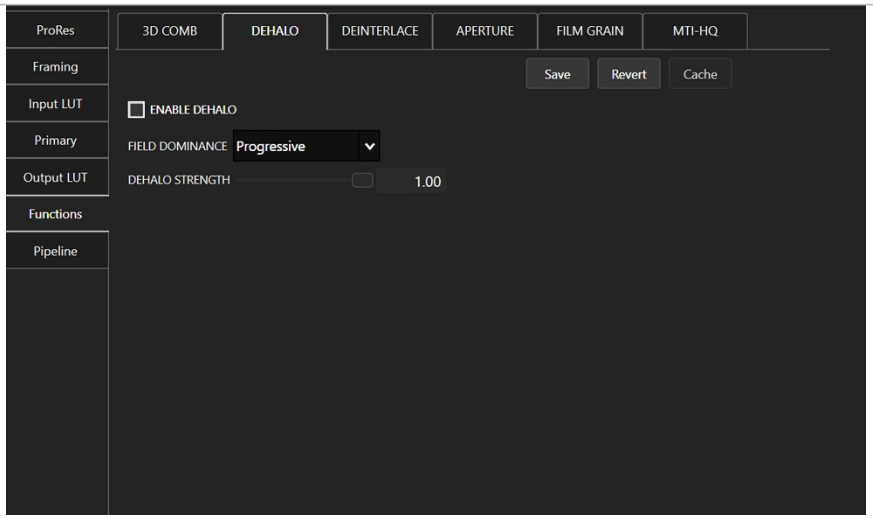


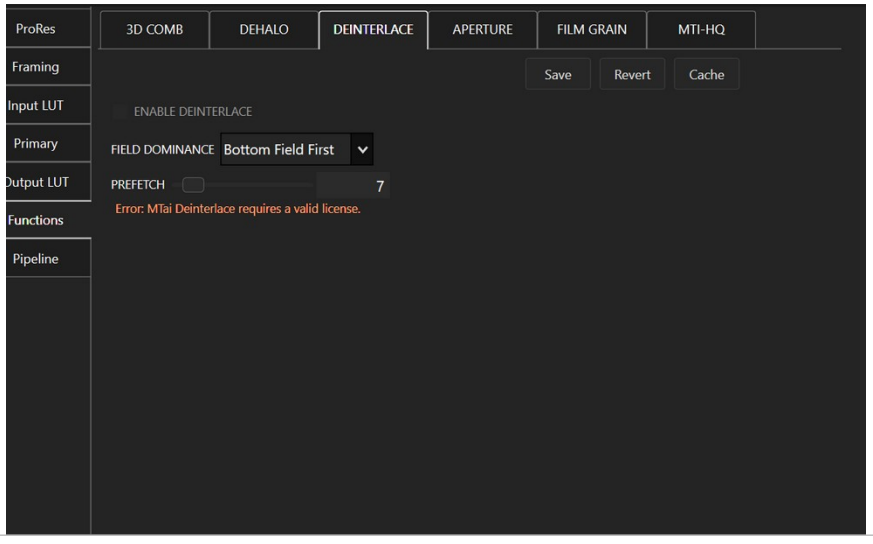


3D COMB Filter

The 3D COMB filter tool is configured with three simple but powerful features that address the temporal false colors that can be observed from frame to frame with composite video original source files where high frequency luminance detail “crawls” and false colors can cross contaminate the high frequency luminance values . The 3D Comb filter filters the luminance, x and y values and chroma values and allows the user to select the strength of the suppression of this cross color and cross luminance effects with a sliding value between from 0 - 1.0. To enable this effect under the 3D COMB tab of the COLOR Function module, be sure to check the ENABLE 3D COMB checkbox. Field Dominance will define the starting point for the 3D COMB filter processing. Choices are; Auto, Bottom Field First or Top Field First. Tip: Default is the Bottom Field First selection.

DEHALO TOOL


ProRes
Framing
Input LUT
Primary
Output LUT
Functions
Pipeline
3D COMB
DEHALO
DEINTERLACE
APERTURE
FILM GRAIN
MTI-HQ
Save
Revert
Cache
ENABLE DEHALO
FIELD DOMINANCE
Progressive
DEHALO STRENGTH
1.00


ProRes
Framing
Input LUT
Primary
Output LUT
Functions
Pipeline
3D COMB
DEHALO
DEINTERLACE
APERTURE
FILM GRAIN
MTI-HQ
Save
Revert
Cache
ENABLE DEINTERLACE
FIELD DOMINANCE
Bottom Field First
PREFETCH
7
Error: MTai Deinterlace requires a valid license.

The DEHALO tool addresses the dark halo effect that occurs around peoples hands, heads and silhouettes the shape of objects. The tool reduces this effect once enabled to provide an adjustable value between 0 - 1.0 to reduce the dark halo or luminance glow. Field dominance can be defined as Progressive, Top Field First, Bottom Field First. Be to check the Enable the DEHALO checkbox to add this effect to the Functions processing during render. Tip: Default is the Bottom Field First selection.

DEINTERLACE TOOL

The DEINTERLACE tool converts video content from an interlaced to a progressive format. This process is often the next step after applying a 3D COMB filter and DEHALO effect in converting a video's format and frame rate.

It is important to maintain the highest possible quality at this stage. Deinterlacing can significantly improve the visual quality of video content and deliver a better viewing experience for content creators, broadcasters, and streaming platforms.



Field Dominance will define the starting point for the DEINTERLACE processing. Choices are; Auto, Bottom Field First or Top Field First. The PRESET setting trades speed against quality, from Placebo (slowest, highest quality) through Ultra Fast; the default is Fast. The PreFetch slider defines the number of frames between 1-64 that are cached in memory while processing.

NOTE: NTSC tends to start with the Bottom field where PAL tends to work better with the Top Field first.

TIP: To learn more about; FILM GRAIN and APERTURE control, please refer to Page 130 below.

Improved MTai Frame Rate Conversion Here is a link to a video tutorial on how to access and set-up the MTai Frame Rate conversion process. Tip: If you want to convert a file from one frame rate to another, make sure to select the clip and right click, to add the clip to a new reel and then configure the clip for the Timecode you want to convert to by deselecting the Enforce Consistency checkbox at the top of the reel configurator.

This will expose new selection criteria. You can now use the pulldown menu to choose the FrameRate of choice for the new rendered clip. Then choose the Frame Rate Conversion Method: None, Drop/Duplicate or MTai. Choose MTai for TensorRT-accelerated MTai interpolation, then close the reel and render to the new frame rate while maintaining the original clip's time base.

Welcome

MTI Film has created a family of applications, known as Cortex, that host a suite of tools designed to assist a variety of users to accomplish critical work-product. DITs and Dailies Personnel, Assistant Editors, Transcoding Operators, IMF, DPP, and DCP creators, and anyone interested in file based workflows will find Cortex to be their go-to application. Each Cortex software edition can interact with all other editions via the Cortex Manifest, allowing metadata to be conveyed from one system to another. Cortex Enterprise can be networked with other Enterprise systems via a shared database, facilitating concurrent Workflows and distributed rendering.

Cortex Editions

FEATURES DIT DIT+ DAILIES ENTERPRISE QC

Project Manager / Deliverables Templates ✓ ✓ ✓ ✓ ✓

Playback All Camera & Codec Formats ✓1 ✓2 ✓ ✓ ✓

SDI & HDMI Output up to 4K ✓ ✓ ✓ ✓ ✓

Background Transcoding/Rendering (see note 3) ✓3 ✓ ✓

Copy & Archive Tool with MD5 Checksum or XXHash* ✓ ✓ ✓ ✓

Color Tool - ASC CDL / ACES Support ✓ ✓ ✓ ✓ ✓

Color Tool - Universal Color LUTs Export/Import ✓ ✓ ✓ ✓ ✓

Color Tool - Hybrid View with Edit Timeline or Sync Tool ✓ ✓ ✓ ✓

Color Tool - Dolby Vision™ Level 1 Analysis/Metadata/Software CMU ✓

Color Tool - Color Space Conversions ✓ ✓ ✓ ✓ ✓

Color Gamut Diagram ✓ ✓ ✓ ✓ ✓

Color Trace ✓ ✓

Sync Tool - Automatic / Manual ✓ ✓ ✓ ✓

Cortex Manifest Data Tracking ✓ ✓ ✓ ✓ ✓

Traceback Media and Metadata ✓ ✓

VFX / EDL Pulls ✓ ✓

Edit Tool - Edit Functions, Slates, EDL Conform ✓ ✓ ✓

Edit Tool – IMF, AS11, AS02, DCP Creation/Packaging ✓ ✓4

Edit Tool - Dolby Vision™ IMF and Metadata Editing ✓ ✓4

Edit Tool - ProRes Insert Editing ✓ ✓4

QA Tool - Dead Pixel Detection ✓5 ✓5 ✓ ✓ ✓

QA Tool - Dead Pixel Correction ✓

QA Tool - Radiation Artifact Detection ✓ ✓

QA Tool - Radiation Artifact Correction ✓

QA Tool - Matte Analysis ✓ ✓

QA Tool - DCP Validation ✓ ✓

MTai Shot Detection and Shot Review ✓ ✓ ✓

SDR to HDR Conversion with Dolby Vision™ Content Mapping ✓

VFX Pull Workflow Action ✓ ✓

Dual-Stream SDI Output and Comparison Playback ✓ ✓

QA Tool - HDR & SDR Scopes / Color Gamut Diagram ✓ ✓

FEATURES - Continued DIT DIT+ DAILIES ENTERPRISE QC

QA Tool - Video Analysis with Graphs and Reports ✓ ✓

QA Tool - Editorial Comments pinned to Timeline with Report ✓ ✓

MTI HQ UpRes ✓ ✓ ✓ ✓

MTI – Samsung UpRes ✓

Loudness Monitoring ✓ ✓

Cortex Share for Multiple Users ✓ ✓ ✓

OPTIONS DIT DIT+ DAILIES ENTERPRISE QC

MTai Slate Detect, Frame Convert and Workflow Automation ✓ ✓

Comb Filter, DeHalo, Deinterlace, Aperture, Grain MTI HQ ✓

Avid Bin Creation and Media Subclipping ✓ ✓

Dolby Vision™ - Level 1 Analysis /Metadata Track Editing/Software CMU ✓

SDR to HDR Option - MEDIUM and HIGH Peak Bands, CHROMA, CONTRAST and ADVANCED ✓

Dolby Atmos® support for IMF, DCP and general compositions Included w/ Dolby ✓ Vision™ in v7.0

Dolby Digital™ Audio - Includes 5.1, 7.1, DolbyE, & Loudness Correction ✓ ✓

Loudness Correction ✓

DVD - Automatically Authored ✓ ✓

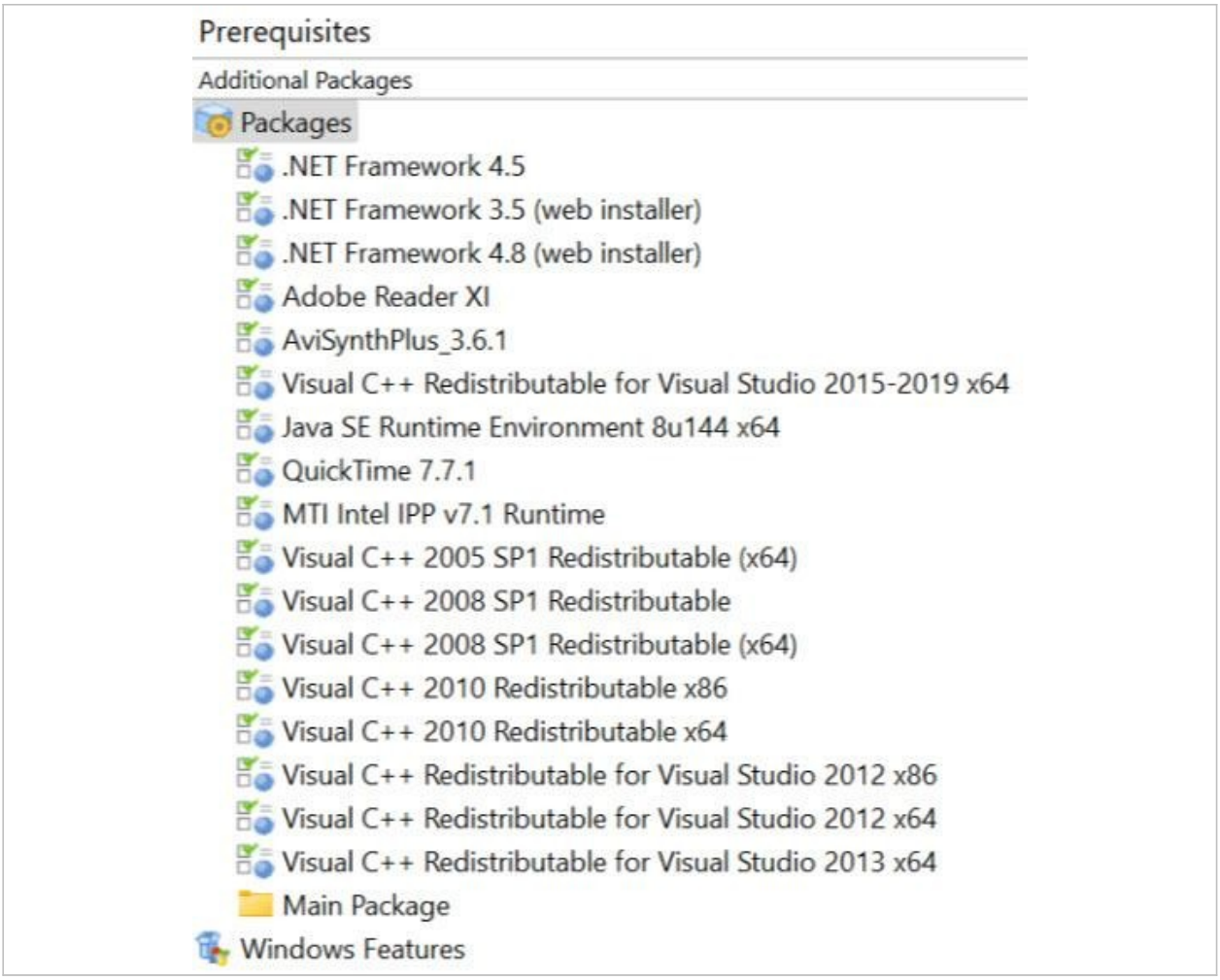
Blu-ray - Automatically Authored ✓ ✓

HEVC ✓ ✓ ✓

Annual CORTEX 24-Hour Online Support ✓ ✓

NOVA Paint ($995.00 option. Supports DPX and EXR only) ✓

1. DIT is not licensed to read H.264, DVCPro/HD or MPEG2 codecs 2. DIT+ is not licensed to read DVCPro/HD or MPEG2 3. DIT+ encodes ProRes, DnxHD, and H.264 up to 1920 x 1080 4. QC can create IMF, AS-02, DPP, DCP packages, and Compositions but not render them 5. DIT and DIT+ detect dead pixels on source clips only, not compositions with edits * The Copy/Archive tool supports up to 3 destinations including LTFS LTO with MD5 Checksum or XXHash and multiple re



Getting Started

Installing Cortex

Hardware Requirements

● Windows 10 or 11 x64. If Windows 10, it must be a Windows 10 build released after 2018. ● 64 GB RAM Minimum (96 to 128MB recommended) ● CPUs: ○ Intel or AMD Threadripper CPUs where clock speed is as high as possible ○ Minimum 2 x 6-core >3 GHz recommended for best rendering performance and playback of some CPU-intensive codecs ● Recommended GPUs: ○ 2 GeForce GTX 3090 ti or 1-2 GeForce GTX 4090 If 2, when possible, a 3rd GPU, i.e. GeForce 1650 for UI use only (Not required but useful with dual displays) ● Video Cards: ○ AJA Kona 4, Kona 5 or Corvid 88 ○ BMD DeckLink series (6G and 12G support), including the DeckLink 8K Pro; two DeckLink cards can also drive two SDI streams

Download The Installer

You can access the latest Cortex installer on our Forum at forum.mtifilm.com

Download the installer file and double-click it to begin installation. All Cortex editions share a single installer. Your feature set is enabled by licensing.

Prerequisites - Check with MTI FILM support for latest updates

Cortex v7.0 builds on CUDA 12.9 and TensorRT 10.10, so an NVIDIA driver recent enough for CUDA 12.9 is required. Check with support for the current minimum driver version. The MTai features described under MTai AI Engines and First Run all require a supported NVIDIA GPU.

Cortex requires that the following prerequisites are installed on the system before Cortex can be installed. The Cortex Installer will scan your system, determine which prerequisites are missing and link you to the download(s). An internet connection is required. Check with support for latest updates on pre-requisites.

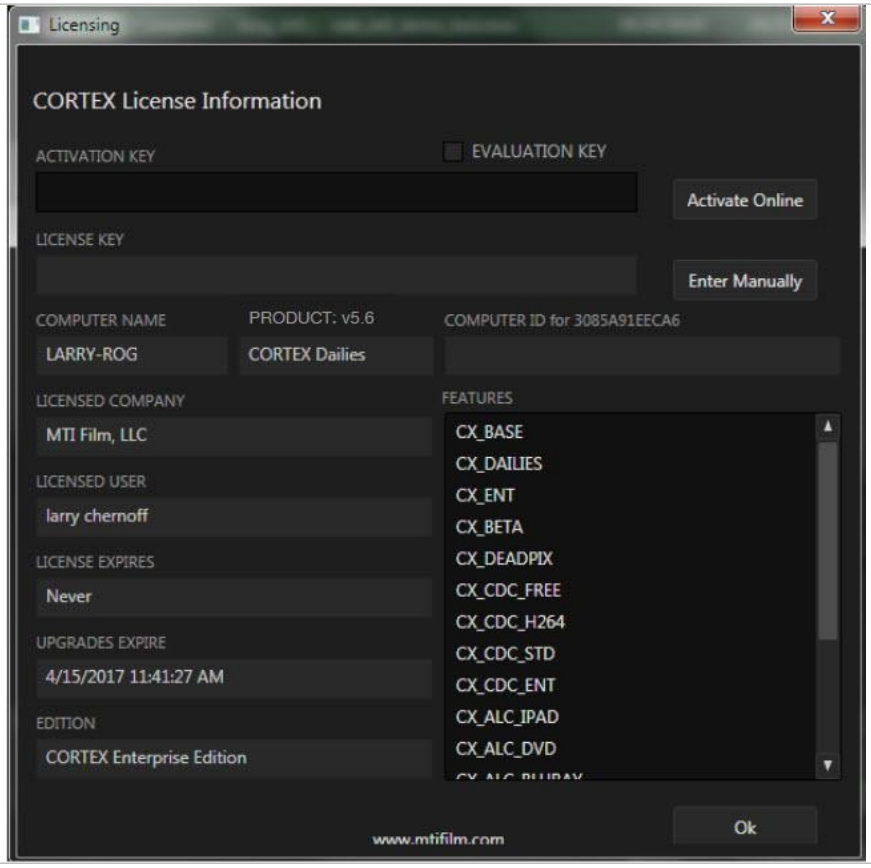
Installation Wizard

The Setup Wizard will guide you through the installation process. Simply click Next on each screen to install using default settings.

Take a moment to read and agree to the Cortex End User License Agreement.

Upgrade Older Version Unless you are just testing a new version, it's generally recommended that you choose 'Yes, remove older versions': ● Yes, replace older version. This will upgrade your existing version to this new version. The old version will no longer be accessible

● No, install side by side with other versions. This will create a separate directory for the new version, leaving your old version intact. You will be able to run either version using individual menu and Desktop shortcuts.



MTai AI Engines and First Run

Several Cortex features are driven by neural network models running on the GPU: MTai Shot Detection, MTai Slate Detect, MTai Frame Convert (frame interpolation) and Radiation Artifact Detection. Cortex

ships the models, but the optimized engine each one actually runs on has to be compiled for the specific GPU in the machine. That build happens the first time a feature is used, not during installation.

When it happens, a progress dialog appears and Cortex is occupied until it completes. The build can take several minutes, and it is a one-time cost per feature per machine — every job after that uses the engine that was built. Each of the four features builds its own engine, so you may see the dialog up to four times as you first exercise different parts of the application. If the GPU is changed, or its driver is substantially updated, the engines are rebuilt the next time they are needed.

MTai Slate Detect asks first: a MTai Slate Detection prompt explains that the model has to be optimized for each machine and offers to do it now. Tick Don't show me this again to stop the prompt appearing.

TIP: on a newly deployed or newly upgraded system, run a short clip through shot detection, slate detect, a frame rate conversion and a radiation detection before the first real session. The engine builds then happen at a convenient moment rather than in front of a client.

Licensing and Activation

The Licensing window will open automatically the first time you run Cortex. You can open this window from the Licensing utility button in the upper right of Cortex. Depending on the Edition, the Features box displays the options available. Ignore the CORTEX Dailies under NOTE: The Product field does not display the complete actual licensed version of CORTEX.



How To License CORTEX

1. If you do not already have an Activation Key, contact your Reseller or MTI Film Support. You will receive an email containing your Activation Key as a text string. 2. Copy the entire Activation Key text. 3. If you are running a Demo/Eval version of Cortex, be sure to check the Evaluation Key checkbox 4. Paste the Activation Key text into the Activation Key box in the Licensing module. 5. Click Activate Online (Note: you must be connected to the internet to complete this step). 6. If you cannot be connected to the internet, please contact support@mtifilm.com for an offline activation. We will require a ComputerID to prepare the activation. 7. After a moment, the Licensing module will populate the rest of the form with the information received from MTI Film's Licensing server. 8. Click OK and Cortex will launch.

How does this work?

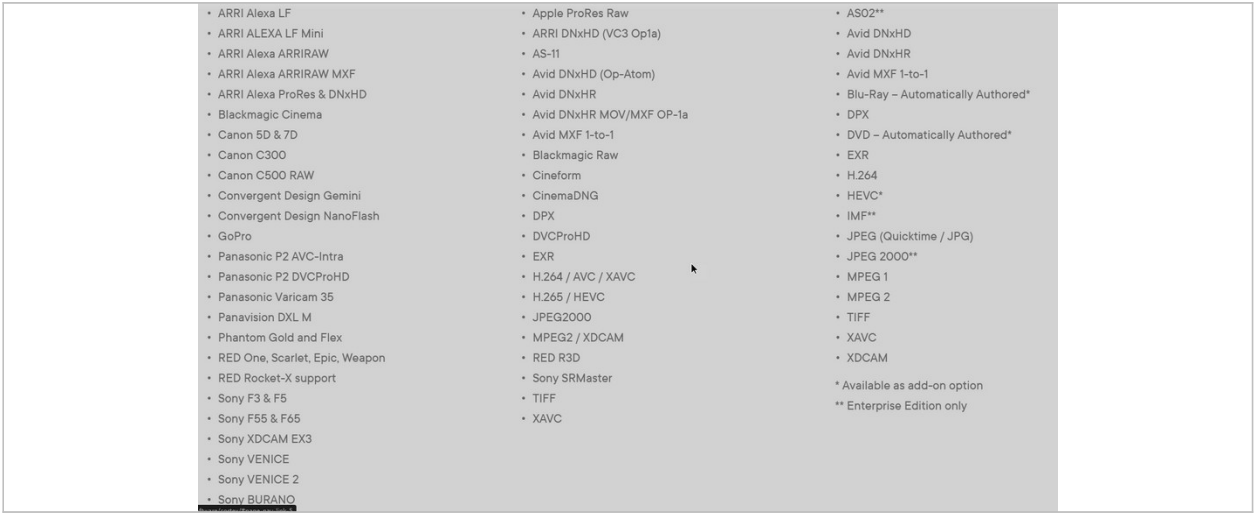
When you enter your Activation Key, the software connects to MTI Film's licensing server to complete activation of your license. Once a license has been activated, it is tied to a single machine and can not be moved or re-used on a different computer.

Upgrades and Support

All Cortex editions come with one year of Upgrades & Support included. For Additional information, requesting help and accessing our knowledge base, you can access MTI Film's Support resources by

registering on our Forum at forum.mtifilm.com, which also includes the most up-to-date version of the software.

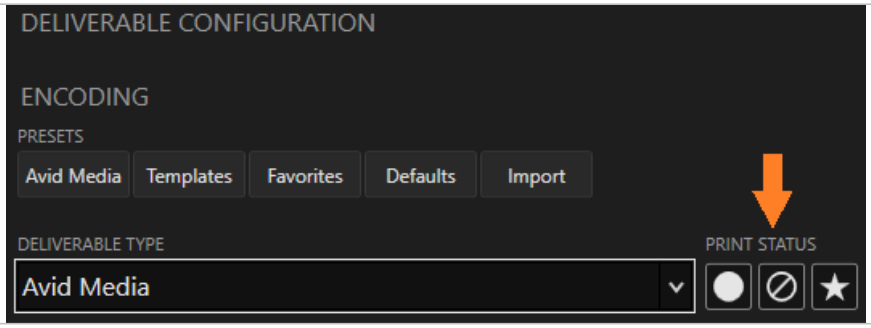
The Cortex Keyboards and Custom Keyboard Stickers MTI FILM makes an optional, backlit, custom keyboard with all the hot keys labels. For existing keyboard owners, MTI Film recommends the Cortex Keyboard Stickers for greater efficiency and interaction with the application. It's best to purchase the keyboard stickers when ordering the software. The stickers can be applied to any American style QWERTY keyboard. Contact: sales@mtifilm.com for pricing on the custom Cortex Keyboard.



Cameras, Codecs, and Outputs supported by Cortex

NOTE: Complete list shown here: https://mtifilm.com/software/cortex/

NOTE: Multiple DJI drones, such as the Ronin4K with the ProRes422 formats are also supported.



First a Few Definitions:

Clip

A clip is a source file that consists of video and/or audio, metadata (i.e. subtitles, Dolby Vision™, etc.) or any standalone file recognized by Cortex.

Composition

A Composition is a grouping of clips that have been organized into a timeline. Clips contained in the timeline are interchangeably defined as Events, Segments, or Shots, which refer to either a whole or part of a clip. The Composition icon is placed before the composition name in the Sidebar.

Deliverable

A Deliverable is a codec type that consists of a configuration of properties as defined by the user in the Deliverable dialog. Properties such as Codec, Bit Rate, Name, Print Status, Resolution, Framing, Color properties, and Audio configuration, etc. help define the Deliverable.

Print Status

Each Deliverable contains a property called the Print Status. Upon import, every clip is assigned a default Print Status of “Circled”. There are three statuses: 1. Circled - meaning “Yes, Print this clip” 2. Non-Circled - meaning “No, do not print this clip” 3. Starred - meaning this clip is important so “Yes, Print this clip” The Print Status of the Deliverable, therefore, acts as a filter through which all clips or segments contained in a reel flow, which determines whether they will be rendered into the Deliverable.

Since the default state of the Print Status is “Circled”, it is generally inconsequential unless the Deliverable is part of a Workflow, such as Dailies, that requires deliverables to discriminate which clips contained in a reel will be included in the render.

File per Clip

Any Deliverable that has its “Packaging” property set to File per clip will begin rendering clips immediately upon being added to the reel. If the clip is modified while the reel is still “Open”, the clip will be re-rendered.

File per Reel

A few deliverable types require the whole reel rendered once it is “Closed” to ensure its complete continuity. This means that every clip intended to be in the reel has been added and that the reel is closed by the user.

Clips Reel

A Clips Reel is a collection of one or more clips intended to be transcoded to one or more Deliverables. Clips added to the reel can be assigned a Print Status. The Clips Reel icon is placed before the composition name in the Sidebar.

Composition Reel

The Composition Reel is a collection of one or more composition events. All events added to the reel will be rendered. The Composition Reel icon appears before the composition name in the Sidebar.

Open Reel

An Open Reel is one where clips are still being added to it or where clips contained in it require modification. In order for a clip in a reel to be modified, the reel must be open. If the reel is closed, the clip can be “Duplicated” for modification leaving the one contained in the reel as is. Reels can be reopened if there is a need to modify a clip. Once modified, the clip will be re-rendered.

Closed Reel

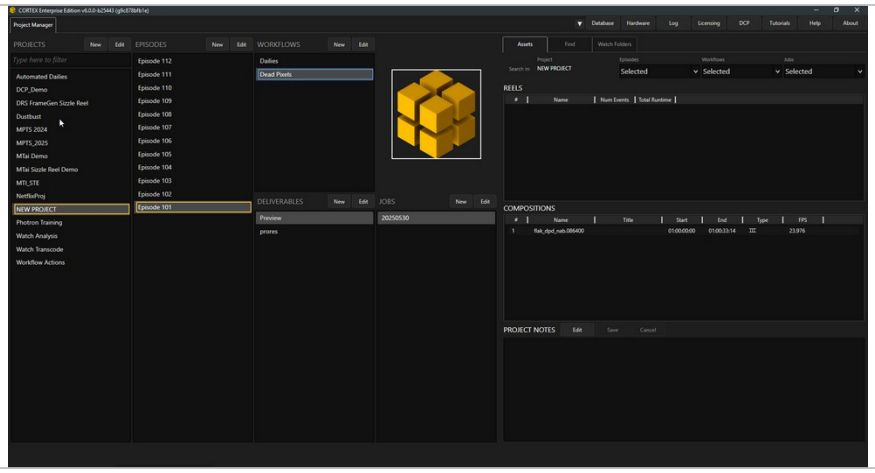
A Closed Reel precludes any changes to be made to any clip contained in the reel. If the reel is closed and a clip that is contained in the reel is selected, all tool modules are disabled including Marks In/Out.

One to One Render

One to One renders one source to one Deliverable at a time.

One to Many Render

One to Many renders one source to many Deliverables simultaneously. When viewed in the Render Monitor Tool, each Deliverable of the Many group will have an asterisk in front of it. TIP: Recommended render selection when creating multiple deliverables. Make sure to enable the checkbox for each deliverable upon render.



Cortex Application Overview

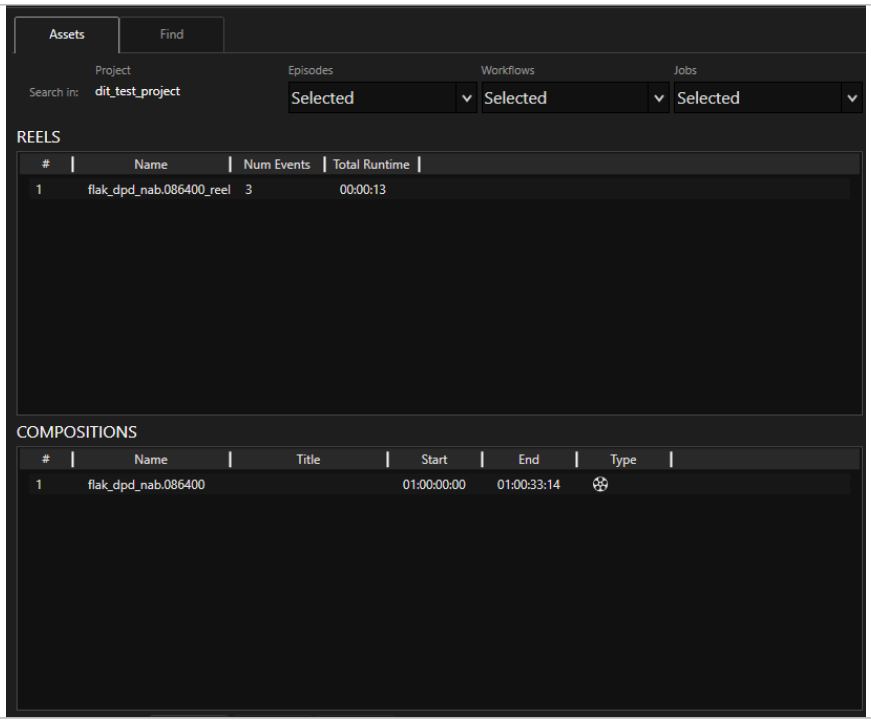
The Project Manager

The Project Manager is where you create, organize, and maintain projects, episodes, Workflows, Deliverables and Jobs. There are two project types, Advanced and Basic. The Advanced view is used for Episodic Television or Feature Films. The Basic view is used for one-off or generic transcoding jobs.

The Project Manager - Advanced View in V7.0

The Project Manager is divided into several sections below.

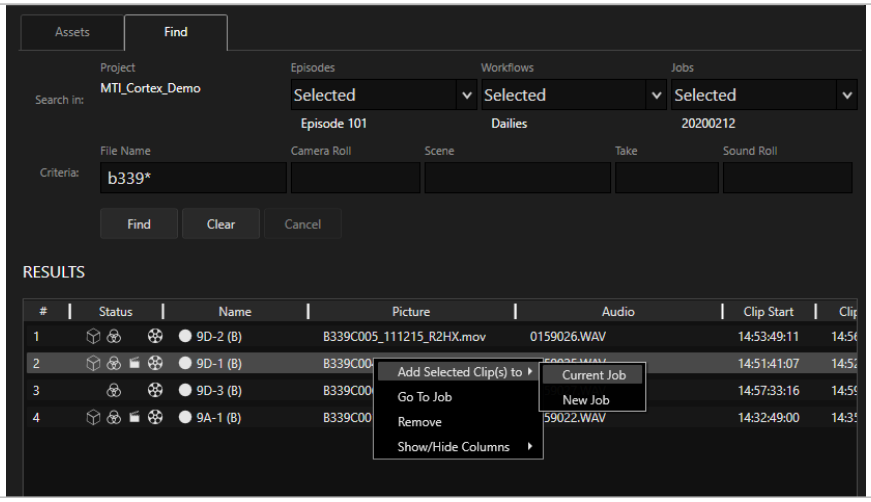
● Projects ● Episodes ● Workflow Actions ● Deliverables ● Jobs ● Assets Tab ● Find Tab ● Project Notes

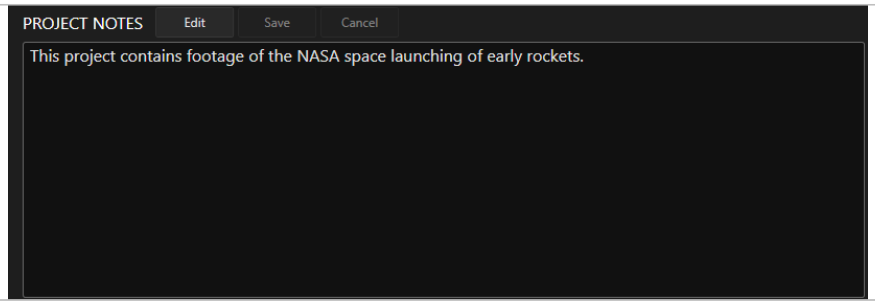


Assets Tab

The Assets Tab provides a view into the contents of each job including reels and compositions. Its Media column reports whether the media behind each item is Online, Partially Offline or Offline, and offline or partially offline compositions and reels are dimmed, so material that has gone offline — an unmounted volume, a purged cache — is visible from the Project Manager without opening the job.

NEW in V7.0, JOBS can be opened by clicking on a Composition or Reel asset which will open the Project to the related JOB asset.





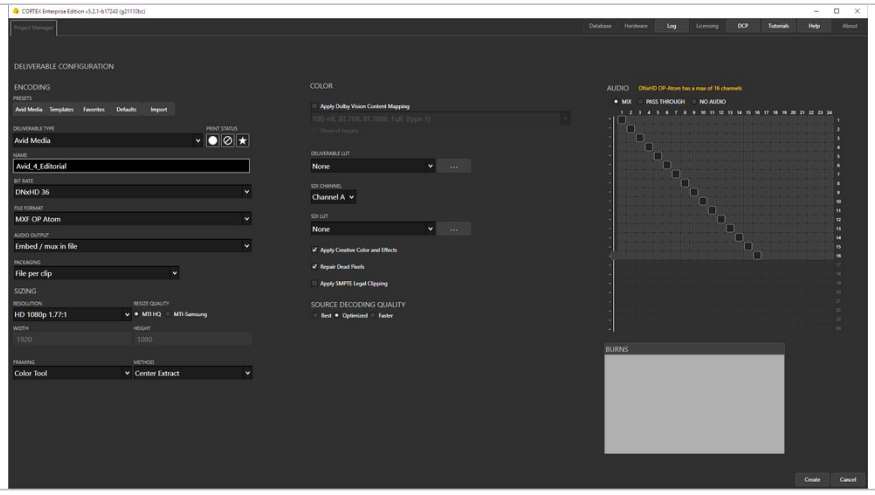
Find Tab

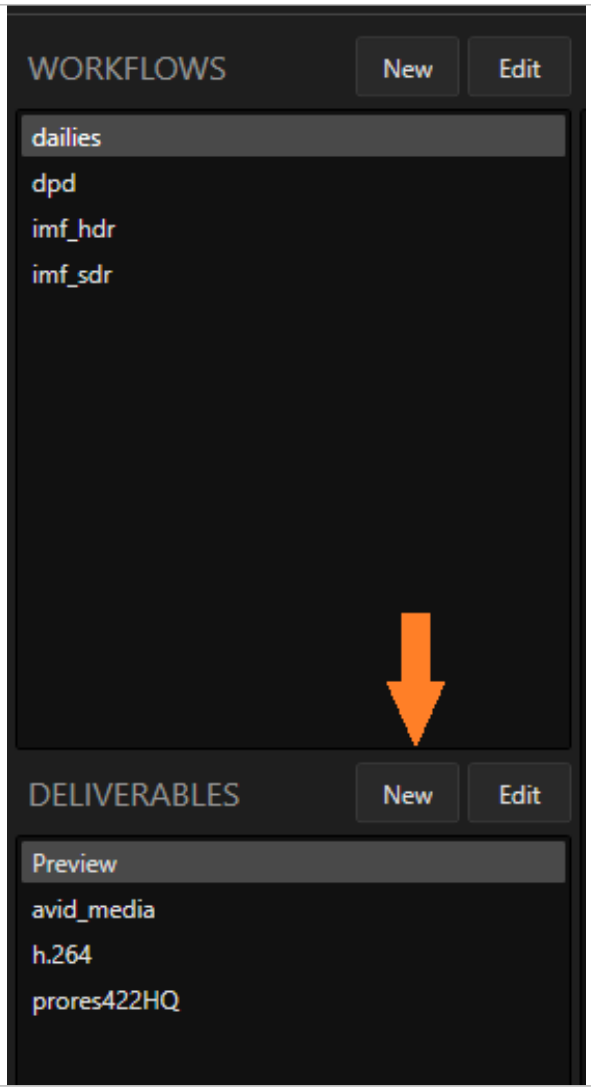
Using the Find Tab, you can search for media contained in Cortex Jobs. Enter search criteria at the top of the tab, click the Find button to return the results, and then Right-click on any clip for a Context Menu. Select clips to add to the Current or New job. Select a single clip to Go To Job or Remove the selected clip(s). Use the Show/Hide Columns to customize the view. To set new search criteria, press the Clear button.

To clear the Results list, click the Clear button on the lower right of the tab.

Project Notes

The Project Notes section provides for entering freestyle text relating to the project.





Deliverable Configuration Editor

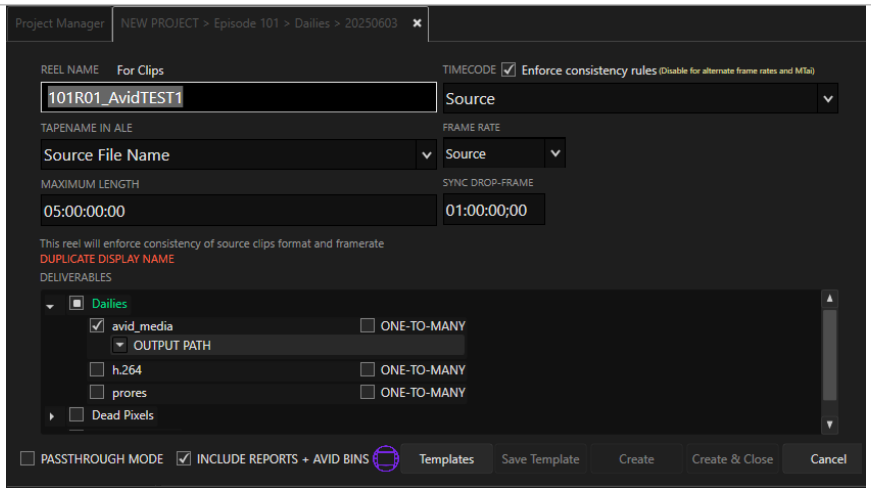
Clicking the New button at the top of the Deliverables column opens the Deliverable Configuration Editor. This is where you choose the various settings for each Deliverable including:

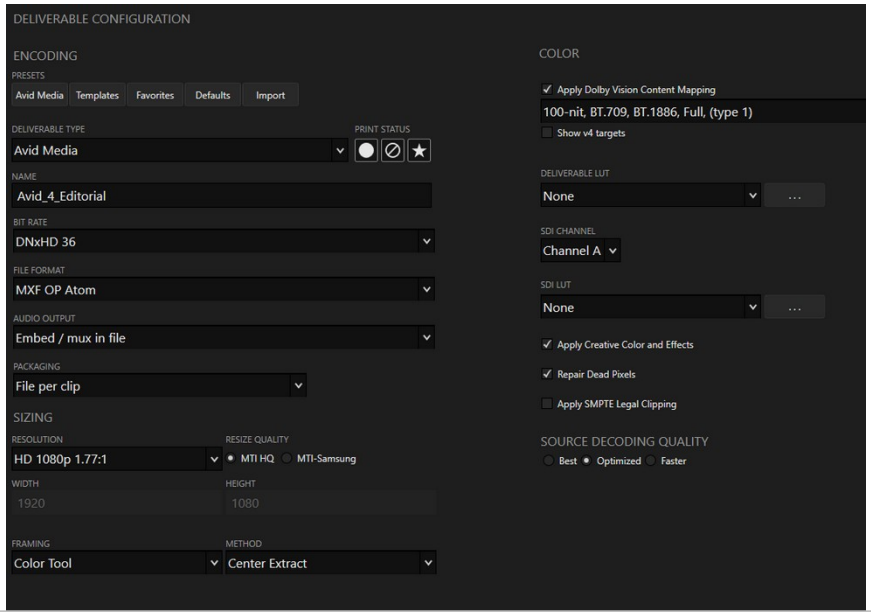
● File format ● Codec ● Bit rate ● Packaging ● Resolution ● Color properties ● Audio Mix ● Burn Windows ● Head Formatting

NOTE: For Avid MediaFiles, in v7.0 you now define where the MXF will be delivered to and they will be displayed in a folder structure preferential to AVID with the following directory structure, Avid MediaFiles/MXF/1.

The Avid Bins will be located in the project defined Output path. This can be overridden inside the Deliverable set-up to have any deliverable to a pre-defined directory path location.

NOTE: The Avid Bins are included with the Dailies Reports if the checkbox during Reel creation and Render is checked.

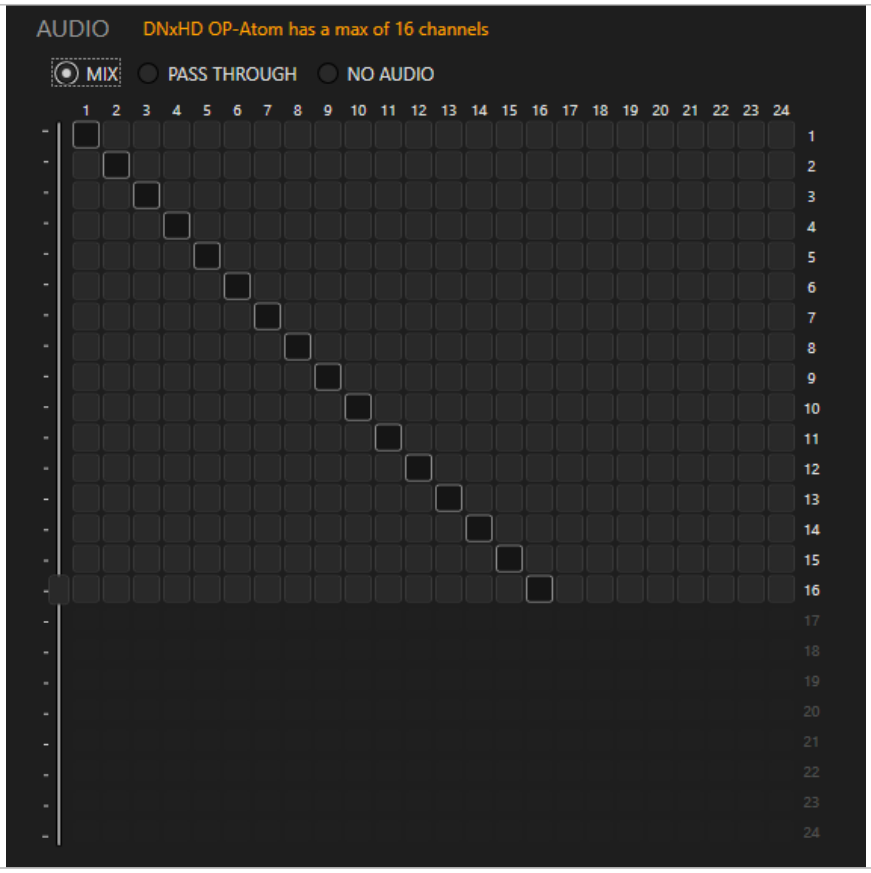




Codec and Color Properties

After choosing a codec, enter the parameters for the encoding and color properties that accurately serve the Deliverable, and name it so it can be easily recognizable in the project manager page.





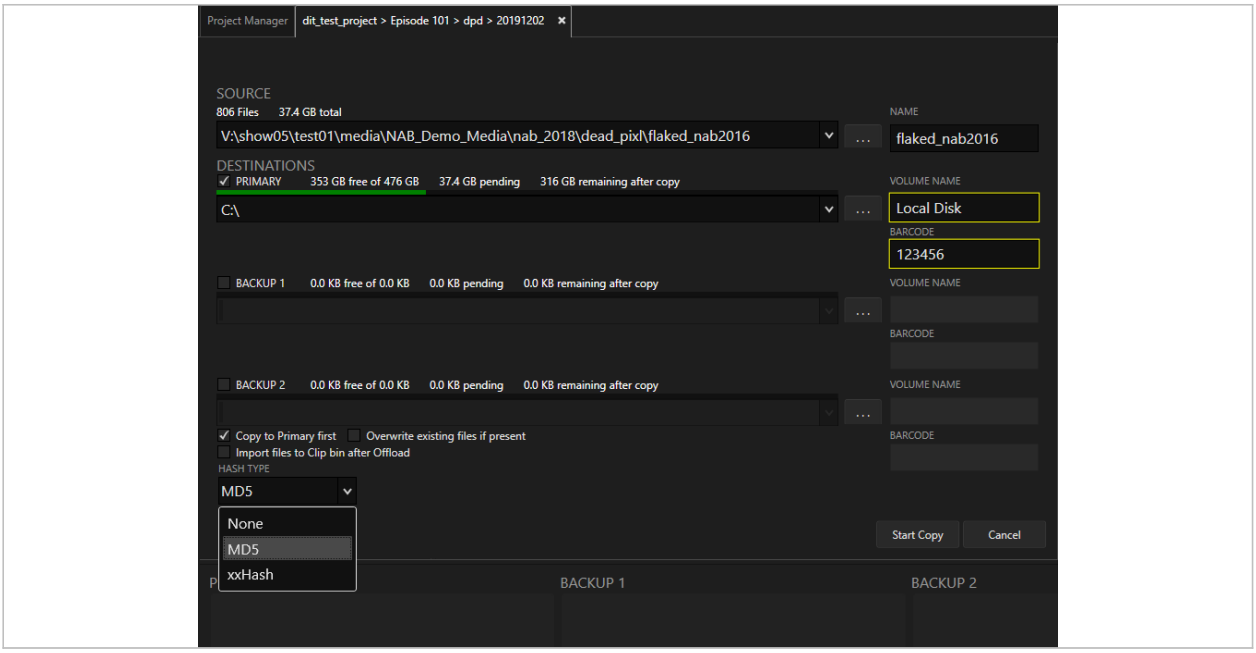
Audio Matrix

The Audio section allows for each Deliverable to have its own configuration of channel assignments.

Burns Canvas

The Burns Canvas provides a flexible graphical display of metadata that can be formatted to suit each user's requirements.

Simply click on the attribute you would like burned in and that attribute will be overlaid on the image canvas. Drag and position as needed to align the burn-ins to the editors or preferred view and save.



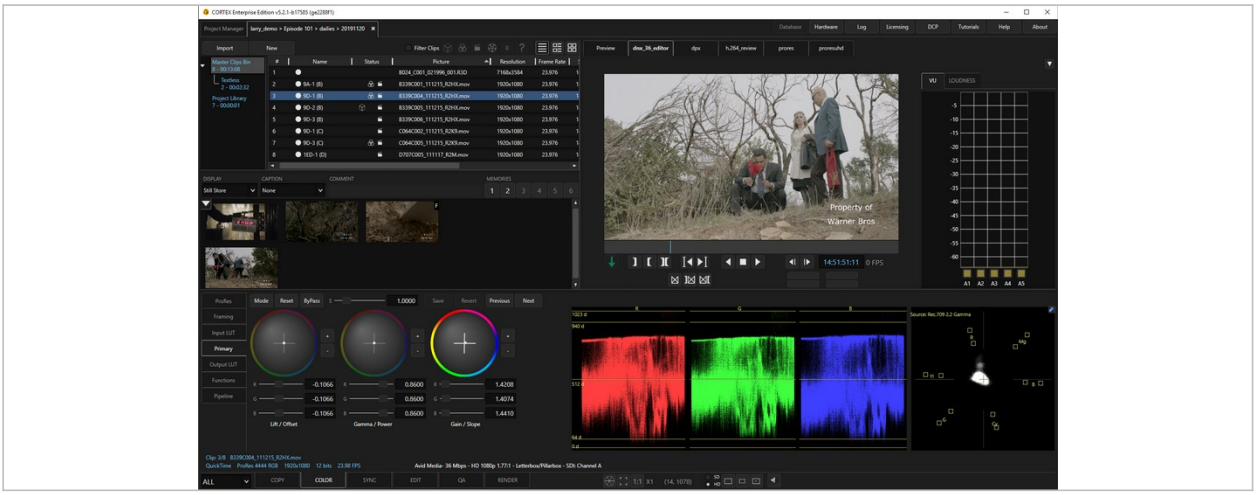
Cortex Tools - Brief Overview

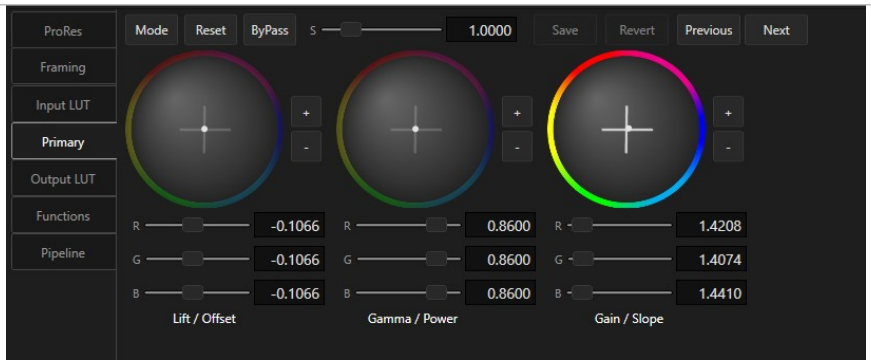
The Copy Tool

The Copy Tool has a simple interface to create an unlimited number of Copy and Archive Tasks and concurrently run up to three at a time. Each Copy Task has a single source (for example, a camera card) and up to three target destinations. The target destinations can include a combination of internal storage, shared storage, attached storage, shuttle drives or LTFS LTO drives. Archive Tasks can have up to two target destinations, which are usually LTFS LTO drives.

Each Task can generate optional MD5 or xxHash Checksums for verification. These checksums will be available in any Manifest file created from the job.

In addition, Cortex also offers MHL Verification (Media Hash List), which works similarly to the Copy and Archive Tasks. If a folder contains the MHL file, Cortex will validate the list against the media contained in the folder.





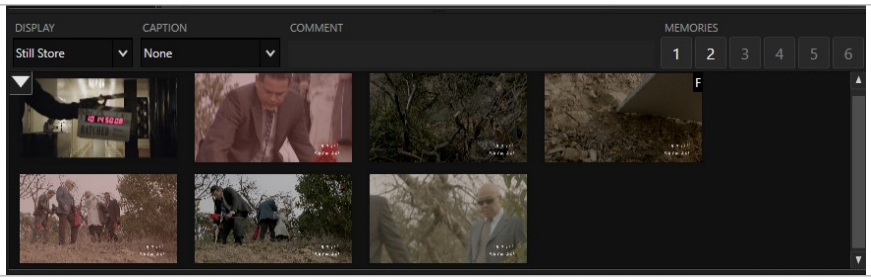


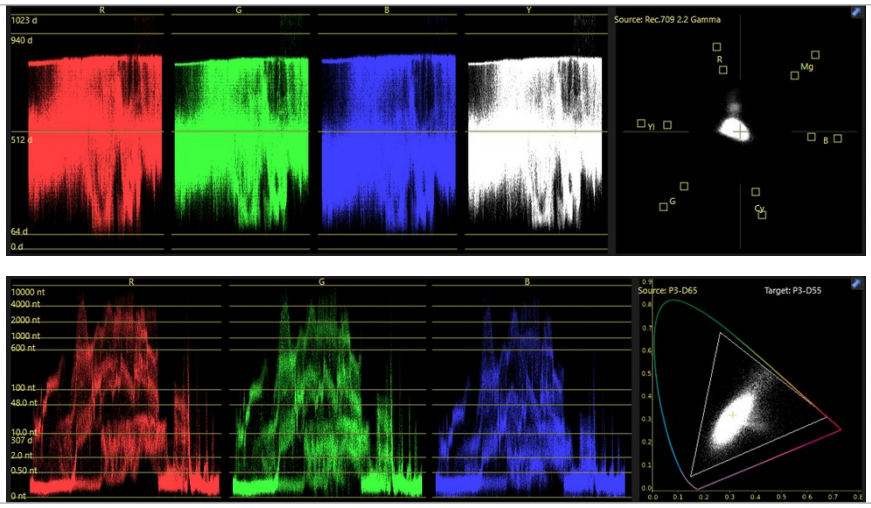
The Color Tool

The Color Tool provides tabs for different image processing functions: ● Source Decoding Parameters ● Framing ● Input LUT ● Primary Color Correction ● Output LUT ● Functions - includes modules for 3D Comb, DeHalo, Deinterlace, Brickwall, Aperture, Grain, MTI-HQ and MTI-Samsung resize settings ● Pipeline - maps the color pipeline from start to end ● Dolby - Dolby Vision™ Level 1 analysis, shown when a Dolby Vision™ composition is selected

Primary Color Corrector

Primary color correction can be operated in two modes: Lift Gamma Gain or Printer Lights. Values can be adjusted using the UI, keyboard shortcuts or a tactile panel. All values are converted to industry standard ASC CDL-SOP / Saturation. Currently, the Tangent Wave (1 & 2), Tangent Element, and Nucoda Precision panels are supported. 3rd party Stills, LUTs and CDLs can be imported via the Image Stores..





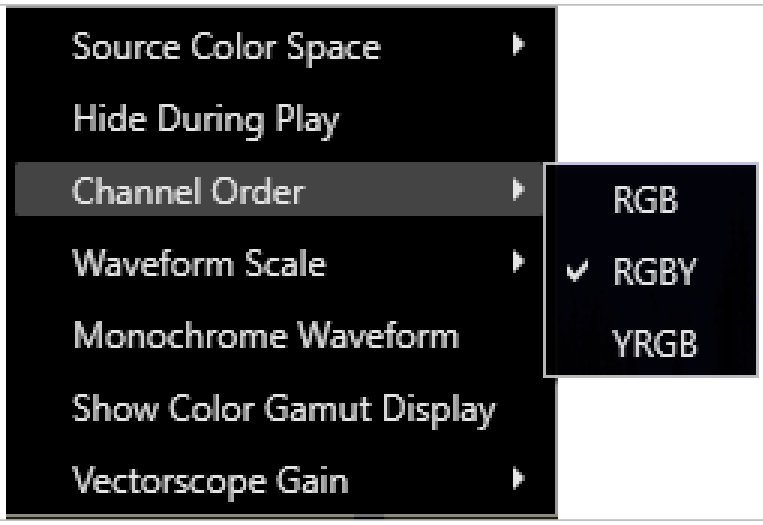
The Image Stores

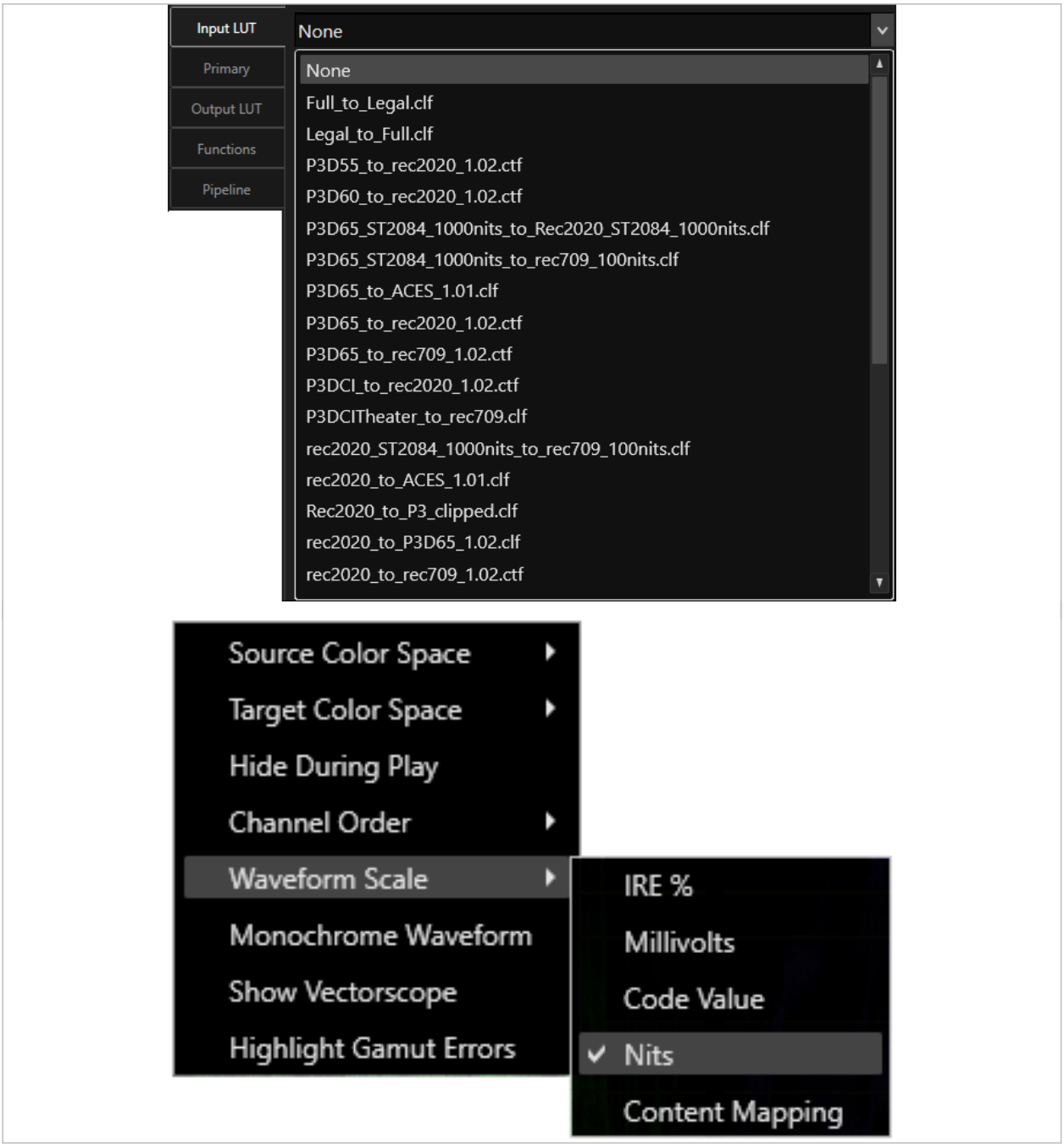
The Image Stores provide different options for capturing, importing, working with and exporting stills. There are 6 stores including: 1. Still Store - for user captured stills 2. Timeline 3. Favorites 4. Imported Stills 5. Imported CDLs 6. LUTs

The Imported Stills, Imported CDLs and LUTs stores can be used to import industry standard files.

Waveform, Vectorscope, Color Gamut Display

A waveform monitor and vectorscope provide additional feedback for color correction under different viewing conditions. The vectorscope can be replaced with a Color Gamut Display (seen below).





Right-clicking on the waveform will present a Context Menu with a variety of view options.

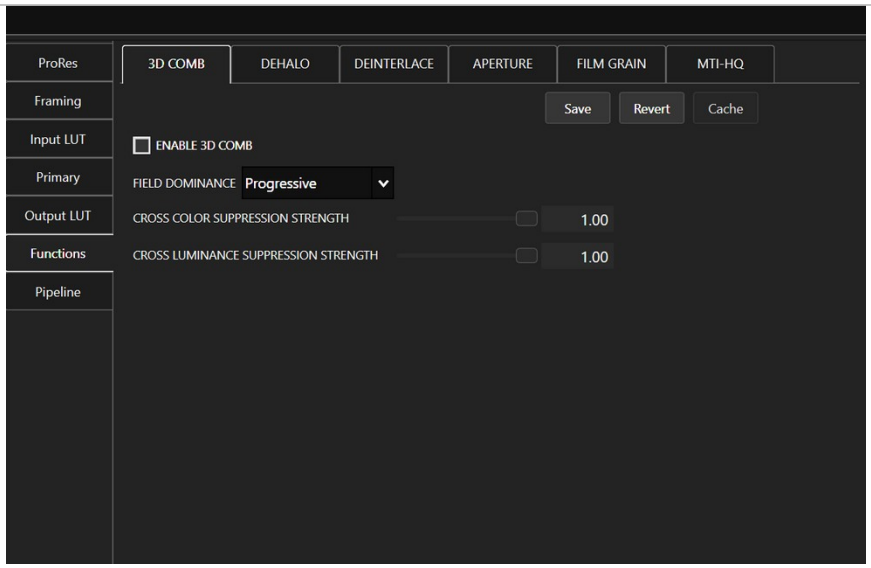
LUTs

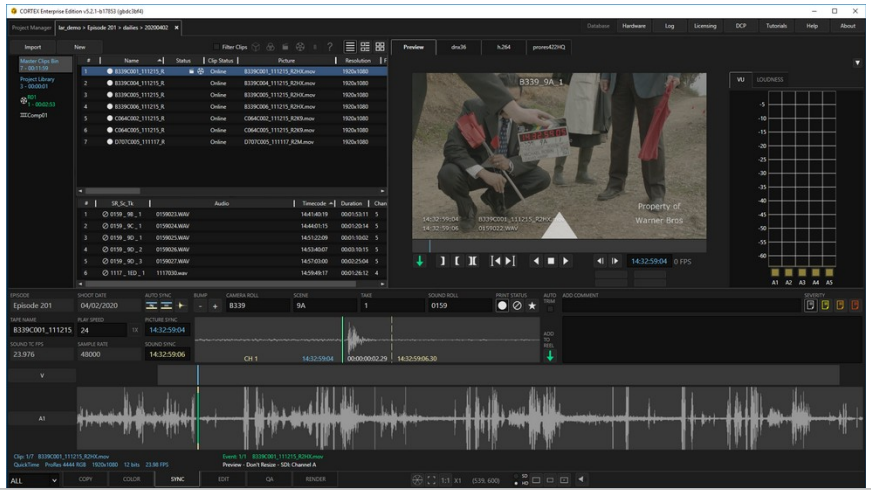
Cortex provides a number of included LUTs ranging from simple rescaling to more complex colorspace transforms. These are located in the Program Files/86/MTI FLM/Transforms

Functions

In addition to color correction, the Color Tool offers several image processing modules, which can be enabled clip by clip, or for compositions on a shot by shot basis. New in 5.6 is the Video Restoration tool stack in support of video tape based restoration. Optional Tool stack includes 3D COMB Filter, DEHALO, DEINTERLACE, FILM GRAIN, APERTURE and UPREZ and under Clip Rendering, you can deploy MTai Frame Rate Conversion.

See Tips and Tricks above.

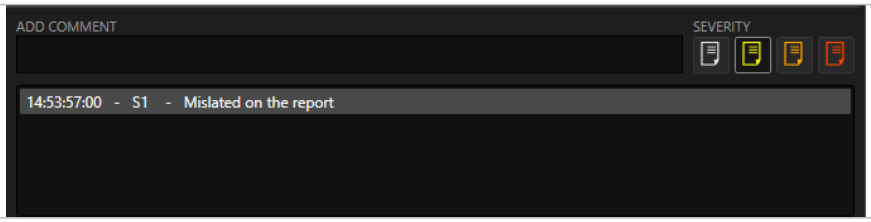




The Sync Tool

The Sync tool provides an interface for synchronizing audio and picture clips as well as viewing, adding, and modifying metadata for each clip. Now powered my MTai with the SYNC WORKFLOW ACTION.

See Tips and Tricks above.



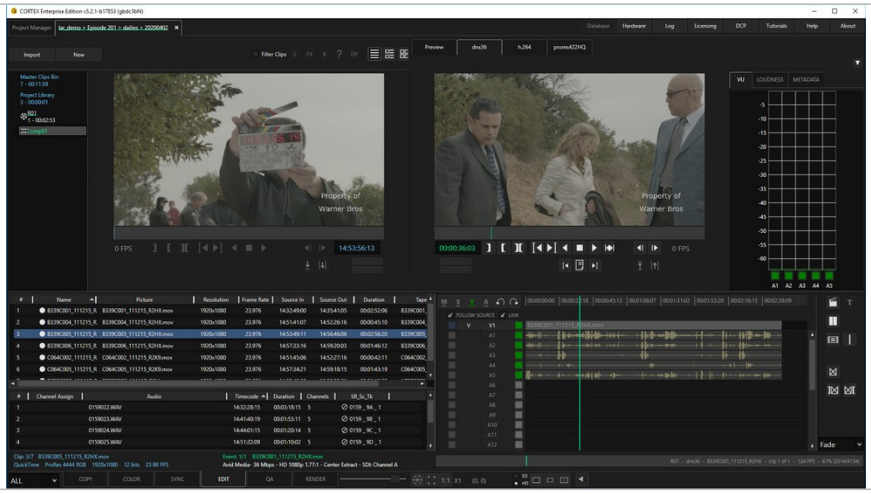
Multiple comments for “Discrepancies” can be assigned to each clip with 4 different “Severity” ratings. Comments are included in the Cortex PDF Report along with their timecode locations. Standard ALEs, AAF, Final Cut and Cortex Manifest reports can also be exported for dailies. Severity ratings include:

0. Comment Only 1. Severity 1 2. Severity 2 3. Severity 3

Comments made for clips in the Sync Tool are different from comments made in a composition, which is explained later in the Edit Tool.

These comments show up in the reports delivered upon render.

NOTE: A new feature for syncing sound is in support of off-speed material. You can now right click on a clip and select “Render offspeed” material and it will allow you to render the clip and import it into the project after rendering to then adjust the TC to sync sound at true speed for 48fps (47.952 fps) and sync sound to deliver a true speed and off-speed clip to editorial.



The Edit Tool

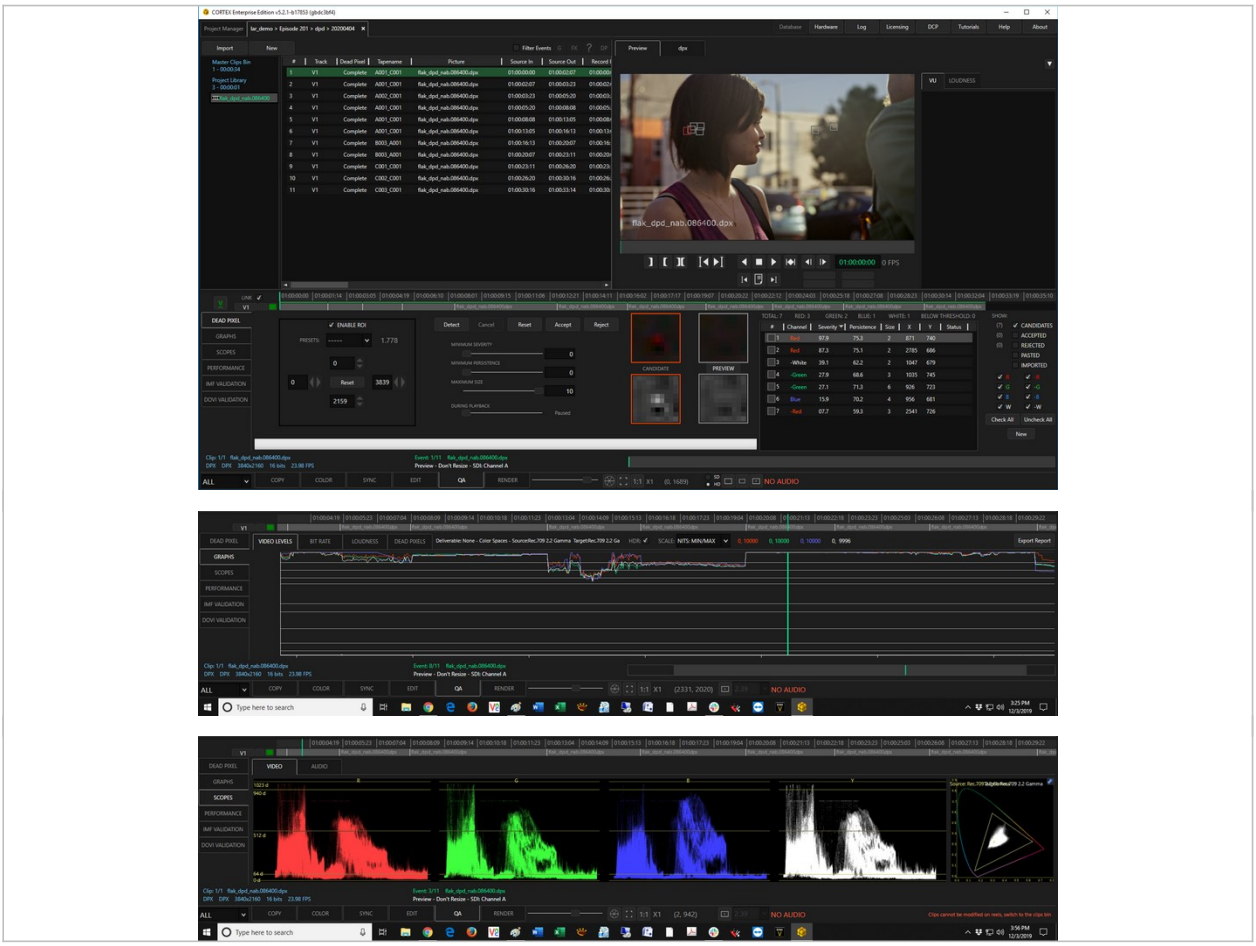
The Edit Tool in Cortex is a non-linear edit utility. Containing familiar edit functions such as Overwrite, Insert, Lift, and Extract, it can be used for a variety of reasons including on-set preview of shot assemblies, trimming sections of a rendered file, inserting or removing black between acts, replacing slates, and conforming a cuts-only CMX 3600 EDL or AAF. Three-point and drag and drop edits are supported as well as Gap and Ripple trims.

The Edit tool can be used in Dailies to manage Offspeed Clips. By right clicking on the clip in the Master Clip bin, the operator can right click on the file and select "Render Off Speed Clip". This will create a reel that is to be used for off speed clips only. Subsequent uses of the command will use the same reel

(regardless of that reel being active or not). The first time you execute the function you will have to create the reel in a similar fashion to other reels by selecting the configuration.

After rendering, these clips can be reimported back into the project by right clicking on the completed reel in the Render tab. They are brought back into a sub-bin of their own rather than into the Master Clips Bin, so the off-speed versions stay separate from the camera originals they were made from. This new offspeed clip can then be used for sound sync.

The Edit Tool is also used to assemble IMF, AS11, DPP, and DCP compositions prior to rendering.



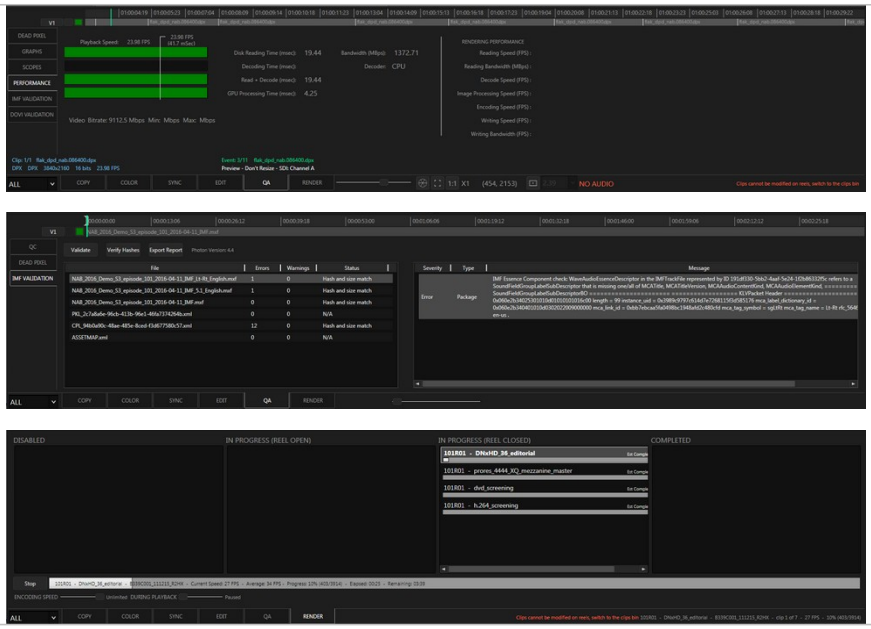
The QA Tool

The QA Tool provides functionality for Dead Pixel Detection & Correction, Radiation Artifact Detection & Correction, matte analysis, and Graphical Analysis of video levels for SDR, HDR, and Audio Loudness with corresponding reports that itemize discrepancies based upon user defined thresholds. The QA Tool also provides statistical feedback of hardware and software performance, and validates Cortex and 3rd party IMF and DCP packages and Dolby Vision™ metadata.

The Dead Pixel Module

The Graphs Module for Video and Audio Metrics

The Scopes Module. Also included are VU and Loudness Meters.



The Performance Module.

IMF and Dolby Vision™ Metadata Validation.

The Render Monitor Tool

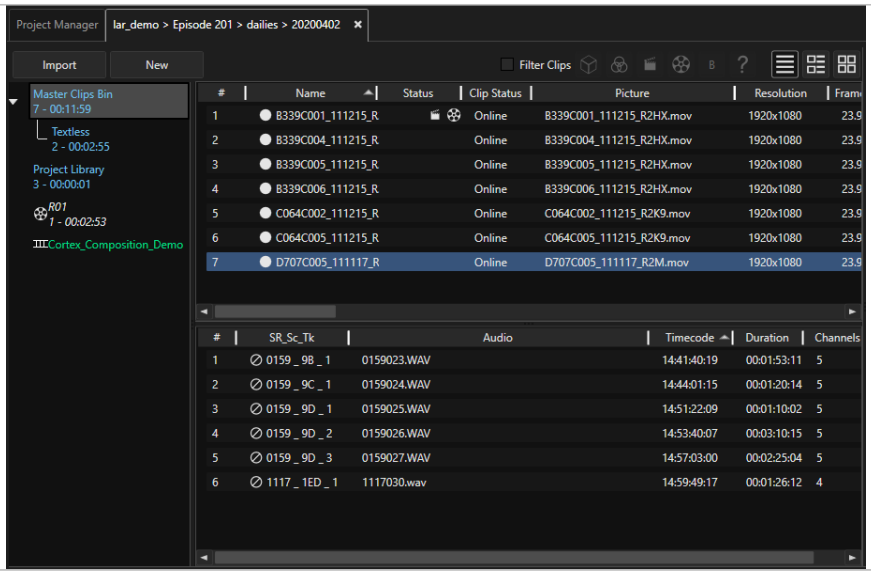
The Render Monitor Tool allows you to monitor the progress and manage the priorities of the background encoding of all Deliverables.

Once rendered, you can right click on a rendered clip and choose to reimport it into the project or to Open the Containing folder to quickly browse to the media deliverables.

Utility Tools

Along the top bar of Cortex are a series of utility based tools.

These utilities include the ability to select a Cortex Database, adjust hardware settings, review error and general information logs, copy your DCP certificate, link to our Cortex Tutorials, access Function and Keyboard Shortcut Help, and review information about Cortex.



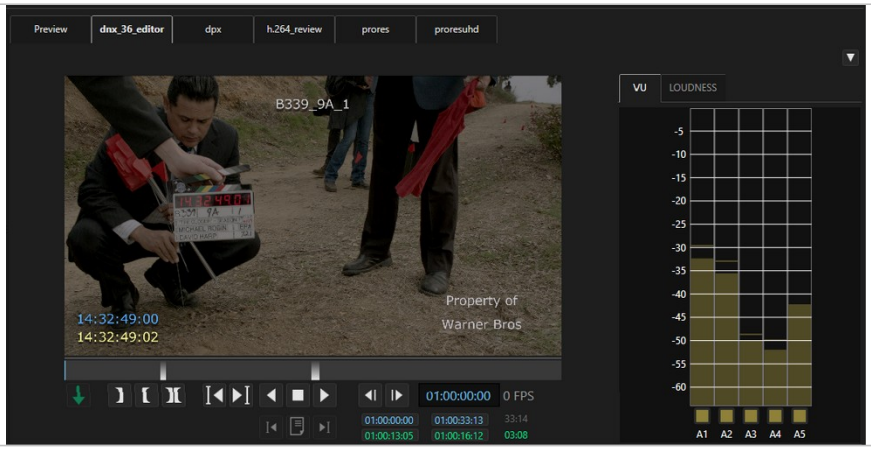
Bins & the Media Player

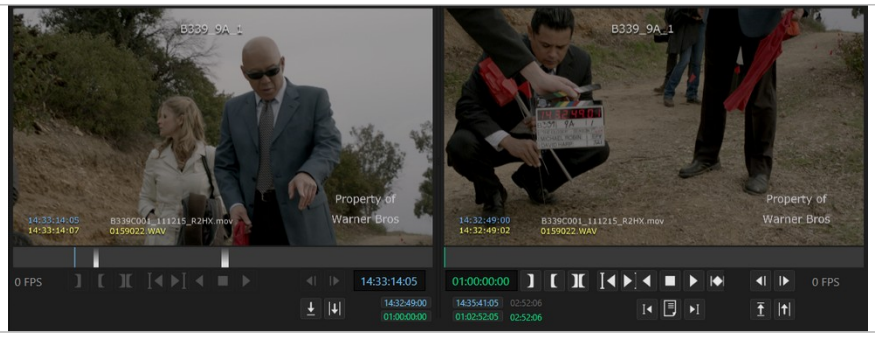
Bins

Along the left side of the UI, the Sidebar displays the Master Clips Bin, Sub-Bins, Project Library, Reels and Compositions. Imported media is stored in the Master Clips Bin. The Project Library contains Bars, Black, and user created slates. Clips can also be added to the Project Library for easy access to media that recurs throughout the project. Sub-Bins contain clips that were copied from the Master Clips Bin though they still exist in the Master Clips Bin.

The Sync & Edit tools also display audio clips in their own bin. With WORKFLOW ACTIONs, the JOBS opened will automatically import the media into the proper bins.

Using the IMPORT option above the Master Clip bin, users can still import media files or folders to either the Video or Audio bins directly.





The Media Player

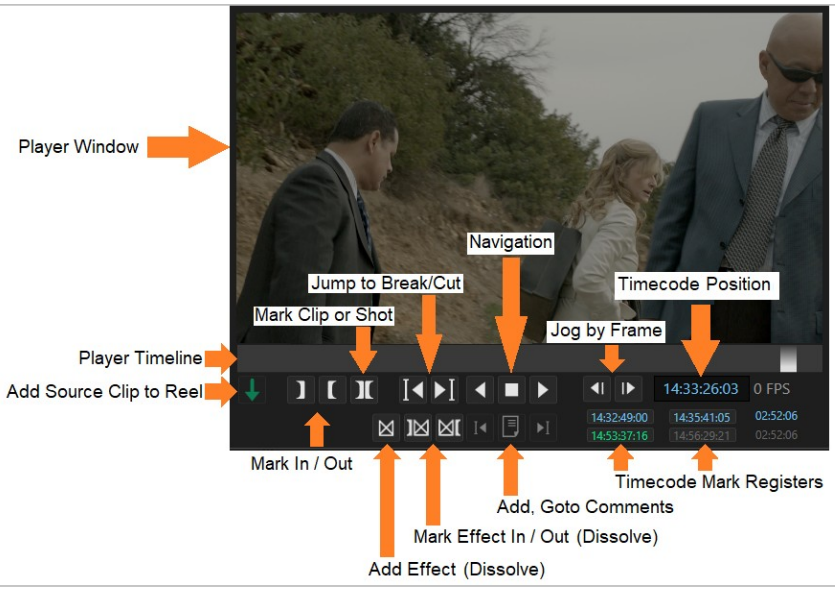
In all tools, except the Edit Tool where there are two players, a Single Media Player switches between playing source files or the composition depending on which is focused. A single click on a clip or composition event will focus and load the media ready to play.

The Deliverable Tabs located above the Media Player provide the ability to select different previews of the output.

When playing a source clip with audio, the VU meter bars are yellow. When playing a composition with audio, the VU meter bars are green.

The Edit Tool Media Players

The Source on the left. The Composition (Record) on the right.



Parts of the Source Single Media Player

The_Player Window

determined by the Deliverable Configuration as explained in the How to Create a Deliverable Configuration in the Project Manager section below.

Zooming the Picture

Using the mouse, hover over the picture: 1. Scroll up to zoom in and down to zoom out. 2. Press the / key on the numberpad in every tool except the Sync Tool (where it is used to enter a picture timecode).

Shift+/ to zoom out. In either case, double click the picture to zoom out completely. Note: This method of zooming does not affect the framing of the picture and is only for viewing.

The Player Timeline

The Player Timeline shows the full length of a source clip or composition segment. If a color dissolve(s) has been added, it appears as a shaded area on the timeline.

Add Source Clip to Clip Reel

If a Clip Reel has been created and a source clip is loaded in the player, pressing the Add Source Clip to Reel button will add the clip to the reel. The button is only visible when a source clip is loaded. It will only be enabled when a source clip is loaded and a Clip Reel has been created; otherwise it appears dim green.

Mark In and Out

The Mark In and Out buttons are used to mark both source and composition timecode positions.

Mark Clip or Segment (Shot)

The Mark Clip or Segment button is used to mark an entire source clip or a segment within two breaks in a composition. For compositions, the track that is enabled will determine the marked segment. If a video and audio track are enabled, the mark will default to the video track.

Go to Previous/Next Clip or Break/Cut

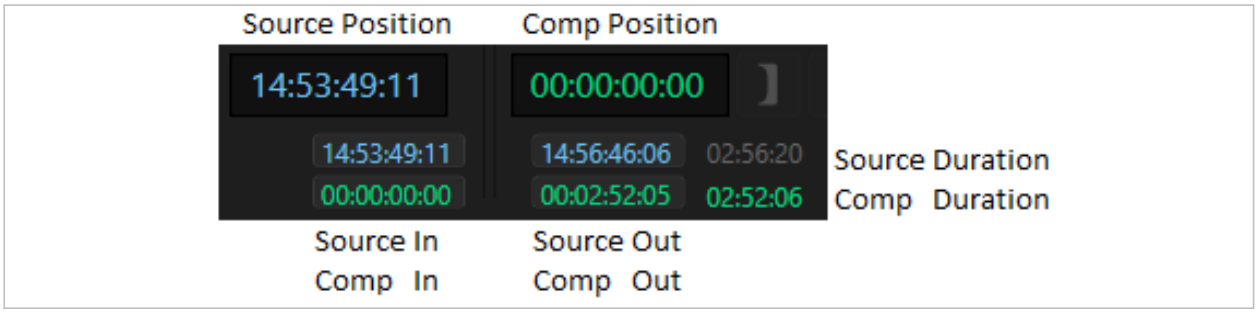
Depending on which is focused, a clip or composition, the “Go to” buttons will either go to clips or breaks/cuts. Breaks and cuts are only found on a composition timeline. A Break reflects a cut generated by the import of an EDL or where a shot has been split by manually adding a Break. It is represented as a white vertical line. A Cut is a point at which two clips of media are joined editorially within the Cortex Edit Tool. It is represented as a black vertical line.

Navigation

The three navigation buttons are, from left to right, Play Reverse, Stop, and Play Forward. Pressed once, the play speed is real time, pressed 2x doubles the speed, and press 3x sets the speed to fast forward or fast reverse.

Jog by Frame

Press once per frame either forward or reverse.



Timecode Position and Mark Registers

When a video source clip is loaded, the Timecode Position display is blue. When a composition is loaded, the timecode display is green. When an audio source clip is loaded in both the Sync or Edit tools, it will be yellow.

Mark In and Out points are also displayed in their corresponding color. The marks, once entered, follow the clip and are displayed in the timecode mark registers whenever the clip is loaded into the player.

Left click on any register to jump to the corresponding location.

Right click on any register to copy the timecode entry.

Add Dissolve or Effect

The Add Effect button is used in both the Color and Edit tools. In the Color Tool, it is the Add Dissolve command. In the Edit Tool, it is referred to as the Add Effect command.

Mark IN Dissolve or Effect

When a Dissolve or Effect is added to a clip or composition segment, the Mark Effect IN is defaulted to the timecode position where the dissolve or effect was added. Once the dissolve or effect has been given a Mark Effect Out and, therefore, a duration, the in point can be adjusted by clicking the Mark Effect In button.

Mark OUT Dissolve or Effect

The Mark Effect Out determines the duration of a dissolve or effect after being added. The duration can be adjusted by the Mark Effect Out as long as it does not cause an overlap of dissolves or effects. A color dissolve and effect, however, are permitted to overlap each other.

Add and Go to Comments

The Add and Go to Comments array of buttons are used to create and place comments in a composition timeline for QC or other user defined purposes. The comments can be exported as a QC .pdf report. Since the Edit Tool has its own composition player, the buttons and commands are always available for use. In the other tools, the Add and Go to Comments buttons are only enabled when a composition is loaded into the player, otherwise they are dimmed.



Parts of the Composition Single Media Player

When in a single media player tool, the only differences between the Source and Composition Media Players are

that the composition player has a Segment Play Mode button that limits play from cut to cut within a

segment while the Source Player has an Add Source Clip to Reel button , which is only available when the source player is active since only source clips can be added to a Clip Reel.

Examples of Marks

Note: When In and Out marks are present in both the source and composition timecode registers, the duration always defaults to the composition. If a timecode and/or duraton is displayed in grey, it means that the timecode and/or duration was calculated based on the other timecode registers' duration.

Source timecodes are shown in blue. Composition timecodes are shown in green.

Both the source and composition In and Out are marked, therefore the composition takes precedence.

This represents a 3 point edit where the source Out mark is determined by the duration of the composition marks.

This represents a 3 point edit where the composition Out mark is determined by the duration of the source marks.

This represents a 3 point edit where the source In mark is determined by the duration of the composition marks.

This represents a 3 point edit where the composition In mark is determined by the duration of the source marks.

Media Player Shortcut Keys

Description Shortcut Keys

Go to Previous Clip in Master Clips Bin E or Up Arrow when Clips Bin is focused

Go to Next Clip in Master Clips Bin R or Down Arrow when Clips Bin is focused

Add Source Clip to Clip Reel G

Mark In I

Go to Mark In Shift+I

Clear Mark In Ctrl+I

Mark Out O

Go to Mark Out Shift+O

Clear Mark Out Ctrl+O

Mark Clip or Shot Z

Clear Mark In and Out for Source and Composition Ctrl+Alt+I or O

Add Break , (comma)

Clear Break Ctrl+,

Go to Previous Break/Cut on Composition Timeline E or Shift+S when composition is focused

Go to Next Break/Cut on Composition Timeline R or Shift+F when composition is focused

Play Forward V or Spacebar, VV for 2x speed, VVV for fast forward

Play from middle of clip Shift+V

Play Reverse X, XX for 2x speed, XXX for fast reverse

Go to middle of clip Shift+X

Play limited to within composition segment Ctrl+Shift+C

Stop C or Spacebar

Jog forward by frame F or Right Arrow

Jog reverse by frame S or Left Arrow

Add Effect in Edit Tool or Dissolve in Color Tool P

Mark Effect or Dissolve In [

Mark Effect or Dissolve Out]

Go to beginning of Next Effect/Dissolve Shift+[

Go to beginning of Previous Effect/Dissolve Shift+]

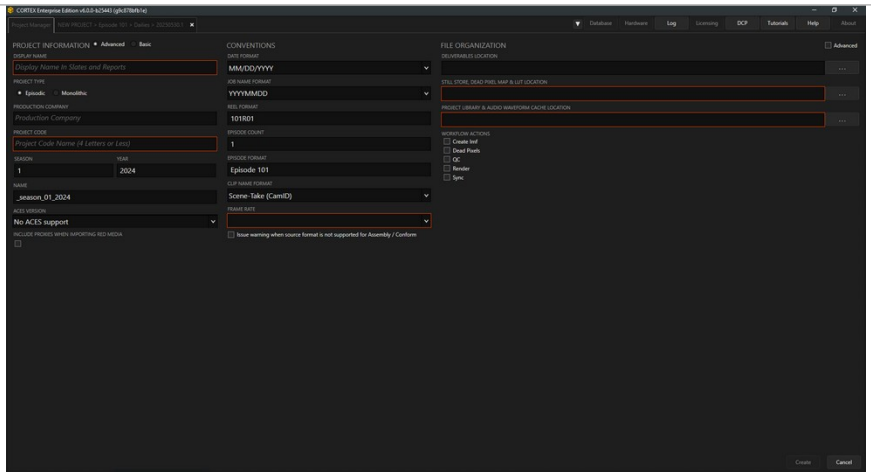
Delete Effect or Dissolve Ctrl+P while located at beginning of effect/dissolve

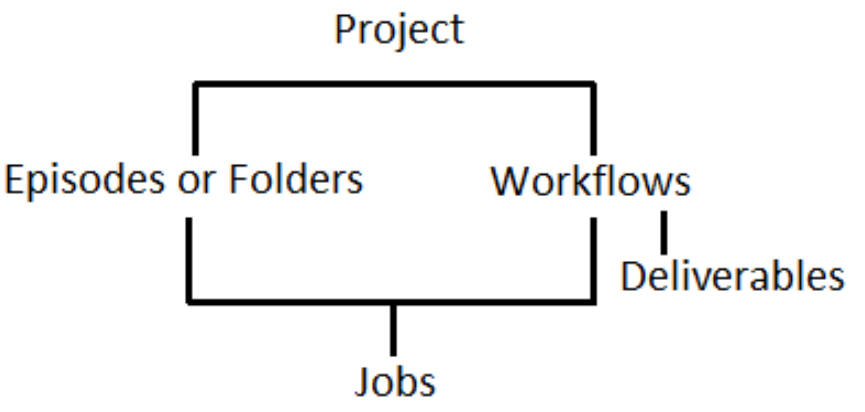
Add Comment to composition timeline Ctrl+Shift+O

Go to Next Comment Ctrl+Shift+F

Go to Previous Comment Ctrl+Shift+S

Tip: you can access the hotkeys latest configuration in Cortex by clicking on the HELP Tab in the upper right hand corner. This brings up a complete list of Cortex HotKeys.





The Project Manager

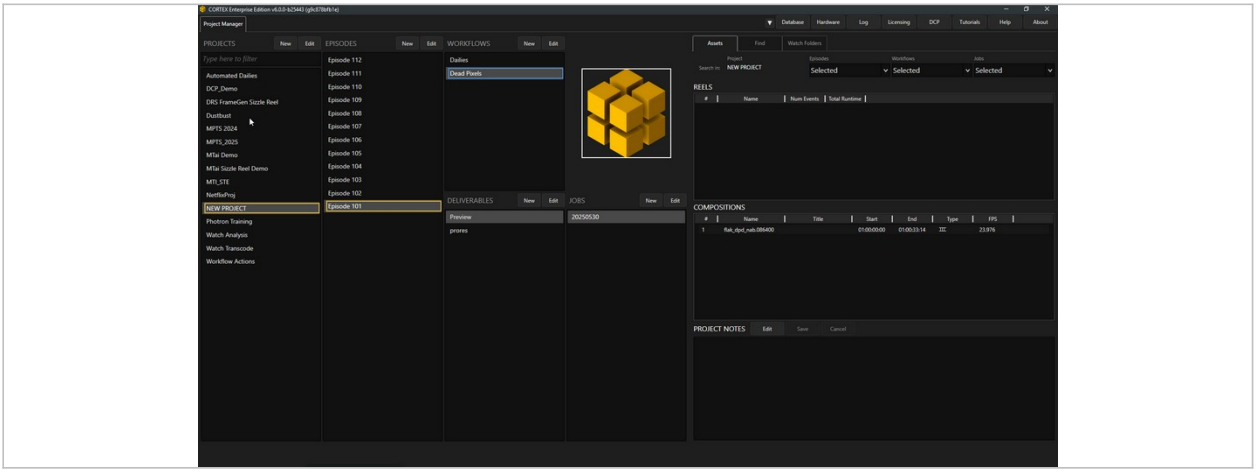
The Project Manager is the starting point for using any of the CORTEX editions. The Project Manager allows you to define and organize projects, Workflows, Workflow Deliverables and corresponding Jobs. There are two Project types, Advanced and Basic, each serving a different purpose.

Advanced Project

Cortex's Advanced project manager is divided into 5 main sections as follows: 1. Projects 2. Episodes or Folders - determined by the project type, either Episodic or Monolithic. 3. Workflows 4. Deliverables 5. Jobs

The Project hierarchy is as follows:

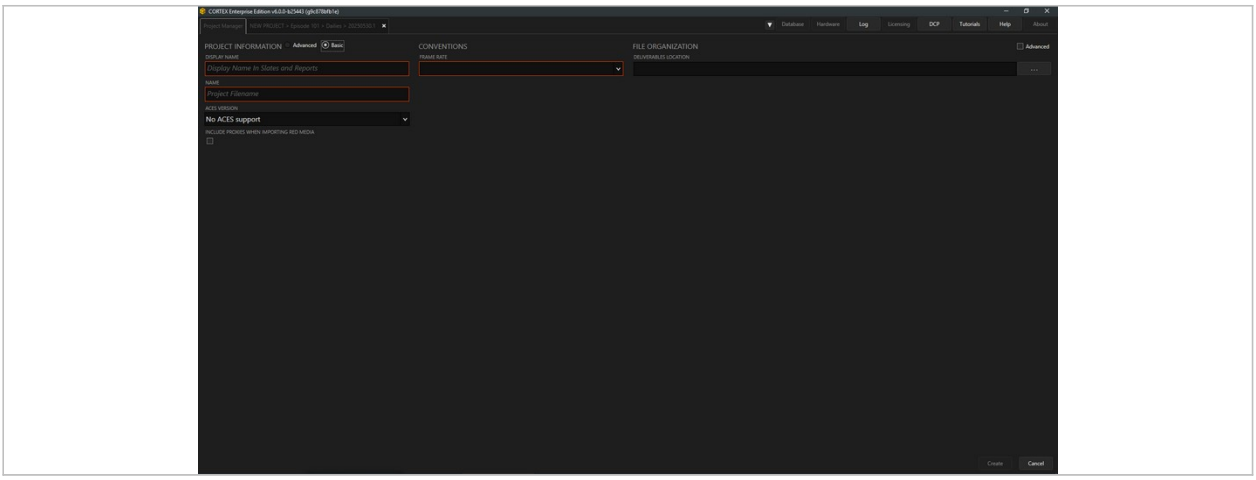
A Cortex Advanced Project normally corresponds to a TV show (Episodic) or Feature film (Monolithic). Projects can contain one or more Episodes for TV shows, or Folders for Feature films. Just complete the fields in RED.



Each Advanced Project can contain one or more Workflows. A Workflow is a collection of Deliverables intended to be rendered for a specific stage of post production. For example, a Workflow called "Dailies" could possibly contain editorial, studio review, and mezzanine Deliverables, whereas a "Final Delivery" Workflow could contain Deliverable files such as an IMF or DCP.

Jobs are created under a combination of a Project, Episode/Folder, and Workflow. When a Job is ready to render, the render dialog will present the Deliverables associated with the Workflow as the first option. However, within any Job, all Workflows and their Deliverables are accessible as render options.

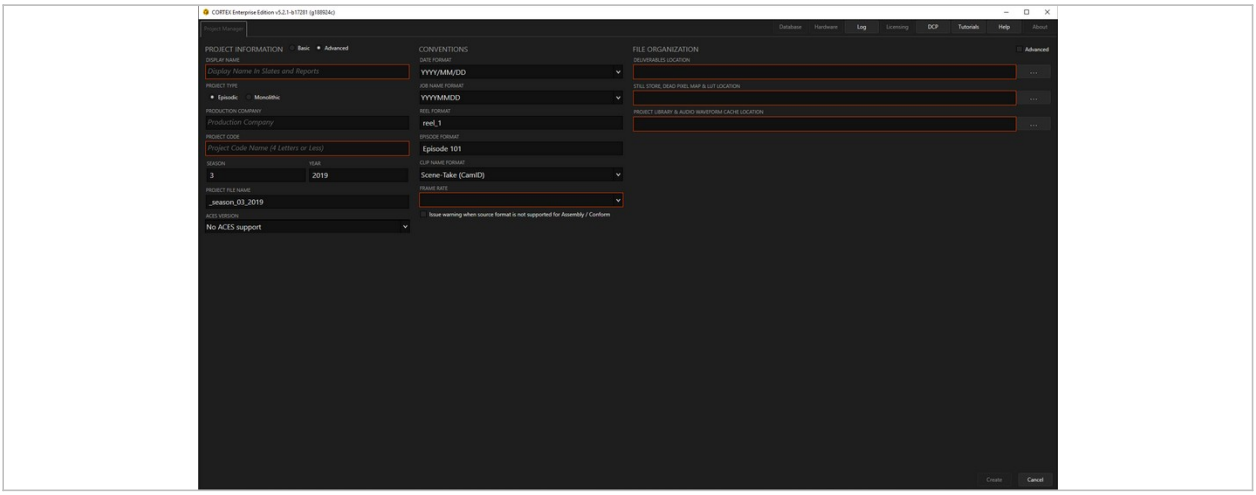
TIP: "My Project" has one Episode and four different Workflows. Each Workflow consists of a unique set of Deliverables. In the case of "dailies", there are five Deliverables including the "Preview" default, which will be explained in the How to Create a Deliverable Configuration section below.

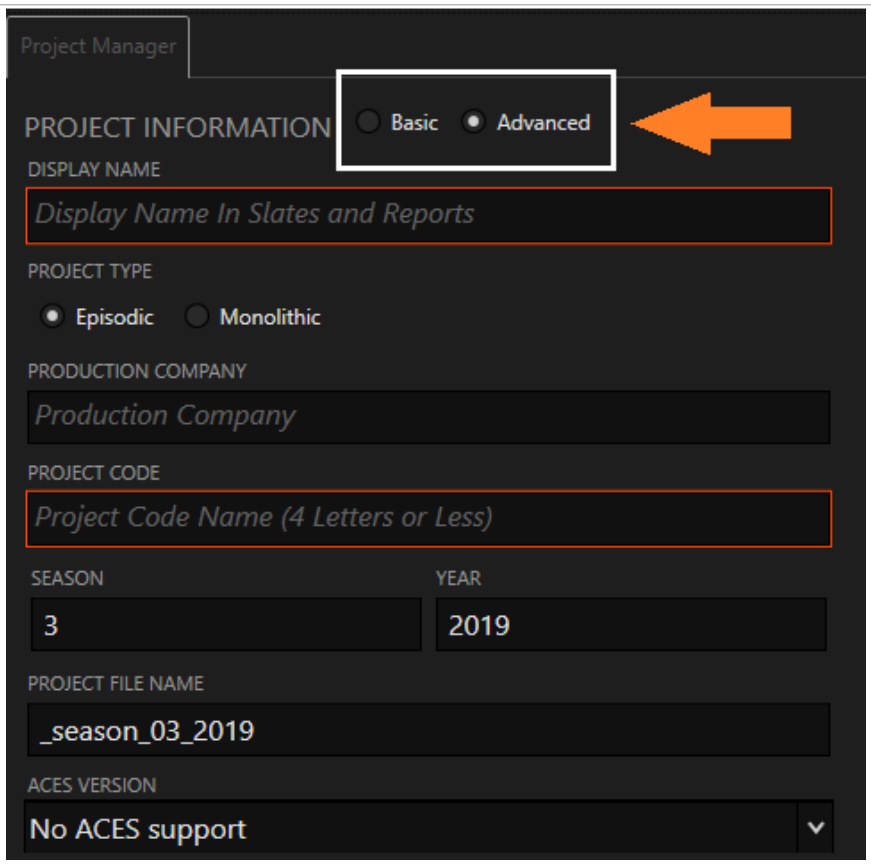


Basic Project

A Basic Project contains 3 main sections: 1. Projects 2. Deliverables 3. Jobs

The Basic Project is used for simple, straight-forward file rendering, for example, IMFs and DCPs. Simply complete the fields in RED and then SAVE.





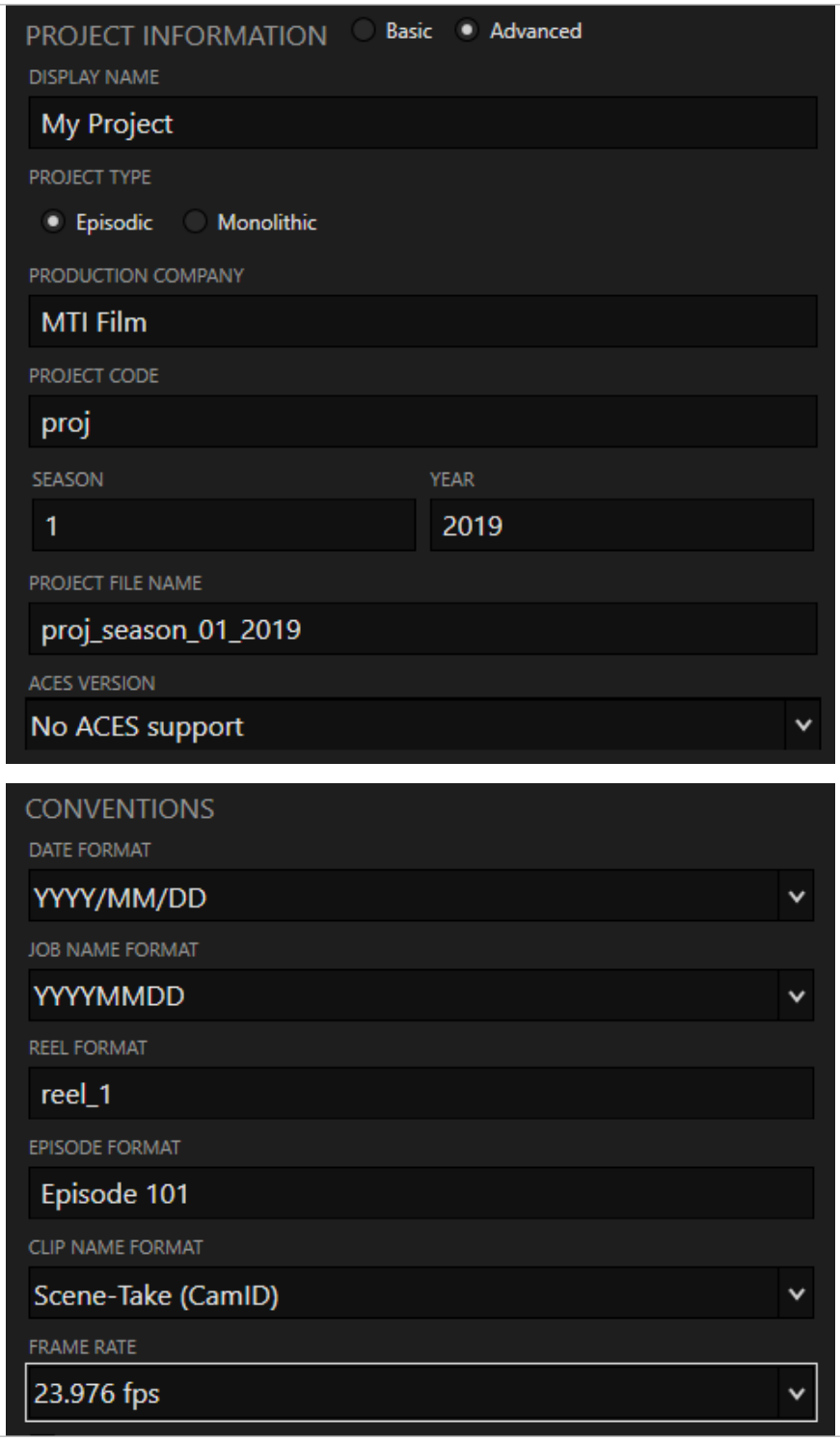


Creating a Project

In the Project Manager tab, click the New button.

The following screen appears with three sections: Project Information, Conventions, File Organization. Fields outlined in red are required.

Choose your Project Type, Basic or Advanced.



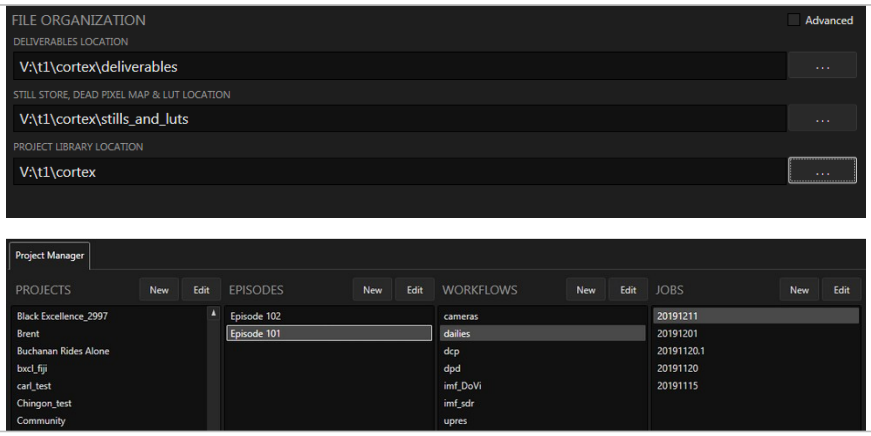
Advanced Project Information

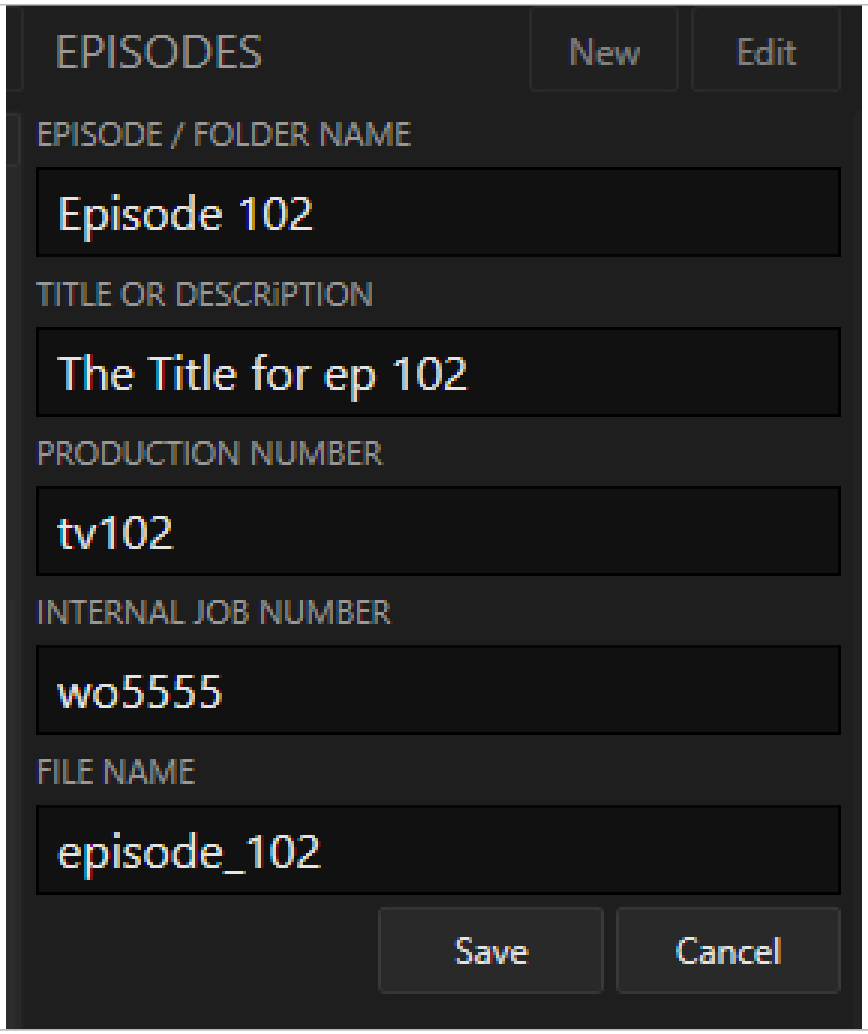
1. Use the Display Name field to enter the name of your project 2. Select the appropriate PROJECT TYPE: Episodic or Monolithic. If you choose Episodic, two additional fields appear below the Project Code: “Season” & “Year” 3. Enter the PRODUCTION COMPANY 4. Enter a PROJECT CODE (nickname) 5. For Episodic, enter SEASON number & YEAR 6. Based on the Project Code, a PROJECT FILE NAME will be created automatically 7. Determine whether the project will support ACES color space. An ACES project impacts the types of color space choices available for Deliverables and Color Tool options

Conventions

Cortex provides for default values to be entered into various fields throughout the application.

1. DATE FORMAT. In this field choose the date format that will be used throughout the application 2. JOB NAME FORMAT. This field determines how your Jobs will be named initially. 3. REEL FORMAT. Enter the desired formatting for when reels are created. If ending in a number, it will auto-increment per reel. 4. EPISODE FORMAT. For episodic job types, enter the desired formatting. If ending in a number, it will auto-increment per episode. 5. CLIP NAME FORMAT. Editors have preferences as to how their clips will be named in their bins. A variety of options are provided. 6. FRAME RATE. Enter the frame rate for the project. When enabled in the reel creation dialog, an optional warning appears when adding clips to reels that do not match the project frame rate. For example, if a 30 fps file is added to a 23.976 reel and the warning has been disabled, the result would be a file that plays back 25% slower than the original.





File Organization

The File Organization determines where you want your renders, Stills, LUTS, and Dead Pixel Maps to be created. The Advanced checkbox allows you to alter the Deliverables directory paths if desired. Once you've finished entering all the Project information, click the Create button at the bottom right of the screen.

Creating Episodes, Workflows and Deliverables

Episodes or Folders

For Advanced projects, the second section header will be either Episodes or Folders depending on the chosen project type.

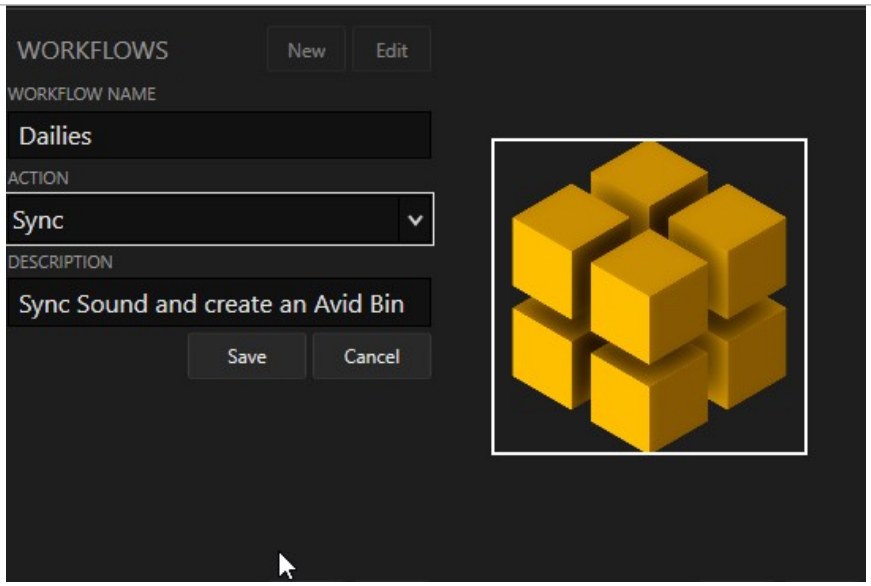
If the EPISODE/FOLDER NAME default ends in a number, the number will auto-increment each new episode/folder.

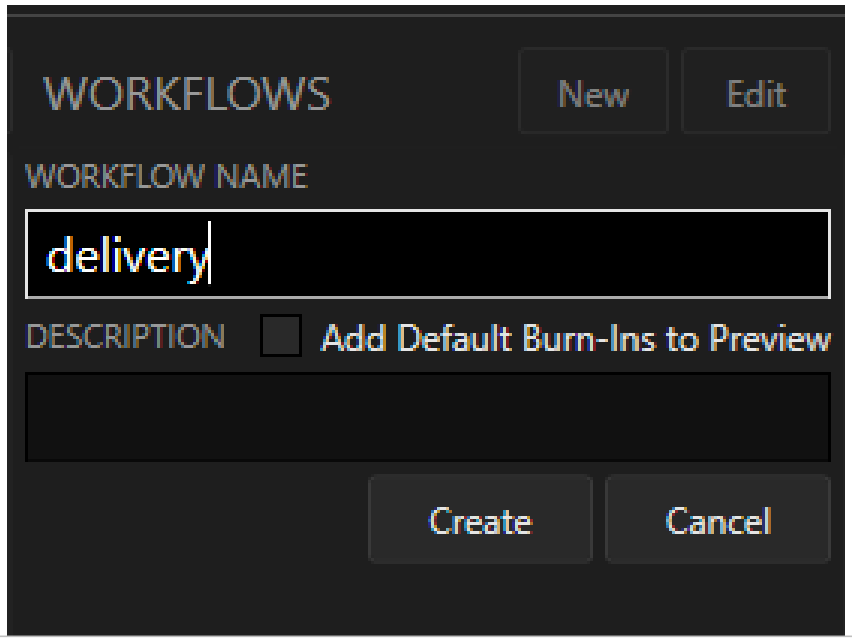
The TITLE or DESCRIPTION and PRODUCTION NUMBER fields are available as burn-ins (discussed later in the Deliverables section) and can be added to Deliverables or slates.

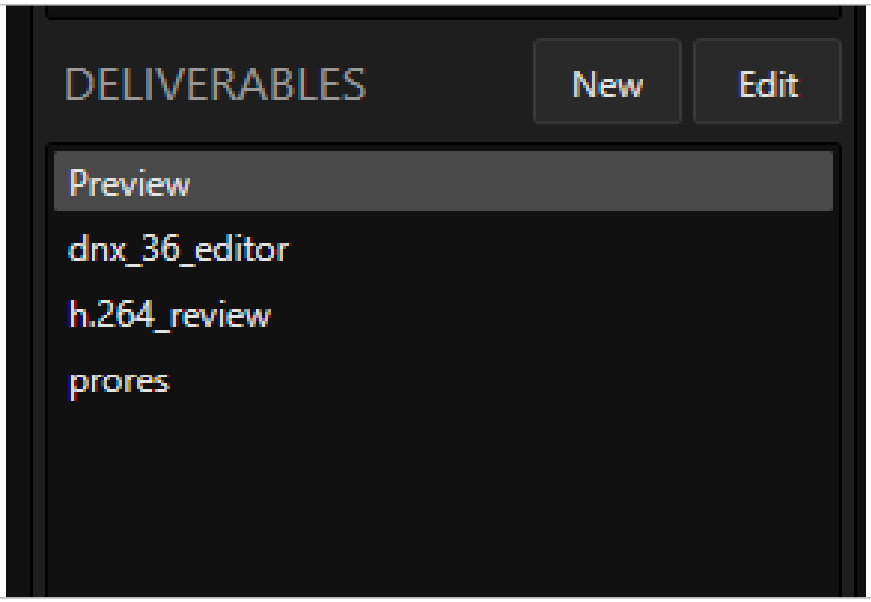
The INTERNAL JOB NUMBER is for reference only.

The FILE NAME reflects the folder that will be created as part of the directory path into which Deliverables will be rendered.

NOTE: In V7.0, you can now define the number of Episodes per project. Deliverables will be supported across all Episodes.







Workflows

A Workflow represents a stage of the Project's post production process and is a collection of specific Deliverables that pertain to it.

Enter the Workflow Name and, if desired, a description.

To use the default Burn-in for the Preview Deliverable, enable the checkbox.

In V7.0, WORKFLOW ACTIONS are new and provide MTai Automation Intelligence to the workflows. Set the Action field on a workflow to one of the following:

Action	What it does
Sync	Imports picture and sound, runs MTai Slate Detect to locate the closed slate in each take, and prepares the clips for auto-sync.
Render	Imports the dropped media and renders the workflow's deliverables. This action was referred to as Transcode in earlier documentation.
QC	Imports the media, builds a composition and runs the analysis tasks configured in the action's options — video levels, mattes and loudness — writing the QA report to the reports folder.
Dead Pixels	Imports the media, runs MTai shot detection, creates a composition timeline and runs dead pixel detection across it.
Create IMF	Assembles the IMF package and validates it automatically once it has been created.
VFX Pull	Traces an editorial EDL back to the source media, builds the reels, renders the deliverables and copies them to the vendor folders. See Chapter 1.
MTAi Frame Convert	Converts the dropped media to a different frame rate using MTai interpolation.
SDR to HDR	Expands a finished SDR grade into HDR, runs the Dolby Vision™ L1 analysis and, if requested, renders the HDR deliverable. See Chapter 3.

Tip: Check out the Tips and Tricks detail at the top of this document.

Analysis Options for the QC Workflow Action

A QC workflow action carries its own set of analysis tasks, which run unattended when the action is executed. Click Options on the workflow to set them.

REPORTS FOLDER — where the QA report and any sidecar .csv files are written.

VIDEO LEVELS — analyzes picture levels. Set the DEFAULT SOURCE COLOR SPACE (used only when the source file does not declare one) and the TARGET COLOR SPACE, along with the BRIGHTNESS TOLERANCE %, GAMUT MIN BRIGHTNESS, NITS, GAMUT TOLERANCE % and GAMUT WARN TOLERANCE % thresholds that decide what is reported as a discrepancy.

MATTES — runs the matte analysis described in the QA Tool section, and optionally includes the result in the QA report.

LOUDNESS — runs the loudness analysis. Choose the MODE (broadcast standard) and set the loudness and true peak thresholds.

QA REPORT — choose what the report contains: INCLUDE CODE VALUES, INCLUDE IRE, INCLUDE MIN/MAX NITS, INCLUDE FALL/CLL NITS, INCLUDE GAMUT LEVELS, INCLUDE BIT RATE, INCLUDE DISCREPANCY STILLS and WRITE HDR REPORT. Use Check All and Uncheck All to set them together. The VIDEO LEVELS, NITS LEVEL and GAMUT LEVEL dropdowns set the ranges the report is measured against.

The MTAi Frame Convert Workflow Action

The MTAi Frame Convert action converts dropped media to a different frame rate using MTai interpolation, without the operator having to build a reel by hand. Create a workflow, set its Action to MTAi Frame Convert, choose the target frame rate and the deliverables to render, then drop the media on the CORTEX logo and execute the action as you would any other workflow action.

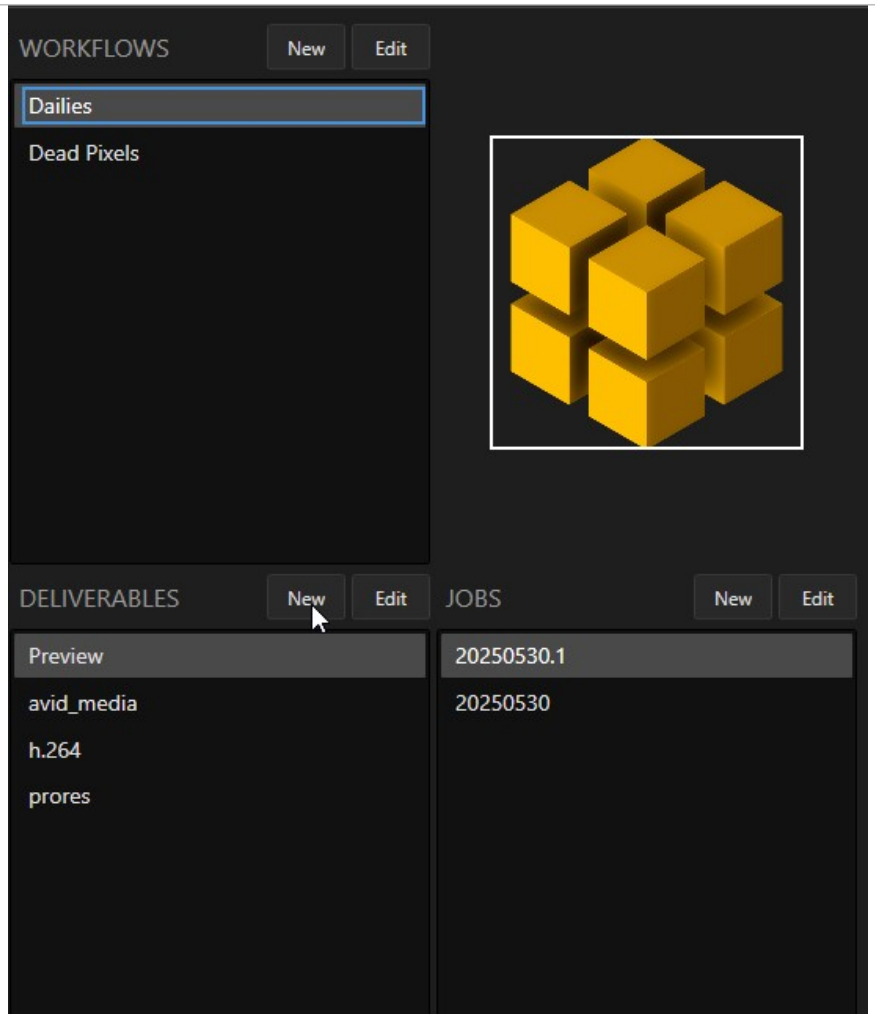
The same conversion is still available manually through the reel configurator — see the frame rate conversion notes in Appendix A — and as an option on a Render watch folder, where each triggered render can be converted as it is produced.

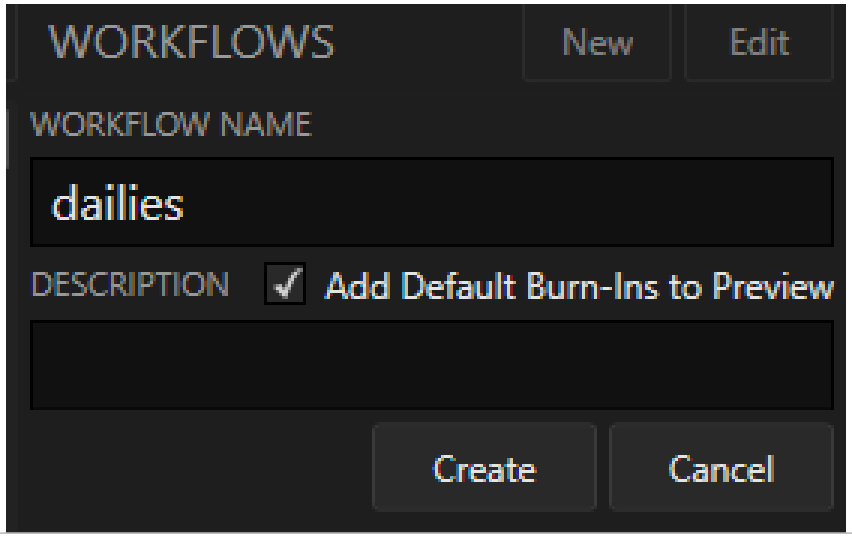
Deliverables

A Deliverable is associated with a Workflow and consists of a configuration of codec parameters that satisfies a specific delivery purpose, such as a H.264 file for customer review.

The Preview Deliverable

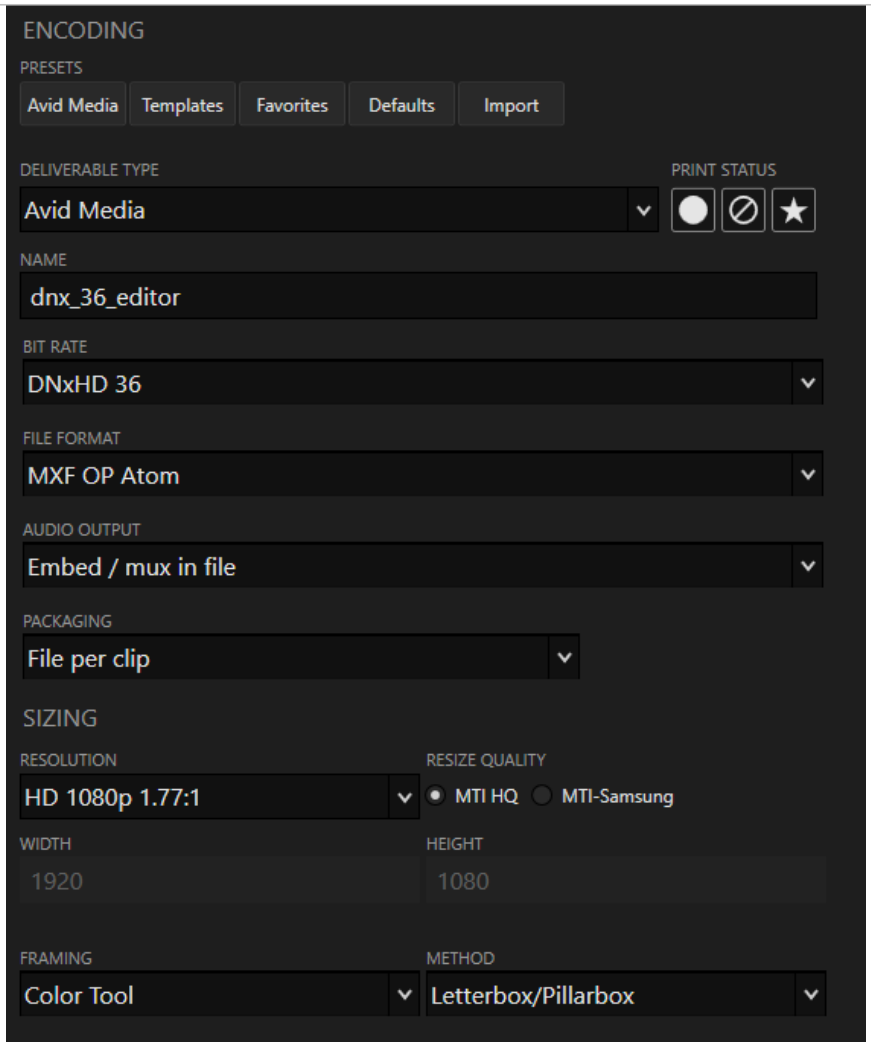
using basic properties, which can be modified if desired.

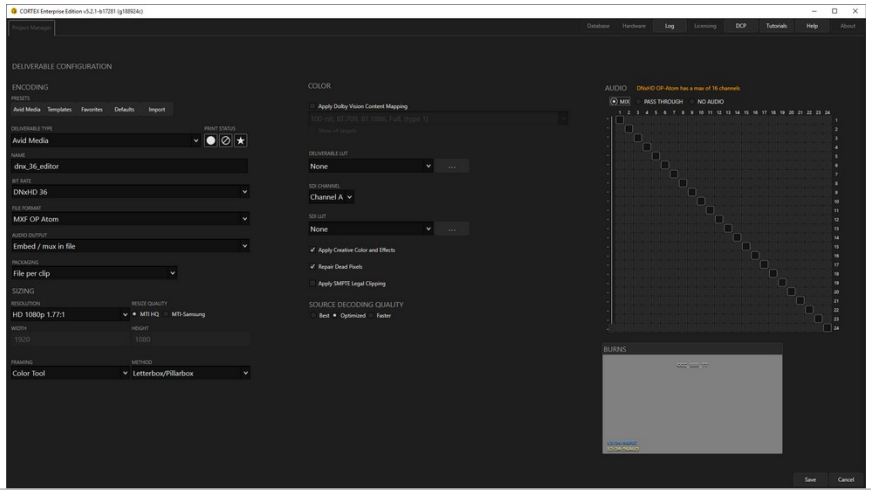




How to Create a Deliverable Configuration Deliverable Configuration Editor The Configuration Editor is divided into four basic sections: Encoding, Color, Audio, and Burns Canvas.

The Preview Deliverable The Preview Deliverable is automatically created for each Workflow with default properties, which include No Resize for picture, Pass Through for sound, and a standard set of graphical burn-ins if the Workflow checkbox for the burn-ins is enabled. It is designed to preview picture and sound as recorded. You can modify the Preview, but it can not be deleted or used for rendering.

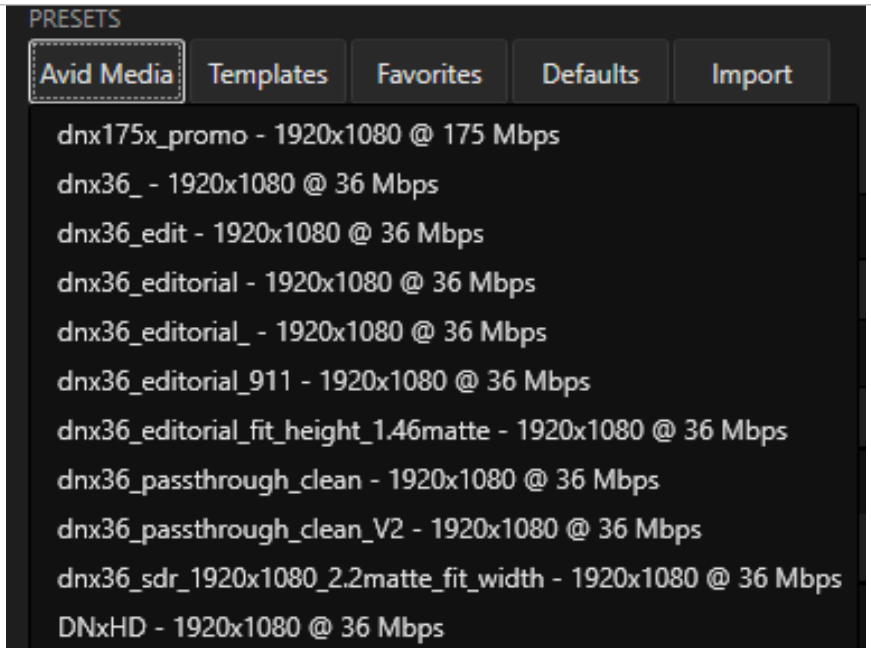


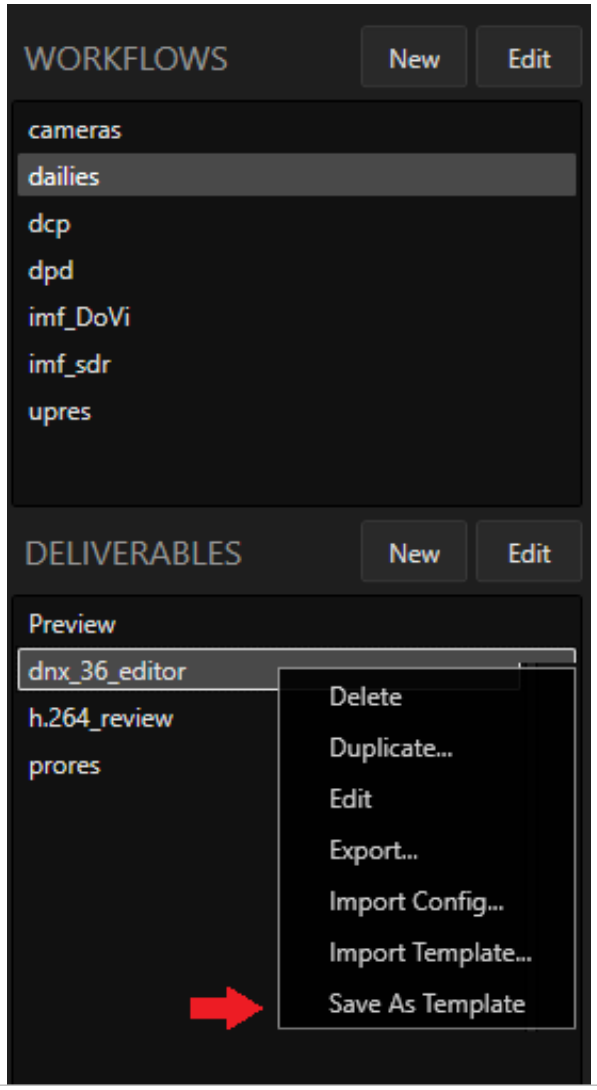


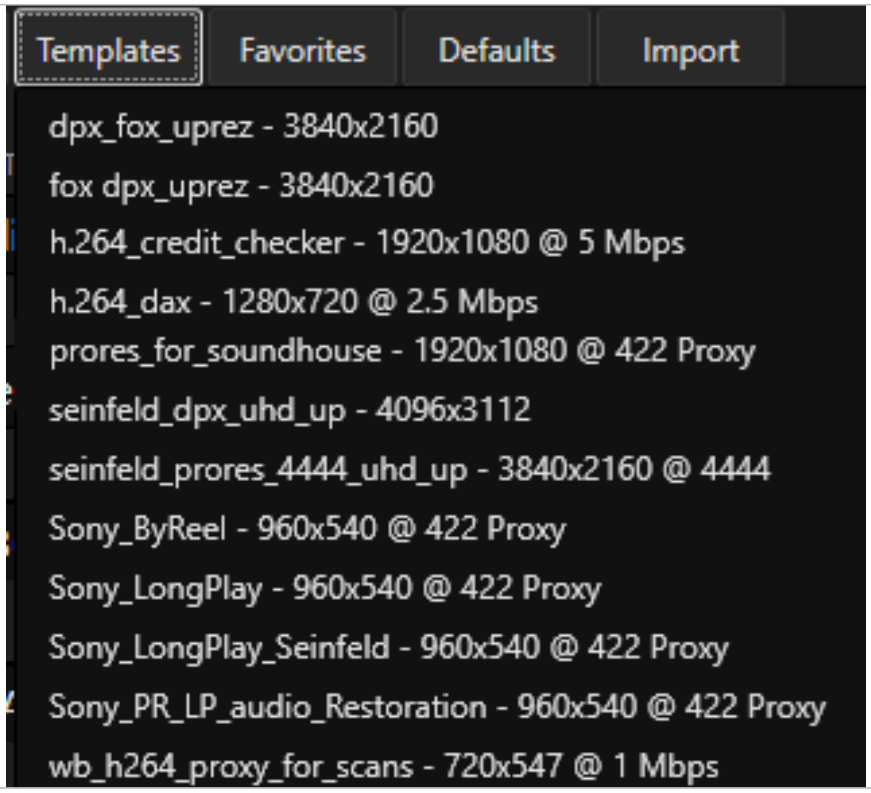
Encoding Section

In the Encoding section, all fields required for profiling and formatting the file are available.

NOTE: If a codec is greyed out then a license must be purchased for it.


PRESETS
Avid Media
Templates
Favorites
Defaults
Import
dnx175x_promo - 1920x1080 @ 175 Mbps
dnx36_ - 1920x1080 @ 36 Mbps
dnx36_edit - 1920x1080 @ 36 Mbps
dnx36_editorial - 1920x1080 @ 36 Mbps
dnx36_editorial_ - 1920x1080 @ 36 Mbps
dnx36_editorial_911 - 1920x1080 @ 36 Mbps
dnx36_editorial_fit_height_1.46matte - 1920x1080 @ 36 Mbps
dnx36_passthrough_clean - 1920x1080 @ 36 Mbps
dnx36_passthrough_clean_V2 - 1920x1080 @ 36 Mbps
dnx36_sdr_1920x1080_2.2matte_fit_width - 1920x1080 @ 36 Mbps
DNxHD - 1920x1080 @ 36 Mbps


WORKFLOWS
New
Edit
cameras
dailies
dcp
dpd
imf_DoVi
imf_sdr
upres
DELIVERABLES
New
Edit
Preview
dnx_36_editor
h.264_review
prores
Delete
Duplicate...
Edit
Export...
Import Config...
Import Template...
Save As Template



Presets

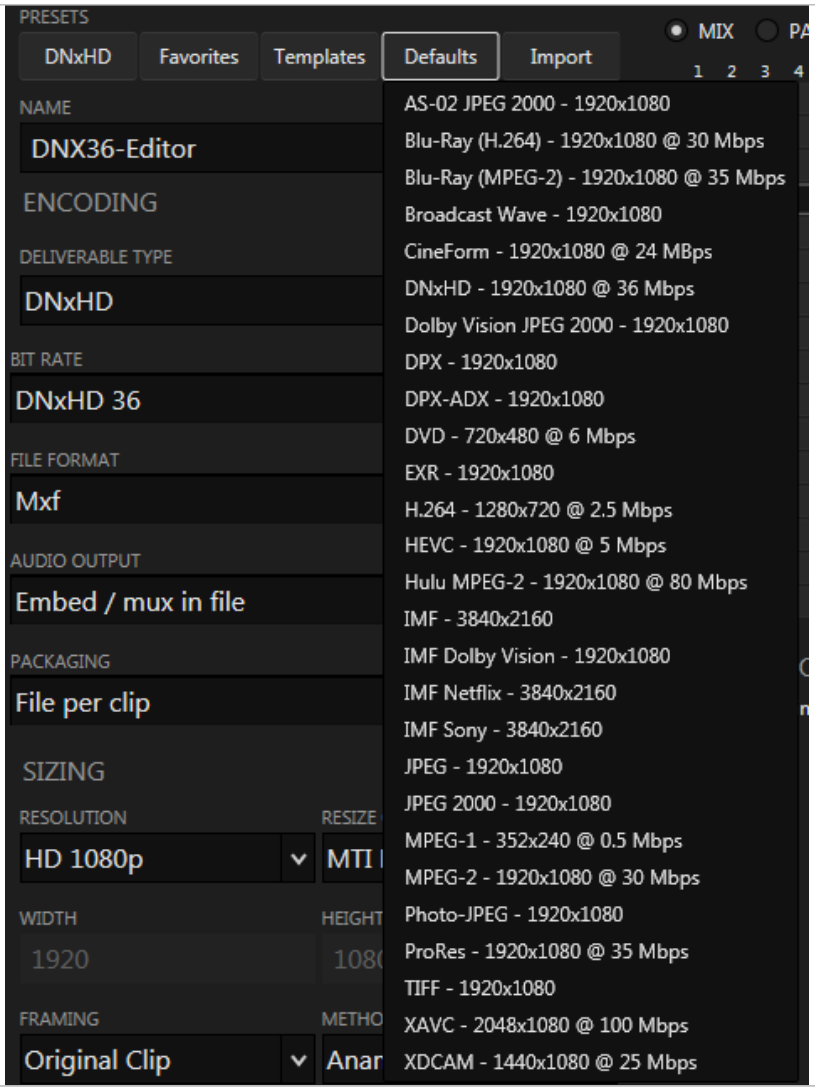
At the top of the Encoding Section are the Presets Drop-down buttons. The first button will be named and contain a quick view of the codecs last created for the selected “Deliverable Type”.

Templates

The Templates list is created by Right-clicking on a Deliverable in the Deliverables section and choosing “Save As Template” in the Context Menu. Other options include Exporting and Renaming Templates.

Favorites

Favorites consists of a list of user defined configurations tagged as “Favorite” from the Templates list. Right-click on the Template configuration and choose “Add to Favorites”.

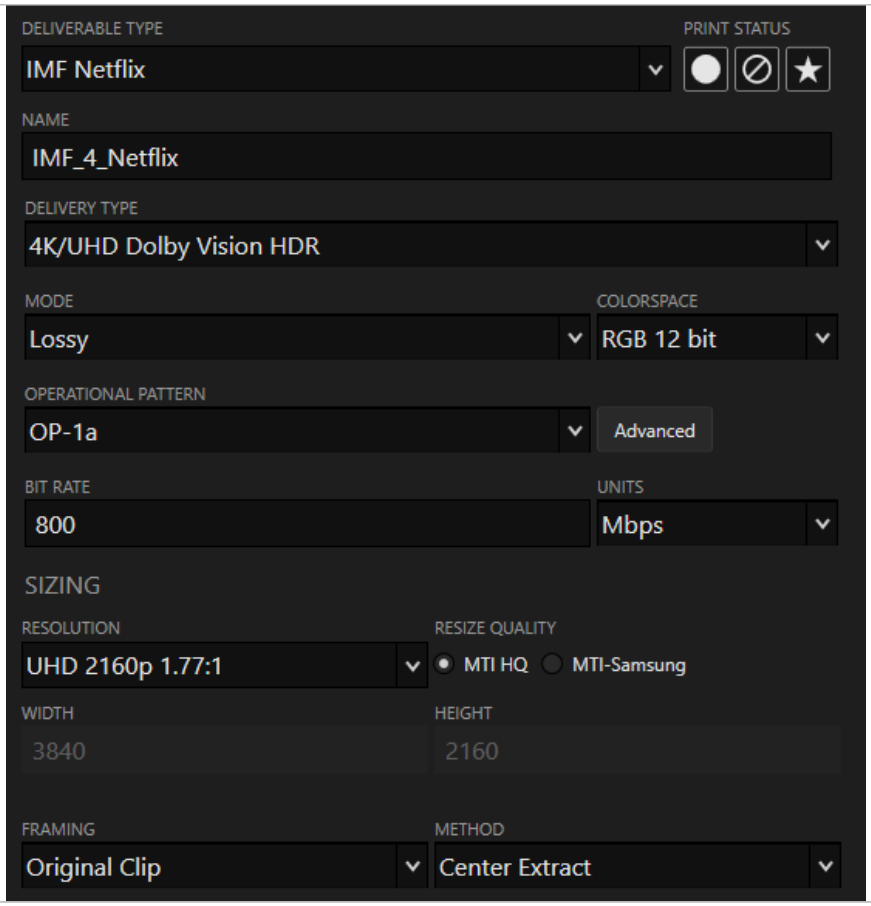


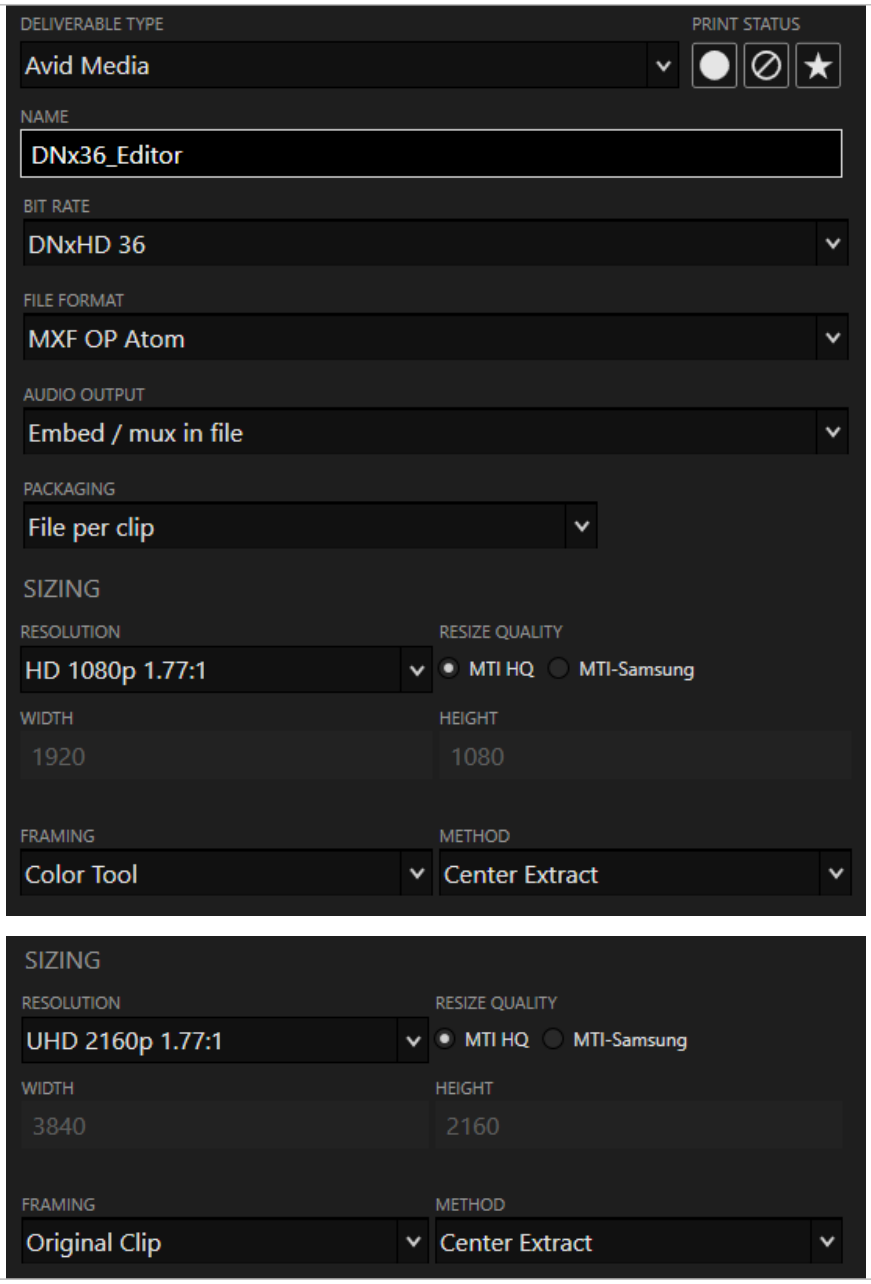
Defaults

The Defaults provide a quick view of the most frequently used output codecs.

Import

The Import button provides the option to import a configuration or template that was exported from a Cortex workstation not attached to the current database.


DELIVERABLE TYPE
PRINT STATUS
IMF Netflix
NAME
IMF_4_Netflix
DELIVERY TYPE
4K/UHD Dolby Vision HDR
MODE
COLORSPACE
Lossy
RGB 12 bit
OPERATIONAL PATTERN
OP-1a
Advanced
BIT RATE
UNITS
800
Mbps
SIZING
RESOLUTION
RESIZE QUALITY
UHD 2160p 1.77:1
MTI HQ
MTI-Samsung
WIDTH
HEIGHT
3840
2160
FRAMING
METHOD
Original Clip
Center Extract



Encoding

Fill in the fields as indicated:

DELIVERABLE TYPE. Select the Deliverable Type from the Drop-down list. The Deliverable Type determines the available encoding options.

NAME. Enter the name you wish to associate with the Deliverable. For example, DNx36_Editor would indicate that the Deliverable is intended for the edit room.

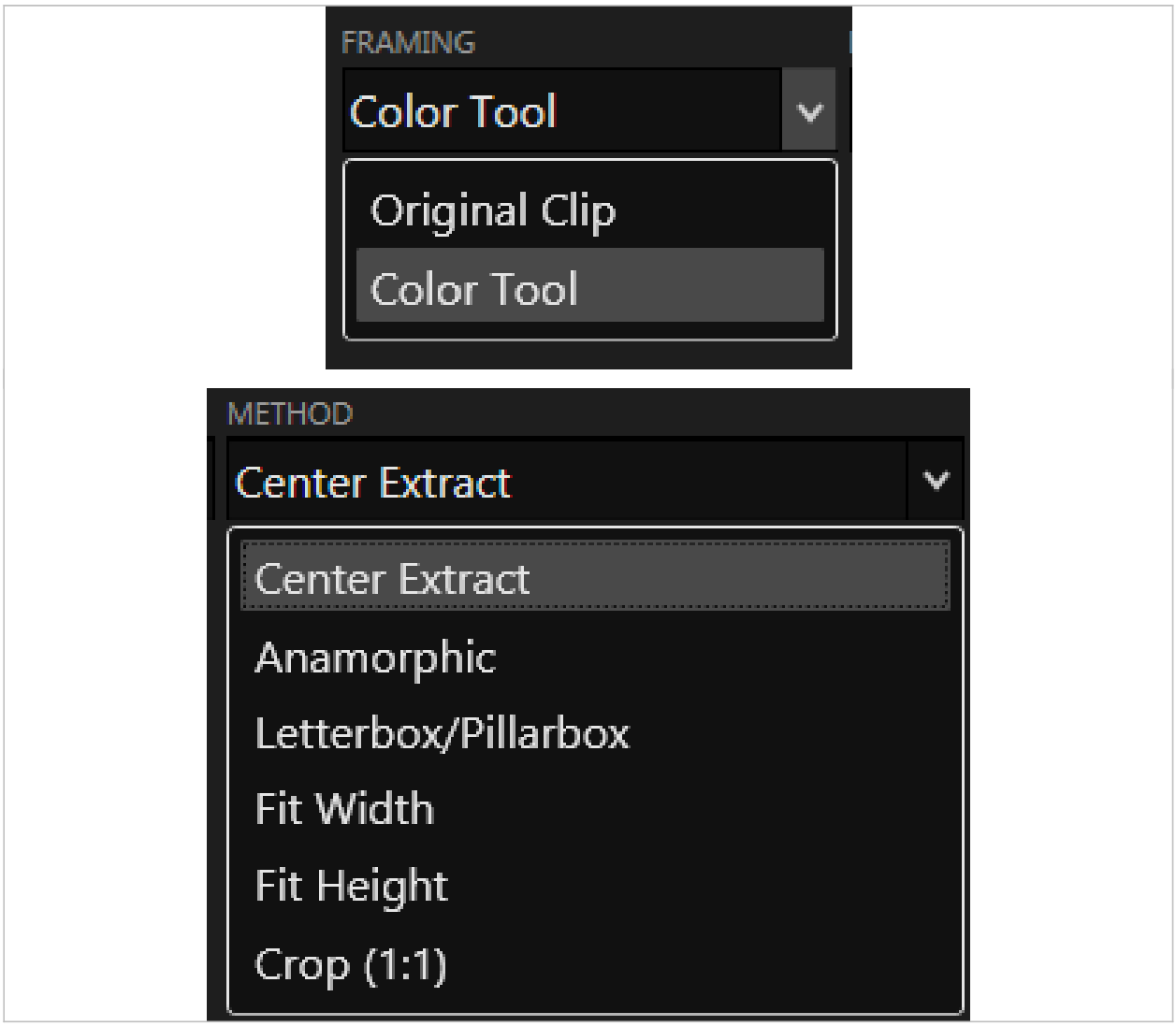
DNx36 encoding options UHD IMF Netflix HDR encoding options

Sizing

In the Sizing section choose the RESOLUTION, RESIZE QUALITY,

Framing

The choices for resolution are determined by the selected codec. If “Don’t Resize” is selected for resolution, the Resize Quality, Framing, and Method fields will be hidden. For Resize Quality, MTI HQ comes standard in Cortex. MTI-Samsung is included with Enterprise only.



MTI HQ MTI HQ provides a high quality up and down rescaler that can be used for projects requiring faster and higher throughput. MTI HQ can be used on frame and field-based media.

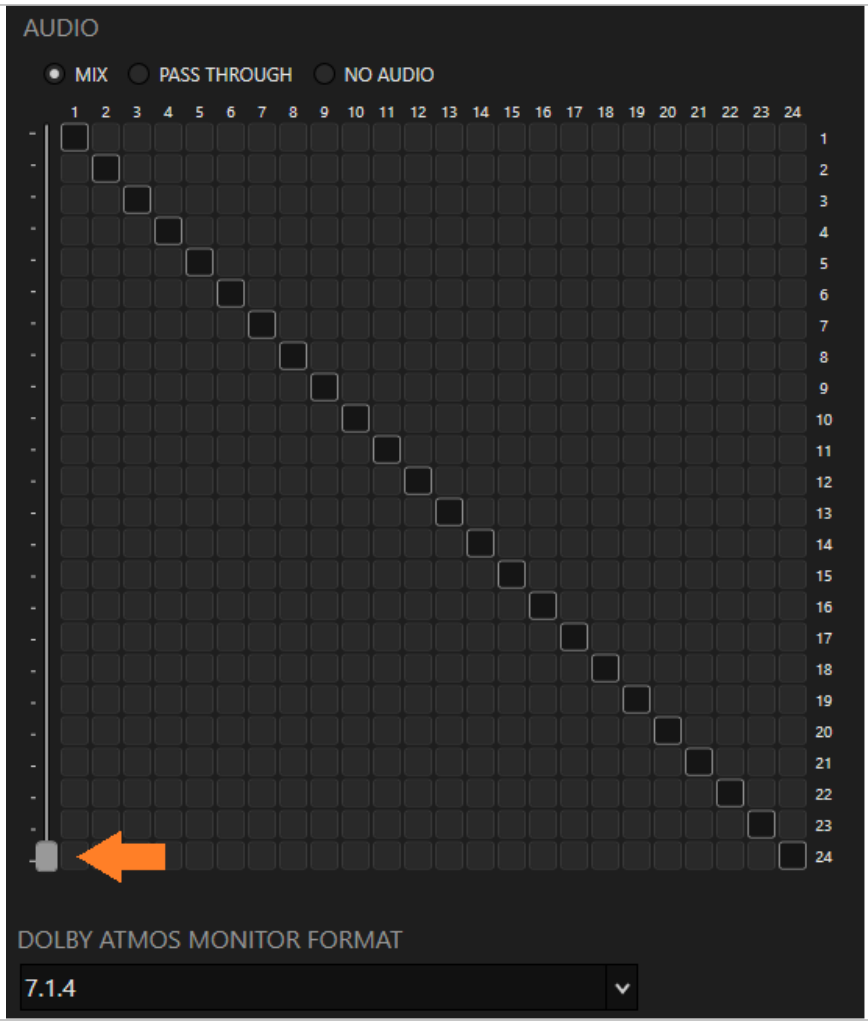
MTI-Samsung MTI-Samsung is a frame-based rescaler that produces high quality results that will require more time for processing. MTI-Samsung has proven very successful for animation projects and is the preferred rescaler by several content owners. NOTE: MTI-Samsung only works with frame-based media and is ideal for Animation.

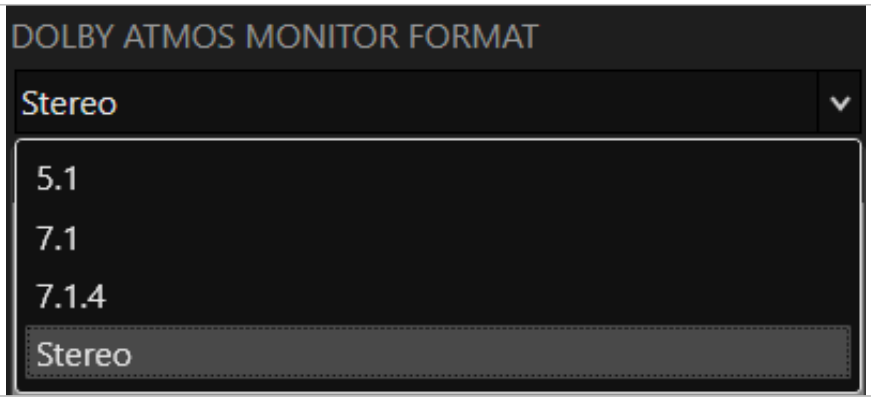
Framing There are two choices to decide which framing settings will be used during the resizing of the Deliverable. 1. Original clip - If no change to the input framing is desired, choose this option. Cortex will resize the media for this Deliverable based on the original frame size and aspect ratio of the source clip. 2. Color Tool - This option allows use of the framing module in the Color Tool, which provides the ability to modify framing with Zoom, Vertical and Horizontal positioning, Flip for both horizontal and vertical directions, and Aspect. a. For Quibi projects, rotation is provided for clockwise and counterclockwise positioning.

Method

There are six choices for the method by which Cortex will resize media for a Deliverable: 1. Center Extract - Cortex will extract an image based upon the Deliverables aspect ratio using the source's center point. 2. Anamorphic - Cortex will compress or stretch the image to match the desired new Deliverable size. 3. Letterbox/Pillarbox - Cortex will add letterbox or pillarbox bars to the image to compensate if necessary for the new Deliverable size. This choice never crops the image. 4. Fit Width uses the sides of the source image and fits them to the Deliverables sides 5. Fit Height uses the top and bottom of the source image and fits them to the Deliverables top and bottom. 6. Crop (1:1) will calculate a horizontal and vertical pixel count in order to present a pixel to pixel view based upon the resolution of the target monitor's viewing area.

Method Example: An example of how to use the framing Method to properly frame an anamorphic 2:39 image into a Deliverable with a 1:78 aspect ratio is to choose the Letterbox option. Cortex will automatically frame the picture into the 1:78 canvas within a letterbox with black on the top and bottom. Framing and Method are interactive so it is important to experiment with different combinations of source and Deliverable aspect ratios to fully understand the process of making correct choices.





Audio

The audio for each Deliverable can be configured uniquely. The Audio Mixer is a 24 by 24 matrix of Source Audio tracks along the top and Destination Audio tracks along the right-hand side. There are 3 available modes:

1. Mix - In Mix mode all channels are available. Use the handle located at the bottom left to eliminate or add tracks by sliding it up or down, or click on the track buttons you wish to silence.

2. Pass Through - Pass Through will pass the audio to the Deliverable as it was recorded on the source.

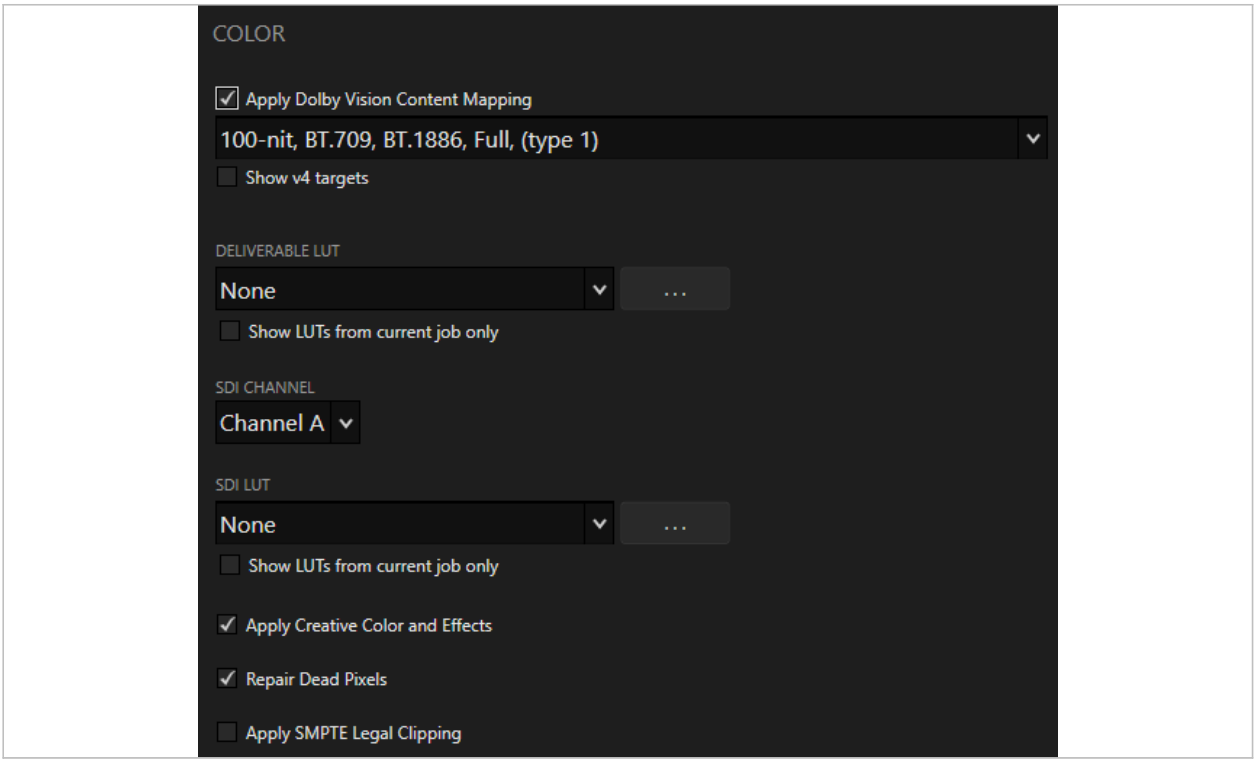
3. No Audio - No Audio will pass silence.

Once the Deliverable is fully configured, click the Create button located on the lower right.

Dolby Atmos®

With V7.0, your Cortex Enterprise edition is licensed for the Dolby Vision™, it will also be licensed for Dolby Atmos®. There are three Dolby Atmos® file types, all of which contain a series of potential Monitor Formats. The ADM BWF is essentially a broadcast wave file with Atmos metadata. The IAB MXF file is the Atmos bitstream wrapped in a MXF file, which is currently used for IMF creation. The DAMF is the Dolby Atmos® Master Format, consisting of 3 files. The one used for import is the .atmos file. Depending on the chosen Deliverable Type, a Monitor Format, derived from the file, can be assigned to it. Be careful to choose the Monitor Format that conforms to the number of channels the Deliverable Type supports.

For certain Deliverables, like an IMF, the Atmos file is simply passed through without the ability to configure it.



Color Section

The Color Section contains fields that impact the color pipeline of a Deliverable. If the project is created with “No ACES Support”, there’s a choice for applying Dolby Vision™ content mapping for compositions containing Dolby Vision metadata, two LUT options, an SDI channel assignment, a color space transform, a source decoding quality setting, an output filename template and a set of color utility checkboxes. Each is described below.

Deliverable LUT

Apply a specific LUT that only affects the Deliverable’s color pipeline.

SDI LUT

Apply a LUT to the SDI color pipeline without affecting the color of the Deliverable.

SDI Channel

Assign an SDI Channel for video output. Cortex offers two SDI channels allowing for simultaneous streaming of two different deliverables such as Dolby Vision HDR and SDR signals. This requires two SDI streams: a card that provides two on its own, such as an AJA Kona 5 or a Blackmagic DeckLink 8K Pro, or two DeckLink cards. See Chapter 2.

Apply Creative Color Correction

Enable this checkbox if you wish to render color decisions made in the Color Tool.

Repair Dead Pixels / Radiation Artifacts

For jobs where Dead Pixel Detection or Radiation Artifact Detection was processed, enable this checkbox to apply the corrections. A single checkbox governs both: any pixel or artifact you have set to Accepted is repaired when the Deliverable renders.

Apply SMPTE Legal Clipping

With this checkbox enabled, white and black values will be clipped to absolute SMPTE legal levels.

Note: Dead Pixel and Radiation Artifact Correction are only available in the Enterprise edition of Cortex. QC and Dailies can detect in both clips and compositions, but cannot render corrections. Cortex DIT and Cortex DIT+ can detect on source clips only.

Apply Effects

Enable this checkbox to render the image processing set up on the Color Tool's Functions tab — 3D Comb, DeHalo, Deinterlace, Brickwall, Aperture, Film Grain and the Upres modules. It is separate from Apply Creative Color Correction, so a Deliverable can carry the restoration work without the grade, or the other way round.

Color Space Transform

The COLOR SPACE TRANSFORM section sets an input and output color space and gamma for this Deliverable, together with the target peak luminance where the output is HDR. This is how a single job produces, for example, a Rec.709 deliverable and a Rec.2020 PQ deliverable from the same source without a LUT. The SDR to HDR expansion controls appear here as well; they are covered in Chapter 3.

Source Decoding Quality

Sets the quality at which camera-original material is decoded for this Deliverable. Lowering it on a review deliverable can materially reduce render time; leave it at full quality for anything being delivered.

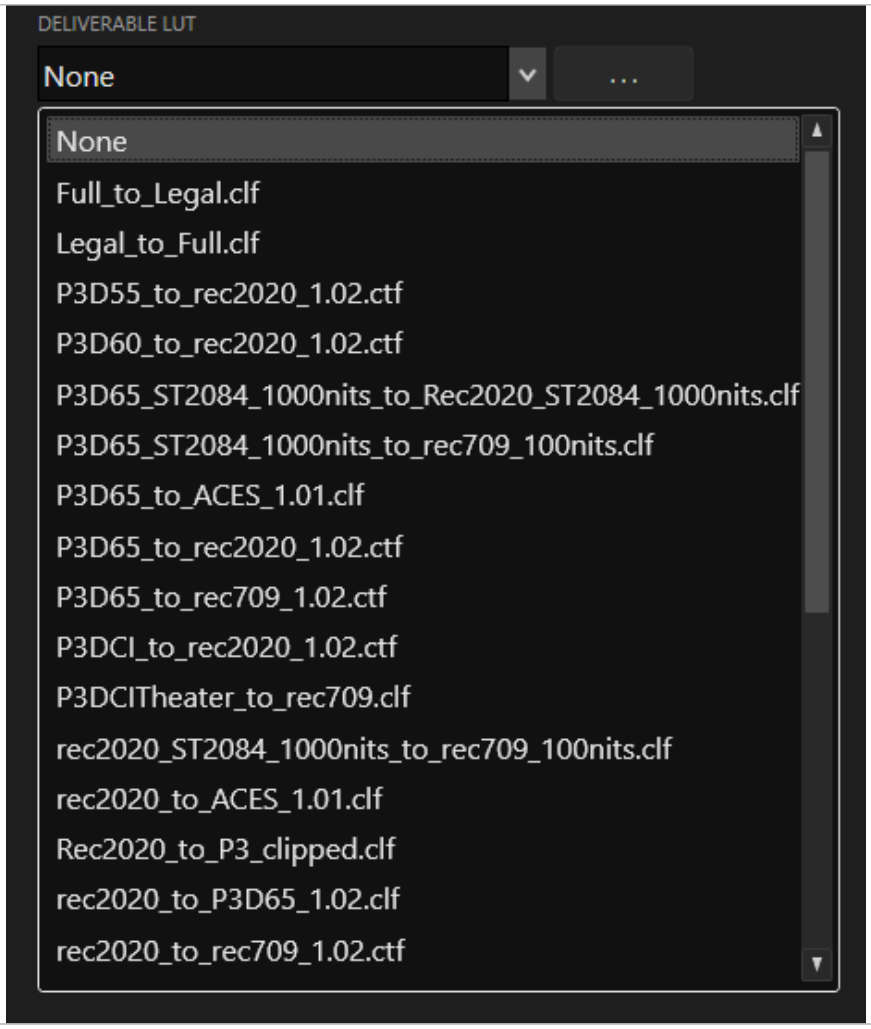
Output Filename

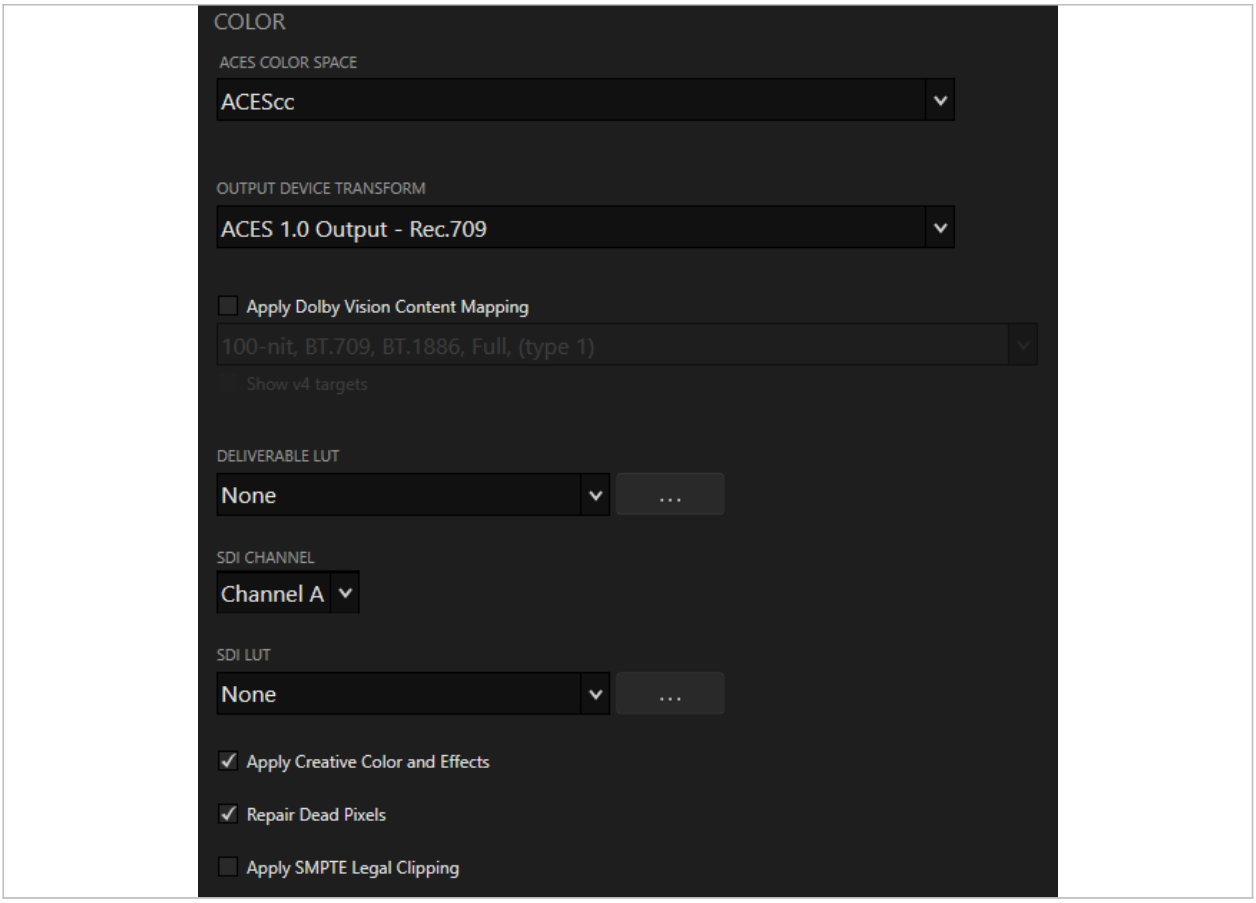
The OUTPUT FILENAME template controls how rendered files are named, built from metadata tokens such as the clip name, scene, take, camera roll and timecode. Note that the filename cannot be set for Avid media — the Avid Media Processor names those files itself — and the editor shows a warning to that effect when an Avid Deliverable type is selected.

Tokens are sanitized on the way into a filename, so characters that are legal in a clip name but not in a filename are removed. In particular, the asterisk used to mark a circled take is allowed in a clip name but is stripped from the file it produces.

Watermarking

Where the system is licensed for it, a forensic watermarking section is shown, allowing the Deliverable to be watermarked as it renders. This section is hidden when watermarking is not available.


DELIVERABLE LUT
None
...
None
Full_to_Legal.clf
Legal_to_Full.clf
P3D55_to_rec2020_1.02.ctf
P3D60_to_rec2020_1.02.ctf
P3D65_ST2084_1000nits_to_Rec2020_ST2084_1000nits.clf
P3D65_ST2084_1000nits_to_rec709_100nits.clf
P3D65_to_ACES_1.01.clf
P3D65_to_rec2020_1.02.ctf
P3D65_to_rec709_1.02.ctf
P3DCI_to_rec2020_1.02.ctf
P3DCITheater_to_rec709.clf
rec2020_ST2084_1000nits_to_rec709_100nits.clf
rec2020_to_ACES_1.01.clf
Rec2020_to_P3_clipped.clf
rec2020_to_P3D65_1.02.clf
rec2020_to_rec709_1.02.ctf



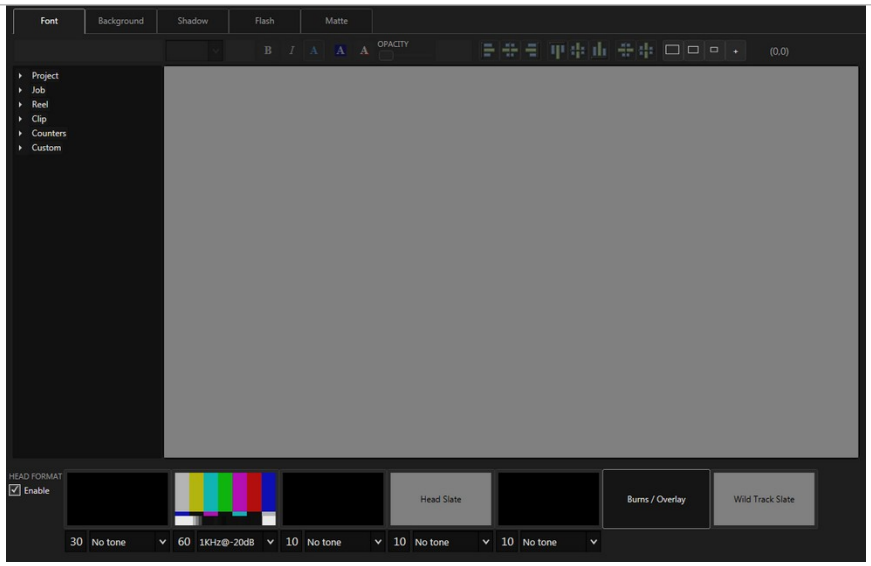
Included LUTs

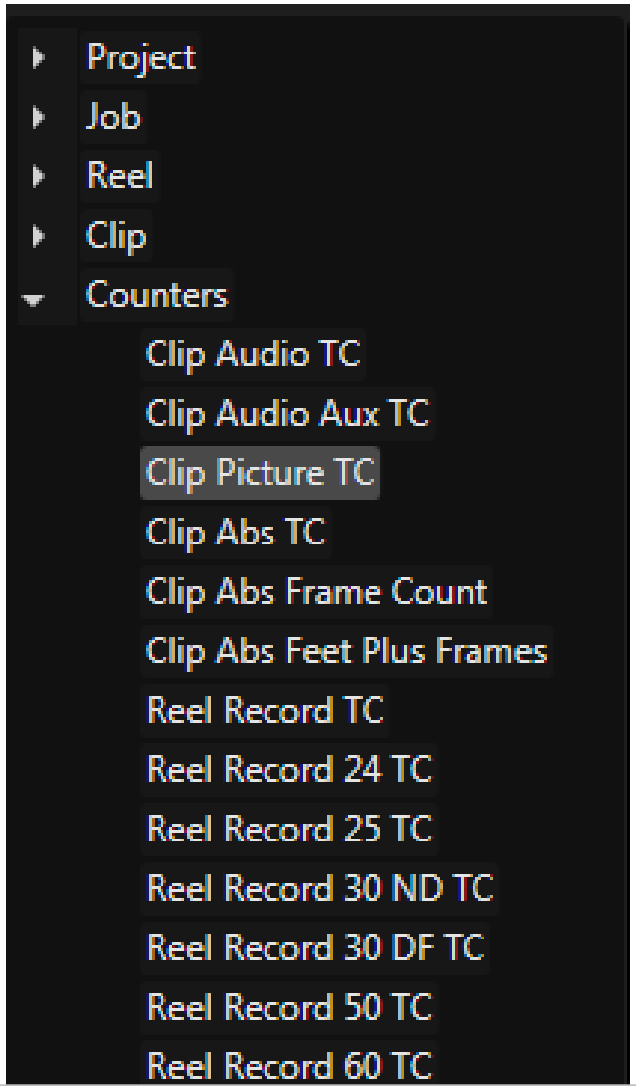
Cortex provides more than 25 different LUTs and color transforms. They include ARRI LogC4 display LUTs, installed in 33- and 65-point versions in the Transforms\ARRI folder: LogC4 to Gamma 2.4 Rec.709 and Rec.2020, Gamma 2.6 P3-D65 and P3-DCI, and HLG and ST 2084 (PQ) outputs at 1,000 nits.

ACES

If the project is created with ACES Support, the ACES Colorspace and Output Device Transform fields are provided.

Cortex supports ACES versions 1.0, 1.1 and 1.2, and all standard ACES Output Transforms.





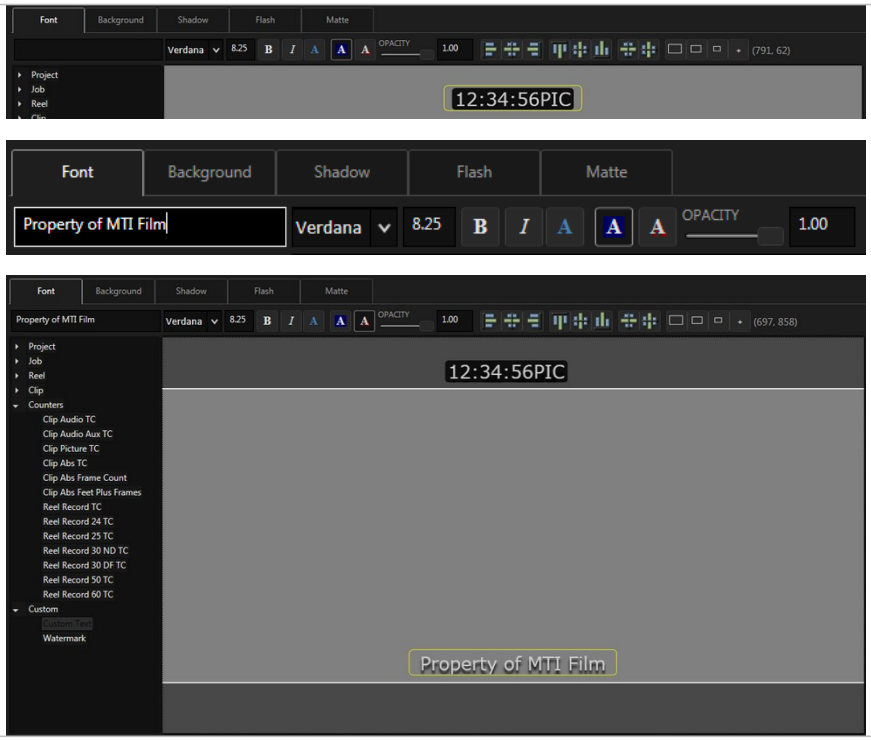
Working with the Burns Canvas for Metadata

To access the Burn Canvas, click the small BURN alias in the lower right corner. The canvas will go to full screen.

If a Job is open and a source clip is selected, the picture will show up on the canvas. You can then use the SIZING METHOD drop-down field located on the lower right of the UI to select a framing method.

Most of the metadata fields available throughout the Cortex application can be “burned in” using the character sets available on the Canvas. Each Category, for example Counters, has a unique set of metadata burn-ins that can be placed onto the canvas. Click on the triangle immediately to the left of the Category to display the complete list.

To place a burn-in onto the canvas, left click on it and drag it to the desired position on the Canvas.



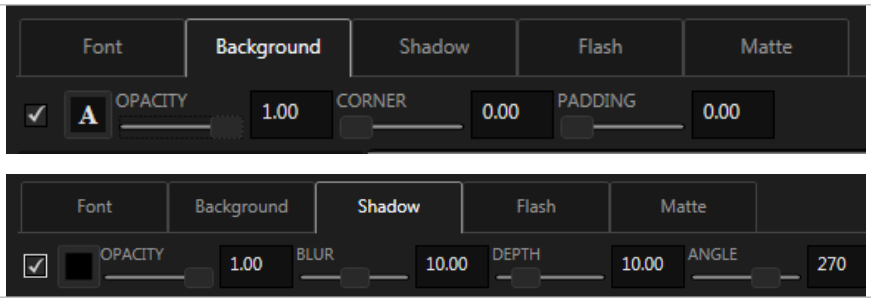
There are a number of ways to change the properties of a burn-in. The properties are as follows: 1. Font 2. Background 3. Shadow 4. Flash 5. Matte

Once a burn-in is positioned on the canvas and selected (indicated by a yellow border) its properties can be modified. You can select one or more metadata burns to modify but at least one must be selected to affect a change.

Font

The Font tab contains variables such as style and size. It also has the ability to quickly add Background and Shadow properties with default values.

Dragging a “Custom Text” burn-in from the “Custom” category and typing into the text field will populate the burn-in with the entered text.



Use the alignment controls for centering and spacing horizontally and vertically.

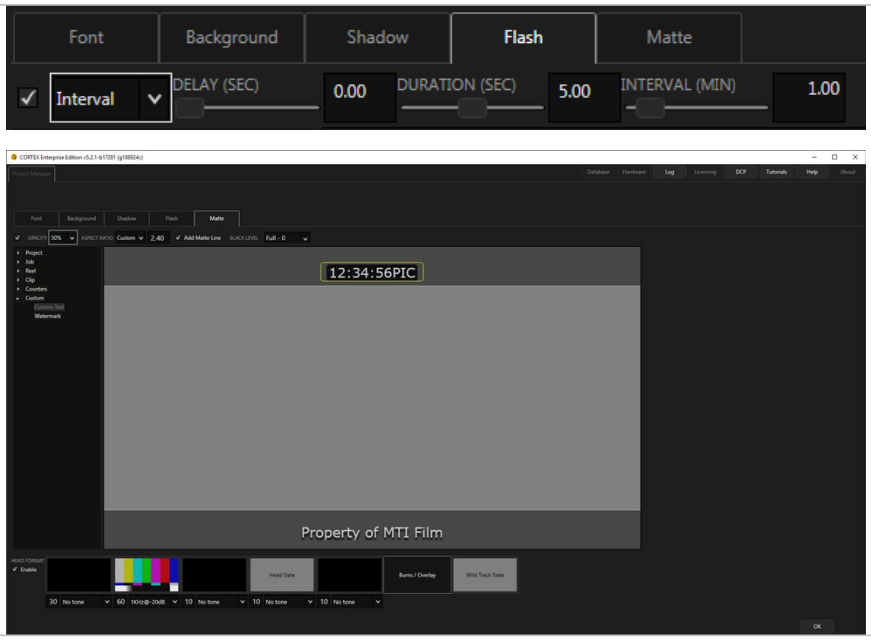
For complete control of all variables of the burn-in property choose its corresponding tab:

Background

The Background property tab includes the following variables: 1. Color - Click the “A” button to open a color selection window. 2. Opacity 3. Corner - from angular to rounded. 4. Padding - the vertical size of the background.

Shadow

The Shadow property tab includes the following variables: 1. Color - click the button to open a color selection window. 2. Opacity - use the slider to determine the transparency of the shadow 3. Blur - the degree the shadow is blurred 4. Depth - the distance from the font at which the shadow is applied 5. Angle - the position of the shadow relative to the font



Flash

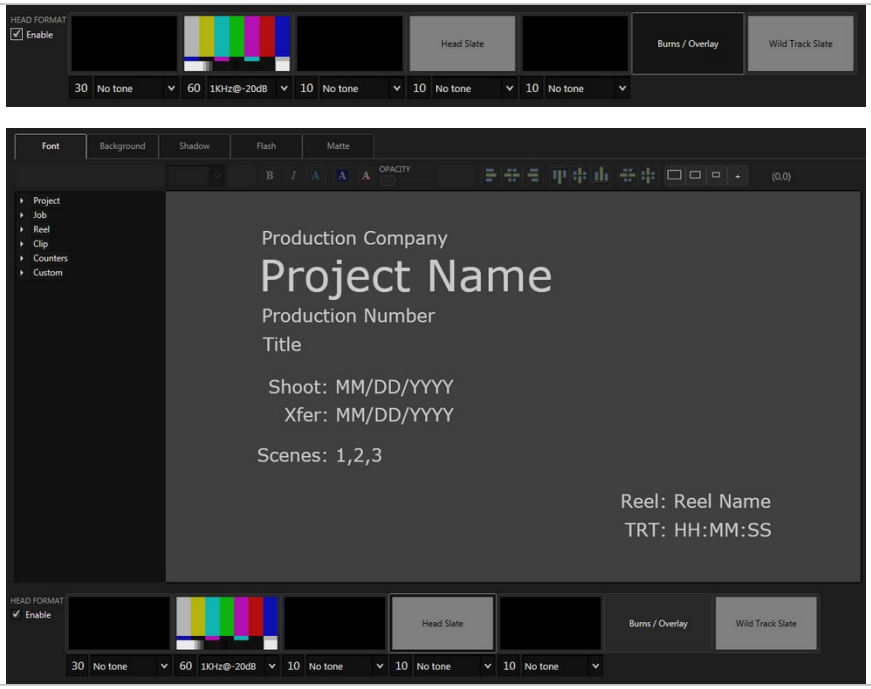
The Flash property tab controls the visibility of the burn-in. There are four possible visibility choices, each with a default duration, which can be adjusted.

1. Head - will flash at the head from the first frame of picture 2. Head and Tail - will flash at the head from the first frame of picture, and at the tail beginning at the frame calculated by the last frame of picture minus the assigned Duration. 3. Interval - will flash at the first frame of picture offset by the Delay value (default is 0 so it will be visible at the first frame of the clip); it will cut on and remain visible for the Duration, which defaults to 5 seconds, at intervals defined by the assigned value, which defaults to 1 minute. 4. Tail - will flash at the tail beginning at the frame calculated by the last frame of picture minus the assigned Duration.

Matte

The Matte property tab provides the ability to superimpose a graphical display of popular and custom aspect ratios with controls for transparency and whether to add a line at the matte edge.

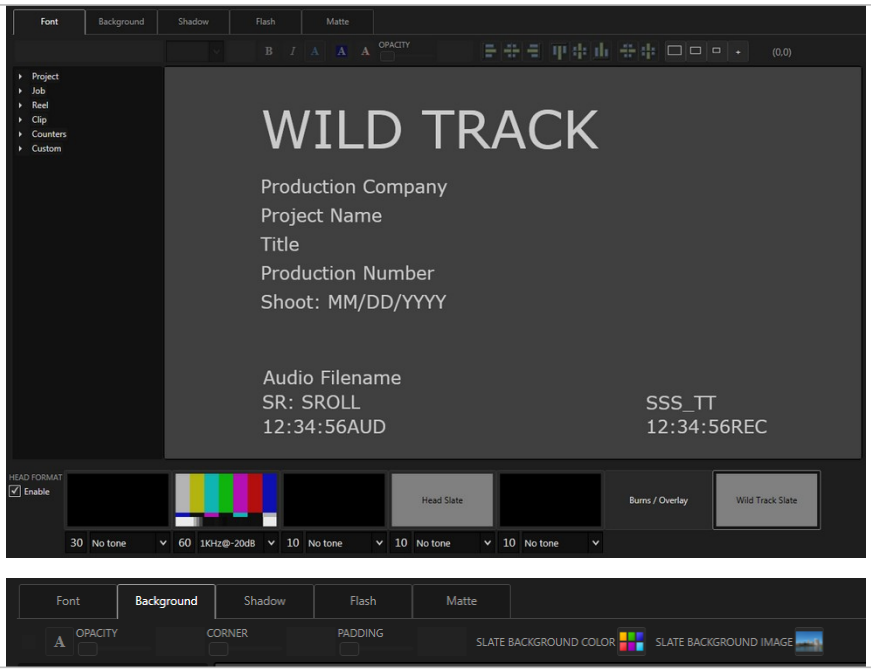
Head

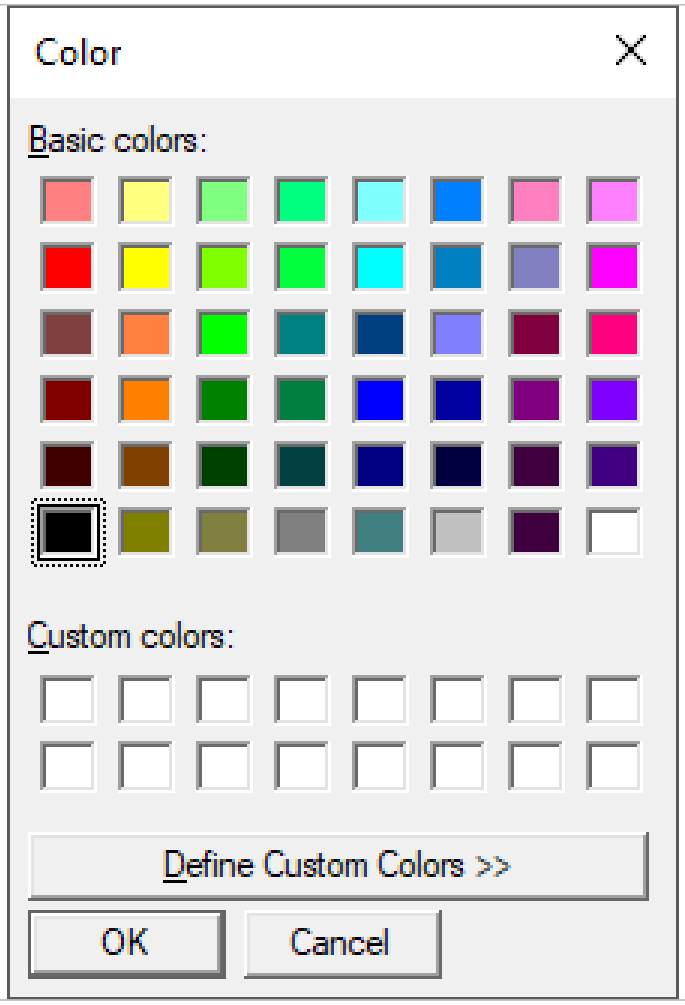


Format

For reels that are comprised of a single file (i.e. DVD), head formatting is often desired including bars, black, and slate. Enable the Head Format checkbox to define the duration of each segment by entering a value, in seconds, for each. To bypass a segment, enter 0.

The Head Slate has a default configuration of burn-ins, which can be modified as desired.



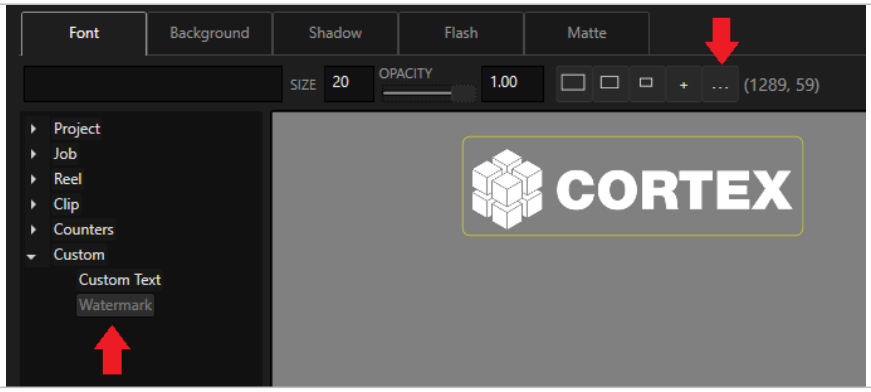


The Wild Track Slate has a default configuration, which can be modified as desired.

Changing the Background Color or Importing a Background Image for Slates

The Slate Background Color or Background Image can be changed by clicking their associated icon button. Clicking the Background Color button will open a color palette. Clicking the Background Image will open a browser for the image selection.

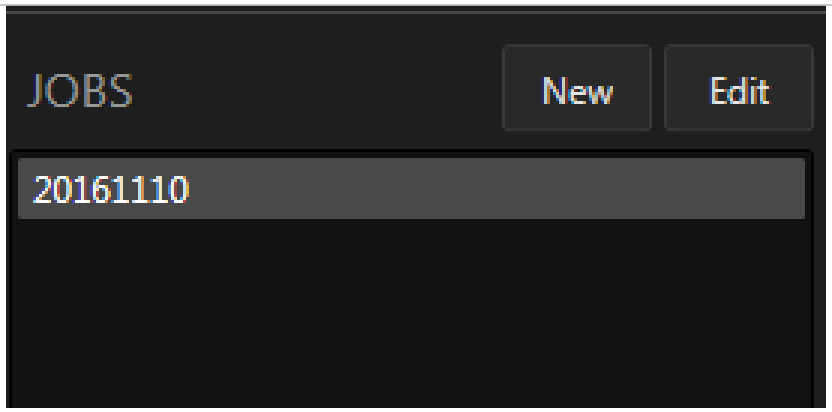
Click on the Burns/Overlay button to return to the current canvas configuration.

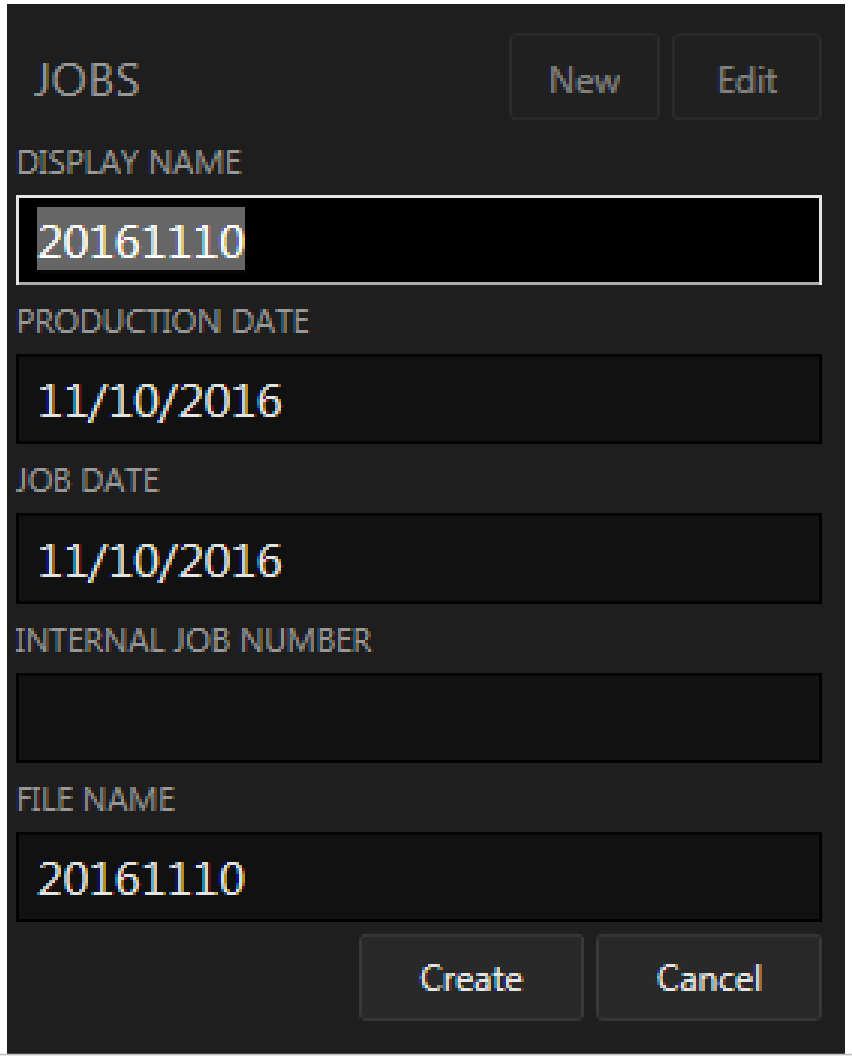


Adding a Watermark Graphic

To add a graphic, such as a logo: 1. Click on the Watermark option under the Custom category. 2. Drag it onto the canvas. It will appear as the Cortex logo. 3. Click the … browse button on the Font tab. A browser window will open. 4. Choose your graphic file and click Open. 5. The Cortex Logo will change to your chosen graphic.

Once all the burns are in place and finalized, click the OK button on the lower right of the UI to save the layout.





Creating a Job

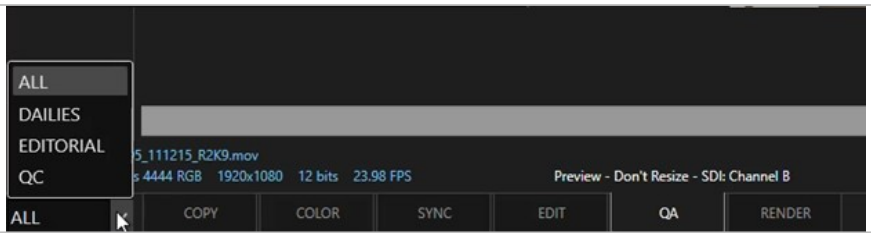
In the Jobs section of the project manager, click the New button

In V7.0, with WORKFLOW ACTIONS, JOB creation is automatic by default, a name is automatically created based upon the project convention default. You may change it to anything you wish.

Fill in the remaining fields as desired.

The FILE NAME folder for this Job will be automatically created based upon the Display Name and will be part of the Deliverable directory path.

Click Create and the new job will be loaded.



Workspaces

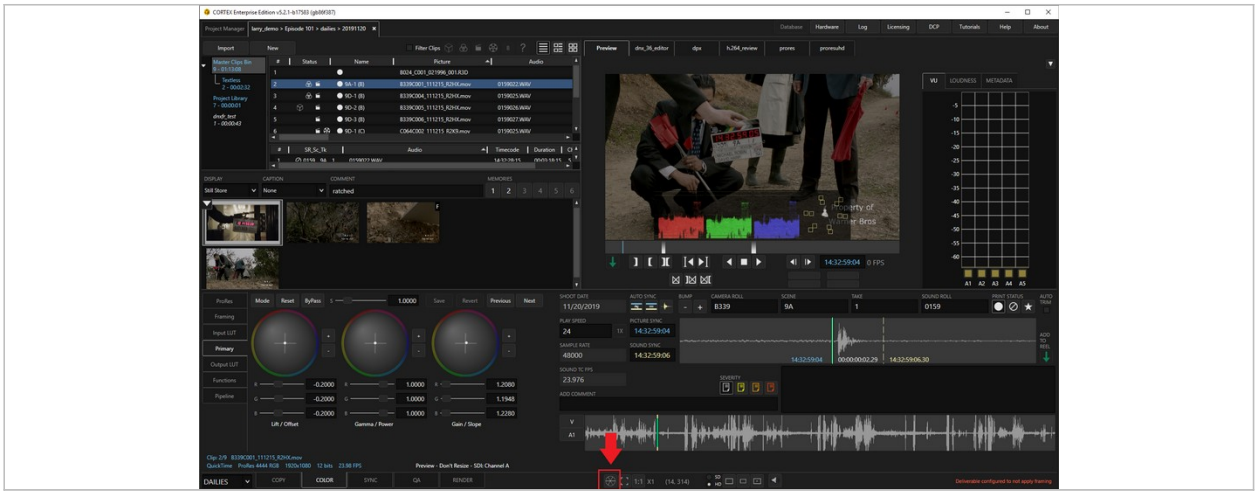
A Workspace determines the visibility and behavior of the tools necessary to perform functions related to the three major post-production tasks served by Cortex: Dailies, Editorial and Quality Control.

The workspaces can be found in the bottom left corner of the application in a drop-down menu where you can choose one of four options: ALL, DAILIES, EDITORIAL, and QC.

Cortex is comprised of 6 tools: COPY, COLOR, SYNC, EDIT, QA, and RENDER. Depending on which edition you are currently running, certain tools and functions may be limited or restricted. The following information is based on the Enterprise Edition, wherein all the tools, functions and rendering options are included. For a comprehensive look at which tools and functions are included in each Edition, please refer to the Cortex Editions page of the manual. Cortex Editions

ALL

The All workspace enables the complete toolset in Cortex, making any task or function available to the operator. When in the Copy tool, you can choose one of three new tasks: Archive, Copy and MHL Verification. When in the Color, Sync, Edit, QA and Render Monitor Tools you can choose to create new reels in order to start a queue for file transcoding. When in the Edit Tool, you can create a variety of compositions, including DCP, IMF, and AS-11. Each composition has its own creation dialog that assists in determining the properties associated with the composition. As explained later, when in Hybrid Mode, The Color Tool can also create compositions.

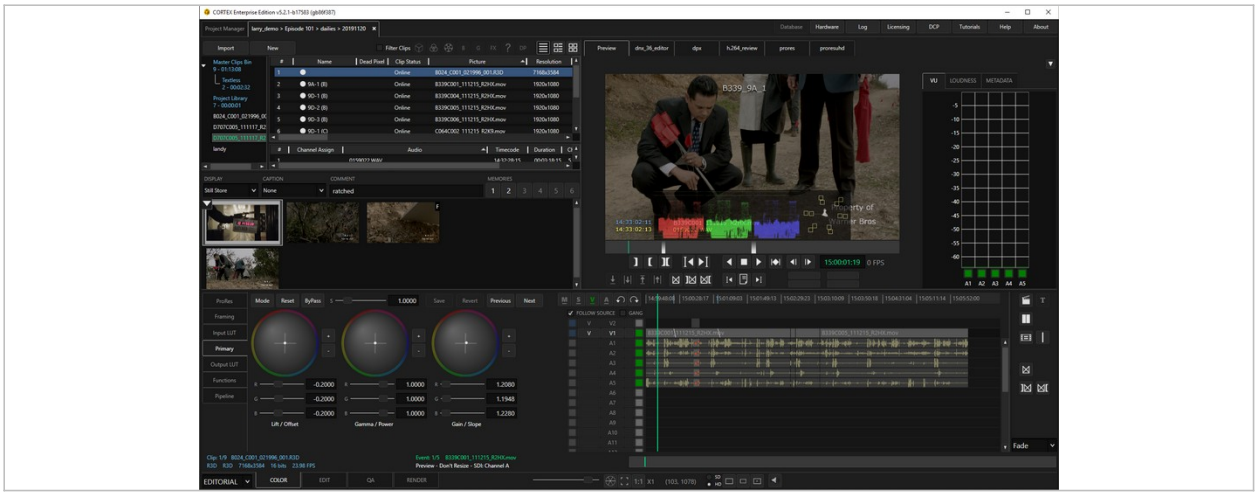


Dailies

The Dailies Workspace hides the Edit Tool, leaving only the tools required to complete daily operations. While in the Color Tool, the Hybrid Mode can be activated so the Color and Sync modules are accessible for concurrent syncing and coloring.

Pressing F12 or clicking the Vectorscope icon button at the bottom of the UI will activate the Hybrid Mode by relocating the Waveform/Vectorscope (WFM/VEC) to the Media Player and adding the required Sync Tool metadata fields in its place. Pressing F12 again cancels the Hybrid Mode.

● Pressing Shift+F12 hides the WFM/VEC during playback. ● Ctrl+F12 toggles hide/show the WFM/VEC while in Hybrid Mode. ● Ctrl+Shift+F12 unlocks and floats the WFM/VEC.



Editorial

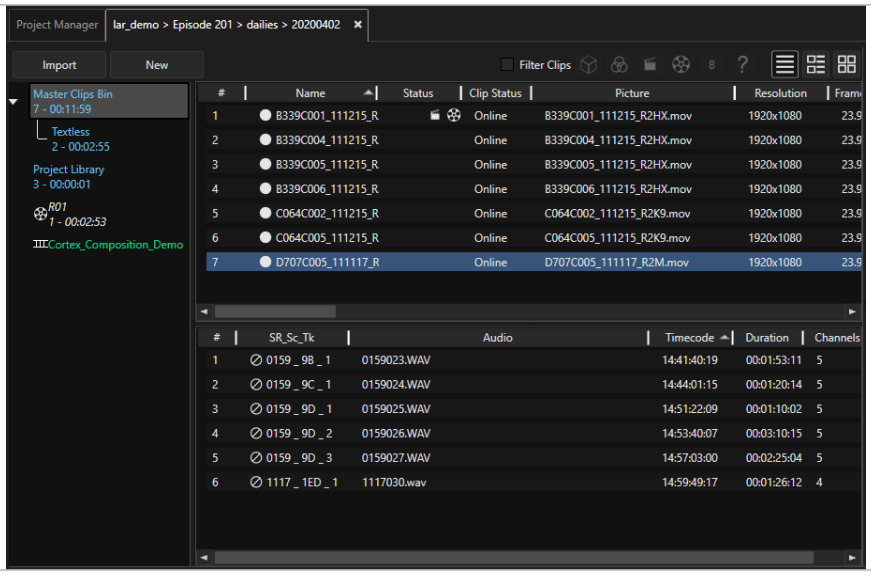
The

Editorial Workspace hides the Copy and Sync Tools, enabling only the Color, Edit, QA and Render Monitor Tools. In this workspace, while in the Color tool, a Hybrid Mode can be activated so both the Color modules and Edit Timeline are accessible. Pressing F12 or clicking the Vectorscope icon button will activate the Hybrid Mode. Pressing F12 again cancels the Hybrid Mode.

Pressing Alt+F12 cycles the WFM/VEC and the Mark Window from the Sync Tool Pressing Shift+F12 hides the WFM/VEC during playback. Ctrl+F12 toggles hide/show the WFM/VEC while in Hybrid Mode. Ctrl+Shift+F12 unlocks and floats the WFM/VEC.

QC

The QC workspace only enables the Edit and QA tools where one can perform a variety of tasks including Dead Pixel Detection and Correction, image and audio analysis, IMF and Dolby Vision™ validation and system performance evaluation.

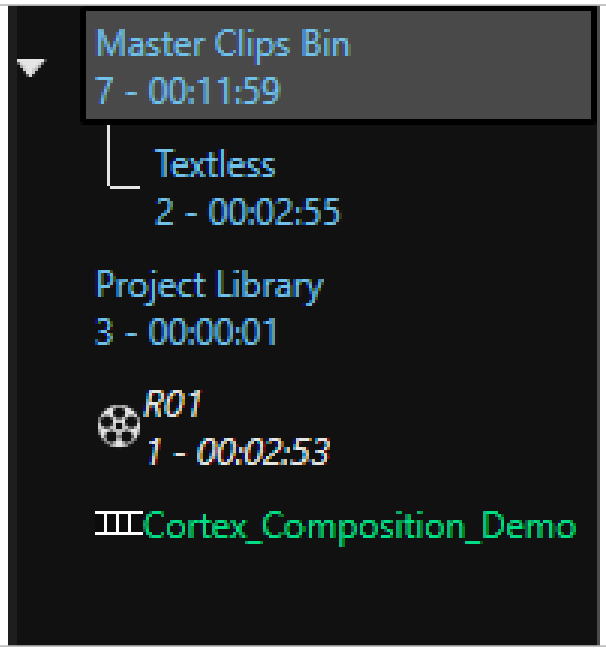


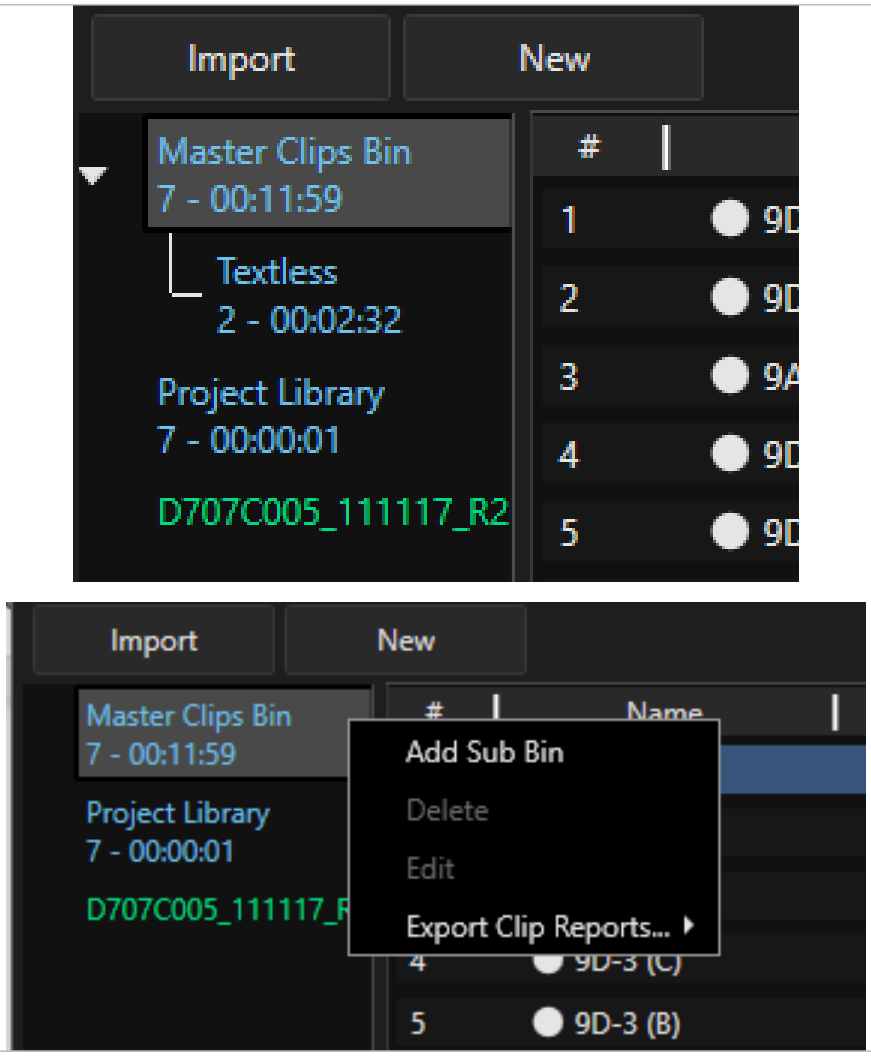
The Parts of the UI

Each tool has its own distinct UI that accommodates its intended use. There are some common parts as per below:

The Master Clip Bin

The Master Clips Bin displays all picture clips. The Audio Bin is visible in the Sync and Edit tools.





The Bin Sidebar

The Bin Sidebar changes the Bin View: ● Master Clips Bin - Displays the clips in current Job ● Sub Bin - Displays clips in the selected Sub Bin. ● Project Library - Displays all clips added to Project Library and any slates created in Cortex. ● Reels - All Reels in the current job are listed. Click on any Reel to change to Reel Bin view. The green highlighted Reel is the currently open and active Reel. ● Files - A list of Copy Task files in the Job and their Manifest verification status. ● Copy Tasks - All Copy Jobs will be listed here. Click on the Job to display a list of files that were copied during the Job. ● Compositions - All Compositions created in Cortex. If focused on a composition or reel, pressing the Q or J keys switches to the Master Clips Bin. Pressing Q or J keys repeatedly cycles between the Master Clips Bin and the Project Library. If focused on the Master Clips Bin or Project Library, pressing the W or K keys switches to the Master Clips Bin. Pressing the W or K keys repeatedly cycles between Compositions.

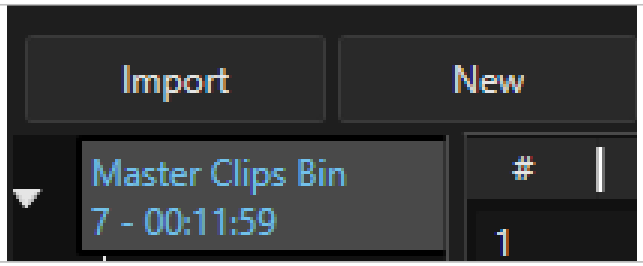
Sub-Bins

For organizing purposes, if you wish to segregate clips, you can create Sub-Bins.

Right click on the Master Clips Bin and select: Add Sub Bin

Name the Bin, click Create, and drag clips into it.

You can create as many Sub-Bins as required and drag any type of clip into it including audio clips.



“New” Menus

In the Copy Tool, New:

● Archive Task - Create a job to archive all media contained inside the current job. ● Copy Task - Create a new copy job to copy media from a source to up to 3 destinations. ● MHL Verify Task - Verify MHL files

In the Color, Sync,and Render Monitor Tools, New:

● Clips Reel - Create a new Clips Reel for adding source clips for rendering ● Composition Reel - Create a new Composition Reel for adding composition events for rendering ● Automation - Create a Render or Analysis watch folder. See the watch folder notes in Appendix A

In the QA tool, New:

● Composition Reel - Create a new Composition Reel for adding composition events for rendering. This can be useful, for example, when used in conjunction with Dead Pixel Detection. After detecting and approving Dead Pixels for correction, if you only require certain shots to be rendered and you filter the event list by “Accepted Dead Pixels” you can add those events to a Composition Reel for rendering.

In the Edit Tool, New:

● Composition - Create a composition for editing in the Edit Tool ● IMF Composition - Create an IMF composition for assembly of an IMF Package ● DCP Composition - Create a DCP composition for either Interop or SMPTE DCPs ● AS-11 Composition - Create an AS-11 composition for assembly of an AS-11 Package ● Composition Reel - Create a new Composition Reel for adding composition events for rendering ● Automation - Create a Render or Analysis watch folder

Importing Media

For picture and audio media, you can drag media from their source folders into either of the bins. Cortex will then populate picture and audio media into their respective bins.

You can also Import media via a file browser for existing media on a storage network or create a New Copy Task to copy media from an external source to the storage network, which will automatically import into Cortex.#heading=h.z2zw24z5lmut

NOTE: To learn about creating a New Copy Task, see the section on The Copy Tool

“Import” Menu

● Media File(s) - Select specific file(s) to import into the Job ● Media Folder - Select an entire folder and all its subfolders to import into the Job ● Media Folder & Sync - Import a folder and run the sound sync in the same pass, rather than importing first and syncing afterwards ● Media Folder (Fast) - This mode is useful when a large amount of files need to be imported for VFX pulls, for example. It makes the import process faster since a “source extractor” is not applied. ● File Per Frame Seq. - Use this option to import file per frame sequence clips such as DPX, tiff, or Raw File sequences. ● XML - Import .xml files

supported by Cortex including .cap, .tt, .ttml, .itt, .scc, .srt and .bdn subtitle files for use in the edit tool with IMF or DCP Packages. ● IMF - Import an IMF package for QC and creating Supplementals. ● DCP - Import a DCP package for QC, validation and creating Supplementals. ● AS-02 - Import an AS-02 package ● AS-11 - Import an AS-11 package ● EDL - Select an EDL to merge with a composition, or conform an edit with imported media. ● Cortex Manifest - Select a Cortex Manifest to relink and verify media files from jobs between systems (for example, a Manifest passed from on-set to post) ● ACES Clip Metadata - Here you can import ACES metadata, including color corrections and IDTs, for existing clips. ● ALE - Select an ALE to reconcile imported media ● AAF - Import an AAF sequence to conform with existing media. Currently supports cuts only. ● Color from CDL - CDL values are displayed as color bars in the Imported CDLs store in the color tool. ● Dead Pixel CSV - Import a CSV to locate and fix dead pixels. ● Sync Info CSV - Import sync points from a CSV produced elsewhere and apply them to the clips in the job.

Working with CORTEX Manifest Files

The CORTEX Manifest is a lightweight sidecar file that contains all the media and metadata information about a CORTEX Job. It can be passed between on-set and post installations to ensure complete coherence of media and other metadata.

The Manifest can be used in all job types whether for dailies, transcodes, compositions of all kinds including IMF, DCP, AS11, etc, and Dead Pixel Detection and Correction.

The Manifest file includes information about: ● Audio and Image files that have been copied or imported ● Checksum for verification ● LUT files applied ● CDL values of primary color correction applied ● Framing settings ● Synchronization points ● Scene/Take/Camera ● Comments & Discrepancies ● Edit markers (trim points) ● Dead Pixel Correction ● Compositions

Manifest files can be loaded into a CORTEX job first and then relinked to the underlying media or the media can be imported first and then traced back with a Manifest.

Creating a Manifest from a Job

A Manifest file can be created at any phase of a job. For example, a Manifest can be generated after Copy & Color or later after synching, Dead Pixel Detection, IMFs, DCPs, etc.

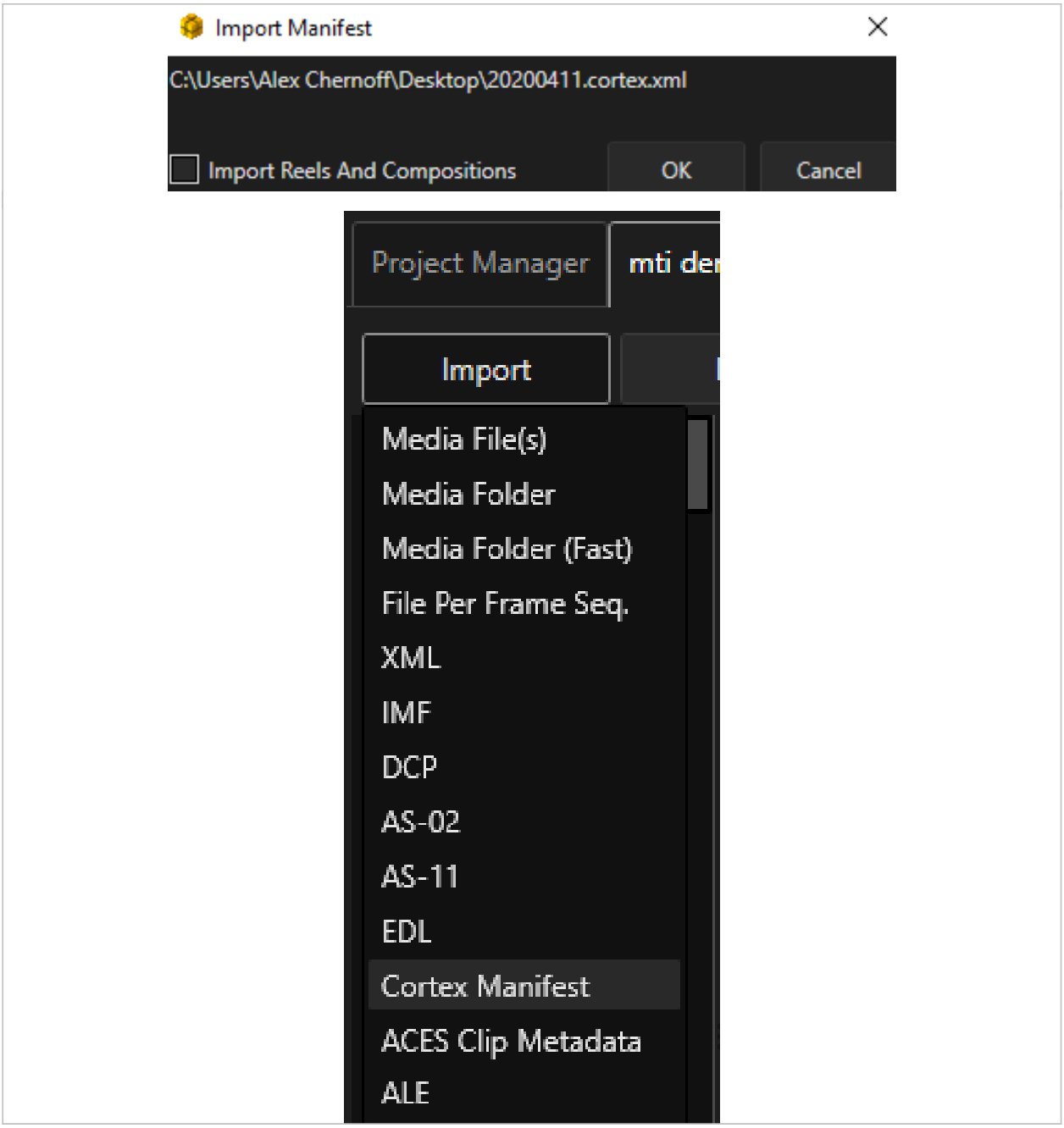
To create a Manifest file

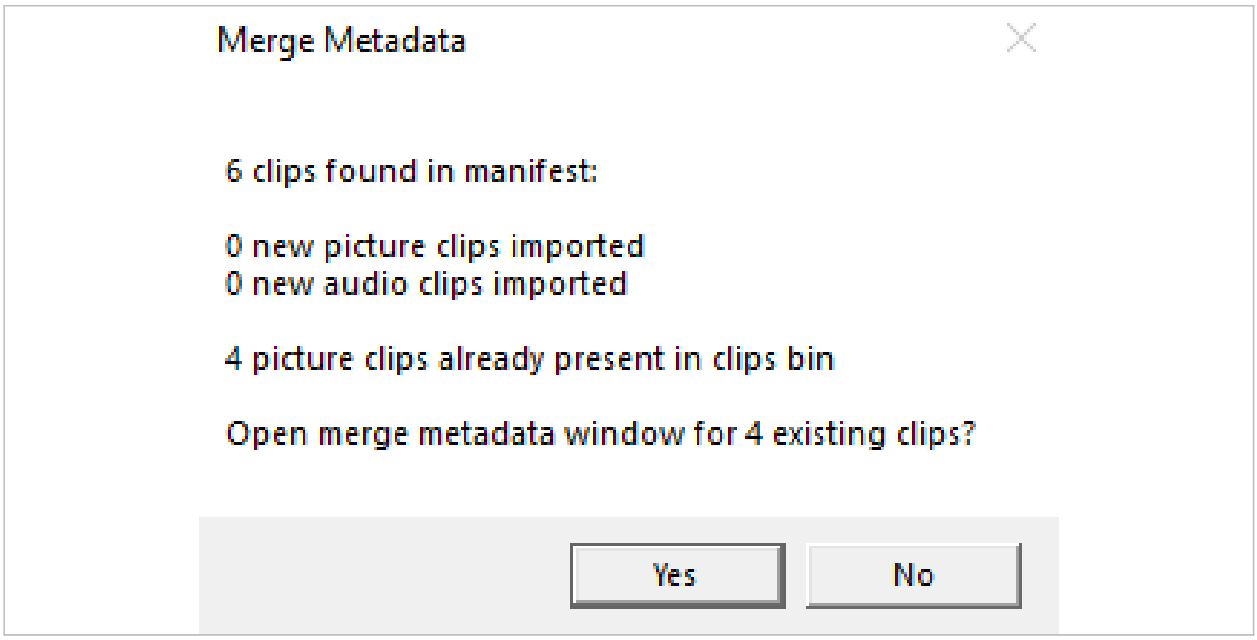
1. Go to the Project Manager 2. Right-click on the Job name 3. Select Export Manifest 4. Choose a location and Save the file. 5. The file can now be emailed, shared via networked storage, sent via thumb drive or added to a shuttle drive.

Importing a Manifest and Relinking to Media

The purpose of the Manifest is to allow work to be done in one Cortex system and imported into another system that does not share the same storage. Using the Manifest will allow for the relinking of media and its corresponding metadata, recreating the exact same parameters and properties generated by the originating system.

An example of this workflow would be dailies generated onset and then imported by facility for rendering and distribution.


Import Manifest
C:\Users\Alex Chernoff\Desktop\20200411.cortex.xml
Import Reels And Compositions
OK
Cancel
Project Manager
mti de
Import
Media File(s)
Media Folder
Media Folder (Fast)
File Per Frame Seq.
XML
IMF
DCP
AS-02
AS-11
EDL
Cortex Manifest
ACES Clip Metadata
ALE



To Import a Manifest

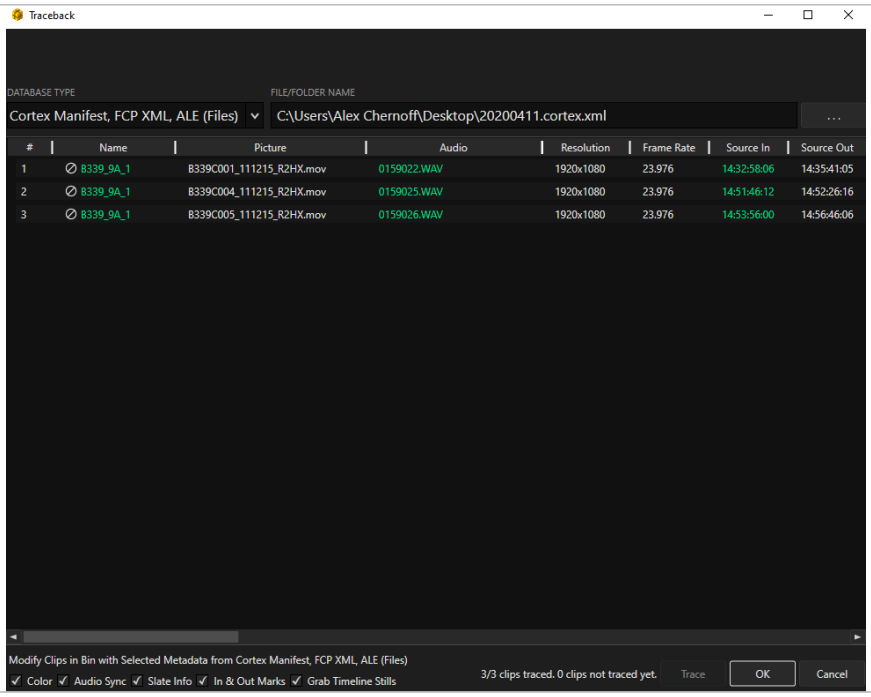
Dailies Workflow

1. Create or Open a Job 2. Import the corresponding media into the Master Clips Bin 3. Click Import and select Cortex Manifest 4. Browse to the file location and click Open 5. Disable Import Reels and Compositions and click OK

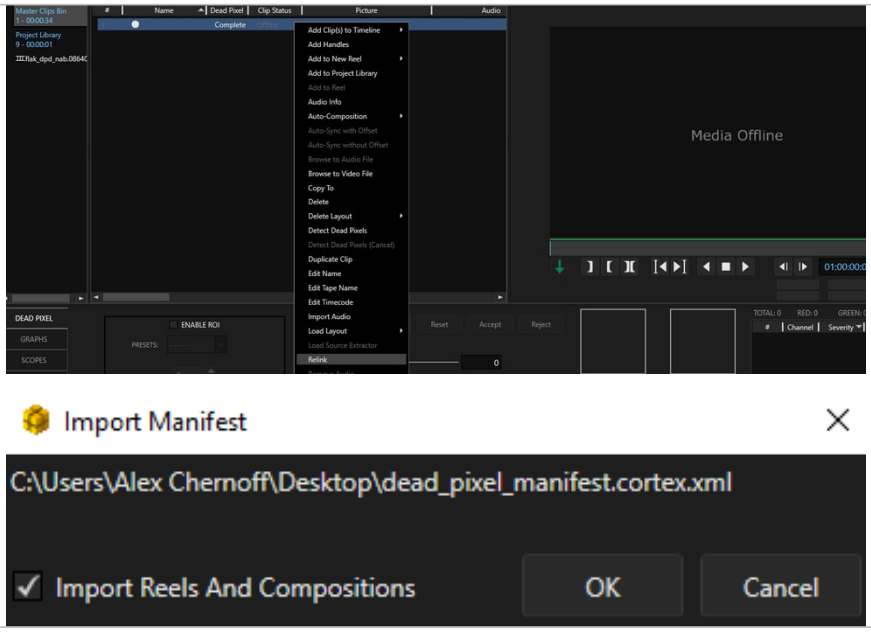
Cortex will instantly scan through the imported media, using the manifest to identify which clips are needed to merge with the metadata.

A list is generated indicating how many clips have been found. Click “Yes” to merge the clips with the metadata provided by the manifest.

This will prompt the Traceback tool to open with corresponding clips in the list.



Click “OK” to merge the clips with the manifest metadata. Now, any clips that were synched and colored in the originating system will be migrated to the new system with color and proper synching, ready to be added to reels.



Composition Workflows

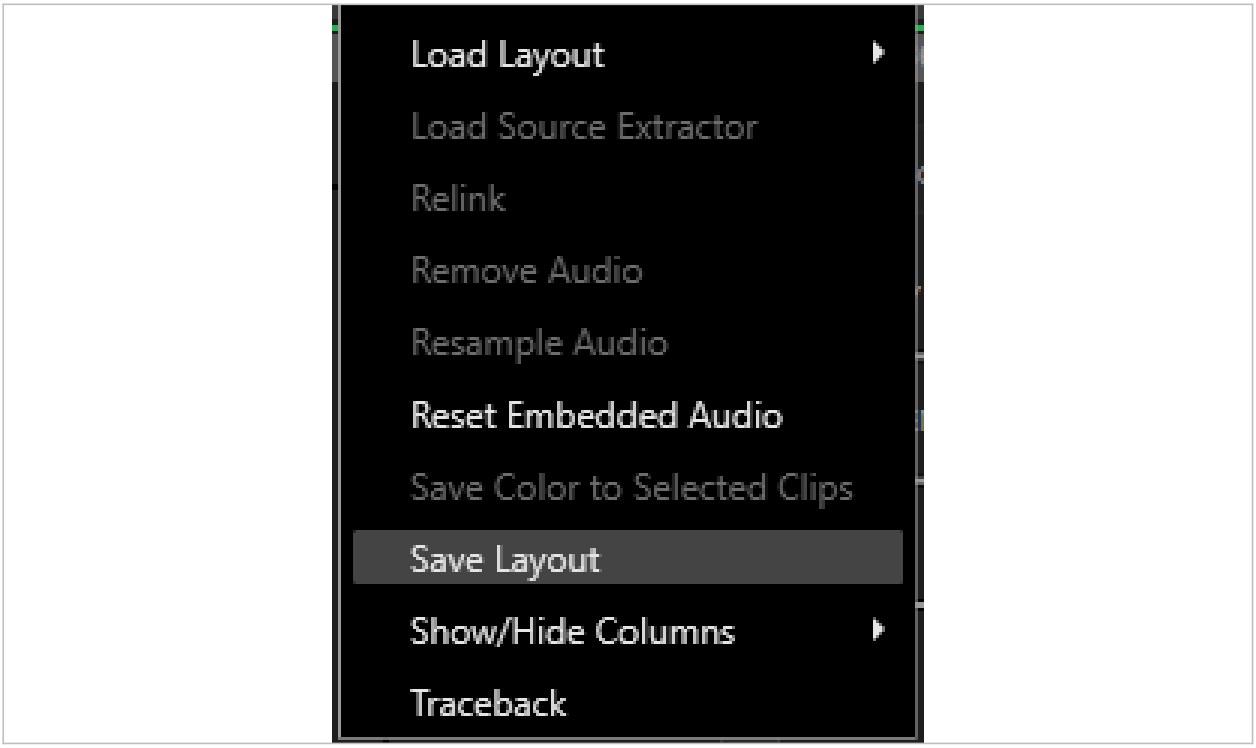
Composition workflows, such as Dead Pixel Detection or IMF creation, require a different order of operation regarding Cortex Manifests.

1. Create or Open Job 2. Click Import and select Cortex Manifest 3. Enable Import Reels and Compositions

The metadata for the clips will be imported along any compositions that were created, however, the media will be offline.

In the Master Clips Bin, highlight the media, right-click and select “Relink.”

Now the media will come online and work can resume. In the case of Dead Pixel Detection, click on the composition to reveal the detection from the originating system.



Clip Bin Views

The Clip Bin Offers three views of clips 1 2 3 1. Text - Detail listing of the clip/file metadata 2. List & Thumbnail- Thumbnail view with clip details 3. Thumbnails - Timeline thumbnail only view

The Text View

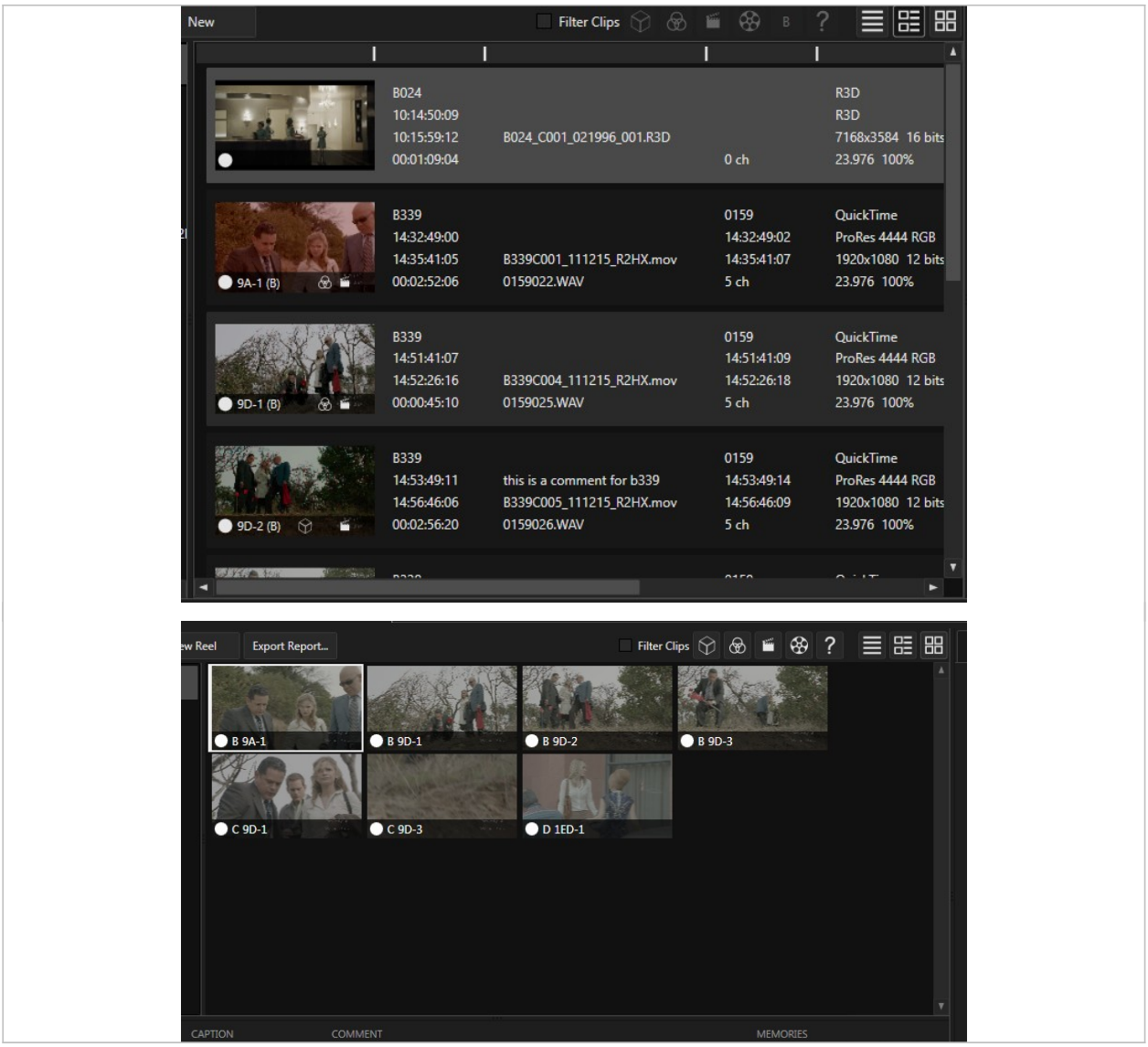
Each clip is displayed in text as a line item. The available metadata, as shown on the right, are presented alphabetically and appear as columns of information in various orders depending on the “Layout” selected. Those with check marks will be visible in the view.

To determine the visibility of each column, right-click anywhere in the Master Clips Bin and select Show/Hide Columns in the Context Menu.

In Detail View, you can rearrange the order of columns and create custom layouts by clicking on a column header and then dragging and dropping it to a new location.

Load saved layouts by right-clicking and selecting Load Layout from the Context Menu.

Save and name layouts by right-clicking and selecting Save Layout from the Context Menu.

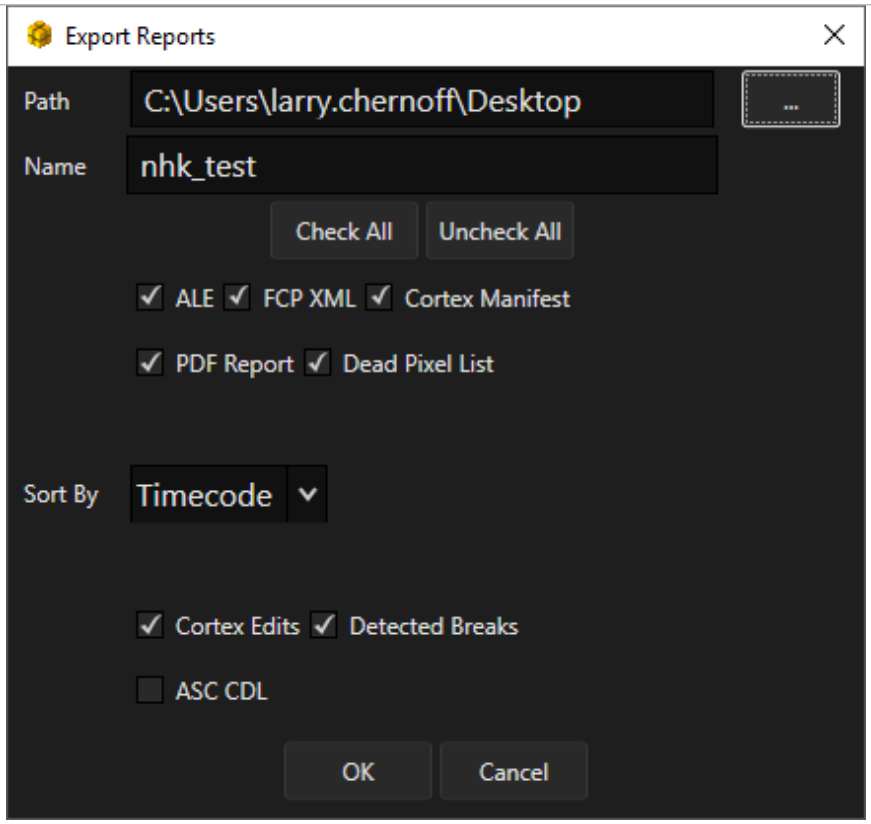


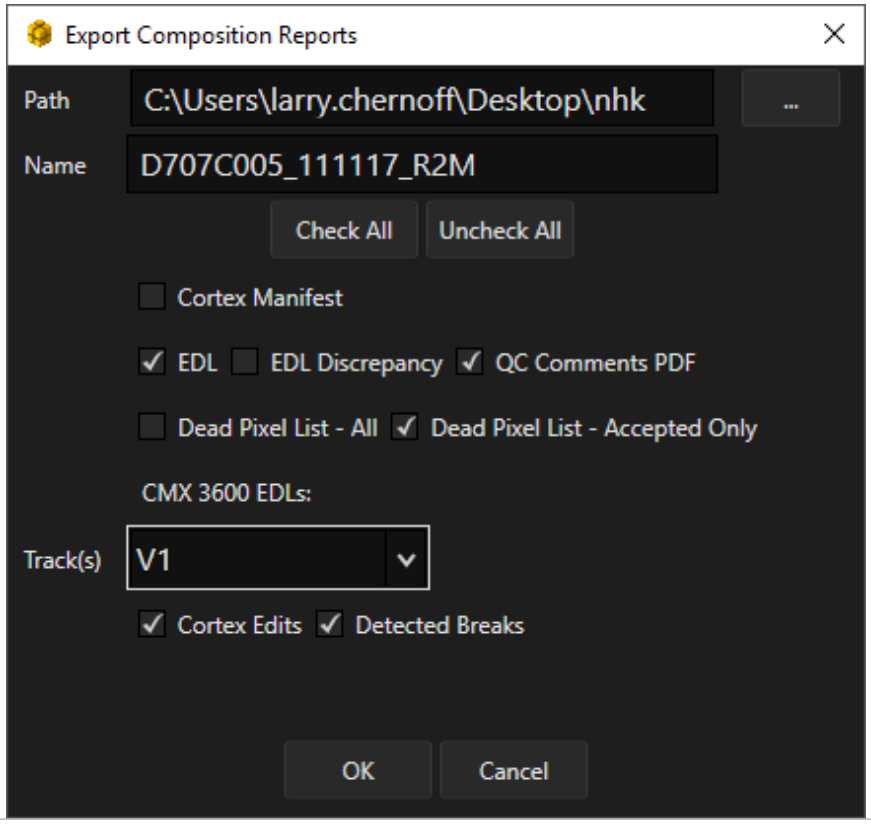
The List/Thumbnail View

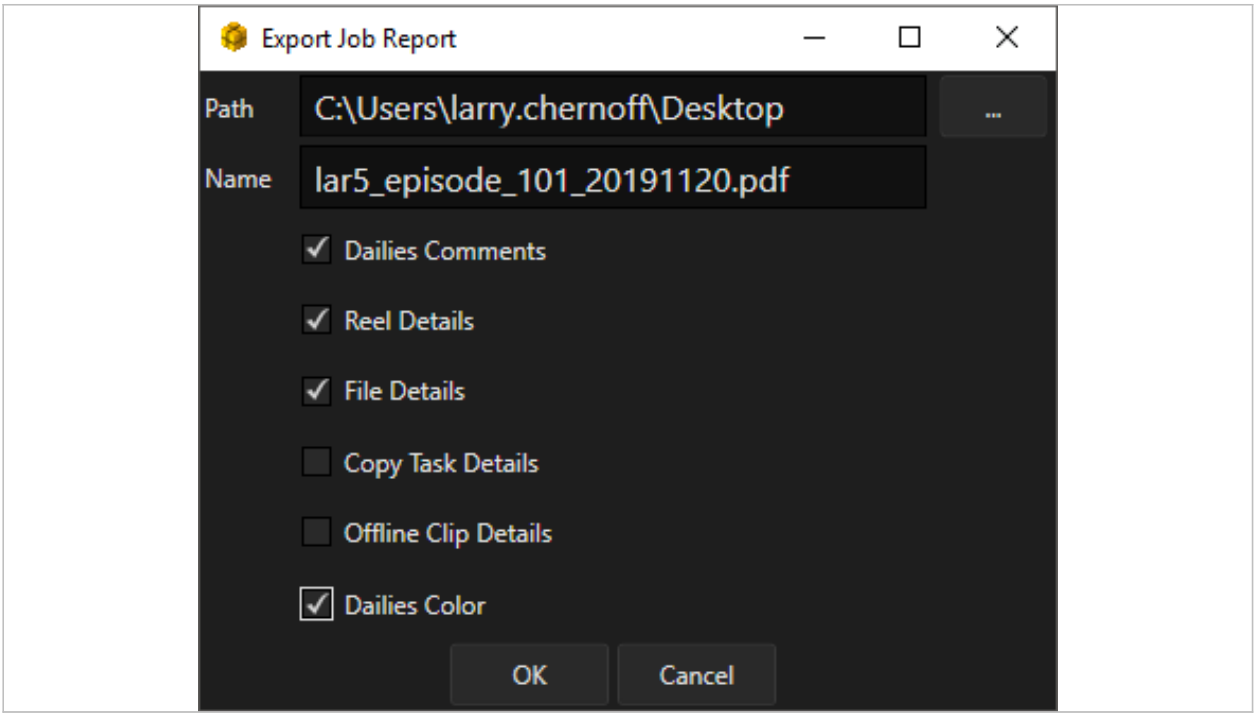
Contains a thumbnail along with clip information.

The Thumbnail View

Displays thumbnails of each clip in a still-store mode with the Camera Roll Letter and Scene/Take metadata.


Export Reports
Path
C:\Users\larry.chernoff\Desktop
...
Name
nhk_test
Check All
Uncheck All
ALE
FCP XML
Cortex Manifest
PDF Report
Dead Pixel List
Sort By
Timecode
Cortex Edits
Detected Breaks
ASC CDL
OK
Cancel


Export Composition Reports
Path
C:\Users\larry.chernoff\Desktop\nhk
...
Name
D707C005_111117_R2M
Check All
Uncheck All
Cortex Manifest
EDL
EDL Discrepancy
QC Comments PDF
Dead Pixel List - All
Dead Pixel List - Accepted Only
CMX 3600 EDLs:
Track(s)
V1
Cortex Edits
Detected Breaks
OK
Cancel



Exporting Reports

Right click on a reel or composition to export a variety of report types.

Export Reports For Reels Export Reports for Compositions

ALE / FCP XML Avid and FCP metadata Cortex Manifest All related Job metadata

Cortex Manifest All related Job metadata EDL EDL of composition events

PDF Report Formatted dailies report EDL Discrepancy EDL of found Discrepancies

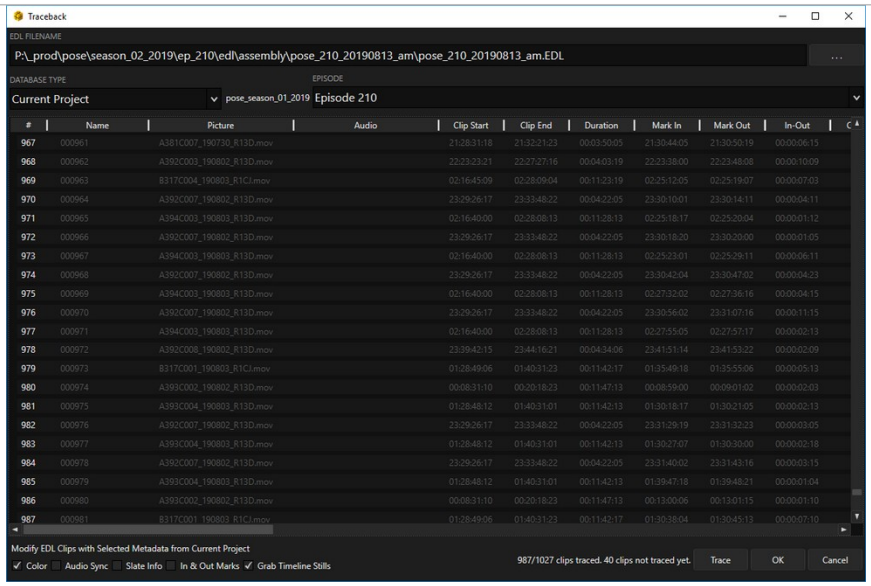
Dead Pixel List .csv of detected pixels Dead Pixel List .csv of detected pixels

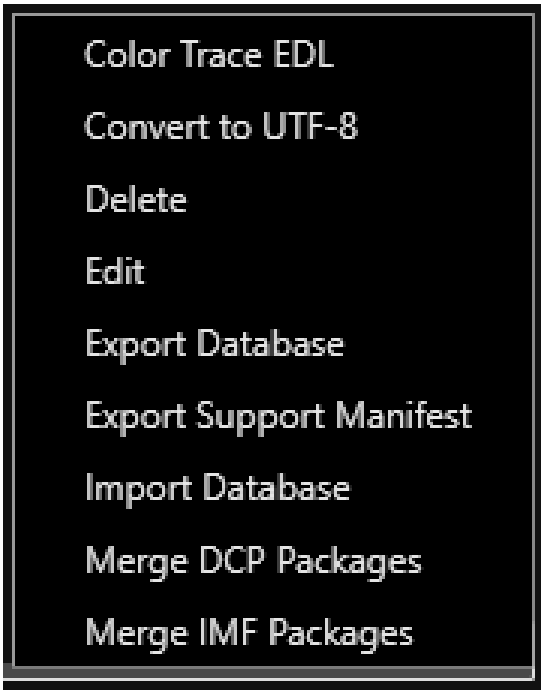
Cortex Edit/Breaks EDL of composition events QC Comments PDF Formatted QC Report

ASC CDL EDL of ASC CDL Values Cortex Edit/Breaks EDL of composition events

Export Reports for Job Right click the Master Clips Bin to export a variety of reports related to the clips in the bin.

Or, you can right-click on the job record in the Project Manager for the report.





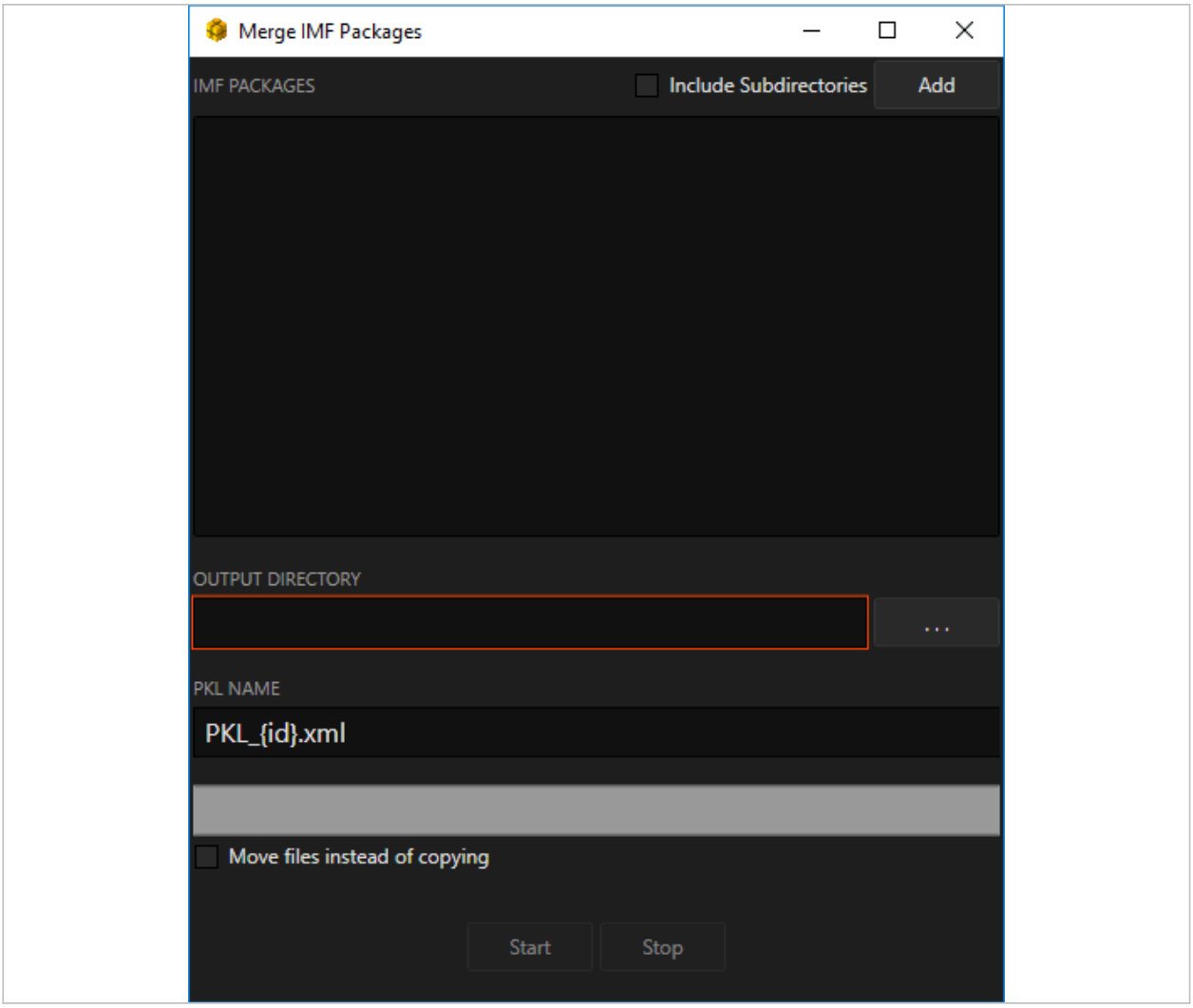
Project Actions and Reports

Color Trace EDL

When dailies color is processed through Cortex with ASC CDL values, either directly or through imported 3D LUTs, Cortex can trace the color values when an EDL with Tapenames is imported and traced through this utility.

1. In the Project Manager, Right click on the Project and choose Color Trace EDL a. A Windows explorer will open 2. Navigate to the EDL and Open it a. A Cortex Traceback Dialog will open i. Enter the “Database Type” 1. Normally it will be the Current Project but other choices are available such as a folder of ALEs. ii. In the Episode field, choose All or a specific one

In the lower left of the UI, make sure the Color checkbox is enabled. In the lower right corner of the UI, click Trace. When the result is found, click OK. This will open a Windows Export window. Navigate to the directory you wish to save the new EDL that contains the ASC SOP values processed in the Color tool.



Convert to UTF-8 (Unicode Transformation Format - 8 bit)

If a project was created in standard ASCII, it can be converted to UTF-8 in order to support the expanded character library.

Delete

To delete a project click the Delete option.

Edit

To Edit a project click the Edit option.

Export Database

To export a database click the Export Database option

Export Support Manifest

If requested by MTI Film's support team, this option generates a Manifest report of the project..

Import Database

Use this option to import a database from another Cortex system.

Merge DCP or Merge IMF Packages

To merge DCP or IMF packages, click the corresponding option:

1. The Merge DCP or IMF Packages Dialog Box appears.

2. Click the Add button to navigate to the DCP packages directories to be merged.

3. Click the … (browse) button to navigate to an output directory

4. If you wish to Move the files instead of copying them, enable the checkbox

5. When ready, click Start

Filtering and Sorting Source Clips

The Clip list can be filtered to hide or show clips that have already had a LUT applied, color correction applied, synchronized, added to a Reel, placed in a Bin, and offline. This is useful to ensure that no clips within a job are missed and to make viewing long lists of clips easier for the user.

To Filter: 1. Check the Filter checkbox to turn filtering on. 2. By default, all clips are shown. Toggle one or more filter buttons to hide or show the clip types.

Filter options:

Hide Clips with LUTs applied

Hide Clips with Color applied

Hide Clips Logged and Sync'd

Hide Clips Added to a Reel(s)

Hide Clips in Master Clips Bin that are also located in Sub-Bins

Show Clips that are Offline

Filtering and Sorting Composition Events

It might be necessary to show certain types of events in a composition created by an imported EDL or natively in Cortex. When a composition is focused, the following buttons provide filtering options:

Show EDL Gap Events (where the EDL has gaps in record time)

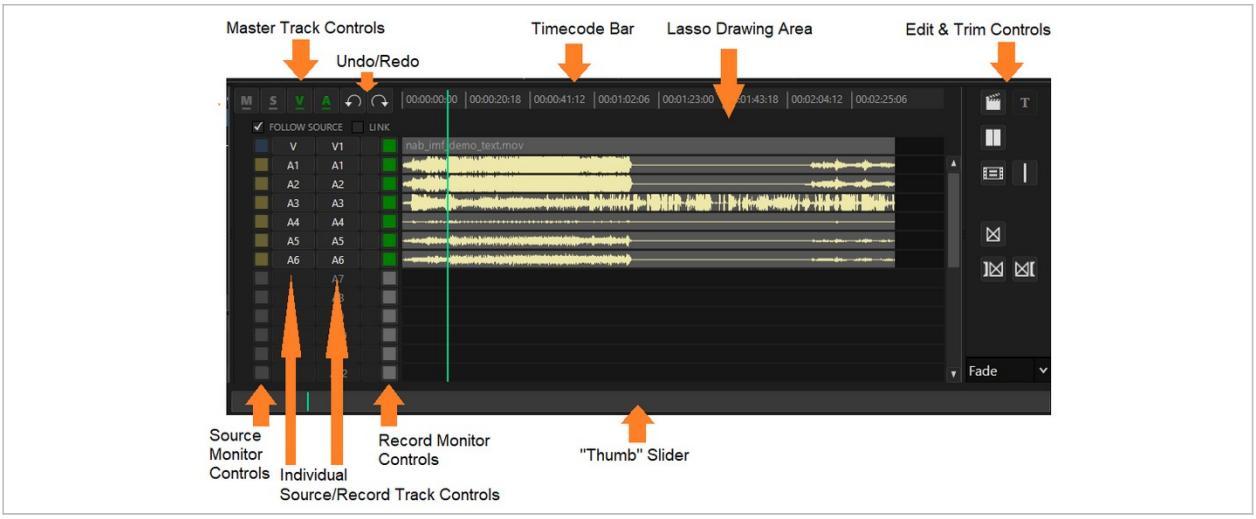
Show EDL FX Events

Show Events with Missing Media

Show Events with Accepted Dead Pixels

Sorting

The Bin can be sorted on any column header, either ascending or descending, by clicking on the header.



The Timeline

The Timeline is displayed when a composition is created in a Job. There are three tools in which the Timeline is displayed, The Edit Tool, the Color Tool, and the QA Tool. In the Color and QA tools, only the video tracks are displayed; the audio tracks are hidden.

The Edit Tool Timeline

The Edit Tool timeline is comprised of several sections:

The Master Track Controls

The Master Track Controls provide a global method of enabling or disabling a track type. For example, if there are six audio tracks enabled and you wish to turn them all off, clicking the A button will toggle them off/on.

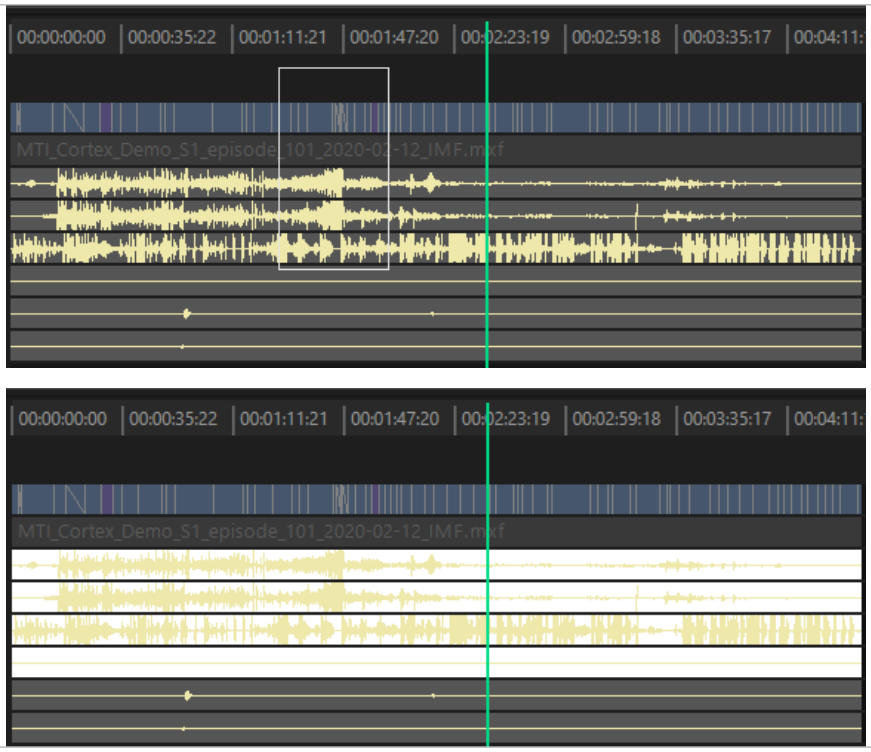
Adding a Metadata, Subtitle, or Video Track

In the Edit Tool, right-click anywhere on the composition to display the Context Menu and choose Add. Then from the extended menu choose which Track Type to add. Shift+clicking on the M, S, or V buttons will add the corresponding track. The timeline contains 1 Metadata, up to 2 Subtitle, 1 Video, and up to 24 Audio tracks.

Closed captions (CEA-608) embedded in QuickTime files play back, and are added to the composition as a subtitle track when the clip is added. Captions can be edited in the Title Tool, which offers TEXT, ROW and COLUMN fields with U (underline) and I (italic).

Follow Source

With Follow Source enabled, Cortex will automatically enable the Video and/or Audio Tracks contained in the source file. For polyphonic audio files, the number of tracks will be automatically enabled. For Monophonic files, pressing Ctrl and clicking on each file sequentially will number them in the order clicked. Follow Source is useful when simple assembly type editing is required.



Link

When the Link checkbox is enabled, the Track and Monitor buttons switch together when either is clicked or Alt+Y is pressed.

Undo/Redo

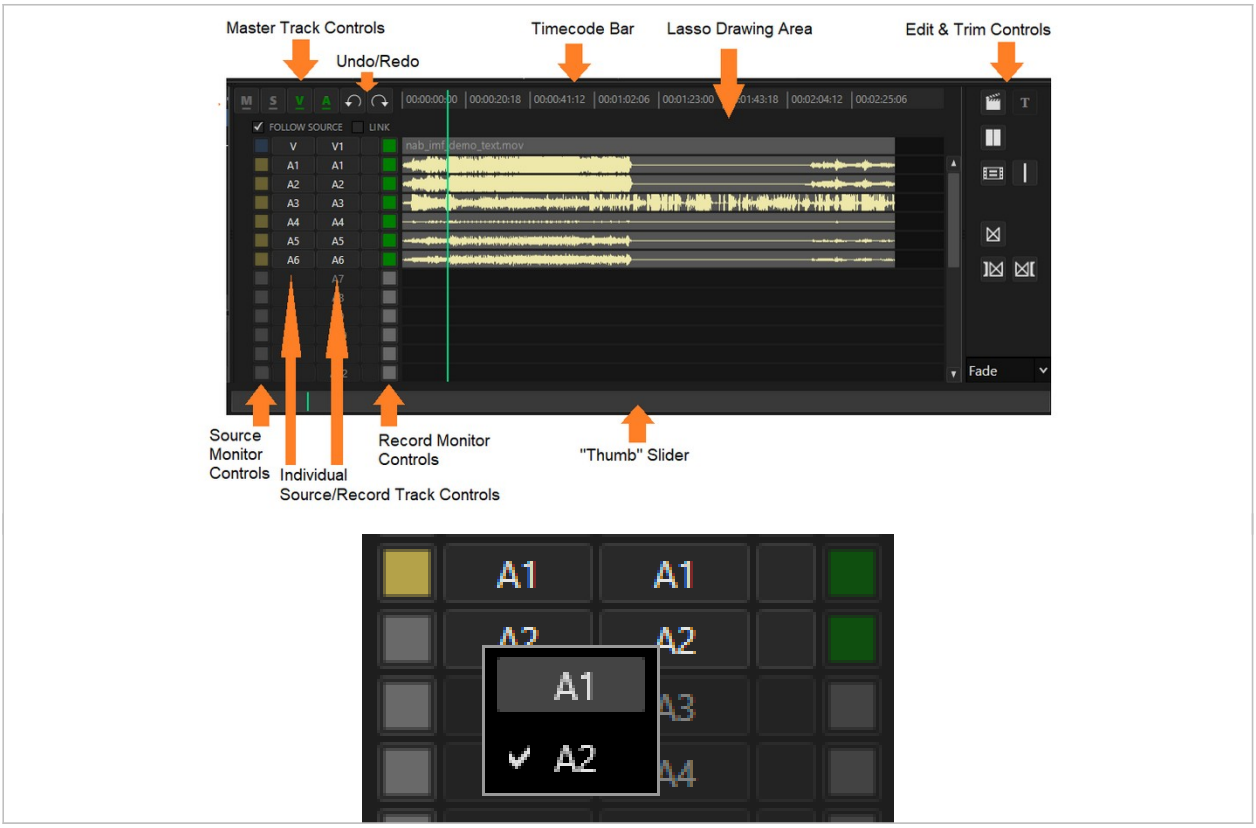
Self explanatory. Just click. You can use Ctrl+Z to undo. The normal Windows Redo shortcut, Ctrl+Y, is not available in the Edit Tool since it is used for other commands.

Timecode Bar

Use the Timecode Bar to scrub the timeline. Click and drag starting at any position.

Lasso Drawing Area

In order to select multiple tracks, enable the desired tracks and then click and drag a lasso from within the Lasso Drawing Area. In this example, only the audio tracks are enabled.



Edit and Trim Controls

Click the slate to open the Slate Generator Click the T button to open the Subtitle luminance adjust slider Click the Trim button to enable the Trim Modes. Press Ctrl and click the Trim button to enable the Ripple Trim Mode Click the Match button to invoke a match frame from either the source or record Click the Break button to add a break. Press Ctrl and click to delete a break.

Click the Effect button to set an initial IN point for an effect.

Click the Mark Effect In button to modify the start point of an effect. Click the Mark Effect Out button to set or modify the end point of an effect. Note: In the Color Tool, the Effect buttons apply only to color dissolves.

In Cortex v5.6, only Fades are supported. Future versions will include Dissolves, Wipes and Superimpositions.

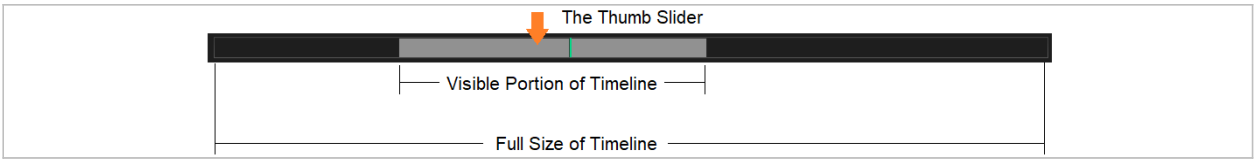
Audio Source and Record Monitor Controls

The yellow Source Monitor buttons control which source audio channels are monitored. The green Record Monitor buttons control which composition audio tracks are monitored. Click a button to toggle its state. Press Shift+click to toggle between isolating the monitor and enabling all monitors.

Individual Source/Record Track Controls

The track buttons on the left determine which source audio channel will be assigned to a record track on the right. Right clicking the source or record track button provides a list of available channels for assignment.

Clicking the Individual Record Track Control buttons determine which tracks will be affected by an edit decision. Click a track button to toggle its state. Press Shift+click to toggle between isolating the track and enabling all tracks containing media.



“Thumb” Slider

When the timeline is zoomed, the Thumb Slider, the lighter gray bar, determines which portion of the timeline is visible.

Click and drag the slider to move the timeline to the desired view.

You can also use the following commands: Pressing Ctrl+Mousewheel Up will move the timeline upstream. Pressing Ctrl+Mousewheel Down will move the timeline downstream.

The Color and QA Tool Timelines

Both Timelines consist of up to two video tracks. The audio tracks are hidden.

Editing and Monitoring Video Tracks

There are a few states that determine which video track is being monitored and which is actionable. Bear in mind that Cortex uses a hierarchical operation to determine which video track is being monitored with V2 taking priority when media exists on both tracks at the same timeline location.

V2 is visible and actionable if its track is selected and monitor is enabled.

Note: In order for both monitors to be enabled, the Link checkbox must be disabled.

V2 is not visible or actionable if its monitor is disabled. If the V1 monitor is enabled, it will be visible but not actionable.

Note: When a monitor button is orange, that is an indication of a conflict between the visibility and actionability for the selected track.

If V1 is selected but its monitor is “blocked” by the V2 monitor, then V1 is neither visible or actionable and V2 is visible.

Zooming the Timeline

Using the Mouse wheel

To zoom the timeline, position the mouse cursor over any area of the timeline and move the mouse wheel up or down to zoom in or out respectively. Very useful when viewing Dead Pixels. Select the Dead Pixel, hold your mouse over the square outline and use the Mouse Scroll wheel to Zoom in on the Dead Pixel. Double click any portion of the Thumb Slider bar area to size the timeline to full visibility.

Using the Keyboard

Press Shift+= to zoom in Press Shift+ - (minus on the keyboard) to zoom out Press Shift+Ctrl+ - (minus on the keyboard) to zoom out to the full extent of the timeline

Timeline Shortcut Keys

Function Shortcut

Add Metadata Track Shift+Click M button

Add Subtitle Track Shift+Click S button

Enable/Disable Video Track(s) Y

Add Video Track Shift+Click V button

Enable/Disable Audio Track(s) U

Switch Video Tracks - no state change for monitors Ctrl+Y

Switch Video Tracks - monitor follows active track Alt+Y

Enable/Disable active track's monitor Shift+Y

Lock a track Ctrl+Click Track button

Lock/Unlock all tracks Ctrl+Shift+Click any track button

Enable the Gap Trim Function Shift+T

Enable the Ripple Trim Function Ctrl+T

Invoke Match frame on either source or record M

Add a Break , (comma) or click button

Delete a Break Ctrl+, (comma) or button

Add Effect and set initial IN point P

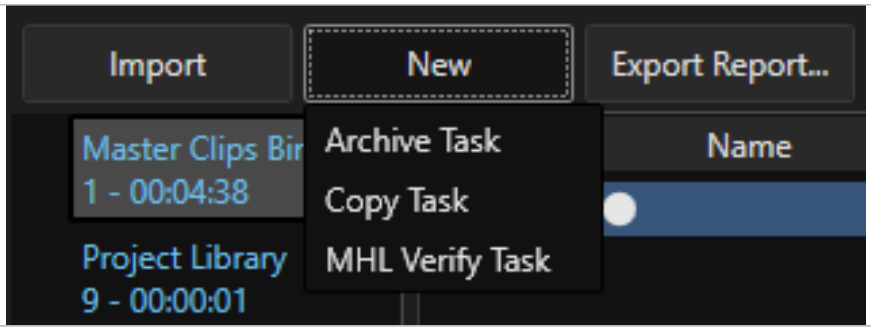
Modify Effect IN [

Mark or Modify Effect OUT]

Go to next Effect Shift+]

Go to previous Effect Shift+[

Delete Effect (must be at Effect IN location Ctrl+P



Cortex Tools in Depth

The Copy Tool

The Copy Tool serves as an interface for copying media from one source to up to three potential destinations with MD5 or xxHash verification. It allows for up to three copy tasks to run concurrently.

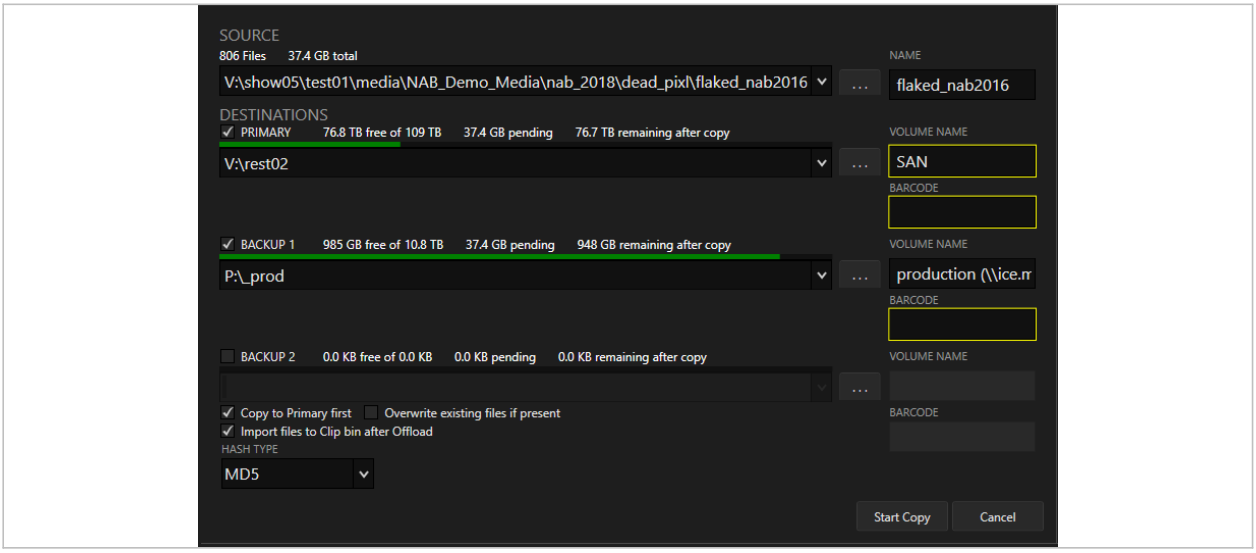
On set it would be used for offloading and backing up camera and audio cards throughout the day. In a facility, the Copy Tool can be used to transfer and backup media to and from shared storage, shuttle drives or LTFS LTO tapes, all while creating a full audit trail. It can also run Media Hash List (MHL) verification tasks.

The Copy Tool can also archive media contained in a job, copying to up to two destinations with a PDF Report. The report reflects a detailed list of the media along with corresponding thumbnails for each clip.

Using The Copy Tool

In a new Cortex Job, select the Copy Tool and click New.

From the Drop-down menu, choose Copy Task. Cortex will then open the Copy Task setup window.



Copy Task Setup

The Copy Task setup screen allows you to specify all the parameters of a copy task. Cortex keeps track of how many tasks are running, allowing up to 3 concurrently.

Destinations

Source - This is where the file path to the source media is entered using the ... (ellipsis) button Destinations - This is where the Primary and Backup destinations are entered using the ... button. Primary - Typically the primary storage associated with a Cortex workstation Backup 1 and Backup 2 - Additional copy/archive destinations Volume Name - This unique identifier for destination drives, which defaults from the drive name, is used to record media storage in reports for later identification. Barcode - The Barcode for destination drives can also be used to identify media storage, such as LTOs.

Options for a Copy Task

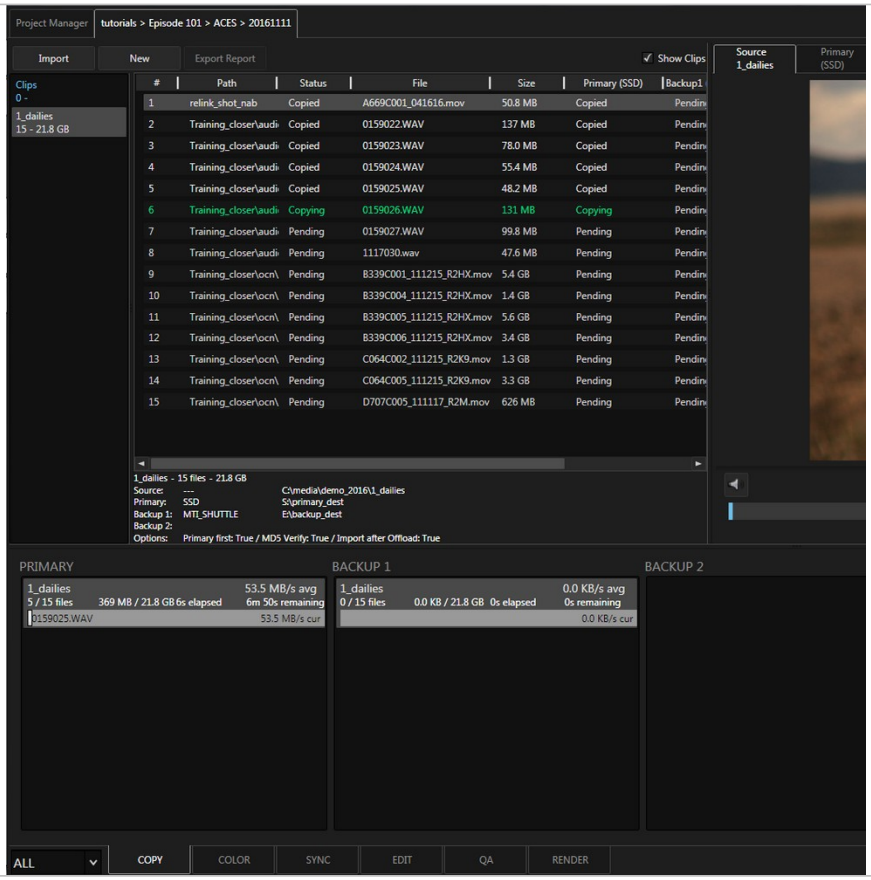
Copy to Primary first - When enabled, Cortex will copy media from Source to Primary first, then create the remaining backup copies using Primary as the source. Recommended for use on-set to free up cards.

Overwrite existing files if present - By default a file already present at the destination is left alone. Enable this to replace it.

Copy all files - Copies every file found at the source, rather than only the media Cortex recognizes.

HASH TYPE - Chooses the checksum used to verify the copy. The choices are None, MD5 and xxHash. Verification is strongly recommended; xxHash is considerably faster than MD5 and is the usual choice on large offloads.

Import files to Master Clips bin after Offload - When selected, loads copied files into the Master Clips Bin of the current job so work can proceed.



Copy Task Status

Once a Copy Task has been created, it will appear in the list in the left hand column. When selected, the copy & verify status of each individual file is displayed.

The overall status of each copy task is displayed in the columns at the bottom.

If “Import files to Clip Bin after Offload” has been enabled, you can switch to another tool as soon as the files are loaded and begin working while other copy tasks are running.

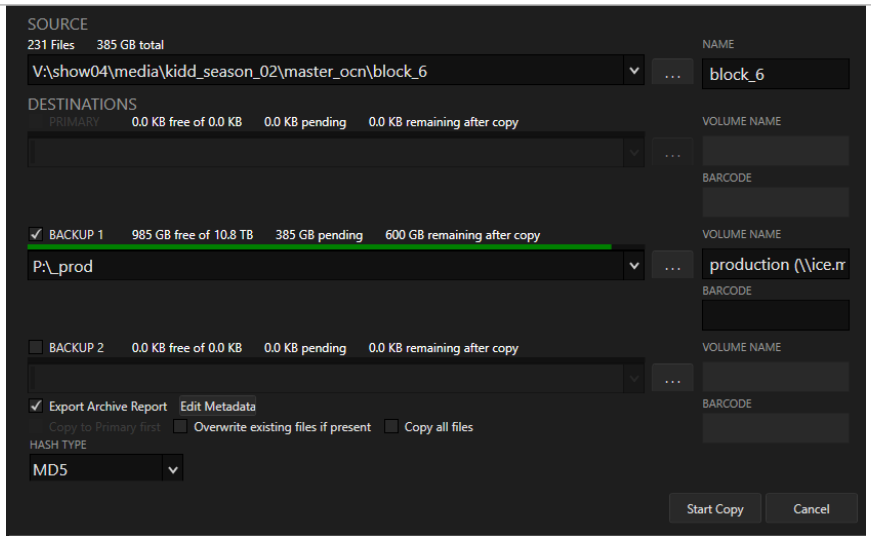
Copy Task Reports

You can generate a full accounting of the Copy Task results in PDF format: 1. Select the Copy Task from the left Sidebar 2. Right click and choose Export Report 3. Select a File Path by clicking the … (browse) button 4. The default file name will be jobname.data.pdf, you can edit this if you wish 5. Click OK

Archive Tasks

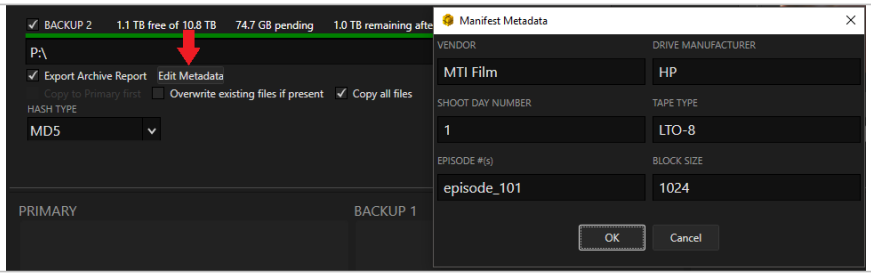
Similar in functionality to a Copy Task, the Archive Task archives media contained in an open Cortex Job. To archive all media in the current Cortex job click New. From the Drop-down, select Archive Task. Cortex will open the Archive Task setup window.

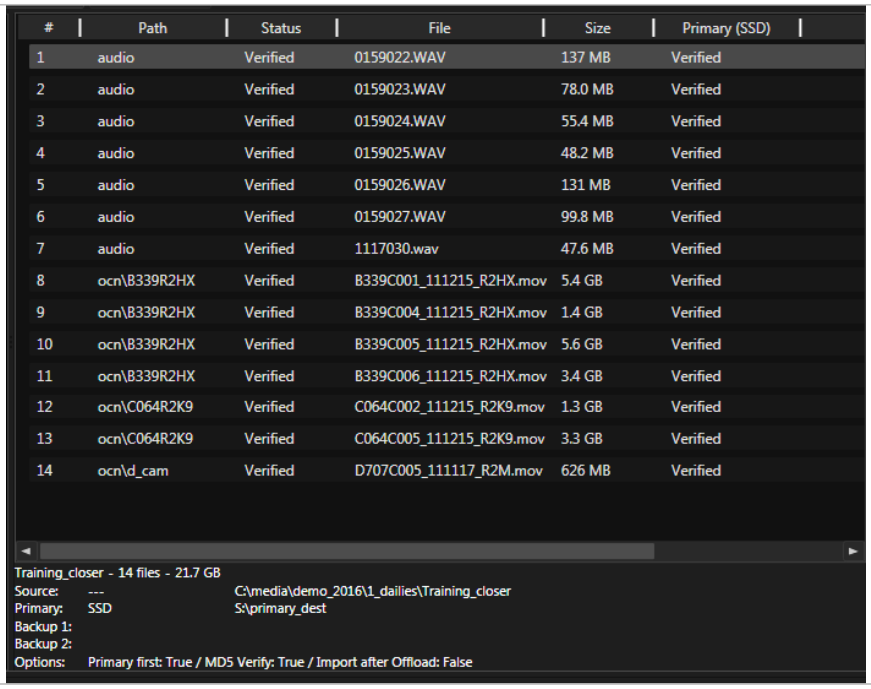
NOTE: An Archive Task can only be run when all media in a Job lives on the same volume.



The Primary Destination option is automatically disabled to prevent the possibility of the Primary being used to copy to other destinations. Choose Backup 1 and/or Backup 2 destinations.

You have the option to export an Archive Report into the destination folder as well. Right click on the task and choose Export Report. The Archive Report is a PDF document listing all clips archived. It contains all relevant reporting data, including file and clip names, timecode, and thumbnail of each clip.





#	Path	Status	File	Size	Primary (SSD)
1	audio	Verified	0159022.WAV	137 MB	Verified
2	audio	Verified	0159023.WAV	78.0 MB	Verified
3	audio	Verified	0159024.WAV	55.4 MB	Verified
4	audio	Verified	0159025.WAV	48.2 MB	Verified
5	audio	Verified	0159026.WAV	131 MB	Verified
6	audio	Verified	0159027.WAV	99.8 MB	Verified
7	audio	Verified	1117030.wav	47.6 MB	Verified
8	ocn\B339R2HX	Verified	B339C001_111215_R2HX.mov	5.4 GB	Verified
9	ocn\B339R2HX	Verified	B339C004_111215_R2HX.mov	1.4 GB	Verified
10	ocn\B339R2HX	Verified	B339C005_111215_R2HX.mov	5.6 GB	Verified
11	ocn\B339R2HX	Verified	B339C006_111215_R2HX.mov	3.4 GB	Verified
12	ocn\C064R2K9	Verified	C064C002_111215_R2K9.mov	1.3 GB	Verified
13	ocn\C064R2K9	Verified	C064C005_111215_R2K9.mov	3.3 GB	Verified
14	ocn\d_cam	Verified	D707C005_111117_R2M.mov	626 MB	Verified

Training_closer - 14 files - 21.7 GB
Source: --- C:\media\demo_2016\1_dailies\Training_closer
Primary: SSD S:\primary_dest
Backup 1:
Backup 2:
Options: Primary first: True / MD5 Verify: True / Import after Offload: False

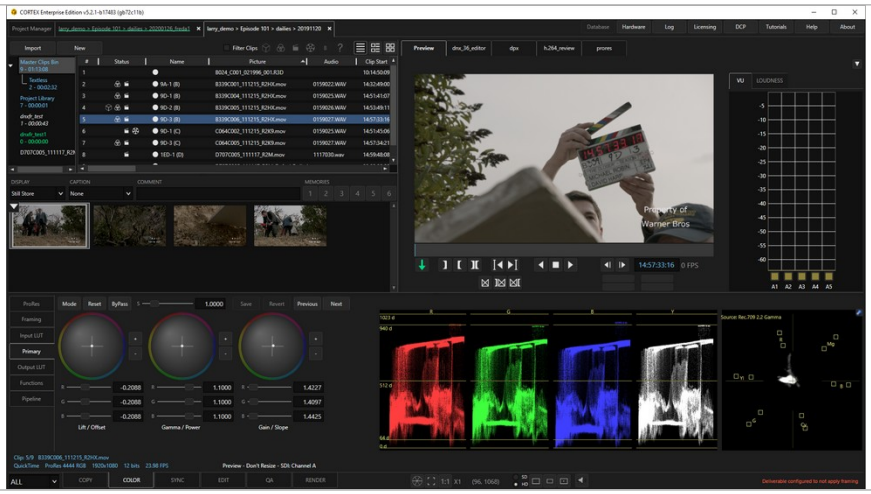
To make changes to certain header data within the Archive Task report, click Edit Metadata and fill in the customizable fields for items like Shoot Day, Tape Type or Episode Number.

When the Archive Task is complete, Cortex will have copied relevant media and reports to the destination in a folder structure similar to the media's original source.

Verify Tasks

You can create a Verify Task to reconcile media that already exists within the Cortex workstation's network against a Cortex Manifest file.

In a job containing the existing media, import a corresponding Cortex Manifest. Then, in the Copy Tool, create a New Copy Task. In the Source field, navigate to the source directory where the footage resides on your local storage. Disable the destination fields and leave them blank.



The Color Tool

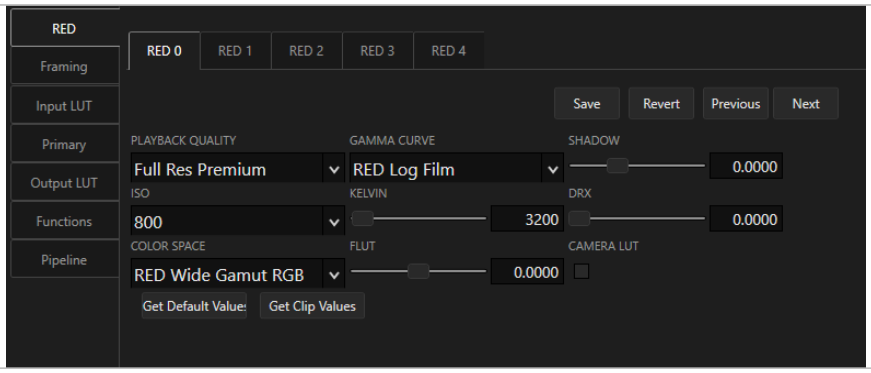
The Color Tool provides an interface for setting or adjusting primary color correction, importing and applying LUTs and CDLs, framing, processing Dolby Vision™ Level 1 analysis, adding Grain or Aperture

Correction effects, setting MTI-Samsung resizing parameters, managing looks via multiple still stores, and exporting color decisions via LUT, ASC CDL and/or stills.

NOTE: Each project may demand a different configuration for monitoring color correction. Be sure to familiarize yourself with the Deliverables/Color Section

NOTE: Clips on “Closed” Clip Reels cannot be modified. Therefore, Cortex will block the “reuse” of a clip once it is added to a clips reel unless the reel is open or the clip is duplicated. Modifying a clip on an open reel, including changing In/Out marks, will cause the clip to be rerendered.

To access the Color tool, click the Color tab, or press the F2 key



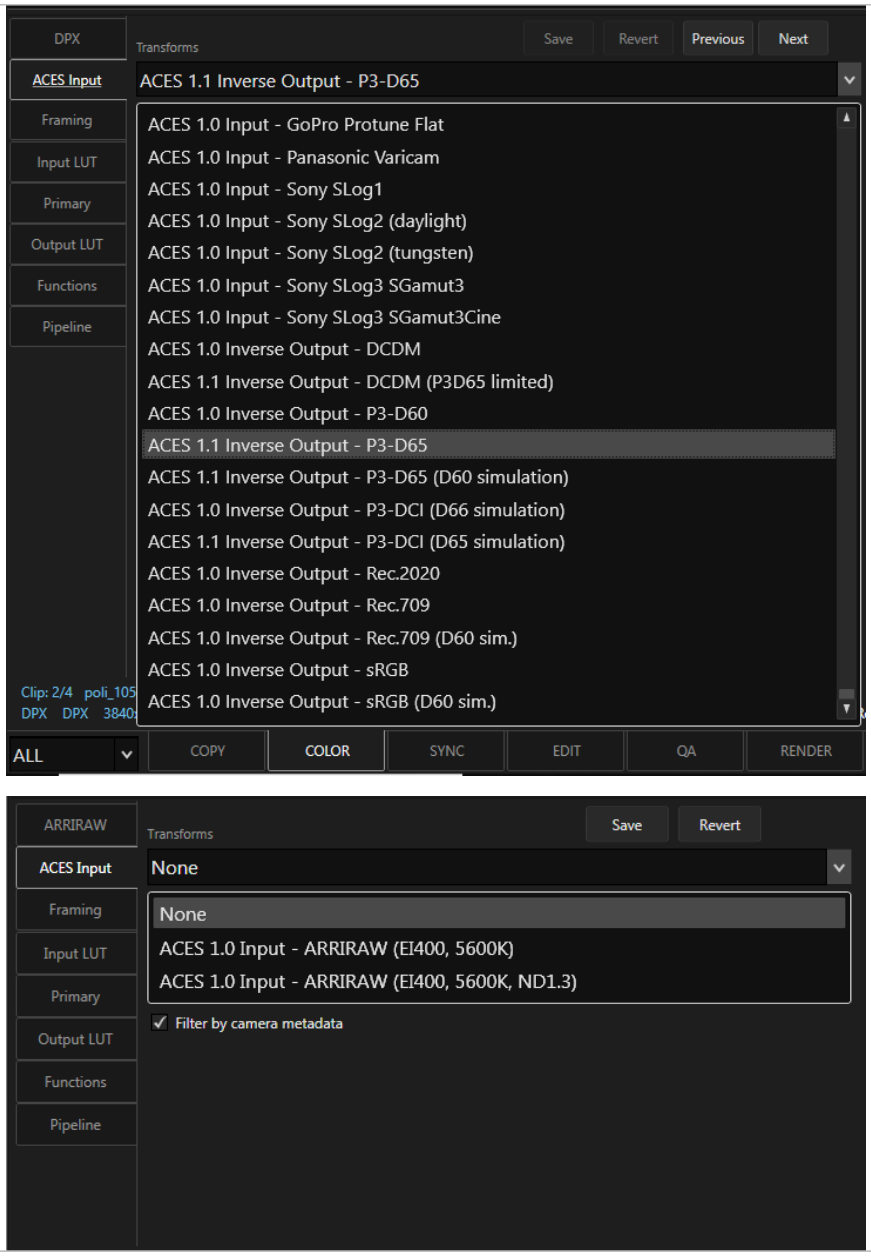
Color Pipeline Tabs

The Color Pipeline Tabs appear on the left side of the UI. ● Camera - Camera-specific settings when available ● ACES Input - Set clip ACES Input Device Transform (if working in an ACES project) ● Framing - Adjust image framing ● Input LUT - Select Input LUT ● Primary - Primary Color Correction tools ● Output LUT - Select clip-specific Output LUT ● Functions - Restoration and image processing: 3D Comb, DeHalo, Deinterlace, Brickwall, Aperture, Film Grain, MTI-HQ and MTI-Samsung ● Pipeline - View All Color and Configuration settings ● Dolby - Dolby Vision™ Level 1 analysis. This tab is shown only when a Dolby Vision™ composition is selected

Camera Tab

The Camera Tab provides properties options related to the currently selected clip’s camera source.

The Camera Tab label will change depending on the clip's camera source.



ACES Input Tab

Set the Input Device Transform (IDT) for your media.

Select the desired IDT from the Drop-down.

If using media that has a large number of available IDTs, use the Filter by Camera Metadata option to filter the list based on camera metadata in each clip. This should give you a smaller list of IDTs to choose from.

With Filter by Camera Metadata on, the IDT is also kept consistent with how a RAW clip is decoded. Sony RAW IDTs are narrowed to the decode color space chosen on the Camera tab, and an ARRIRAW clip decoded straight to ACES (SceneLin. - ACES) needs no IDT, so the ACES Input tab is hidden for it to prevent a double conversion.

Note: RED files automatically apply an IDT provided by the RED SDK.

Framing

The framing tab provides all the necessary controls to modify the displayed dimensions of the media clip which include Zoom, Horizontal and Vertical positioning, and Aspect Ratio. In addition, Horizontal and Vertical Flip and Rotation.

Note: The Framing module is used to modify the framing of the picture and can be saved as a property of the clip. Zooming the picture with the mouse while hovering over the Media Player does not affect the output framing and is only used for viewing purposes.

Input LUT

From the Drop-down list, select an Input LUT to apply to the clip before Primary color correction from one previously used, from the Cortex provided LUTs, or by importing a new LUT.

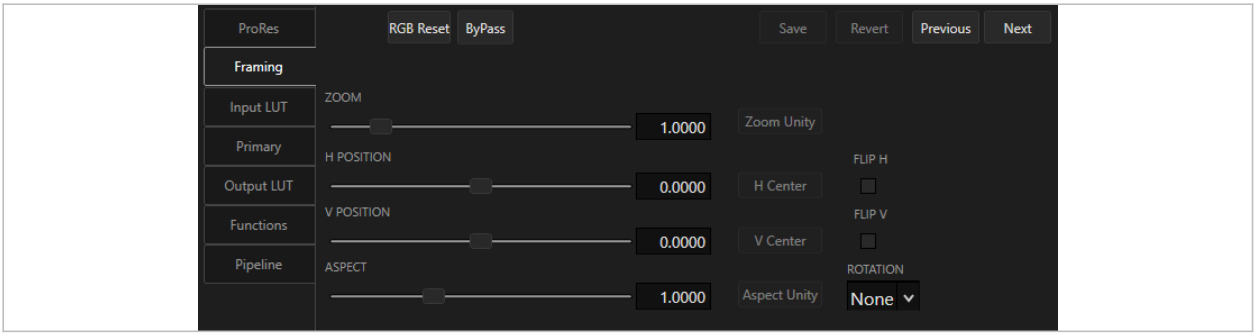
Cortex comes standard with a set of typical LUTs for use with common camera and codec types.

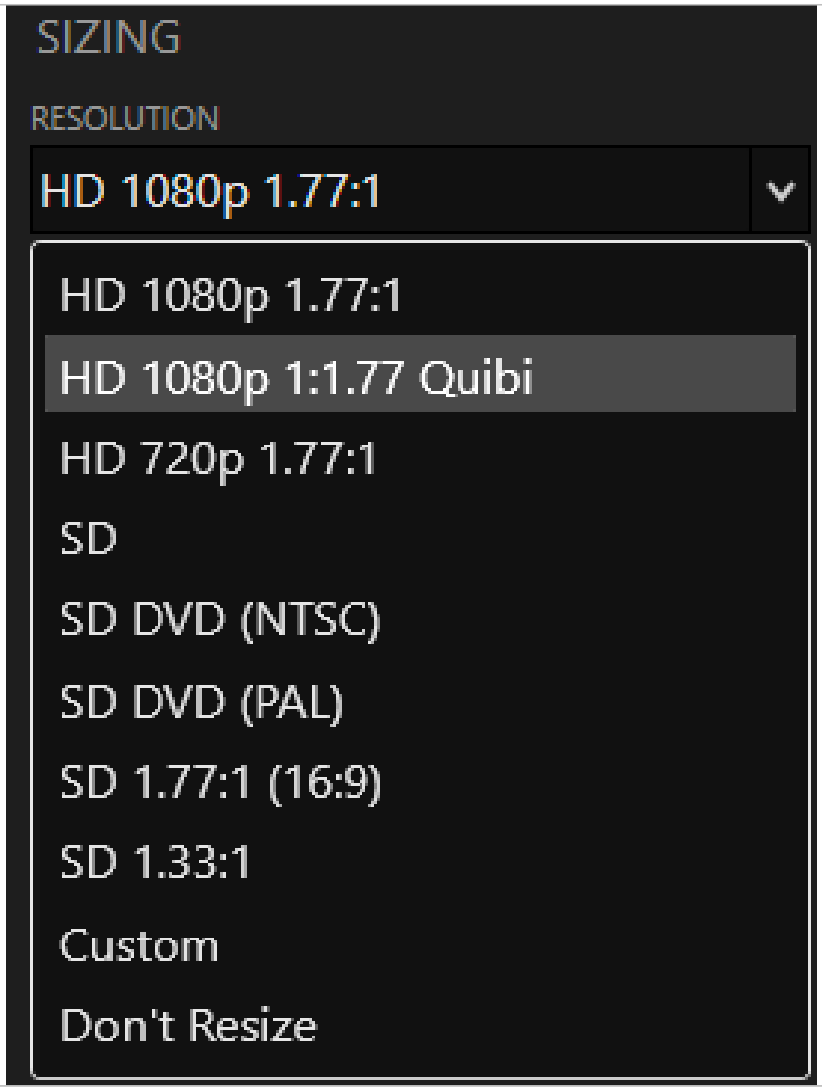
Primary Tab

The Primary tab includes: ● A view of color parameters as they've been adjusted. ● GUI interface to adjust color parameters consisting of three color wheels that act as Lift(Offset), Gamma(Power), and Gain(Slope) controls, which are converted to ASC SOP CDL values for reporting via ALEs, CDLs, EDLs and Cortex Manifests. ● Saturation control ● Waveform and vectorscope displays.

Output LUT

From the Drop-down list, select an Output LUT to apply to the clip after Primary color correction from one previously used, from the Cortex provided LUTs, or by importing a new LUT.





Functions

The Function tab holds the restoration and image processing stack, presented as a row of tabs in the order they are normally applied: 3D COMB, DEHALO, DEINTERLACE, BRICKWALL, APERTURE, FILM GRAIN, MTI-HQ and MTI-SAMSUNG. Each is enabled by its own checkbox and can be set clip by clip, or for compositions on a shot by shot basis. MTI-Samsung Upres settings can be adjusted if the Resize Quality “MTI-Samsung” option has been applied to the active Deliverable. Note that Dolby Vision™ Level 1 analysis is no longer processed from this tab; it now has its own Dolby tab, which appears whenever a Dolby Vision™ composition is selected.

Pipeline

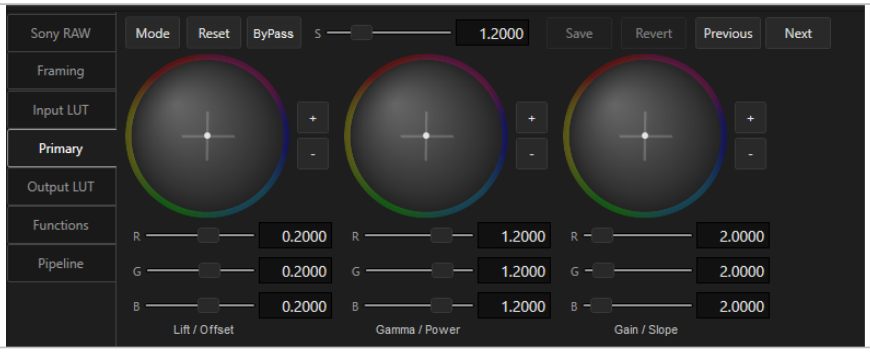
The pipeline tab displays all framing, color and function information applied to the active clip. It also displays, in Magenta, the current Deliverable configuration and any relevant metadata for the active clip.

Using the Framing Tool

Use the ZOOM, H POSITION, V POSITION and ASPECT sliders to adjust the framing of the active clip. H Center, V Center and Aspect Unity will reset each of these parameters. The Flip H and Flip V checkboxes will respectively flip the image horizontally and vertically.

Vertical 9 x 16 mode

In conjunction with the Deliverable's Resolution, the framing tool can be used to frame 9x16 images or content from the Creator Community using the Rotation function. The dropdown provides clockwise and counterclockwise rotation. These have been renamed VERTICAL 9 x 16 in V7.0



The Primary Color Corrector

Using the GUI to Color Correct

From left to right, the color wheels are represented as Lift, Gamma, and Gain or as ASC values of Offset, Power and Slope respectively. Using the mouse, click on any of the three color wheels and drag in the desired direction. Use the + and - buttons to raise or lower the values of each color component.

The three Individual sliders for each color component can be adjusted by left-clicking and dragging the slider or by clicking in the numeric box and using the up and down arrows to adjust values.

To toggle between the pending and existing color tool corrections press, hold and release the T key. To revert all pending color tool settings to the existing correction press the A key. To bypass pending color correction back to raw press, hold and release the 6 key. To bypass pending color correction and LUTs back to raw press, hold and release the Shift+6 keys. To reset existing color correction back to raw press the 5 key. To reset existing color correction and LUTs back to raw press Shift+5.

Framing functions must be reset individually on the Framing tab.

What follows are keyboard shortcuts for the Color Tool. A complete list of shortcut keys will be found at the end of this tutorial section.

Saving Color Settings

To the current clip:

Press the Save Button or press Ctrl+S

Changes to a composition event are also saved automatically when you select a different event, just as they are when you move between clips in the clips bin.

To Multiple clips:

Using the settings on the current clip, select the span of clips you wish to apply the settings and click the Save button or press Ctrl+S. A Dialog Box will appear. Carefully enable those properties you wish to apply and click the Save button.

Using the Keyboard to Color Correct

You can also use the keyboard to color correct as follows:

Color Function Shortcut Key Description

Lift 1 Selects the Lift Color Wheel

Gamma 2 Selects the Gamma Color Wheel

Gain 3 Selects the Gain Color Wheel

Lift Color 1 - Press and Hold Adjust Red - Up/Down arrows; Adjust Blue - Left/Right arrows

Gamma Color 2 - Press and Hold Adjust Red - Up/Down arrows; Adjust Blue - Left/Right arrows

Gain Color 3 - Press and Hold Adjust Red - Up/Down arrows; Adjust Blue - Left/Right arrows

Luminance Alt + up/dn arrows Click + or - buttons

Saturation 4 Adjusts the saturation value using the Up/Down Arrows. Enter to accept

Button Shortcut Key Description

Mode ~ Switches between Lift Gamma Gain and Printer Lites modes

Luminance Ctrl+Shift+ Click + or - buttons

Reset 5 Reverts the primary correction settings to Unity

Shift+Reset Shift+5 Reverts the primary correction and LUT settings to Unity

Bypass Primary 6 Bypass the primary color correction only - (Hold key down)

Bypass Primary/LUT Shift+6 Bypass the primary color correction and LUT - (Hold key down)

Toggle Preview T Toggle between the pending and existing corrections - (Hold key down)

Save Ctrl+S Saves the current settings to the active clip

Revert A While previewing the pending settings, reverts to the last saved settings

Previous 8 Successively applies color and sizing settings of the Previous clip(s)

Shift+Previous Shift+8 Successively applies only color settings of the Previous clip(s).

Ctrl+Previous Ctrl+8 Shows correction menu for Previous clip(s) or segment(s)

Next 9 Successively applies color and sizing settings of the Next clip(s)

Shift+Next Shift+9 Successively applies only color settings of the Next clip(s).

Ctrl+Next Ctrl+9 Shows correction menu of the Next clip(s) or segment(s)



Dissolves

Dissolve Timeline

The Timeline Bar beneath the Media Player displays the location of dissolves for the active clip.

Cortex supports adding dissolves from one setting to another setting within the same clip.

To Create a Dissolve:

● Create settings for a clip. ● Navigate to the frame where the dissolve is to start

● Click the Add Dissolve button or press the P key ● Navigate to the frame where the dissolve is to end

● Click the Mark Dissolve Out button or press the] key ● Create new settings for the clip and review the dissolve

To Adjust the Length of a Dissolve:

Use the Mark Dissolve In button ([ )or Mark Dissolve Out button ( ])to adjust the Dissolve. ● If you Mark Dissolve In before the dissolve, it will lengthen the dissolve to the new mark ● If you Mark Dissolve In within the dissolve, it will shorten the dissolve to the new mark ● If you Mark Dissolve Out after the dissolve, it will lengthen the dissolve to the new mark ● If you Mark Dissolve Out within the dissolve, it will shorten the dissolve to the new mark

To Navigate Between Dissolves:

● Press Shift+Mark Dissolve In button or press Shift+[to navigate to the previous dissolve start ● Press Shift+Mark Dissolve Out button or press Shift+] to navigate to the next dissolve start

To Remove a Dissolve:

● Navigate to the beginning of the dissolve

● Press Ctrl+click Add Dissolve button or press Ctrl+P

Notes ● If you copy color from a clip with a dissolve, it will copy the first color correction only ● ALEs will export only the CDL values for the first color correction ● When you grab a still from a clip with a dissolve, it will grab the color correction for the frame currently located in the Media Player



Printer Lights GUI Controls

The RGB Sliders adjust the Red, Green and Blue levels. A color-coded box indicates the active slider(s), which can be adjusted with the mouse wheel. Use the 1, 2, and 3 keys to select Red, Green, Blue respectively. The + and - buttons gang the controls in their relative positions.

Image Stores

The Image Stores contain stills saved or imported by the user into Cortex. There are six different image stores, each serving a unique function.

The Six Image Stores

Image Store Shortcut Key Displays: 1. Still Store ; Stills explicitly saved by user

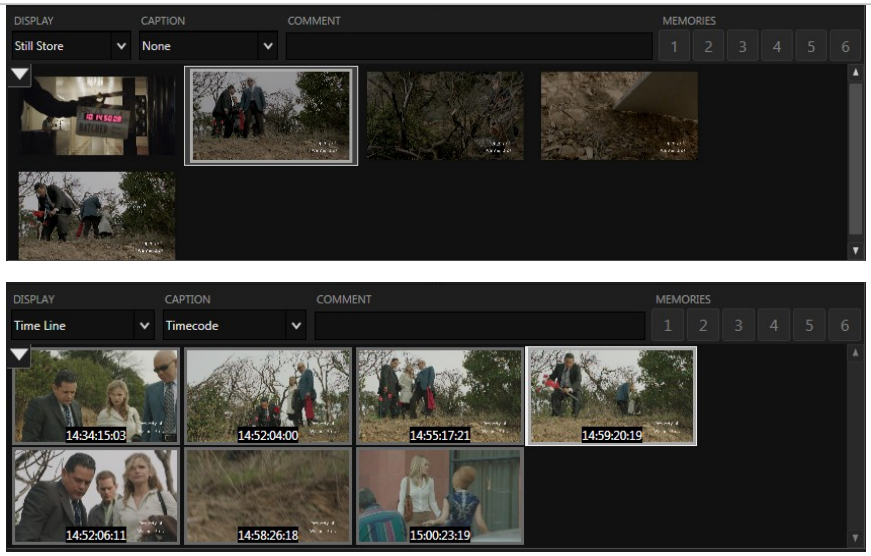
2. Timeline L A still for each clip with current color decision

3. Favorites ‘ Stills saved to Faves list by user

4. Imported Stills Shift+’ Imported Cortex Stills or 3rd party stills

5. Imported CDLs Shift+’ Imported CDL Values as Bars thumbnails

6. LUTs Shift+L Imported LUTs as Bars thumbnails



Still Store

Stills “grabbed” from clips during the course of color correction are automatically saved to the Still Store. All properties are saved with the still, which can be recalled later and applied to other clips. The stills can also be exported as jpegs or Cortex Stills. Cortex Stills can be imported into other non-networked Cortex hosts where all aspects of the properties saved in the still can be recalled and applied to clips.

To Grab the current clip’s color settings to a still, press the B key or right-click the still and choose “Grab Still” from the Context Menu.

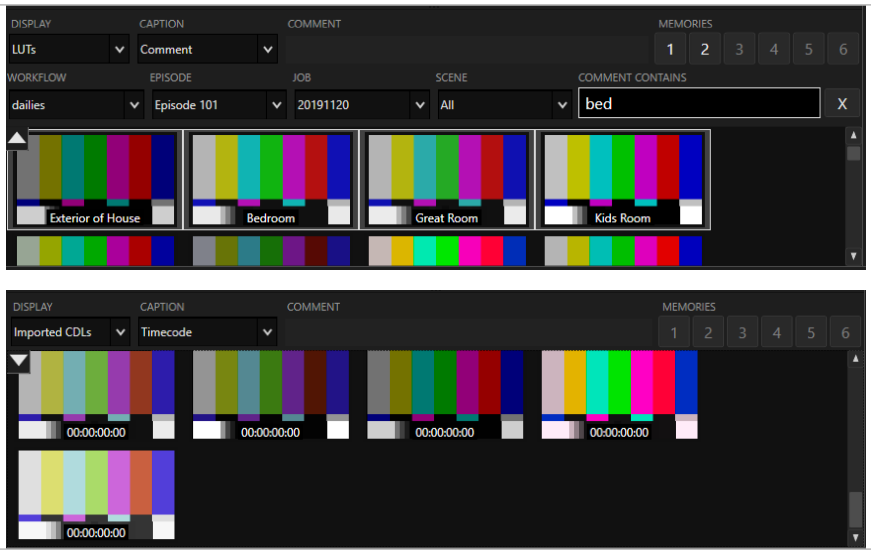
Timeline Store

The Timeline store displays a thumbnail, saved from the middle of each clip in the bin, with the currently applied color properties. As color tool properties are saved, the corresponding still will be updated with the revised properties. While all properties are saved to the still, framing changes will not be reflected in the thumbnail.

Note: By default, Cortex does not populate the Timeline store automatically since it is time consuming and, perhaps, not needed. To populate the Timeline store, right-click on and choose “Update Timeline Stills” from the Context Menu.

Favorites Store

To use stills across multiple jobs in a project, the Favorites store is where user defined favorites are saved. To add (or remove) stills to the Favorites store, select the still(s) and press the keyboard 0 (zero) key or right-click on any still(s) and choose “Toggle Favorite”. A still marked as a favorite will have an located against a black background in the upper righthand corner of the still. The Favorites Still Store defaults to filtering by Job but setting the Job Drop-down field to All shows all Favorites saved within the Project.



Imported Stills Store

The Imported Stills store allows you to import stills from 3rd party or Cortex Stills exported by a Cortex host. 3rd party stills, such as jpegs, are used for reference only unless accompanied by corresponding LUTs or CDL values. Cortex Stills, which can be generated via any Cortex edition, will contain all saved color properties and, once imported, can be applied to any clip. Stills with color properties can be tagged as Favorites.

Importing Stills

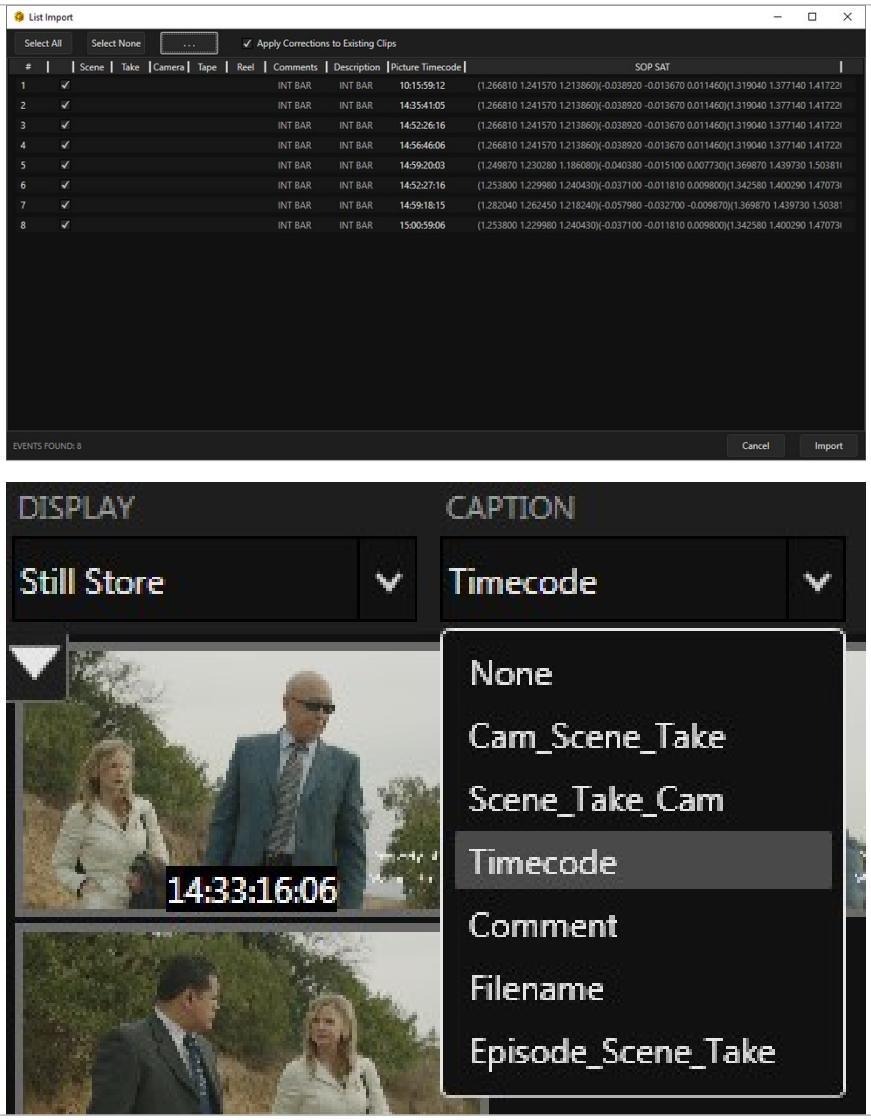
1. Right-click in any image store a. Select Import Stills... in the Context Menu. A Windows Browser will appear. Navigate to and select the stills to be imported and then click Open. File types supported include: bmp, Cortex Still, dpx, exr, jpeg, tiff.

LUTs Store

The LUT Store lets you access LUTs that have been imported into the Job. The Comment field can be used to apply a description, which can then be searched using the “COMMENT CONTAINS” field.

Imported CDLs Store

CDLs created by 3rd party or other Cortex hosts can be imported into Cortex and applied to their corresponding clips. All CDL values are displayed as color bars.



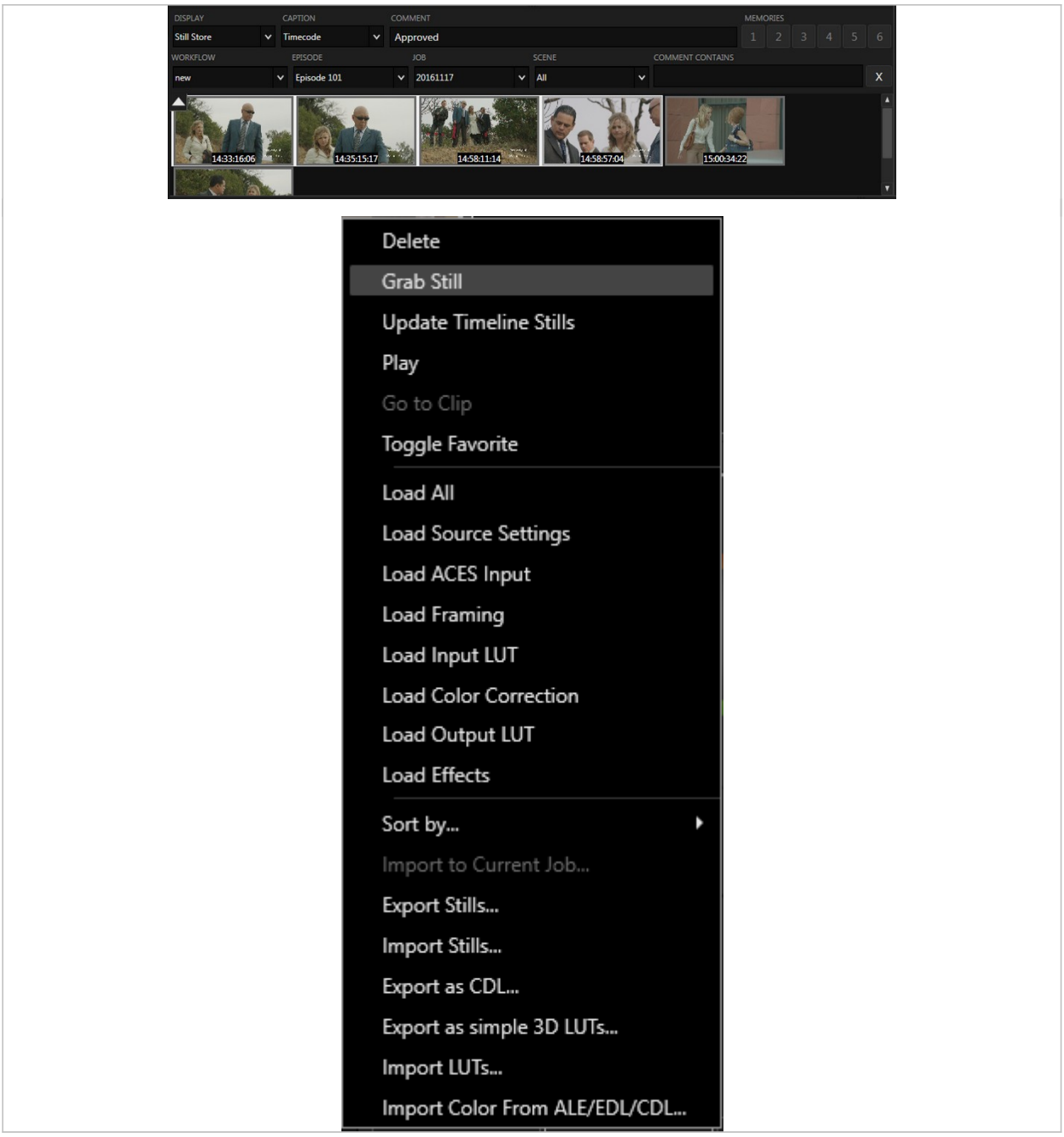
Importing CDL Values

1. Right-click in any image store a. Select Import Color From ALE/EDL/CDL… b. The List Import window will open. Click Browse (…). A Windows Browser will appear. Navigate to and select the color line items to be imported and then click Open. c. Use the checkboxes to select/deselect which items to import d. If desired, use the checkbox to “Apply Corrections to Existing Clips” e. Click Import

If the “Apply Corrections to Existing Clips” is enabled, Cortex will attempt to match the CDL line items to their corresponding clips using the Picture Timecode, Tape Name, Scene/Take/Camera, or a combination. If no metadata is present for any of the fields, it will simply import the values.

Stills can be displayed with a Caption for identification. Caption options are: ● None ● Cam_Scene_Take ● Scene_Take_Cam ● Timecode ● Comment ● Filename ● Episode_Scene_Take

Stills are automatically sorted in the same sort order chosen for the clips bin.



Filtering and Searching

You can access stills saved in other jobs for the selected image store using the Filter/Search feature. To toggle the Search bar, click the Down Arrow button on the left side of the still store. It will expose a series of fields by which you can filter a search. You can filter by Workflow, Episode, Job, and Scene. Using the Comment Contains field, you can search for a text string by entering any text and pressing Enter. For example, to search for Favorite stills, first select the Favorites still store and then enter search criteria as desired.

Saving and Recalling Stills

To save (Grab) the current clip's color settings to a still, press the B key or right-click the still and choose "Grab Still" from the Context Menu. The still will appear in the Still Store.

To recall and load a still's color settings to another clip:

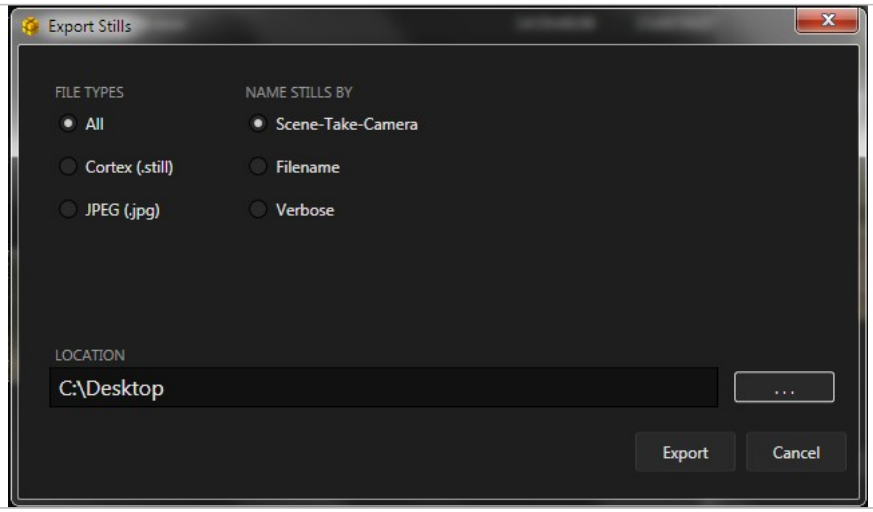
1. Select the clip to be colored 2. Press N or choose Play from the Context Menu 3. Navigate to the desired Still. Once you've found the desired Still, press N again to return to the active clip 4. Pres Shift+N or Double Click the still to load the color settings 5. Click Ctrl+S to save the color decision to the clip

To add a comment to a still:

1. Select the still 2. Type the comment in the comment box and press ENTER

To go to the clip of the selected still:

Note: Applies only to stills with corresponding clips in the current Job. 1. Select the still 2. Right click on the still and select "Go to Clip" or press Alt+Left click on the still or press Ctrl+Shift+N



Still Functions

There are a number of options for working with stills: ● Double-click - load color decisions from still into current clip Right click for a Context Menu with the following options: ● Grab Still - grab a still of the color correction options on the current clip ● Update Timeline Stills - Refresh the stills within the Timeline store ● Play - Toggle between the selected still and the current clip within the Media Player. ● Go To Clip - load the corresponding clip the still was grabbed from ● Toggle Favorite - Add or remove from Favorites

● Load All - Load all color parameters related to this still. You can choose to selectively: ○ Load Source Settings ○ Load Framing ○ Load Input LUT ○ Load Color Correction ○ Load Output LUT ○ Load Effects

● Import to Current Job - Enabled when viewing stills from other Jobs via search/filter ● Export Stills - Export Cortex or JPEG stills from your active store. ● Import Stills - Import Cortex or JPEG stills to the Imported Stills store. ● Import Color from ALE/EDL/CDL - Import color decisions via ALE/EDL/CDL into the Imported CDLs Store ● Delete - Delete the selected still.

Stills grabbed from a Dolby Vision composition keep that frame's Dolby Vision metadata, which is applied when the still is played or exported.

Exporting Stills

Stills can be exported from any Image Store, or via the Project Manager for the Still and Timeline stores. In the desired Image Store, select the Still(s) you want to export, right-click and choose Export Stills. When exporting stills from the Image Store, Cortex provides the following options: File Types - Which

kind of Stills to export ● All - Export both types of stills ● Cortex (.still) - Export stills in a format readable by other Cortex systems ● JPEG (.jpg) - Export stills as standard JPEG files Name Stills By - Select the file naming convention ● Scene-Take-Camera ● Filename ● Verbose (includes S/T/C and Filename info) Quality - For JPEG stills, QUALITY sets the compression level; High is the default.

Exporting Stills via a Job in the Project Manager

To Export stills located in a job, right-click on the job in the Project manager and choose “Export Stills...” Cortex provides options to export stills from: ● All (meaning both from the Still Store and Timeline Store) ● Still Store ● Timeline Specify an output file location using the Browse button, then click Export.

Memories

You can save up to 6 color corrections by storing them in the Memories buffers. Above the Still Stores are 6 buttons for saving user defined color corrections.

The Keyboard shortcuts are as follows: Ctrl+Shift+Delete Save MEM 1

Ctrl+Shift+End Save MEM 2

Ctrl+Shift+PgDn Save MEM 3

Ctrl+Shift+Insert Save MEM 4

Ctrl+Shift+Home Save MEM 5

Ctrl+Shift+PgUp Save MEM 6

Shift+Delete Recall MEM 1

Shift+End Recall MEM 2

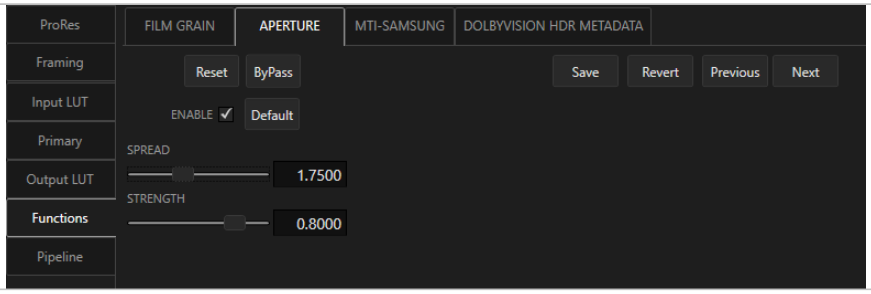
Shift+PgDn Recall MEM 3

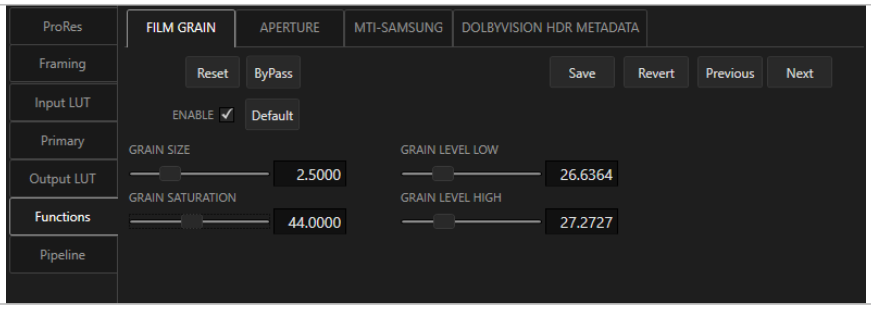
Shift+Insert Recall MEM 4

Shift+Home Recall MEM 5

Shift+PgUp Recall MEM 6

To use the mouse, replace the keys with the corresponding buttons. If a Memory button position is unused, it will be Dim. If a color correction has been saved to a button position it will be White. The last recalled Memory will be Green.





The Functions Tab

The Functions tab provides the restoration and image processing modules — 3D Comb, DeHalo, Deinterlace, Brickwall, Aperture, Film Grain, MTI-HQ and MTI-Samsung. Dolby Vision™ Level 1 analysis, described below, is processed on the Color Tool's Dolby tab. Note: Grain and Aperture Correction settings are “baked in” to Deliverables and do not carry as metadata in CDL files. However, they are passed on as metadata in Cortex Manifest Files.

Brickwall

The BRICKWALL tab provides a DVO brickwall filter, used to band-limit an image before or after a resize. Its most common use is on material that has been scaled, or is about to be, where a hard frequency limit removes the aliasing and ringing that a resizer would otherwise leave behind.

Enable the ENABLE checkbox to add the filter to the Functions processing, then set:

● CUTOFF FREQUENCY (H) and CUTOFF FREQUENCY (V) — the horizontal and vertical frequency limits. They are set independently, which matters on anamorphic and on standards-converted material where the two axes have different histories.

● FILTER TYPE and FILTER SIZE — the shape and length of the filter kernel. A larger filter is more precise at the cutoff and costs more time.

● SHARPNESS — trims the apparent sharpness of the result, to taste.

TIP: as with the other restoration tools, enable the filter at its defaults and preview the result before adjusting anything. Use the Cache setting on the Hardware page to preview at speed.

Film Grain

Grain Size Create larger or smaller Grain

Grain Saturation Color saturation of the grain

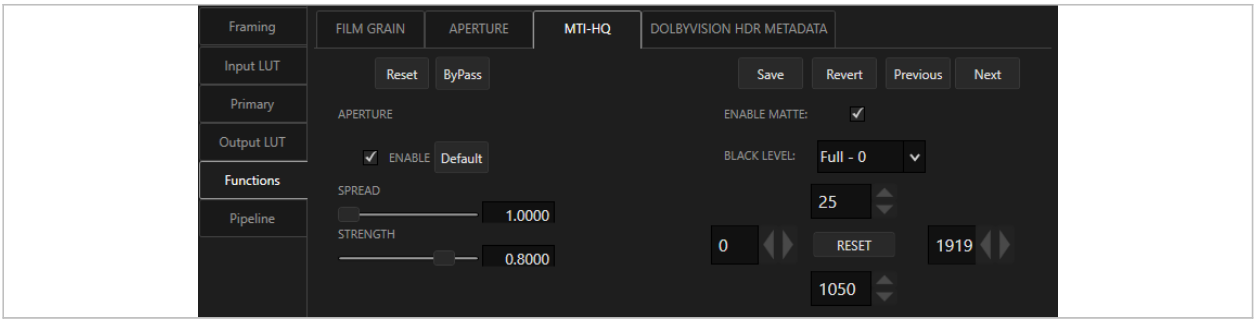
Grain Level Low Make the grain more or less apparent in dark regions of the frame

Grain Level High Make the grain more or less apparent in light regions of the frame

Aperture Correction Settings

Spread Determines the amount of noise suppression

Strength Determines the strength of edge detection



MTI HQ

If your Deliverable is set to resize using MTI HQ, the MTI HQ module will be available. MTI HQ supports progressive and interlaced frames.

The Aperture function is duplicated from the Aperture Tab and will be identical in both places. To enable

Matte Function for MTI HQ

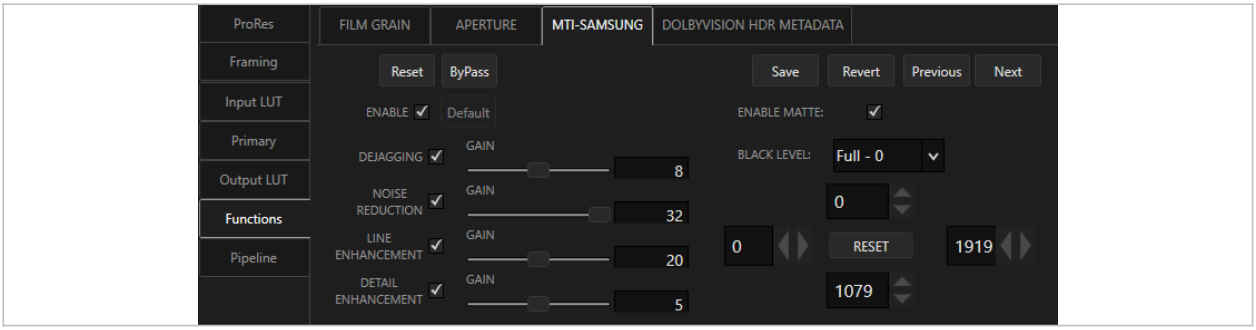
When upscaling video that contains a letterbox or pillarbox matte, the matte line can be compromised by the rescaling. To avoid this, MTI HQ provides a matte replacement function. 1. Choose the Black Level; either Full-0 or Legal-64 per code values 2. Click on the arrow buttons to adjust the vertical or horizontal position of the matte a. Hold down the Shift button to increase the rate the matte moves

Note: For Preview purposes, the matte will be gray in order to show better the difference between the original matte and what will be the replacement. It will be rendered black according to the level setting.

3. Zoom in on the edge of the original matte a. Scroll the mouse wheel up to zoom and left click and drag to position the frame in the Media Player, or click the 1:1 button for a pixel to pixel view of the image b. Double click the image to return to full frame view

Make sure that the original matte is completely covered by the gray matte. Repeat the operation for all sides of the matte and then save the setting by clicking the Save button or pressing Ctrl+S.

Note: When used in a composition, the matte can be enabled or disabled on a shot by shot basis. For best results with MTI HQ, it is recommended to enable the default Aperture setting for all affected clips or composition shots.



MTI-Samsung

If your Deliverable is set to resize using MTI-Samsung, the MTI Samsung module will be available. MTI-Samsung only supports progressive frames. For interlaced frames, use MTI HQ.

Dejagging Smooths aliasing

Noise Reduction The default is the recommended setting

Line Enhancement Particularly helpful for upresing animation

Detail Enhancement Enhances the amount of detail brought out by the resizing

It is best to use an SDI monitor to observe the effect of settings changes. If no SDI monitor is available, use the

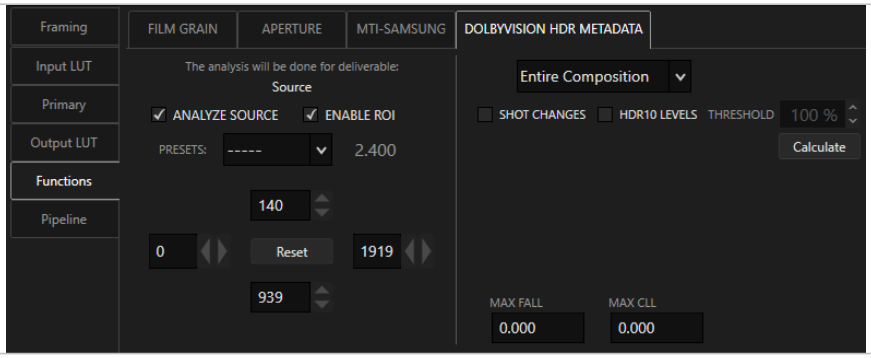
1:1 button located at the bottom of the UI for a pixel to pixel view of the settings' effect.

Matte Function for MTI-Samsung

When upscaling video that contains a letterbox or pillarbox matte, the matte line can be compromised by the rescaling. To avoid this, MTI-Samsung provides a matte replacement function. 1. Choose the Black Level; either Full-0 or Legal-64 per code values 2. Click on the arrow buttons to adjust the vertical or horizontal position of the matte a. Hold down the Shift button to increase the rate the matte moves

Note: For Preview purposes, the matte will be gray in order to show better the difference between the original matte and what will be the replacement. It will be rendered black according to the level setting.

3. Zoom in on the edge of the original matte a. Scroll the mouse wheel up to zoom and left click and drag to position the frame in the Media Player, or click the 1:1 button for a pixel to pixel view of the image b. Double click the image to return to full frame view Make sure that the original matte is completely covered by the gray matte. Repeat the operation for all sides of the matte and then save the setting by clicking the Save button or pressing Ctrl+S.

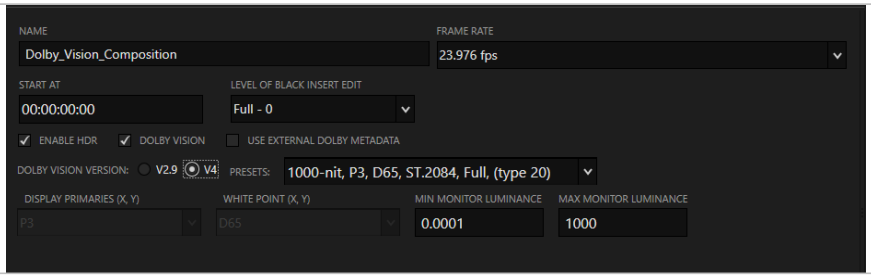


Creating Dolby Vision™ Level 1 HDR Metadata

Cortex Supports the processing of Level 1 Dolby Vision™ (DoVi) metadata. For example, if an HDR 10 master needs to be converted to DoVi there are different methods for doing that outside of Cortex, generally by tying up a color bay. With Cortex Enterprise, you can generate Level 1 DoVi metadata by using a Cortex created composition.

If you're not familiar with Cortex's Edit Tool, you should review it prior to this section since a composition is essential for processing Dolby Vision™ metadata. The Edit Tool

Follow the steps below to create a DoVi composition.



Edit Tool Steps for Creating a Dolby Vision™ Composition

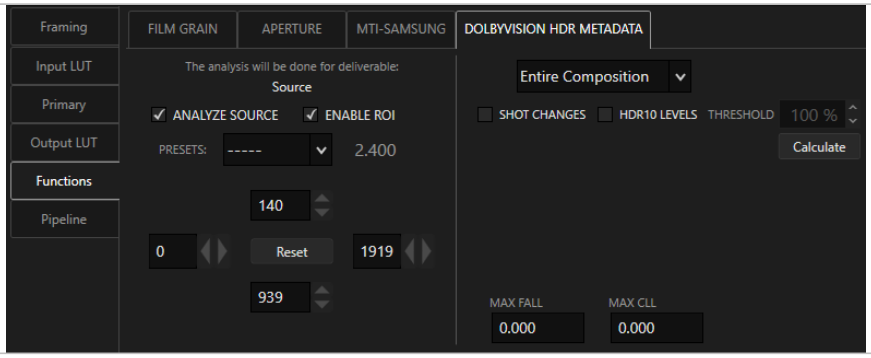
1. In the Edit Tool, create a new composition by clicking the New button 2. Select “Composition” from the Drop-down menu

Note: For this tutorial, we will focus on a normal Composition rather than an IMF Composition since we’ll be covering IMF creation in the Edit Tool tutorial.

3. In the Create dialog, enter the timecode for the START AT field 4. Enter the Black Level, either Full-0 or Legal-64, for insert edits using the Shift+H command

5. Check the ENABLE HDR and Dolby Vision™ checkboxes 6. Choose the DoVi version — 2.9, 4 or 5. Version 5 is included as standard in v7.0 7. From the PRESETS Drop-down field, choose which monitor type was used 8. If needed, modify the MIN and MAX Monitor Luminance fields 9. Click Create

Using the Edit Tool, create the composition. Right-click anywhere on the timeline to show the Context Menu and, if a corresponding EDL is available, select Merge EDL or the “Detect Shot Change” option if no EDL exists. If using the “Detect Shot Change” option, be sure to vet the cuts to ensure there are no false positives or negatives.



Color Tool Steps for Processing Dolby Vision™

Once the composition is ready and the cuts are vetted: 1. Switch to the Color Tool 2. Make sure the composition is selected and that the Metadata track (M) is visible though empty. 3. Choose the Dolby tab. This tab appears in the Color Tool only while a Dolby Vision™ composition is selected

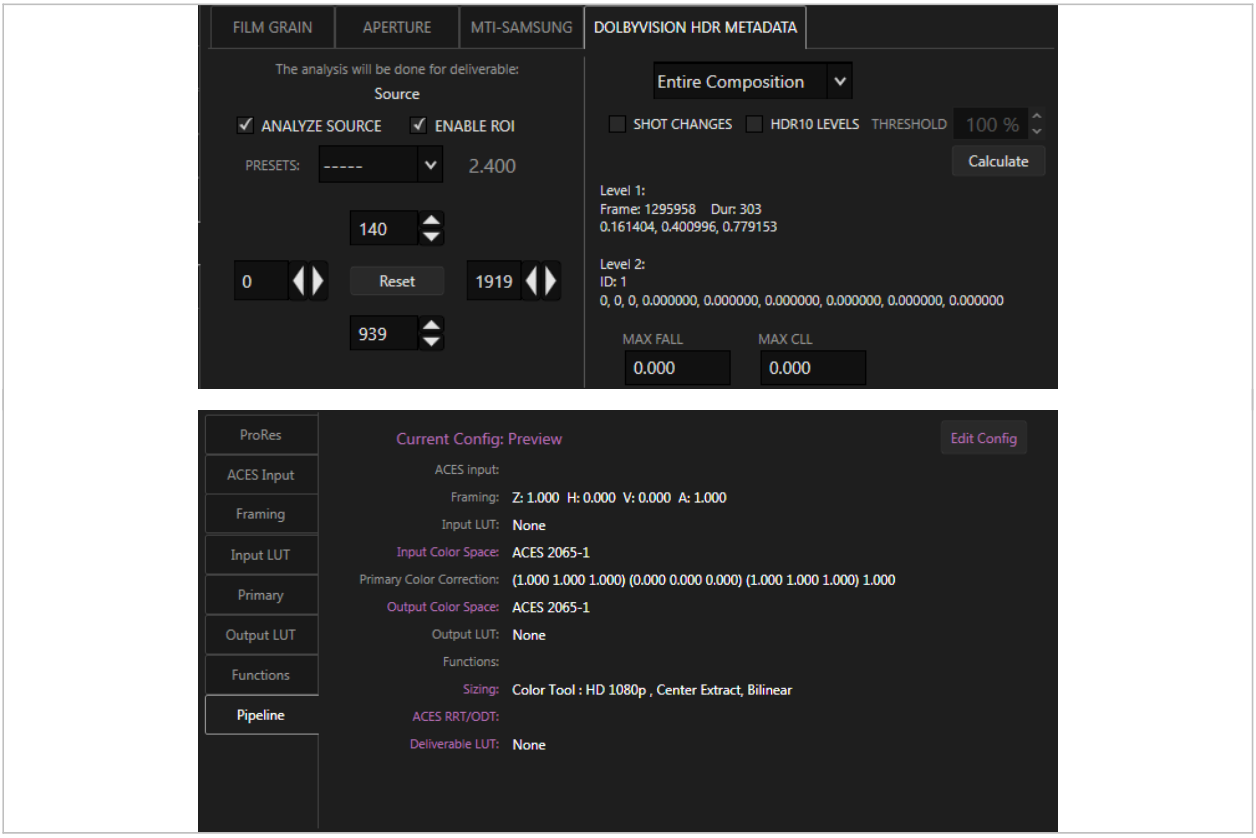
4. If you wish to Analyze the source media, enable the ANALYZE FROM SOURCE checkbox. Disabling it will allow you to choose a specific Deliverable’s color pipeline for the analysis by selecting its Deliverable tab above the Media Player. 5. If the picture content contains a matte, the analysis must exclude the matte from the analysis. To exclude the matte from analysis: a. On the ROI tab, check the ENABLE ROI checkbox and choose an aspect ratio from the PRESETS Drop-down list. An ROI with Red line boundaries will appear. b. As needed, adjust the boundaries of the ROI with the arrow buttons. 6. If no EDL was merged or MTai shot detection was not run in the Edit Tool, enable the DETECT SHOT CHANGES checkbox. You will still have to vet the cuts after the analysis. 7. If you wish to generate and include HDR 10 metadata for MAX FALL and MAX CLL enable the HDR10 LEVELS checkbox and enter a value for the THRESHOLD. The value entered serves as the percent of the total number of frames that will determine the MAX FALL and MAX CLL values. As an example, if the media contains 1000 frames and the threshold is set to 98%, 2% of the frames (20) with the highest values will be omitted from the final result.

Note: It is not necessary to include these values in a DoVi Deliverable but is available in the event HDR 10 Deliverables are required

8. If the composition is set to Dolby Vision™ v4 or later, choose an L1 ANALYSIS TUNING preset. Leave it on Legacy CM4 L1 unless you have a reason to change it — see below.

9. Click ANALYZE

The Metadata track will turn purple and the analysis will begin. Once the analysis is complete, the metadata track will turn blue and the Level 1 values will be displayed on the right side of the module.



Note that Level 2 (Trims) are unaffected. Cortex does not support changing Level 2 and, therefore, does not require you to purchase a license issued by Dolby.

L1 Analysis Tuning

When a composition is set to Dolby Vision™ v4 or later, an L1 ANALYSIS TUNING dropdown is shown alongside the analysis controls. It biases how much of the mapping the L1 metadata asks a downstream display to do, trading highlight detail against the amount of tone mapping applied.

Setting	Effect
Legacy CM4 L1	The analysis behavior used in previous versions. This is the default and remains the correct choice for most work.
Most Highlight Detail/Most Mapping	The most conservative setting. Preserves the most highlight detail and asks the display for the most mapping.
More Highlight Detail/More Mapping	Conservative.
Balanced	A midpoint between the two extremes.
Less Highlight Detail/Less Mapping	Aggressive.

Least Highlight Detail/Least Mapping	The most aggressive setting. Preserves the least highlight detail and asks the display for the least mapping.

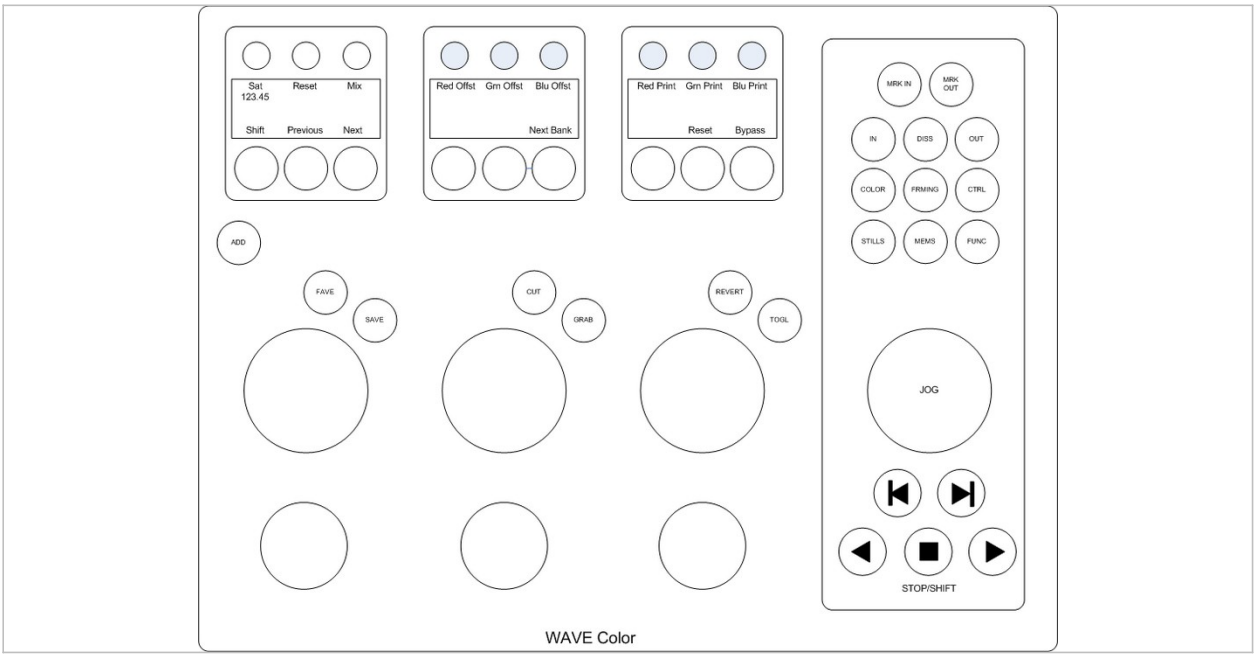
Changing the tuning invalidates any analysis already on the composition. Set it before you analyze, and re-run the analysis if you change it afterwards.

PREVIEW V2.9 — once a v4 analysis has completed, this button previews how the same content would be mapped under Dolby Vision™ 2.9, which is useful when a delivery requires both. HDR10 LEVELS calculates MaxFALL and MaxCLL alongside the L1 analysis, and DETECT SHOT CHANGES runs MTai shot detection as part of the same pass if the composition does not already carry cuts.

Pipeline Tab

To confirm all color, framing, LUT and Device Transform settings, click the Pipeline tab. This gives you a full list of the active clip's color tool and ACES settings (if applicable), based on the Deliverable configuration currently in the preview monitor.

The items colored magenta are found in the Deliverable configuration. To modify any of these settings, click the Edit Config button to open the configuration window for editing.



Wave Panel Button Functions

Wave Button Function Qwerty Keyboard Equivalent ADD G - Add event to Clip Reel SAVE Ctrl+S - Save current color correction MEMS Please see Keyboard shortcuts CUT N - compare with current still MODE ~ - Toggle Lift Gamma Gain/Printer Lights GRAB B - grab picture to Still Store REVERT A - Revert to saved color correction TOGL T - Toggle last two viewed color corrections SCREEN F11 - Toggle Full Screen/GUI WFVS F12 - Toggle Waveform and Vectorscope in Full Screen MEMS Show Mems menu DISS P - Add dissolve GRAIN F2 - Repeat to cycle to Grain Tool tab COLOR F2 - Repeat to cycle to Primary Tool tab FRAMING F2 - Repeat to cycle to Framing Tool tab TIMLIN L - Go to Timeline Still Store LUTS Ctrl+L - Go to LUTs still store STILLS ; - Go to Still Store FAVES ‘ Go to Faves Still Store Imported Stills/CDLs Shift+’ - Toggle Imported Stills/CDLs

Keyboard Shortcuts

For all Color shortcuts, use the top row keyboard numbers unless otherwise indicated

Navigation Description

Q or J Switch focus to Clips Bin

W or K Switch focus to Composition

E or Up arrow Go to previous clip or edit (when focused on composition)

R or Down arrow Go to next clip or or edit (when focused on composition)

Shift + S Go to previous edit (if focus is on clips bin, first press switches to composition)

Shift + F Go to next edit (if focus is on clips bin, first press switches to composition)

X Play reverse (press 2x or 3x for faster playback)

Shift + X Go to center of selected clip

C Stop

V Play forward (press 2x or 3x for faster playback)

Shift + V Play forward from middle of clip or segment

Ctrl + V Loop Play from mark in to mark out

S Step reverse one frame

F Step forward one frame

Space Bar Toggle Play/Stop

Composition Timeline

Shift - (minus) Zoom out timeline

Shift + (plus) Zoom in timeline to cursor position

Ctrl + Shift - (minus) Zoom out entire timeline

Mouse Wheel Zoom timeline in/out while hovering mouse over timeline

Ctrl + Mouse Wheel Scroll timeline left/right.

Marks Description

I Mark In

Shift + I Go to Mark In

Ctrl + I Clear Mark In

O Mark Out

Shift + O Go to Mark Out

Ctrl + O Clear Mark Out

Alt+Shift+ I and O Clear Mark In and Mark Out on both source and composition

Z Mark entire clip or segment

Color Tool Commands Description

FUNCTION KEYS

F2 (Shift to reverse) Select Color Tool and Cycle through Function Tabs

F11 Toggle Full Screen On/Off

F12 Toggle Waveform/Vectorscope and Sync fields or Timeline

Shift+F12 Move Waveform/Vectorscope to Media Player

Ctrl+F12 Turn off Waveform/Vectorscope in Media Player

Ctrl+Shift+F12 Undock and float Waveform/Vectorscope

ALT+F12 When in Editorial Hybrid - show sound Mark Window

ARROW KEYS (Use Shift and Ctrl for greater/lesser increments)

Up arrow Increase value when cursor is located in field box

Down arrow Decrease value when cursor is located in field box

COLOR – Lift Gamma Gain Mode

~ Toggle Lift Gamma Gain and Printer Lites modes

1 Select Lift; adjust luminance with up/down arrows

1 – Press and Hold Select Lift; adjust red with up/down arrows; adjust blue with left/right arrows

Ctrl+1 Reset Lift

2 Select Gamma; adjust luminance with up/down arrows

2 – Press and Hold Select Gamma; adjust red with up/down arrows; adjust blue with left/right arrows

Ctrl+2 Reset Gamma

3 Select Gain; adjust luminance with up/down arrows

3 – Press and Hold Select Gain; adjust red with up/down arrows; adjust blue with left/right arrows

Ctrl+3 Reset Gain

4 Select Saturation; adjust with up/down arrows

Ctrl+4 Reset Saturation

COLOR – Printer Lites Mode

~ Toggle Lift Gamma Gain and Printer Lites modes

1 Select Red channel

Ctrl+1 Reset Red channel

2 Select Green channel

Ctrl+2 Reset Green channel

3 Select Blue channel

Ctrl+3 Reset Blue channel

COLOR – COMMON COMMANDS

4 Saturation

5 Reset all color to unity

SHIFT+5 Reset all color to unity and clear LUTs

6 – Press and hold Bypass color correction except LUTs

Shift+6 – Press and hold Bypass color correction and LUTs

8 Load all corrections of Previous clip(s) or segment(s)

SHIFT+8 Load color correction only of Previous clip(s) or segment(s)

Ctrl+8 Show correction menu for Previous clip(s) or segment(s)

9 Load all corrections for Next clip(s) or segment(s)

SHIFT+9 Load color correction only of Next clip(s) or segment(s)

Ctrl+9 Show correction menu for Next clip(s) or segment(s)

T Toggle pending and existing corrections

A Revert to saved correction and reject pending

Ctrl+S Save Correction (Autosave occurs when another clip is selected)

Ctrl+A Select all clips or segments

STILL STORE

B Grab a still

N Cut to still (toggle)

Shift+N Load color settings from still

Ctrl+Shift+N Go to clip of selected still

L Select Timeline store

; (semicolon) Select Still Store

‘ (apostrophe) Select Faves store

Shift+‘ (apostrophe) Toggle Imported Stills/Imported CDLs

Ctrl+L or Ctrl+‘(apostrophe) Select LUTs store

0 (zero) Toggle “Fave” status of selected still

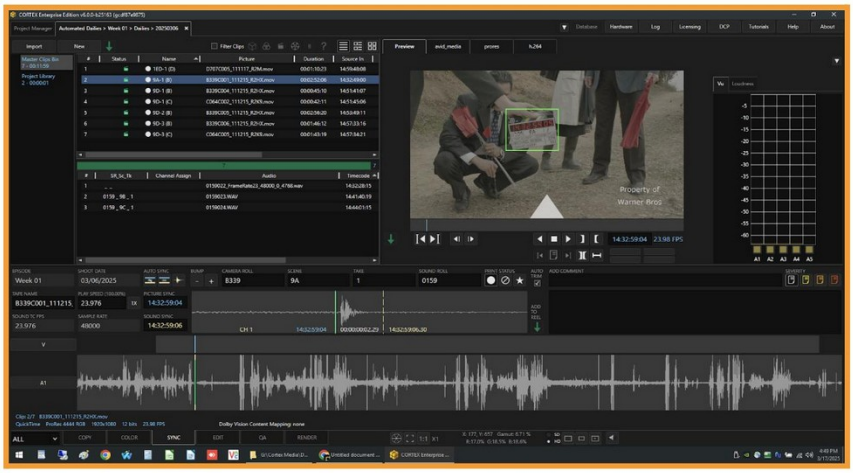
DISSOLVES

P Add dissolve

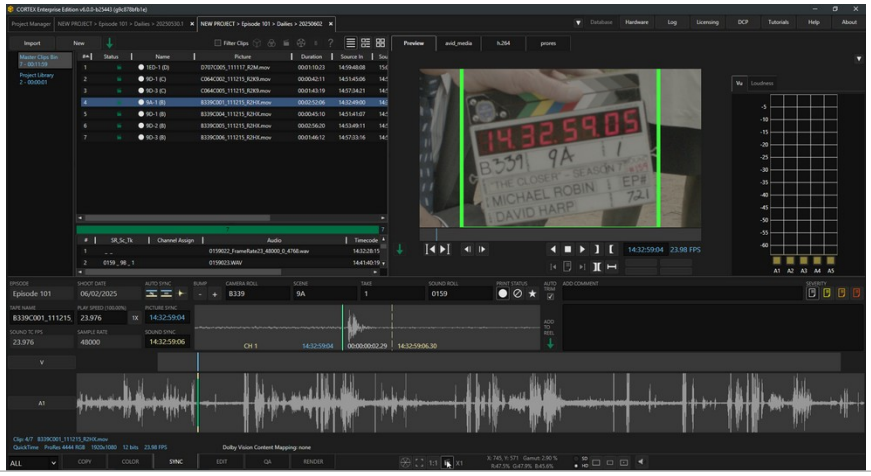
[Mark or Re-mark dissolve in

] Mark or Re-mark dissolve out

Ctrl+P Remove dissolve (cursor must be on or at beginning of the dissolve)



CORTEX Dailies with MTai Slate Detection

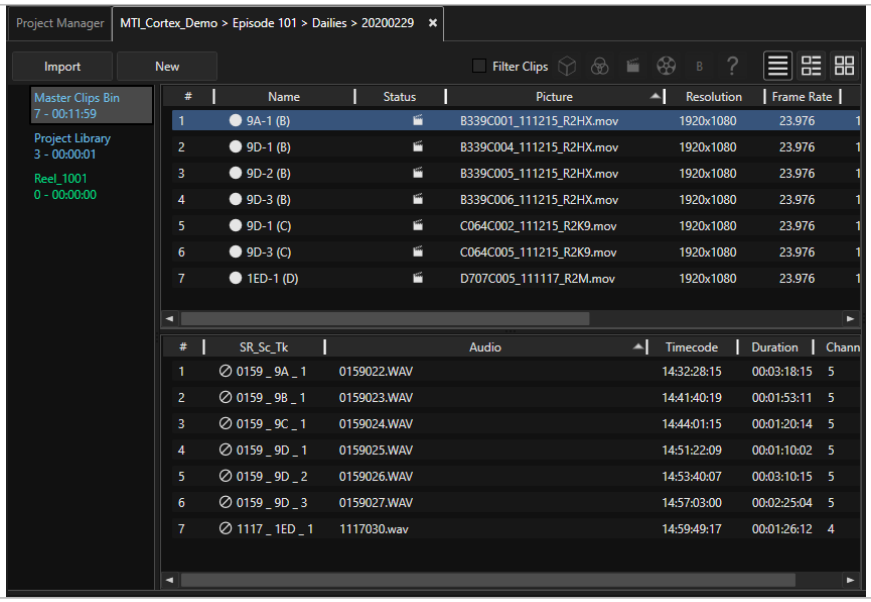


The Sync Tool

The Sync Tool is used predominantly to synchronize audio and picture for Dailies use. However, it can be used, for example, to synchronize a reel of a movie prior to its use in a DCP composition.

The basic operation of the tool is to import picture and corresponding audio into a Job, select a picture clip and use the Auto-Sync options. The tool also provides for manual syncing if needed.

Review the Tips and Tricks at the top of this document. With V7.0 and MTai SlateDetect, the WORKFLOW ACTION for SYNC process is automated.

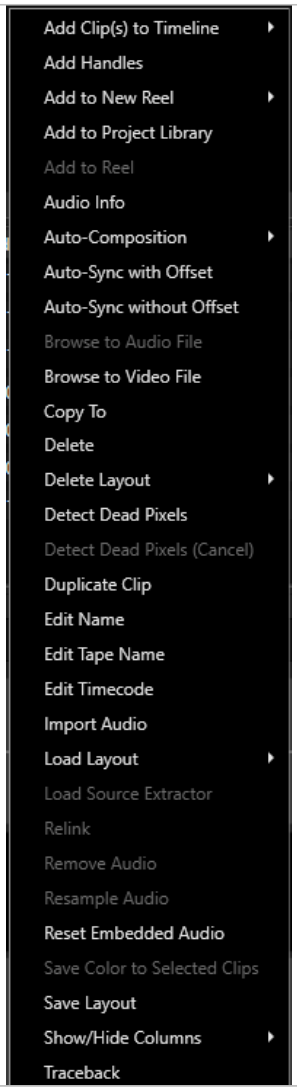


The Master Clips Bin

In the Sync Tool, the Master Clips Bin is divided in two sections, video and audio. When media is imported, Cortex places the media in their corresponding sections.

While Cortex allows for dailies operations to be done in any order. The following is a description of a typical dailies session. 1. Import picture and audio files 2. Using the Sync Tool, synchronize the audio to picture a. Double check sync and verify the shot metadata b. Create a Clips Reel 3. Color Correct (using Color Tool) a. Add clips to the reel and “Close” the reel when it is completed If you have one workstation, you can continue working in the foreground while rendering in the background. With multiple workstations licensed for the Enterprise Edition, rendering can be distributed for greater efficiency if each workstation is attached to a central database server.

NOTE: Clips on “Closed” Clip Reels cannot be modified. Therefore, Cortex will block the “reuse” of a clips once it is added to a clips reel unless the reel is open or the clip is duplicated. Modifying a clip on an open reel, including changing In/Out marks, will cause the clip to be rerendered.



The highlighted options in yellow are NOT available in the Sync Tool: Add Clip(s) to Timeline Various options how to add clips to timeline

Add Handles Add Handles to clips in reel prior to rendering

Add to New Reel Add clips to newly created reel to be rendered

Add to Project Library Add a clip(s) to the Project Library

Add to Reel Add clip(s) to selected Reel

Audio Info When available shows audio metadata

Auto-Composition Create a composition using start TC and fps

Auto-Sync with Offset Sync audio to pix using established offset

Auto-Sync without Offset Sync audio to pix matching pix TC

Browse to Audio File Open containing folder of audio

Browse to Video File Open containing folder of video

Copy To Open Copy Tool dialog for selected clip(s)

Delete Delete selected clip(s)

Delete Layout Delete a user defined bin Layout

Detect Dead Pixels Show Dead Pixel Dialog (switch to QA Tool)

Detect Dead Pixels (cancel) Cancel Detection processing

Duplicate Clip Duplicate clip for alternate versions

Edit Name Edit the clip name

Edit Tape Name Edit the clip's Tape Name

Edit Timecode Change the Frame rate of the clip

Import Audio Import corresponding .wav file to pix clip

Load Layout Load a user defined bin Layout

Load Source Extractor After import Media Folder (fast), enable video

Relink Relink media to new location after being moved

Remove Audio Remove embedded audio from clip

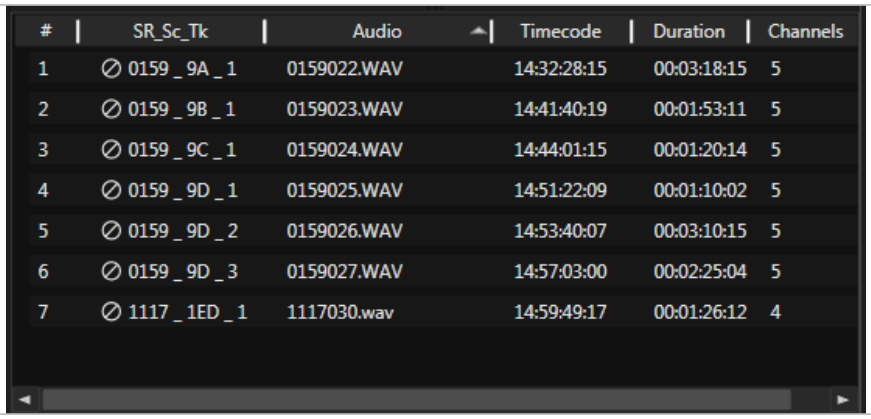
Reset Embedded Audio Reset embedded audio to clip after removal

Save Color to Selected Clips In Color Tool save pending color to clips

Save Layout Save user defined Layout

Show/Hide Columns Toggle visibility of bin columns

Traceback Open Traceback dialog for imported EDL



#	SR_Sc_Tk	Audio	Timecode	Duration	Channels
1	0159 _ 9A _ 1	0159022.WAV	14:32:28:15	00:03:18:15	5
2	0159 _ 9B _ 1	0159023.WAV	14:41:40:19	00:01:53:11	5
3	0159 _ 9C _ 1	0159024.WAV	14:44:01:15	00:01:20:14	5
4	0159 _ 9D _ 1	0159025.WAV	14:51:22:09	00:01:10:02	5
5	0159 _ 9D _ 2	0159026.WAV	14:53:40:07	00:03:10:15	5
6	0159 _ 9D _ 3	0159027.WAV	14:57:03:00	00:02:25:04	5
7	1117 _ 1ED _ 1	1117030.wav	14:59:49:17	00:01:26:12	4

The Audio Bin

The audio bin displays all imported audio files that have not yet been synchronized.

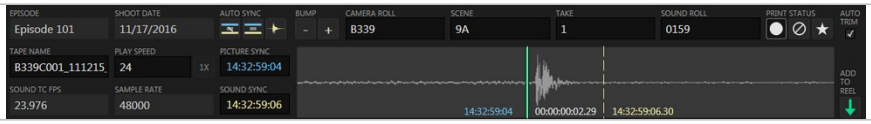
Audio files are automatically added to the audio bin if they are located in a folder in the same directory path as the video media, otherwise import them separately.

If a video file has corresponding audio with identical start timecode, for example a finished master, you can add an audio file directly to a picture by right-clicking on the picture clip and selecting Import Audio. A browser will open allowing you to navigate to the audio file.

If the audio file is located within the same folder as the picture, it will automatically be synched to the clip as long as the two files have identical start timecodes. In the event the timecodes are not identical, the user can use the Sync Tool toolset.

Audio Metadata

After import, the audio clip will be displayed with the following metadata ● # - Import order ● SR_Sc_Tk - Sound Roll/Scene/Take info & status. The symbol to the left indicates the clip's status- Circled, Excluded or Starred. Clips are Circled by default. ● Audio - Audio file name ● Timecode - Clip start timecode ● Duration - Clip duration ● Channels - Number of channels detected in the clip.



You can right-click each audio clip and select from the following options: ● Audio Info - Display audio file properties ● Resample - Make changes to the output frames per second and/or sample rate ● Delete - Remove the audio clip from the bin ● Relink - Relink missing media files by pointing to a new source folder. ● Browse to Audio File - Browse to the folder containing the selected source audio files ● Edit Timecode - Edit the start timecode and/or framerate of the audio clip.

Metadata Input

Metadata will be automatically read from the video and audio files where available and can be modified by the user. If no metadata is available, press the Tab key to navigate to each metadata field and manually enter information. Pressing the Up and Down arrow keys will change the values in increments of one based on the last letter or number in the last entry. For example, if the take number of the last entry is 2, pressing the Up arrow will increase the value to 3.

Metadata Field Source

Camera Roll Video File

Scene Audio File

Take Audio File

Sound Roll Audio file

Episode Project Manager

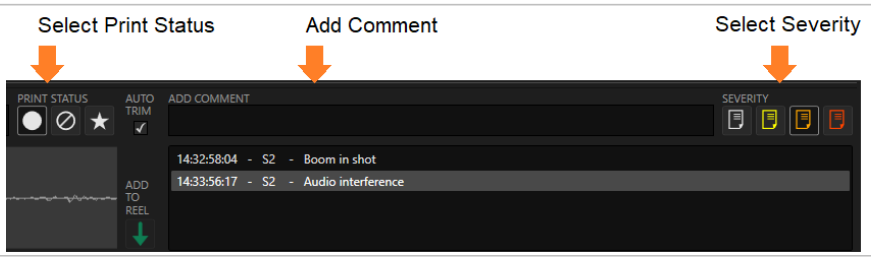
Play Speed Video File

Shoot Date Project Manager

Tape Name Video File

Sound TC FPS Audio file

Sample Rate Audio File





Additional Metadata entry

Users can also add additional metadata about a clip: ● Print Status - There are three options: Circled, Not Circled, or Starred. The user assigns a single Print Status to the clip. Whether a clip is added to a deliverable is determined by which print status options were enabled when the deliverable was created. For example, if a DNx36 deliverable has all three statuses enabled, all clips will be added to that deliverable for rendering. If, however, an H.264 only has Circled and Starred takes enabled, it will exclude any Not Circled clips. ● Comment - Add a comment at current timecode with specified severity (0-3).

Modifying Multiple Clips

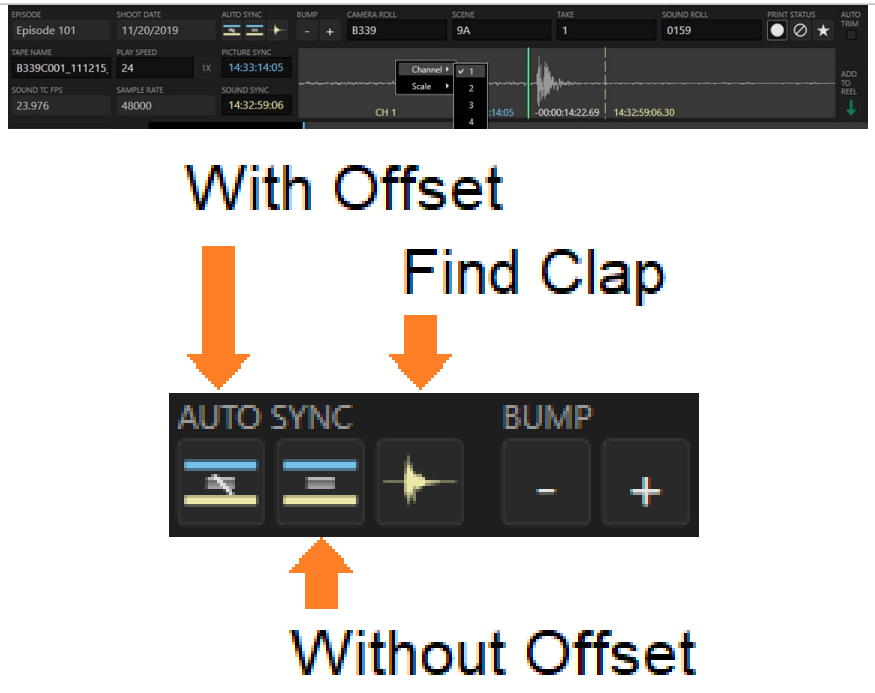
To modify multiple clips, hold the Shift key while clicking to select a span of clips, or hold the Ctrl key while clicking to individually add or remove clips from the selection. You can then modify the Camera Roll, Scene, Sound Roll, Print Status, and Comments fields. The Take field cannot be modified.

Synchronization Tools

Timeline

The selected clip timeline consists of both Video and Audio tracks. The timeline represents the length of the Video clip and expands to include the full length of the synchronized audio when the audio is longer than the video.

Once audio and video are synchronized, the tracks will be locked together during navigation.



Mark Window

The Mark Window provides a magnified view of 7 frames of the active area of the sound track where the user can mark the exact timecode position of the sync point to within a quarter frame. The video

timecode is displayed in blue on the left of the Playhead and the audio timecode is displayed in yellow on the right. The Offset, meaning the difference between the video and audio timecodes, is displayed in white within the playhead, which begins at the serrated yellow line.

To change which audio channel is being displayed, right-click and choose from the extended menu. The scale of the waveform can also be modified.

The Auto Sync buttons allow for Sync with Offset, Sync without Offset, and Find Clap within Mark Window. The Bump - and + buttons bump the audio by one frame. Hold the Ctrl key to bump a quarter frame.

Synchronizing Audio and Video

Auto-syncing a single clip

Auto-syncing a single clip uses the video timecode as a control against which Cortex scans the audio files for a matching timecode. 1. Select the video clip to be synchronized 2. Navigate to the slate close (clap) point (while it is not required, it is recommended) 3. Select an auto-sync option via the UI buttons or keyboard shortcuts a. Auto-sync with Offset (\ key) - uses the established timecode offset b. Auto-sync without Offset (Shift+\) - matches audio timecode to video timecode 4. If the clap waveform is visible in the Mark Window but off by a frame or more, click the Find Clap button or press the D key to auto-refine the sync. You can also just click on the Mark Window near the clap

waveform. With either method, doing so will add a “Slate Icon” to the clip Status column in the Master Clips Bin 5. If the sync is correct, you can add the clip to the Clips Reel by pressing the G key or clicking the Add to

Clip Reel button . If you want to color the clips prior to adding them to a reel, jump to the next clip with the R or Down arrow key in order to continue syncing. Later, as color is applied, you can add the clips to the reel one by one or group select them and add all at once.

Auto-syncing multiple clips

Auto-syncing multiple clips uses matching timecodes or an established offset to define sync. 1. Select multiple clips using the Ctrl or SHIFT modifiers 2. Select an Auto-sync option via the UI buttons or keyboard shortcuts a. Auto-sync with Offset (\ key) - uses the established timecode offset b. Auto-sync without Offset (Shift+\) - matches audio timecode to video timecode 3. It is recommended to check the slate clap of each clip and click the Find Clap button or press the D key to

auto-refine the sync. Doing so will add a “Slate Icon” to the clip Status column in the Master Clips Bin indicating that the take has been checked. 4. If the sync is correct, you can add the clip to the Clips Reel by pressing the G key or clicking the Add to

Clip Reel button . If you want to color the clips prior to adding them to a reel, jump to the next clip with the R or Down arrow key in order to continue syncing. Later, as color is applied, you can add the clips to the reel one by one or group select them and add all at once.

Using Timecode to search for Audio Sync Points

1. Navigate to the desired picture sync frame

2. Press the * key on the Number Pad or click in the Sound Sync field 3. Input the audio timecode value or enter a + or - before the timecode entry to trim the current position by the input value 4. Press Enter.

Using Timecode to search for Picture Sync Points

1. Navigate to the desired audio sync frame.

2. Press the / key on the Number Pad or click in the Picture Sync field 3. Input the picture timecode value or enter a + or - before the timecode entry to trim the current position by the input value 4. Press Enter.

Adjusting Clip Synchronization

There are several methods to adjust the synchronization relationship of the picture and audio.

Adjusting audio sync against the current picture frame

1. Navigate to the desired picture frame. 2. Unlock the audio track timeline (U). The picture will remain frozen while the audio clip will be free to navigate. 3. Navigate through the audio until you find the desired sync point (probably a clap). a. While in Unlock (U) mode, you can also enter an audio timecode value directly into the Media Player timecode buffer using the number pad; just start typing the timecode, there's no need to click in the buffer. 4. To sync and re-lock the audio you can: a. Click in the Mark Window on the magnified waveform where desired b. Press the D key to resync to the detected clap waveform within the Mark Window c. Press the \ key to use the audio currently located at the playhead.

To cancel and return to the original sync relationship, press the U key again or press Esc.

Adjusting the picture sync against the current audio frame

1. Navigate to the desired audio frame 2. Unlock the picture track timeline (Y). The audio will remain frozen while the picture clip will be free to navigate 3. Navigate to the desired picture sync frame a. While in Unlock (Y) mode, you can also enter a picture timecode value directly into the Media Player timecode buffer using the number pad; just start typing the timecode, there's no need to click in the buffer. 4. Press the \ key to resync the picture at the current frame.

Changing Clip Play Speed

A clip's play speed can be altered in the PLAY SPEED box, either as a frame rate or as a percentage of the clip's native rate, whichever the paperwork gives you. Right-click the box and choose Edit As Percent or Edit As FPS to switch between them; the label beside it shows the same speed in the other unit. This will adjust playback in the Media Player and all Deliverables.

To return to a clip's original play speed, click the 1X button.

Note: Play speed only affects the video, not the audio. Audio will play at its native speed.

In and Out Points

You can trim clips manually by using the Mark In and Out functions.

Note: Trimming clips in the Sync or Color tools can only be performed on clips in the Master Clips Bin prior to being added to a Reel.

To trim the head of a clip, navigate to the desired in point and press the I key, or click the In button. To jump to the Mark In, press Shift+I. To clear the Mark In, press Ctrl+I. To trim the tail of a clip, navigate to the desired out point and press the O key, or click the Out button. To jump to the Mark Out, press Shift+O. To clear the Mark Out, press Ctrl+O.

To Mark the entire clip, press Z or click the Mark In/Out button.

AutoTrim

You can automatically trim the head of a clip based upon the sync point by enabling AutoTrim. Navigate to your sync point (usually a slate close) and press the D key to refine sync to this point. The head of the clip will be trimmed automatically to 1 second prior to the sync point.

Tail Sticks Syncing

For Tail Sticks: 1. Navigate to the tail stick 2. Press the \ key to sync the clip. 3. Press Ctrl+D to refine the tail stick sync if AutoTrim is enabled. This will ignore the AutoTrim option leaving the In-Point at the head of the clip.

Note: To modify the In point of a tail stick clip, navigate to the desired in-point and press the I key, or click the In button.

Sync Tool Shortcut Keys

Shortcut Key Function Notes

I Shift + I: Go To Mark In Mark In Ctrl + I: Clear Mark In

O Shift + O: Go To Mark Out Mark Out Ctrl + O: Clear Mark Out

Y Unlock Video Track While unlocked, navigation keys move picture only

U Unlock Audio Track While unlocked, navigation keys move audio only

\ ● When picture and audio are locked: Sync clip using picture and audio timecode difference from previous sync. Auto-Sync with Offset ● When picture or audio are unlocked: Use current frame for sync point

SHIFT + \ Auto-Sync with No Offset Sync clip with no timecode difference between picture and audio

D Syncs the peak waveform in the Mark Window to the current picture Auto-detect peak waveform frame.

SHIFT + D Go to Sync Point

Num Pad Input clip timecode value Locate and load a specific timecode position within all picture clips in bin.

/ + Num Pad Input picture sync timecode Locate and load a specific timecode position within all picture clips in bin and use it as a sync point.

* + Num Pad Input sound sync timecode Locate and load a specific timecode position within all audio clips in bin and use it as a sync point.

Enter Cue to entered timecode

Arrow Keys Increase / Decrease Increment values in the currently selected metadata field (ie Take 1 to Take 2)

Ctrl + 0 Set comment severity to 0

Ctrl + 1 Set comment severity to 1

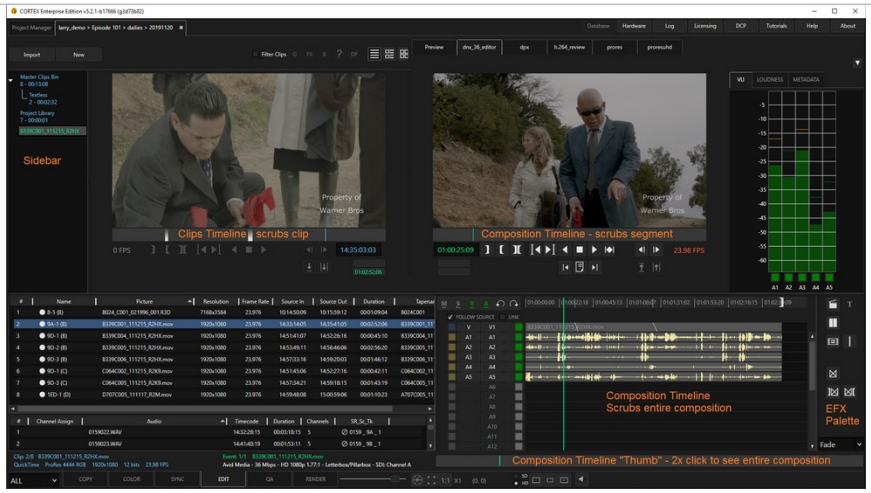
Ctrl + 2 Set comment severity to 2

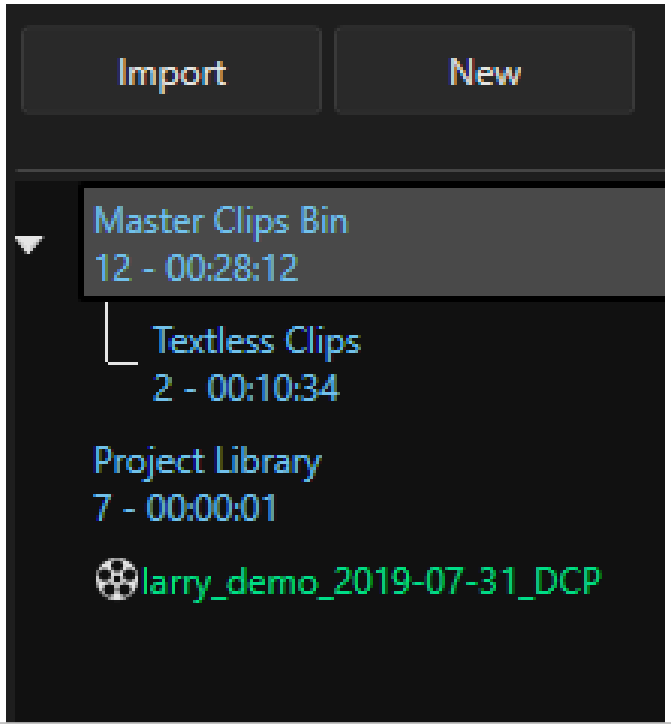
Ctrl + 3 Set comment severity to 3

Ctrl + 4 Set print status to Circled

Ctrl + 5 Set print status to Excluded (Uncircled or B-Neg)

Ctrl + 6 Set print status to Starred





The Edit Tool

The Edit Tool is a non-linear editor consisting of media bins, a composition timeline and set of function tools that allow the user to perform editorial requirements where Overwrite, Insert, Lift, and Extract are needed. Also provided are a slate generator, trim functions, and video and audio fades.

Parts of the Edit Tool

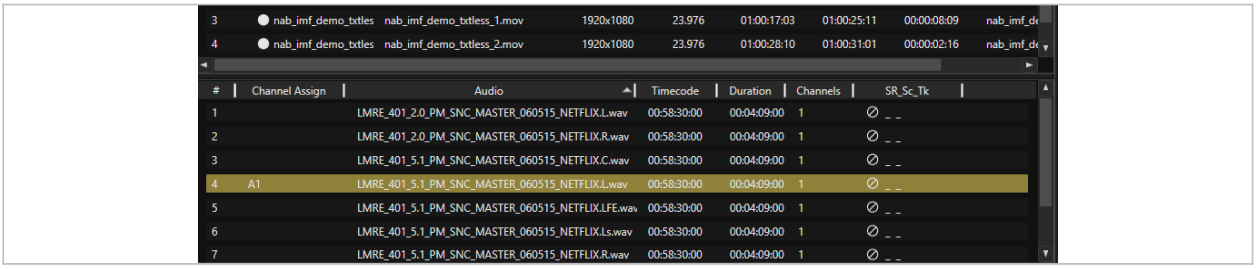
The Sidebar

The Sidebar is where you'll access your media asset types:

● Master Clips Bin - All imported picture and audio media can be found in the Master Clips Bin. ○ Sub-Bins - Cortex provides for the creation of Sub-Bins where media can be moved for organizational purposes.

● Project Library - A bin containing regularly used media, available across Workflows and Jobs for easy access such as Bars, Black and Slates.

● Compositions - All compositions are listed below the Master Clips Bin and Project Library.



The Clips Bin(s)

After being imported in the Edit Tool, picture and audio clips are automatically placed in their corresponding bin.

The Audio Bin displays files that have not been previously synchronized to picture or noted as Wild-Track in the Sync Tool. Typically, only polyphonic files are synchronized in the Sync Tool. Monophonic files are edited in sync using the composition timeline.

When editing, source clips are generally always visible in the picture and audio bins. However, when working in a composition, you can choose to show the composition's picture edits as a list of events. Right click on the composition in the Sidebar and choose "Show Event List" in the Context Menu. When the event list is active, clicking on any event will jump the timeline playhead to that location. To go back to viewing source clips in the picture bin, right-click the composition again and choose "Hide Event List"

The Project Library

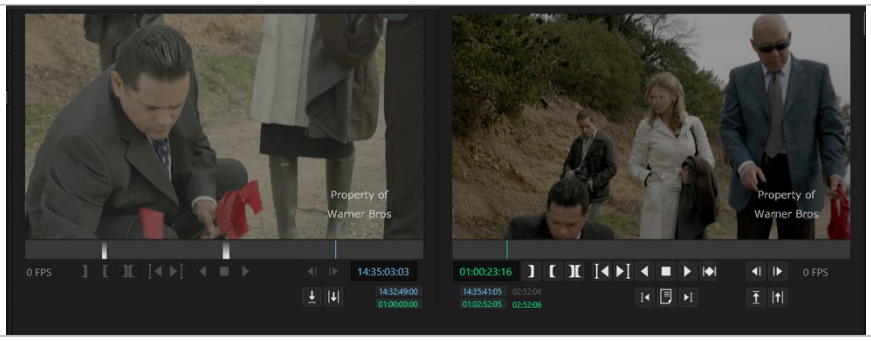
The Project Library provides a bin in which regularly used media can be stored and used across all Workflows and Jobs in a project. Each project can set a specific directory location for its Project Library during initial setup in the Project Manager. Be mindful that the directory location should be able to accommodate the speed of playback required for media placed in it.

Slates created in Cortex are automatically added to the Project Library. Imported media and still image clips must be manually saved to it. Right click on a clip and choose "Add to Project Library" from the Context Menu.

Compositions

When a composition is created it will be listed in the Sidebar beneath the clips bin and project library. Each newly created composition automatically becomes the active composition, displayed in green. To work in other compositions, choose them from the Sidebar.

To duplicate a composition, right-click on the composition in the Sidebar and select Duplicate.



The Media Players

The Edit Tool Media Players are set up for source and record (composition) displays. The left player displays the currently selected source clip; the right player displays the composition's current location.

Switching Focus between the Media Players

To switch focus from the Source to the Composition Media Player: ● Click the desired composition in the Sidebar. The navigation controls will be enabled. ● Press the W or K keys ● press Shift+S or F. If focus is currently on the Source Player, the first press will switch focus to the Composition Player. Subsequent presses will jump from one event to the other based upon which video and audio tracks are enabled. ● Click any blank space on the Composition timeline. ● Click on the image in the right side media player.

To switch focus from the Composition to the Source Media Player: ● Click on the Master Clips Bin in the Sidebar ● Press the Q or J keys ● Click on a picture or audio clip ● Click on the image in the left side media player

Note: Pressing the Q or J key repeatedly cycles between the Master Clips Bin and Project Library. Pressing the W or K key repeatedly cycles between Compositions.

Note: If there are gaps between media on the selected timeline track, pressing the E (previous) or R (next) keys will jump to the beginning and end of the next shot.

Navigation Controls

The Media Players provide controls for playback and navigation of their own timeline and for scrubbing. The Source Media Player font types are blue. The Composition Media Player font types are green.

The Source Media Player Controls

The Composition Media Player Controls

Button Key Description

I Mark In Shift+ I - Go to, Ctrl+ I - Clear Ctrl+Alt I - Clear In of Source & Comp

O Mark Out Shift+ O - Go to Ctrl+ O - Clear Ctrl+Alt I - Clear Out of Source & Comp

Z Mark Entire Clip

E or Up Arrow Go to Previous Clip - Source or Shift+ S - Composition Go to Previous Break - Composition

R or Down Arrow Go to Next Clip - Source or Shift+ F - Composition Go to Next Break - Composition

X - Play Reverse 2x for 2x speed 1x for real time 3x for fast reverse

C or Spacebar Stop

V or Spacebar - Play Forward 2x for 2x speed 1x for real time 3x for fast forward

Ctrl+Shift+C Segment Play For Composition

S or Left Arrow Jog to Previous Frame

F or Right Arrow Jog to Next Frame

Edit Command Buttons

Button Key Description

G Overwrite Edit to Timeline

H Insert Edit to Timeline

, (comma) or Delete Lift from Timeline

/ on keyboard or Ctrl+ Delete Extract from Timeline

Timeline Comments Buttons

You can add and navigate comments on the composition timeline and then print out pdf reports. Button Key Description

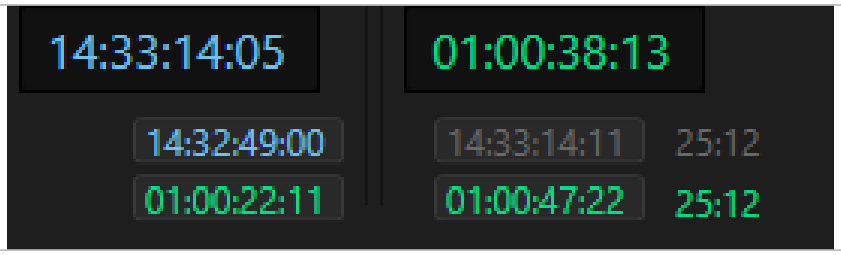
Ctrl+Shift+S Go to Previous Comment

Ctrl+Shift+O Add Comment

Ctrl+Shift+F Got to Next Comment

Timecode Position Registers

The timecode position display for a Source clip is blue. The timecode position display for the Composition is green. When an audio source clip is loaded, it will be yellow.



Timecode Mark Registers

Below the Timecode Position Registers are Timecode Mark Registers and their durations, displayed with corresponding colors.

Timeline Tracks Commands

The Timeline Tracks Commands buttons determine which tracks will be affected by an edit. If the track is enabled, it will be green.

Button Key Description

Used for Dolby Vision™ Metadata. Press Shift+M Button to add a track Metadata Track or right-click on the timeline and choose Add from menu

Cortex allows for up to 2 Subtitle tracks. Press Shift+S Button to add a Subtitle Track track or right-click on the timeline and choose Add from Context Menu

Cortex allows for up to 2 video tracks. Press Shift+V Button to add a Y - Video Track track or right-click on the timeline and choose Add from Context Menu

Cortex allows for up to 24 audio tracks. Ctrl+click any track to lock it or U - Audio Track(s) Ctrl+Shift+any M, S, V, or A track to lock out all tracks. Shift+Click on any track to enable only those tracks containing media.

Ctrl+Z Undo

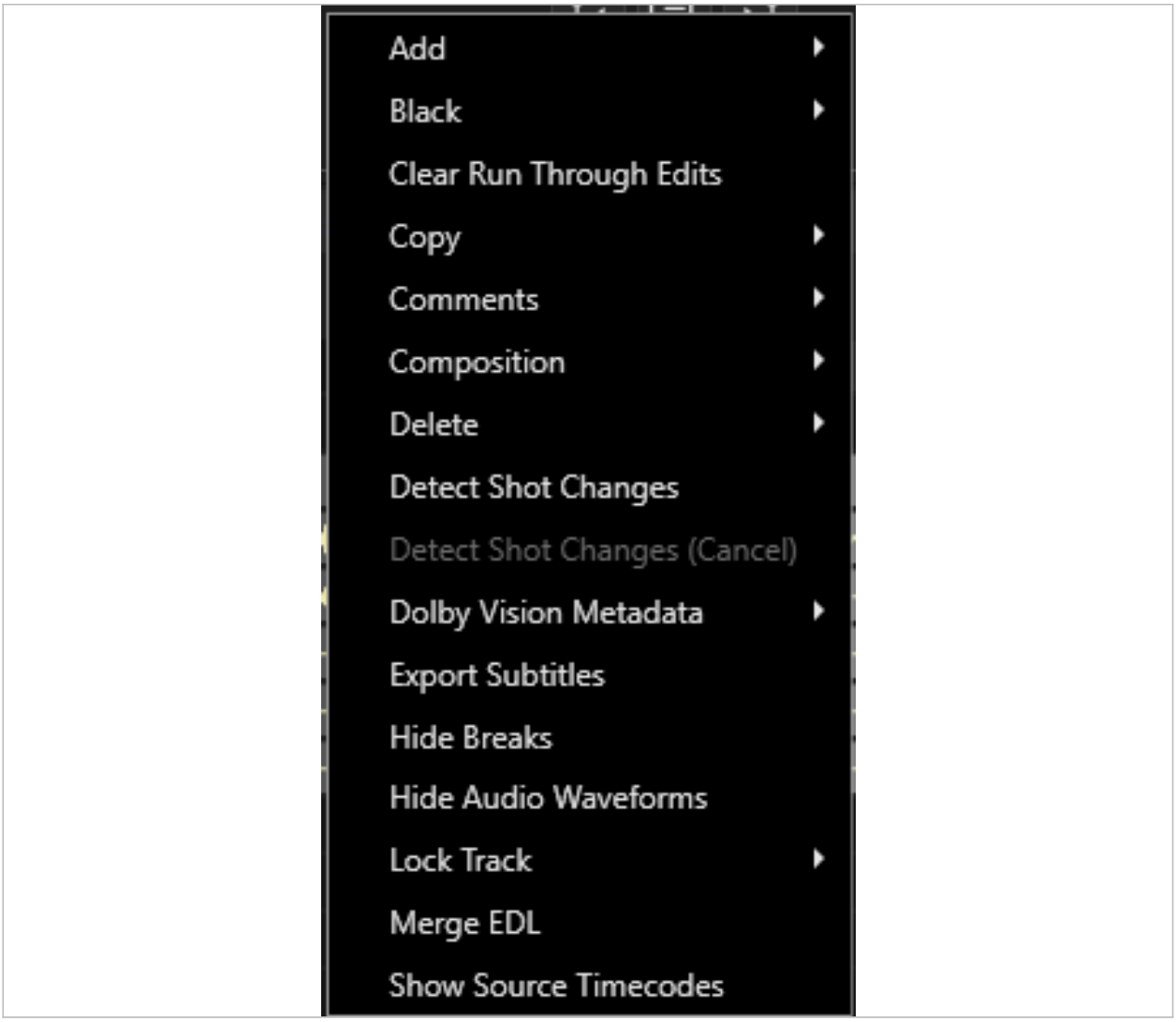
Ctrl+Y Redo

Follow Source Checkbox

If the Follow Source checkbox is enabled, Cortex will automatically enable the corresponding timeline track(s) depending on which source type is selected. For example, if a video-only clip is selected, CORTEX will automatically enable the active video track for editing and disable the rest.

Link Checkbox

The Link checkbox maintains the “actionable and visible” state of the selected video track, meaning that clicking on one or the other will automatically make both follow the click. If, for example, the timeline has two video tracks and the user clicks on a video track, it will be enabled for editing (actionable) and loaded in the player (visible).



Context Menu

Right clicking anywhere on the timeline will display the Context Menu. From there you can choose a function as follows: Function Options

Dolby Atmos Track Metadata Track Add Subtitle Track Video Track

Black Full - 0, Legal - 64

Clear Run Through Edits Will clear all run-through edits

Breaks Only (from V1 to V2) Copy Breaks and Dead Pixels (from V1 to V2)

Comments Add, Delete, Edit, Next, Previous

Create - Various composition types Composition Delete Duplicate

Audio Track - Extended menu Dolby Atmos Track Delete Metadata Track Subtitle Track Video Track

Detect Shot Changes Invoke MTai shot detection (Cancel)

Copy Breaks to Video Track Copy (metadata from highlighted shot) Establish Sync (between metadata and video Dolby Vision™ Metadata tracks) Export... (metadata) Paste (metadata to highlighted shot)

Export Subtitles Open Windows Browser for target

Hide/Show Breaks Toggle on/off

Hide/Show Audio Toggle on/off Waveforms (on Timeline)

Lock Tracks Use extended menu

Merge EDL From .edl to timeline

Show Source Timecodes F8 for each enabled track

The EFX Palette

Under the Media Player is the EFX Palette, which contains buttons and controls for editing in Cortex.

Button Key Description

Create slates, backgrounds, solid frames or Bars/Tone n/a to be added into the Project Library

n/a Modify the luminance level of Subtitles

Shift+ T Invokes the ability to execute Gap Trims Ctrl+ T Invokes the ability to execute Ripple Trims

M Match Frame

, (comma) Add a manual Break to the composition

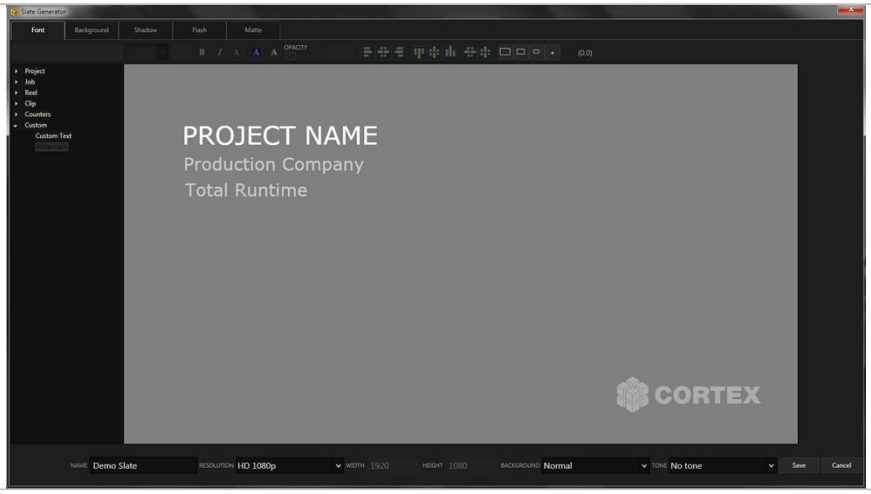
P Add Effect (Fade In or Out only in this version)

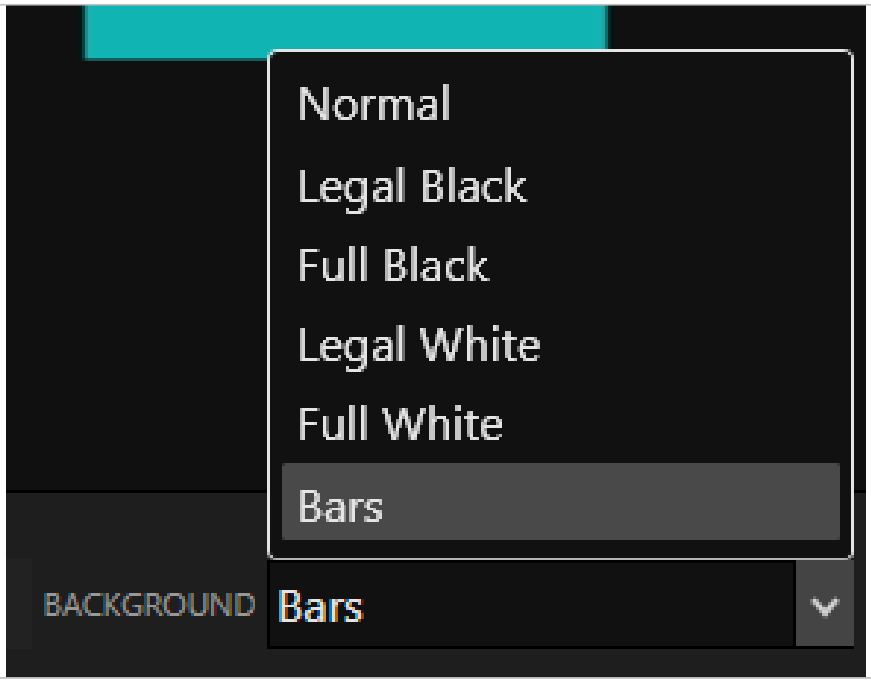
[Mark IN or modify the in point of the effect

] Mark Out or modify the out point of the effect

Effect Drop-down Field

Currently contains the Fade Option for Fade In and Out. As more effects are added, such as video dissolves, wipes, and titling, they will be added to the drop-down.





The Slate Generator

To create a slate, click the Slate button on the Command Palette.

In addition to generating slates, the Slate Generator can create background media such as legal and full black, legal and full white, and color bars, all of which can be or are automatically added to the Project Library for repeated use.

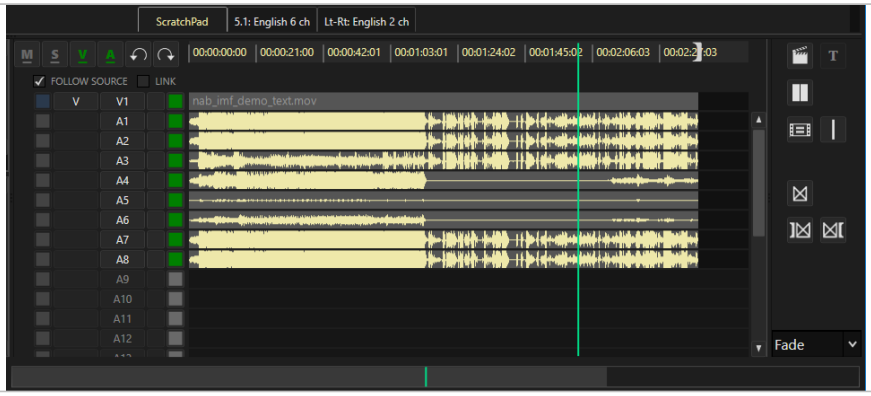
NOTE: The slate generator in the Edit Tool shares the same functionality and metadata fields as the slate generator in the Project Deliverable Configuration Window.

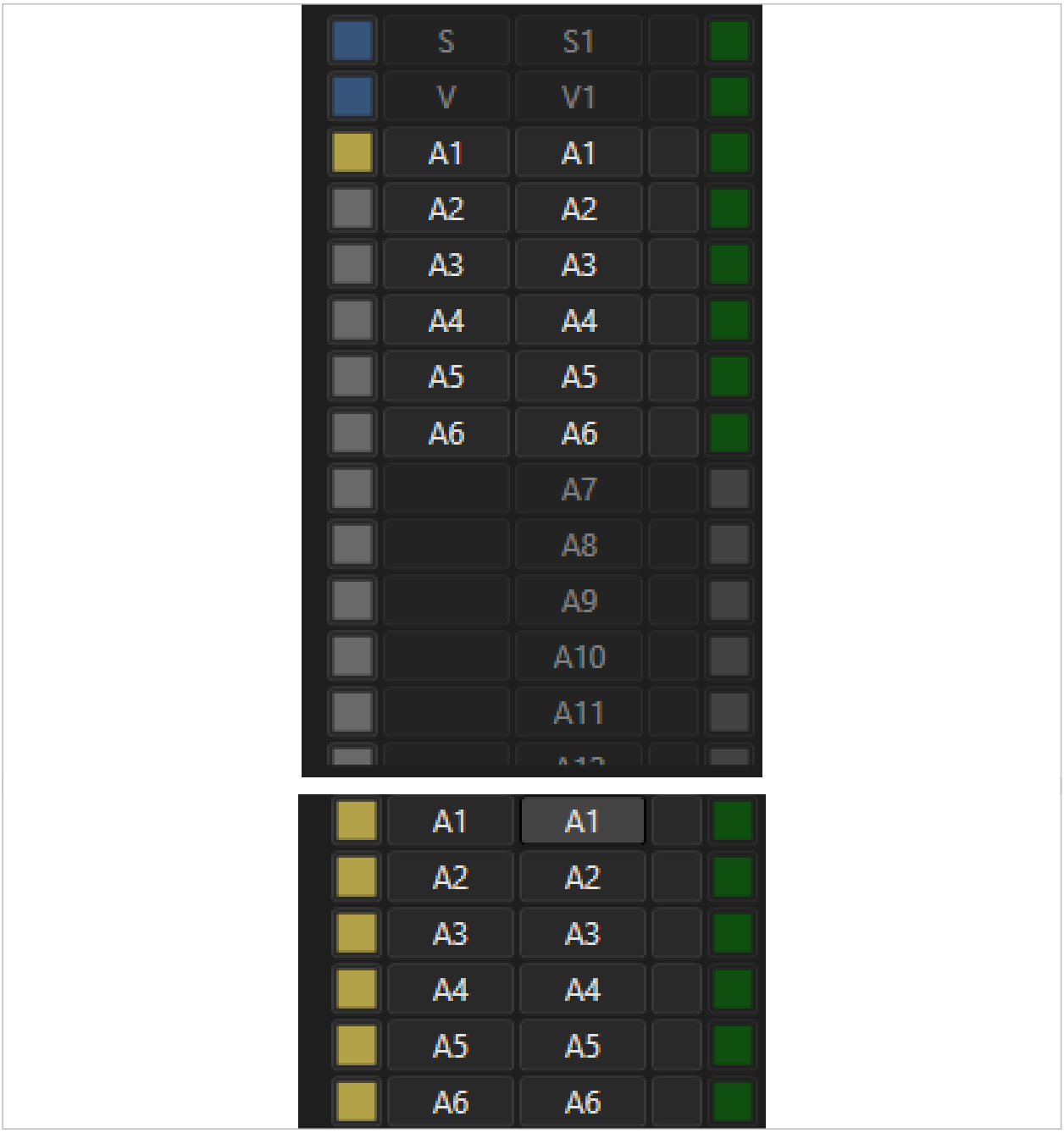
Set a name and a resolution for your slate and then choose its background type in the drop down field.

If you choose Normal, you can use the Background tab to determine the background color or insert an image file.

Once you've created your slate, Click Save and the slate will be automatically saved to the Project Library and loaded in the Media Player as a still frame. You can then set any duration for your slates when editing.

If you wish to edit or create another version of an existing slate, right-click on the desired slate and choose "Create New Slate from Existing" from the Context Menu. Make any changes you wish and then click Save.





The Shot Review Window

MTai shot detection is accurate but not infallible, and every downstream process that depends on the cuts — Dolby Vision™ Level 1 analysis, dead pixel and radiation detection, per-shot grading — inherits any mistake it makes. The Shot Review window exists to let you vet a whole composition's cuts quickly, in one place, instead of jogging the timeline shot by shot.

To open it, right-click the composition in the Edit Tool and choose Shot Review... from the Context Menu.

The window presents one row per detected shot. Each row shows the shot number and its start timecode, then three thumbnails: the First frame of the shot, the Last frame of the shot, and the first frame of the Next shot. The cut being vetted is the one at the end of the shot, marked with an orange line.

Reading the row is straightforward:

● If the Last frame and the Next shot look the same, the detector has probably called a cut where there isn’t one — a false positive.

● If the First frame and the Last frame of the same shot differ a great deal, a cut has probably been missed somewhere inside that shot.

Use the Thumb size control to trade detail against how many shots fit on screen. Selecting a row takes the timeline playhead to that shot — double-clicking does too — so you can confirm the call against the moving picture before acting on it.

To remove a false positive, click Delete Cut on its row, or select the row and press Ctrl+, (comma). The cut is removed from the composition and the two shots either side are joined. Pressing , (comma) on its own adds a break at the playhead, so a missed cut can be added without leaving the window.

The list passes the player's keys through as well: the Left and Right arrows step a frame, Space plays and stops, and E and R move to the previous and next shot.

Note: a composition on a closed reel cannot be modified, so Delete Cut is unavailable until the reel is reopened.

Composition Timeline

In the Edit tool, the Composition Timeline provides for up to 2 video tracks, up to 24 audio tracks with a “ScratchPad” to assist in creating audio configurations, 2 subtitle tracks, and 1 metadata track used primarily for Dolby Vision™.

The Control Columns

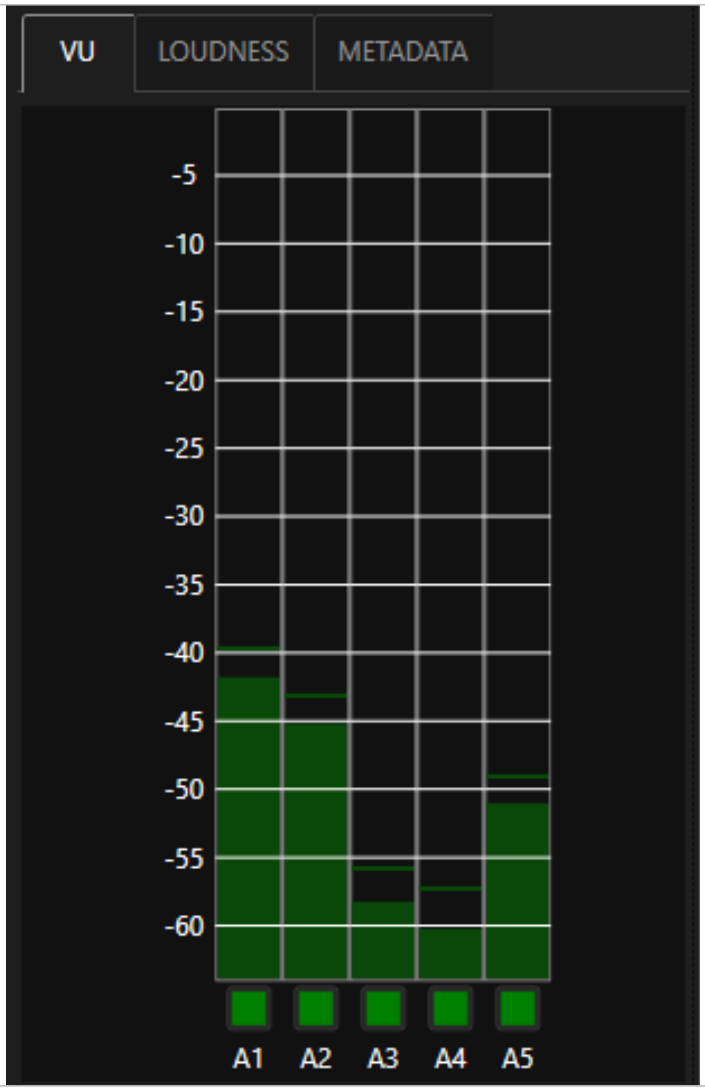
The Control Columns are composed of Source and Composition Track and Monitor buttons. When enabled, the source audio monitor buttons are yellow and the composition buttons are green. When disabled, buttons are grey.

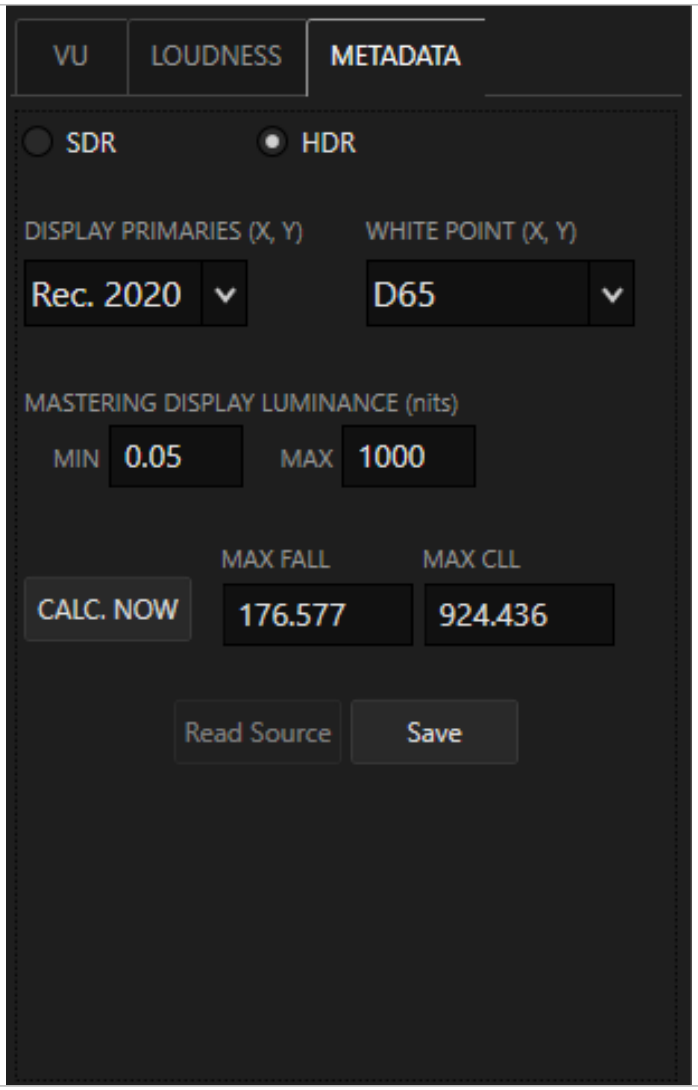
As per the example to the left, if a group of source monophonic audio clips are selected, only the first clip can be monitored.

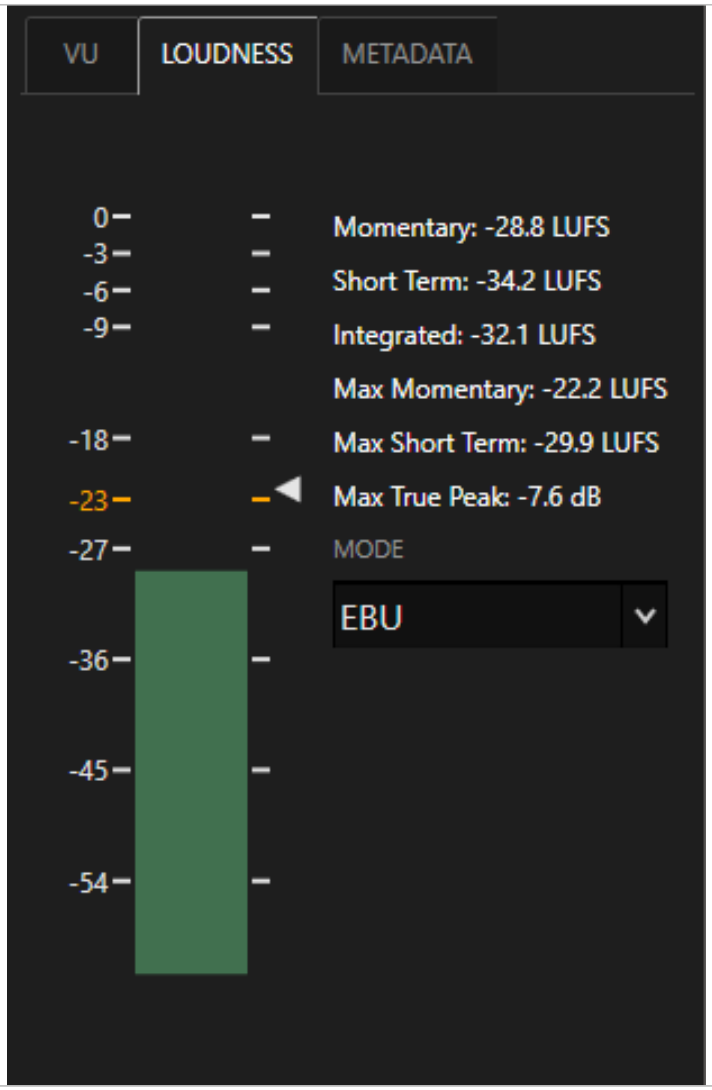
If a polyphonic audio clip is selected, channels are automatically assigned. Clicking an individual monitor button disables/enables monitoring.

Shift clicking on a monitor button disables/enables all other monitor buttons leaving the clicked button enabled for either isolated or group monitoring.

To toggle the V1 or V2 Track on/off, click the Track button or press Y when the track is focused To toggle the V1 or V2 monitor on/off, click the monitor button or press Shift+Y when the track is focused To switch between V1 and V2 you can click on their respective Track button or press Ctrl+Shift+Y To lock/unlock a track, Ctrl+click on its Track button To lock/unlock all tracks, Ctrl+Shift+click on any Track button. You can also right-click on the timeline and choose “Lock Track” in the Context Menu.

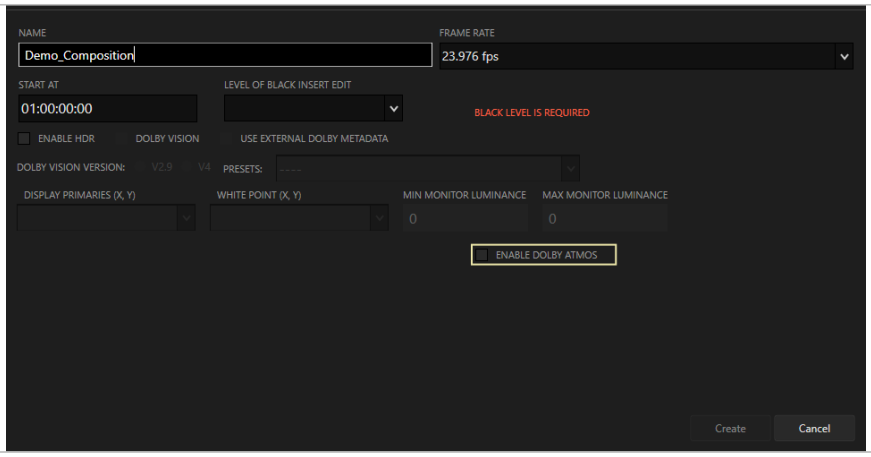

VU
LOUDNESS
METADATA
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
A1
A2
A3
A4
A5


VU
LOUDNESS
METADATA
SDR
HDR
DISPLAY PRIMARIES (X, Y)
Rec. 2020
WHITE POINT (X, Y)
D65
MASTERING DISPLAY LUMINANCE (nits)
MIN
0.05
MAX
1000
MAX FALL
MAX CLL
CALC. NOW
176.577
924.436
Read Source
Save



The VU/Loudness/Metadata Tabs

The VU meter automatically The loudness meter dynamically The Metadata tab displays HDR adjusts to display the number updates the Momentary, Short video metadata. For Dolby of tracks contained in either Term, Integrated, Max Momentary, Vision™, the metadata is the source or composition. Max Short Term and Max True automatically loaded if derived Peak in either EBU or ITU modes. from a DoVi xml file. For HDR10, Source tracks are displayed in you can manually enter criteria yellow while the composition and then calculate the MaxFALL tracks are green. and MaxCLL values.



Creating a Composition

To create a new composition, click the New button at the top of the UI and choose which type of Composition to create from the Drop-down.

Type Description

Composition

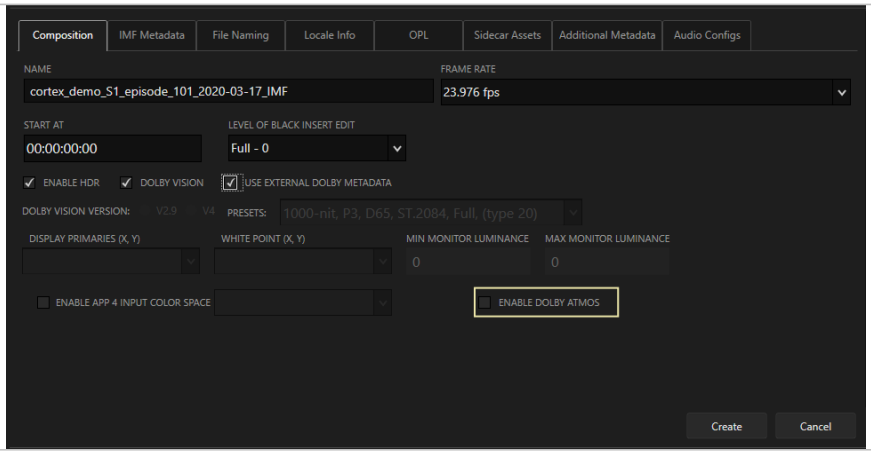
IMF Composition

DCP Composition With specific fields for DCP delivery

AS-11 Composition With specific fields for AS-11 delivery

Composition Reel Used to render individual segments of a composition

Composition Use this option for simple modifications to a file; normal editorial tasks such as inserting or extracting black, revising slates, replacing shots, etc.

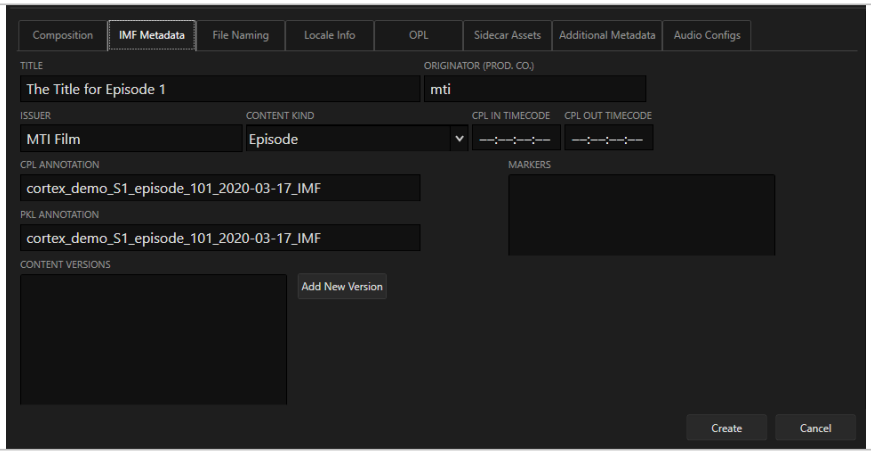


IMF Composition The IMF Composition shares a number of fields on the naming page with the simple Composition, however, there are additional tabs that can be used.

Composition Tab

1. Name - The name field is automatically inherited from the project name with an IMF extension. It can, of course, be changed to suit the particular delivery 2. Frame Rate - This is an important field. Bear in mind that the source media must match the composition's frame rate 3. Start At - Most IMF

compositions start at 00:00:00:00, however, if there is a special requirement, modify it here 4. Level of Black Insert - If a black insertion is done using the keyboard command, Shift+H, this field determines the black level of that insert, either Full - 0 or Legal - 64 5. Enable HDR Checkbox - If the source is HDR, enable the checkbox 6. Dolby Vision™ Checkbox - If the source is accompanied by Dolby Vision™ metadata or will be processed through Cortex's Color Tool for Level 1 analysis, enable this checkbox 7. Use External Dolby Metadata Checkbox - If the media is accompanied by a Dolby Vision™ metadata generated by a third party color corrector, enable this checkbox. 8. Dolby Vision™ Version - If External Dolby Metadata is used, all remaining fields will be disabled. If, however, the composition will be processed through Cortex's Color Tool for Level 1 analysis, choose between V2.9 or V4. V4 allows for modification of the Min and Max Monitor Luminance 9. Enable APP 4 Input Color Space - If the IMF needs to be output in XYZ color space, use this field to define the input color space 10.Enable Dolby Atmos® - If the composition requires the use of Dolby Atmos® , enable this checkbox and Cortex will automatically provide a DA track in the composition timeline



IMF Metadata Tab

1. Title - For episodic TV, this field would describe the episode's title. For monolithic projects, the Name and Title can be the same. 2. Originator - Normally the Production Company or Studio 3. Issuer - Your company name 4. Content Kind - Choose from the options available in the dropdown list 5. CPL In and Out Timecode - If the desired content start and end is different from the start and end of the composition 6. CPL Annotation - If the CPL needs to be different from the Name 7. PKL Annotation - If the PKL needs to be different from the Name 8. Markers - If Markers were added to the composition, they are listed here. To add a Marker, press Ctrl+Shift+I and choose from the dropdown list 9. Content Version - Normally associated with the EIDR (Entertainment Identifier Registry) and describes the version of the media. For more information: https://eidr.org

BBC IMF deliveries add ADVERTISER, AUDIO ANNOTATION, VIDEO ANNOTATION, TIMED TEXT ANNOTATION, BRAND, CAMPAIGN, EMAIL ADDRESS and CONTACT TELEPHONE NUMBER fields, and Cortex warns when BBC metadata files are missing.

File Naming Tab

1. CPL Name - Composition Playlist. In the event there is a need to modify the name, do it here 2. PKL Name - Packing List. In the event there is a need to modify the name, do it here 3. Image Track Name - Defaulted to Composition Name 4. Audio Track Name - Defaulted to Composition Name and includes the Audio Configuration and language 5. Subtitle Track Name - Defaulted to Composition Name

Locale Info Tab

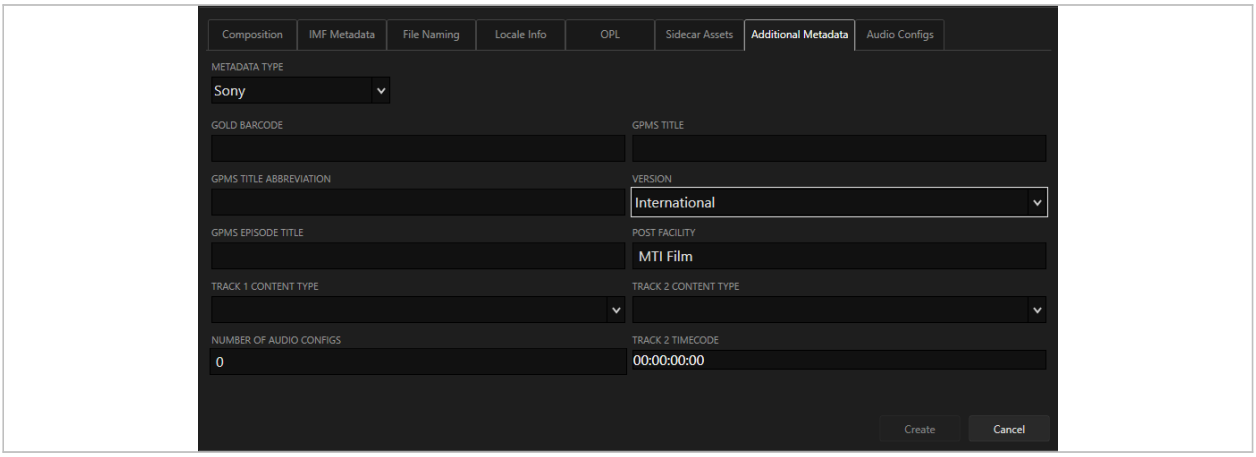
Similar to DCPs, this information describes which locations the IMF will service

OPL Tab

Output Profile List - A series of macro steps that determine the output from the IMF, for example, an H.264

Sidecar Assets

Used for any type of file type to be included in the packaging of the IMF

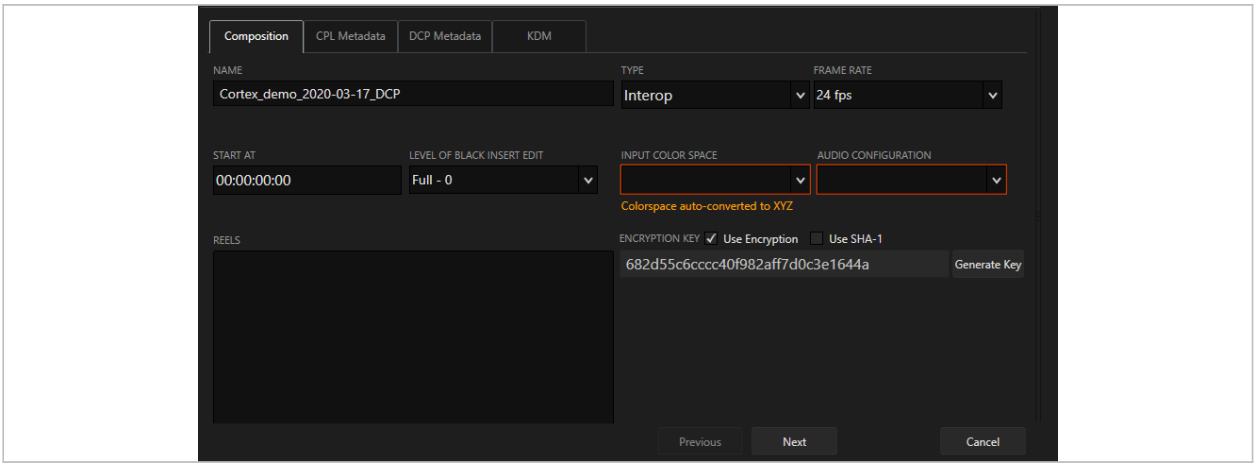


Additional Metadata Tab

At this time, this is only used for Sony. Fill in fields as required.

Audio Configs Tab

Displays the various audio configurations created for the IMF



DCP Composition

Cortex offers two types of DCP packages, Interop and SMPTE. DCP Compositions are easy to put together on the timeline and, generally, require edits that append each reel to the previous one.

Composition Tab

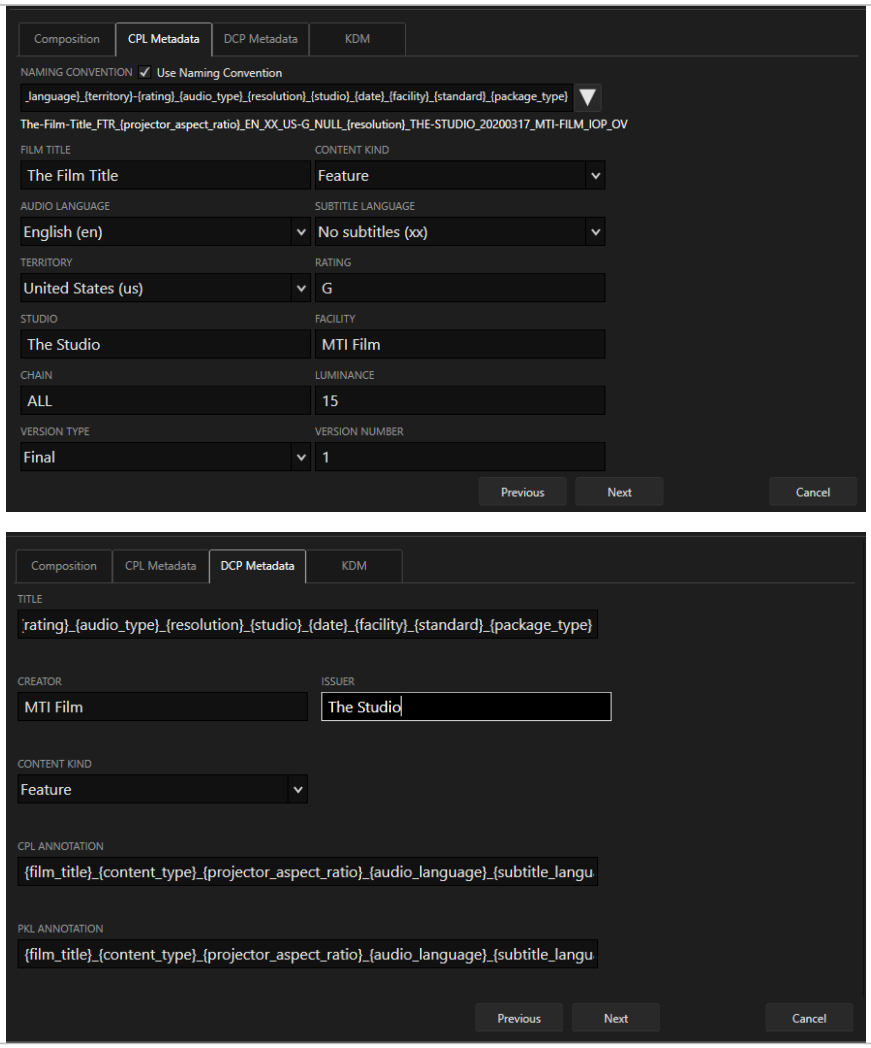
1. Name - The name is normally inherited from the project but can, of course, be changed 2. Type - Choose either Interop or SMPTE from the dropdown list 3. Frame Rate - This is an important field. Bear in mind that the source media must match the composition's frame rate 4. Start At - Most DCP compositions start at 00:00:00:00, however, if there is a special requirement, modify it here 5. Level of

Black Insert Edit - If a black insertion is done using the keyboard command, Shift+H, this field determines the black level of that insert, either Full - 0 or Legal - 64 6. Input Color Space - Cortex provides the ability to automatically convert from any color space to the required XYZ color space. Enter the input color space from the drop down list 7. Audio Configuration - Choose from the dropdown list the audio configuration of the DCP mix 8. Encryption Key Checkbox - If Encryption is desired for the DCP, enable the checkbox and then use the

SMPTE DCPs also offer a 2.0 Stereo soundfield group, and a non-DCI DCP 2K 1.77:1 (1920x1080) resolution is available for venues that accept it; Cortex warns before rendering that most cinema servers will reject it. To copy a DCP composition's CPL name, right-click the composition and choose Copy CPL Name.

KDM Tab

Cortex network. When the DCP is loaded on one of the Cortex networked workstations, the KDM will be validated and able to play back the DCP. 9. Use SHA-1 Checkbox - SHA-1 (short for Secure Hash Algorithm 1) is one of several cryptographic hash functions. SHA-1 is most often used to verify that a file has been unaltered. This is done by producing a checksum before the file has been transmitted, and then again once it reaches its destination.

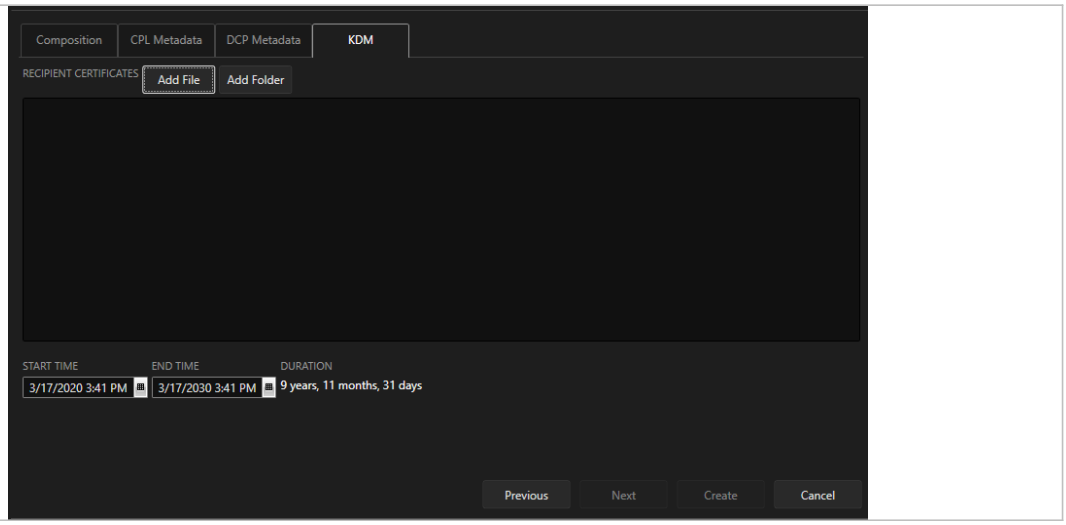


CPL Metadata Tab

1. Use Naming Convention Checkbox - If enabled, as the other fields are filled in, Cortex will build a industry standard name for the DCP, which is displayed and updated as fields are entered 2. Film Title and balance of fields - fill as required. The luminance is for the screen luminance the content was mastered.

DCP Metadata Tab

1. Title - Essentially the same as the CPL Metadata Tab. Suggest to leave as is unless otherwise instructed 2. Creator - Your company name 3. Issuer - The production company 4. CPL Name - Composition Playlist. In the event there is a need to modify the name, do it here 5. PKL Name - Packing List. In the event there is a need to modify the name, do it here



KDM Tab

1. Add File Button - Add individual KDM files 2. Add Folder - Add KDM files found in a folder 3. Start/End Times - Automatically set for 10 years. Use the date fields to modify the duration

Note: If your workstation will be used to play a DCP from a third party source and requires that you send a KDM valid for your workstation, in the upper right hand corner of the UI is a button named DCP. Click the button and then Save the file to a location from which you can send it. Also, determine prior to saving whether a SHA-1 encryption is required and, if so, enable the checkbox.

Creating KDMs

As well as loading KDMs for playback, Cortex can issue them. Right-click an imported DCP composition in the Edit Tool and choose Create KDM(s) from the Context Menu.

In the dialog, supply the recipient certificate — a single .pem file, or a folder of them when you are issuing to several targets at once — and the validity window for the keys. A KDM is written per recipient.

The dialog can also produce a DKDM (Distribution KDM) alongside the recipient KDMs, which is what you keep in order to re-issue keys later without going back to the original mastering material. Generating the DKDM is optional; turn it off if your workflow already holds one.

Note: the recipient certificate must be an RSA certificate. Encryption silently has no effect on a non-RSA recipient certificate, so confirm the certificate you have been sent before issuing.

Creating KDMs from the Command Line

KDM generation is also available from the command line, for facilities that issue keys as part of a scripted delivery rather than by hand. The DcpCreator utility, installed alongside Cortex, takes a KDM mode:

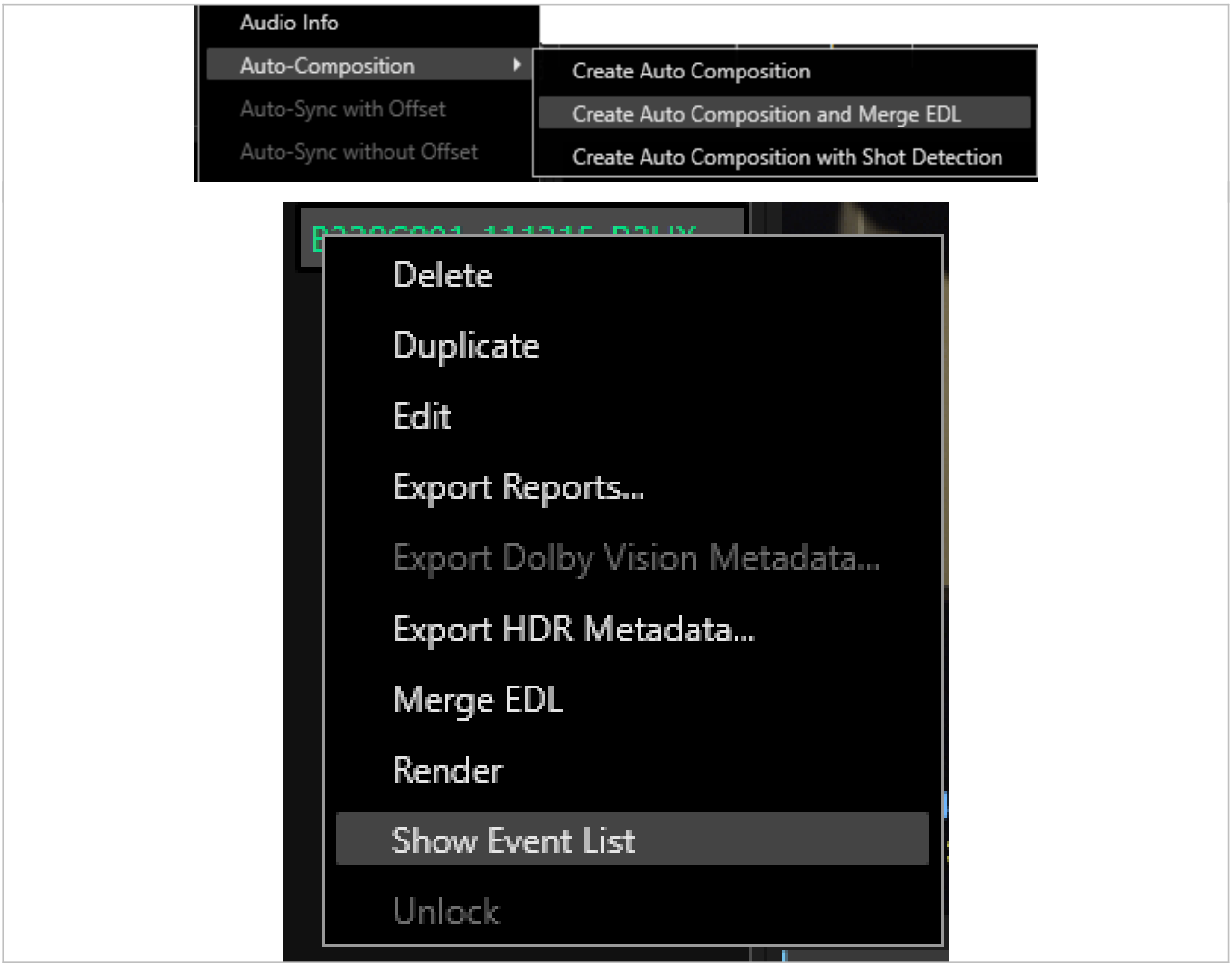
DcpCreator --kdm --cpl <cpl.xml> --dkdm <dkdm.xml> --recipient <cert.pem or directory> --end "2027-07-06 23:59" --out <directory>

--recipient accepts either a single certificate or a directory of certificates, in which case one KDM is written per certificate into the output directory. --start sets when the keys become valid (the default is now), and --timezone takes a Windows time zone ID for the validity window (the default is the local time zone). --novideomarking and --noaudiomarking turn off forensic marking of the video or the audio.

The facility's certificate chain is found automatically: DcpCreator reads the Cortex settings file, cortex.config.xml, and uses the certificate folders on the Cortex share it points to. Use --certdir to point at a different certificate folder, or when the settings file cannot be found.

AS-11 Composition

The initial metadata required for an AS-11 composition is simple. Name, frame rate, start timecode, Level of Black, and RDD6 filename. The RDD6 file would contain a Dolby Digital metadata and is optional to the composition. RDD stands for Registered Disclosure Document.



Composition Reel

A Composition Reel allows you to place segments (shots or “events”) of the composition into a reel for rendering. It has the same protocols as the Clip Reel but is intended to be used for compositions.

In the Edit Tool, the bins normally show the source clips regardless of whether the Master Bin or Composition is focused. The other tools automatically switch to the event list when the composition is focused.

To show the event list, right-click on the composition name in the Sidebar and select Show Event List in the Context Menu.

With the list showing, select events to be added to the Composition Reel and then right-click and choose: 1. Add selected to Comp Reel 2. Add Marked Events Range to Comp Reel Events can be added one at a time, group selected, or within a marked range. When completed, right-click on the composition name and select Render in the Context Menu.

Auto Compositions

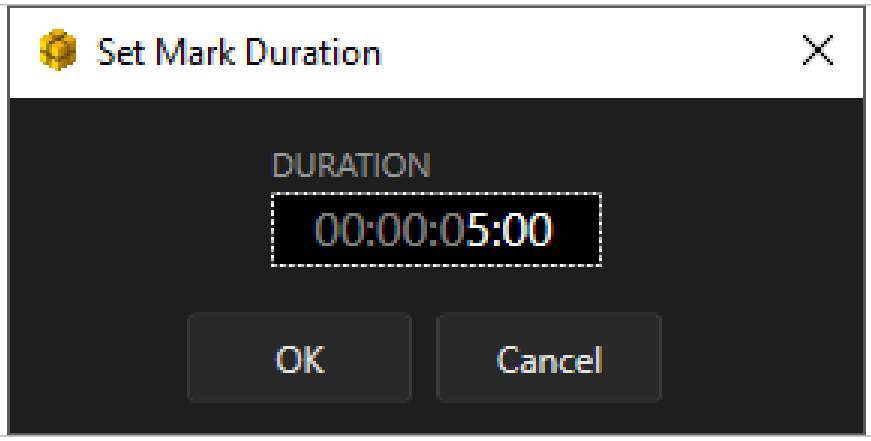
If a source file is an edited piece of content and you’d like to locate where those edits occur, there are three ways to do this: 1. With MTai Shot Detection 2. Merging an EDL 3. Manually inserting Breaks at each edit point

An Auto-Composition automatically creates a composition using the source clip’s name, start and end timecodes, and frame rate. Creating an Auto Composition causes.

To create an Auto Composition:

Right click on the picture clip and select Auto-Composition. There are 4 choices in the extended menu: 1. Create Auto Composition - Cortex will insert the whole clip into a new composition 2. Create Auto Composition and Merge EDL - Cortex will open a browser window to locate the EDL 3. Create Auto Composition with MTai Shot Detection - Cortex will insert the whole clip into a new composition and begin MTai shot detection. Like any MTai shot detection, the results might invoke false positives and negatives so please verify the breaks. 4. Create Auto Composition with SDR to HDR - choose Dolby V4 1000-nit Rec2020 or Dolby V4 1000-nit P3. Cortex will insert the whole clip into a new Dolby Vision v4 composition for that mastering display and begin MTai shot detection, ready for the SDR to HDR conversion described in Chapter 3. Verify the breaks the same way.

a. To add a break - press the , (comma) key or click the Break button in the EFX Palette b. To delete a break - press Ctrl +,(comma) or Ctrl + Break button Both MTai Shot Detection and Merge EDL options are always available by right-clicking on the composition timeline and selecting one of them.



Once you've created a new composition, editing in Cortex is a process similar to any nonlinear editing system you might be familiar with. Cortex supports 3 point and drag and drop editing with typical overwrite, insert, lift and extract functions. The Edit Tool in Cortex is designed to perform basic editorial functions in order to complete delivery specifications. As of version 5.6, the Edit Tool has successfully delivered all composition types with particular emphasis on IMF delivery.

3 Point Editing

Using 3 point editing, below are examples of the logic used for marking source clips, in blue, and compositions, in green: Note: When In and Out marks are present in both the source and composition timecode registers, the duration always defaults to the composition. If a timecode and/or duration is displayed in grey, it means that the timecode and/or duration was calculated based on the other timecode registers' duration.

Both the source and composition In and Out are marked, therefore the composition takes precedence.

This represents a 3 point edit where the source Out mark is determined by the duration of the composition marks.

This represents a 3 point edit where the composition Out mark is determined by the duration of the source marks.

This represents a 3 point edit where the source In mark is determined by the duration of the composition marks.

This represents a 3 point edit where the composition In mark is determined by the duration of the source marks.

Setting a Duration

To set a duration, press the * key on the number pad. An input window appears. Enter a value and press enter. To enter a value in frames press + before entering the number. To repeat the previously entered duration for the next edit press Shift+*

Whenever a 3 point edit calculates the in or out mark of either the clip or composition, a blue "phantom mark" will show the calculated position of the mark. In the below example, the source clip dictates the out point of the composition and, therefore, a blue mark indicates the calculated position of the mark.

Once the marks are set, use the following to perform a 3 point Overwrite or Insert edit:

Edit Commands

Button Key Description

G Overwrite Edit to Timeline

H Insert Edit to Timeline

Drag and Drop Editing

Dragging a clip from the Picture or audio bin is simple. If the Follow Source checkbox on the timeline is enabled, the tracks affected by the edit will be automatically enabled. If the Follow Source checkbox is disabled, enable the tracks to be affected by the edit before dragging.

When a marked range of a source clip is dragged to the timeline, the segment is represented as a grey bar that is sized relative to the current size of the timeline but is always, at least, perceptible. At a snap point it will turn blue for picture or yellow for audio, but you can drop at any timeline location.

Edit Snap Points include: 1. Marks 2. Breaks 3. Cuts 4. The Cursor

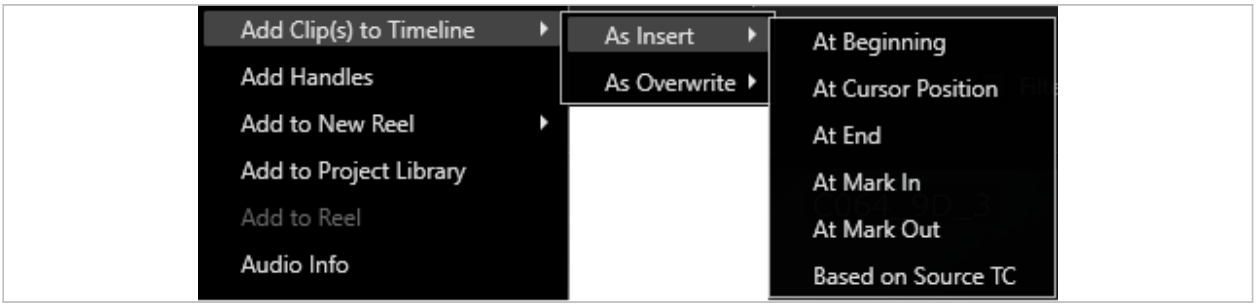
Drag and Dropping an Overwrite 3 Point Edit

To perform an Overwrite edit, mark the In and Out points required for the 3 point edit and then drag the source to the composition timeline: 1. You can “snap” the source In or Out to any Edit Snap Points as explained above 2. You can drop the source clip at any position on the timeline

Drag and Dropping an Insert 3 Point Edit

If you wish to Insert the clip and thereby “ripple” the existing media at the insertion point: 1. Drag the clip to the timeline 2. Press the Ctrl key 3. Drop the clip to the timeline

NOTE: After an edit is made using a shortcut key (G or H), the composition Mark In register is updated with the previous out timecode +1. Using drag and drop does not update the register.



Adding Multiple Clips to the Timeline

There are several ways to add multiple clips to the timeline as an Overwrite or Insert Edit using Drag and Drop or the Context Menu selection. For Drag and Drop actions, you must snap to the position desired. Right click on a selection of multiple clips to view the Add Clip(s) to Timeline context menu items.

1. At Beginning 2. At Cursor Position 3. At End 4. At Mark In 5. At Mark Out 6. Based on Source TC

When Dragging and Dropping Multiple Clips

If there are marks in and out on multiple source clips and they are dragged and dropped anywhere on the timeline, either snapped or not, their duration will be per the source marks.

If from the Context Menu:

Same as above except:

For At Mark in, the clips will always be front filled starting at the Mark In and beginning with the first clip selected.

For At Mark Out, the clips will always be backfilled starting at the Mark Out and beginning with the last clip selected.

For all cases for “Based on Source TC”: Will always use the first marked frame of the source clip (or if unmarked – the first frame of the clip) and is placed at its corresponding composition location

For At the Beginning, At the Cursor Position, and At End: The clips will always be front filled respecting the durations marked on each source.

If no marks on source: the full clip If only a mark in, then starting at Mark In to the last frame of the clip If only a mark out, then starting at the first frame of the clip and ending at mark out

Drag and Drop and then Shift

There is another way available through drag and drop only. For example, if there are three textless source clips that have the same mm:ss:ff timecode as the texted clips located in the composition and they need to be placed in sync as either a direct overwrite replacement or on a separate video track:

1. Place the composition timeline cursor at the timecode location of the first source clip 2. Select the three clips and drag/drop and then press Shift prior to snapping to the cursor The 3 clips will be located to their respective mm:ss:ff positions.

NOTE: The hour number is disregarded if the clips are snapped to the timeline cursor location NOTE: After an edit is made, the composition Media Player is automatically focused for review.

Lift or Extract a Marked Range

If you want to remove a marked range of the composition, you can Lift or Extract it. 1. Lifting a range leaves black in its place creating a gap. 2. Extracting a range shifts everything that followed the extraction upstream filling the gap.

Once the marks are set, use the following to perform a Lift or Extract edit:

Lift and Extract Commands

, (comma) or Delete Lift from Timeline

/ on keyboard or Ctrl+Delete Extract from Timeline

Graphical Trim Types

Trimming by clicking directly on the timeline and moving the edit points via dragging or by timecode or frames. NOTE: To execute a Trim or Segment reposition, one of the Trim Modes must be enabled.

Gap Trim

To enable the Gap Trim mode, click the Trim button or There are two ways to enable Ripple Trim mode: press Shift+T. The Trim button icon will turn red 1. Press Ctrl+T or Ctrl+Click the Trim button indicating a Gap Trim is enabled. 2. While in Gap Trim mode and hovering over an edit, press and hold Ctrl. To exit the Trim Mode, click the button again, press To exit the Trim Mode, click the button again, press Shift+T again, or press Esc Shift+T again, or press Esc.

NOTE: In general, with the Trim Mode enabled, a Left Click or a Modifier Key+Left Click and drag near the edit will initiate the trim, however you can also mouse-up after the click, which leaves the trim mode enabled. After mouse-up, an additional left click (without modifier) near the edit point will allow you to drag the trim too. To cancel the trim 1. Press the Escape key 2. Click on the Lasso Area located above the video tracks 3. Press the Shift+T key or Ctrl+T key 4. Click the Trim button.

Gap Trim

Gap Trims ensure that the overall length of affected timeline track(s) will not be modified by trimming.

If no gap exists between two adjacent segments, only an inward trim is permitted, which creates a gap equal to the trim value.

If a gap does exist, then an outward trim is permitted to overwrite the gap but is limited to the edit point of the adjacent segment or to the extent of the available source media content.

Executing a Gap Trim

By Dragging the Mouse Cursor

While hovering the mouse cursor on either side of the edit point, a red bar appears indicating the segment is ready to be trimmed.

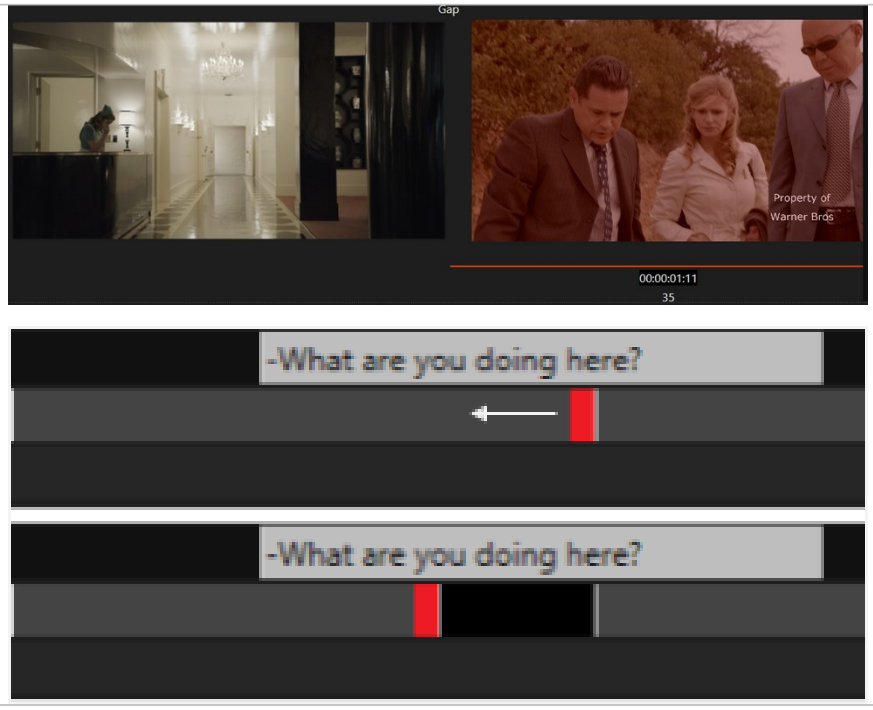
You have two options to execute the trim with a click and drag action: 1. Left Click and drag the red bar. On mouse-up the trim is completed. 2. Left Click on the red bar and mouse-up. Left click again and drag. On mouse-up the trim is completed.

Using the Numeric Keypad

Left Click on one side of the edit and mouse-up. A red bar appears indicating the segment is ready to be trimmed. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

Selecting Edit Points for Gap Trims on Multiple Tracks

Left Click on one side of an edit and mouse-up. A red bar appears on the side of the click. Left Click on the same side of additional track edits to execute a gang trim. Once a trim type and side(s) are chosen for the trim, the other trim types and sides are precluded from being enabled. All edit points are trimmed equally.



Example Gap Trim

The following demonstrates an inward trim where a gap is created by the action.

An inward trim creates a gap.

The trim will snap to any marker in its navigation path including audio edit points where tracks have been enabled.

Gap Trim View

We see a frozen image of the non-trimmed segment and a continuously updated image of the trimmed segment with the # of frames and timecode trimmed either + or -

Ripple Trim

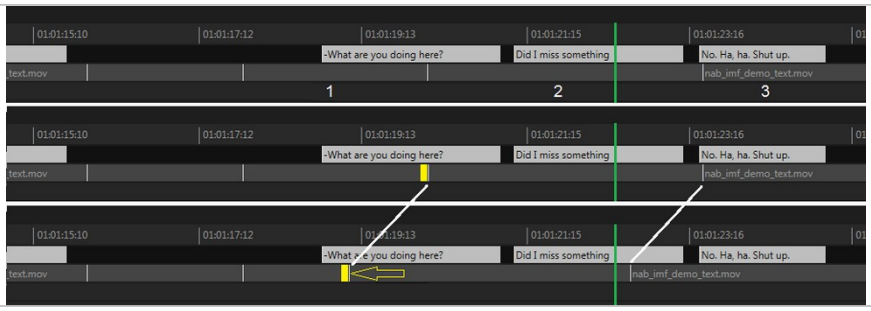
Ripple Trims lengthen or shorten the head or tail of a segment, moving or “rippling” all downstream segments farther up or downstream based on the direction of the trim. The segments are rippled equal to the trim value.

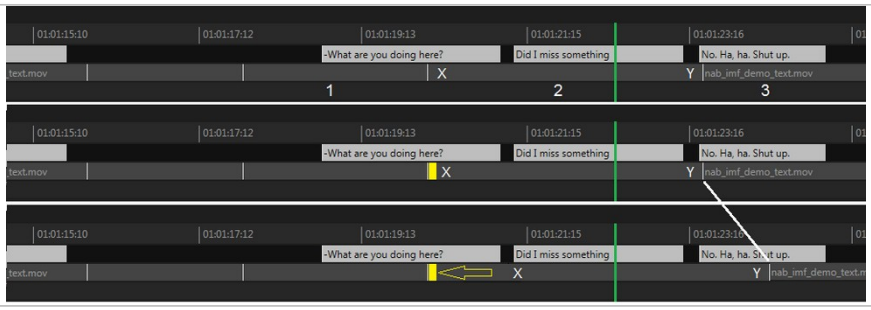
There are two ways to enable Ripple Trim mode: 1. Press Ctrl+T or Ctrl+Click the Trim button. The trim icon will turn yellow. 2. While in Gap Trim mode and hovering over an edit, press and hold Ctrl. Releasing the Ctrl button prior to left clicking will return the trim state to Gap Trim.

Executing a Ripple Trim

By Dragging the Mouse Cursor

While pressing the Ctrl button and hovering the mouse cursor on either side of the edit point, a yellow bar appears indicating the segment is ready to be trimmed.





You have two options to execute the trim with a click and drag action: 1. Ctrl+Left Click and drag the yellow bar. On mouse-up the trim is completed. 2. Ctrl+Left Click on the yellow bar and mouse-up. Left click again and drag. On mouse-up the trim is completed.

Using the Numeric Keypad

Ctrl+Left Click and mouse-up on one side of the edit. The yellow trim bar will remain enabled. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

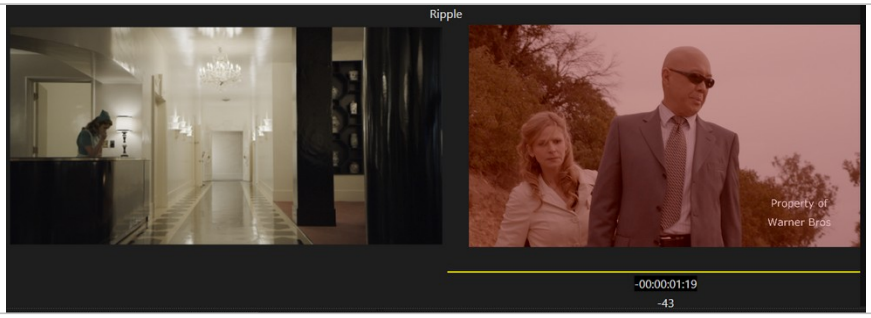
Selecting Edit Points for Ripple Trims on Multiple Tracks

Ctrl+Left Click on one side of an edit and mouse-up. A yellow bar appears on the side of the click. Ctrl+Left Click on the same side of additional edits to execute a gang trim. Once a trim type and side(s) is chosen for the trim, the other trim types and sides are precluded from being enabled. All edit points are trimmed equally.

Example Ripple Trim

In the following figure, segment 1 is being shortened at its tail, which ripples the downstream segments upstream by the amount of the trim.

In the following figure, segment 2 is being lengthened at its head, which ripples the downstream segments farther downstream by the amount of the trim.



Note that the upstream segments have not moved. All ripple trims only affect downstream segments.

Ripple Trim View

We see a frozen image of the non-trimmed segment and a continuously updated image of the trimmed segment with the # of frames and timecode trimmed either + or -

Rolling Trim

A Rolling Trim moves the edit point between segments by trimming their respective sides by an equal number of frames thereby maintaining the overall duration of the affected timeline track(s); therefore adjacent segments remain untouched in position or length.

Executing the Rolling Trim

By Dragging the Mouse Cursor

While pressing the Shift button and hovering the mouse cursor on the edit point, a red bar appears on both sides of the edit indicating the segment is ready to be trimmed.

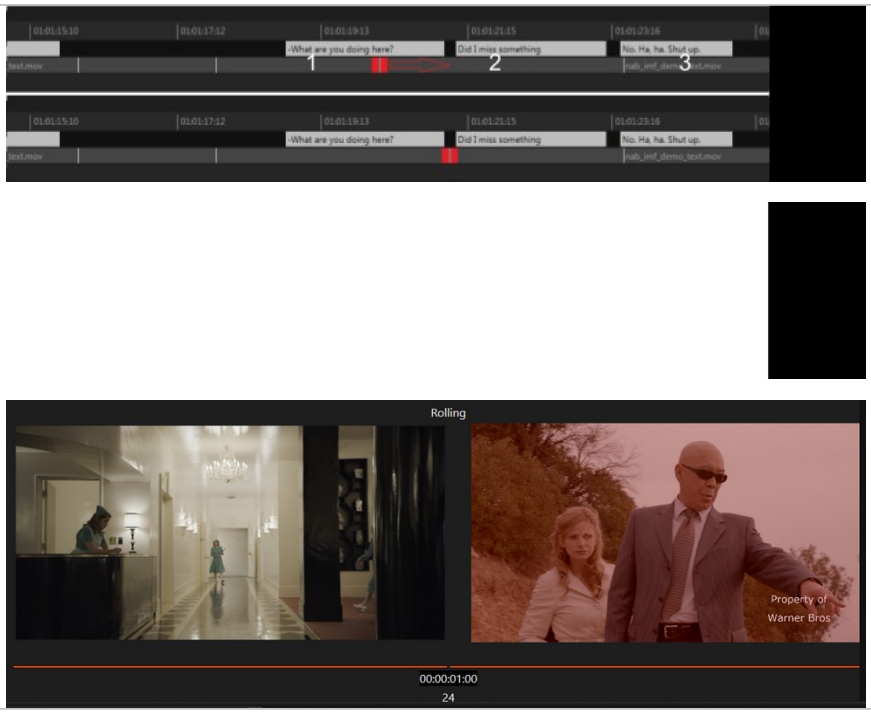
You have two options to execute the rolling trim with a click and drag action: 3. Shift+Left Click and drag the pair of red bars. On mouse-up the trim is completed. 4. Shift+ Left Click on the pair of red bars and mouse-up. Left click again and drag. On mouse-up the trim is completed.

Using the Numeric Keypad

Shift+Left Click on the edit and mouse-up. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

Selecting Edit Points for Rolling Trims on Multiple Tracks

Shift+Left Click on an edit and mouse-up. A red bar appears on both sides of the click. Shift+Left Click on additional edits to execute a gang trim. Once a trim type and side(s) are chosen for the trim, the other trim types and sides are precluded from being enabled.



All edit points are trimmed equally.

Example – Rolling Trim

In the following figure, segment 1 is being lengthened at its tail while segment 2 is trimmed and shortened by an equal amount at its head.

Rolling Trim View

We see continuously updated images of both sides of the trimmed segments with the # of frames or timecode trimmed either + or -

Slide Trim

A Slide Trim places a red trim bar at the tail of the adjacent upstream segment and at the head of the adjacent downstream segment, trimming these segments by an equal number of frames. Slide Trims do not change the overall length of the affected timeline track(s).

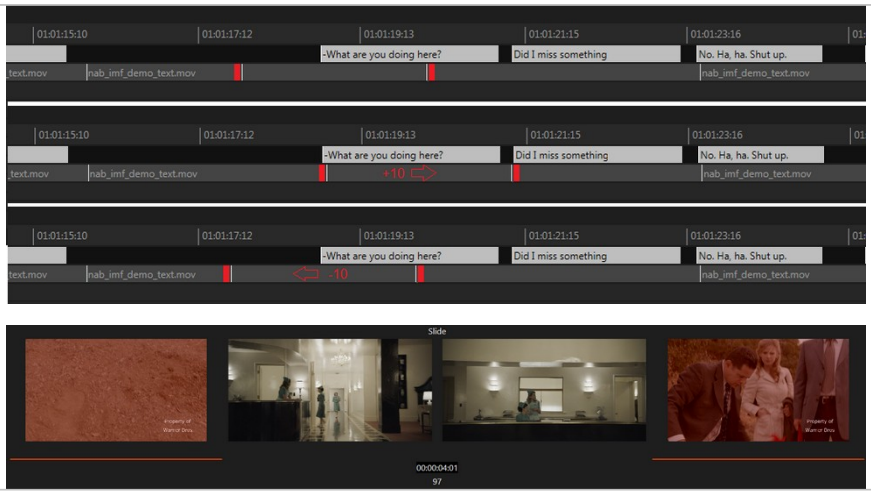
Executing the Slide Trim

By Dragging the Mouse Cursor

You have two options to execute the trim with a click and drag action: 1. Alt+Left Click near the center and drag the pair of red bars. On mouse-up the trim is completed. 2. Alt+ Left Click near the center and mouse-up. Left click again and drag. On mouse-up the trim is completed. a. Dragging Left will trim - b. Dragging Right will trim +

Using the Numeric Keypad

Alt+Left Click near the center and mouse-up. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.



Example – Slide Trim

The adjacent segments are trimmed based upon the direction the selected segment is slid.

Slide Trim View

We see 4 monitors. The two sides of the trimmed segments are continuously updated while the segment being slid is frozen.

Slip Trim

A Slip Trim places a red trim bar at the head and tail of a single segment. The trim will “scroll” the head and tail of the segment leaving its timeline position fixed, therefore adjacent segments remain untouched in position or length.

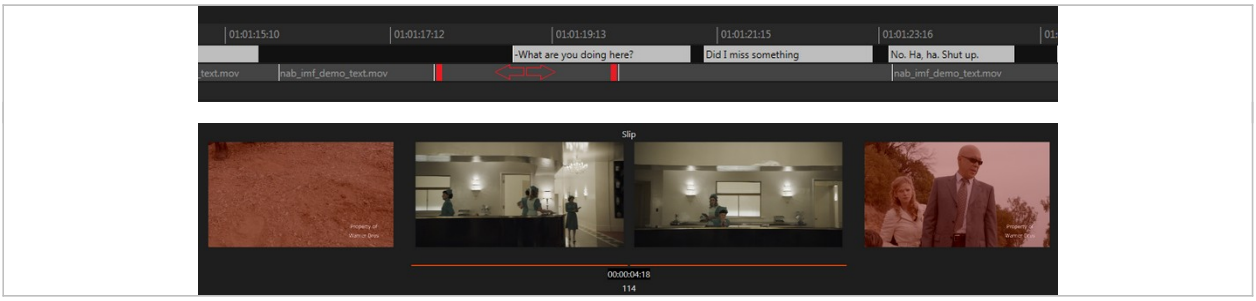
Executing the Slip Trim

By Dragging the Mouse Cursor

You have two options to execute the trim with a click and drag action: 1. Shift+Alt+Left Click near the center and drag the pair of red bars. On mouse-up the trim is completed. 2. Shift+Alt+Left Click near the center and mouse-up. Left click again and drag. On mouse-up the trim is completed. a. Dragging Left will trim - b. Dragging Right will trim +

Using the Numeric Keypad

Shift+Alt+Left Click and mouse-up at or near the center of a segment. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.



Example – Slip Trim

Drag in either direction to slip the media within the existing break locations, or use the numeric keypad to input trim values.

Slip Trim View

We see both sides of the segment continuously updated while the last and first frame of the adjacent segments are frozen.

Selecting, Repositioning, and Deleting Segments

Clicking on a segment allows the user to reposition or delete the segment respecting the Gap/Overwrite and Ripple trim modes. To select a segment the track must be enabled; segments on locked tracks cannot be modified.

Selecting a single segment

Left clicking near the center of a segment will highlight and select the segment for repositioning or deleting. Left clicking again near the center of a single selected segment deselects the segment. Alternatively, press Esc.

Selecting multiple segments

1. To select additional segments after selecting the first segment, hold down the Shift key and Left click near the center of additional contiguous segments. Skipped segments will be included in the group selection if they are between the last two clicked segments.

2. Ctrl+Left click near the center to select individual segments that are not contiguous. Ctrl+Left click again near the center of selected segments to deselect them.

3. To select the current segment and the balance of upstream segments, press Ctrl+Shift+Click.

4. To select the current segment and the balance of downstream segments, press Ctrl+Alt+Click.

Repositioning Segments on the Same or to Like Tracks

Movement Behavior

As all segments are moved, their head or tail will snap to edit points on both video and audio tracks regardless of whether they are enabled or not, to marks in and out, and the cursor position. Movements are completed on mouse-up regardless of whether the segment has been snapped or simply repositioned to a new location.

Repositioning a Segment In Gap Trim Mode

With your segment(s) selected as per above you have two options to execute the movement of the segment on the same track:

1. Left+Click near the center of the segment and drag in either direction. 2. To move by timecode press + or - followed by the value and then press Enter. To move by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

On mouse-up after the drag or entering a numeric trim value, the moved segment will overwrite the overlapped segment(s) leaving a gap in the area vacated by the moved segment.

Repositioning a Segment in Ripple Mode

With your segment(s) selected as per above you have two options to execute the movement of the segment on the same track:

1. Ctrl+Left+Click near the center of the segment and drag in either direction. 2. To move by timecode press + or - followed by the value and then press Enter. To move by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

On mouse-up or entering a numeric trim value and based upon the direction of the move, the head or tail of the moved segment determines the insertion point in the timeline track.

If the insertion is not located at an edit point then the insertion bifurcates the overlapped segment:

1. When moving a segment upstream (that is, toward the head of the timeline) then the point of bifurcation is determined by the head of the segment being moved. 2. When moving a segment downstream (toward the tail of the timeline) then the point of bifurcation is determined by the tail of the segment being moved.

If the segment being moved is relocated directly on an edit point then no bifurcation takes place:

1. If the segment is moved upstream and its head is relocated at an edit point then the segment is inserted, shifting the overlapped segment(s) downstream to fill the vacated space. 2. If the segment is

moved downstream and its tail relocated at an edit point then the segment is inserted, shifting the overlapped segment(s) upstream to fill the vacated space.

In the above cases, the area vacated by the moved segment is shifted, therefore the overall length of the track is not altered.



Deleting Segments with or without a Ripple

To delete a segment without Rippling the timeline 1. Left Click near the center of the Segment and:

a. Press the Lift key (. period key) or button , or press the Delete key

To delete a segment with Rippling the timeline 1. Left Click near the center of the segment and:

a. Press the Extract key (/ forward slash key) or button , or press Ctrl+Delete

The Lasso Area and Selecting Multiple Tracks or Edit Points

The Neutral zone is the empty space in the timeline beneath the timecode track and above the media tracks. Clicking in the Lasso Area is equivalent to pressing the Escape key on the keyboard. It can also be used to initiate group selections by Left clicking and lassoing multiple segments or edit points.

Lassoing Segments

To select segments with a lasso:

Left Click and Drag across the desired segments. Any segment crossed in the path of the lasso will be selected. Once selected, they can be: 1. Moved in Gap or Ripple mode 2. Lifted or Extracted

Lassoing Edit Points

To select edit points with a lasso for Gap Trims:

Shift+Left Click and Drag across the desired segments. 1. If the lasso is drawn to the left of the edit point(s), a Gap Trim is initiated on the A side of the edits for all segments crossed in the path of the lasso. 2. If the lasso is drawn to the right of the edit point(s), a Gap Trim is initiated on the B side of the edits for all segments crossed in the path of the lasso.

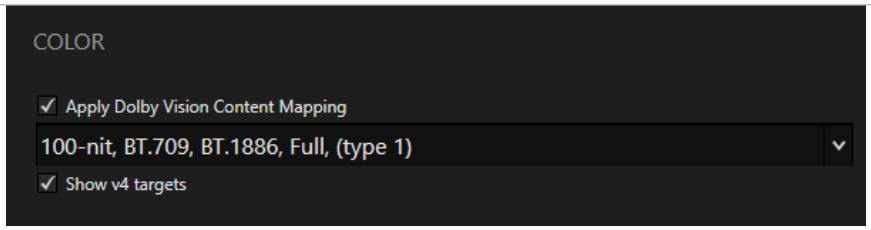
To select edit points with a lasso for Rolling Trims:

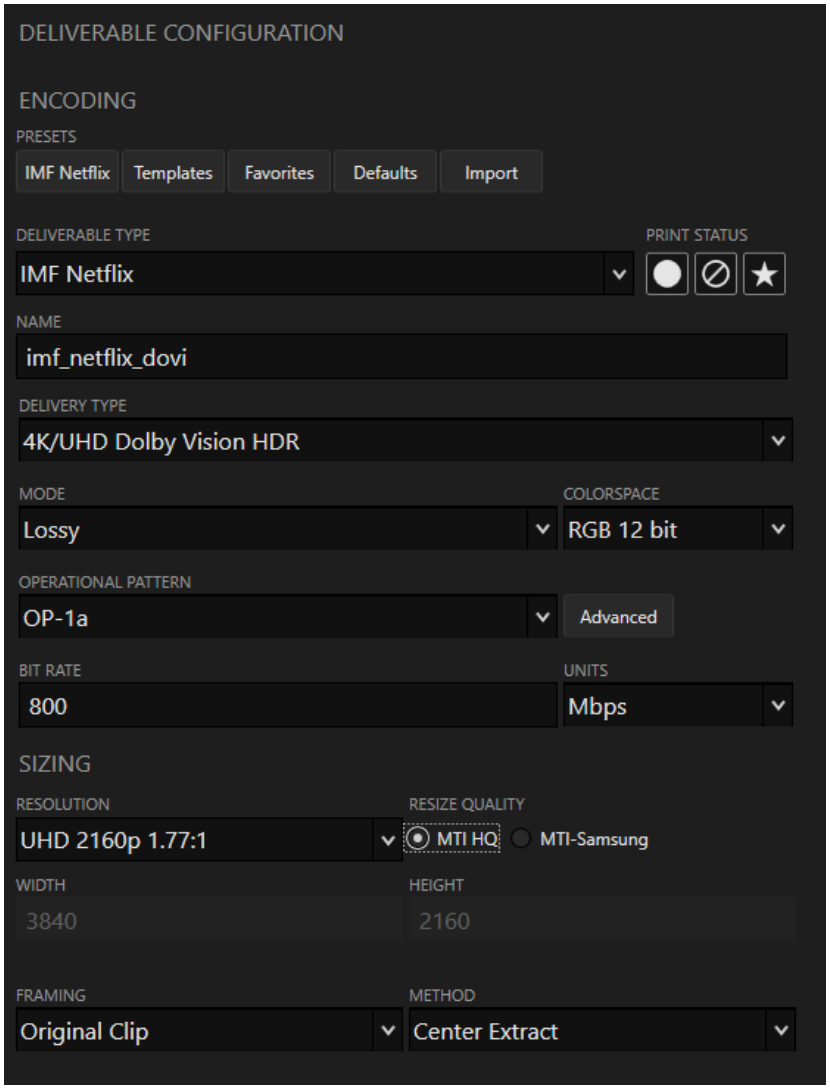
Shift+Left Click and Drag across the desired edit points. If the lasso drawn crosses an edit point, a Rolling Trim is initiated.

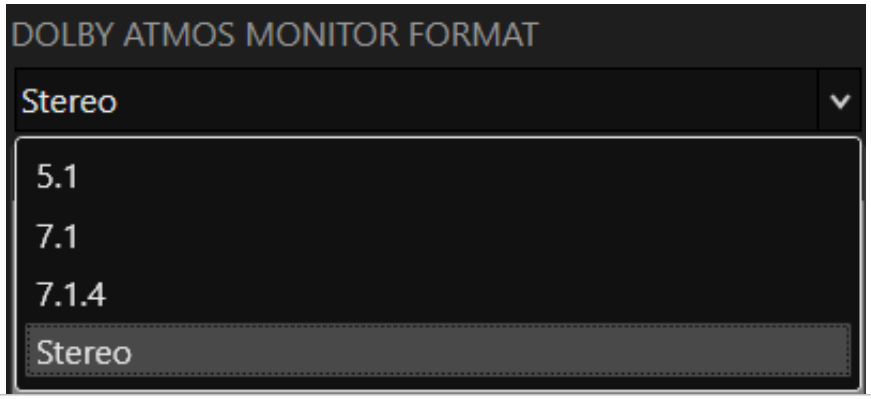
To select edit points with a lasso for Ripple Trims:

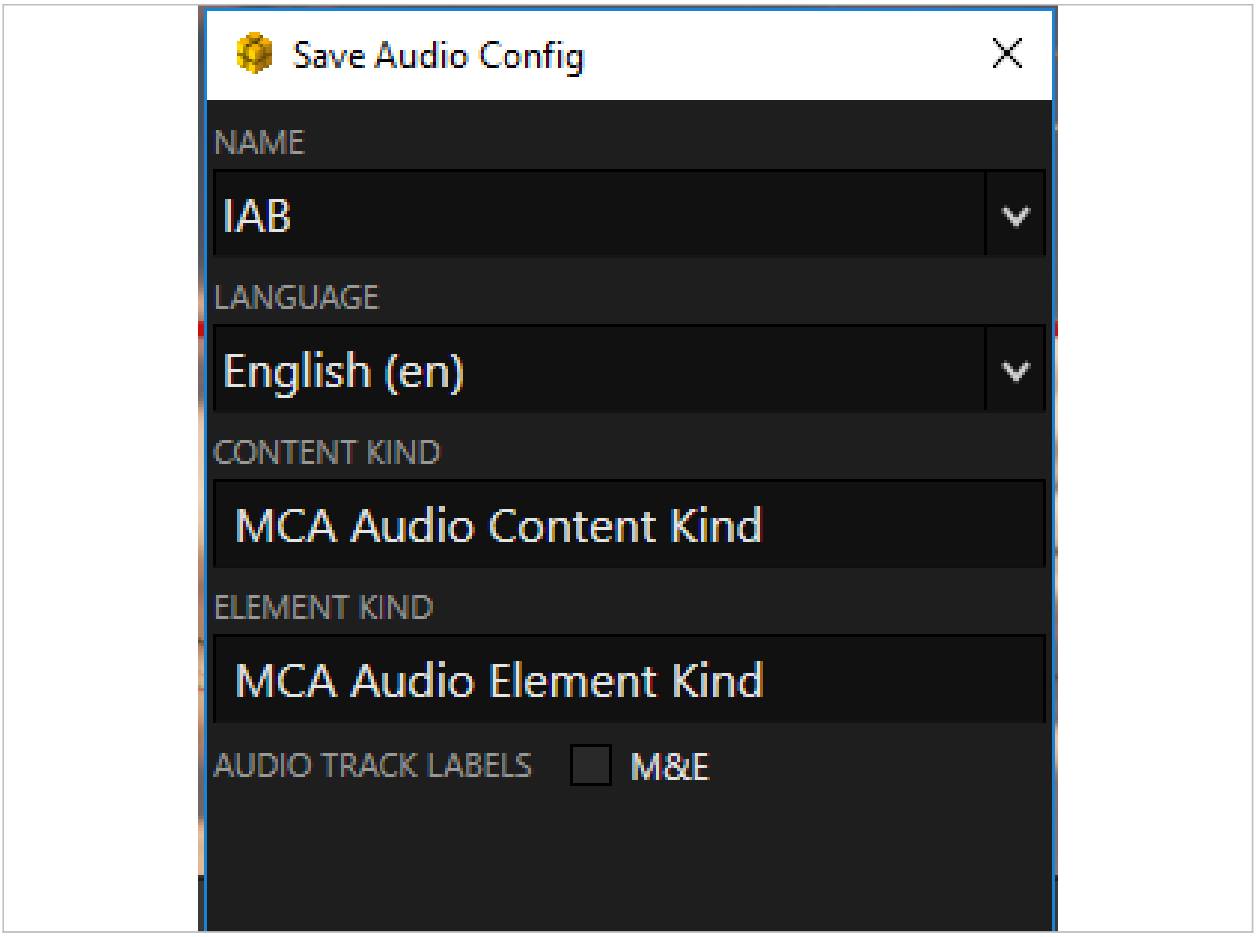
Ctrl+Left Click and Drag across the desired segments. 1. If the lasso is drawn to the left of the edit point(s), a Ripple Trim is initiated on the A side of the edits for all segments crossed in the path of the lasso. 2. If the lasso is drawn to the right of the edit point(s), a Ripple Trim is initiated on the B side of the edits for all segments crossed in the path of the lasso.

In all cases pressing escape or Left clicking in the Lasso Area will cancel the selection.


COLOR
Apply Dolby Vision Content Mapping
100-nit, BT.709, BT.1886, Full, (type 1)
Show v4 targets


DELIVERABLE CONFIGURATION
ENCODING
PRESETS
IMF Netflix
Templates
Favorites
Defaults
Import
DELIVERABLE TYPE
PRINT STATUS
IMF Netflix
NAME
imf_netflix_dovi
DELIVERY TYPE
4K/UHD Dolby Vision HDR
MODE
COLORSPACE
Lossy
RGB 12 bit
OPERATIONAL PATTERN
OP-1a
Advanced
BIT RATE
UNITS
800
Mbps
SIZING
RESOLUTION
RESIZE QUALITY
UHD 2160p 1.77:1
MTI HQ
MTI-Samsung
WIDTH
HEIGHT
3840
2160
FRAMING
METHOD
Original Clip
Center Extract


DOLBY ATMOS MONITOR FORMAT
Stereo
5.1
7.1
7.1.4
Stereo



Creating a Dolby Vision™ / Dolby Atmos® Composition

Before creating a composition for both Dolby Vision™(DoVi) and Dolby Atmos® (DoAt), make sure that you've created and configured the proper Deliverables, of which there should be, at least two; the IMF Deliverable Type and modifying the Preview to reflect the desired Content Mapping and Audio tracks to be monitored from the Atmos file.

In the "Deliverable Type", Cortex provides a number of templates for various OTT and broadcasters/studios including Netflix, hulu, Fox, HBO, Sony, Apple, etc. The templates only require the "Delivery Type" entered and the balance of properties will be automatically filled.

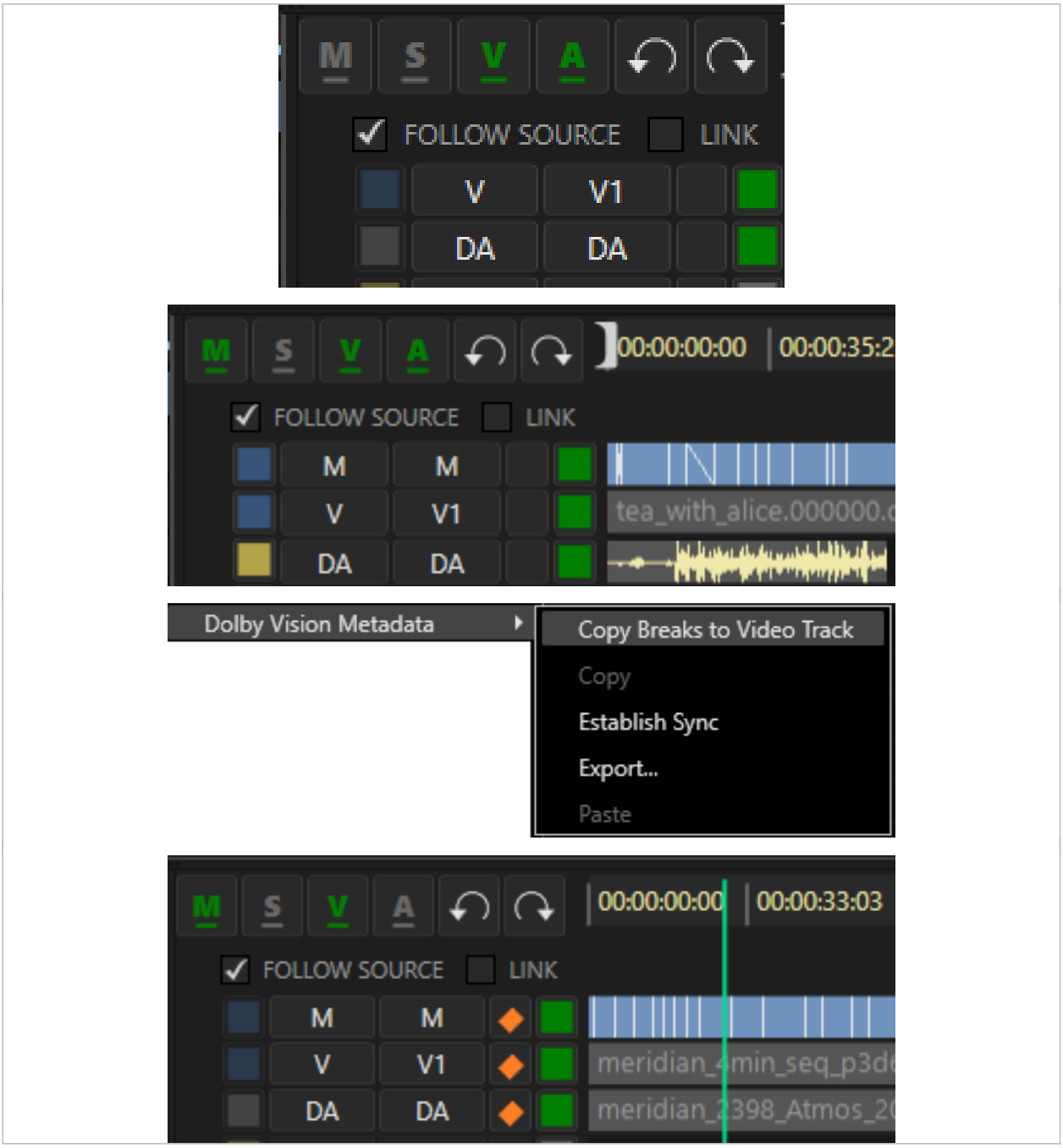
Dolby Atmos®

If your Cortex Enterprise edition is licensed for the Dolby Vision™ option, it will also be licensed for Dolby Atmos® . There are three Atmos file types, all of which contain a series of potential Monitor Formats. The ADM (Audio Definition Model) BWF is essentially a broadcast wave file with Atmos metadata.

The IAB (Immersive Audio Bitstream) MXF file is the Atmos bitstream wrapped in a MXF file, which is used for IMF creation. The DAMF (Dolby Atmos® Master Format) consists of 3 files. The one used for import is the .atmos file.

When saving the audio configuration for an IMF with Dolby Atmos® , be sure to choose IAB as the configuration type.

Depending on the chosen Deliverable Type, a Monitor Format derived from the file can be assigned to it. Be careful to choose the Monitor Format that conforms to the number of channels the Deliverable Type supports. For IMFs, the Atmos file is simply passed through without the ability to configure it.



If the IMF Composition (refer to IMF Composition) has the Dolby Atmos® option enabled, a DA track is automatically added to the timeline.

<-- This is where the Atmos® track is placed.

Dolby Vision™Metadata

When a Dolby Vision™ xml file is supplied, it is intended to be placed on the Metadata Track in sync with the master video file so that any Content Mapping will be displayed correctly.

To copy the breaks contained in the metadata track to the video track, right-click and choose Dolby Vision™ Metadata/Copy Breaks to Video Track from the context menu.

Cortex provides a method to ensure that the Metadata and other tracks remain in sync eliminating the risk of rendering the color metadata out of sync with the video. To Establish Sync between the tracks right-click and choose Dolby Vision™ Metadata/Establish Sync. Orange diamonds appear after the track names.



Missing DoVi Metadata

If for any reason illegal or missing Level 1 metadata is present in the .xml file, it will display as a purple segment and also be listed in the GAP LIST of the SHOTS tab.

Double clicking on the Gap List event will jump the timeline to the related segment.

Three Methods of Fixing Bad Metadata

There are three ways to fix illegal or missing metadata. 1. Copy DoVi metadata from other similar segments

2. Use the Trim Function to Extend Metadata from an Adjacent Segment

3. Use the Color Tool to Analyze Level 1 Content Mapping

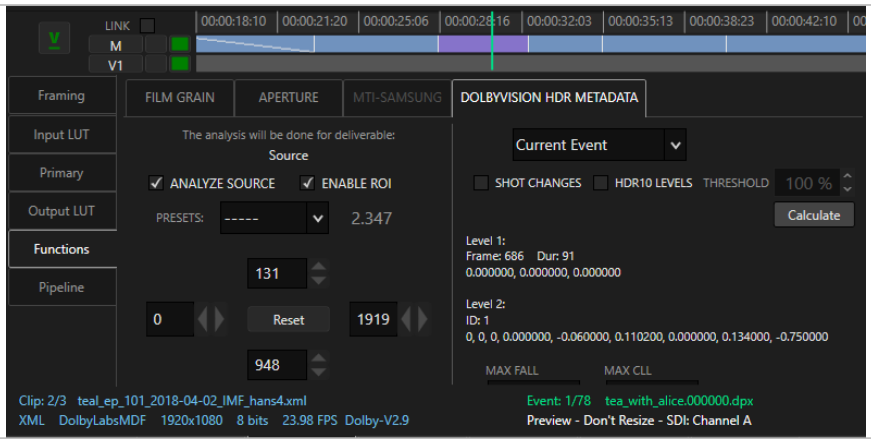
1. Copy Dolby Vision™ Metadata By locating a segment that has similar color characteristics you can copy that metadata and then paste it to the segment with bad metadata.

Click on the good segment and press Ctrl+C or right-click on the timeline and choose:

Dolby Vision™ Metadata/Copy

Click on the bad segment and press Ctrl+V or right-click on the timeline and choose:

Dolby Vision™ Metadata/Paste



2. Use the Trim Function to Extend Metadata from an Adjacent Segment MTI Film holds a patent for editing metadata tracks as you would video or audio media tracks.

Shift+click on an edit to initiate a Rolling trim and then drag the trim to the end of the segment.

When you reach the break of the next segment,

mouse up and observe the two segments have become one

3. Use the Color Tool to Analyze Level 1 Content Mapping

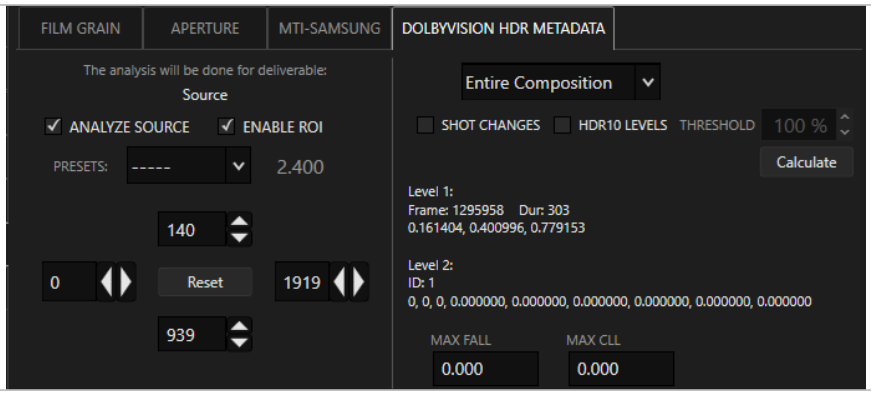
In the Color Tool, select the Dolby tab.

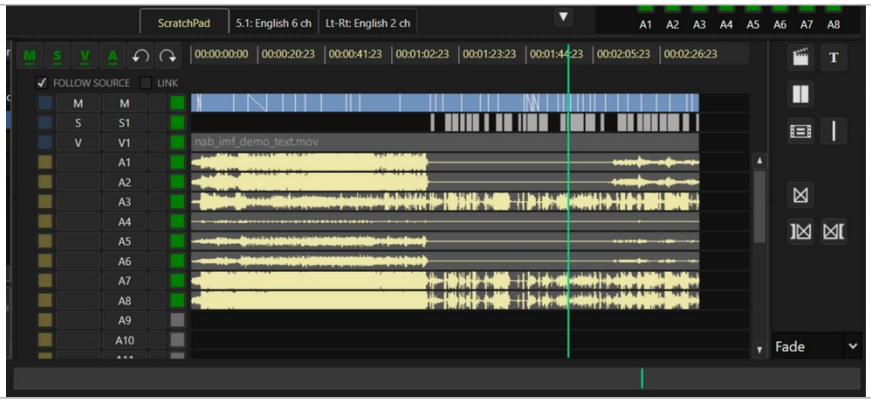
1. If you wish to Analyze the source media, enable the ANALYZE FROM SOURCE checkbox. Disabling it will allow you to choose a specific Deliverables color pipeline for the analysis by selecting its Deliverable tab above the Media Player.

2. If the picture content contains a matte, the analysis must exclude the matte from the analysis. To exclude the matte from analysis: a. On the ROI tab, check the ENABLE ROI checkbox and choose an aspect ratio from the PRESETS Drop-down list. An ROI with Red line boundaries will appear. b. If needed, adjust the boundaries of the ROI with the arrow buttons.

3. Mark the bad segment on the timeline (Z marks the segment under the cursor), then on the Analysis tab click Mark In and Mark Out to set START and END to it.

4. Click ANALYZE





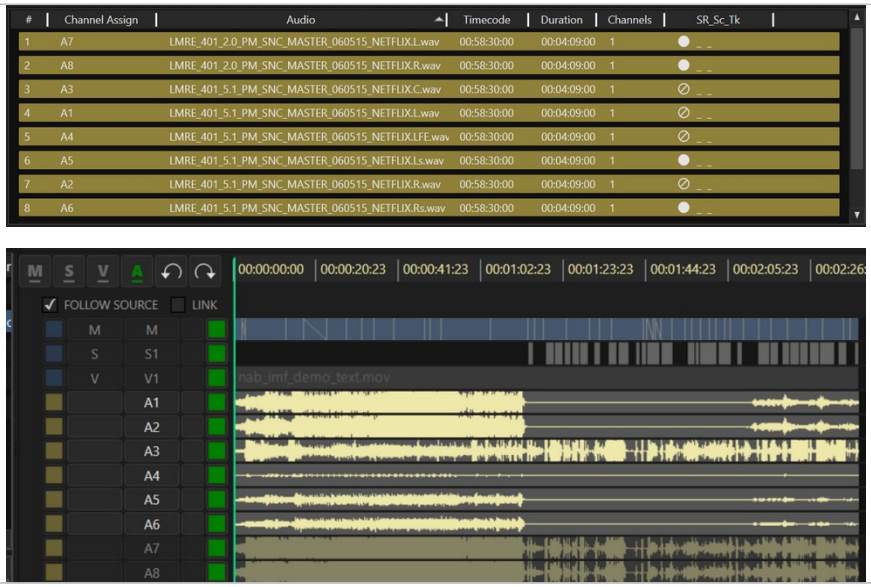
The Metadata track analysis will begin. Once the analysis is complete, the metadata track will turn blue and the Level 1 values will be displayed on the right side of the module.

Note that Level 2 (Trims) are unaffected. Cortex does not support changing Level 2 and, therefore, does not require you to purchase a license issued by Dolby.

ScratchPad Audio and Creating Audio Configurations for Compositions

The ScratchPad is used to house all audio files required to create audio configurations for all composition types. For example, the mixes provided might include 5.1 and LTRT mixes that both have to be included in the render. In this case, there would be a need to organize the files in a manner that allows for synchronization and review.

In this illustration the ScratchPad contains a total of 8 audio tracks consisting of 5.1 and LTRT mixes. The 5.1 mix is on tracks A1 - A6 and the LTRT are on A7 and A8.



Adding Audio Tracks to the ScratchPad

To Add audio tracks to the timeline, if the files are monophonic, Ctrl+click on each channel of audio in the order you wish to populate the ScratchPad timeline. In the below example, the channel assignment order starts with #4 for the 5.1 mix and ends with #2 for the LTRT mix.

Follow these steps for monophonic “Stem” tracks: 1. Ctrl+click on each channel of audio in the order that you wish to populate the ScratchPad timeline. The first clicked track will be the one you can monitor (A1) 2. Add them to the ScratchPad Timeline a. Mark the In and Out points as a 3 point edit and

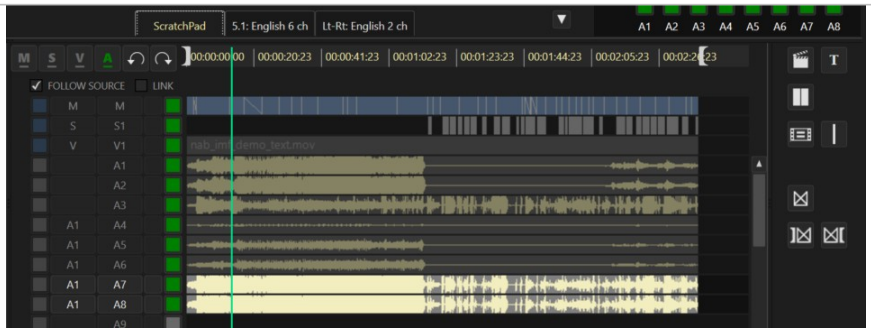
either press the G key (Overwrite) or drag to the timeline b. If all the files begin at the same picture timecode location already edited to the timeline just drag them to the timeline; no marks needed

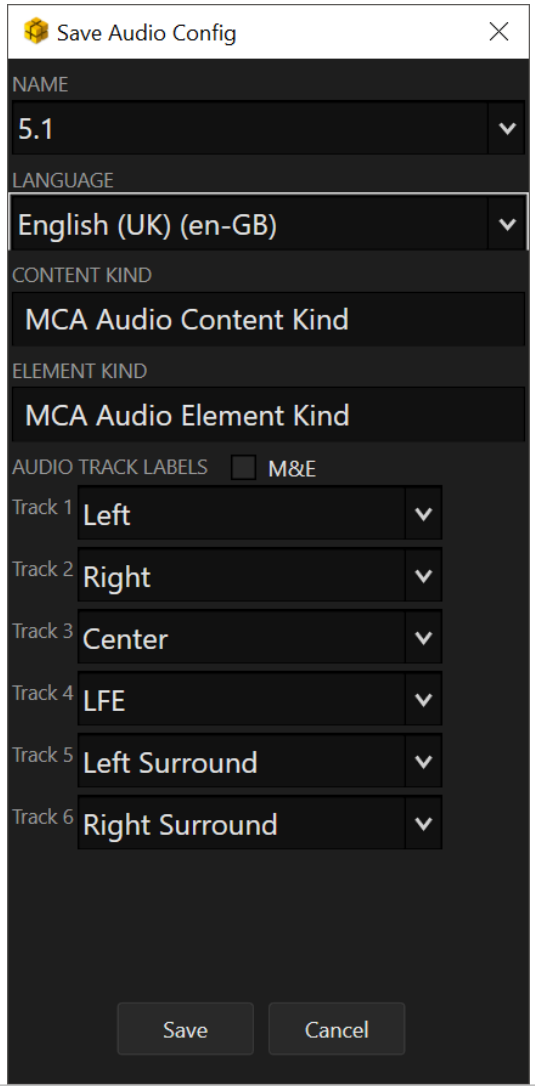
Saving Audio Configurations

For the 5.1 Mix:

1. Disable all but the 5.1 audio tracks (A1 - A6 in the example below)

2. Press Ctrl+S or right-click on the timeline and choose Save Audio Config 3. A Dialog Box appears. Fill in the metadata and click Save



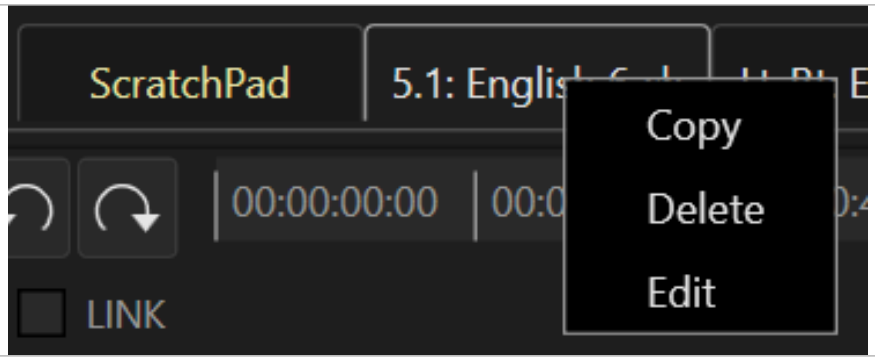


The Content Kind and the Element Kind must be filled in. Cortex uses the defaults MCA (Multi Channel Audio) Audio Content Kind and MCA Element Kind for that purpose. However, if the spec requires a different one, this is where you would enter it.

For the LTRT Mix:

1. Disable all audio tracks and then enable tracks A7 and A8 (they will be rendered to tracks 1&2). 2. Press Ctrl+S or right-click on the timeline and choose Save Audio Config 3. A Dialog Box will appear. Fill in the needed metadata and click Save

For polyphonic wav files, channel assignments are normally automatically created, however, if there are two polyphonic files, after the first file is added to the timeline, the second file will automatically be assigned to A1 and A2. Disable those tracks and assign them to the desired ones, i.e. A7 and A8.



Move an Audio Configuration

If the configurations are created in an order that is not the desired one, you can click on the configuration tab and drag it to the proper position. For example if the LTRT was created prior to the 5.1 and it needs to be last, click on either tab and drag it to overlap the one to be replaced.

Once the config overlaps the one to be replaced, release the mouse button and the config will be moved.

Copy, Delete, or Edit an Audio Configuration

There are times when it is necessary to modify an audio configuration in order to change one aspect of it, for example its language.

To Copy an Audio Configuration

Right click on the desired audio configuration tab and select Copy.

The Audio Configuration dialog appears.

The “Language” field will be empty anticipating the modification, however you can edit any aspect of the dialog. Click Save

To Delete an Audio Configuration

Right click on the desired audio configuration tab and select Delete. A message box appears. Click the Yes or No response button

To Edit an Audio Configuration

Right click on the desired audio configuration and select Edit. The Audio Configuration dialog appears. Make edits as required and then click Save.



Sync Loss Indicators

If video and audio files were synchronized in the Sync tool, and the synchronization between them is affected in the Edit Tool, a “sync loss indicator” is drawn in red on the affected tracks.

In all cases the indicator will suggest the trim action to resync the tracks.

For example, if a +10 frame trim is executed at the head of a video segment causing a loss of sync, the indicator will be as follows:

Executing the suggested trim on the audio track(s) will resync the affected tracks.

Effects and Transitions

Adding Effects in the Edit Tool is similar to adding dissolves in the Color Tool.

In the EFX Palette be sure Fade is chosen in the Effect Dropdown field. NOTE: In V5.6 only Fades are supported with more to be added in future releases.

Working With Fades

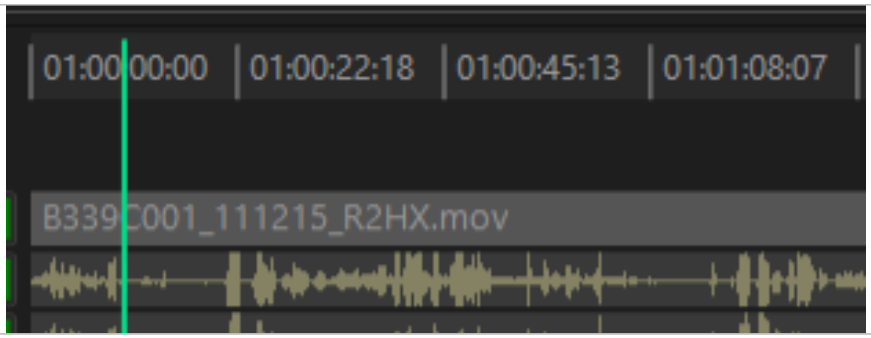
In compositions, you can add a Fade In or Fade Out to your clip.

To Create a Fade In:

1. Navigate to the frame where you wish to begin the fade (usually the first frame of a segment) 2. Click the Add Effect button or press the P key 3. Navigate to the desired Out point for your fade (for a 16 frame fade-in enter +15, which will include the first frame for a total of 16) a. Click the Mark Effect Out button or press the] key b. To lengthen or shorten the fade, adjust the Mark Effect Out

To Create a Fade Out:

1. Navigate to the frame where you wish to end the fade (usually the last frame of a segment). 2. Click the Add Effect button or press the P key. 3. Navigate to the desired In point for your fade (for a 24 frame fade out enter -23, which will include the last frame for a total of 24) a. Click the Mark Effect Out button or press the] key. b. To lengthen or shorten the fade, adjust the Mark Effect In



Effect Symbols

Fades In and Out are displayed as two blue diagonal lines beginning and ending at the center of the track respectively. Color Dissolves are white diagonal lines beginning at the top of the track and ending at the bottom.

To Delete an Effect

Go to the beginning or anywhere in the effect and press Ctrl+P

P Add Effect (Fade In or Out only in this version) Ctrl+P Delete Effect

[Mark IN or modify the in point of the effect Shift+[Go to Previous Effect

] Mark OUT or modify the out point of the effect Shift+] Go to Next Effect

Navigating the Timeline

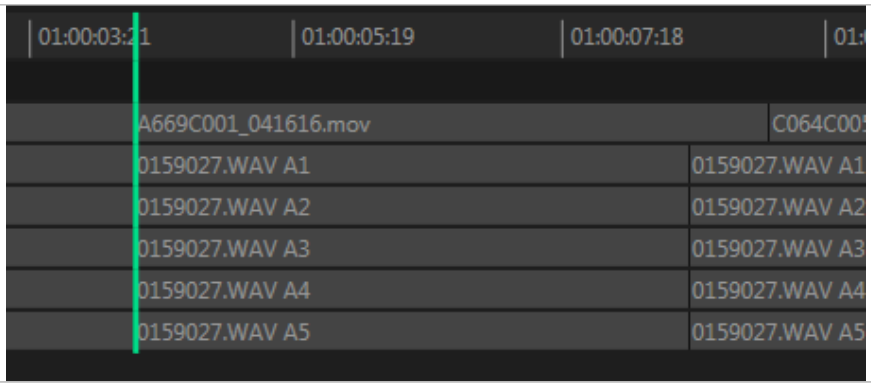
In addition to playing or jogging forward/reverse and jumping between breaks, you can use the Timecode Bar to scrub the timeline. Click anywhere on the Timecode Bar at the top of the timeline and the playhead will jump to that location. Drag up or downstream to scrub.

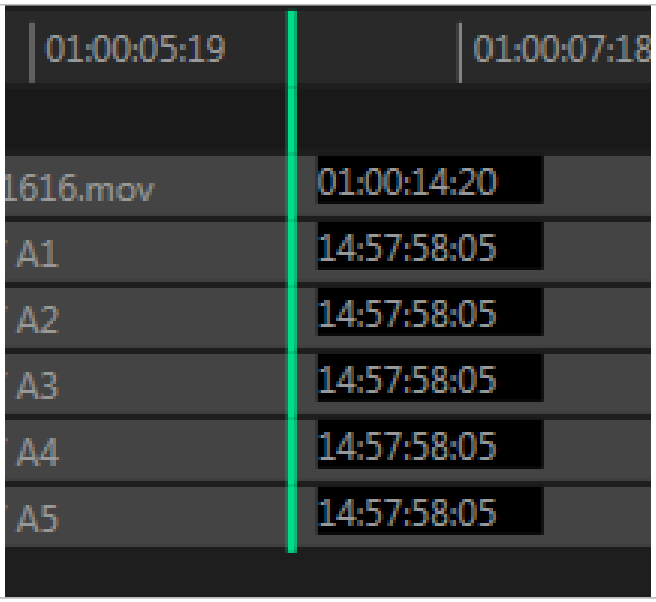
Searching a Timecode

You can enter a timecode directly into the composition Timecode Position Field. Just start typing on the number pad and press enter to jump to the timecode location. Use the . (dot) key to enter leading or following 00s.

Moving by Timecode or Frames

To navigate by moving by timecode or frames use the + or - keys on the number pad. Pressing the plus or minus key once enters a timecode value. Pressing the plus or minus buttons twice enters a value in frames. Press enter and the cursor will jump by the input value.





Jumping Edit by Edit

When focus is on the composition, the E and R or UP and Down arrow keys will jump to the next or previous edit points based on which tracks are enabled.

If the Media Player is focused on a clips bin, pressing Shift+S or Shift+F will initially switch focus to the composition. Subsequent presses will move in the desired direction edit by edit regardless of which tracks are enabled.

Showing Source Timecode in the Composition

To show/hide the timecode of source media contained in the composition, place the playhead at the desired position and press F8 or right-click and choose “Show Source Timecodes” in the Context Menu. When showing, pressing play will hide the timecodes.

Zooming the Timeline

There are several methods to zoom in or out of the timeline.

1. At the bottom of the UI there is a control bar that zooms in or out of the timeline. 2. Hovering the mouse cursor over the timeline and scrolling the mouse wheel up or down will zoom in and out of the timeline based on the location of the mouse cursor. 3. Pressing Shift while scrolling the mouse wheel up or down will alter the height of the tracks. 4. Pressing Ctrl and scrolling the mouse wheel up or down will scroll the timeline up or downstream. 5. Pressing Shift and + or - on the keyboard will zoom in and out respectively. 6. Pressing Ctrl+Shift and - will fit the entire timeline in the composition window.

Double clicking anywhere on the Timeline Thumb/Slider located at the bottom of the screen will also fit the entire timeline in the composition window.

Matchframes

Using the Matchframe functions in Cortex are extremely helpful in finding specific corresponding source media used in the composition and vice versa. It can also be used to “trim” the head and tail of shots as opposed to using the graphical trim functions (explained earlier in Trim Types). The Matchframe command can be invoked by pressing the M key or clicking the Matchframe button in the EFX Palette.

For this section, the keyboard shortcuts will be referenced.

Simple Matchframe

With the composition focused and the Media Player sitting on the desired frame you wish to match, press M. This finds the corresponding source clip/frame and loads it in the Source Media Player. Conversely, if a clip has been used in the composition and the Matchframe command is invoked while focused on the source clip, the corresponding matchframe will be loaded in Composition Media Player.

NOTE: A simple matchframe leaves the timecode registers unchanged,

Lengthening the Tail of a Shot

To lengthen a shot while located at the last frame of a shot, press Shift+M. This will load the matching timecode values plus one frame into both the source and composition Mark In registers, leaving the Mark Out registers empty and ready for input. Focus is initially placed on the Source Media Player. After an out point is entered, an Overwrite or Insert edit can be performed.

Note: When inserting Black, you can use the Shift+H command on any and all tracks. It will automatically use the Black Level assigned when the composition was created. Set a Mark in and Out on the timeline, enable the tracks required and press Shift+H.

Lengthening the Head of a Shot as an Overwrite

To lengthen a shot as an overwrite edit while located at the first frame of a shot, press Ctrl+M. This will load the matching timecode values minus one frame into both the source and composition Mark Out registers, leaving the Mark In registers empty and ready for input. Focus is initially placed on the Source Media Player. After an In point is entered, an Overwrite edit can be performed.

Lengthening the Head of a Shot as an Insert

To lengthen a shot as an insert edit while located at the first frame of a shot, press Ctrl+Shift+M. This will load the matching timecode values minus one frame into both the source Mark Out and composition Mark In registers, leaving the other registers empty and ready for input. Focus is initially placed on the Source Media Player. After an additional mark is entered, an Insert edit can be performed.

Reversing a Jump Cut

To undo a jump cut, locate the composition timeline cursor at the jump cut. Then press Shift+M or Ctrl+M. The new marks present a marked range that will repair the jump cut. Then click the Insert button.

Run-throughs now appear on the timeline indicating an edit has been made where the adjacent timecodes are continuous. Run-throughs can be cleared individually by placing the timeline cursor on an edit point with a Run-through and pressing Ctrl+, (comma) or Ctrl+clicking the Add Edit button. To clear them all at once and with the timeline cursor located anywhere on the timeline you can: 1. Press Ctrl+Shift+,

2. Press Ctrl+Shift+Click the Add Edit button 3. Right click on the timeline and select “Clear run through edits” from the Context Menu.

Edit Function Keys

Trim Types

Gap/Overwrite Trim Left Click & Drag One sided trim

Ripple Trim Ctrl+Left Click & Drag One sided trim with ripple

Rolling Trim Shift+Left Click & Drag Two sided trim

Slide Trim Alt+Left Click & Drag Click near center of segment

Slip Trim Shift+Alt+Left Click & Drag Click near center of segment

Selecting Segments

Select a single segment Left Click

Select additional segments Shift+Left Click Selects contiguous segments

Select additional segments Ctrl+Left Click For non-contiguous segments

Select current & upstream Shift+Alt+Click segments

Select current & downstream Ctrl+Alt+Click segments

Lasso Segments From the Neutral Bar Lasso and Drag downward

Repositioning Segments

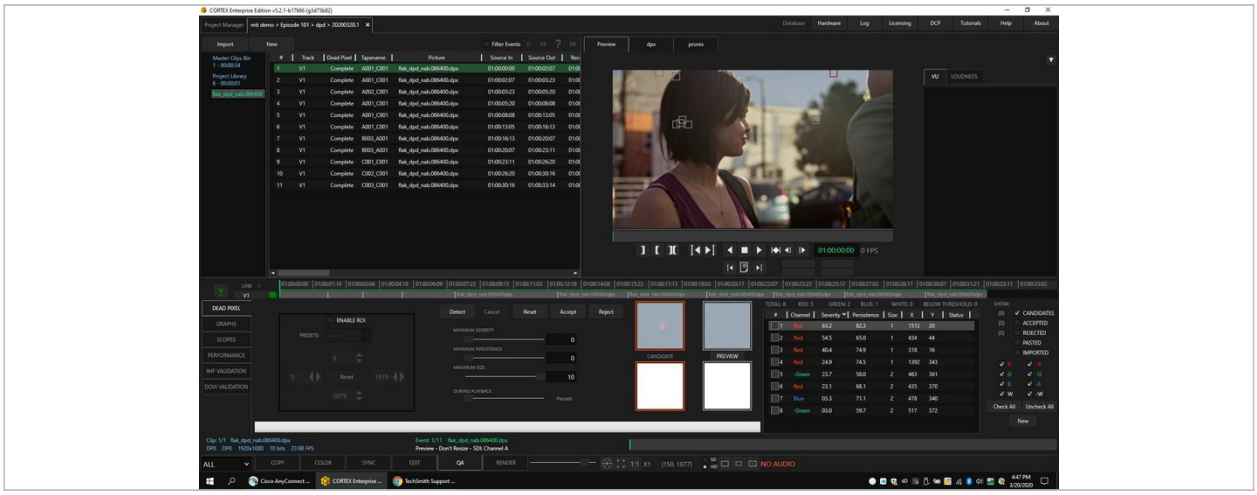
Reposition in Gap mode Left Click & Drag to location Segment overwrites and leaves a gap

Reposition with Ripple mode Ctrl+Left Click & Drag to location Segment Bifurcates overlapping segment area

Deleting Segments

Delete a segment with Gap Left Click and click Lift or press the Deletes the segment and leaves a Delete key gap

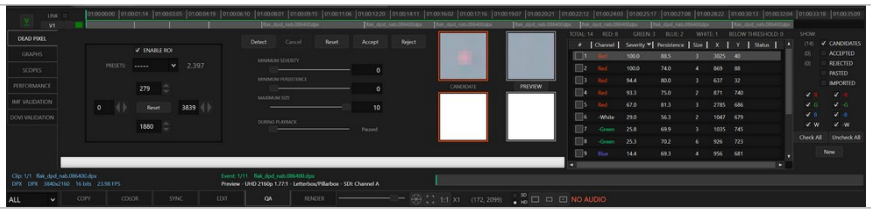
Delete a segment with Ripple Left Click and click Extract or press Deletes the segment and ripples Ctrl+Delete downstream segments



The QA Tool

The QA Tool provides modules for: 1. Dead Pixel Detection and Correction 2. Radiation Artifact Detection and Correction 3. Graphical Data Analysis for: a. Video Levels b. Bit Rate c. Mattes d. Audio Levels e. Dead Pixels 4. Video Scopes (Scopes can also be detached and displayed on another monitor) - F12 will display a. Waveform with various scales b. Vectorscope c. Gamut Display 5. Audio Meters a. VU b. Loudness 6. System performance monitoring 7. IMF Photron Validation 8. DCP Validation 9. Dolby Vision™ Metadata Validation.

Note: Dead Pixel Detection is available in all versions of Cortex. In the DIT editions only source clips can be detected. In the Enterprise, Dailies, and QC editions, source clips and compositions can be detected. Dead Pixel Correction is only available in the Enterprise edition.



The Dead Pixel Module

The Dead Pixel module provides the ability to detect and correct dead pixels found in picture media. Dead Pixels, sometimes referred to as “Stuck” pixels, are caused by defective spots of the camera image sensor. In digital cameras, defective pixels fail to sense light levels correctly, whereas defective pixels in LCDs fail to reproduce light levels correctly.

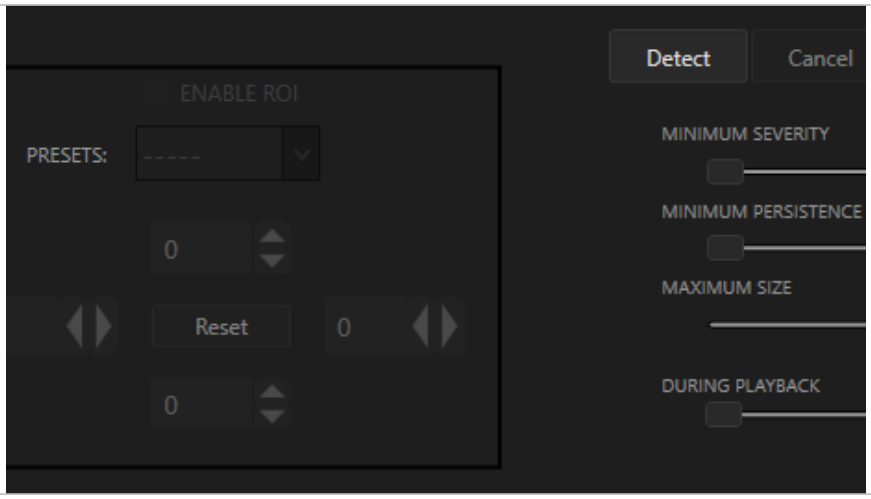
The Dead Pixel module can detect single-take camera files or compositions that contain edited material. As of version v7.0 a Workflow Action called DEAD PIXEL can be launched through the Project Manager and this tool will build a composition reel and automatically detect dead pixels with an MTai analysis.

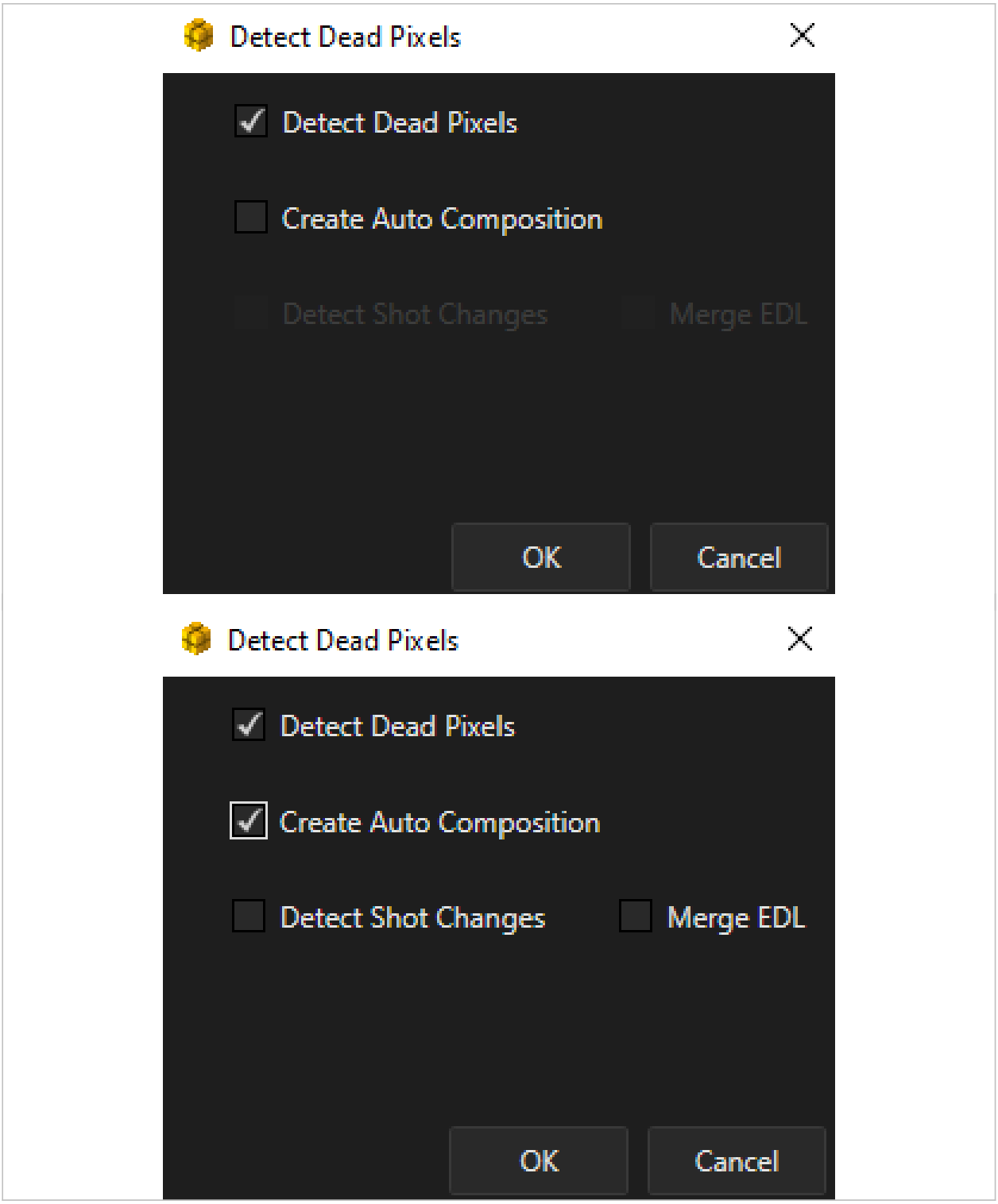
NOTE: Cortex can correct a third party detection with the importation of .csv files. For detection, we recommend using the highest quality version of the media in order to ensure the greatest level of accuracy.

Preparing Deliverables for Dead Pixel Correction

The Dead Pixel module uses the Preview deliverable color pipeline for its analysis and, therefore, must have the deliverable properties “Apply Creative Color and Effects” and “Repair Dead Pixels” enabled. The other deliverables should disable Apply Creative Color and Effects but leave Repair Dead Pixels enabled as explained below. When detecting ungraded camera or HDR clips, it is recommended to increase the saturation of the clips prior to detection using the ColorTool. This enhances the detection process and increases the contrast of the dead pixels.

Preparing the Deliverables as instructed allows changes to saturation without ultimately affecting the image when rendering the Deliverables of choice.





Detecting a Single Camera Clip

To initiate a detection, select the intended media and click the Detect button, found just below the Master Clips Bin.

If

the selected clip is a single camera file, ensure that “Detect Dead Pixels” is checked and then click “OK.”

Detecting Edited Media

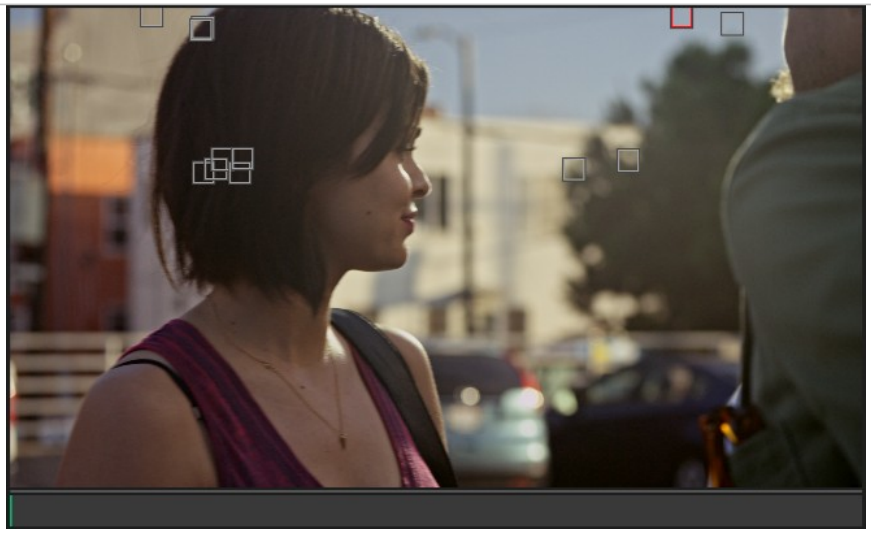
If the media contains edits, you will need to create a composition by enabling “Create Auto Composition.” There are three choices how edits are applied: 1. By merging an EDL 2. Using Cortex’s MTai shot detection 3. By copying the breaks already present on the composition’s Metadata track.

It is recommended to use an EDL. This saves time by eliminating the need to detect and vet the edits.

If you enable “Merge EDL,” an explorer window will open. Navigate to and select the corresponding EDL. Once selected, the media will appear on a new composition timeline with the cuts in place.

If you click “Detect Shot Changes,” the media is placed onto the timeline and the edit points appear as the MTai shot detection progresses.

In either case, during pixel and/or MTai shot detection, green progress bars appear above each shot on the timeline. Cortex detects all the shots in the composition simultaneously and refreshes every 30 seconds allowing work to begin while the detection continues in the background.



#	Channel	Severity	Persistence	Size	X	Y
1	Red	82.78	100.00	4	1512	20
2	Red	79.57	75.75	4	435	370
3	Red	78.21	93.01	4	434	44
4	Red	66.61	95.36	4	318	16
5	Red	56.46	73.84	5	1392	343
6	Red	27.14	62.37	5	463	362
7	Blue	11.27	61.70	4	478	340
8	Red	09.94	42.47	4	517	371
9	-Red	09.32	61.05	1	1270	363
10	-Red	03.85	39.33	2	523	339

The Detection Workflow

As the detection progresses, Cortex generates a Dead Pixel List of “Candidates” for each shot. They are displayed in the Media Player contained in boxes.

“Candidates” are pixels that Cortex has determined are likely dead. All pixels in the list are initially assigned Candidate status.

In the Dead Pixel List, pixels are displayed in rows with values or scores for their Color channel, Severity (or contrast), and Persistence (the visibility of the candidate in the shot), Size, X/Y coordinates, and Status.

In the Media Player, dead pixel candidates are displayed as boxes comprising two parts. a core and border.

The core reflects the color channel of the dead pixel candidate as follows: Red -Red

Green -Green

Blue -Blue

White -White

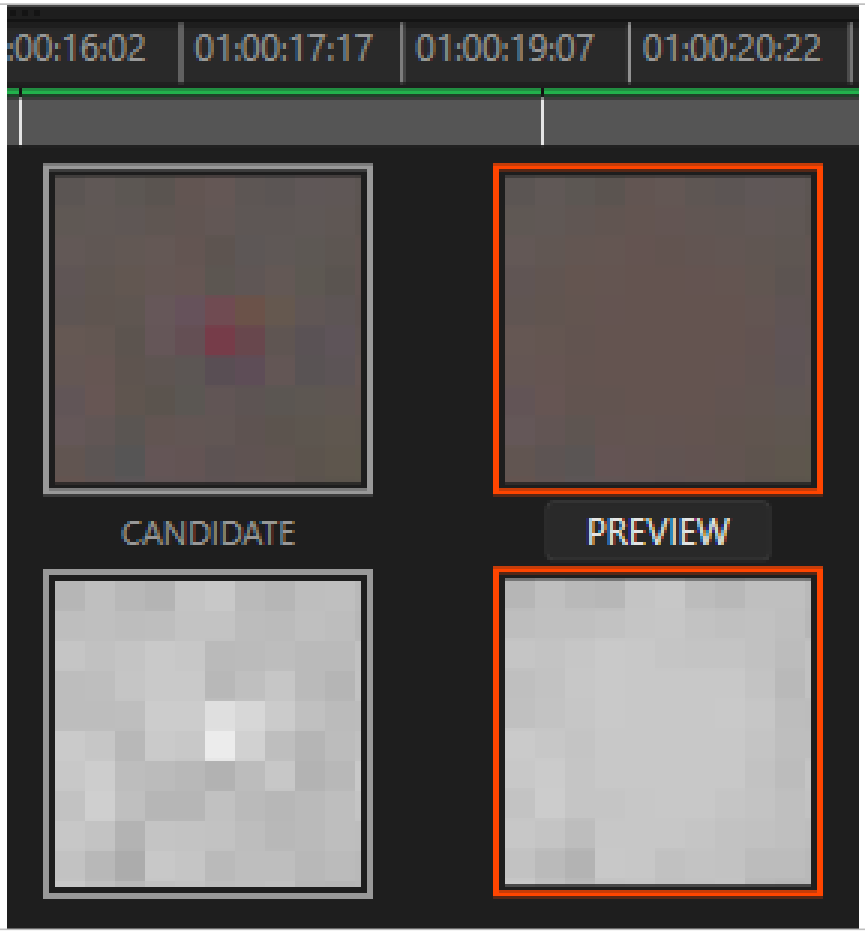
The border represents the status of the pixel: Color Status

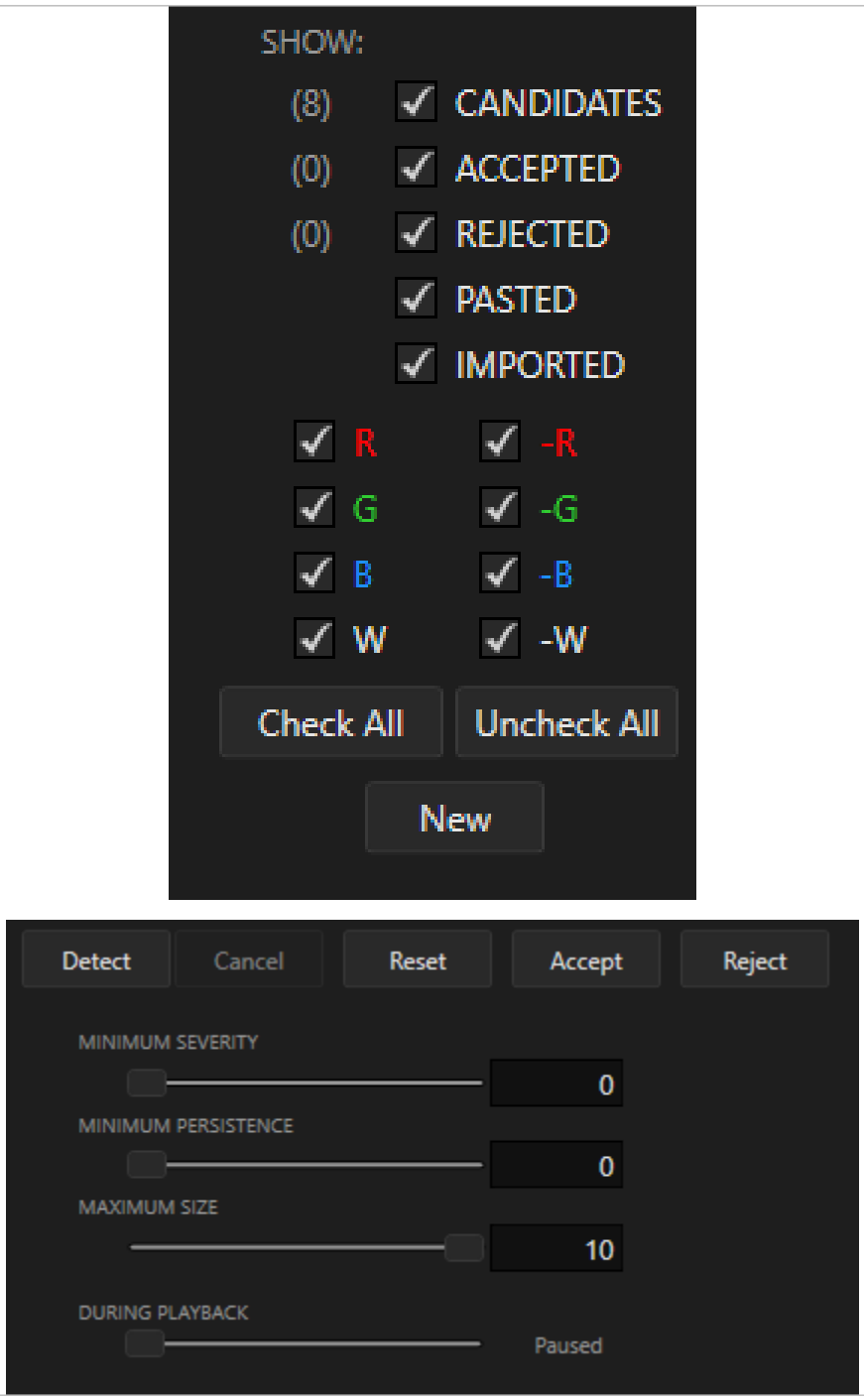
Grey Candidate

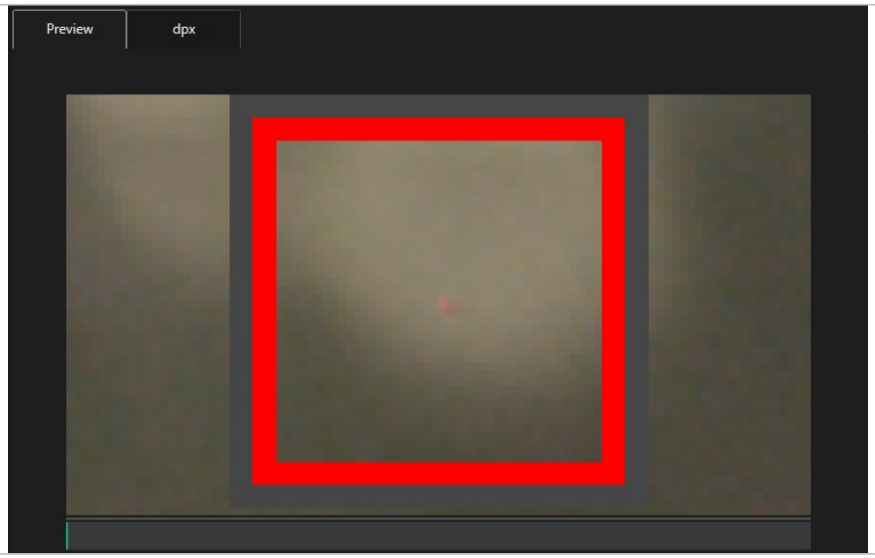
White Accepted

Black Rejected

Same color as the core During Preview




SHOW:
(8)
CANDIDATES
(0)
ACCEPTED
(0)
REJECTED
PASTED
IMPORTED
R
-R
G
-G
B
-B
W
-W
Check All
Uncheck All
New
Detect
Cancel
Reset
Accept
Reject
MINIMUM SEVERITY
0
MINIMUM PERSISTENCE
0
MAXIMUM SIZE
10
DURING PLAYBACK
Paused



Selecting a Pixel

Pixels can be selected by left or right-clicking the center of the box or on the list item.

The selected pixel is displayed in two sets of magnified boxes. The left set of boxes shows the pixel defect before the fix. The top box is displayed in full RGB color. The bottom box is a black & white display of the pixel's affected color channel.

The right set of windows shows the pixel candidate after the Cortex fix.

The Dead Pixel List can be filtered in several ways:

Checkboxes along the side of the UI can filter out pixels based upon their status (Candidate, Accepted, Rejected, Pasted or Imported). They can also be filtered from the list based on their color channel.

Using the sliders, Pixels can be filtered based on user-defined Minimum Severity and Persistence, and Maximum Size.

The number of pixels detected can potentially number 100 per shot. The filter sliders help eliminate pixels with low scores that are not visible to the eye and, therefore, are hidden to lessen screen clutter.

The mouse wheel is used to zoom in on the Media Player. Scrolling up zooms in, down zooms out. Holding Shift while scrolling, focuses the zoom on the selected pixel. Double clicking on the Media Player returns the display to the full frame view.

Repeatedly pressing the T key or clicking the PREVIEW button toggles a preview of the fix before and after.

Segment Play

The "Segment Play" button instructs Cortex to only play up to the end of the current segment, rather than move into subsequent segments. You can select this play mode by clicking the button or by pressing Ctrl+Shift+C. The current segment will be colored orange indicating Segment Play is active.

Segment Play mode is helpful when trying to determine the status of a pixel since it limits the cursor to the current shot, preventing the cursor from moving to the next shot where another pixel would be automatically selected. You can, however, still jump to the beginning of the next and previous shots using the corresponding navigation functions.

Assigning Status

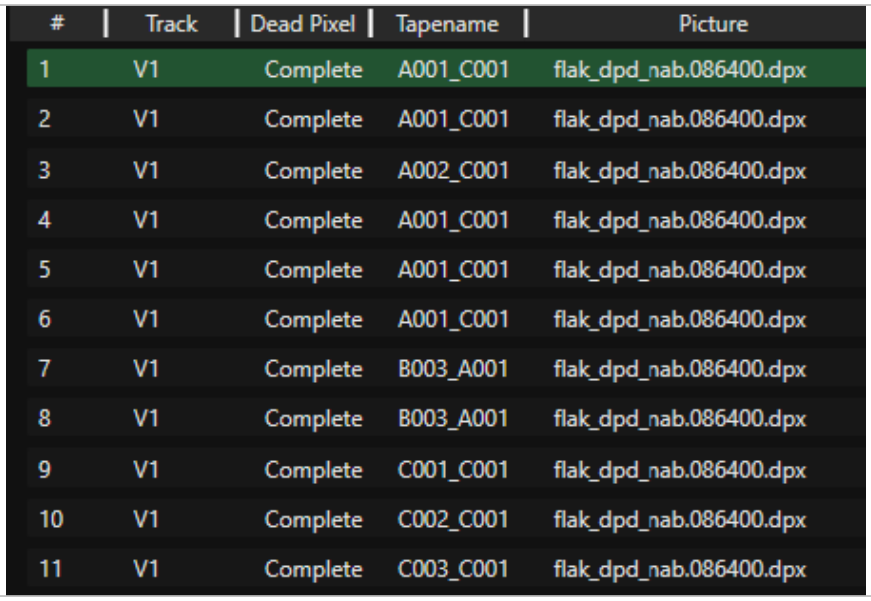
As stated, every detected pixel defect is assigned a default status of “Candidate”. The user determines which candidates will be Accepted, Rejected, Copied/Pasted, Imported, or left as a Candidate.

Accepted pixels are added to the database for rendering the repairs. Rejected pixels are filtered from the render. Pixels that are Pasted inherit the status of the copied pixels.

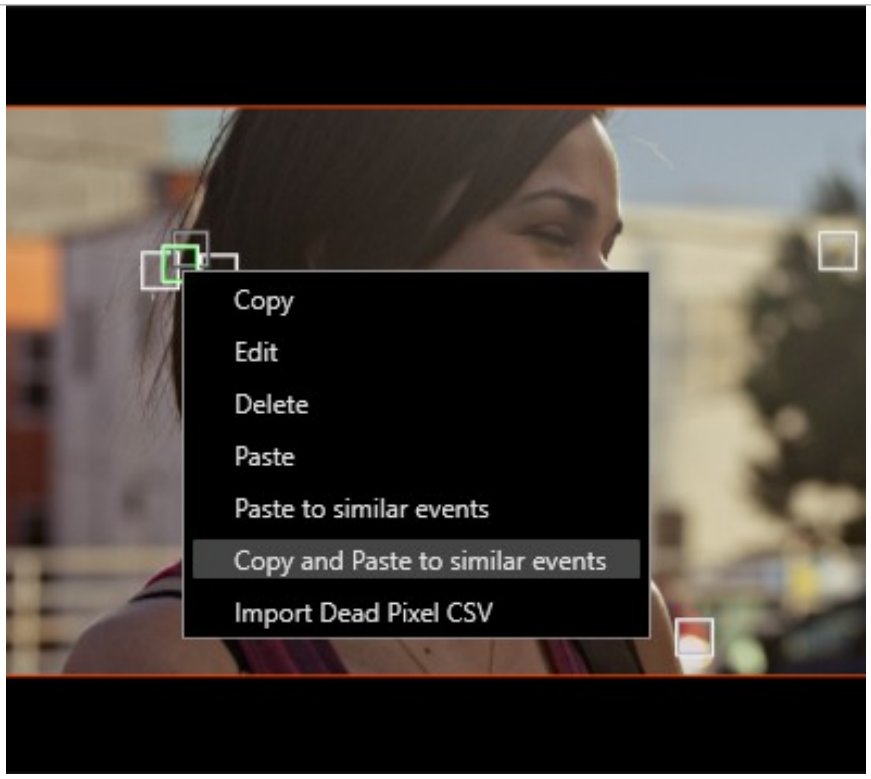
Automatic Status Rippling

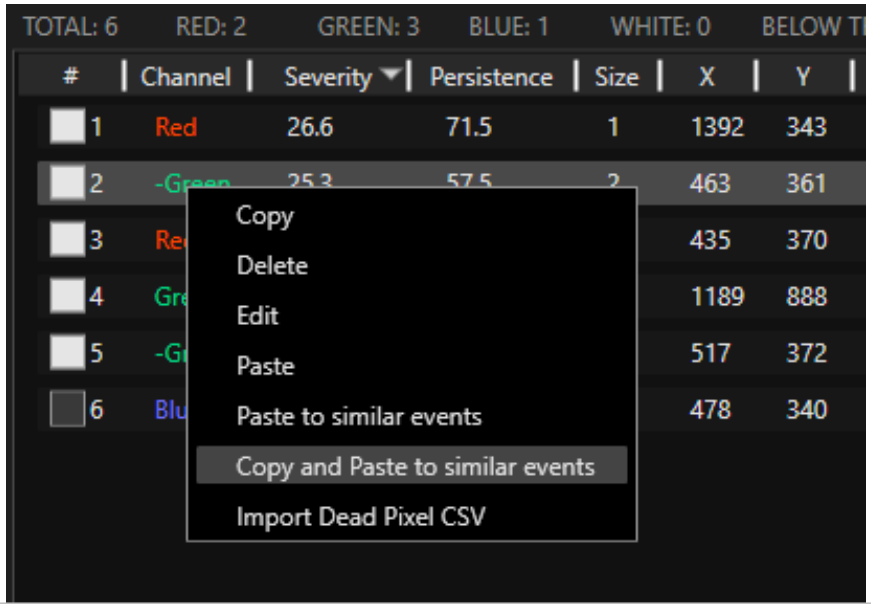
By x/y coordinates

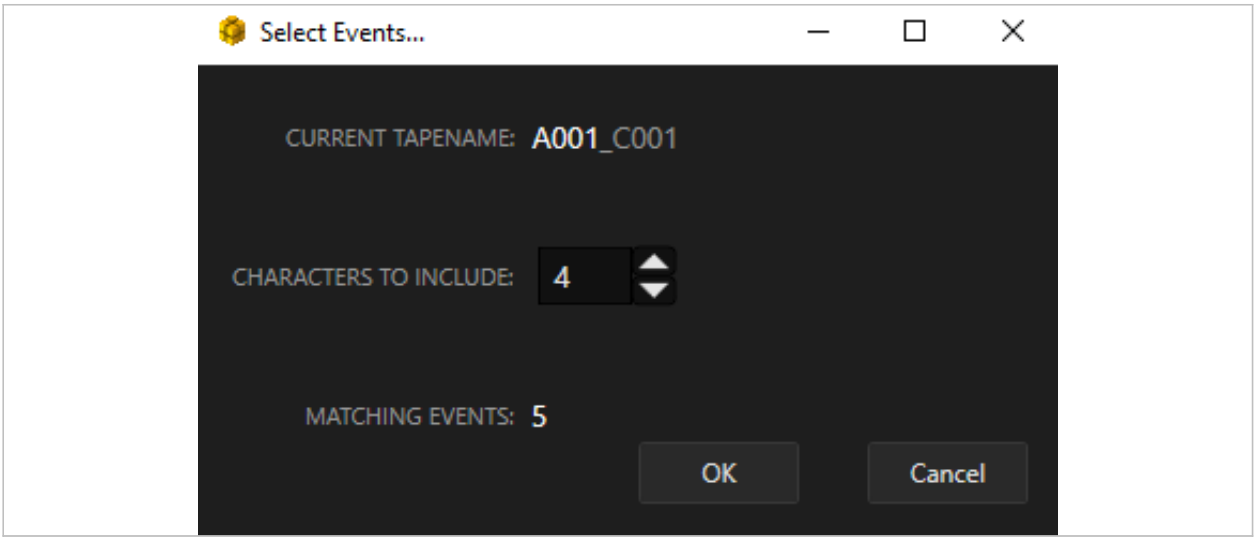
Since dead pixels are an inherent camera sensor defect, they tend to repeat throughout a composition of edited content based on repetition of camera use. With this in mind, when a status is assigned to a pixel, Cortex ripples through the timeline and automatically assigns the same status to pixels with matching x/y coordinates. This expedites the approval process, saving time in the manual operation of dead pixel detection.



#	Track	Dead Pixel	Tapename	Picture
1	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
2	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
3	V1	Complete	A002_C001	flak_dpd_nab.086400.dpx
4	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
5	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
6	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
7	V1	Complete	B003_A001	flak_dpd_nab.086400.dpx
8	V1	Complete	B003_A001	flak_dpd_nab.086400.dpx
9	V1	Complete	C001_C001	flak_dpd_nab.086400.dpx
10	V1	Complete	C002_C001	flak_dpd_nab.086400.dpx
11	V1	Complete	C003_C001	flak_dpd_nab.086400.dpx


Copy
Edit
Delete
Paste
Paste to similar events
Copy and Paste to similar events
Import Dead Pixel CSV


TOTAL: 6
RED: 2
GREEN: 3
BLUE: 1
WHITE: 0
BELOW TI
| Channel | Severity | Persistence | Size | X | Y
1 Red 26.6 71.5 1 1392 343
2 -Green 25.3 57.5 2 463 361
3 Re 435 370
4 Gre 1189 888
5 -Gr 517 372
6 Blu 478 340
Copy
Delete
Edit
Paste
Paste to similar events
Copy and Paste to similar events
Import Dead Pixel CSV



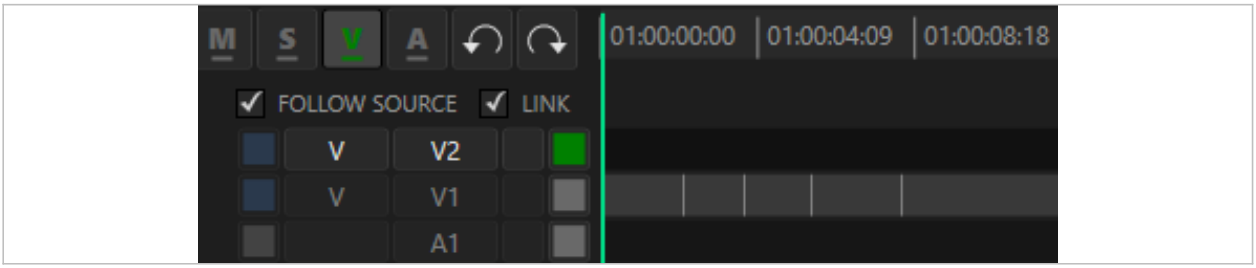
By Tapename

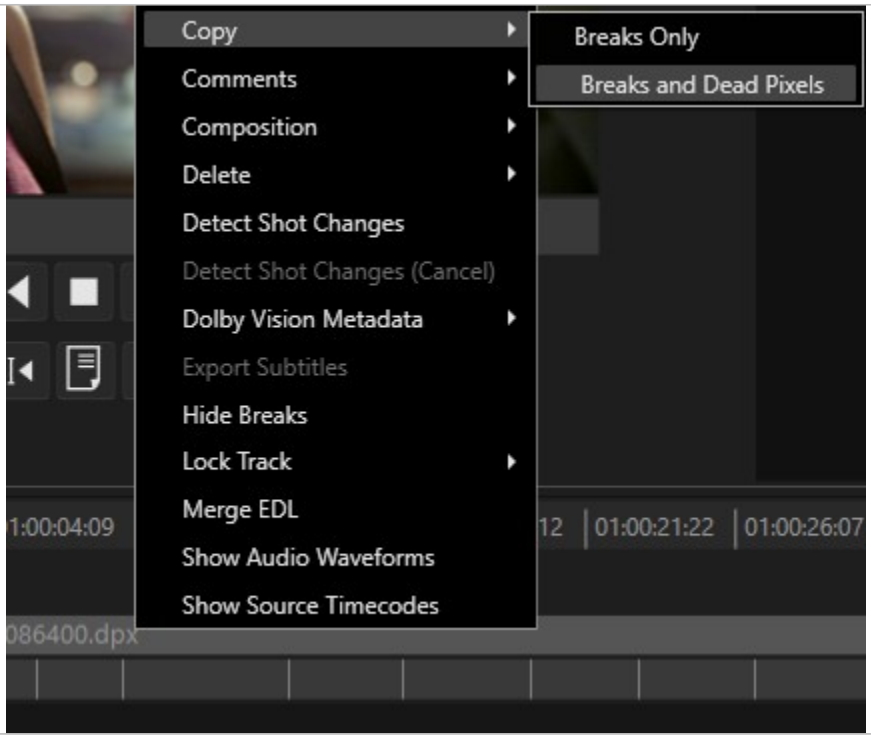
During the course of the workflow, the user may observe a Candidate present in one shot, however, missing from a similar shot captured by the same camera.

If an EDL was merged to the composition, the “Tapename” column can identify the camera source for each event in the composition. Another method of automating status assignment is to use the Copy and Paste to Similar Events function.

With the pixel you intend to copy selected, right-click on the Media Player or in the List view and choose, “Copy and paste to similar events.”

The Select Events Dialog Box opens. Using the up and down buttons, choose how many characters are included in the search criteria for matching camera rolls. For example, if 4 characters are included, Cortex will paste the pixel record to all events captured in the camera roll.





Copying and Pasting a Pixel Record

If needed, a pixel record can be copied from one shot and pasted to another. Right click on the pixel record and choose “Copy” from the context menu. Navigate to the shot you wish to paste in and then right-click and choose paste. The pasted pixel has the identical status to the copied pixel.

Deleting a Pixel Record

To delete a pixel record, right-click on it and choose Delete from the context menu.

Editing a Pixel Record

At times it might be necessary to edit the metadata, such as its x and y coordinates. Right click on the pixel and choose Edit from the context menu. Modify the property and click Okay.

Copying and Pasting Dead Pixel Records to New Media

In the event that you have media that matches a composition that has already been detected, Cortex allows for copying the original Dead Pixel Detection to the newly imported media. For example, if detection has been processed on a Color Master, and it is required to commit those decisions to the Assembly Master, Cortex provides the ability to do so using the Edit and QA tools.

Note: The media needs to match cut for cut and is pixel accurate in both resolution and aspect ratio to the original media.

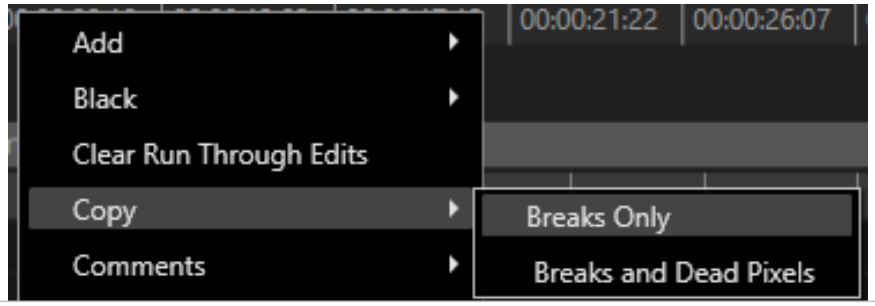
In the Edit Tool, import the new media. Add a video layer to the existing composition and edit the new media to V2.

Be sure that the media was cut in accurately by toggling the green Monitor button next to V2, turning the layer off and on to reveal V1.

With the new media on the timeline, right-click and choose “Copy/Breaks and Dead Pixels” from the context menu. The dead pixel detection and breaks from V1 to V2 are copied.

Once complete, rendering can begin for the new media.

	A	B	C	D
1	File_Name	X	Y	RecordStartTimecode
2	80213572 – Demo: Season 1: Pilot - 101	272	1469	00:00:00:15
3	80213572 – Demo: Season 1: Pilot - 101	272	1468	00:00:01:07
4	80213572 – Demo: Season 1: Pilot - 101	304	1224	00:00:02:23
5	80213572 – Demo: Season 1: Pilot - 101	272	1468	00:00:04:17
6	80213572 – Demo: Season 1: Pilot - 101	272	1469	00:00:04:17
7	80213572 – Demo: Season 1: Pilot - 101	272	1469	00:00:07:02
8	80213572 – Demo: Season 1: Pilot - 101	272	1469	00:00:07:02
9	80213572 – Demo: Season 1: Pilot - 101	304	1224	00:00:09:12
10	80213572 – Demo: Season 1: Pilot - 101	523	772	00:00:13:22
11	80213572 – Demo: Season 1: Pilot - 101	523	772	00:00:13:22
12	80213572 – Demo: Season 1: Pilot - 101	516	632	00:00:18:11
13	80213572 – Demo: Season 1: Pilot - 101	516	632	00:00:21:11
14	80213572 – Demo: Season 1: Pilot - 101	3284	608	00:00:24:22



Importing A Dead Pixel CSV Provided by a Third Party QC

In the case where third party QC departments have run detection, either using Cortex or another application, Cortex can import a properly formatted .csv file that directs the software to the x/y coordinates of the detected pixels. Once the file is imported, Cortex can then render the corrections to the required deliverables.

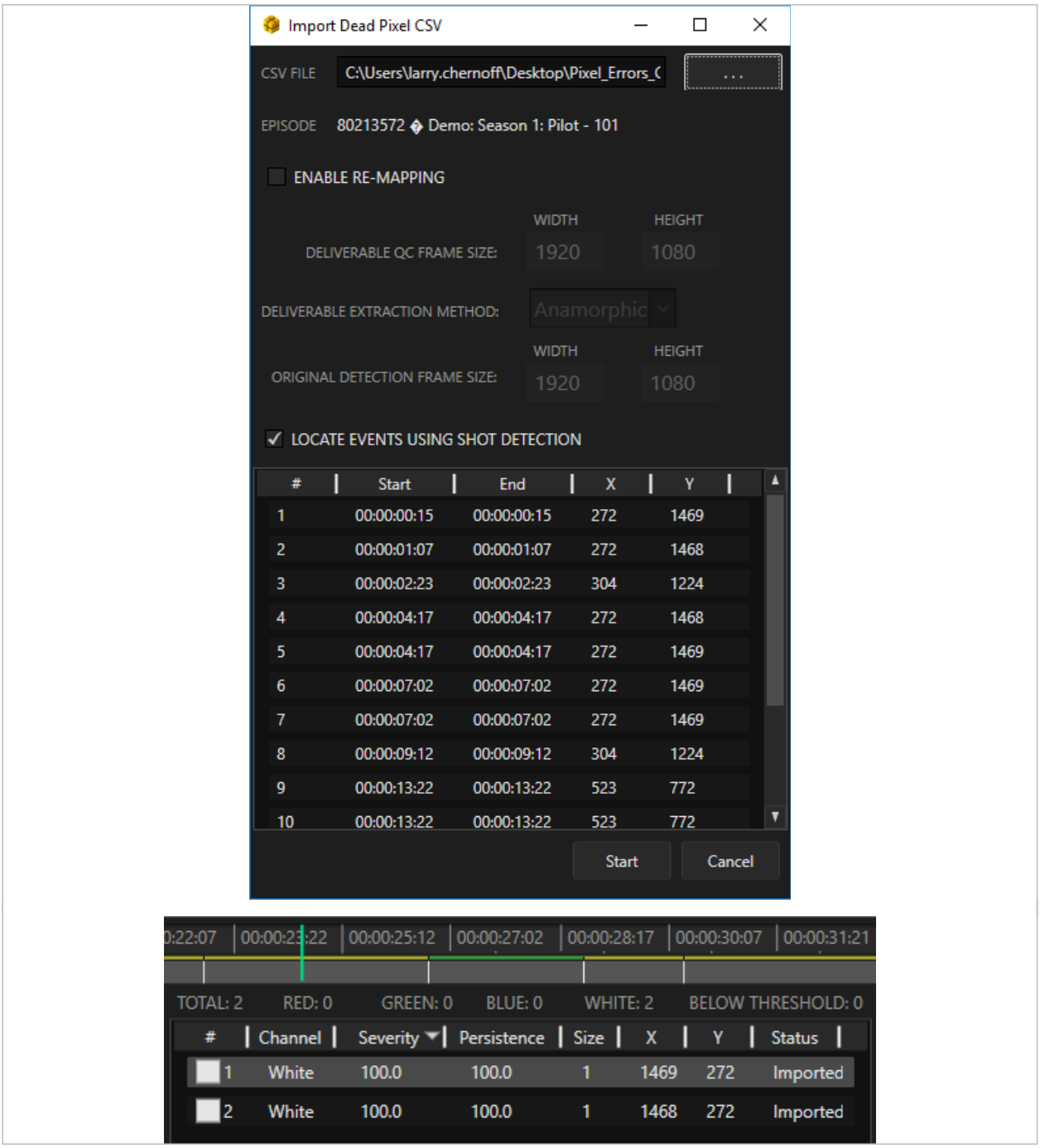
Note: The .csv file needs to be properly formatted and will only work if the media is pixel accurate in resolution to the original detected media.

For 3rd party .csv files, the file structure must follow this example

Using the original media that rendered the media used by the QC company to generate its report, create a composition that starts and ends at the exact same timecode or, if an existing composition exists on V1, consider placing the same clip on V2 and copying the breaks if present. This will isolate the imported pixel detections onto V2 and later allow rendering only the affected shots.

In the Edit Tool, add the media to V2, right-click on the timeline and choose “Copy/Breaks Only” from the context menu.

The breaks from V1 are copied to V2. If no cuts are present on the timeline, the import dialog provides the option to detect the shot changes surrounding the reported timecode.



Click the Import button or right-click in the Dead Pixel List and choose “(Import) Dead Pixel CSV” from the context menu. The Import Dead Pixel CSV dialogue window opens. Navigate to and select the provided .csv file.

Once the .csv file is opened, Cortex will load a list of dead pixels with the Start and End timecodes as well as x/y coordinates.

If the list was generated using the properly formatted 3rd party .csv, the start and end timecodes will be identical. If the list was generated by Cortex and breaks were located on the timeline, the timecodes will be from the start of a shot to its end.

If no breaks are present on the composition timeline, enable the “LOCATE EVENTS USING MTai SHOT DETECTION” check box.

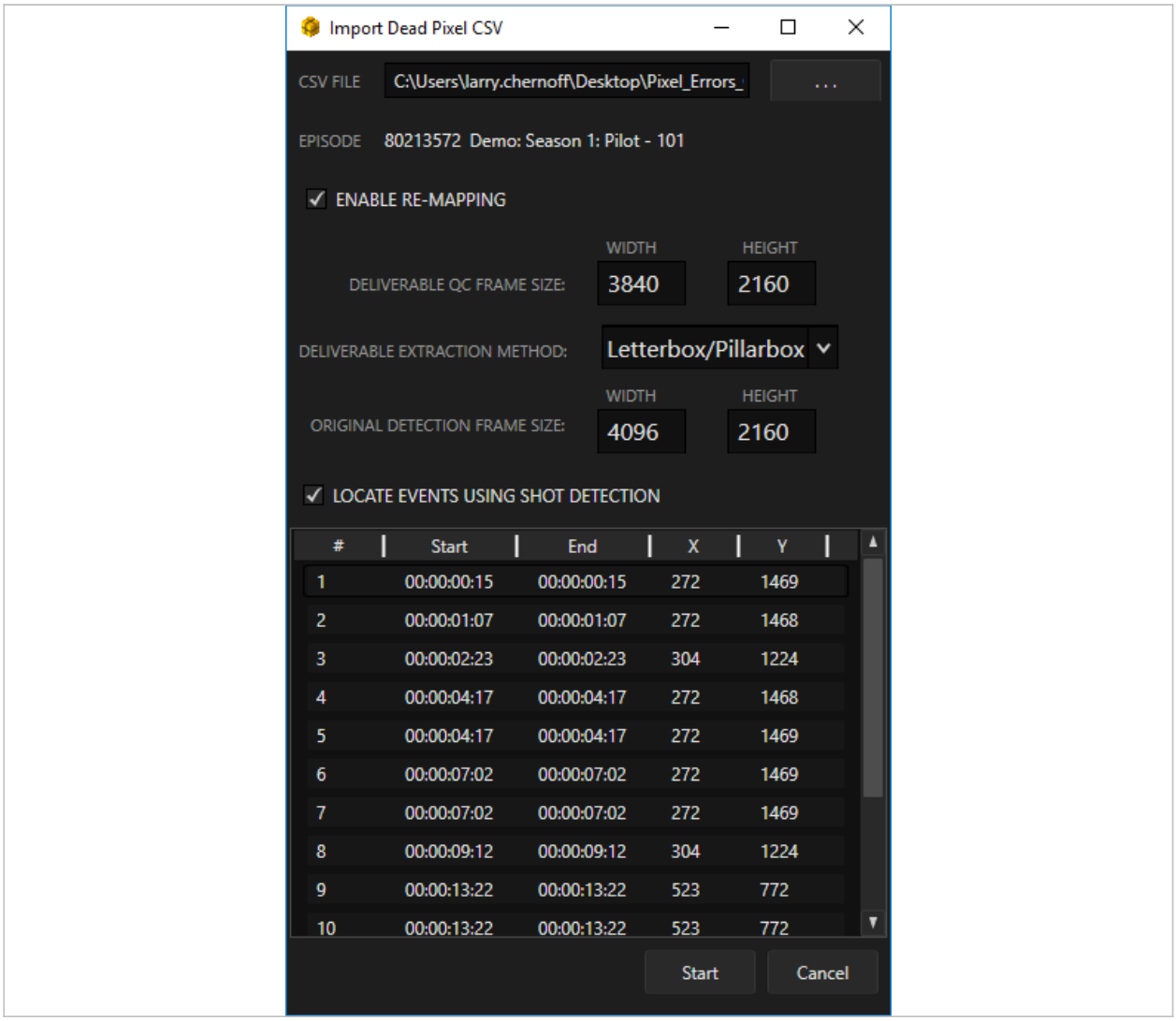
If no remapping of the x/y coordinates are required, click “Start” to initiate the import process. If the edit breaks were already present, the import will be almost instantaneous. If MTai Shot Detection is required, more time is needed.

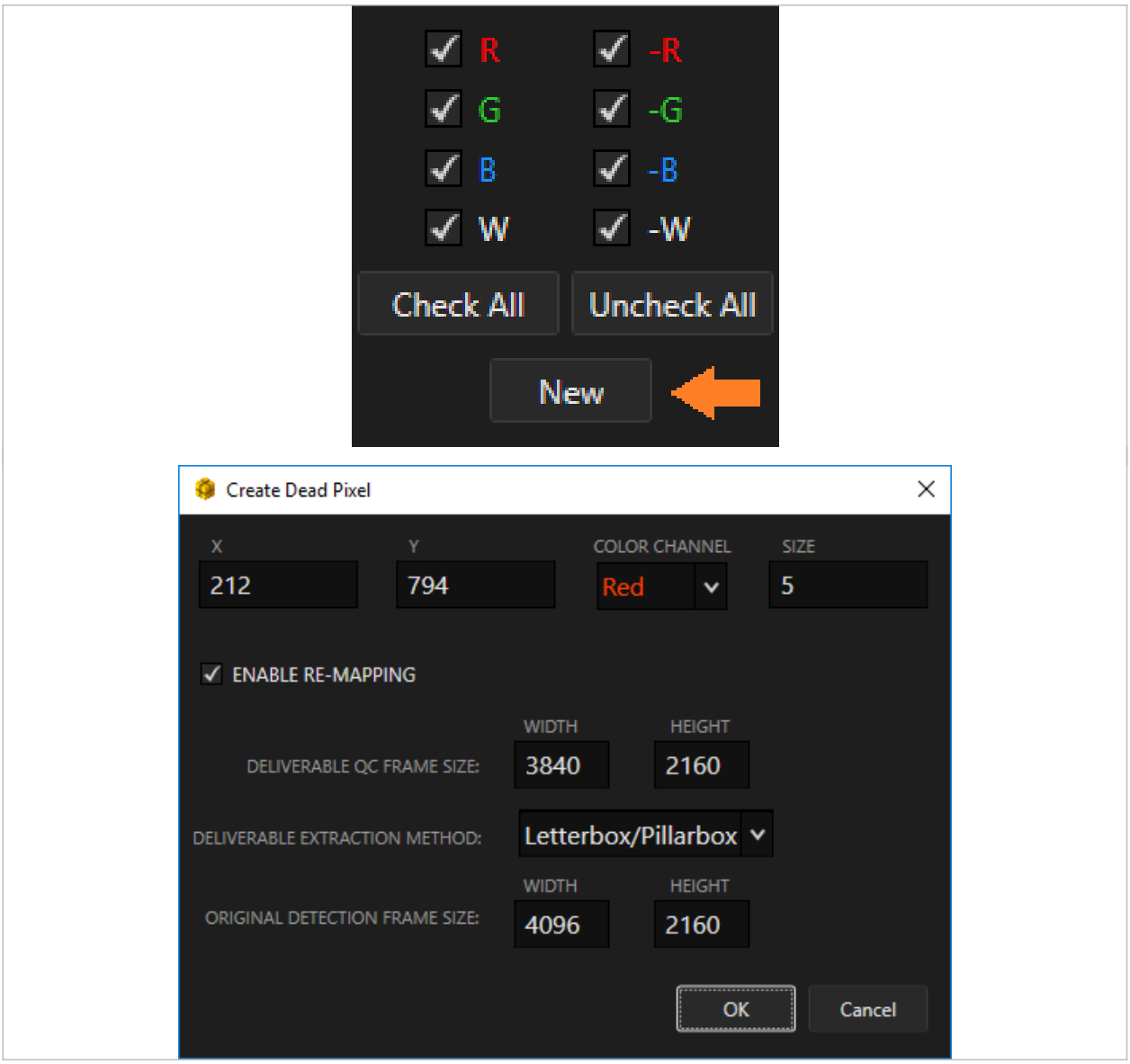
Once complete, the timeline will populate yellow lines above the segments where pixels have been imported. If MTai shot detection was used, the edit breaks will also appear.

Above each segment is either a green or yellow line. The yellow lines indicate shots that have imported pixels versus green lines that indicate pixels detected by Cortex.

Filtering Events with Imported Pixels

Imported Pixels are automatically assigned Accepted status. To render only the shots that contain the newly imported pixels, while focused on the composition, enable the Filter Events checkbox and click the DP button. This will present the events that only contain Accepted dead pixels.





Remapping X/Y Coordinates

If the frame size of the media used to generate the x/y coordinates of the imported list differs from the frames size of the media in the composition used for the original detection then the imported x/y coordinates will need to be remapped. For example, a Master DPX frame size of 4096x2160 was used in a composition to generate a 3840x2160 IMF that was QC'ed by a third party. The QC generates a list of x/y coordinates that require correction but, of course, the original Master DPX files require new coordinates that map properly to their frame size.

Steps to Remapping x/y Coordinates

1. Enable the RE-MAPPING checkbox 2. Enter the frame size of the media used by the QC house 3. Enter the type of extraction method used to create the QC media 4. Enter the frame size of the media in the original composition

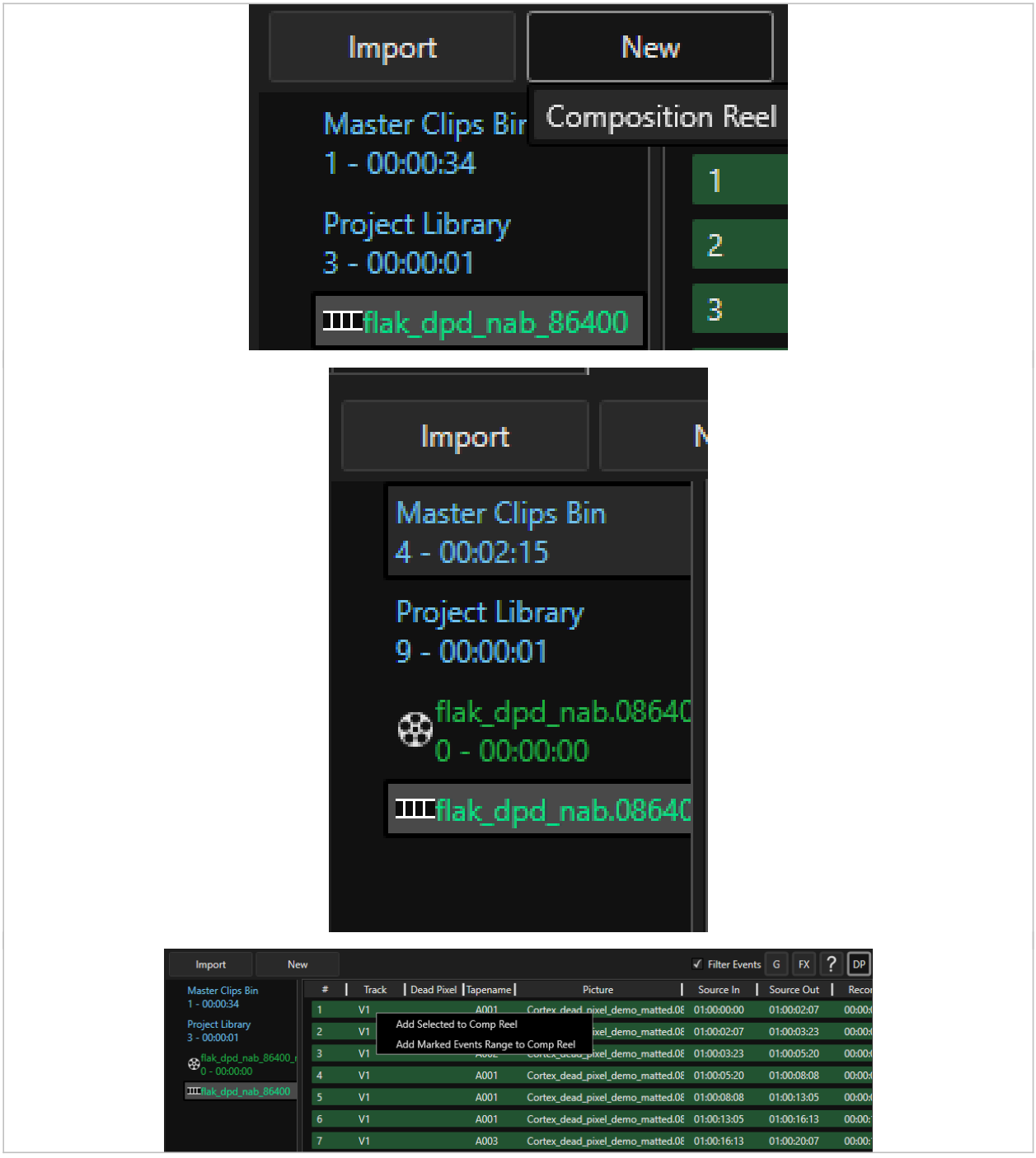
The coordinates will be remapped upon import.

Manually Creating a New Pixel

At times it might be necessary to create a dead pixel that Cortex does not detect but is reported by QC. To create a new Pixel record, click the New button. The selected deliverable config's resize must be set to Don't Resize; if it is not, Cortex says so and the pixel cannot be created.

A dialog box will open. Enter the x/y coordinates, a color channel (which can be any color in this case) and a size, which can be left at 1 if unknown. The created pixel will automatically be given Accepted status.

If remapping is required, enable the checkbox and input the corresponding metadata as explained above.



Rendering Corrected Dead Pixels

Depending on the workflow requirements, the user can now choose to render a file of the entire composition or only the shots needing correction.

Rendering the Whole Composition

To render the entire composition, right-click on the composition name in the Sidebar and choose “Render”. (Learn more here Rendering a Composition)

Rendering Filtered Events

By filtering, as described on the previous page, Cortex provides the ability to render only the shots that contain Accepted Dead Pixels. This can be especially useful with image sequences (i.e. dpx, tiff, exr) where the objective is to replace the frames that have been corrected.

Create a Composition Reel

A Composition Reel is used to render specific segments of a composition versus the entire composition. Click the “New” button and choose “Composition Reel”.

(Learn more here Creating a Clips or Composition Reel) This prompts the Create Reel dialog box to open where the reel is named and other metadata is added. Choose “Source” in the Timecode field to preserve the original timecode of the source media and click create.

The reel is placed above the corresponding composition.

With the filtered events showing, select the shots in the list to be rendered. Right click and choose “Add Selected to Comp Reel”. Rendering begins immediately as clips are added.

Like Clip Reels, close the reel to complete the render.

For immediate access to the rendered file, switch to the Render Monitor Tool and, in the Completed column, right-click on the completed render task and select “Open Containing Folder.”

Dead Pixel Module Function Keys

Left Mouse Button Select dead pixel.

Right Mouse Button Select dead pixel and edit/delete.

Ctrl+Shift+Left Mouse Button Add new dead pixel at mouse cursor position.

G Accept selected pixel(s) and ripple to all matching X/Y locations.

Shift + G Accept visible pixel(s) in the Player for the current event only.

Ctrl + Shift + G Accept selected pixel(s) for the current event only.

A Reject selected pixel(s) and ripple to all matching X/Y locations.

Shift + A Reject visible pixel(s) in the Player for the current event only.

Ctrl + Shift + A Reject selected pixel(s) for the current event only.

0 Reset selected pixel(s) and ripple to all matching X/Y locations.

Shift + 0 Reset visible pixel(s) in the Player for the current event only.

Ctrl + Shift + 0 Reset selected pixel(s) for the current event only.

Ctrl + A Select all events in composition.

Alt + A Select all dead pixels in the list.

Ctrl + C Copy selected dead pixel(s).

Ctrl + V Paste copied dead pixel(s).

Ctrl + Shift + V Select and copy all pixels in the list and paste to matching events.

1 Toggle Candidates filter

2 Toggle Accepted filter

3 Toggle Rejected filter

4 Toggle Pasted filter

5 Toggle Imported filter

6 Toggle +Red dead pixel candidates filter

7 Toggle +Green dead pixel candidates filter

8 Toggle +Blue dead pixel candidates filter

9 Toggle +White dead pixel candidates filter

Shift + 6 Toggle -Red dead pixel candidates filter

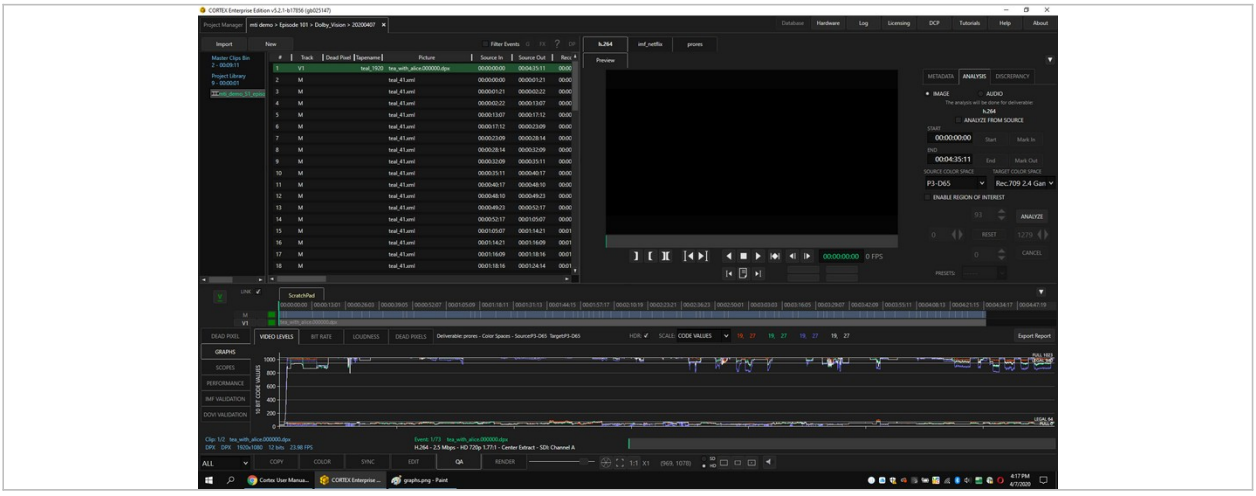
Shift + 7 Toggle -Green dead pixel candidates filter

Shift + 8 Toggle -Blue dead pixel candidates filter

Shift + 9 Toggle -White dead pixel candidates filter

Tab Tab to Confidence and Severity value fields

Enter Return value



The Radiation Artifact Module

Radiation artifacts are bright, short-lived defects that appear when a cosmic ray or an X-ray scanner strikes the camera sensor. Unlike a dead pixel, which sits at the same x/y coordinate for the life of the sensor, a radiation artifact appears in one frame at a random position and is gone in the next. They are easily mistaken for dirt, and they are tedious to find by eye.

The Radiation module detects them with an MTai analysis and repairs the ones you accept. It is laid out like the Dead Pixel module and works the same way, so an operator familiar with dead pixel QC will already know the workflow. Select the RADIATION tab in the QA Tool to use it.

Preparing Deliverables for Radiation Artifact Correction

As with dead pixels, correction is applied by the Deliverable. Enable Repair Dead Pixels / Radiation Artifacts on each Deliverable that should carry the repairs. The one checkbox governs both kinds of correction.

Running a Detection

Radiation detection runs against a composition. Select the composition, go to the QA Tool and select the RADIATION tab, then open the ANALYSIS tab in the upper right of the GUI. The analysis defaults to the full length of the composition; to restrict it, mark the range on the timeline and use the Mark In and Mark Out buttons, or enter the START and END timecodes directly. Click ANALYZE to begin.

Progress is reported at the bottom right of the GUI, and the Radiation Artifact column in the event list shows the detection state of each event. That column can be turned on from the column chooser on the clip bin and the composition event list, and is shown automatically while the QA Tool is selected.

NOTE: the first radiation detection on a given machine builds the TensorRT engine for the detector. See MTai AI Engines and First Run in the Getting Started section.

Reviewing Candidates

Every artifact the analysis finds is added to the list as a Candidate. Selecting one shows it in two magnified views: the artifact as detected on the left, and the same area after the Cortex repair on the right, so you can judge the fix rather than just the detection.

Filter the list with the CANDIDATES, ACCEPTED and REJECTED checkboxes along the top of the module. Each carries a live count, and the total is shown above the list, which makes it easy to work a large composition down to nothing outstanding.

Assigning Status

Select one or more artifacts, then use the buttons above the list:

● Accept — the artifact will be repaired when a Deliverable with Repair Dead Pixels / Radiation Artifacts enabled is rendered.

● Reject — the artifact is real detail, or a fix would do more harm than good. It is left alone.

● Reset — returns the artifact to Candidate status.

Rendering Corrected Artifacts

Rendering works exactly as it does for dead pixels. Render the whole composition, or filter the event list to the events that carry accepted artifacts and add just those to a Composition Reel. Only artifacts set to Accepted are repaired; Candidates and Rejected artifacts render untouched.

Exporting the Artifact List

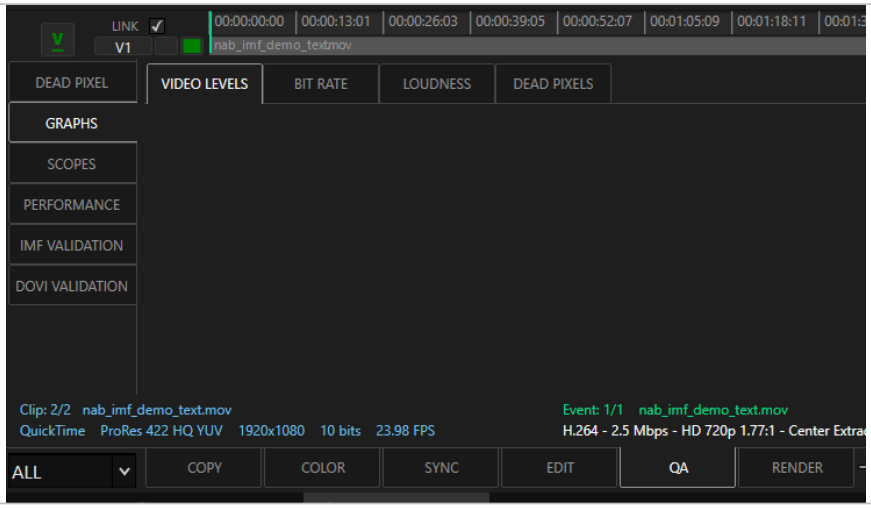
To hand the findings to someone else, right-click the clip or the composition and choose Export Radiation Artifact List… from the Context Menu. The Export Reports dialog also offers Radiation Artifact .csv (Accepted Only), which writes only the artifacts you have approved for repair.

The Graphs Module

In the QA tab, Cortex provides image and audio data analysis tools with graphical reports of the results. These reports can then be distributed through PDF. You can choose to analyze media based on the following:

● Video Levels (HDR and SDR) ● Bit Rate ● Mattes ● Loudness ● Dead Pixels

v



Video Analysis

Cortex allows the user to analyze video from a composition for both SDR and HDR material. The analysis can be done straight from the source material or filtered through a color pipeline configured in a deliverable. Once analysis is complete a graphical report will be generated and displayed below the timeline where the user can choose to see:

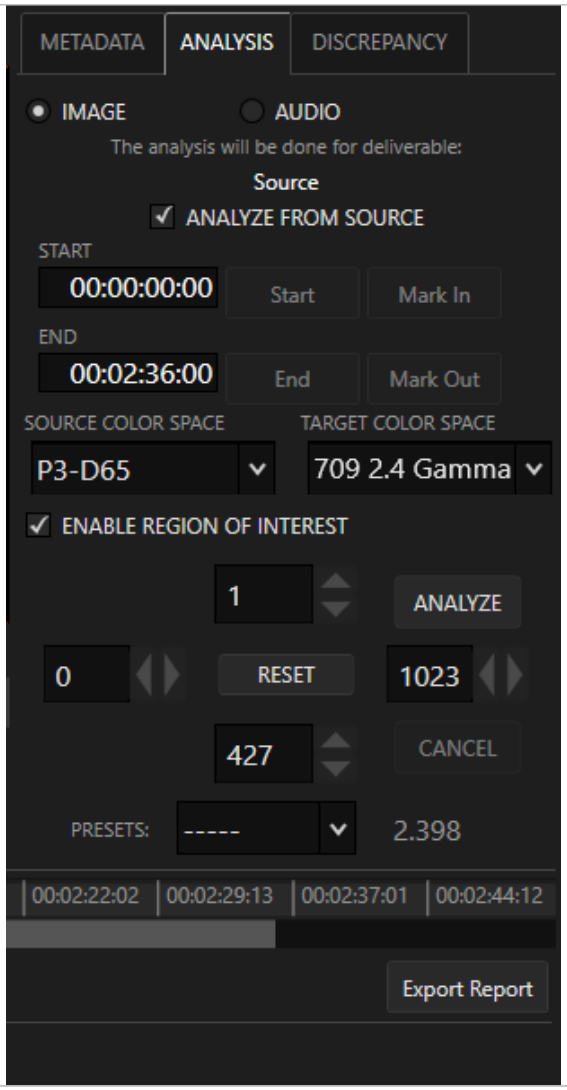
● Video Levels ○ Code Values ○ IRE Values ○ Nits Max FLL/CLL(HDR only) ○ Nits Min/Max(HDR only)

● Bit Rate read in mbps

SDR Analysis

To begin an analysis, a composition must be created in the Edit Tool. For a comprehensive explanation of how to create a composition in the Edit Tool, refer to Creating a Composition.

With media in place on the timeline, you are now ready for image analysis. Switch to the QA Tool and select the GRAPHS module.



Click the ANALYSIS Tab in the upper right corner of the GUI to see all the analysis options.

Enable the IMAGE radio button.

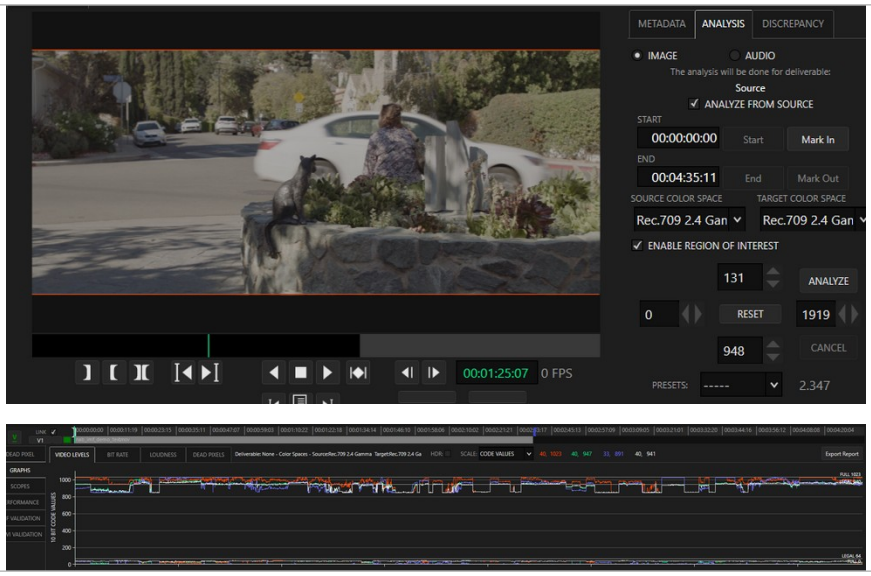
To analyze the media without any influence by deliverable configurations or color pipelines, enable ANALYZE FROM SOURCE. This ensures that LUTs or Creative Color Corrections permitted by a deliverable will be ignored.

If it is required to use a color pipeline permitted by a deliverable, leave ANALYZE FROM SOURCE disabled and select the deliverable required for the analysis. For example, if the source material has a signal in full range blacks, but an analysis with legal range blacks is wanted, select a configuration with a FULL_to_LEGAL lut.

The analysis will default with the in and out timecodes of the entire sequence. If only a section of the video requires analysis, mark the in and/or out range on the timeline and click the Mark In and/or Mark Out buttons to exclude the balance of the composition from the analysis.

Select the SOURCE COLOR SPACE and the TARGET COLOR SPACE. The SOURCE COLOR SPACE should always match the color space in which the material was mastered in. However, the TARGET COLOR SPACE may vary, depending on the target display for which the analysis is intended.

If the TARGET COLOR SPACE differs from the SOURCE COLOR SPACE, Cortex will provide the timecodes where the video falls outside of the gamut of the TARGET COLOR SPACE.

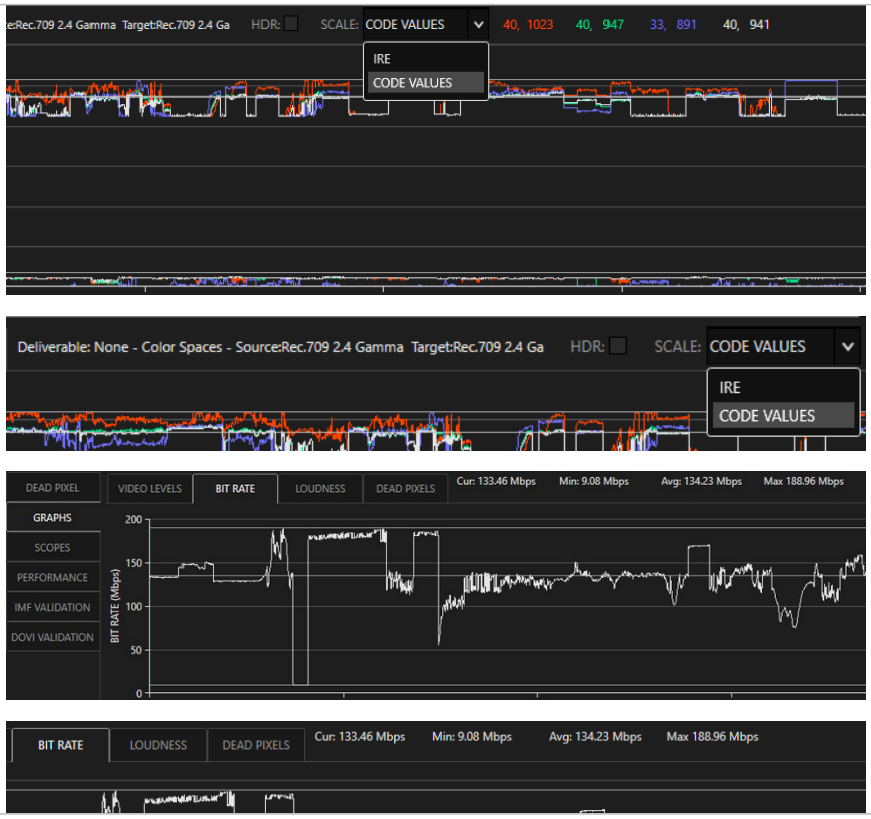


If the video has a matte that needs to be excluded from the analysis, click ENABLE REGION OF INTEREST. Then select from several aspect ratio presets or use the arrows to create a custom ROI. Red lines will appear on the Video Player to represent the portion of video that will be excluded.

Example of an ROI set to 2.35

Once finished filling in the parameters, click ANALYZE to initiate processing. The progres of the analysis is reported in the bottom right corner of the GUI.

When the analysis is complete, a graph will appear underneath the timeline.

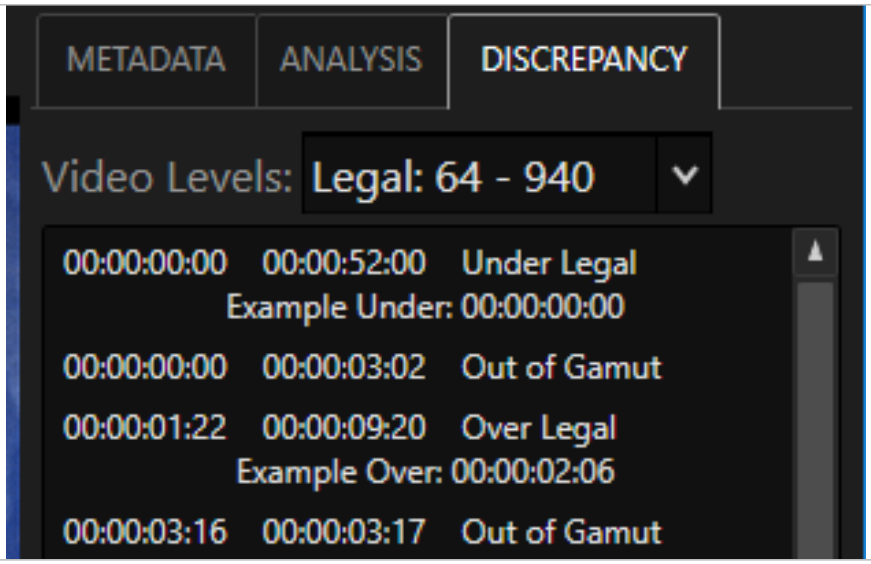


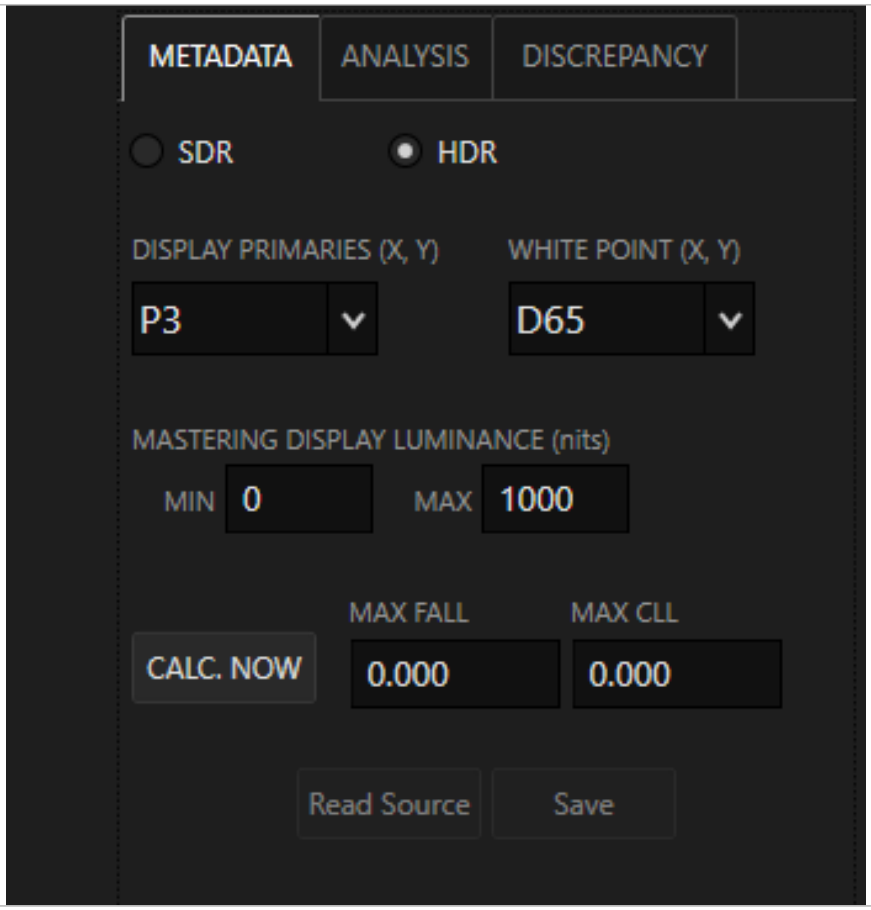
For SDR analysis, choose to view in either IRE or CODE VALUES. As the playhead moves along the timeline min/max values for the Red, Green Blue channels as well as luminance will present themselves for the frame you're parked on.

Above the graphs, the deliverable that was selected while running the analysis is displayed. If ANALYZE FROM SOURCE was enabled this will say NONE. The SOURCE COLOR SPACE and TARGET COLOR SPACE are also shown.

Cortex also offers a graph of the Bit Rate of your file. Select the BIT RATE tab next to the VIDEO LEVELS tab to display this graph.

Along with the graphical representation of the bit rate variances, Cortex provides numerical readouts of the Current, Minimum, Maximum and Average bit rate. These readouts are found directly above the graph in the Bit Rate tab.





For a list of discrepancies found during the ANALYSIS return to the upper right corner of the GUI. Select the DISCREPANCY tab to display a list of timecodes where the signal is out of the range.

In the Video Levels dropdown field, choose the target range of the analysis. Choices include FULL: 0-1023 or LEGAL: 64-940

The list of timecodes shows where the signal goes over or under the Video Level or Out of Gamut.

Double Click on an event in the list and the Playhead goes to the timecode on the Composition.

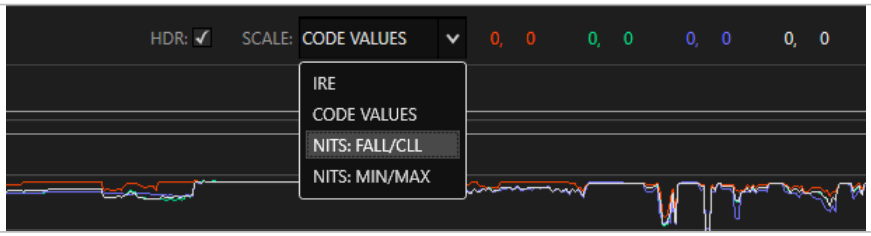
HDR Analysis

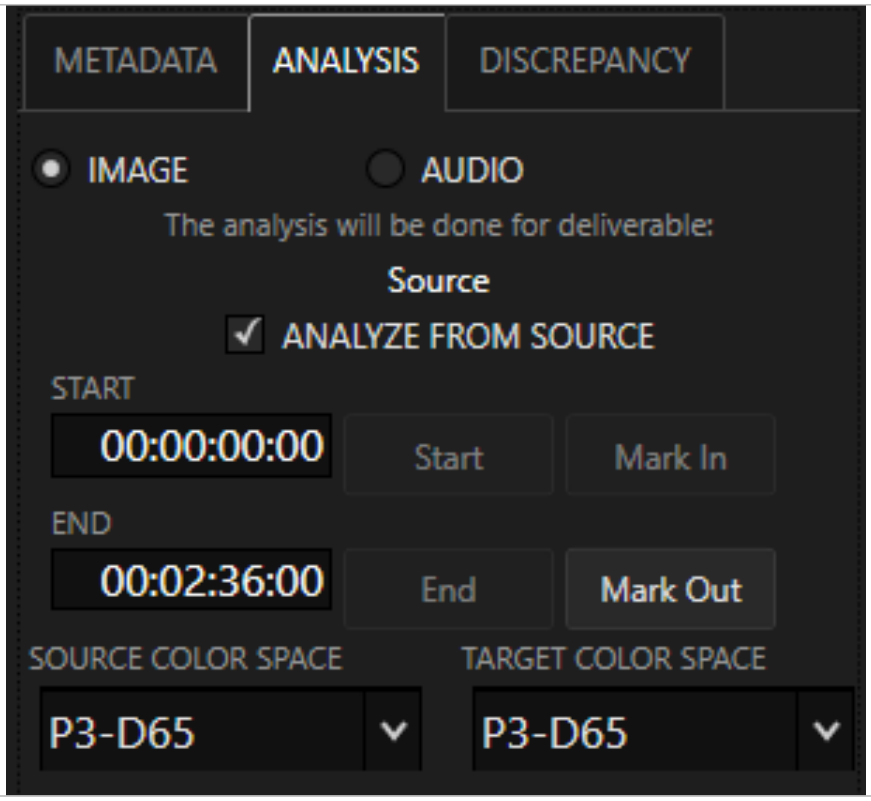
Running an analysis on HDR material is similar to the SDR process, however, there are few more options available that are pertinent to an HDR signal.

When creating a composition, be sure to select the HDR mode in the METADATA tab for the mastering parameters: ● Display Primaries ● White Point ● Min/Max Mastering Display Luminance

If the media is Dolby Vision, its metadata xml file will automatically populate these fields.

If desired, Cortex can also calculate the MaxFall and MaxCLL separate from the overall analysis.





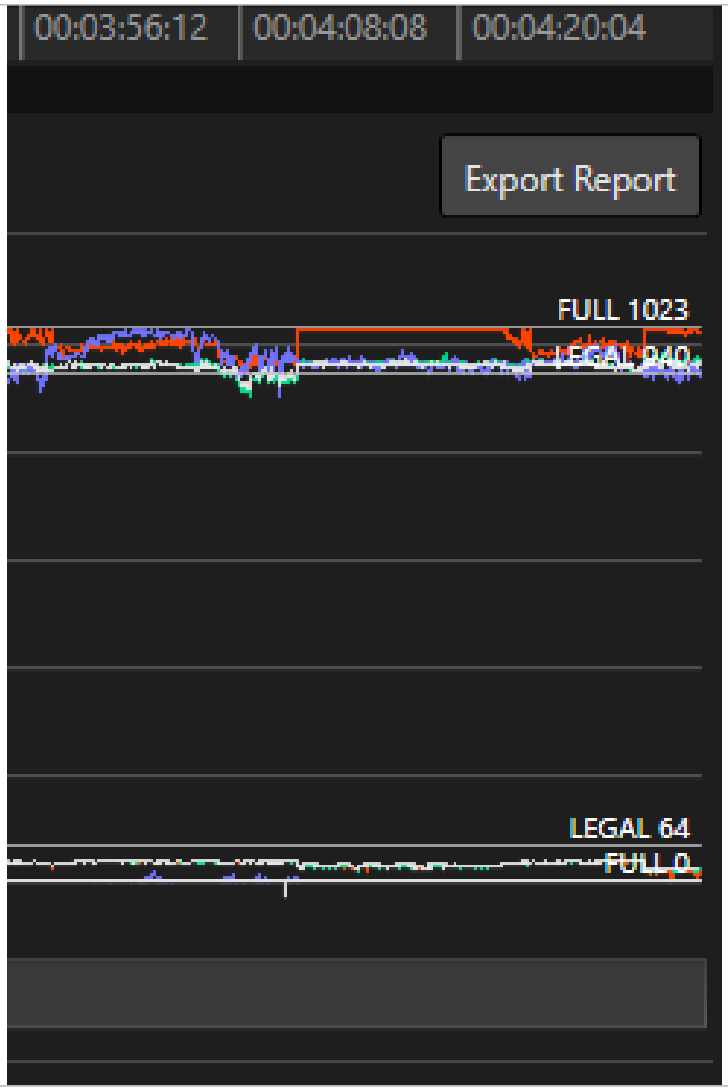
Like SDR video, choose the SOURCE COLOR SPACE and TARGET COLOR SPACE. Enable an ROI if needed and mark the range on the timeline intended for analysis.

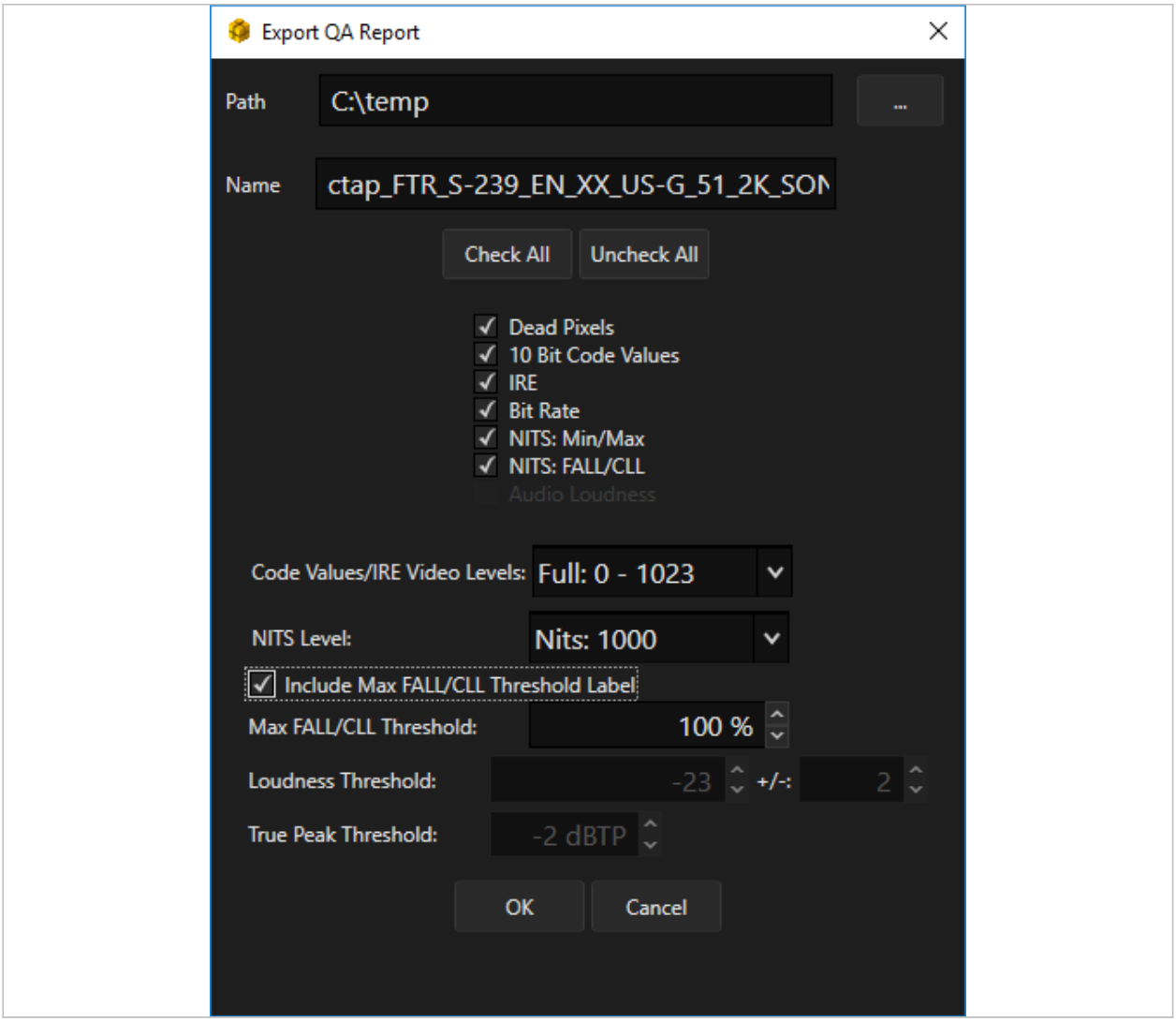
Graphs will appear below the timeline once the analysis is finished. When HDR mode is enabled, Cortex expands the scale options to include NITs: FALL/CLL and NITs: MIN/MAX

Select NITs: FALL/CLL to display the graph and values for these scales.

The FALL values represent the average light level of a single frame. The CLL values represent the maximum light values of a single pixel. Both FALL and CLL have two numerical readouts. The numbers on the left represent values of the current frame. The parenthetical numbers on the right represent the maximum values of the composition. Accordingly, when you scrub through the composition, the numbers on the left will change while the numbers on the right will remain the same. You can, however, reduce the numbers on the right by lowering the threshold. This will tell Cortex to ignore the percentage light level above that threshold.




00:03:56:12
00:04:08:08
00:04:20:04
Export Report
FULL 1023
LEGAL 940
LEGAL 64
FULL 0



Select NITs Min/Max to display the graph and values for these scales.

The values here represent the minimum and maximum nit levels for each color channel and overall luminance of a particular frame. As you scrub through the timeline, these values will change respectively.

The user can now export PDF reports of the different graphs included in a Cortex Image Analysis. To do this, click the EXPORT REPORTS button found above the graph on the right side of the GUI.

This will prompt a dialogue box for the selection of graphs to include and thresholds to be set for the PDF report.

Click the ellipsis button next to “Path” to navigate to where the PDF should be saved.

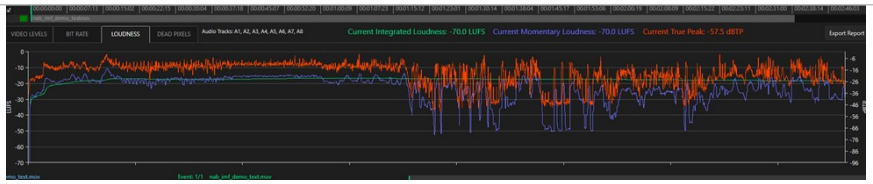
Enable the checkboxes of the graphs to include in the PDF.

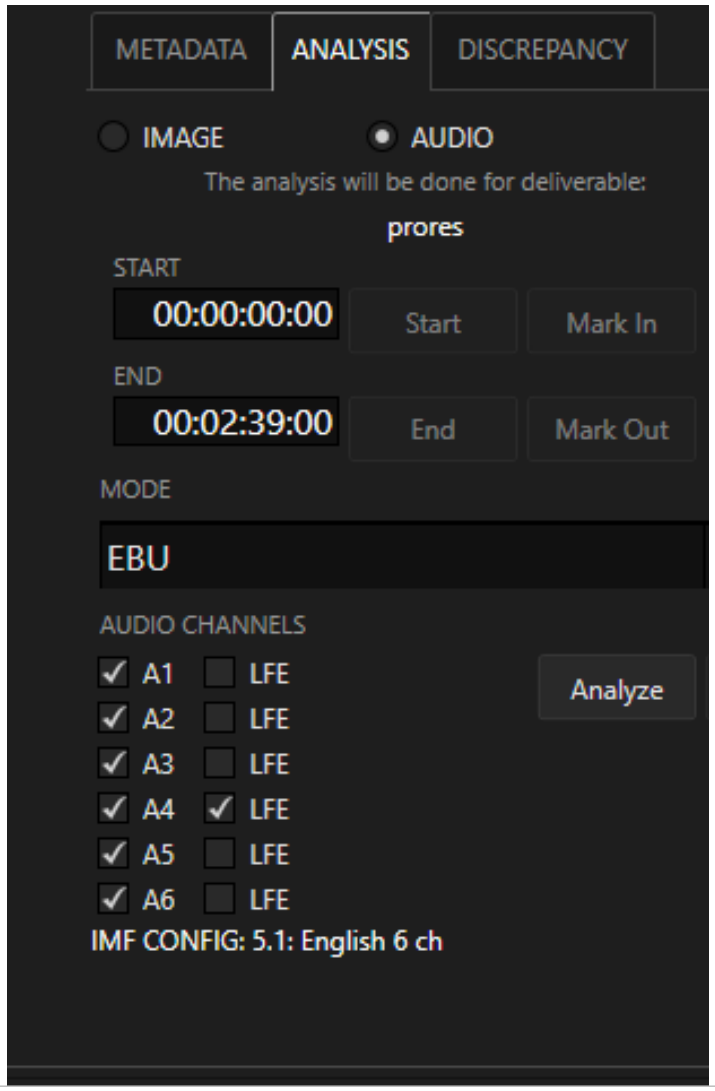
Choose the range. FULL: 0-1023 or Legal: 64-940. Set the NITS LEVEL. For SDR, NITS LEVEL can be ignored as it is irrelevant to an SDR signal.

If desired, enable the Max FALL/CLL Threshold and set it using the spinbox.

Click “OK” to generate and save the PDF.

The report will include a discrepancy list for excursions above or below these thresholds.





Audio Analysis

Cortex offers audio data analysis based on the two Loudness standards for broadcast television; EBU(European Broadcast Union) and ITU(International Telecommunications Union) Like Image analysis, this can be accomplished from any type of composition.

To start an Audio analysis, click on the QA tab and choose the GRAPHS module. Return to the upper right section of the GUI and select the ANALYSIS tab.

Click “AUDIO” to reveal the audio options in the ANALYSIS tool.

In most compositions, the Audio analysis will be done based on the deliverable configuration selected before the analysis. The audio configuration inside the deliverable will instruct Cortex as to how the channels are mapped.

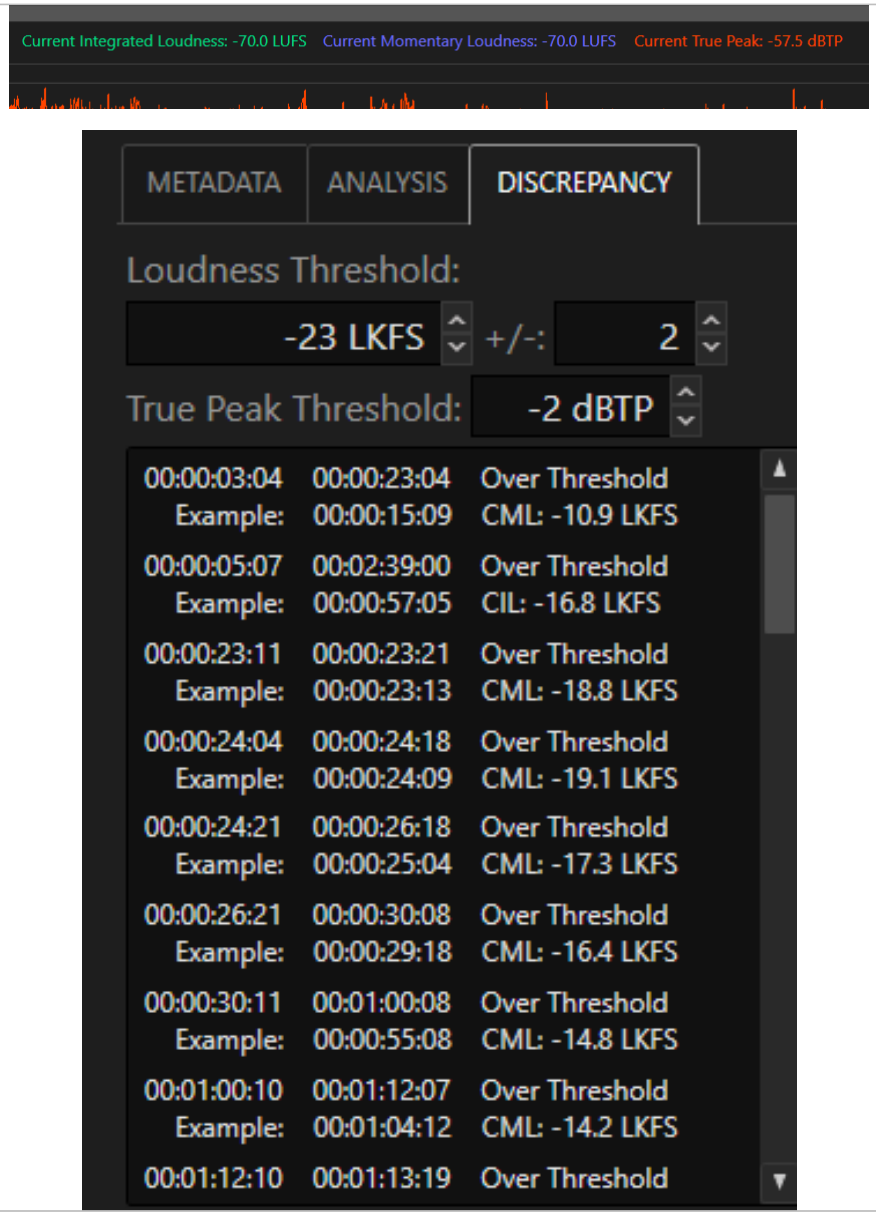
In an IMF composition, select from one of the saved Audio Configurations or the Scratchpad.

In the MODE drop down menu, choose which Broadcast Standard Cortex should use to analyze.

Click “LFE” next to the channel number where the LFE (Low Frequency Effects) has been placed. Cortex will ignore this channel in the analysis.

Click “Analyze.” Follow the progress in the bottom right corner of the GUI.

Once Complete, the graph will appear below the timeline.



Cortex provides numerical readouts for the channels selected for analysis. The readouts are given in LUFS or LKFS, depending on the Broadcast standard chosen, and Decibels for the True Peak. Scrubbing through the timeline will change these values respectively. The three standards reported are the following:

1. Current Integrated Loudness(LUFS or LKFS) 2. Current Momentary Loudness(LUFS or LKFS) 3. Current True Peak(dBTP)

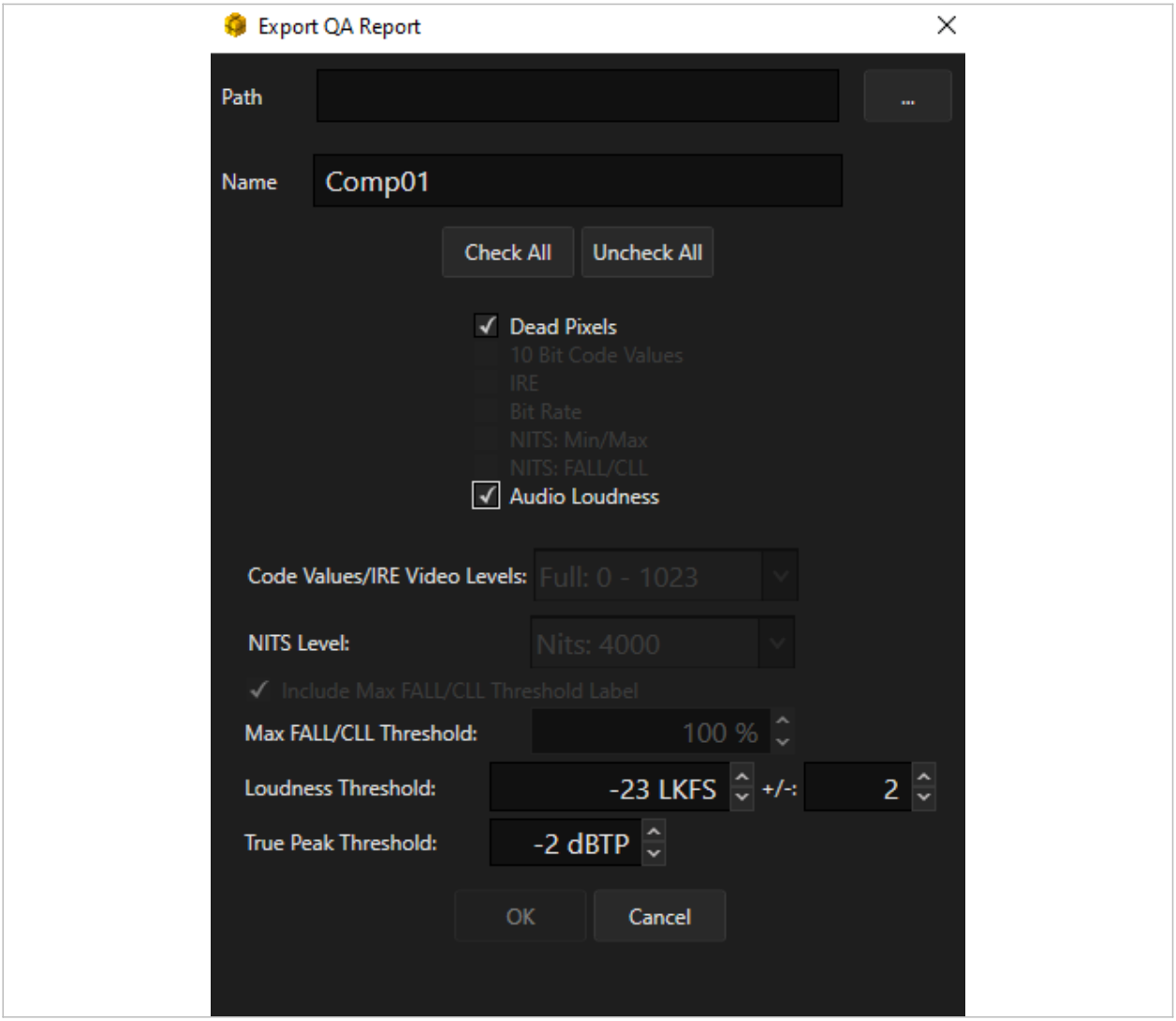
To reveal loudness excursions, select the DISCREPANCY tab next to the ANALYSIS tab.

Set the loudness and true peak thresholds. These values will vary depending on the broadcast company or streaming platform and will be provided by them.

The Loudness Threshold comes with a target value and +/- range of what is acceptable from that target.

The True Peak Threshold is a single value and any excursion beyond it will be reported as a discrepancy.

Double click on an event in the list and the playhead goes to the timecode on the composition.



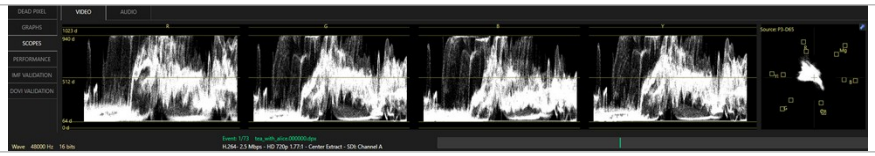
Click “Export Report” to generate a PDF of this graph.

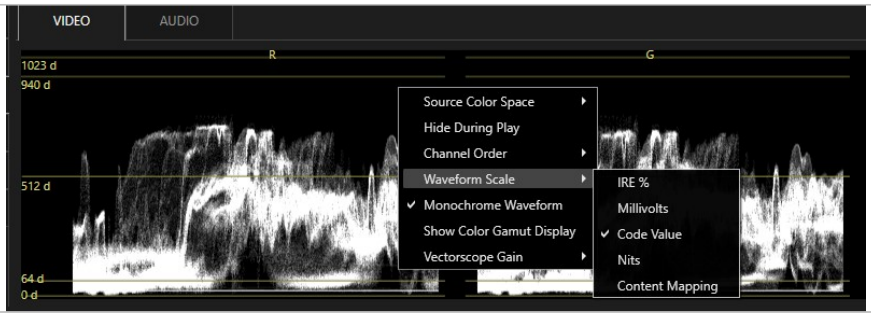
Select a path to place the PDF on the Cortex system.

Enable “Audio Loudness” to allow the audio options for the paperwork. This will activate the loudness and true peak thresholds.

For these fields, fill in the standards provided by the broadcast company.

Click “OK” to save the document to the determined path.





Matte Analysis

Cortex can measure the matte on every frame of a composition and graph how it moves. This catches the faults that are hard to see in real time: a matte that drifts a few lines over a reel, a single frame where the matte is absent, a shot cut in at the wrong aspect ratio, or a letterbox that is not centered.

To run it, select the GRAPHS module in the QA Tool and open the ANALYSIS tab in the upper right of the GUI. Choose the matte analysis, set the range if you do not want the whole composition, and click ANALYZE.

When the analysis finishes, select the MATTES tab alongside VIDEO LEVELS and BIT RATE. The graph plots four traces — the top, bottom, left and right matte edges — against the timeline, with live numeric readouts for each as the playhead moves. A steady delivery shows four flat lines; anything that steps or drifts is worth looking at.

The discrepancy list below the graph itemizes the frames where the matte departs from what is expected. Double-click an entry to take the playhead to that timecode. To discard an entry you have judged acceptable, right-click it and choose Remove Selected Discrepancy.

Matte results can be delivered two ways. Enable Mattes in the QA report to include them in the PDF, or choose Matte Discrepancy .csv in the Export Reports dialog for a list that can be worked in a spreadsheet.

Matte analysis can also be run unattended: as an analysis task on a QC workflow action, and on an Analysis watch folder, in both cases with its own INCLUDE IN QA REPORT option.

Scopes Module

As part of its QA toolset, Cortex provides several types of video and audio scopes. The video scopes read HDR and SDR signals as well as the full range of gamut options, including ACES support. The audio scopes include a VU Meter as well as a loudness scope. NOTE: Tap the Function F12 to bring up the Scopes full screen.

Video Scopes

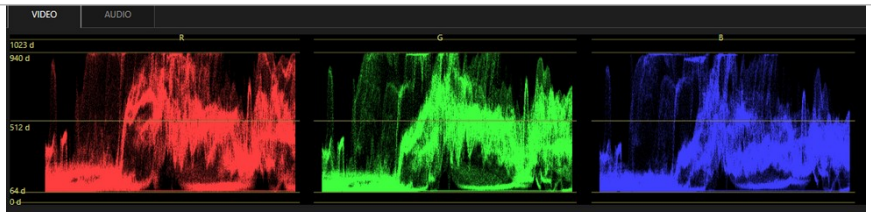
Select the Video tab in the SCOPES module to reveal the Video Scopes.

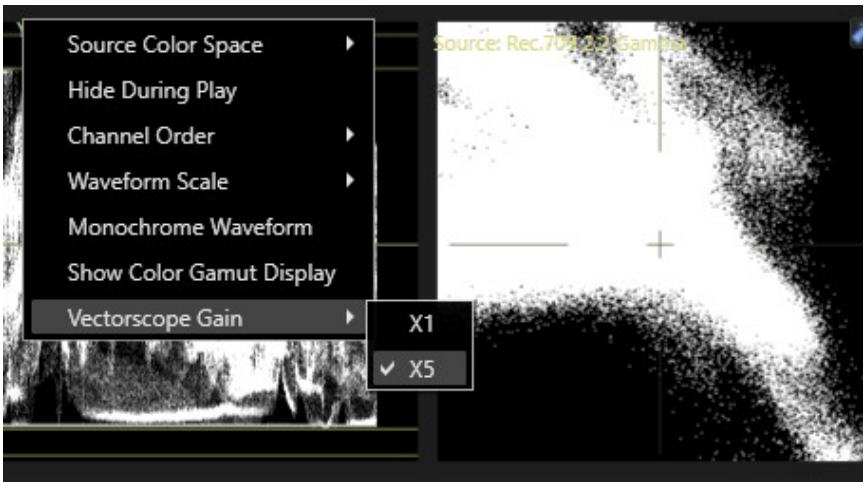
The waveform scale reads the signal in RGB as well as luminance represented by Y. The Scope on the right can be viewed as either a vector scope or gamut display.

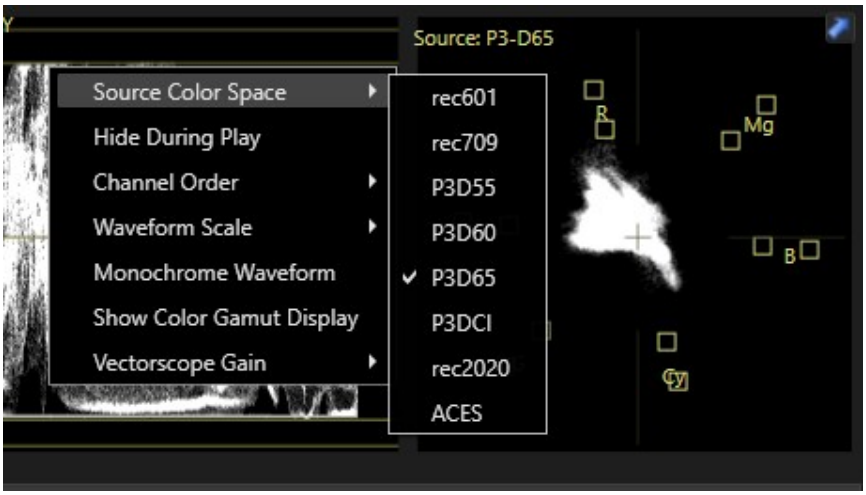
Waveform Scope

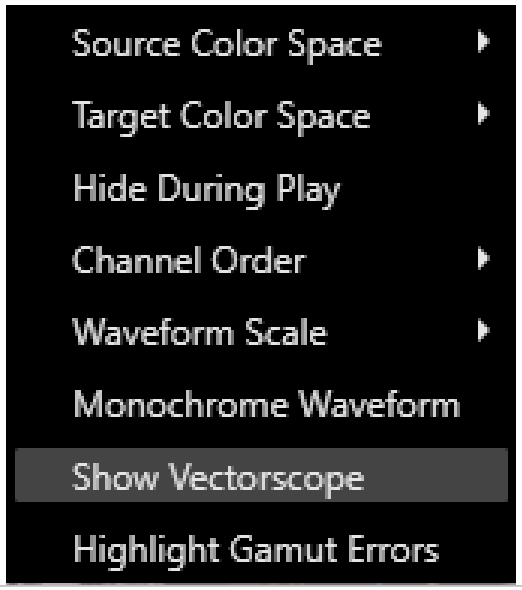
Right click on the waveform and choose Waveform Scale to reveal the reticle options for the scope. Choose from the following options:

1. % 2. IRE % 3. Millivolts 4. Code Value (reticles include Full and SMPTE range) 5. Nits (for HDR signals only) 6. Content Mapping


VIDEO
AUDIO
R
G
B
1023 d
940 d
512 d
64 d
0 d


Source Color Space
Hide During Play
Channel Order
Waveform Scale
Monochrome Waveform
Show Color Gamut Display
Vectorscope Gain
X1
X5


Source: P3-D65
Source Color Space
Hide During Play
Channel Order
Waveform Scale
Monochrome Waveform
Show Color Gamut Display
Vectorscope Gain
rec601
rec709
P3D55
P3D60
P3D65
P3DCI
rec2020
ACES
R
Mg
B
Cy


Source Color Space
Target Color Space
Hide During Play
Channel Order
Waveform Scale
Monochrome Waveform
Show Vectorscope
Highlight Gamut Errors

Uncheck the Monochrome Waveform to view the Channels in their respective colors

Vector and Gamut Display Scopes

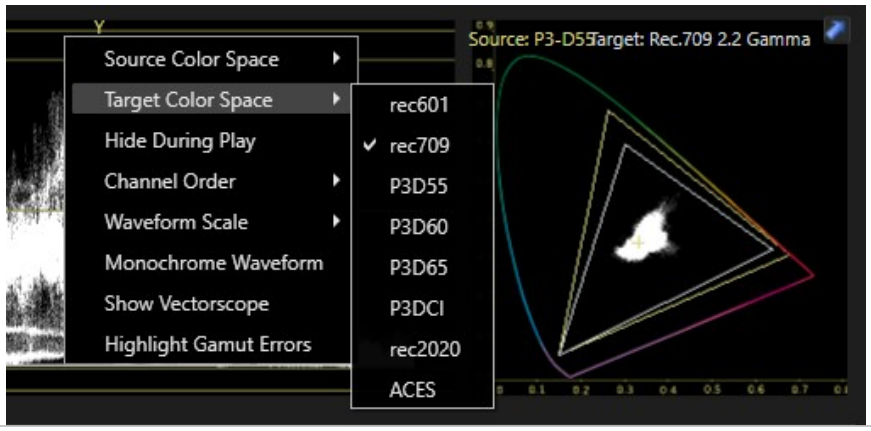
To switch from the Gamut Display to the Vectoscope, right-click and select Show Vectorscope

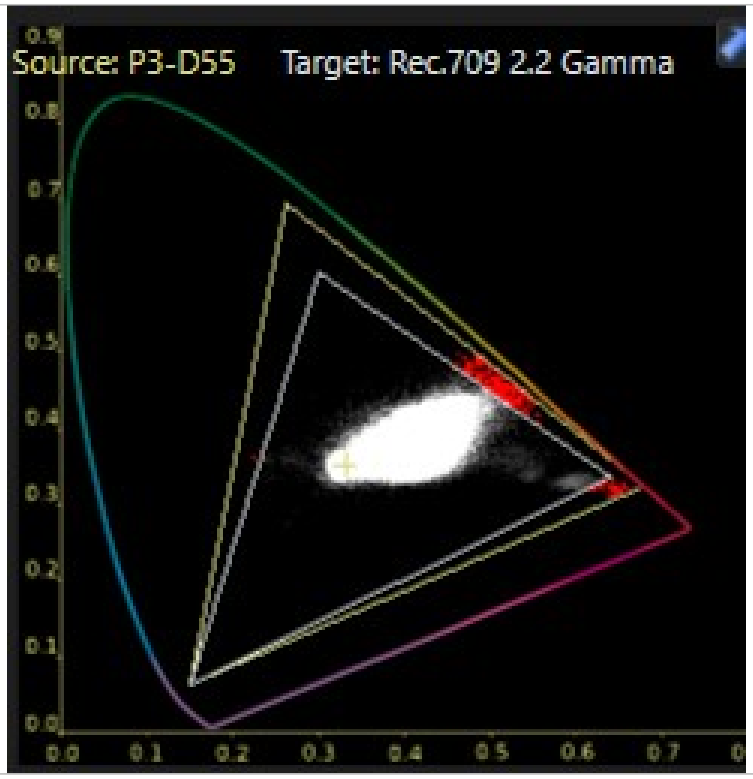
When the Gamut Display is on, the option will change to Show Vectorscope and vice versa.

With the vectorscope now active, choose the Source Color Space. The signal will move along with the reticles to reflect the color space.

To magnify the vectorscope, right-click and choose Vectorscope Gain, then X5.







To show the Gamut Display, right-click and select Show Color Gamut Display. When the Gamut Display is active, a Target Color Space option is added.

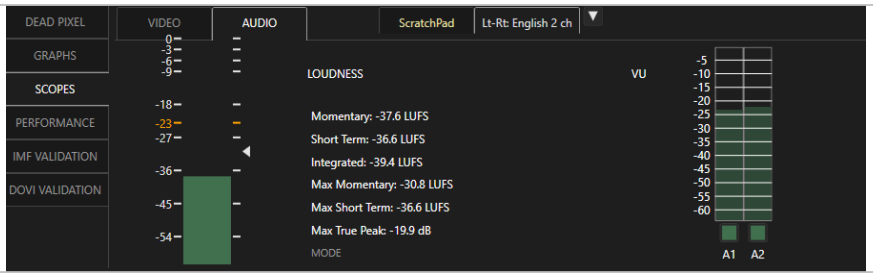
Adding the Target Color Space allows the Gamut Display to expose where the signal falls out of the gamut for the different display primaries.

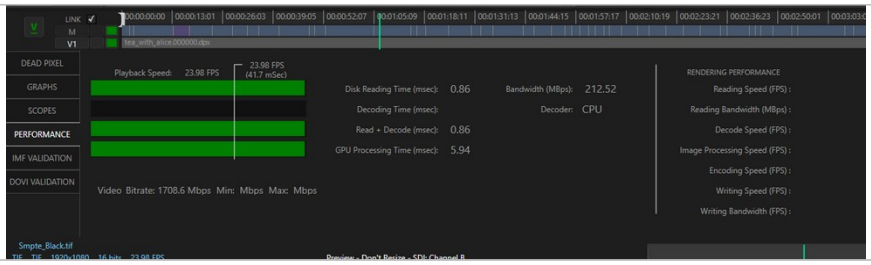
The Source Color Space will always match the color space in which the media was mastered.

The Target Color Space will vary depending on the display the media will be viewed on.

When the signal falls out of the gamut of the Target Color Space, the excursions will be highlighted in red on the Gamut Display Scope. To see them as a zebra pattern in the Media Player, enable Highlight Out Of Gamut in the QA Tool's Graphs module.

Get Matte Lines, on the same right-click menu, measures the matte on the frame in the active player and reports its Top, Bottom, Left and Right matte lines.





Audio Scopes

Select the Audio Tab in the SCOPES module to display the Audio Scopes.

On the left is the Loudness meter and the right a VU meter. The VU meter displays the number of channels included in the selected Deliverable.

In a composition, the ScratchPad and a drop down of all the saved audio configurations appear above the scopes. From there, select the audio configuration to meter.

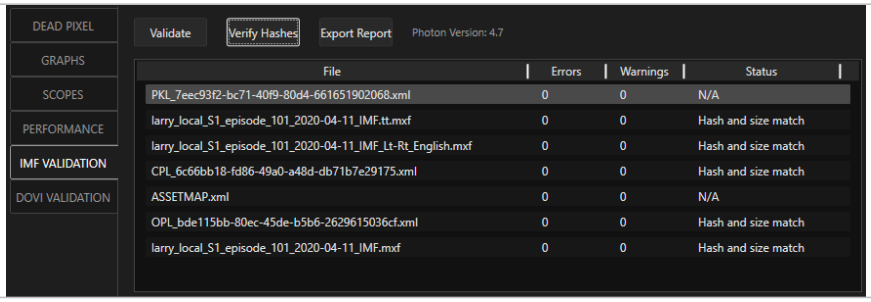
Performance Module

In the Performance Module, Cortex provides live readouts and meters of the system performance.

On the left is the playback speed. A healthy system will show green bars during playback. Red bars indicate a bottleneck in one of 4 areas:

1. Disk Reading Time 2. Decoding Time 3. Read and Decode time 4. CPU or GPU processing time

The numerical readouts to the right of the graph express the values in milliseconds. These graphs and readouts can assist in diagnosing system problems and hardware related issues.



On the right, Cortex displays RENDERING PERFORMANCE expressed in FPS(Frames per second) or MBps (Megabytes per second) in the following categories:

1. Reading Speed(FPS) 2. Reading Bandwidth (MBps) 3. Decode Speed(FPS) 4. Image Processing Speed(FPS) 5. Encoding speed(FPS) 6. Writing Speed(FPS) 7. Writing Bandwidth(FPS)

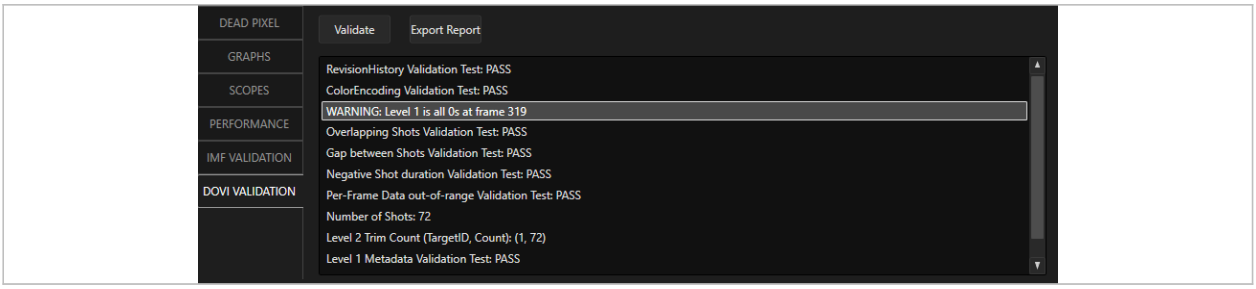
IMF Validation

The IMF Validation module confirms that an IMF package conforms to the SMPTE standard. Using Photon, an open source validator from Netflix, the IMF Validator module confirms the presence of all required MXF, XML and CPL files, verifies elements based on hashes created during rendering, and allows the user to export a PDF report of the validation status and errors for the IMF package.

Steps to IMF Validation

1. Select the IMF to be validated 2. Click the Validate button 3. Check the messages if any after processing 4. Click the Verify Hashes button 5. If desired, click the Export Report button

NOTE: With “Create an IMF” WORKFLOW ACTION, the IMF can be automatically reimported and Validated upon render.



DCP Validation

Cortex validates DCP packages as well as IMF packages, whether the DCP was created in Cortex or received from a third party. Select the DCP VALIDATION tab in the QA Tool.

Steps to DCP Validation

1. Import the DCP into the job using Import → DCP.

2. Switch to the QA Tool and select the DCP VALIDATION tab.

3. Select the DCP to be validated.

4. Start the validation. Progress is reported as the package is checked, and the results are listed as they are produced.

Note: validating an encrypted DCP requires the corresponding KDM to have been loaded against the composition first — see Load KDM on the composition’s Context Menu. Validation of an encrypted package without a valid KDM cannot inspect the essence.

Dolby Vision™ Metadata Validation

The DOVI Validation module confirms the Dolby Vision™metadata provided in the XML by a color corrector. Using Metafier, a validator from Dolby Laboratories, the DoVi Validation verifies a list of specifications and reports on a Pass or Fail basis and alerts to warnings.

DOVI Validation can be performed on a composition prior to render or on imported delivery files such as an IMF package.

Steps to DOVI Validation

1. Select the composition or file to Validate 2. Click the Validate button 3. Check the list for Pass or Fails 4. If Desired, click Export Report to generate a PDF of the Validation

In the example above, the Dolby Vision Metadata passes all requirements, however, reports a warning regarding “0” values in Level 1.

Rendering and the Render Monitor Tool

Before beginning this tutorial, please review the following section: First a Few Definitions

Definitions Worth Repeating

Events, Segments, or Shots

A Composition is a grouping of clips that have been organized into a timeline continuity. Clips contained in the timeline are interchangeably defined as Events, Segments, or Shots, which refer to either a whole or part of a clip. The Composition icon is placed before the composition name in the Sidebar.

File per Clip

Any Deliverable that has its “Packaging” property set to File per clip will begin rendering clips immediately upon being added to the reel. If the clip is modified while the reel is still “Open”, the clip will be automatically re-rendered.

File per Reel

A few deliverable types require the whole reel rendered once it is “Closed” to ensure its complete continuity. This means that every clip intended to be in the reel has been added and that the reel is closed by the user.

Clips Reel

A Clips Reel is a collection of one or more clips intended to be transcoded to one or more Deliverables. Clips added to the reel can be assigned a Print Status.

Composition Reel

The Composition Reel is a collection of one or more composition events. All events added to the reel will be rendered.

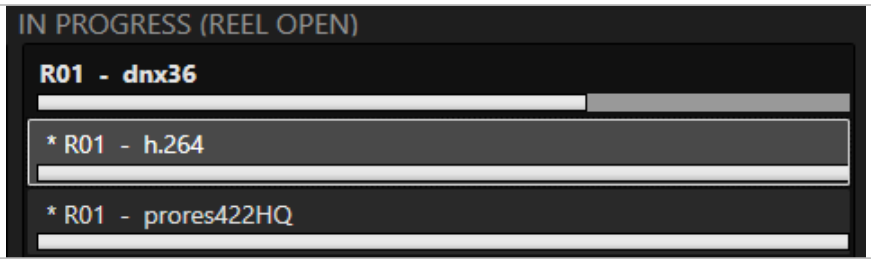
Open Reel

An Open Reel is one where clips are still being added to it or where clips contained in it require modification. In order for a clip in a reel to be modified, the reel must be open. If the reel is closed, the clip can be “Duplicated” for modification leaving the one contained in the reel as is. Reels can be reopened if there is a need to modify a clip. Once modified, the clip will be automatically re-rendered.

Closed Reel

A Closed Reel precludes any changes to be made to any clip contained in the reel. If the reel is closed and a clip that is contained in the reel is selected, all tool modules are disabled including Marks In/Out.

NOTE: The difference between rendering a Composition Reel and a Composition is that a reel is created prior to rendering in order to include individual segments added by the user to render Deliverables that have predetermined audio configurations. Rendering the Composition, without a reel, renders it based upon the whole timeline with the option to choose from audio configurations created in the composition.



Render Methods

There are two methods of rendering files for Clips and Composition Reels and Compositions:

One to One Render

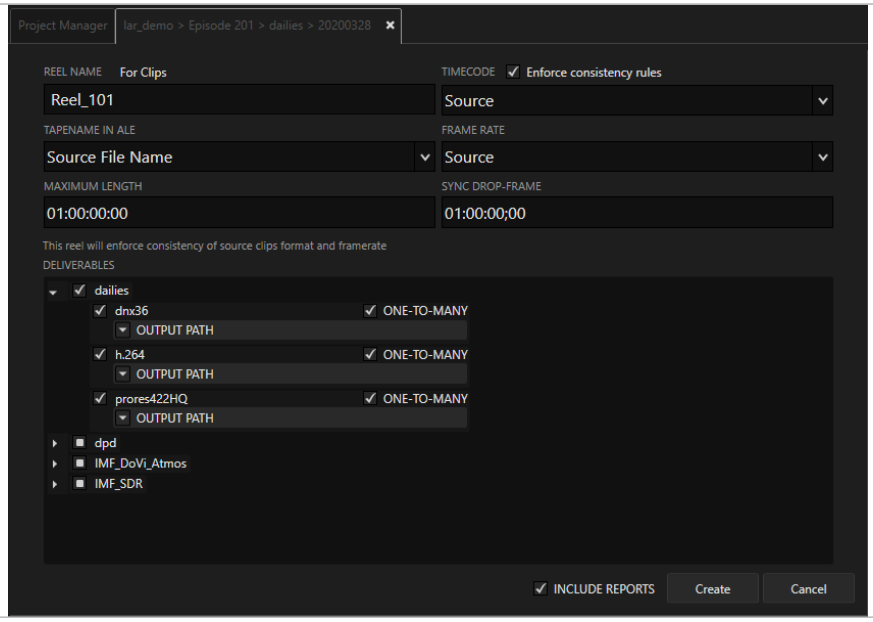
One to One renders one source to one Deliverable at a time. In a multiple Cortex Enterprise workstation environment using a shared database, clips added to a reel will be distributed for rendering by Cortex to available workstations on the shared network.

One to Many Render

One to Many renders one source to many Deliverables simultaneously on a single machine. When viewed in the Render Monitor Tool, each Deliverable of the Many group will have an asterisk in front of it. Clips Reels and Composition Reels are capable of One to Many Renders. For Compositions One to Many is possible but only the Deliverable Configurations can be used for audio processing; the Scratch-Track or any audio configuration created in the edit tool can not be used in a One to Many render.

There are some Deliverables that are incompatible with one to many. For example:

1. IMF 2. DCP 3. File Per Reel Deliverables if the deliverable is DNx op Atom.mxf - The checkbox is automatically disabled



Creating a Clips Reel or Composition Reel

Click the New button in the Color, Sync or Render Monitor Tools and select Clips or Composition Reel. The Edit Tool and QA Tool can only create Composition Reels.

Fill the fields as needed:

● Reel Name ○ Fill in the name of the reel. ○ It must be unique and not a duplicate of a previously created reel.

● Enforce consistency rules ○ When enabled, this ensures that the reel will be consistent with the Project's frame rate. Cortex also ensures that the frame rate of clips added to the reel match the Project frame rate and warns that a mismatched clip cannot be added. ○ If left unchecked, Cortex allows for reels to be created that do not match the Project frame rate. Clips added to the reel are then rendered

at the frame rate consistent with the reel's frame rate setting, which is set in the Frame Rate field dropdown menu.

● Timecode ○ If "Source" is selected, the source timecode will be applied to the rendered file. ○ If "Continuous" is selected, additional fields are displayed as explained later.

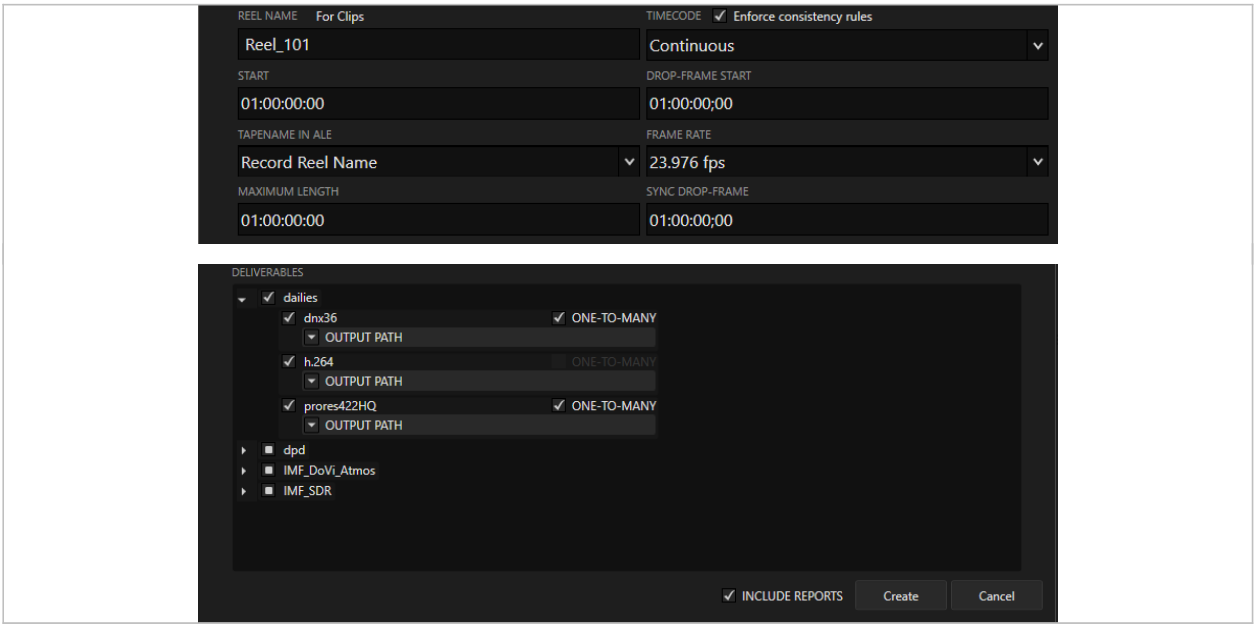
● Tapename in ALE ○ There are three choices ■ Source File Name - defaults for Source timecode reels ■ Record Reel Name - defaults for Continuous timecode reels ■ Source Tape Name - used when a source file was derived from a videotape

● Frame Rate ○ If the Enforce consistency rules checkbox is enabled and the Timecode field is set to "Source", the Frame Rate field is automatically set to the only choice, "Source". ○ If the Enforce consistency rules checkbox is disabled, the Frame Rate field will be automatically set to the Project's frame rate, however, it can be changed to any choice allowed in the dropdown menu.

● Maximum Length ○ This is defaulted to 1 hour but can be modified. A 1 hour reel is recommended particularly for a Deliverable that is profiled as File per Reel since all clips must be rendered at once in order to assure the continuity of the reel. This also assures that the Deliverable can be copied or uploaded in a timely manner so that any receiving party can begin viewing or processing as needed.

● Sync Drop Frame ○ This field sets the relationship between Non-Drop and Drop Frame synchronization of time. It is recommended that this field be left at 1:00:00;00 for Clips Reels.

Any warnings or instructions are placed above the Deliverables section of the Dialog Box.



Continuous Timecode Reels

The general purpose of a Continuous Timecode Reel is to create a mezzanine master file(s) for any file type that does not easily integrate into the post workflow. For example, videos created on phones, oddball cameras, or other such devices that have no timecode at all or where the format of the video needs to be harmonized to the file types of the project.

For this purpose, it is recommended that the mezzanine file be created and rendered first and then used as a source for other derivative files to be used in the post workflow.

If the "Enforce consistency rules" checkbox is enabled, the Frame Rate field will default to the Project's frame rate. When disabled, any frame rate in the field's dropdown menu can be chosen.

The “Start” field dictates the start timecode of the rendered file. The Drop Frame Start sets the relationship between Non-Drop and Drop frame timecode start frames.

Determining One to One and One to Many Renders

In the above example, the h.264 is excluded from the group since it was profiled as a File per Reel Deliverable. Enable the One-To-Many checkboxes as desired and decide whether you wish to “Include Reports”. Press Create when ready.

Once a Reel is created, it will appear in the Sidebar with a Reel Icon.



When the reel is active it is displayed green. For Deliverables that are profiled as File per Clip, add clips as they are finalized by pressing the G key or clicking the Add to Clips Reel button located on the source Media Player. Rendering begins immediately.

Rendering Compositions are discussed later in Rendering a Composition

While rendering, the name and Deliverable tabs are underlined in Green.

Selecting a Deliverable tab displays the contents of the reel in the Master Clips Bin.

The Render Monitor Tool

Switch to the Render Monitor Tool to view the progress of the rendering. The Render Monitor Tool consists of 4 columns:

Disabled If a deliverable is disabled, it is moved to this column

In Progress (Reel Open) When a reel is created, its Deliverables are first moved to this column

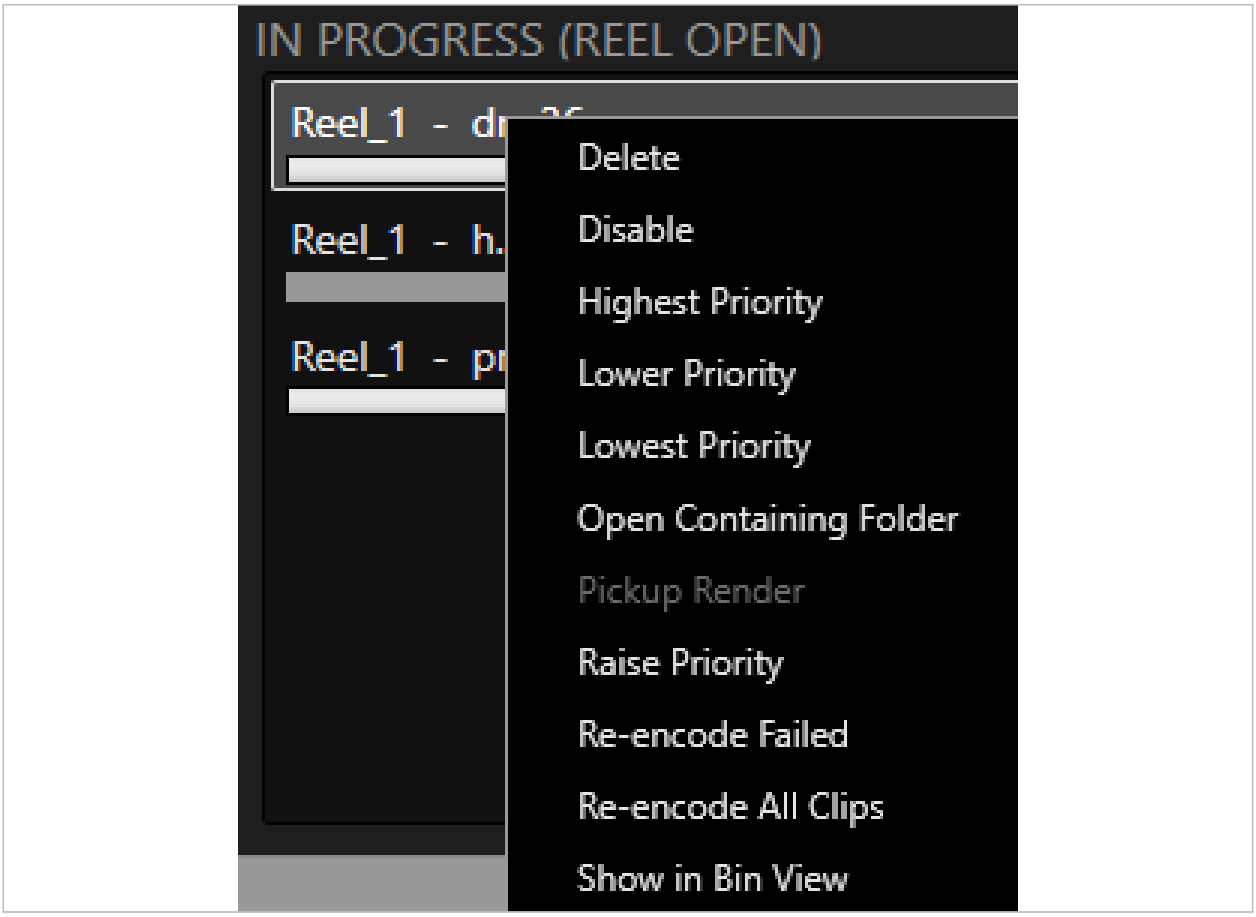
In Progress (Reel Closed After the reel is closed, its Deliverables moves to this column

Completed After completion, the reel is moved to the Completed column

An abbreviated render progress is also displayed in the lower right corner of every tool.

Closing a Reel

When a reel is ready to be closed, right-click on the reel name in the Sidebar and choose “Close” from the context menu or click the “Close” button at the top of the UI above the Master Clips Bin. The reel and its Deliverables will move from the column, “In Progress (Reel Open)” to the column, “In Progress (Reel Closed)”. When rendering is complete the reel will move the Completed column.



Selecting Deliverables in the Render Monitor Tool

In any of the columns, right-click on a single or group selection of Deliverables to display a context menu.

A variety of options are available

● Delete. Three are three options a. Delete the Deliverable(s) from the list but leave the directory folder(s) b. Delete the Deliverable(s) from the list and its corresponding directory folder(s) c. Cancel

● Disable - disables the selected Deliverable(s) and places them in the Disabled column for later action

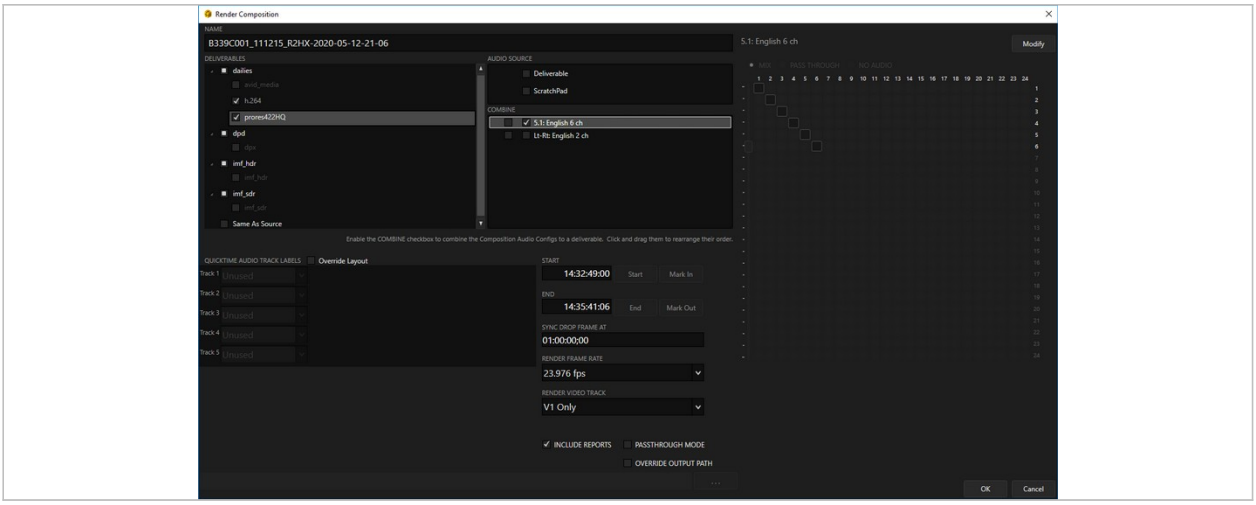
● Highest Priority a. If One to One - Raíses the selected Deliverable to the highest priority for rendering b. If One to Many - Raises all in the many-group regardless of which Deliverable is selected

● Lower Priority c. If One to One - Lowers the selected Deliverable priority by one position for rendering d. If One to Many - Lowers all in the many-group by one position regardless of which Deliverable is selected

● Open Containing Folder a. Works the same for both One to One and One to Many rendering b. If more than one Deliverable is selected, it opens all directories

● Pickup Render - Works for any “file per frame” render (i.e. DPX) and is especially useful to insert a single shot into a previously rendered clip or composition. For example, if a single shot needs to be replaced in a composition, right-click on the Deliverable and choose Pickup Render: a. A Render Composition dialog opens b. If a Mark In and Mark Out exist click the Mark In and Mark Out buttons c. The marks will appear in the Start and End timecode registers d. Choose which video tracks from which

to render in the Render Video Track dropdown menu e. Enable or disable the Include Reports checkbox f. Click Ok The files are then rendered overwriting existing files.



● Raise Priority a. If One to One - Raises the selected Deliverable priority by one position for rendering b. If One to Many - Raises all in the many-group by one position regardless of which Deliverable is selected

● Re-Encode Failed a. Re-encodes any failed clips for both One to One and One to Many Deliverables

● Re-Encode All Clips a. Re-encodes all clips in selected Deliverable(s)

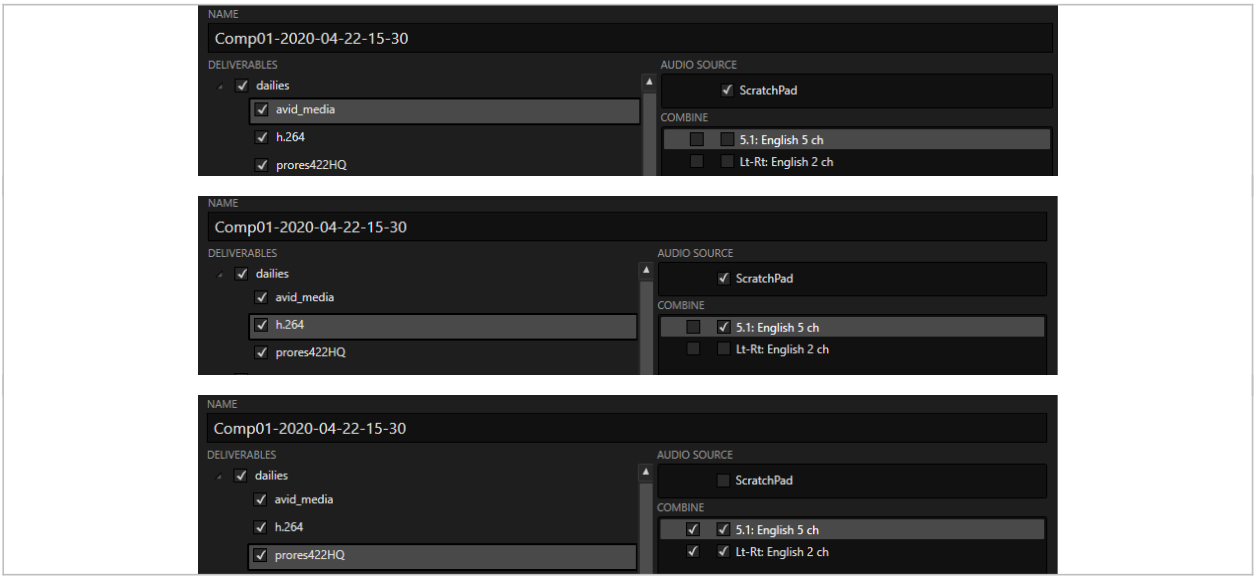
● Show in Bin View a. For this option, only one Deliverable can be selected. b. If more than one deliverable is selected, the option is disabled.

Rendering a Composition

To Render a Composition right-click on the composition in the Sidebar and select Render.

The Render Composition Dialog Box

The Render Composition Dialog box consists of three basic sections: Deliverables, Audio Sources, and Audio Mixer.



Enable the Deliverables to be rendered. Each Deliverable can be rendered with one or more audio mixes found in the Audio Source section. To determine which audio mix(es) will be rendered with the Deliverable: 1. Click on the Deliverable 2. Enable the mix checkboxes to be included in the render 3. If there are more than one mix available, the Combine checkbox will be available. ■ To combine mixes to a single render, enable the desired Combine checkboxes.

If the Combine checkbox is left disabled, Cortex will render each mix separately to a new Deliverable file.

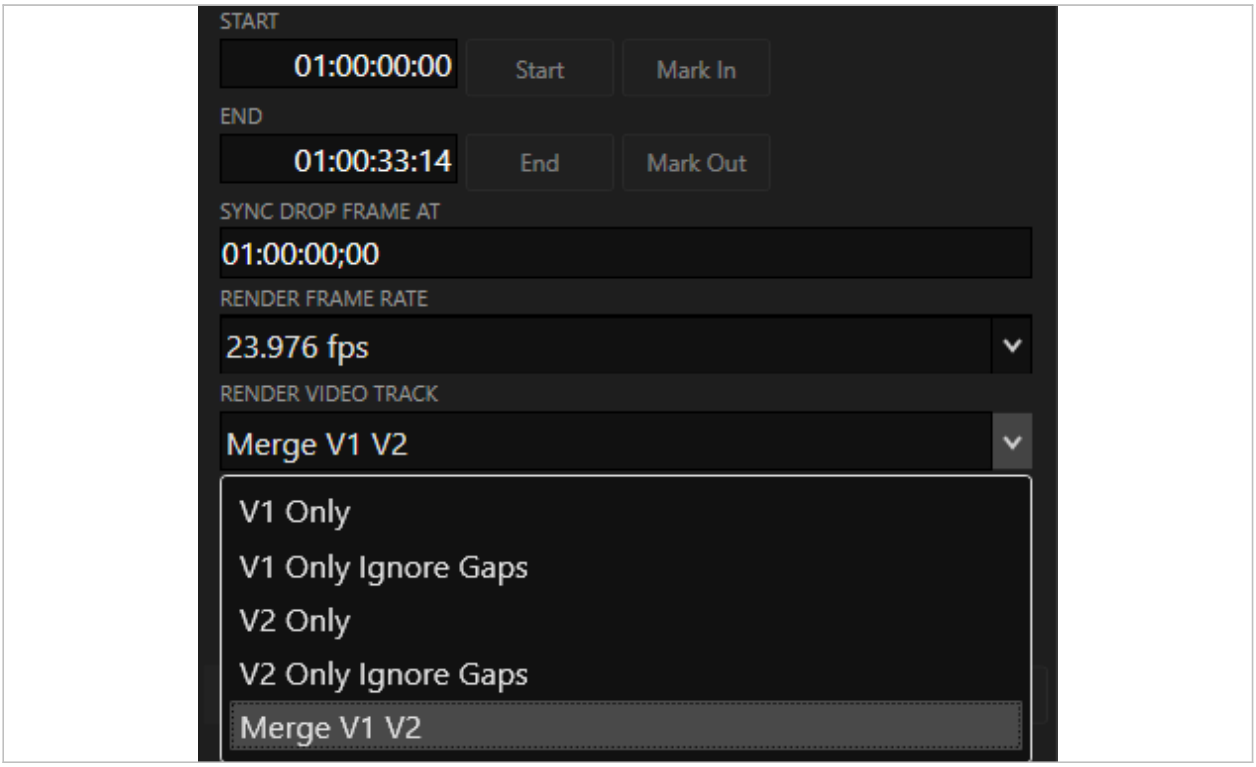
After choosing the Deliverable and Audio Mix(es), it is possible to modify each of the Audio Mixes using the mixer. The modification is temporary and only applies to the current render(s). Click the Modify button and adjust the mixer matrix as required.

Note: The ScratchPad audio cannot be combined with other mixes and is rendered separately.

In the following figure, the avid_media Deliverable is selected and only the ScratchPad mix will be rendered.

In this figure, the h.264 Deliverable will be rendered twice separately, once with the ScratchPad and once with the 5.1 English mix.

In this figure, the prores422HQ Deliverable will be rendered once combining the 5.1 and LtRt mixes.



By default, the Start and End timecodes of the composition are entered in the corresponding fields. If a Mark In and/or Mark Out are present on the composition, you can choose to use them as start or end times for the render by clicking their respective buttons. You can also manually enter In and Out points for rendering.

Enter the timecode for the “Sync Drop Frame At” field. Normally left at the 01:00:00;00 default. Choose the “Render Frame Rate”, which defaults to the project frame rate. If there is more than one video track in the composition, a number of options are presented in the “Render Video Track” field. Choose the one in the dropdown menu that best suits the required render.

If there are gaps in the video track, Cortex can ignore those gaps and jump to the next filled video segment.

Quicktime Audio Track Labels

If required, use the dropdown menu to label the tracks contained in a rendered Quicktime file. Enable the Override Layout checkbox and choose from a comprehensive list of labels provided by Apple.

Please contact support@mtifilm.com to ask additional questions and support. Learn more at: https://mtifilm.com



Cortex User Manual Version 6.0 Dated June 1st, 2024

Thank you for choosing to learn about Cortex.

For Additional information, requesting help and accessing our knowledge base, you can access MTI Film's Support resources by registering on our Forum at forum.mtifilm.com, which also includes the most up-to-date version of the software.

Check for the latest MTI Film CORTEX news and product info at: https://www.mtifilm.com