

ICE USER MANUAL

Marquise Technologies

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REFERENCE PLAYER
FOR ADVANCED QC

1. INTRODUCTION

1.1. About this manual

1.1.1. Copyright Notice

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1.1.4. Conventions

This documentation makes use of several symbols and typographical conventions in order to differentiate various paragraphs from standard descriptive text. Here is the list of symbols and typographical styles used:



INFO : Additional information about the current topic.



WARNING : Important information that you should always take into consideration.



TOOL-TIP : Additional information about tool usage

1.2. About ICE

ICE is a Reference player for the playback and QC of high-end content in any format from SD to 4K, including DCP as well as Interoperable Master Format (IMF) packages. Validation tools, audio & image analysis and support for automated QC reports complete the toolset.

Dedicated to post houses, broadcasters, archives and cinema operators, ICE plays natively all the formats used in the industry in the production, post production and distribution phases, and also support ACES and HDR content.

1.3. Documents & Resources

Information like product brochures, white papers and video tutorials are referenced here: <http://marquise-tech.com/resources.html>

The release notes of ICE, the latest available version of the software and the Knowledge Base is available on Marquise Technologies support portal.

1.3.1. Creating an account on the Support Portal

<https://support.marquise-tech.cloud>

Press the button New Account and fill the form.

A validation link will be sent by email, necessary to confirm the registration

Once this part is done, the Account administrator is able to send invitation to his/her team to create new users on your account from the Account Management tab.

1.4. Contacting Support

Support is available for customers under a valid support and maintenance program.

All the Support requests need to be sent using our ticketing system, accessible from the Support Portal.

To inform us of an issue or place a question related to product support, please go under TICKETS to create a new ticket.

Please report only one question or issue per ticket and indicated the version of the software you are using.

The more information you give us, the best we can help. You can also add tags to help the process (product name, urgent, custom information). Please note that for urgent tickets we process them in order of arrival.

2. INSTALLATION

This chapter covers high level information about ICE, and in particular:

- Hardware Requirements
- Software installation
- License installation

2.1. Hardware Requirements

The way ICE playbacks media highly depends on the capabilities of the hardware chosen. Please make sure to select the workstation according to your needs.

Operating SySTEM ICE uses Microsoft Windows 64 bit

Supported GPU ICE supports the following NVIDIA Cuda GPUs: RTX 4000, P5000, P6000, GTX 1080, GTX 1080ti, RTX 4000, RTX 6000, RTX 2080, RTX 2080ti



All configurations MUST have 2 GPUs when GPU is used for decoding JPEG2000 (DCP & IMF). A single GPU machine will not reach its peak performance.



In order to ensure the proper functioning of Nvidia's GPUs cards, please keep up to date the version of your drivers and refer to the Multi-GPU Configuration article of the Knowledge base.

Supported Video IO cards ICE supports the following video IO cards: Bluefish44 Kronos elektronik, Bluefish444 Supernova S+, Bluefish444 Neutron, AJA Kona 5, AJA Kona 4, Aja Corvid 88, BlackMagic DeckLink Studio 4K

Screen Minimum 1 screen of 1920 x 1200 resolution. The second screen for dual display mode can be 1920 x 1080 resolution

Storage Whatever the type of storage chosen, internal, NAS or SAN, its capacity and bandwidth will impact the playback speed of ICE.

2.2. Recommended Hardware configurations

Recommended Systems for DCP Playback

HP Z8

CPU	Dual Intel Xeon Gold 6130 processors or higher
Memory	Minimum 64GB
GPU 1	1 NVIDIA RTX 4000

GPU 2	1 NVIDIA RTX 6000
Video IO	Bluefish444 Supernova S+, AJA Kona 4 or higher

Recommended Systems for IMF Playback

HP Z8

CPU	Dual CPU Intel Xeon Gold 6134 3,20Ghz processors or higher
Memory	Minimum 128GB
GPU 1	1 NVIDIA RTX 4000
GPU 2	1 NVIDIA RTX 6000
Video IO	Bluefish444 Kronos elektronik, AJA Kona 5, Corvid 88

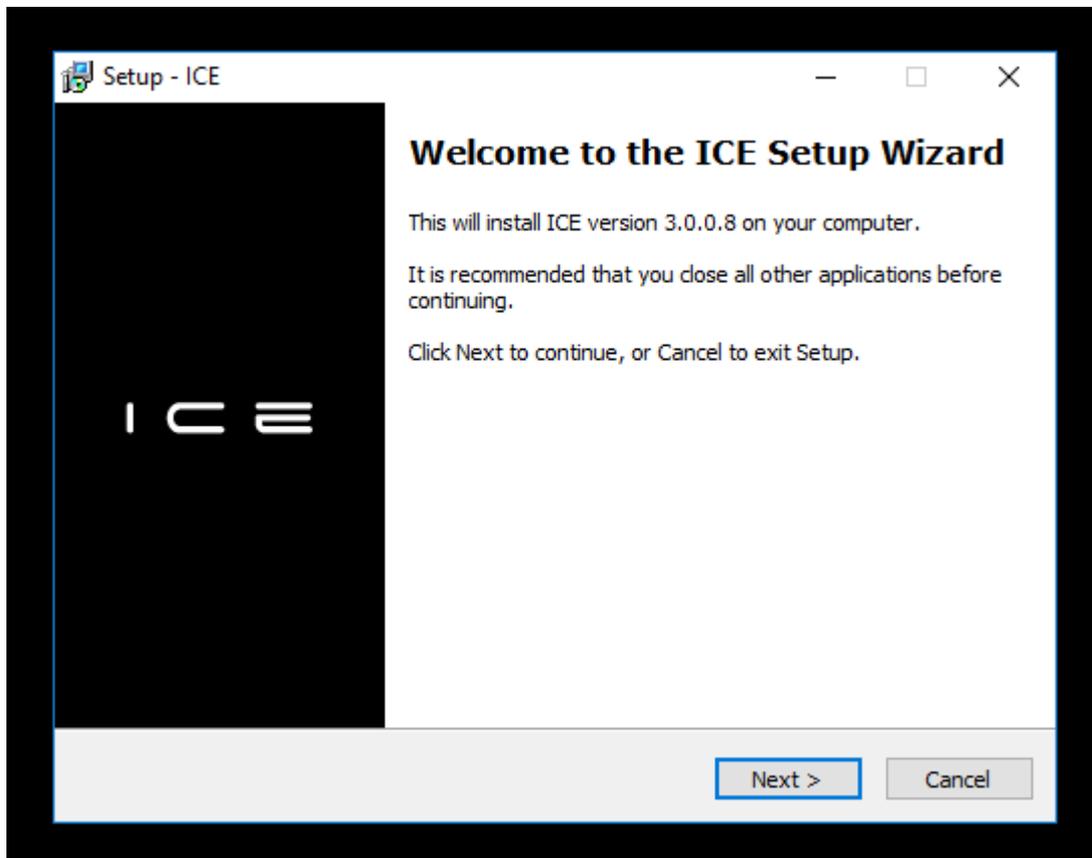
Supermicro SYS-7049GP-TRT

CPU	Dual CPU Intel Xeon Gold 6134 3,20Ghz processors or higher
Memory	Minimum 128GB
GPU	Minimum 3 x NVIDIA RTX 2080ti
Video IO	Bluefish444 Kronos elektronik, AJA Kona 5, Corvid 88

2.3. Software Installation

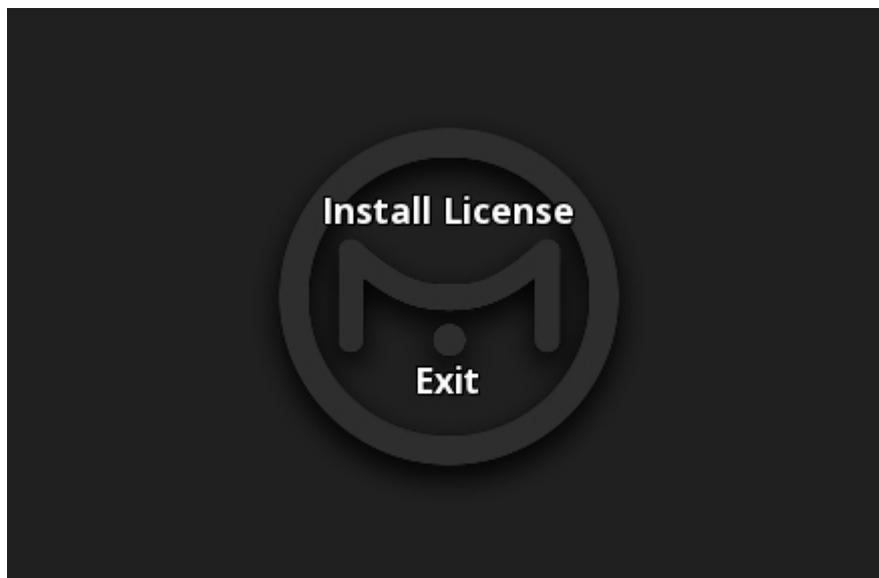
ICE latest release version can be downloaded from the [Support Portal](#).

Follow the instructions of the Set up wizard for the installation on your computer :



2.4. License installation

After having installed ICE, you need to launch the software.



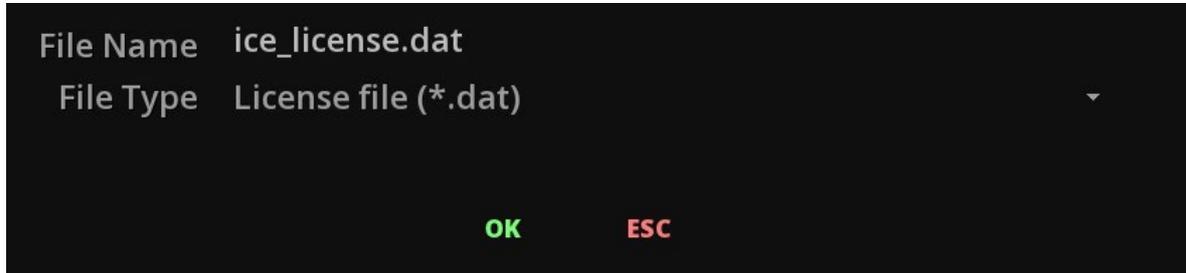
Select the "Install License" button.



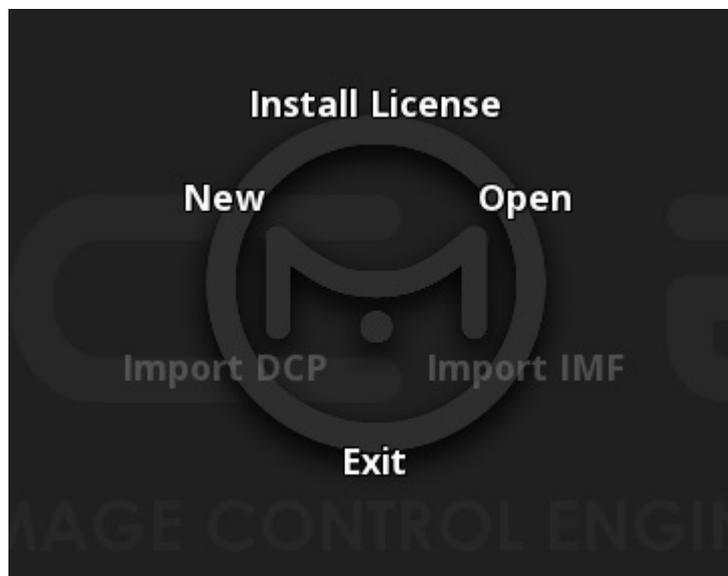
From support@marquise-tech.com, you should have received two files: `ice_license.dat` and `ice.lic`. Sometimes, for a special purpose, these files have different names, you just need to rename them like this.

Installing Primary License for ICE

First step, you have to import the `ice_license.dat` file. You need to browse the file system where you have stored the licenses. It is easier to find by setting the correct ".dat" filter in the "File Type" line:

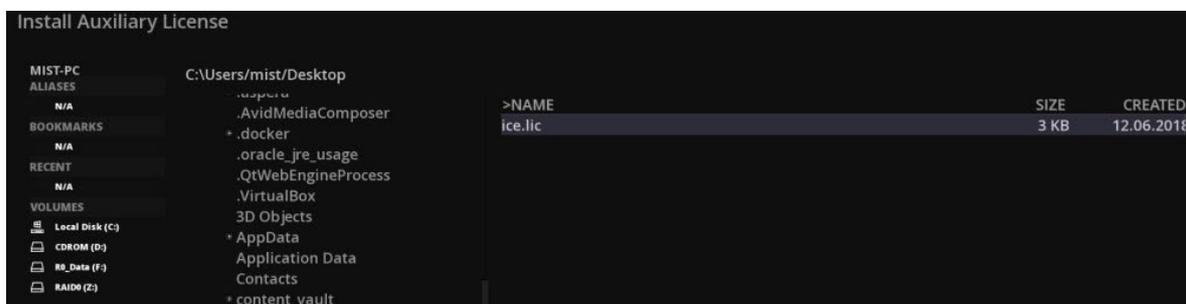


Should the import of the license worked fine, new functions will appear in the starting menu:

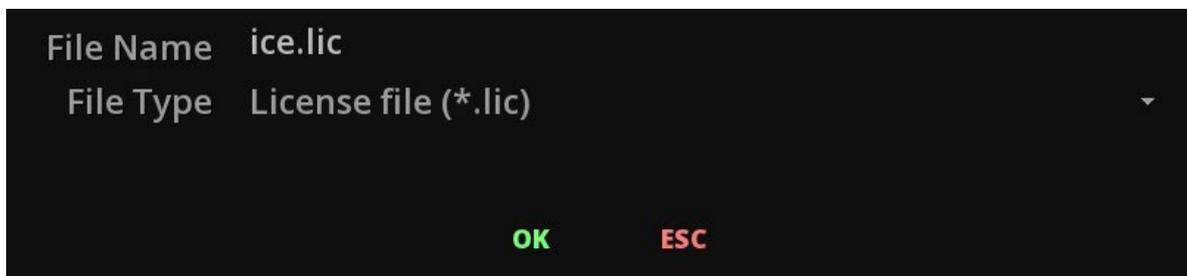


Installing Auxiliary License for ICE

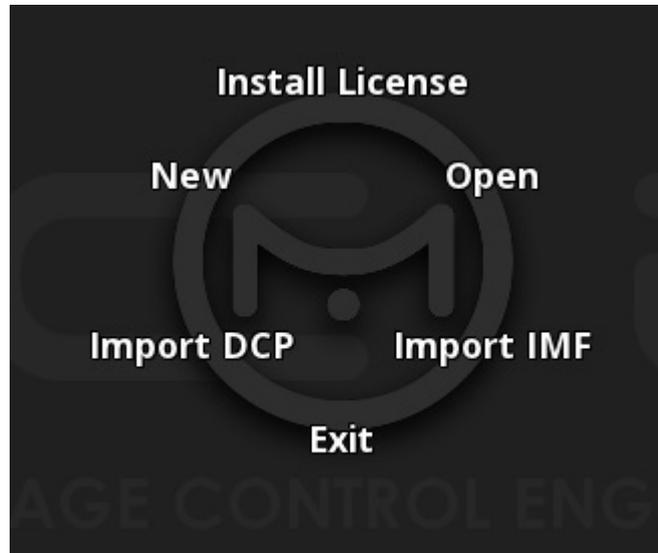
The Auxiliary License needs to be imported as well, so select again "Install License" button to to install the `ice.lic` file:



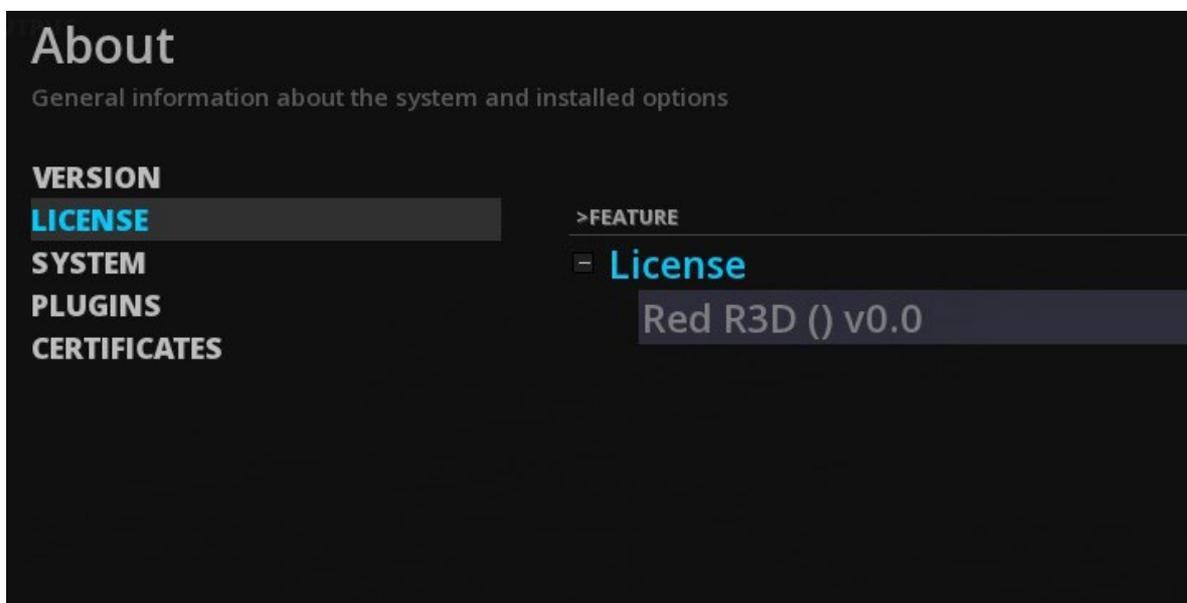
Again browse the file system where you have stored the licenses, and select ".lic" in the file type for retrieving the file.



Now, you have your software correctly activated.



You can check your license and plugins by pressing **F12** (About) or by pressing **ctrl + right click** on the viewer, when a project is open.



3. GETTING STARTED

This chapter covers high level information about ICE, and in particular:

- ICE User Interface Structure

- Interface Basics

3.1. Software Organization

ICE is built around 2 main modules :

- The Project Manager
- The TimeLine

The TimeLine also has sub-modules, like the Project Library for example.

3.1.1. Navigation across modules

A module can be accessed from the other module using either keyboard shortcuts or the Module Radial Menu.

Using Keyboard shortcuts

- To access Project press F1
- To access TimeLine press F3

Using Module Radial Menu

See the following section [Contextual Menu](#) to know more about the Radial menus.

3.2. Interface Basics

Below you will find an overview of all the User Interface elements you will see using ICE.

3.2.1. Cursors

ICE mouse cursor changes appearance if an action with the mouse is possible:

	Cursor in normal mode
	Possibility to move horizontally an interface element
	Possibility to move vertically an interface element
	Possibility to extend or resize an interface element
	Cursor in move mode
	Possibility to set an IN point (in the timeline)
	Possibility to set an OUT point (in the timeline) or to extend a clip duration (from the last frame of the clip)
	Cursor in trim mode



Indicates that the application is busy performing an operation

3.2.2. Contextual Menu

A contextual menu is a menu in a graphical user interface (GUI) that appears upon user interaction, such as a right mouse click. These menus offer a selected set of choices that are available in the current state, or context, of the application.



Calling the Contextual Menu when mouse cursor is located on a specific panel or interface element is not always possible. In that particular case, move the cursor to the nearest empty part of the user interface to be able to call the desired Contextual Menu.

ICE uses two different Contextual Menus: The radial Menu and the drop-down Menu.

Module Radial Menu

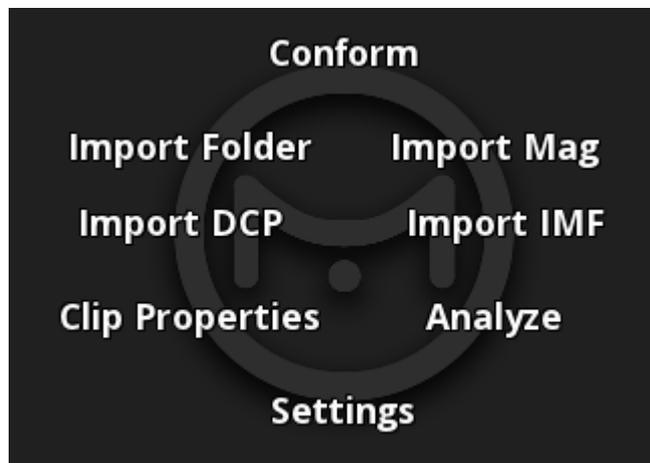
The Modules Menu allows navigation through the different modules.

Calling Module Radial Menu also allows to exit ICE application.

- To call the Modules Menu, use **Ctrl** + **right mouse** click to display the Radial menu.

Action Radial Menu

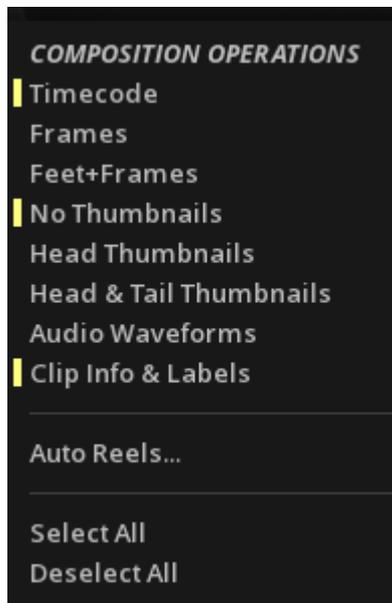
The Action Radial Menu gives quick access to possible actions available from the TimeLine:



- To display the Action Radial Menu, use **Right mouse** click.

Drop-down menu

The drop-down menus give quick access to possible actions for the specific area the mouse is located.

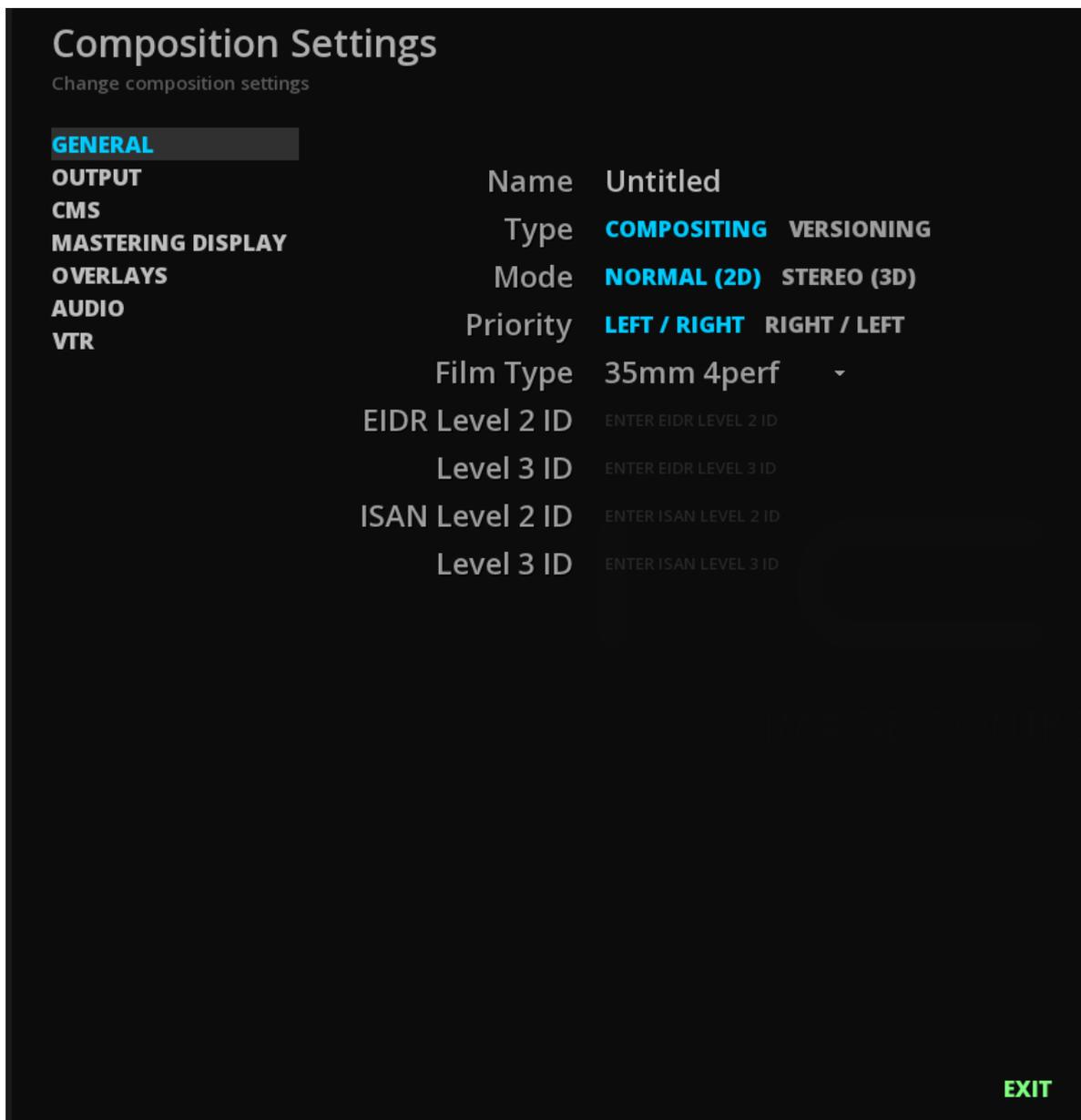


3.2.3. Dialogue Windows

Dialogue windows are represented by large rectangles opening over the module you are in.

They are accessible using interface buttons.

Dialogues windows can have several tabs and sometimes sub-tabs where the user can set different parameters.



3.2.4. Hot Boxes

Hot boxes are available on certain part of the user interfaces, allowing a quick access to tools related to the timeline or the image Viewport.

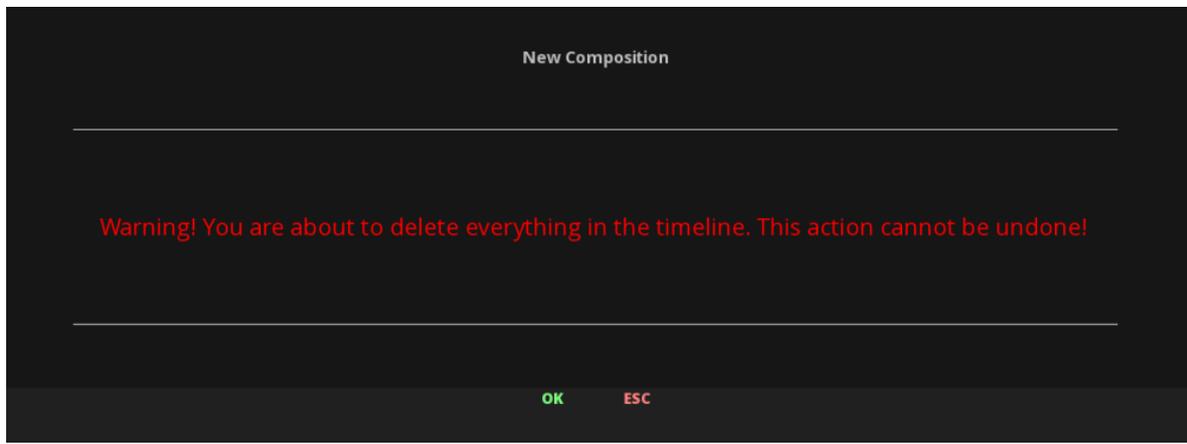


3.2.5. Warning Messages

Warning messages can appear in the different modules of ICE.

These messages interrupt the current work, in order to inform the user about a critical path.

Warning messages always require an action from the user : press [**OK**] to continue or [**ESC**] to cancel.



3.2.6. Keyboard Shortcuts - Help

A lot of keyboard shortcuts are available in ICE.

- Press the keyboard **H** key to display the Shortcuts List available for the current Module (available from the Library module and the TimeLine module)

Below is a recapitulation of the available Keyboards Shortcuts for ICE.

TOPIC	MODIFIER KEY	DESCRIPTION
NAVIGATION	F1	Go to Project
NAVIGATION	F6	Go to Composition Analysis
NAVIGATION	Alt + F6	Go to Video Pipeline Diagram
NAVIGATION	F7	Go to Storyboard
NAVIGATION	F10	Go to Timeline
NAVIGATION	F11	Switch Calibrate/Timeline
NAVIGATION	F12	About
NAVIGATION	Esc	Escape from current operation
NAVIGATION	H	Help
NAVIGATION	Page Up	Show Timeline
NAVIGATION	Page Down	Hide Timeline
NAVIGATION	Ctrl + Q	Exit Project
NAVIGATION	Alt + Ctrl + Esc	Minimize

NAVIGATION	Alt + F2	Toggle Library access
CLIP MANAGEMENT	Ctrl + Shift + P	Show Clip Properties
OTHER	Ctrl + F12	Take Snapshot
AUDIO	Alt + Shift + A	Show/Hide Audio Mixer
DISPLAY	Shift + H	Show/Hide Histogram
DISPLAY	Shift + V	Show/Hide Vectorscope
DISPLAY	Shift + W	Show/Hide Waveform
DISPLAY	Shift + A	Show/Hide Audio levels
DISPLAY	Shift + B	Show/Hide Bitrate
DISPLAY	Shift + N	Show/Hide Luminance Meter
DISPLAY	Shift + D	Show/Hide DMCVT Metadata
DISPLAY	Shift + M	Show/Hide Dynamic Metadata
DISPLAY	Shift + P	Show/Hide PSNR Meter
DISPLAY	Alt + Z	Show/Hide Zebra
DISPLAY	Alt + Q	Show/Hide Dynamic Mapping
DISPLAY	Alt + T	Change time display
DISPLAY	F	Fit Viewport
DISPLAY	Shift + F	Toggle Full Screen Viewport
DISPLAY	C	Center Viewport
DISPLAY	Alt + C	Toggle Camera View
DISPLAY	Alt + F	Toggle Safe Frames
DISPLAY	Alt + A	Toggle Axis View
DISPLAY	Alt + K	Show/Hide Color Picker Info
DISPLAY	Alt + Shift + K	Toggle Color Picker Display Modes

DISPLAY	Alt + J	Show/Hide Information
DISPLAY	Alt + 1	Toggle Red Channel
DISPLAY	Alt + 2	Toggle Green Channel
DISPLAY	Alt + 3	Toggle Blue Channel
DISPLAY	Alt + 4	Toggle Alpha Channel
DISPLAY	Alt + 5	Toggle Mask
DISPLAY	Alt + B	Toggle Active Area
DISPLAY	Alt + S	Toggle Mono/Stereo
DISPLAY	Alt + D	Toggle Left/Right Display
DISPLAY	Alt + G	Toggle Geometry Display
DISPLAY	X	Toggle Dual Viewport
DISPLAY	Alt + X	Toggle Single/Dual Viewport
DISPLAY	G	Lock Dual Viewport
LUT	9	Toggle LUT Computer Display
LUT	0	Toggle LUT Mastering Display
TIMELINE	Ctrl + Shift + F	Fit Timeline
TIMELINE	Alt + Ctrl + F	Fit duration
TIMELINE	Alt + Ctrl + Shift + F	Fit All durations
TIMELINE	Ctrl + Shift + C	Center Timeline
TIMELINE	Ctrl + +	Zoom In Timeline
TIMELINE	Ctrl + -	Zoom Out Timeline
TIMELINE	Alt + H	Toggle Clip Handles
EDIT	Ctrl + Z	Undo

EDIT	Ctrl + Y	Redo
EDIT	Ctrl + A	Select all Clips
EDIT	Ctrl + D	Deselect All Clips
EDIT	Del	Delete Selected Clips
EDIT	Backspace	Ripple Delete Selected Clips
EDIT	I	Mark In
EDIT	O	Mark Out
EDIT	Alt + I	Clear Mark In
EDIT	Alt + O	Clear Mark Out
EDIT	Ctrl + Shift + I	Set Composition In
EDIT	Ctrl + Shift + O	Set Composition Out
EDIT	Alt + M	Clear Mark points
EDIT	Ctrl + K	Razor at time marker
EDIT	Ctrl + L	Lift marked region
EDIT	Ctrl + E	Extract marked region
EDIT	Ctrl + J	Join
EDIT	Insert	Toggle Insert/Replace Mode
EDIT	Ctrl + C	Copy
EDIT	Ctrl + V	Paste
EDIT	S	Select Current Clip
EDIT	Ctrl + Up	Activate Layer Above
EDIT	Ctrl + Down	Activate Layer Below
EDIT	Ctrl + Shift + L	Lock/Unlock Active Layer
EDIT	Ctrl + Shift + E	Enable/Disable Active layer

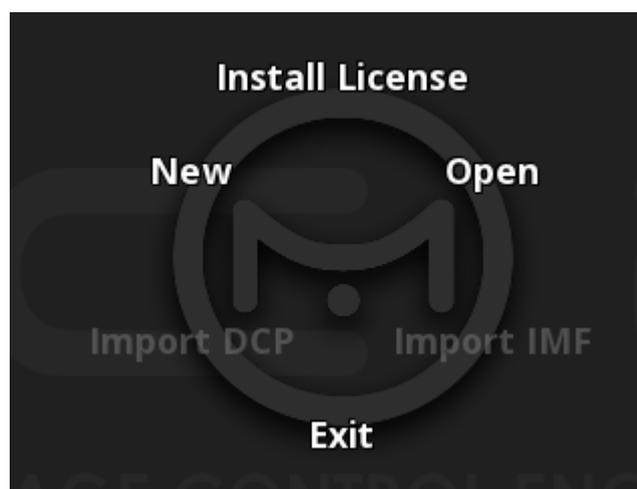
EDIT	T	Insert Dissolve
EDIT	Y	Insert from Source
EDIT	Ctrl + Shift + A	Insert Audio layer
EDIT	Ctrl + Shift + V	Insert Video Layer
EDIT	Ctrl + Shift + W	Merge Stereo Video Layers
EDIT	Alt + Ctrl + V	Paste Layered
EDIT	W	Toggle Snap
EDIT	Alt + Left	Trim In -1 frame
EDIT	Alt + Right	Trim In +1 frame
EDIT	Alt + Shift + Left	Trim Out -1 frame
EDIT	Alt + Shift + Right	Trim Out +1 frame
EDIT	Alt + Ctrl + Left	Slip -1 frame
EDIT	Alt + Ctrl + Right	Slip +1 frame
EDIT	Alt + Up	Slide -1 frame
EDIT	Alt + Down	Slide +1 frame
TRANSPORT	J	J Pressed
TRANSPORT	J	J Released
TRANSPORT	K	K Pressed
TRANSPORT	K	K Released
TRANSPORT	L	L Pressed
TRANSPORT	L	L Released
TRANSPORT	Space	Play Forwards
TRANSPORT	Ctrl + Space	Play Backwards

TRANSPORT	Alt + Space	Play Forwards Marked Range
TRANSPORT	Alt + Ctrl + Space	Play Backwards Marked Range
TRANSPORT	Shift + I	Go to IN point
TRANSPORT	Shift + 0	Go to OUT Point
TRANSPORT	Left	Previous Frame
TRANSPORT	Right	Next Frame
TRANSPORT	Shift + Left	Previous 10 Frames
TRANSPORT	Shift + Right	Next 10 frames
TRANSPORT	Ctrl + Left	Previous 100 Frames
TRANSPORT	Ctrl + Right	Next 100 Frames
TRANSPORT	Ctrl + Shift + Left	Go to Previous Cut
TRANSPORT	Ctrl + Shift + Right	Go to Next Cut
TRANSPORT	Home	Go to First Frame of the Composition
TRANSPORT	End	Go to Last Frame of the Composition
TRANSPORT	Ctrl + P	Toggle Playback Mode
TRANSPORT	Shift + Home	Go to Layer Start
TRANSPORT	Shift + End	Go to Layer End
TRANSPORT	Ctrl + Home	Go to Clip Start
TRANSPORT	Ctrl + End	Go to Clip End
TRANSPORT	Alt + Page Up	Previous Audio Cut
TRANSPORT	Alt + Page Down	Next Audio Cut
TRANSPORT	Shift + Page Up	Previous Subtitle
TRANSPORT	Shift + Page Down	Next Subtitle

MARKERS	Alt + U	Previous Composition Marker
MARKERS	Shift + U	Next Composition Marker
MARKERS	Alt + CTRL + M	Previous Segment Marker
MARKERS	Ctrl + Shift + M	Next Segment Marker
MARKERS	Ctrl + M	Add Composition Marker
MARKERS	Alt + Shift + M	Add Segment Marker
STILL STORE	8	Enter/Toggle Compare Mode
STILL STORE	Alt + 8	Exit Compare Mode
STILL STORE	Ctrl + 8	Copy Frame to Still Store
STILL STORE	Ctrl + Shift + 8	Toggle Comparator Visibility
EVENT VIEWER	E	Show/Hide Event Viewer
REELS	Alt + Ctrl + Page Up	Previous reel
REELS	Alt + Ctrl + Page Down	Next reel

3.3. Starting ICE

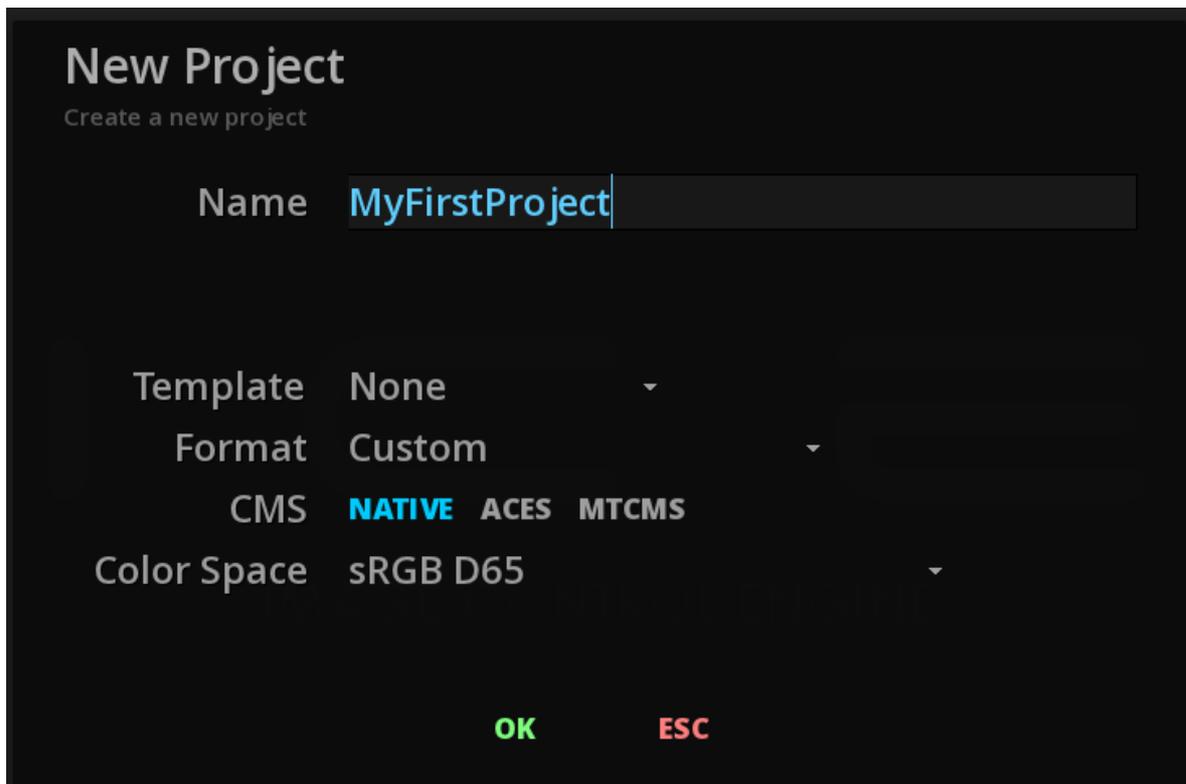
On opening, ICE displays a Radial Menu:



- From the menu choose **New**

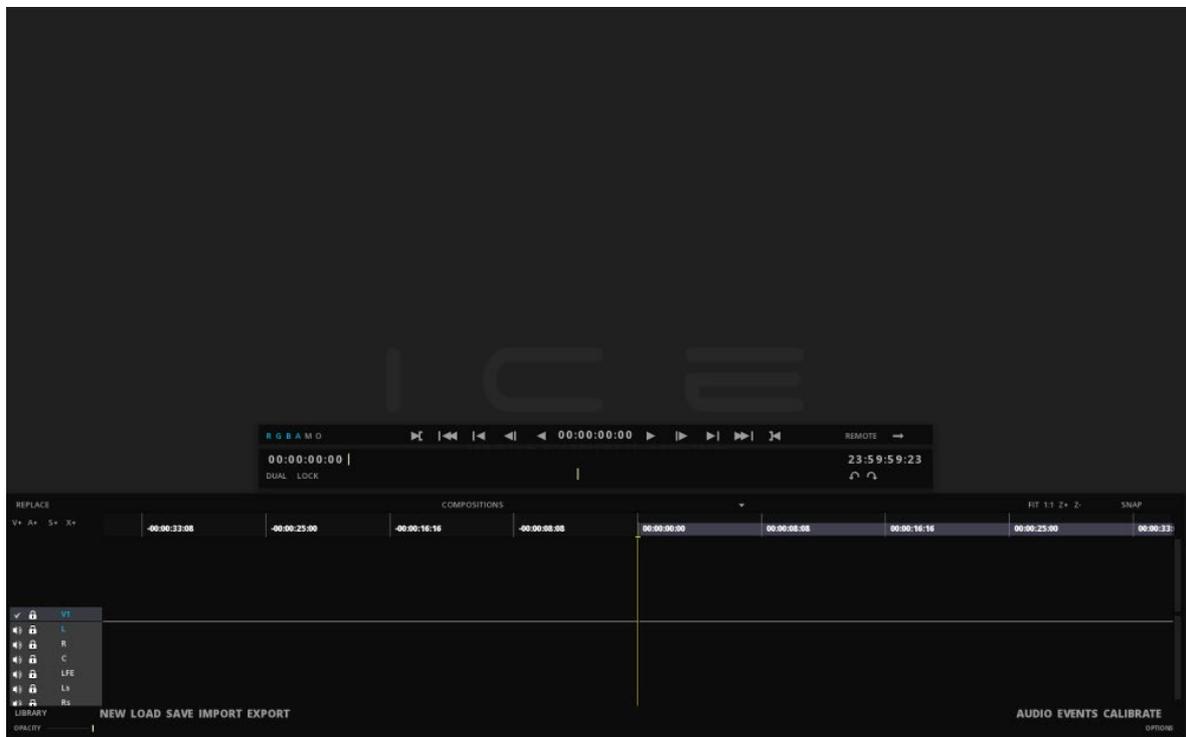
The New Project window appears.

Add a name and select your settings then click [**OK**]



Details about the settings can be found in the [Project Management](#) chapter.

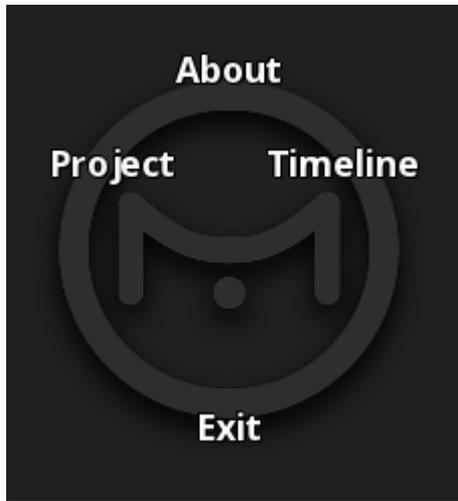
The new project opens on an empty TimeLine.



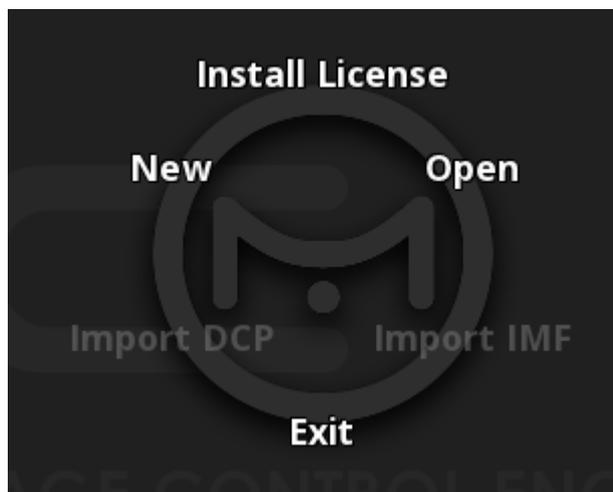
Details about the TimeLine can be found in the [TimeLine](#) chapter.

3.4. Closing ICE

- Press **Ctrl** + **right mouse** click to display the menu and select **Exit** to leave the Project.



Once you have exited the Project, chose Exit to close ICE.



4. PROJECT MANAGEMENT

4.1. About Project Management

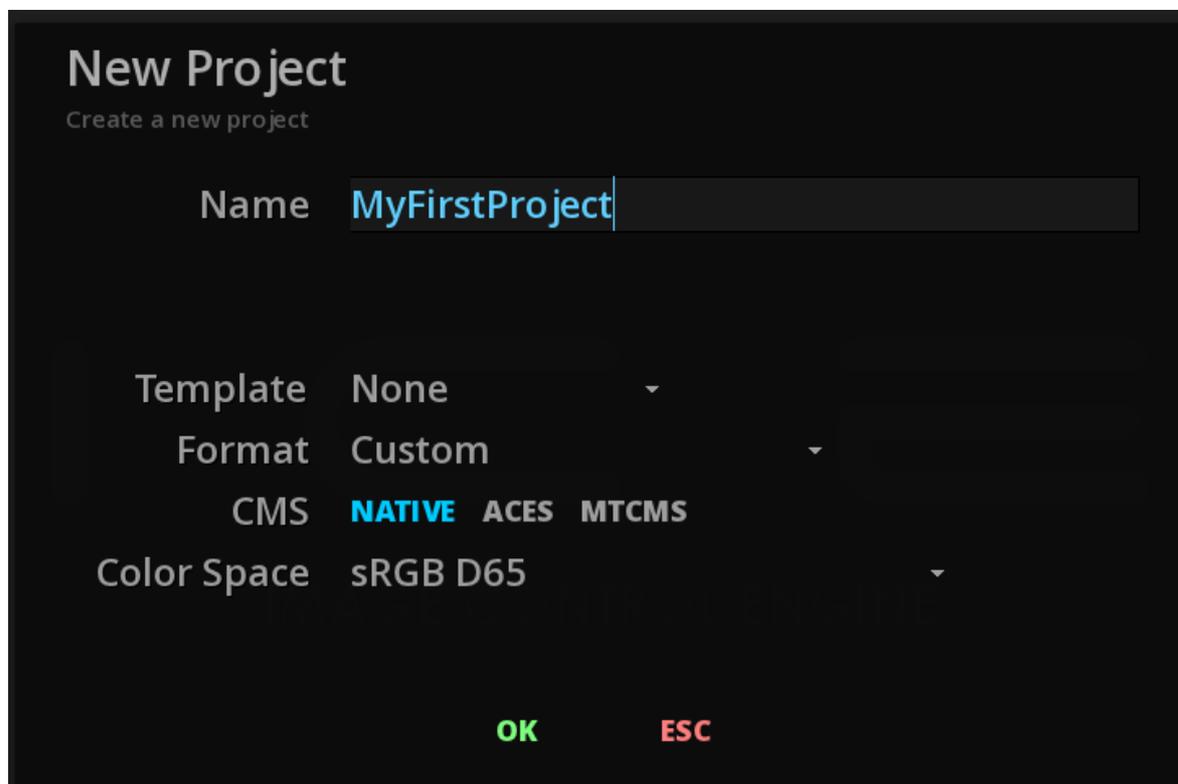
In ICE every playback starts with a project. In ICE a project designates a whole structure of directories and files that all together make up the project. The project can be then regarded as a shell for various objects that you work with or work on, including assets (video, audio, timed text) and metadata. Managing the content to playback per project is necessary when you work with component based media, and it allows ICE to support supplemental packages and multiple compositions when playing back DCP and IMF content. The general hierarchy of a project is based on various key elements that are used while working on a project. These elements are listed in the table below:

Project settings	Parameters that define the project at the top level such as default composition settings, user interface settings, video IO settings, etc.
Library	The library is the place where media is referenced before it can be used in any composition.
Compositions	Each composition is an actual timeline with video and audio capabilities. Any media playback will be done within a composition.

Various metadata Other metadata stored in the project.

4.2. Creating a new Project

On opening of ICE, if you select new project, the following window is displayed:



Format Choose a resolutions for the project : on opening the timeline will already have the attribute you have chosen.

CMS Choose the Color Management System for the project:

Native: displays the media as it is and will not apply any colorimetric transformation.

ACES: sets the project in ACES mode and already apply the correct parameters for the Composition settings.

MTCMS: detects the colorimetric information if present in the content and already sets all the parameters in the right color space (scopes, compositions settings, etc).



The CMS you choose at the creation of the project has an impact on the way ICE displays the content. For example, if you choose MTCMS for a DCP, the image will be visually transformed from XYZ to RGB to look normal. If you choose Native, the image will be greenish, like any XYZ content displayed natively on a RGB display.

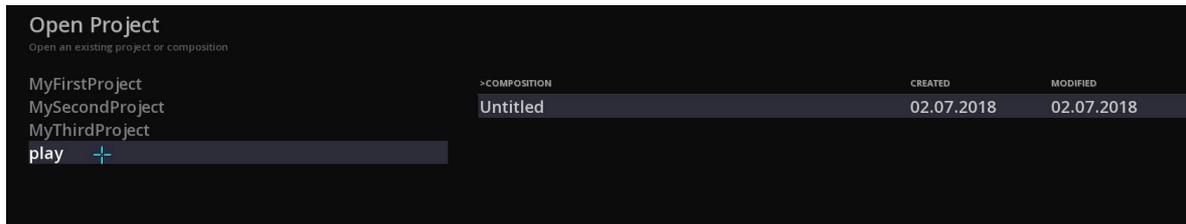
Color Space Allows you to choose the working color space for the project.

The Project parameters are default settings to apply on each new composition. They can be modified at any time in

the [Composition settings](#).

4.3. Opening an existing Project

- From the Radial menu, choose **Open** to open an existing project.



On the left side of the panel the list of all the projects is displayed.

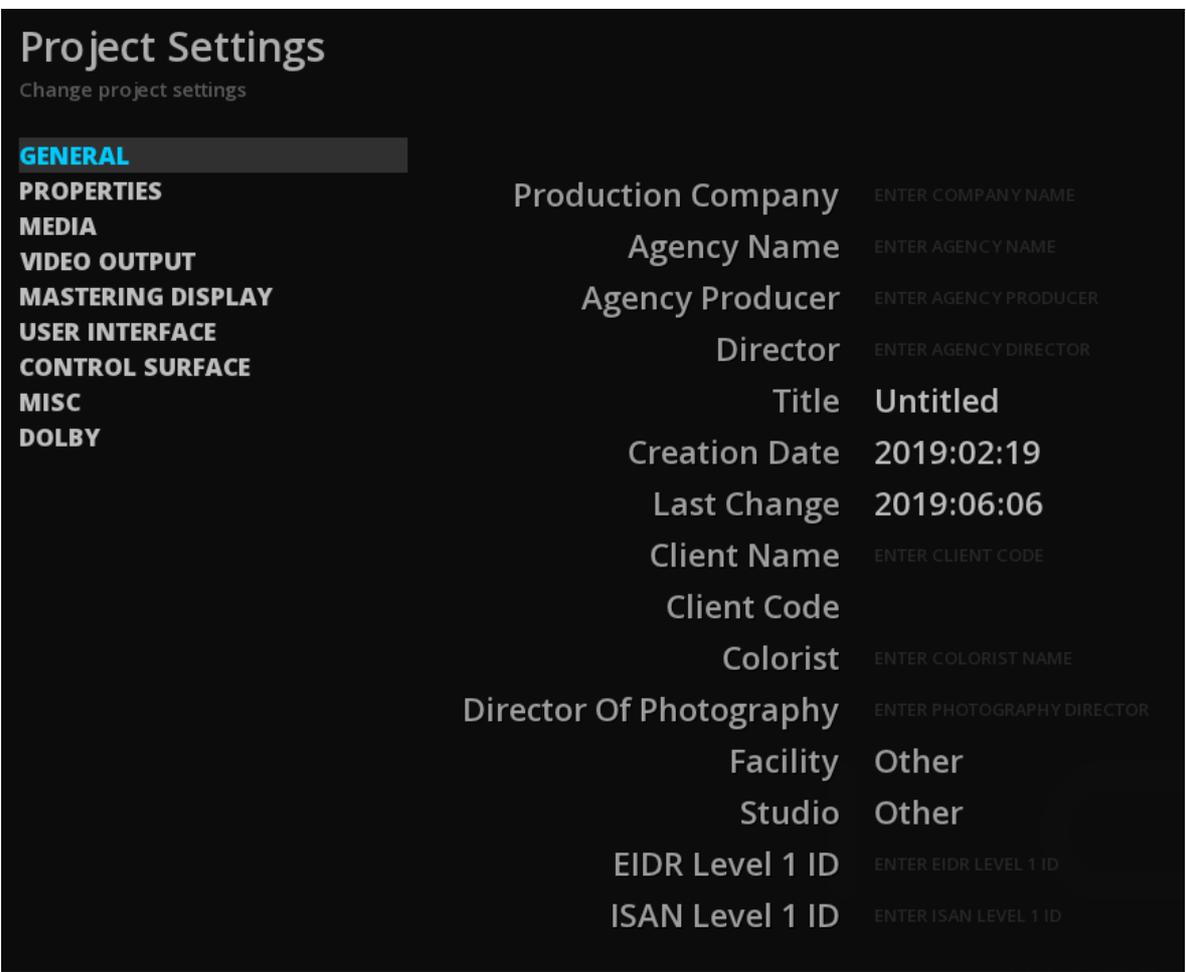
On the right side are indicated the list of all the compositions saved for a chosen project.

The name of the composition displayed is the one that is entered when doing manual saving.

- Select your project and click [**OK**]
- A double click on a Composition will open the last saved composition (warning: this may not include last works on current composition).

4.4. Project Settings

- To display the Project settings window press **F1** :



- To leave the Project Settings, press **Ctrl** + **Q** (Exit Project) or **F3** to go the TimeLine.

4.4.1. General Settings

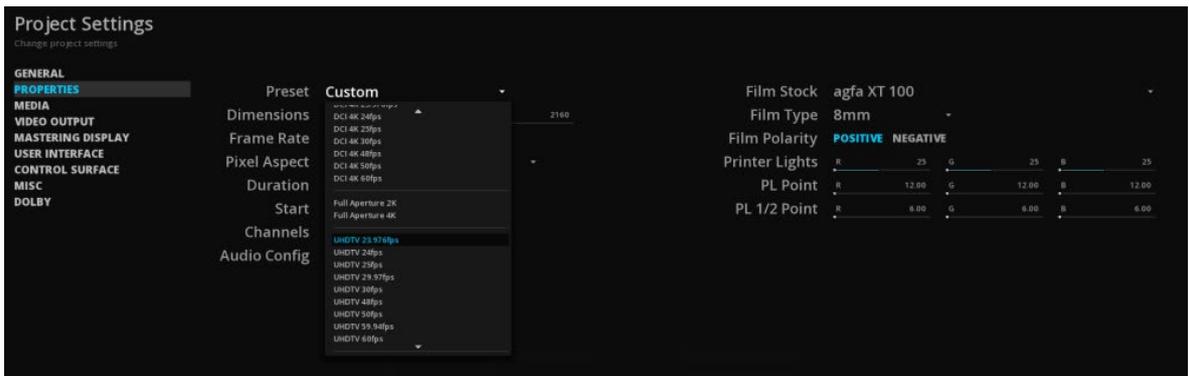
On this tab you can add various information about the content. This can be particularly important if you plan to export a QC report, as these information will be used.

4.4.2. Properties

In the Properties tab, you can set the dimensions, frame rate, or duration of the project.

These parameters will be applied by default on each new TimeLine within the same project. However, because ICE can mix resolutions and file formats, a Composition can have different properties. Read also the section [Composition](#) for reference.

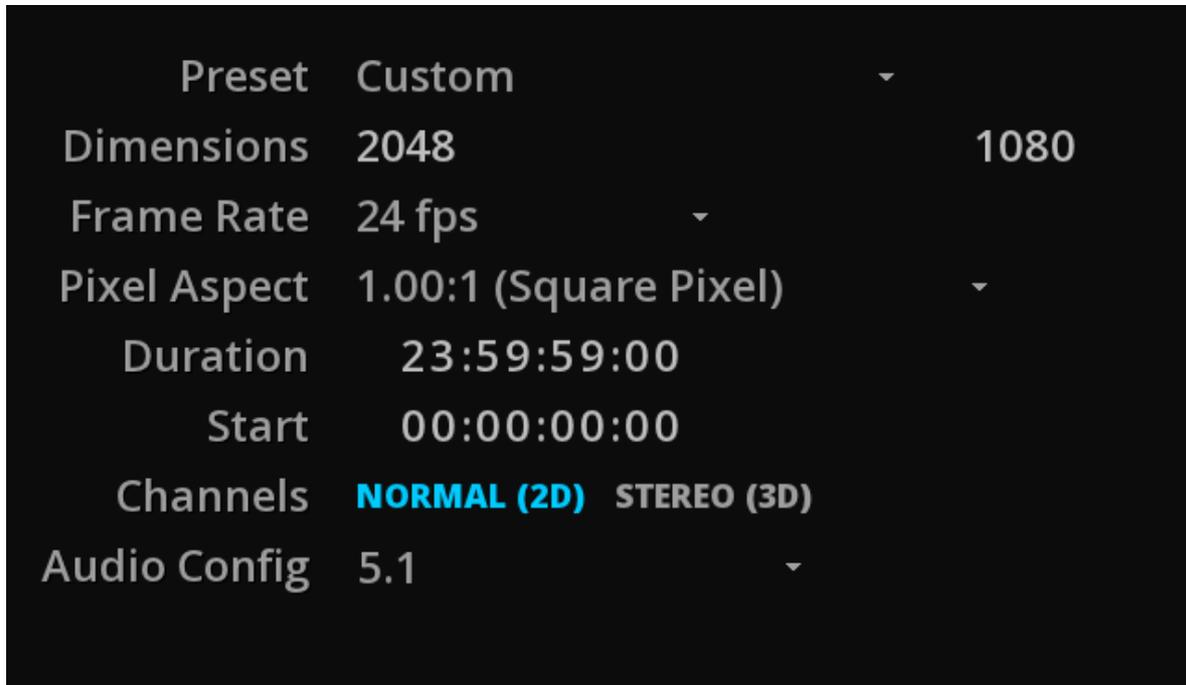
Preset



ICE has already presets for a large variety of image resolution and frame format.

- Select the desired preset and ICE will adapt automatically the dimensions, the frame rates and the pixel aspect for the Project.

By choosing **Custom**, you can manually define the settings :



Dimensions

- Click on the width digits to edit the text and enter the desired value.
- Press tab to edit the height digits.
- Finish with to save the new dimensions

Frame Rate

Choose from the drop-down menu the playback speed for the Project.



ICE supports Archival Frame rates

Pixel Aspect

Choose from the drop-down menu the default aspect ratio for the Project.



Duration

By default, the composition duration is set on 24h.

- To change the project composition duration, click on the edit field and enter the desired composition duration for the project.

Start

ICE allows you to set the beginning of the composition (the start) at a specific TimeCode.

By default, the Start is set on 00:00:00:00

Channels

This allows you to choose if your project is a 3D stereo or normal 2D project. By default, ICE sets the project as a 2D one.

Audio Config

Defines the default number of audio tracks.



ICE supports an unlimited number of audio channels. It also understands the notion of soundfield.

At any time you can add additional soundfields or single audio tracks in the TimeLine.

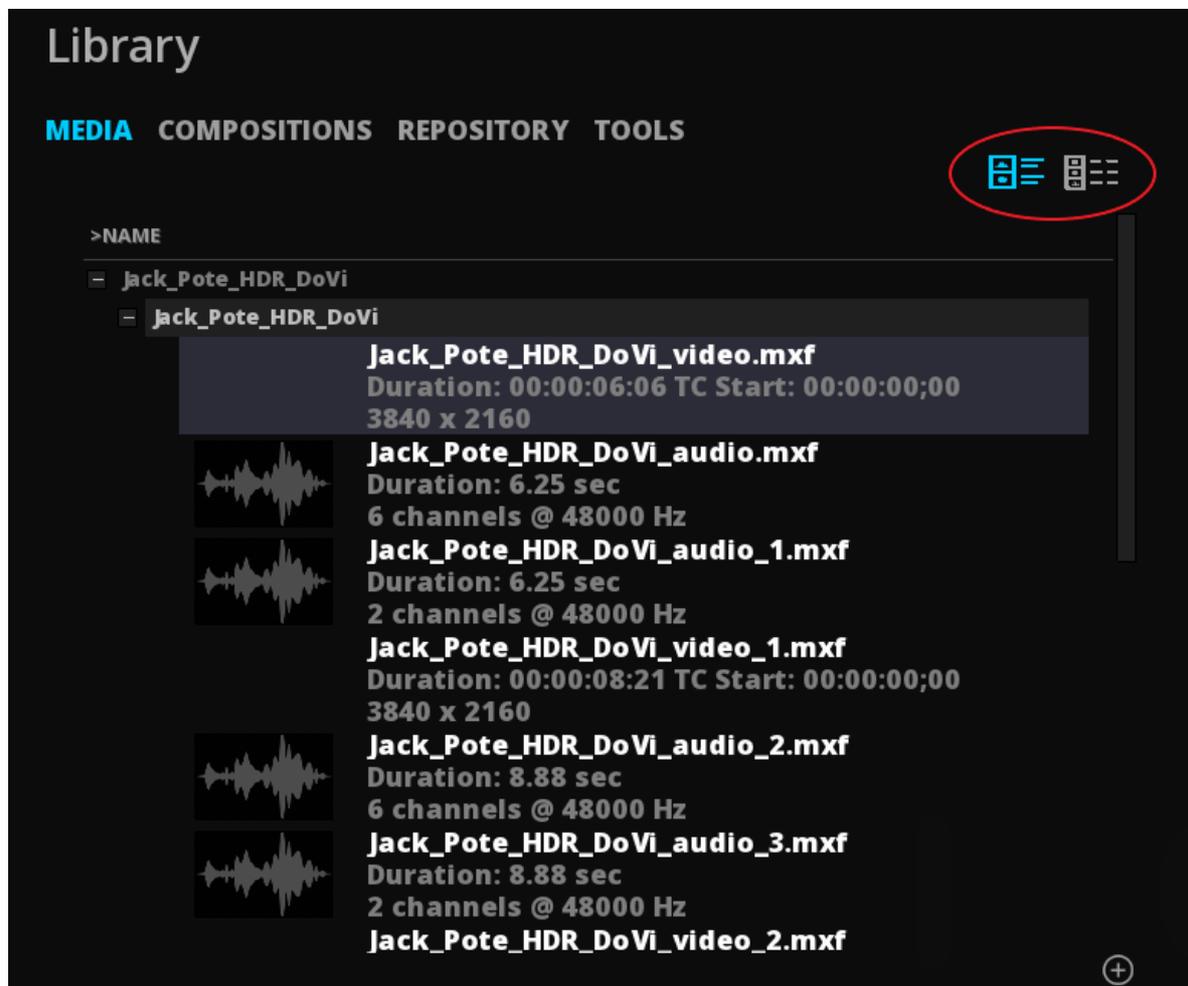
Film Roll Settings

Setting a Film type will define how the TimeLine is calculated in Feet + Frames (see section TimeLine). This is important only when working from traditional film content sources.



4.4.3. Media

This tab sets the default parameters for ICE to interpret correctly a new media.



Media directory

You can set a Directory per default for the media. When loading / saving content, ICE will automatically display this directory first.

Preview Directory

ICE creates preview images for displaying thumbnails or events. By default, they are saved in the Project directory, but it is better to define a location outside of disc C.

Default Frame Rate

If your media has no frame rate matadata, like DPX sequences for example, it is necessary to set a Frame Rate prior to the import, allowing ICE to playback the content accurately.

Default Start

If your media has no timecode matadata, like DPX sequences for example, it is necessary to set a Start prior to the import, allowing ICE to use TimeCodes.

Snapshots Directory

Select the directory for saving the Snapshots.

By default, they are saved in the Project directory, but it is better to define a location outside of disc C.

Name Template

Define a name per default for saving the Snapshots

LUT

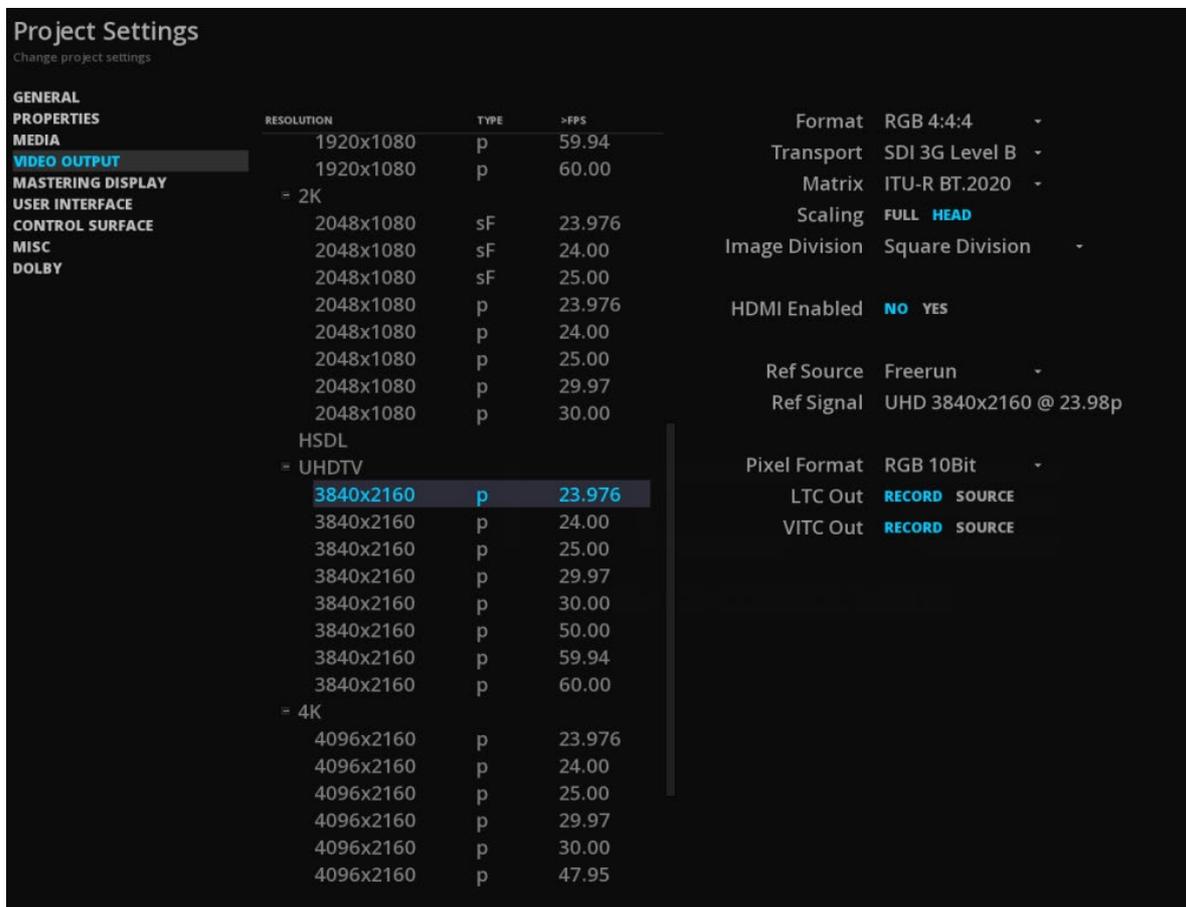
Choose if the display LUT sets in Calibrate applies on the Snapshots or not.

4.4.4. Video Output

ICE supports the following VIDEO IO cards:

- Bluefish444 Supernova S+, Neutron; Kronos
- AJA Kona 3G and Kona 4G;
- Blackmagic DeckLink Studio

Once your ICE workstation has been properly connected to the display device (i.e. A DCI compliant projector or a SDI reference monitor), you can setup the video output of your project to obtain the appropriate signal on your device.



Choose from the drop down menu the desired video format to output.

The formats displayed are those supported by the video IO card.

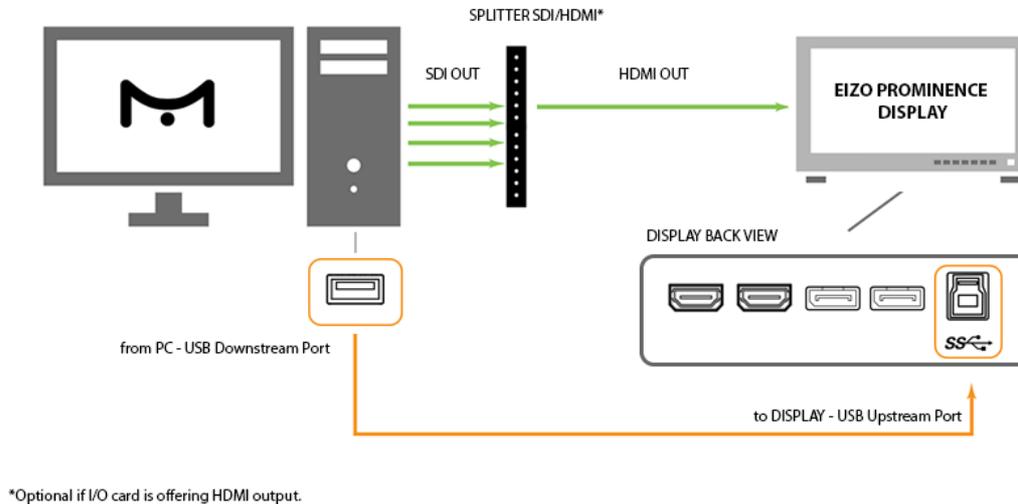
4.4.5. Mastering display

This tab allows to set up the remote control of the mastering display: ICE automatically configures the monitor to the right color space, EOTF, luminance levels, etc.

For now, ICE can control the following displays:

- Canon HDR 4K monitors
- Eizo HDR 4K monitors
- TVLogic HDR 4K

Eizo CG-3145 PROMINENCE



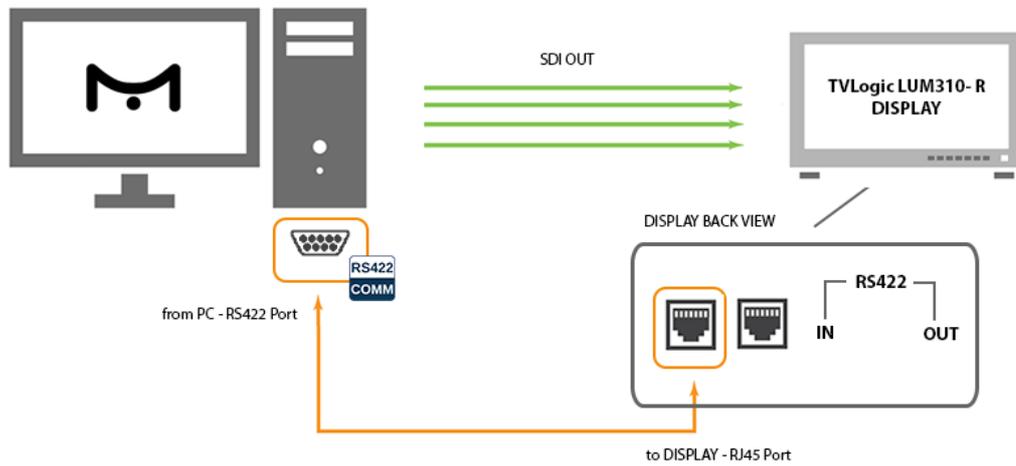
To establish the communication between your EIZO Prominence monitor and your ICE workstation, you need to connect a USB cable between the USB downstream port of the PC and the USB upstream port of the monitor before launching the software. The USB hub function is set up automatically upon connection of the USB cable.

As soon as the program is launched, ICE takes control of the settings of the EIZO monitor. Each time a composition is loaded, the selected mastering display parameters are communicated to the EIZO monitor, which is configured accordingly.

A new selection of mastering display will refresh the monitor. The new parameters used are indicated temporarily on the monitor.

TVLogic LUM-310R

To establish the communication between your TVLogic LUM-310R monitor and your ICE workstation, you must follow these steps:



1. Get a DB9 Female to RJ45 Male cable.
2. Connect the cable from the RS-232 port of your computer to the RS-422 IN port of the TVLogic display.
3. Open the ICE.cfg file in the directory **C:\Users\%SessionName%\AppData\Roaming\Marquise Technologies\session**.
4. Add the following lines between <MTSessionConfig> and the </MTSessionConfig> tag:

```
<DisplayMonitorConfigList>
  <DisplayMonitorConfig id="tvlogic">
    <CommPort>COM1</CommPort>
    <DeviceId>1</DeviceId>
  </DisplayMonitorConfig>
</DisplayMonitorConfigList>
```

The CommPort number to add depends on CommPort available on your machine.

The DeviceId number must be the same as indicated in the monitor's menu settings in the GPI tab then Monitor ID. Change one or the other accordingly. The default DeviceId is number 1.

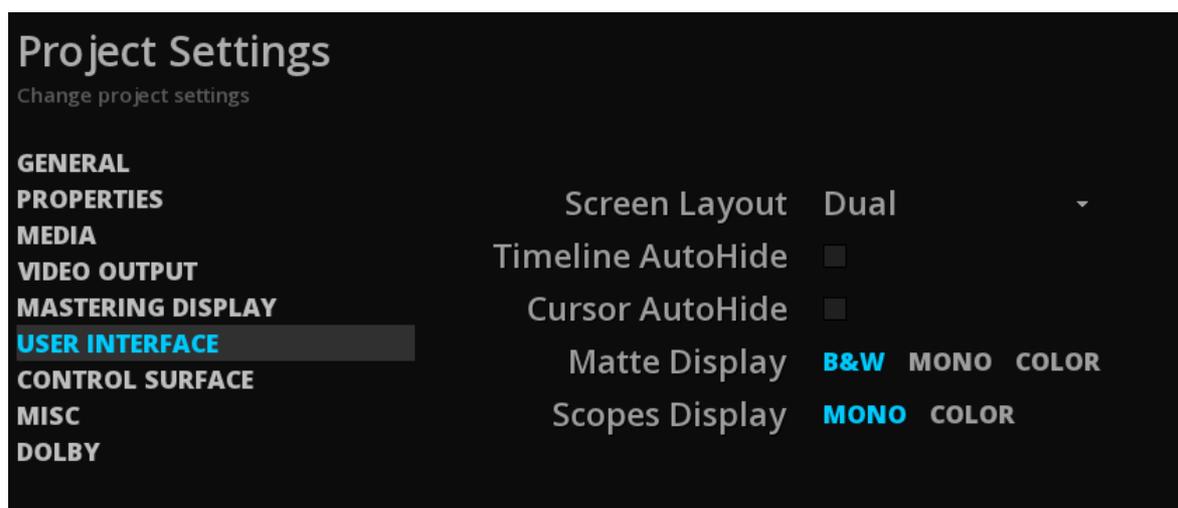
Save the file before leaving.

4.4.6. User Interface

User interface parameters concern your preferred settings as a user.

Screen Layout	Displays the software interface on one or two screens. To change the configuration, you must restart the software. For now, only scopes can be placed on the second screen.
TimeLine AutoHide	Allows to hide automatically the TimeLine during playback. Check the box to enable this feature.
Cursor AutoHide	Allows to hide automatically the mouse cursor during playback. Check the box to enable this feature.

- Scopes** Choose the display of the video scopes:
- Display**
- Mono**: scopes will appear without colors
 - Color** : scopes will display the color channels



4.4.7. Misc

This setting allows to set the AutoSave delay. By default it is set to save automatically every 1 minute.

- To change the delay, use the slider bar.

4.4.8. Leaving Project Settings

- Pressing **F3** will exit the Project Settings and switch to the TimeLine.

5. THE LIBRARY

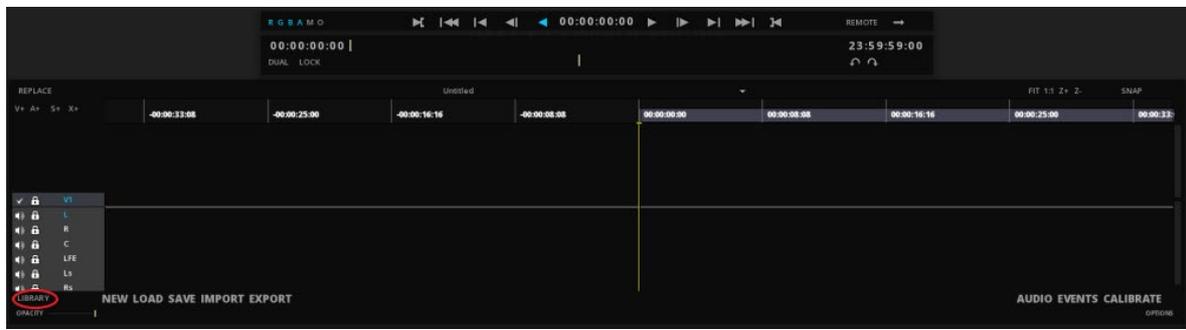
After creating a New Project, ICE opens on the project TimeLine and display the Library panel.

To import media on the TimeLine, you must first reference them in the Project Library.

The Library references all the content for the current project. It can display files with embedded audio, but also packages and side car assets like subtitles or separate audio files.

5.1. Closing/Opening the Library

The Library of the Project is closed and opened by clicking on **LIBRARY** at the bottom left of the TimeLine:



- Alternatively you can use the key **Alt** + **F2** to display / hide the Library.

5.2. Library Layout

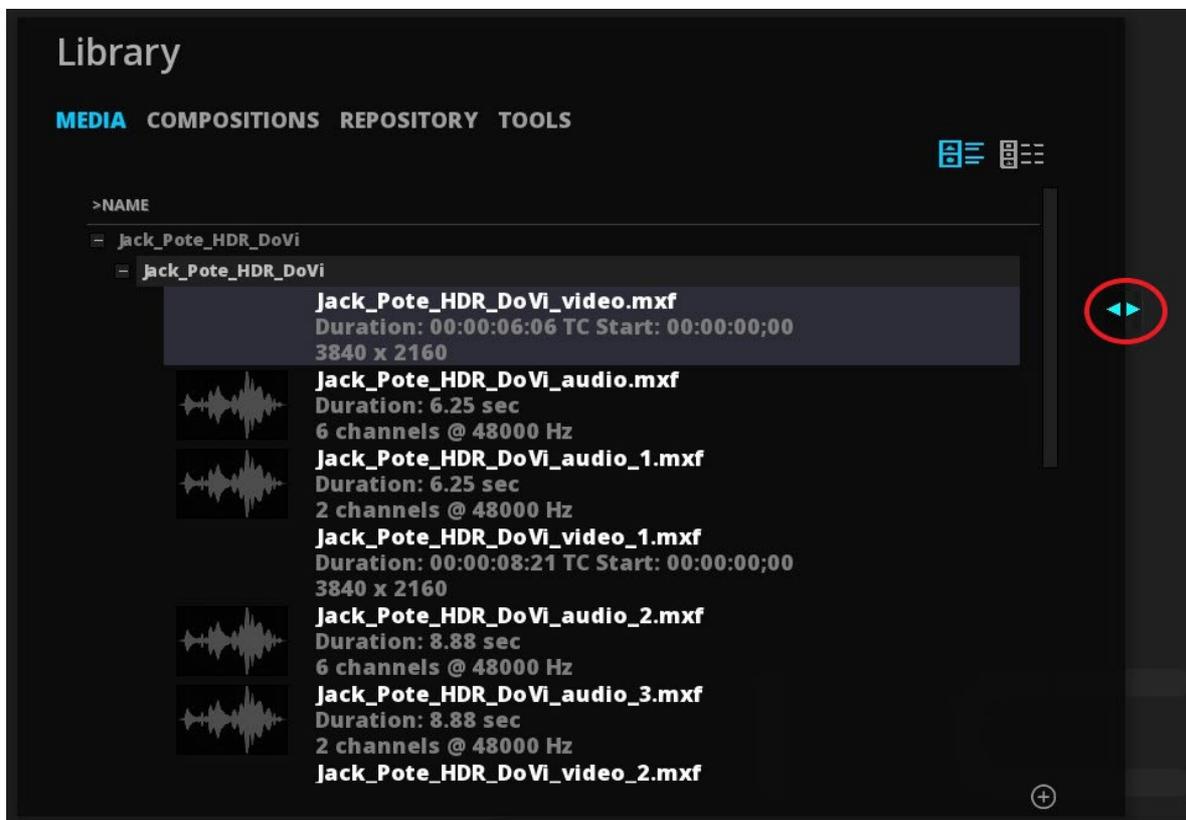
The Library is divided in several parts:

- MEDIA** All the imported assets are listed here. The assets are displayed by default in thumbnail mode. To display the assets in List View, click on the List icon on the upper right of the Library window:
- COMPOSITIONS** All the compositions imported or created and saved into ICE are listed here.
- TOOLS** From here, you can access the ROUTING, REELS, MARKERS, SUBTITLES and LOCATORS tabs.
- METADATA** Click on this panel to access all metadata included in the file : composition, clip, static and dynamic metadata.

5.3. Resizing Library window

You can resize the Library window vertically:

- Position the mouse cursor at the edge of the window, and when it changes appearance click and slide up to your need.



5.4. Adding content in the Library

Once the Library window is displayed, you can display your system browser (hit the Windows key or press the + button at the bottom at the Library) and directly drag & drop content:

- Select your files or your packages and drop them anywhere in ICE window.

Once the content is referenced, it is displayed in the Library windows.

5.4.1. Import of image sequences

DPX or TIFF sequences can be easily imported in the Library:

- Drag & drop the first image of your sequence and ICE will automatically import the full sequence.



Because there is no information about frame rates in DPX or TIFF images, first set the correct frame rate in the Properties of the Project prior to the Import, for ICE to correctly import the images on the TimeLine.

5.4.2. Import of packages

The import of component-based packages like DCP, IMF or iTunes deliverables is also possible using drag & drop:

- To import a package, drag & drop the entire directory.

Additional import methods with validation process are also available: refer to refer to DCP and [IMF](#) QC workflow sections for more information.

If the package contains different Compositions, they are displayed under the Composition tab of the Library.

5.5. Deleting content

To delete content from the Library, select the desired media and press the - button at the bottom of the Library panel.

6. THE TIMELINE

The TimeLine is the core feature of ICE.

From the TimeLine, you have access to a variety of tools allowing to play and QC any type of content.

6.1. Definitions

Below you will have an overview of the vocabulary frequently used in the Timeline section :

Project	A project in ICE is a structure that is made of several compositions.
Composition	<p>A composition is a structure made of different sort of media: video, audio and timed text. It is also defined by a format (width, height, bitdepth, frame rate, sample rate, etc) and a duration. In addition other composition properties exist such as a marking zone, markers, playheads, etc to help the QC process.</p> <p>Each sort of media is organized into layers: the video layers (located in the video layer stack) and the audio layers (located in the audio layer stack).</p> <p>Layers are composited together in their category (video layers together, audio layers together)</p> <p>The result of a composition is a video stream and one or more audio streams (one for mono, two for stereo, etc).</p>
Layer	<p>A layer is a placeholder for tracks.</p> <p>The number of tracks depends on the layer category, audio, video or other.</p>
Video Layer	<p>A video layer is made of 3 tracks: V1, T and V2:</p> <p>V1 (also called the A-Roll) is the main video track of the layer.</p> <p>V2 (also called the B-Roll) is the secondary video track of the layer is generally used when supplemental video segments are involved.</p>
Audio Layer	<p>An audio layer is made of one or several tracks, depending on the audio configuration.</p> <p>The audio configuration specifies the number of audible tracks, usually assigned to individual speakers in a spatial configuration.</p> <p>ICE supports the following configurations among others:</p> <ul style="list-style-type: none">Mono: one trackStereo: two tracks5.1: five + one tracks6.1: six + one tracks7.1: seven + one tracks

Auxiliary Layer

This type of layer can include object based audio metadata or HDR metadata for example.

Track

A track is a placeholder for segments. Segments can be moved within the track, trimmed, slid (Slide operation) or slipped (Slip operation).

Segment

A segment is a basic unit of editing. It defines the start and end of a media source (audio, video or composition) in time. Transitions (video or audio) are special segments that do not represent any media source but rather blend two other segments (audio and audio or video and video).

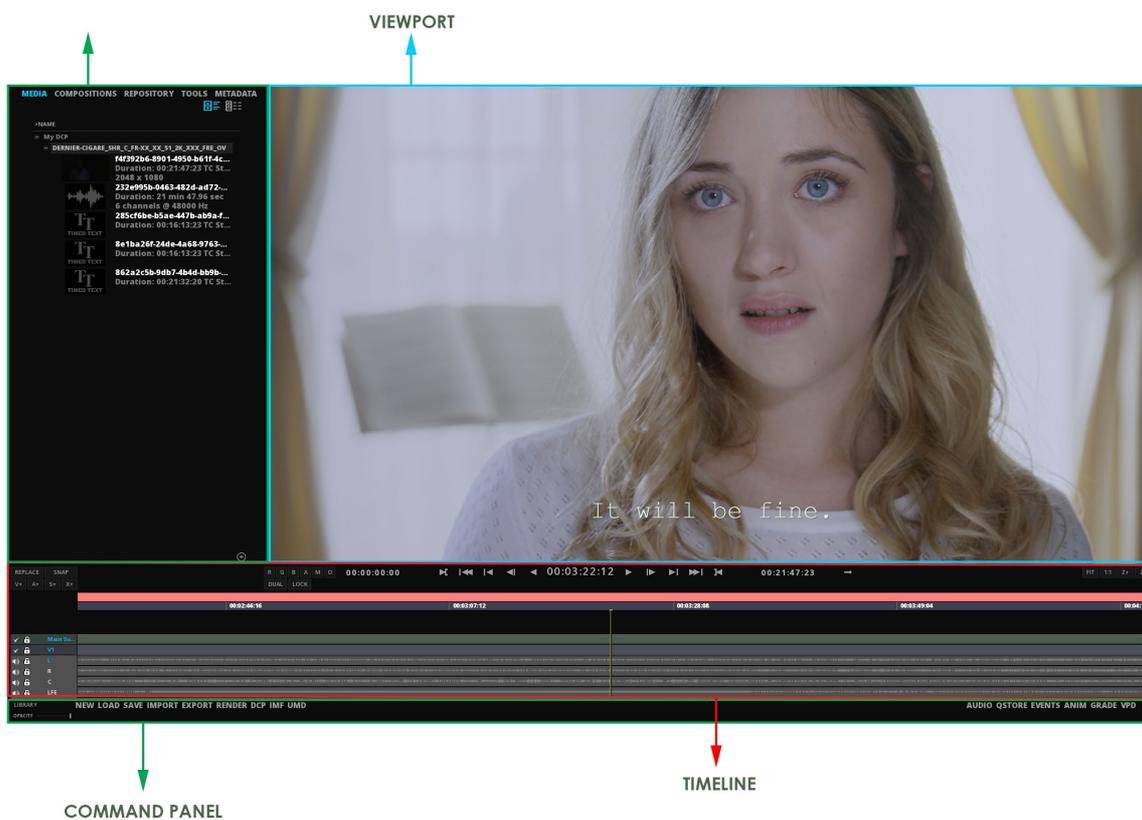
6.2. Accessing the TimeLine

The TimeLine Module is accessed by either opening an existing project or when creating a new project.

From the Project Settings window, press **F3** on the keyboard to switch to the TimeLine.

The TimeLine Module workspace is composed of different elements:

- The Image Viewport
- The Library
- The TimeLine
- The Command Panel

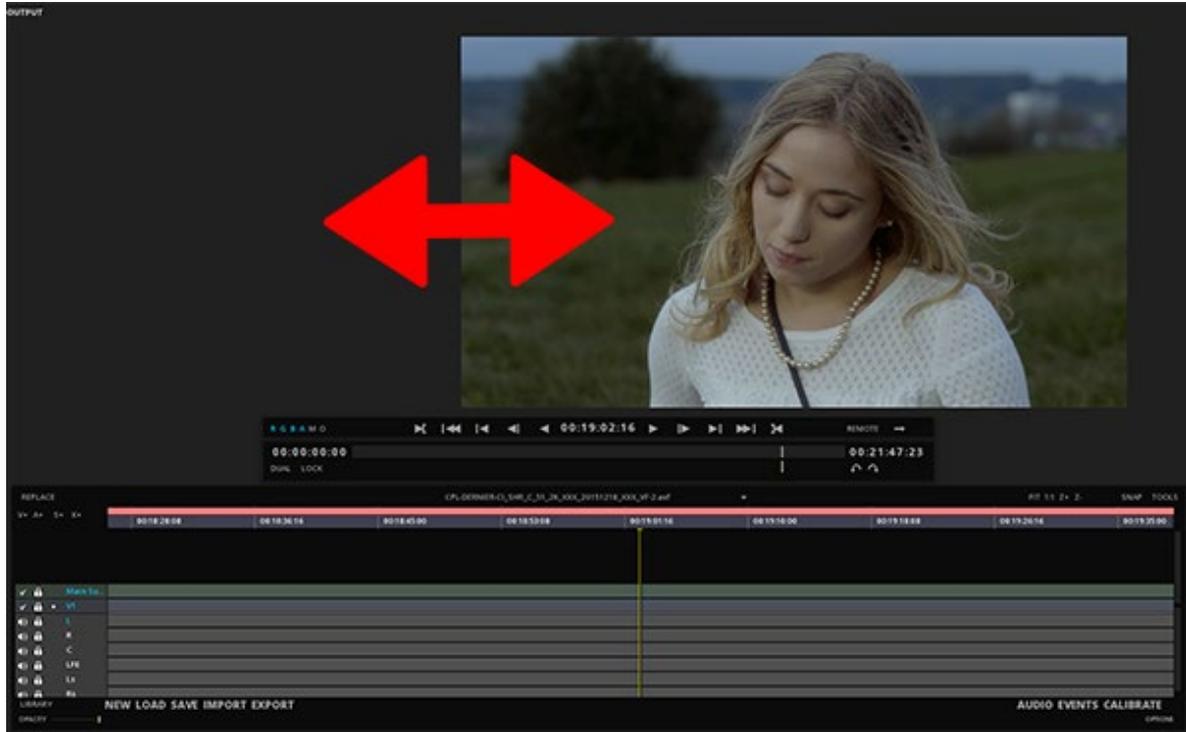


6.3. Image Viewport

6.3.1. Navigate / Pan

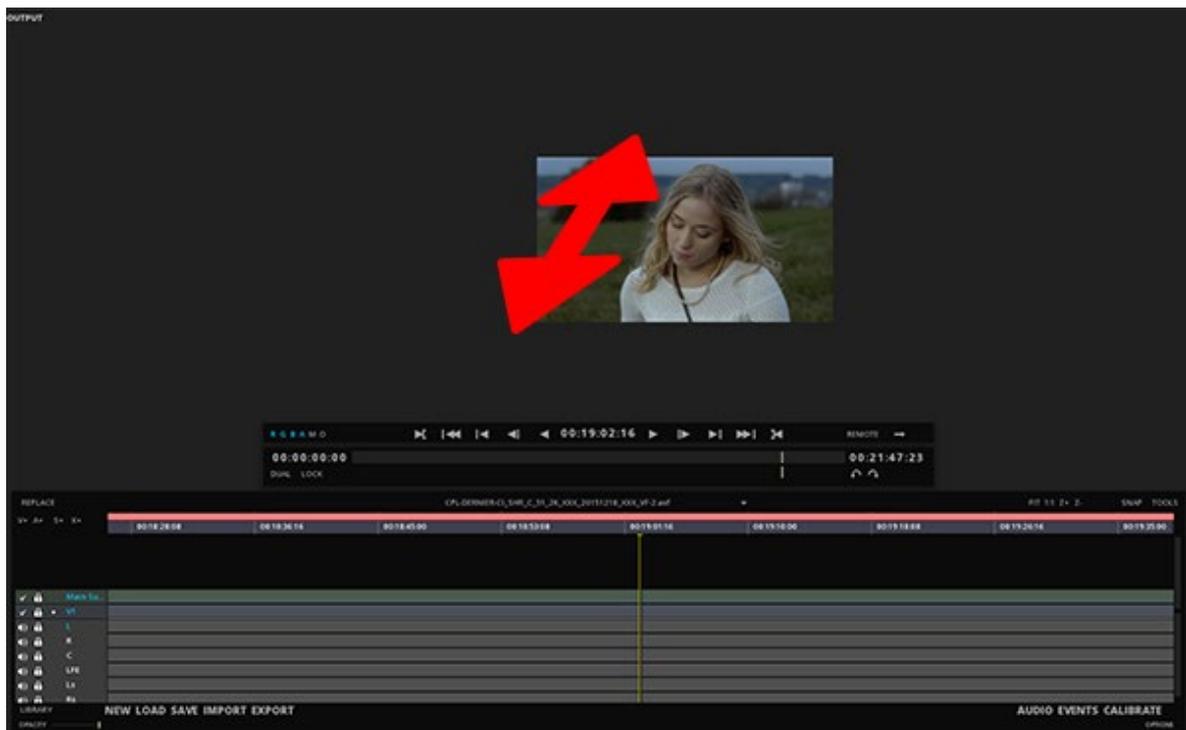
To easily navigate in any area of the image, use the pan navigation:

- Keep pressed **Alt** + **left mouse** button to move the image in every possible direction.
- Press **C** to center the image in the Viewport.



6.3.2. Zoom

- Scroll middle mouse button down to zoom IN, and scroll up to zoom OUT.



6.3.3. Viewport Options

From the GUI

Some controls for the Viewport are directly accessible from the GUI (in addition to keyboard shortcuts).



R	Show / hide Red channel
G	Show / hide Green channel
B	Show / hide Blue channel
A	Show / hide Alpha channel
M	Show / hide Mask
O	Show / hide Original image
Z	Show / hide Zebra mode
D	Show / hide Dynamic Tone Mapping
F	Lock Fit Viewport
G	Gang the 2 Viewports
C	Comparator
Dual	Show / Hide Dual Viewport
Lock	Lock Viewports playback together

Viewport Hot Box

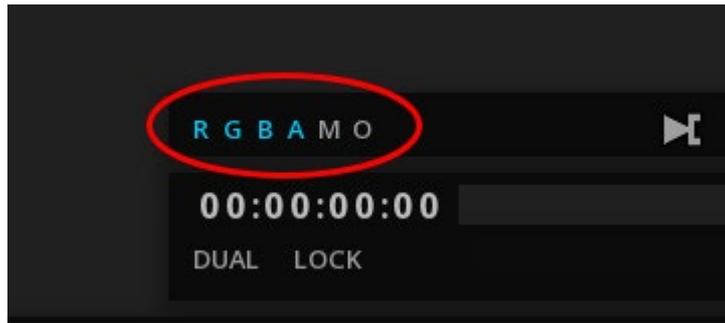
Additional options for the Viewport are available through the Viewport Hot Box.

- Position the mouse on the Image Viewport and press **Alt** + **Right mouse** click.
- Keep the right mouse button pressed and navigate through the different tabs, select your item with the left mouse button.

Viewport

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
Chn Red		Chn Green		Chn Blue		Chn Alpha
Chn RGBA		Original		LUT		LUT SDI Out
Mask		Mask Luma		Mask Gray		Mask Color
Center		Fit		Toggle FS		

- alternatively, you can display individual color channels (Red, Green, Blue and Alpha) using the RGB and A buttons on the left side of the transport bar to show or hide the respective channel:



2D/Stereo3D options

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
Left Only		Right Only		D-Map		Blend
S3D AG True		S3D SxS Hrz		S3D I-Hrz		S3D Mesh
S3D AG Gray		S3D SxS Vrt		S3D I-Vrt		
S3D AG Color						
S3D AG HColor						
S3D AG Optimized						

Scopes display

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
Histogram		Vectorscope		Waveform		Audio Levels
Bitrate Meter		Luminance Meter		Color Picker		Extra Info

Refer to the [Image Analysis](#) section for more information about the scopes.

Image Comparator

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
Show/Hide		Store Current		Left/Right		Right/Left
		Store Original		Top/Bottom		Bottom/Top

- To use the Image comparator, position the playhead on the image you want to compare from, call the Hot Box and choose Store Current.
- Navigate to the location you want to compare, and select Show/Hide from the Hot Box.
- Use the other options to display the slider either horizontally or vertically
- Select Show/Hide again to close the comparator.

Guides

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
Camera		Axis		Safe Frames		Active Area

Display guide lines on the Image Viewport:

Camera shows camera borders (project format)

Axis displays the Viewport axis

Safe Frames shows Action and Title safe areas according to the Active Area chosen.

Active Area shows the borders of the frame as per the frame aspect shosen in the Active Area tab.

Hotkeys:

- Press **Alt** + **C** to display camera borders
- Press **Alt** + **F** to display safe frames
- Press **Alt** + **A** to display the Viewport axis
- Press **Alt** + **B** to display the frame Active Area

Active Area

Choose the active area you want without having to go into the composition settings:

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
1.00:1 (Square Pixel)		1.15:1 (Movietone)		1.33:1 (4:3 PAL/NTSC)		1.34:1
1.35:1		1.36:1		1.37:1 (Academy)		1.40:1
1.43:1 (IMAX)		1.50:1 (VistaVision)		1.66:1 (Film Europe)		1.78:1 (16:9 HDTV)
1.85:1 (Film US)		1.89:1 (DCI)		2.00:1 (SuperScope)		2.20:1 (Todd-AO)
2.21:1 (MPEG-2)		2.28:1		2.35:1 (CinemaScope)		2.36:1
2.39:1 (Panavision)		2.40:1 (Blu-ray)		2.52:1		2.55:1 (CinemaScope 55)
2.59:1 (Cinemarama)		2.64:1		2.66:1		2.70:1
2.72:1		2.75:1 (Ultra-Panavision 70)		2.76:1 (Ultra-Panavision 70)		2.77:1
2.93:1 (MGM Camera 65)		4.00:1 (Polyvision)				

CMS

Switch quickly from one color system to another without having to go into the composition settings:

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA	CMS
Native (None)		ACES		MTCMS		

For more informations, please read the chapter [Color Management](#) .

Working Full Screen

- To hide partially or totally the timeline, use **Page Down** and **Page Up** keys.



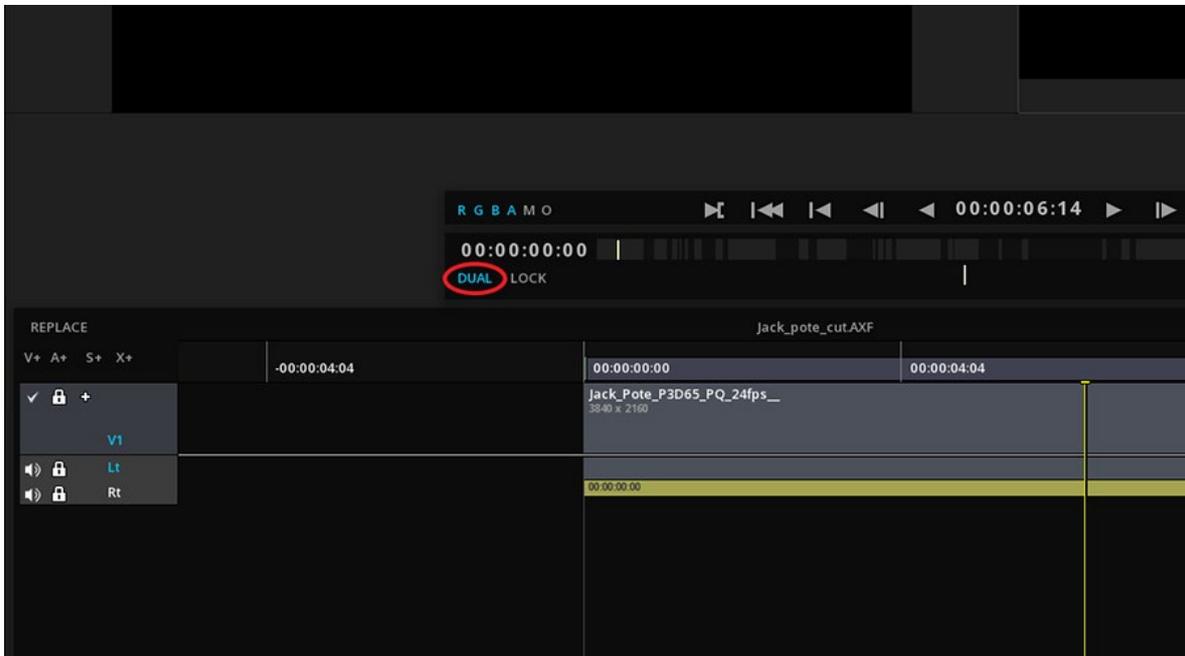
6.4. Dual Viewport

The Dual Viewport allows you to display simultaneously two video tracks for comparison purposes. The two Viewports can also be synchronized together, for an accurate frame matching.

6.4.1. Adding media on the Dual Viewport

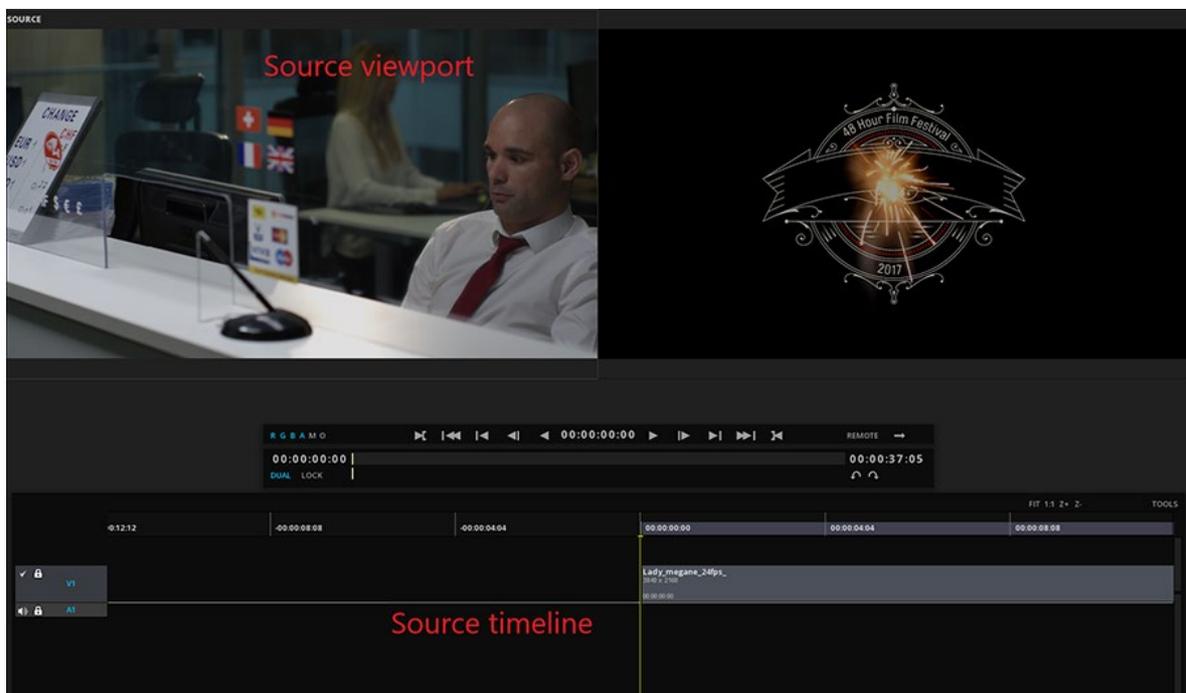
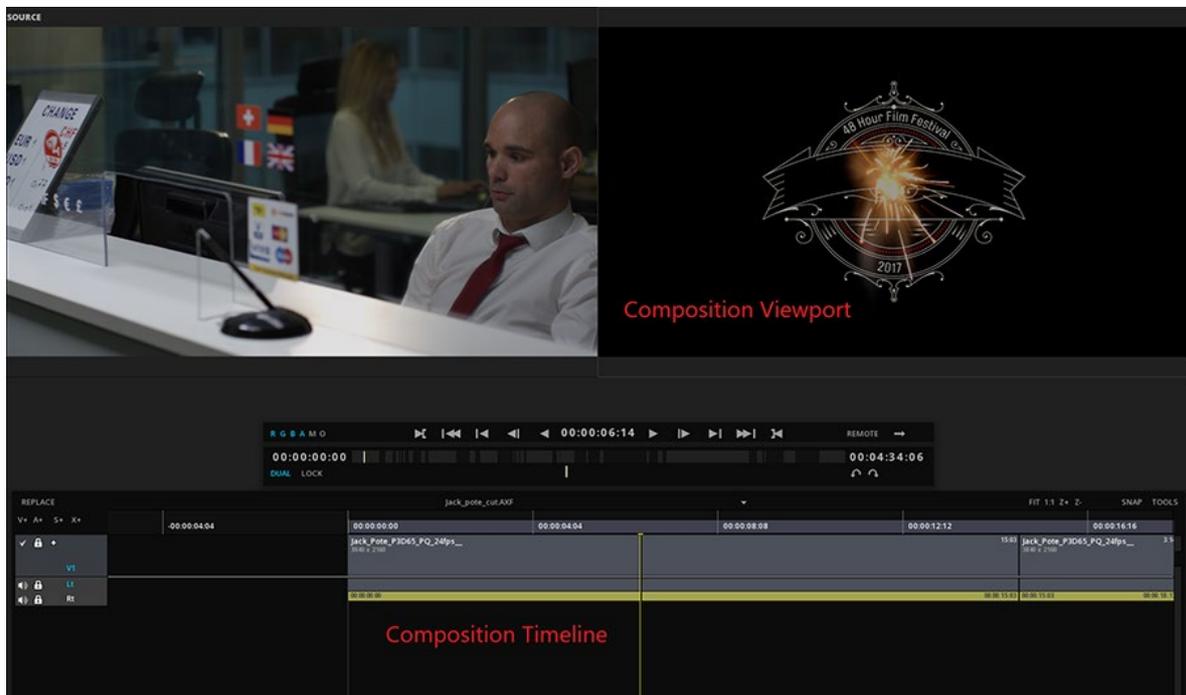
To use the Dual Viewport option, it is easier to start with an open project.

- To open the Dual Viewport, click on the **DUAL** button on the TimeLine or use the shortcut **Alt** + **X** :



The right Viewport is for the Composition, and the left Viewport is used by the source media.

- Select the source media from the **Library** and press **Ctrl** + double click on it: it will automatically be placed in the Source Viewport.
- To toggle from one Viewport to the other, click on the desired Viewport.



- You can also switch from one to the other with the **X** shortcut.

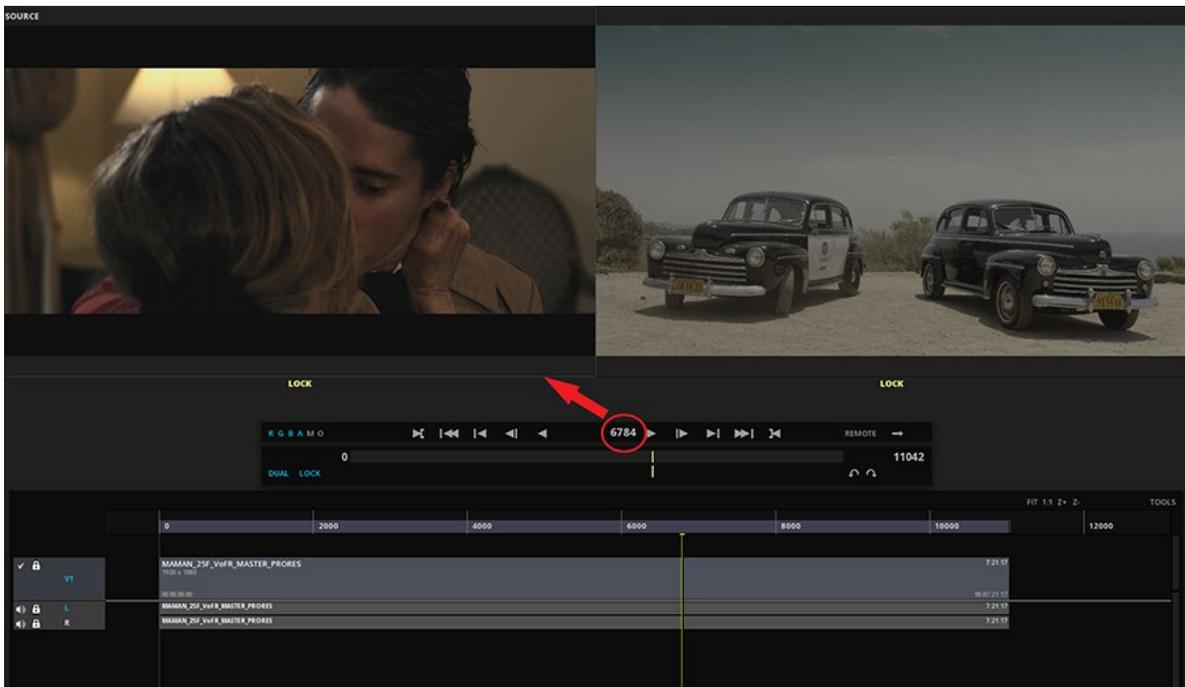
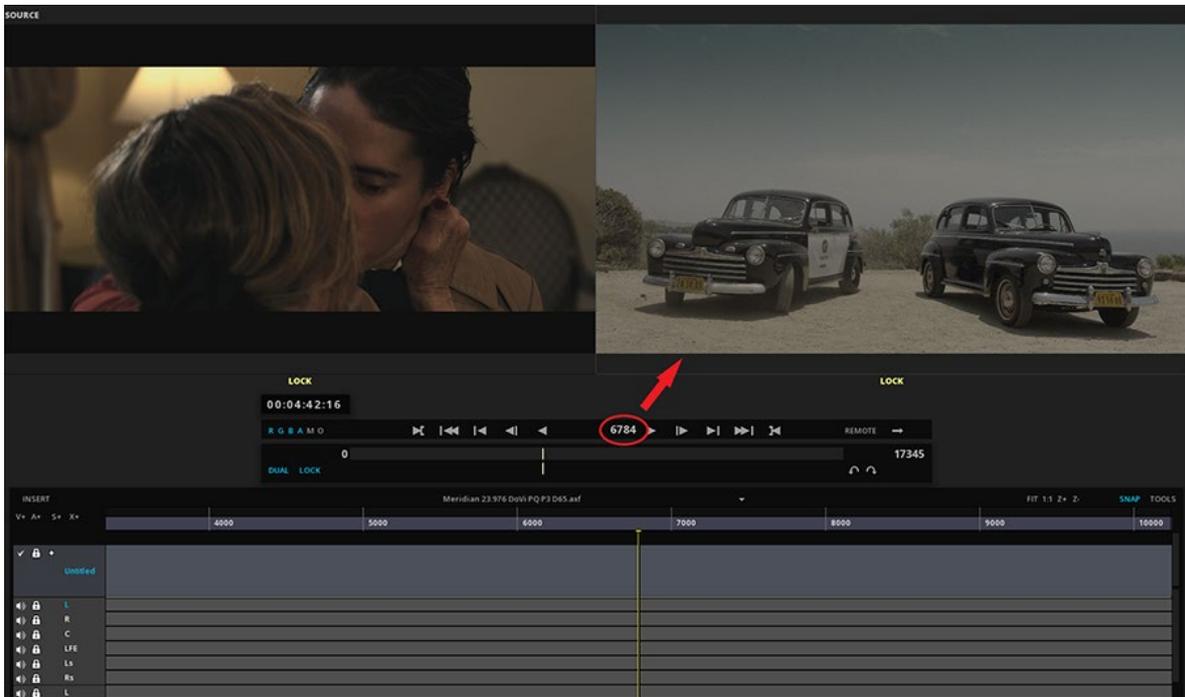
The navigation management tools in the Viewport remain the same as for Single Viewport on the selected Viewport. Refer to above information.

6.4.2. Frame matching

It is possible to synchronize the timeline of the source with the one of the composition to do frame matching.

- Select the viewport you want to use as the reference image, position the playhead on the desired location and click the **LOCK** button or press the **G** key.

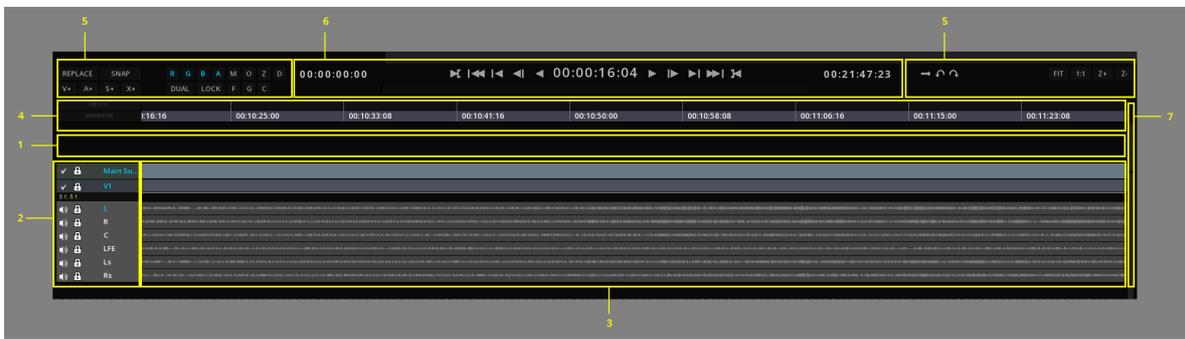
Automatically, the second timeline will place and lock the playhead position at the same image number. You can also playback both timelines at the same time.



The frame matching depends on the duration of the two timelines. If one is shorter than the other, the last selected image of the shortest timeline will remain frozen.

6.5. Timeline Basics

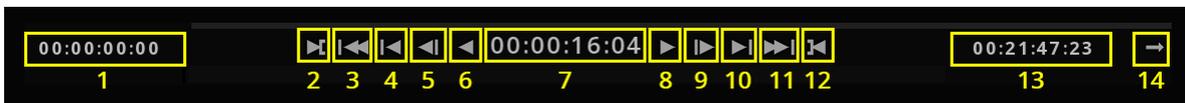
The Timeline itself is composed of several parts:



1	TimeLine Background
2	Layers Control Box
3	Layers
4	Composition Timescale
5	TimeLine Controls
6	Transport Controls
7	Slider

6.5.1. Transport Controls

The commands for the **Transport controls** are the following:



1	Composition Start time
2	Mark IN point
3	Go back to first frame
4	Go back last key frame
5	Go back next frame
6	Play backward
7	Time Code at current frame / playhead position
8	Play / Stop
9	Go to next frame
10	Go to next key frame

11	Go to last frame
12	Mark OUT point
13	Composition End time
14	Playback Mode

6.5.2. TimeLine Controls

Some controls for the timeline are directly accessible from the GUI (in addition to keyboard shortcuts).

Editing controls



Replace	Toggle Replace / Insert modes for clips
Snap	Snap clip to playhead or cuts
V+	Add a video track
A+	Add an audio track
S+	Add a subtitle track
X+	Add an auxiliary track



TimeLine Display Controls

1	Undo
2	Redo
FIT	Fit TimeLine on screen
1:1	Display timeLine 1:1
Z+	Zoom in the TimeLine
Z-	Zoom out the TimeLine

6.5.3. Navigating the Timeline

Depending on the length of the composition, you may need to navigate through the composition back and forth, or change the display scale to reveal more or less of it.

Moving around in the Timeline

To move around the timeline without changing the playhead position, is done by using the keyboard and mouse. The following procedure explains how to move the timeline to the left or to the right to reveal the parts that could not be displayed on screen:

- Press **Alt** on the keyboard and using the mouse, click the left button and drag the mouse while keeping the left button pressed.

The timeline will be shifted to the left or to the right, revealing the hidden regions.

Zooming the Timeline

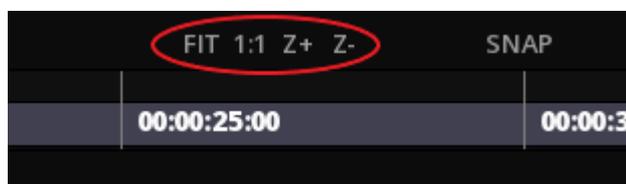
You can display the complete timeline or a detailed part of it without changing playhead position by zooming in or out the timeline:

- To zoom IN our OUT use the hotkeys **Ctrl** + **+** and **Ctrl** + **-**.

You can also automatically fit the composition in the timeline:

- To fit the composition in the timeline, use **Ctrl** + **Shift** + **F**.

Alternatively, you can also use the icons on the top right of the TimeLine:



Positioning the Playhead

This vertical yellow line indicates where in the timescale the current frame is located. It is also referred as “Timemarker”.

To center the playhead in the TimeLine, use the hotkey **Ctrl** + **Shift** + **C**.

6.5.4. TimeLine Navigation Shortcuts

To navigate more easily in the timeline some playhead shortcuts are available and detailed in the document [ICE Keyboard Shortcuts](#).

6.5.5. TimeLine Configuration

The TimeLine can be configured to serve your needs depending on the projects you are working on. Possible configurations include:

- Changing the Timebase

- Modifying the Layers appearance and manipulating them
- Manage Layers and create new ones

Changing the Timebase display

The Timebase (or timescale) is by default in time code mode.

It can be modified to display other time codes or frame information.

In ICE the Timeline can be displayed in the following modes:

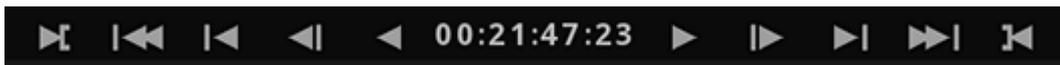
Normal time Code

Feet + Frame

Frame Number

- You can toggle the Timebase displays using **Alt** + **T**.

Timebase display in Time Code:



Timebase display in Feet + Frame:



Timebase display in Frame Number:

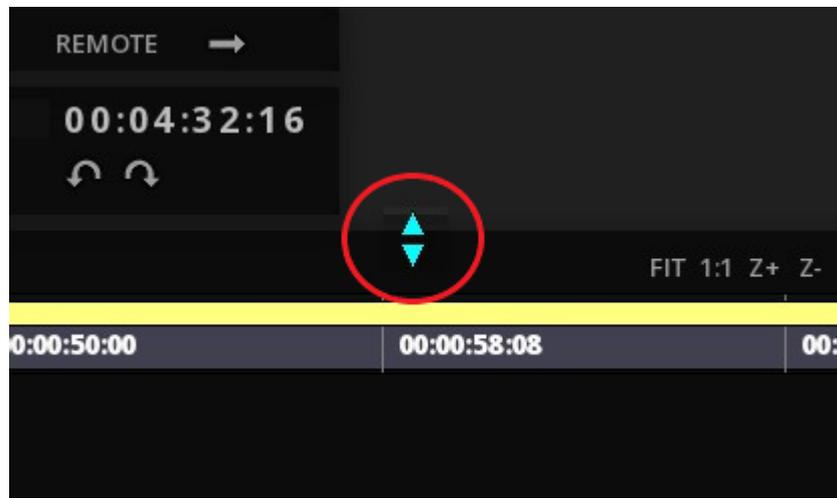


Modifying Layers appearance

The layer appearance can be modified to better display the tracks information if needed.

The TimeLine part can be expanded to display more layers:

- To expand or collapse the TimeLine background, place the cursor on the top of the timeline until it changes appearance and lift up or down.



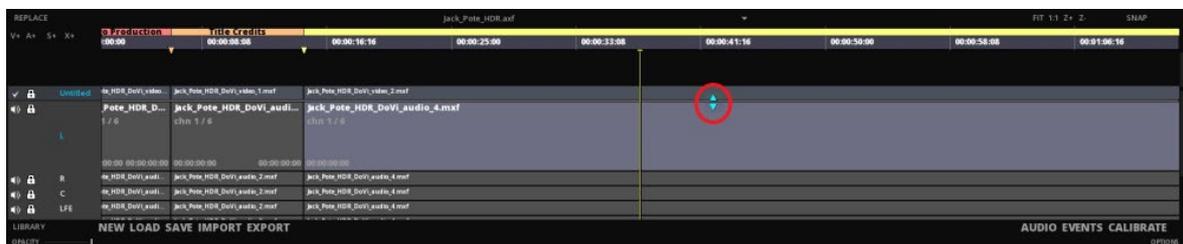
You can also reposition the layers on the TimeLine background. This can be usefull when adding for example new audio tracks.

- Position the mouse cursor between the video and audio layers until it changes appearance and lift up or down:



- To navigate in the different layers, use the Scroll Bar on the right of the Timeline.
- To select several layers, press **Ctrl** + **left mouse** button and pick the desired layers.
- To select all the layers, press **Ctrl** + **A**.
- To deselect all the layers, press **Ctrl** + **D**.

In the user interface the tracks are separated by a "split". It can be moved up and down to reveal more or less of one of the track.



This action reveals additional information like the image resolution for the video layer, or the audio channel number for an audio layer.

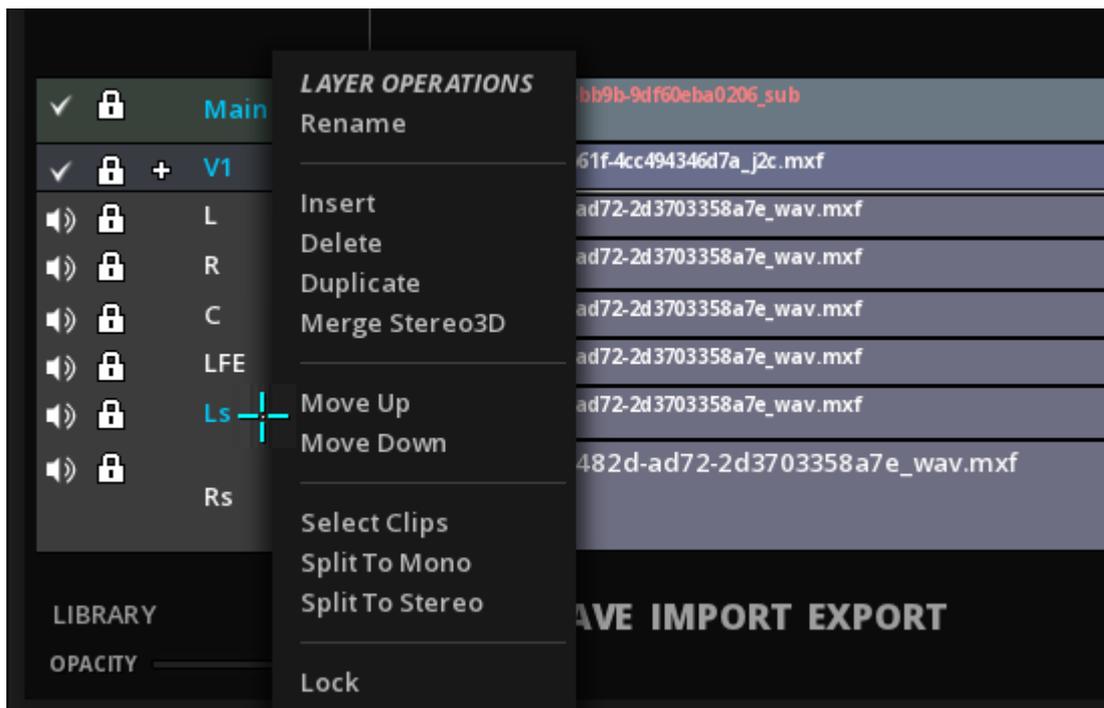
- To resize all the layers altogether, select the layers on the Control Box on the left of the TimeLine using **Ctrl** + **left mouse** button, keep **Ctrl** pressed and scroll up or down the mouse reel.



Managing Layers

Some managing operations are available for each type of layer.

- To display the drop down menu for the layers, position the mouse on the Layer you want to modify on the layers Control Box on the left of the TimeLine and press **right mouse** button.



Rename

Allows to rename the layer.

Insert

Insert a layer right above.

Merge

Allows to merge left and right eyes in one track.

Stereo 3D

Delete

Delete the current layer. Deleting a track removes all clip instances on the track but does not affect source clips available in the library.

- Lock** Lock the current layer.
- Move Up/Down** Allows to reorder your tracks by moving them up or down.
- Select Clips** Selects all the clips in the track chosen.
- Split** You can split your audio configuration to mono or stereo tracks

Layers Manipulation

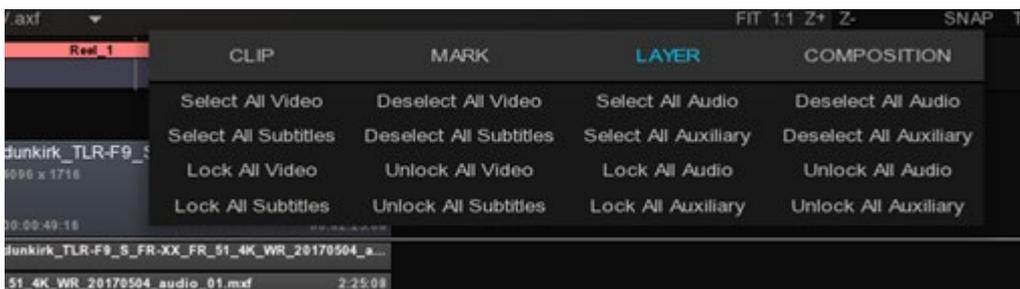
An important notion when manipulating the Timeline layers is the “Active” layer.

Active layers are labelled in blue:



In order to quickly manipulate the layers, you can use the Timeline Hot Box.

- Place the mouse cursor on the TimeLine background and press **Ctrl** + **Right mouse** button to display the Hot Box for the TimeLine and select LAYER:



The Hot box provides you with short cuts to select or deselect the different type of layers.

The Layer Control Box also displays important icons:

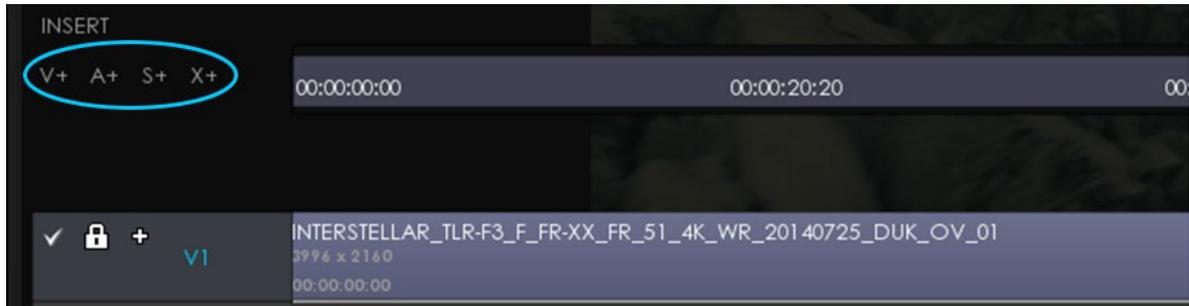
✓	Indicates that the layer is enabled. To change layer status to disabled, click on the icon.
✗	Indicates that the layer is disabled. To change layer status to enabled, click on the icon.



Shortcut to lock the layer. Icon turns red when activated.

Create new Layers

At any time you can add additional layers. Layers can be added according to their type, video, audio, etc..



- V+** Insert a Video layer on top of all others
- A+** Add an audio layer at the bottom of all others
- S+** Add a timed text layer (for subtitles or closed captioning) on top of the video layers.
- X+** Add an auxiliary track at the bottom of the audio layers. Auxiliary tracks are used to display special tracks like Dolby Atmos, D-Box, etc...

6.6. Compositions

Assembling a content from multiple assets is done in a composition. By default every project has a default composition, called "Default".

You can create multiple compositions within the same project.



If you drag & drop an IMF or a DCP package containing multiple CPLs, ICE will automatically creates the compositions for each of the CPLs.

Composition duration is displayed in light grey over the timescale:



By default, the composition is set on 24h.

The duration of the composition can be adjusted by a simple move (left mouse click and drag) of the small handles at each end of the line.

- To auto adjust the composition duration to the clips on the timeline, press **Alt** + **Ctrl** + **F**.

The Composition can also be manually adjusted by typing values for the beginning and the end of the composition:

- Click in the Composition Start and / or End in the Shuttle Bar, and type desired values.



The composition line is automatically updated with the new duration.

In order to quickly fit the composition, you can also use the Timeline Hot Box:

- Press **Ctrl** + **Right mouse** button on the Timeline background to display the TimeLine Hot Box and select COMPOSITION.

CLIP	MARK	LAYER	COMPOSITION
Fit Duration All	Fit Duration Video	Fit Duration Audio	Fit Duration Subtitles
Fit Duration Auxiliary	Set Max Duration	In/Out From Mark Rang	

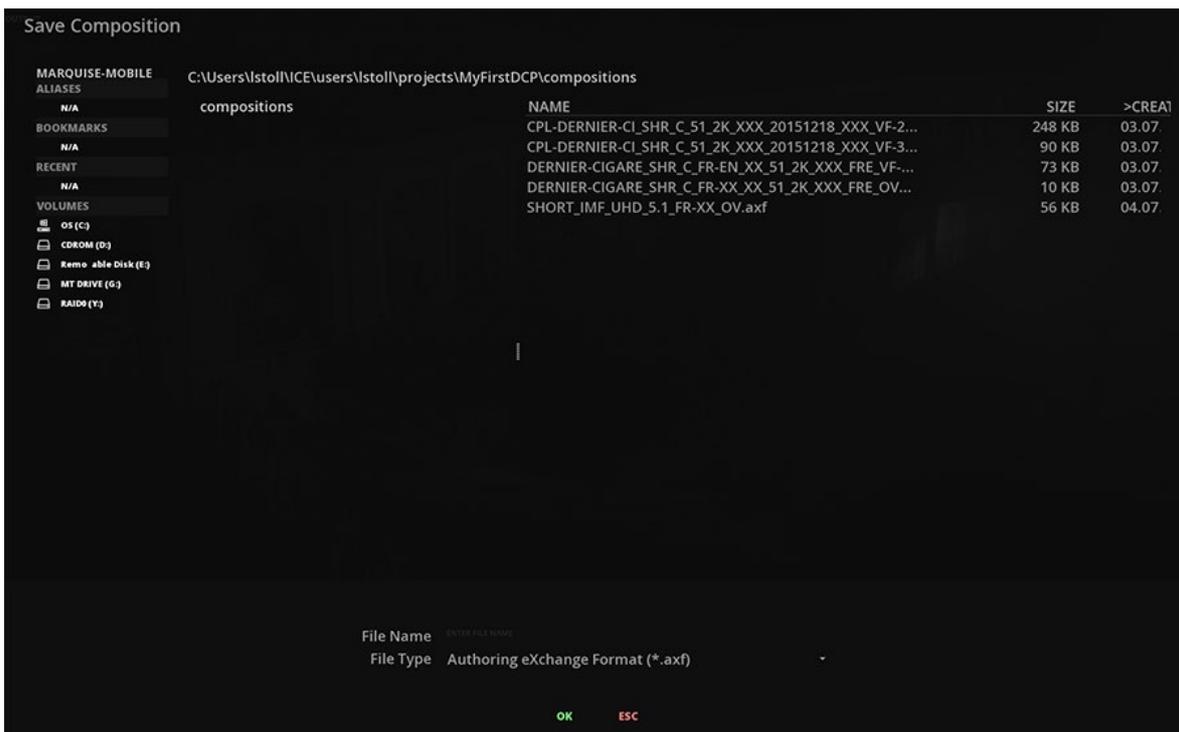
The Hotbox will provide you with shortcuts to fit the different type of layers of the composition.

6.6.1. Composition Management

ICE allows to manage unlimited compositions for the same project with different output formats, frame rate or image resolution.

Save a composition

- To save a composition, click the **[SAVE]** button on the bottom of the timeline (left side).



When opening the Save Composition window, the browser displayed by default the current working disk of the

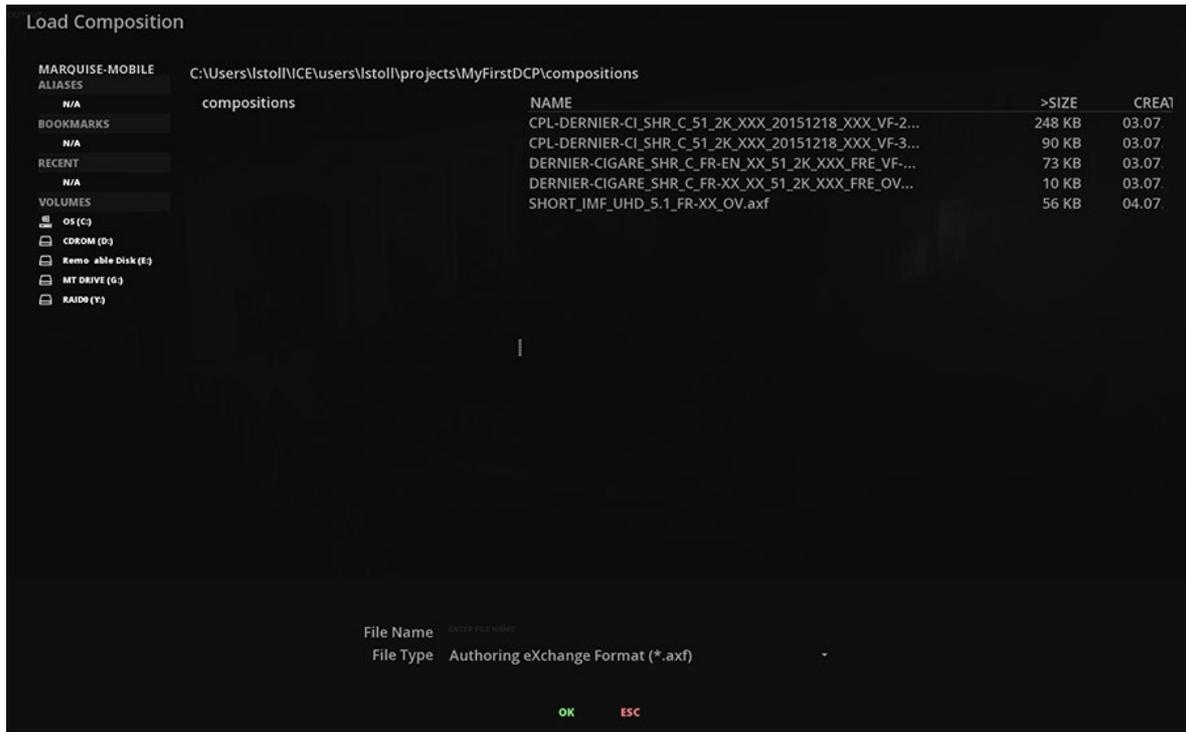
computer.

You can specify another location by browsing the folder tree on the left.

By default, ICE saves the composition in Authoring eXchange format (.axf)

Load an existing composition

- To load a composition, click the LOAD button on the bottom of the timeline (left side),
- or press **Ctrl** + **O**



When opening the Load Composition window, the browser displayed by default the current working disk of the computer.

You can search in another location by browsing the folder tree on the left.

Start a new composition

- Click the NEW button on the bottom of the timeline (left side),
- or press **Ctrl** + **N**



This action deletes the current composition if it has not been saved.

Switch compositions in the project

When a project holds several compositions, you can quickly toggle from one to another one:

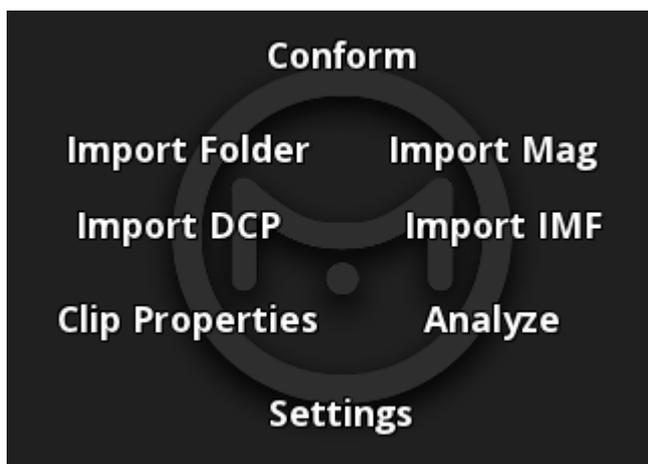
- To toggle between compositions, display the list of compositions in the Library and double click on the desired one.

6.6.2. Composition Settings

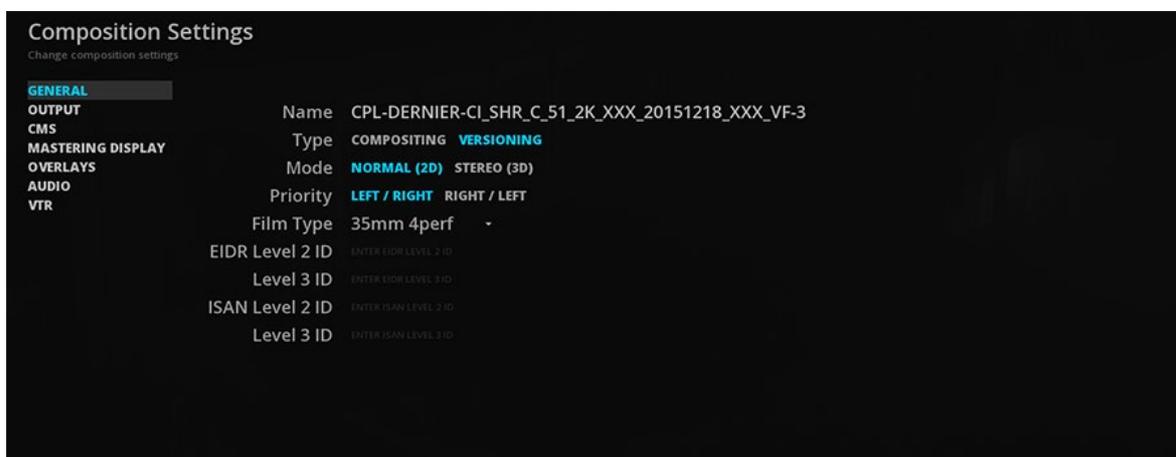
By default, when double clicking on a composition, ICE will automatically load the composition on the timeline, set all the parameters according to the media properties (resolution, frame rate, HDR settings, etc) and starts play.

You can also modify the parameters for the composition. These parameters can be accessed from the Module Action menu:

- Positions the mouse on the image Viewport and press the **Right mouse** button. Chose **Settings** from the menu:

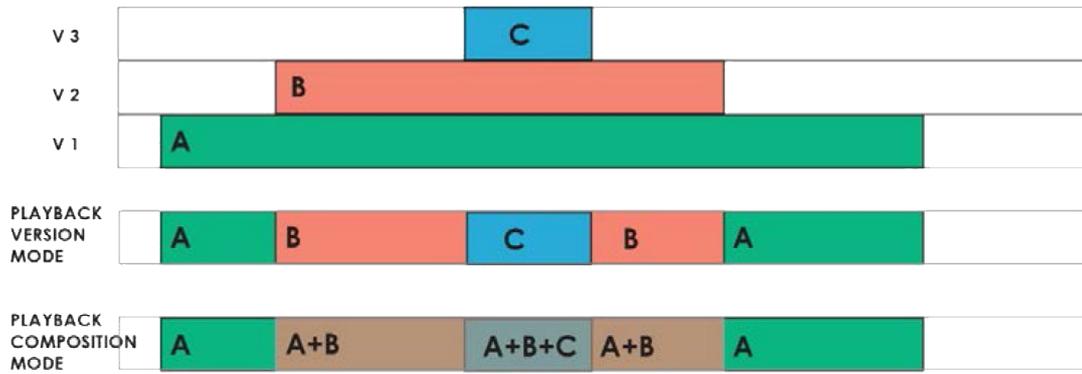


General Settings



The general settings define the type and the mode of your composition.

Type Defines the type of your composition. ICE is in **Compositing** by default for any new project. If you import a DCP or IMF original version package, ICE will set itself on the Versioning type. The type affects the way ICE plays back a composition:



Mode This parameter set the composition in Stereo3D or in normal 2D mode.

Priority Applies if the Stereo3D mode is chosen. When you add a new track it will be setup as the left eye and the new/upper track will be for the right eye or you can invert. Usually the left eye is the first track.

Film Type Setting a Film type will define how the TimeLine is calculated in Feet + Frames.

EIDR/ISAN Levels This is where you set the Levels 2 and 3 of the content EIDR or ISAN Number. This information can be required for the export of QC reports. The level 1 is set in the Project Settings.

Output Settings

You can define an image resolution for your content, independently of it's original size. However, if the chosen format is not compatible with the source content (frame rate for example), the video layer will turn red.



These output settings are only applying to the TimeLine. The Video out settings are managed from the Project Settings.

Preset formats or custom output formats are available:

Preset Output format

Select the desired preset and ICE will adapt automatically the dimensions, the frame rates and the pixel aspect of the content.

Custom Output format

To define a custom format, select Custom in the Preset drop down menu, and enter the desired format, frame rate and pixel aspect:

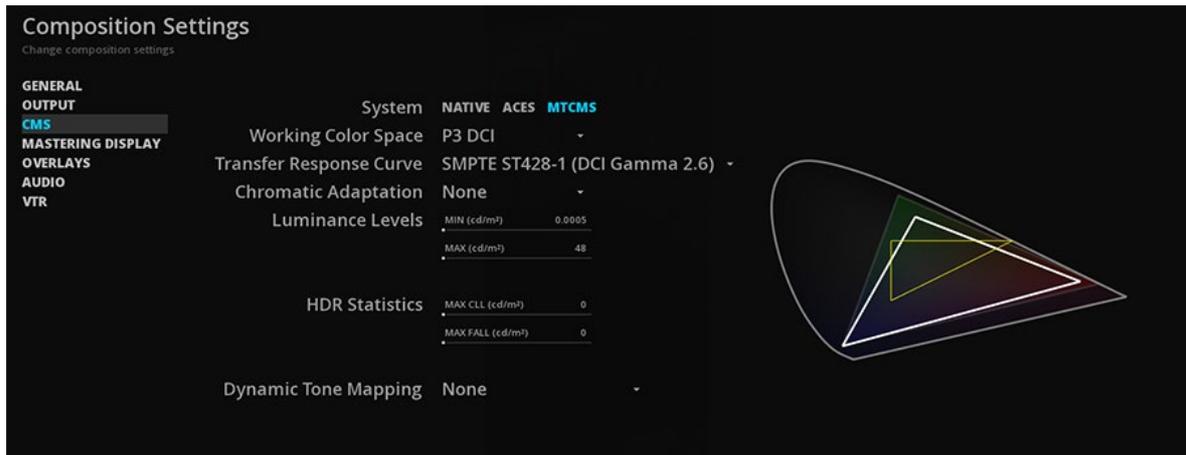
Dimensions Click on the width and heights digits to enter the desired values.

Frame rate Choose if the composition will be played from 14 up to 72 frames per second.

Pixel Aspect Select the desired aspect ratio of the clips size, from 1 to 2.77.

CMS

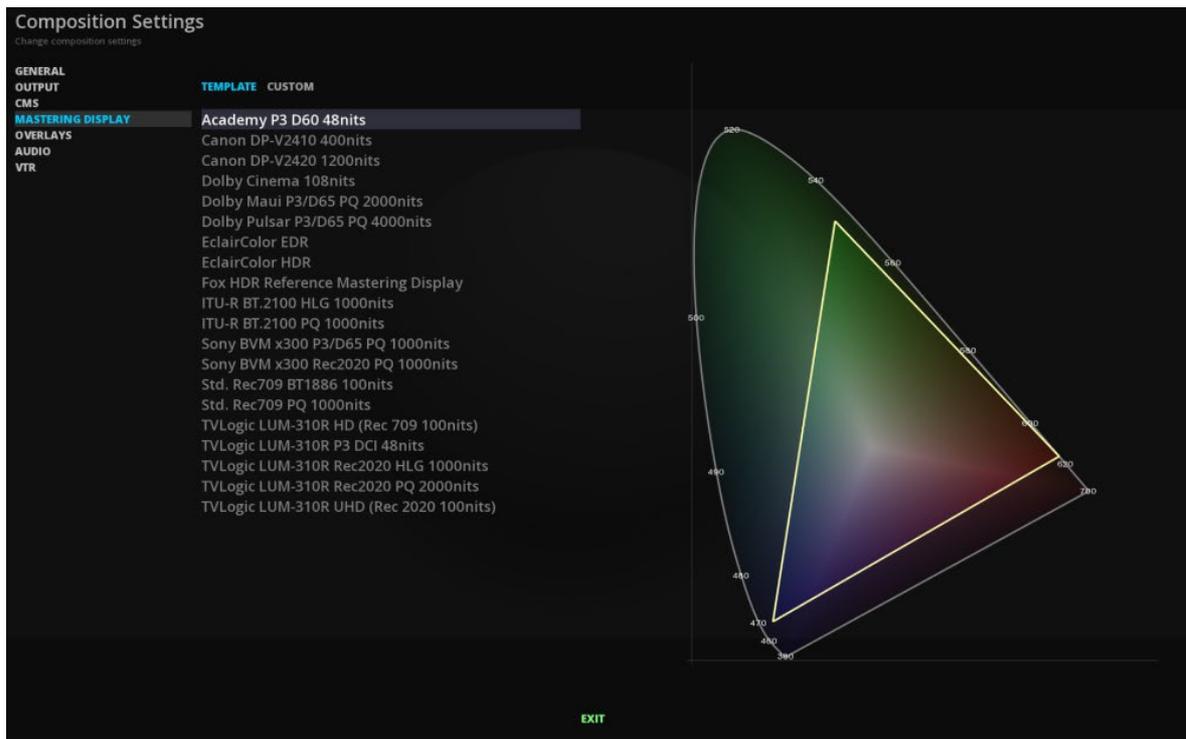
In ICE, you can set different Color Spaces in the same projet, one per composition.



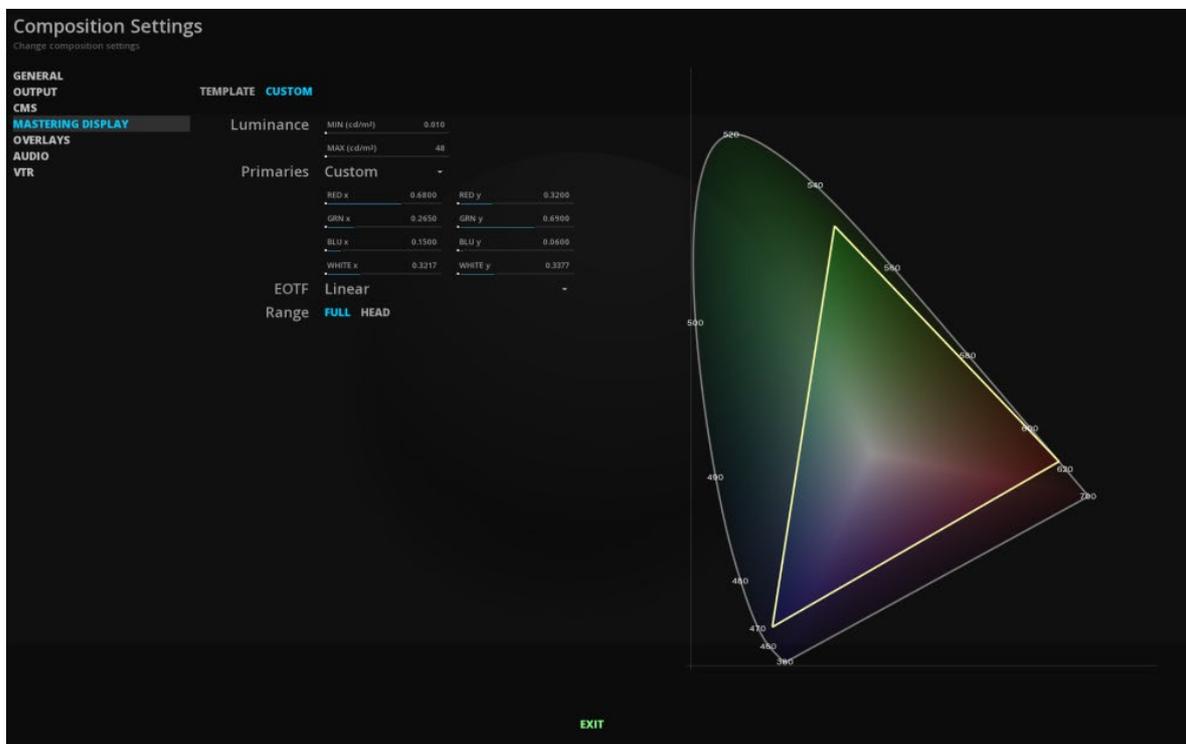
These settings are detailed in the section [Color Management](#) of this manual.

Mastering Display

This tab allows you to set the Mastering Display you are using for the QC. It is very important to set it properly in the case of HDR content. You can choose an existing template from the list:



Or customize your settings in the dedicated tab:



These settings are detailed in the section [HDR](#) of this manual.

Overlays

Overlays allows you to apply Blankings and Burn-ins on the image.

- Blanking** Enables image blankings (letterhead and pillar boxing)
- Frame Aspect** A list of preset frame aspects for the blankings.
- Opacity** Allows opacity controls of the blankings.
- Names** Burn in the image Clip, Reel or File name.
- Timecodes** Burn in the image the Source or Record TimeCode.
- Edgecode** Burn in the image the EdgeCode.
- Slate** Burn in the image the Scene or Take number.
- Rolls** Burn in the image the Camera, Lab or Daily number.

6.7. Clips

In ICE, a clip is the visual representation of any type of asset : video, audio, subtitle or metadata file.

Depending on the assets, like audio tracks for example, the way they are added on the Composition timeline is important.

6.7.1. Adding clips to the Timeline

Once you have dropped your media in the Library (see [Adding content in the Library](#), you can start adding the clips on the Timeline.

There are several ways to add clips to a composition and they all depend on the context. Some methods will be more appropriate than others in some particular cases.

Double click

When double-clicking on a clip or a composition in the Library, ICE will automatically load it on the timeline and start the playback.

With this method, the media gets loaded in a temporary composition, and every parameter is set according to the media properties (resolution, frame rate, HDR settings, etc).

Sequential Paste

This is the easiest method to manually drop some clips in the timeline.

The clips will be placed in the timeline automatically at the playhead position, one after the other, in the order you have selected them in the Library.

1. Select the clip in the Library (clip turns in grey when selected)
2. Using the mouse, click on the thumbnail then lift it with a quick swipe of the **left mouse** button. This process is called Lift, Carry & Drop.

The Clip will be attached to the mouse:

Library

MEDIA COMPOSITIONS REPOSITORY TOOLS



>NAME

[-] SMPTE-3D-SUBS_TST_S_MOS-EN_MOS_2K_ISDCF_20130501_DLA_3D

[+] Jack_Pote_HDR_DoVi

[+] SMPTE-3D-SUBS_TST_S_MOS-EN_MOS_2K_ISDCF_20130501_DLA_3D



Jack_Pote_HDR_DoVi_audio_4.mxf
Duration: 3 min 49.88 sec
6 channels @ 48000 Hz

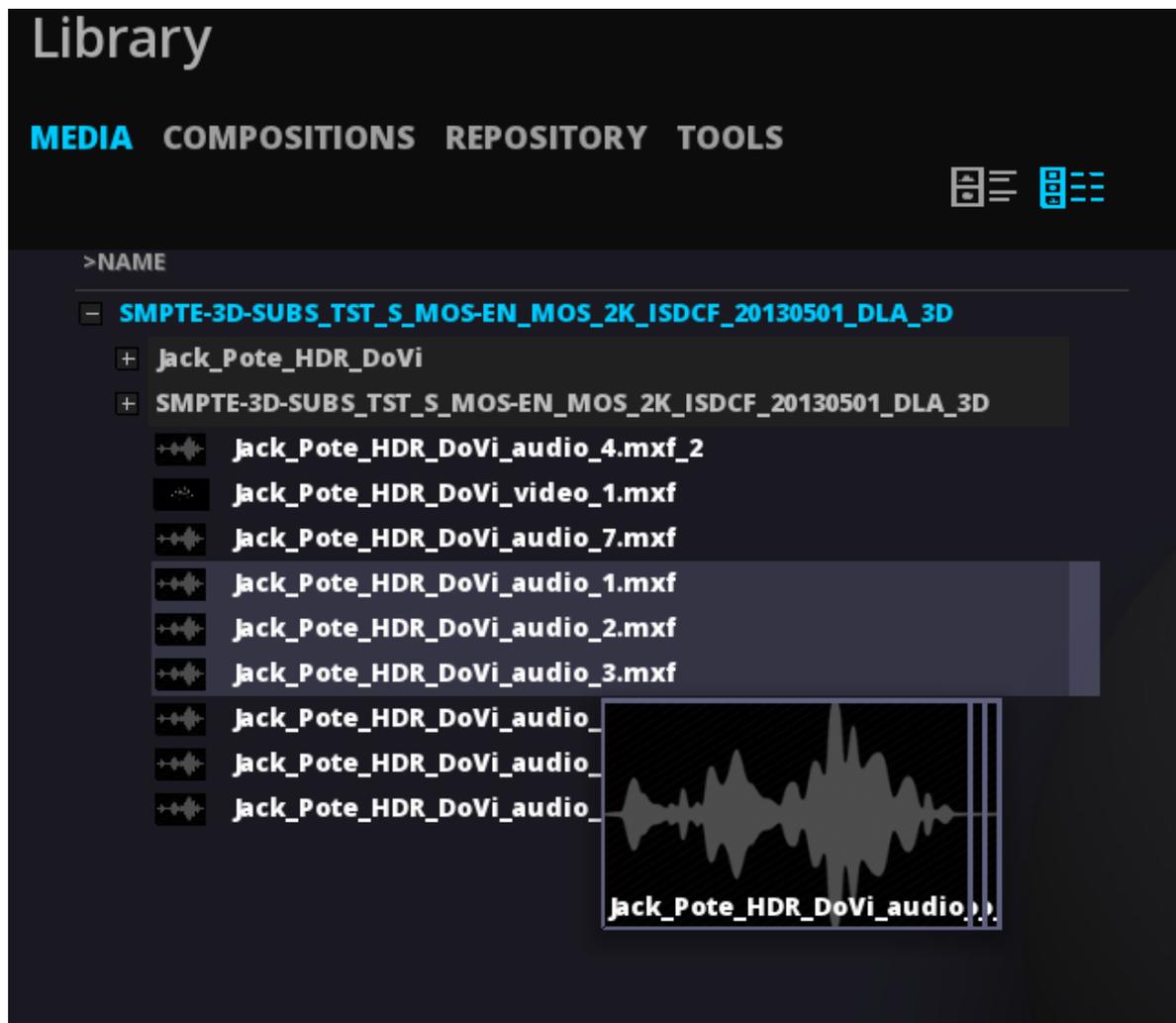


Jack_Pote_HDR_DoVi_video_1.mxf
Duration: 00:00:08:21 TC Start: 00:00:0...
3840 x 2160



Jack_Pote_HDR_DoVi_video_1

To import several clips, select them in the Library in the order you want them on the TimeLine using **Ctrl** + **Left mouse** button then click on any thumbnail and lift them with a quick swipe of the **left mouse** button:



- Once the clip(s) is/are attached to the mouse, press **Ctrl** + **V** to drop the clip(s) on the timeline.

The clips will position themselves on the layers, at the playhead position.



The Timeline must be configured with the right number of audio tracks prior to the import. This can be configured either from the Project properties, or by adding manually additional layers (press A+ or S+ for example).

- After having pressed **Ctrl** + **V**, you can either make a second “Paste” with the same clip(s) by making a **Ctrl** + **V** again, or press **Esc** to free the mouse.

Stacked Paste

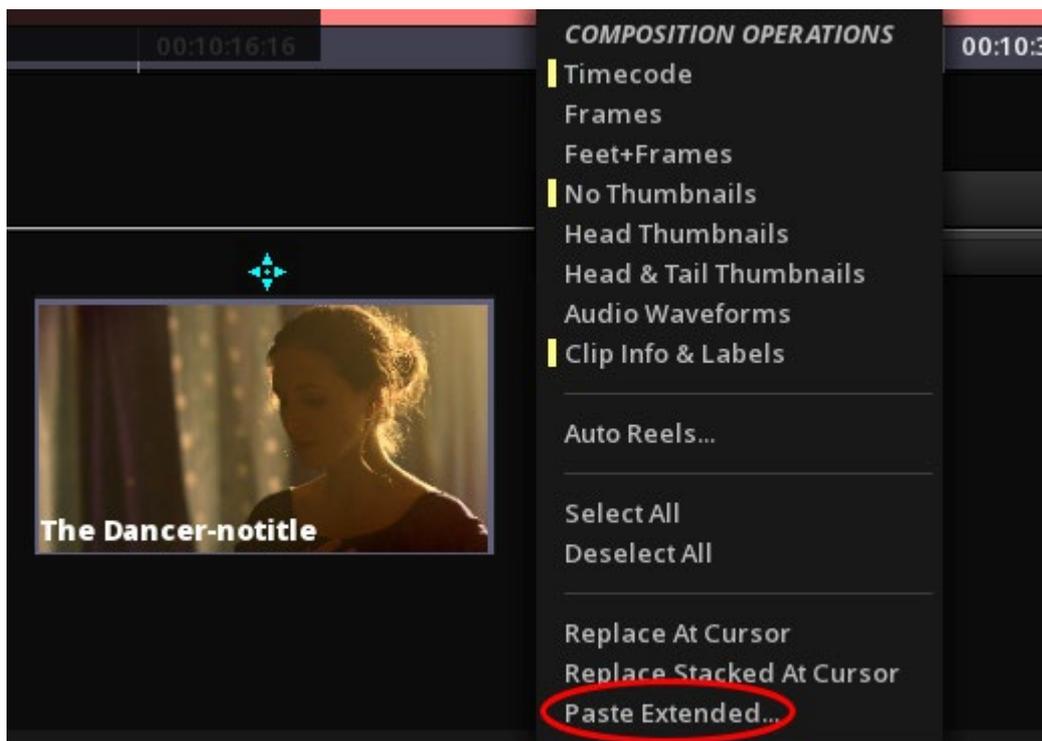
In Stacked Paste mode, the clips will be placed in the timeline in pile, one below each other, starting from the playhead location.

- Select the clips in the Library as mentioned above
- Once the clip(s) is/are attached to the mouse, press **Ctrl** + **Shift** + **V** to drop the clip(s) on the timeline.
- Press **Esc** to free the mouse.

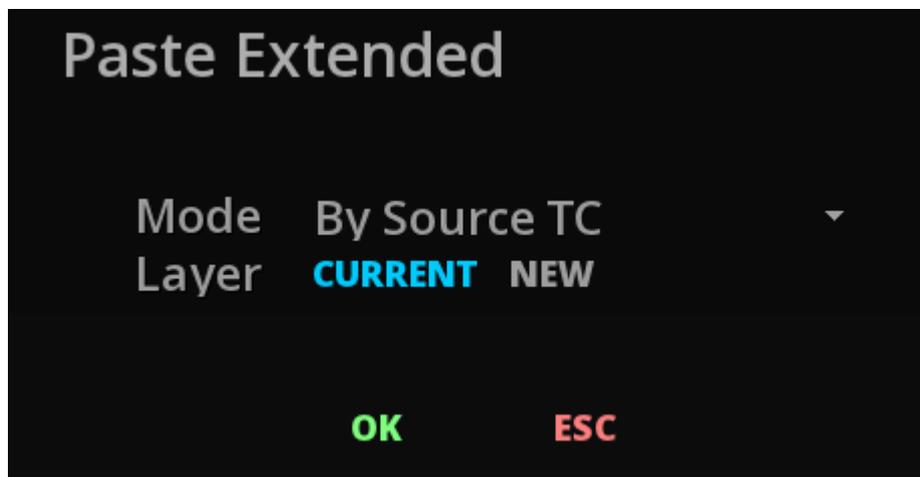
Extended Pasting

When none of the above methods is convenient, ICE offers extended paste functions.

- With the clip(s) attached to the mouse, press the right mouse button on an empty area of the timeline to display the dropdown menu:



This action opens the Paste Extended tool box:



- Select the desired paste mode with the drop down menu to be applied either on the current layer or on a new one.

The various paste methods include:

- By Source TC** will place the clips at specific places in the composition, according to their source timecode.
- By Increasing Source TC** will place the clips one after each other but sorted by their source timecode.
- Alphanumeric order** will drop the clips one after each other sorted by their name in the increasing

alphabetical order.

Reverse Alphanumeric order

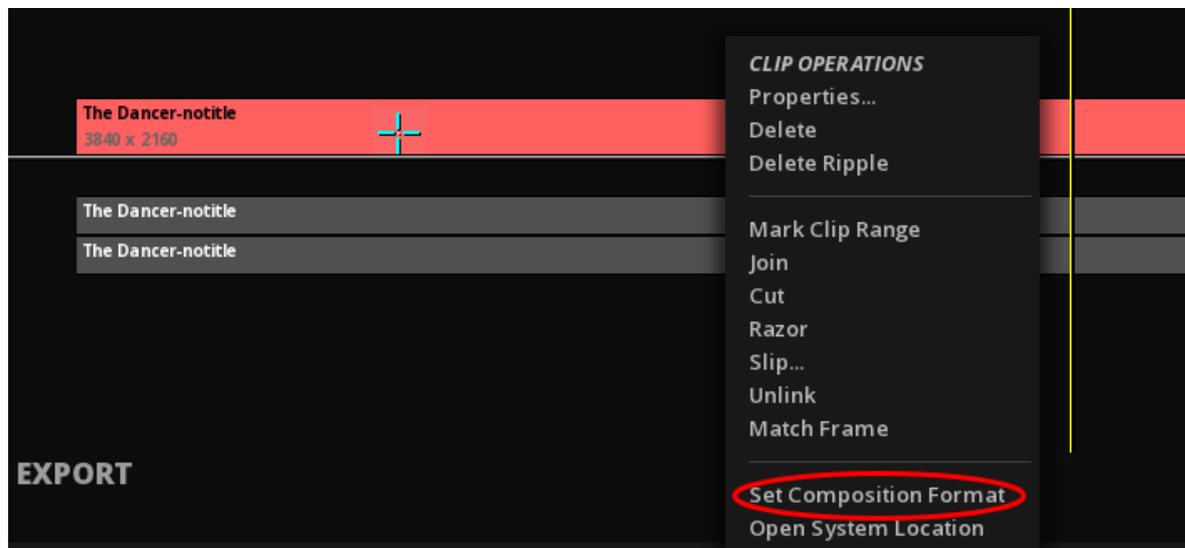
will drop the clips one after each other sorted by their name in the reverse alphabetical order.

Clip and composition frame rate

After the import, if your clip appears in red on the TimeLine, it means that your composition settings have not the same frame rate than your clip:



- To modify them, you can either call the Action menu (press **right mouse** button from the image Viewport) to access the Composition settings and change them manually, or
- Press right mouse button on the clip itself to display the Clip Operations drop down menu :

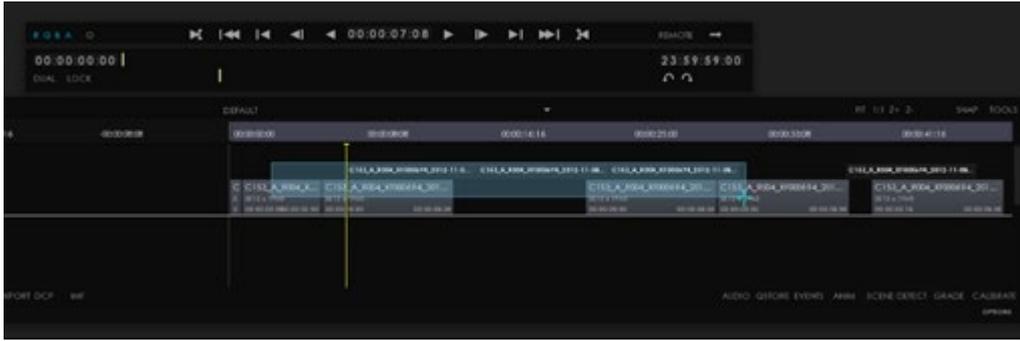


- Choose **Set Composition Format** to automatically adapt the composition settings to the clip properties.

6.7.2. Selecting clips

- To select a clip on the track, click on it using the **left mouse** button. Clip will change color to light grey.
- To select several clips, use **Ctrl** + **left mouse** button on each of them.
- To select all the clips, start to select one clip then use **Ctrl** + **A** .
- To deselect clip(s), use **Ctrl** + **D** .

- To select a range of clips, position the mouse on the track next to a clip you would like to enclose and press **Shift** + **left mouse** button and drag the mouse over the desired clips. The covered range is bordered in blue.



Alternatively you can use the TimeLine Hot Box to quickly manipulate the clips:

CLIP	MARK	LAYER	COMPOSITION
Select All	Deselect All	Select Linked	Select Unlinked
Select All Video	Deselect All Video	Select All Audio	Deselect All Audio
Select All Subtitles	Deselect All Subtitles	Select All Auxiliary	Deselect All Auxiliary
Delete	Delete Ripple		

6.7.3. Removing clips

You can remove an entire clip or a range of frames from the composition using several methods :

Delete clips

- Select the clip(s) you need to delete and press **Delete** .

Delete Ripple

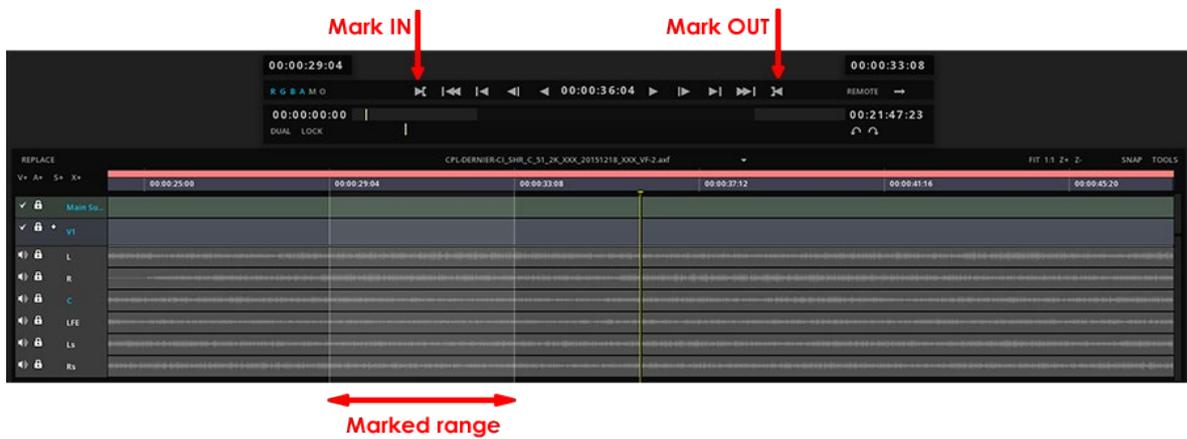
This deleting mode allows to delete a clip without leaving a gap in the Timeline.

- Select the clip(s), and press **Backspace** on the keyboard.

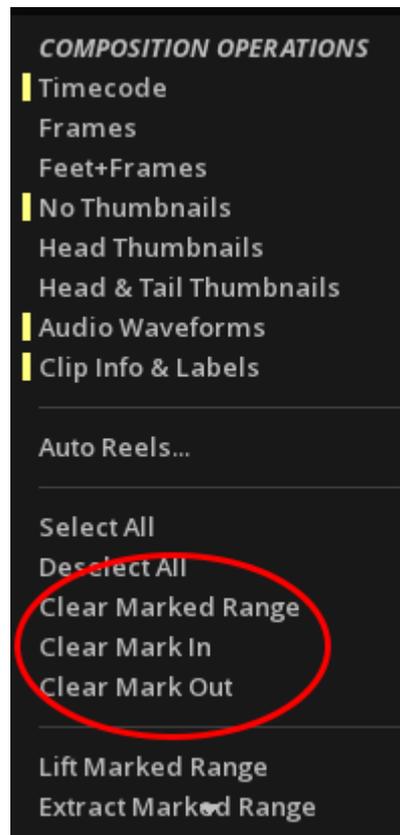
Lifting clips or a range of frames

Lifting is the process of removing one or more clips or a range of frames from the composition. The range of the composition to be lifted is defined by the mark in/out range. When lifted, the marked range leaves a gap of the same duration as the mark in/out range.

In order to remove a portion of the composition using the Lift operation, you need first to mark the range using the Mark In/Out tool :



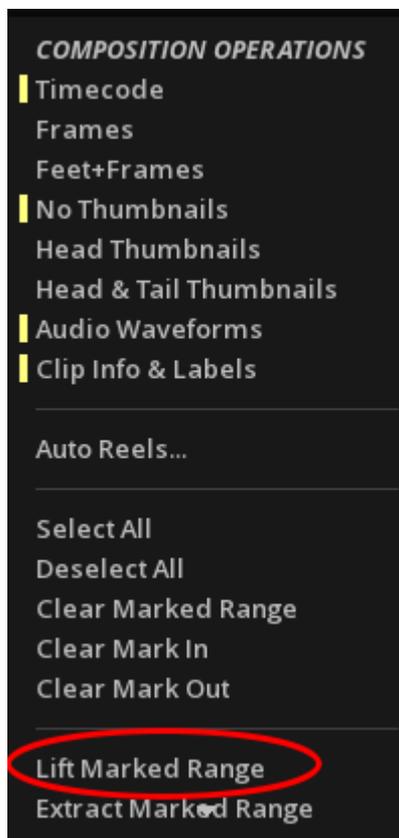
- to remove a marked region, press **Right mouse** button on the TimeLine background to display the Composition drop-down menu and select Clear Marked Range or Clear Mark :



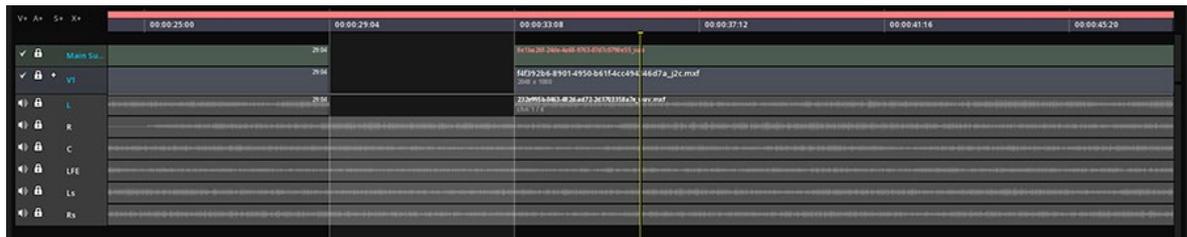
- Alternatively you can use the shortcuts **Alt + I** and **Alt + O** to set / remove the marked range.

Once the region is marked, to perform the lift you can:

- press **Ctrl + L**
- display the Composition drop-down menu by clicking **Right mouse** button on the TimeLine background and select **Lift Marked Range**.



Timeline after a LIFT operation:



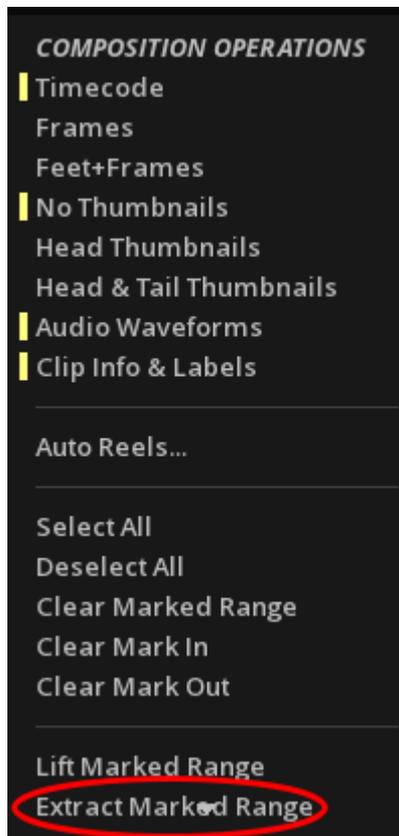
This operation occurs on the active layers only.

Extracting clips or a range of frames

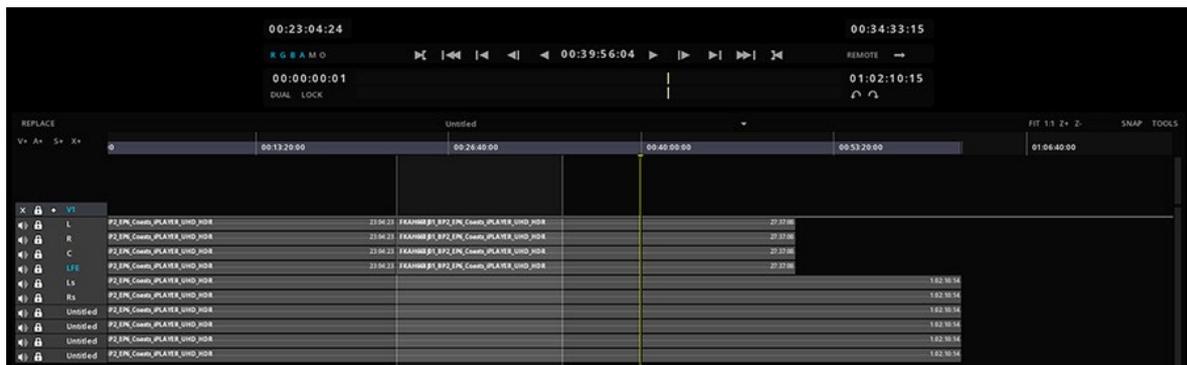
Extracting clips is a process similar to Lift, however there is no gap left by the removed marked range. The remaining clip parts or full clips that were on the right of the mark Out point are moved backwards to the left to fill the gap (also called ripple deletion).

To Extract a clip or a range of frames you must first mark a range and then :

- press **Ctrl** + **E** or
- display the Composition drop-down menu by clicking **Right mouse** button on the TimeLine background and select **Extract Marked Range**.



Timeline after an EXTRACT operation:



This operation occurs on the active layers only.

6.7.4. Clip Properties

To access the Clip Properties, display the Clip Operations drop-down menu by pressing **Ctrl** + **Right mouse** button on the desired clip:



General Properties

General Properties display general clip information like system's location or frame rate.

Clip Properties

Inspect clip properties

GENERAL METADATA LOGGING

Name	FKAH668J01_BP2_EP6_Coasts_iPLAYER_UHD_HDR	
Library Path	/FKAH668J01_BP2_EP6_Coasts_iPLAYER_UHD_HDR.mov	
System Path	G:\FKAH668J01_BP2_EP6_Coasts_iPLAYER_UHD_HDR.mov	
Frame Rate	25 fps	▼
Aspect Ratio	1.00:1 (Square Pixel)	▼
Source TC	09:59:30:00	11:01:40:13
Absolute TC	00:00:00:00	00:00:00:00
Edge TC	00:00:00:00	00:00:00:00
Aux TC	09:59:30:00	11:01:40:13
Camera Roll	ENTER CAMERA ROLL NAME	
Lab Roll	ENTER LAB ROLL NAME	
Daily Roll	ENTER DAILY ROLL NAME	
Scene	ENTER SCENE NAME	
Take	ENTER TAKE NAME	
Film Type	35mm 4perf	▼

Clip Metadata

This tab displays the metadata embedded in the file itself.

Clip Properties

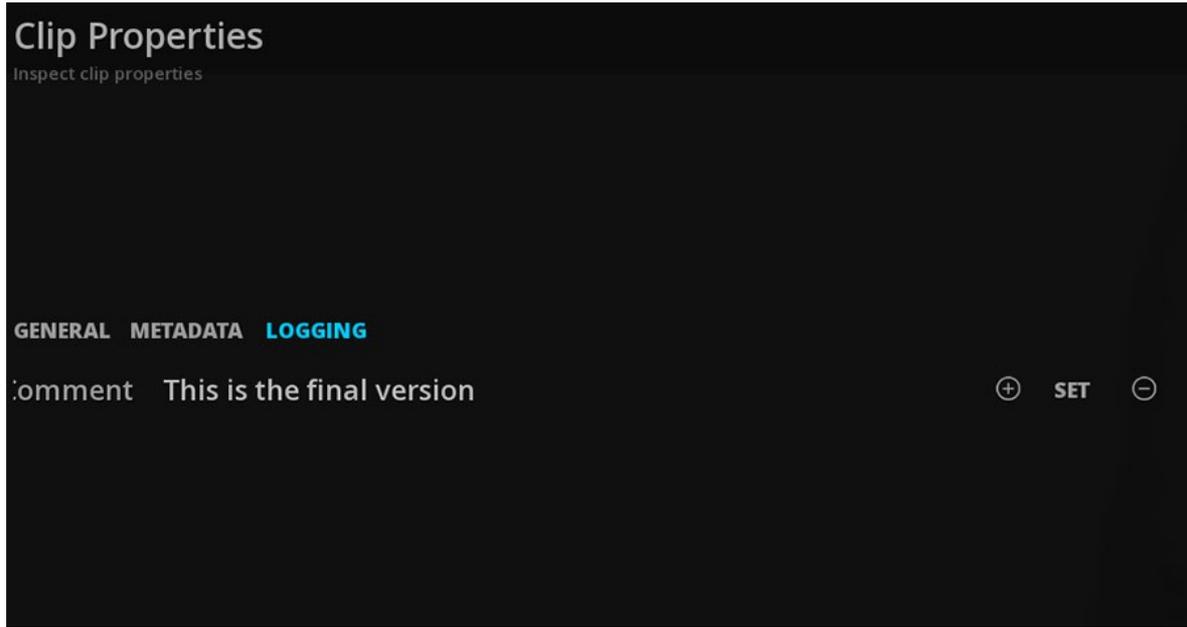
Inspect clip properties

GENERAL METADATA LOGGING

>Property	Value
[-] FKAH668J01_BP2_...	
[-] General	
Format	QuickTime
[-] Video	
Codec	ProRes
Profile	4:2:2 (HQ)
Width	3840
Height	2160
Frame Rate	25:1
Frame Count	93264
Bit Depth	10
Bitrate	673.209
Frame Layout	Progressive
Color Primaries	ITU-R BT.2020
Transfer Chara...	HLG
Coding Equat...	ITU-R BT.2020
Code Range	Full
Creation Time	2017-11-16 18:33:04
Handler Name	Linux Alias Data Handler
Language	eng
Timecode	09:59:30:00
[-] Audio	
Channel Count	10
[-] Soundfield #1	

Clip Logging

You can add custom comments for a specific clip.



- Use the - and + buttons to add / delete comments.

6.8. Playback Modes

ICE has different playback modes to help the QC process.

6.8.1. Toggle Playback Modes

The different playback modes include:

	Play Once	Play the current composition just once
	Play ping pong	Play backward then forward the composition, endless.
	Play Loop	Play back the current composition, endless

By default, ICE is set in **Play once** mode.

- To toggle to the other modes, click on the icon on the Transport bar until the desired mode is displayed.

6.8.2. Playing Back a Marked Region

To play a specific region of the composition, mark the desired range with IN and/or OUT points:

IN point	OUT point	Description	Shortkey
			

SET	SET	Play forward in the marked region	Alt + Space
SET	SET	Play backward in the marked region	Alt + Ctrl + Space
SET	None	Play forward from the IN point to the end of the composio	Alt + Space
SET	None	Play backward from the end of the composition to the IN point	Alt + Ctrl + Space
none	SET	Play forward from the beginning of the composition to the OUT point	Alt + Space
none	SET	Play backward from the OUT point to the beginning of the composition	Alt + Ctrl + Space



If the playhead is inside the marked range, the playback starts at the playhead position.

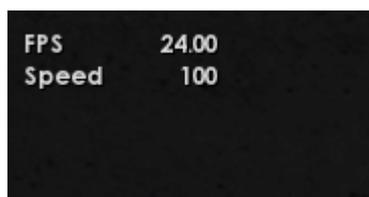
6.8.3. Playback Information

ICE can display playback information such as:

FPS Frame Per Second: Actual frame rate of the playback. If the frame rate is below the frame rate selected in the Composition settings, it means that the hardware has not sufficient performances. If the frame rate is over the frame rate selected, it might come from a display synchronization issue.

Speed Define the increment between the frames:
 Speed 100%: ICE plays all the images
 Speed 200% : ICE plays on frame out of two
 Speed 400% : ICE plays on frame out of four

- To display the Playback information panel, click **Alt** + **J**.
- To modify the speed, press several times on **L** or **J** for backwards payback.

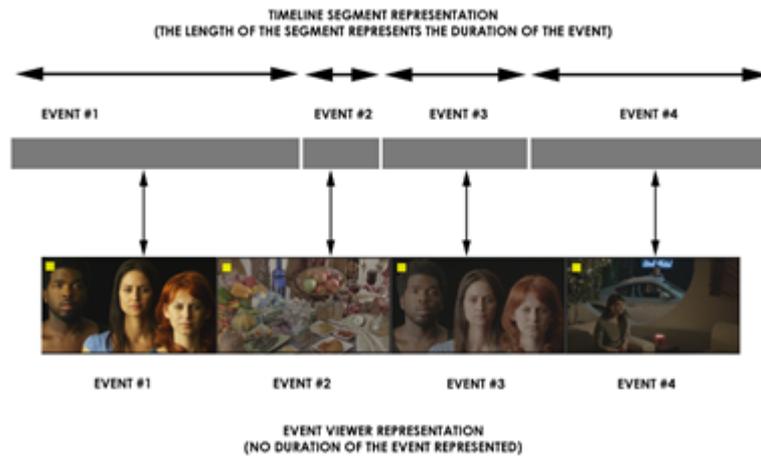


6.9. Event Viewer

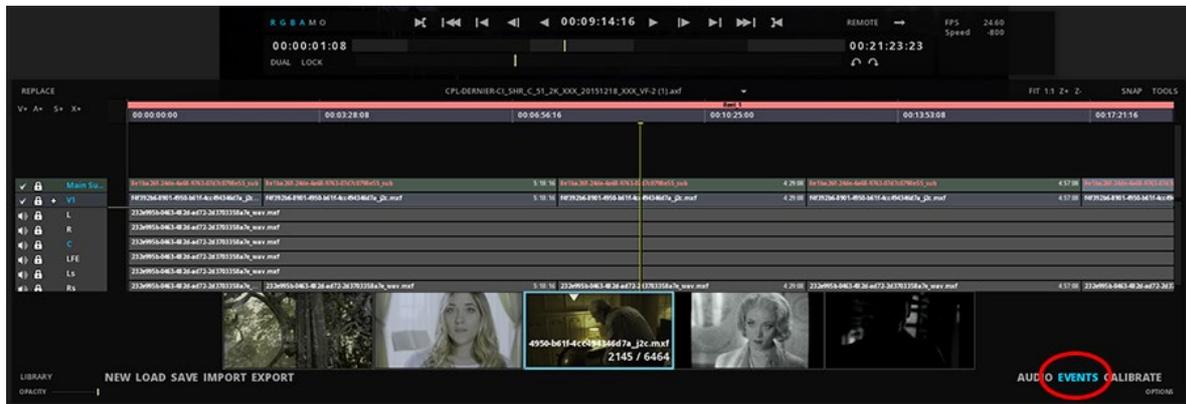
ICE allows to display the clips as Events.

The Event Viewer also displays the clips available on the timeline in a chronological manner; however, it represents

each clip with a preview of one of the frames of the clip. Each preview is displayed next to each other and their dimension is always the same. As a matter of fact, the Event Viewer does not visually represent the length of a clip (or shot).



- To display / Hide the Event Viewer, press EVENTS on the bottom of the TimeLine.



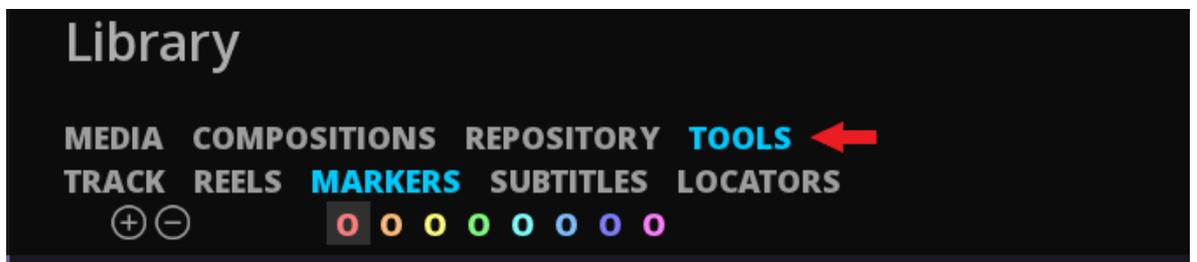
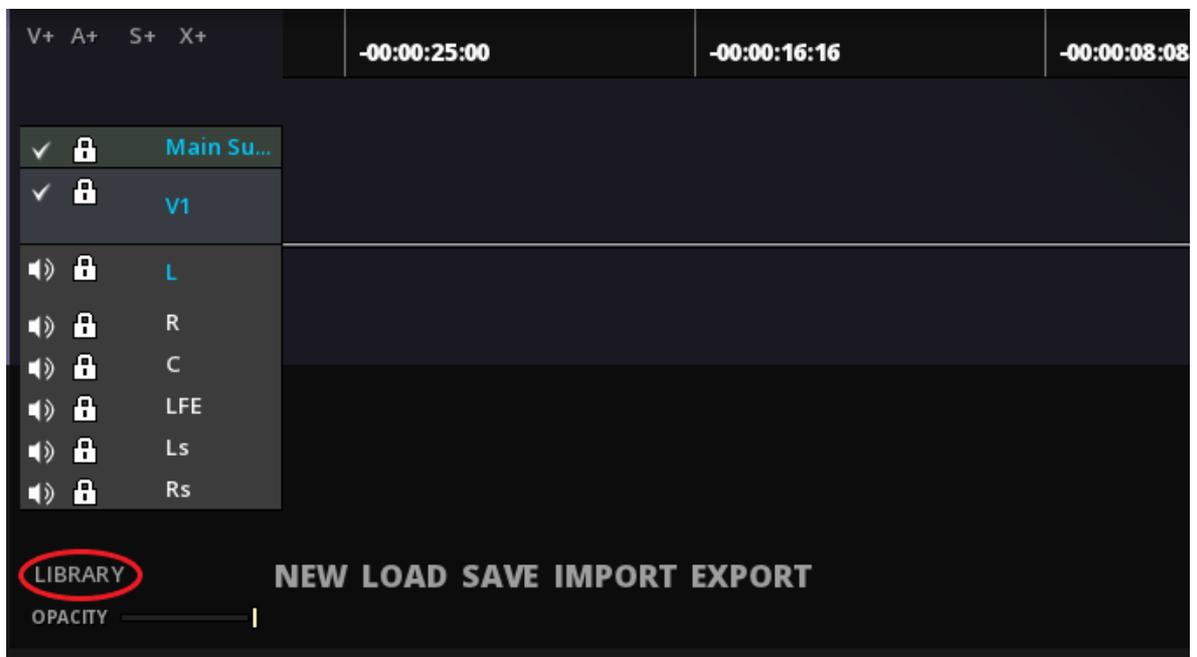
- Alternatively you can also use the key **E** to show / hide it.
- To navigate between events, double click on any thumbnail : the playhead will move to the first frame of the event you have selected.

6.10. Markers

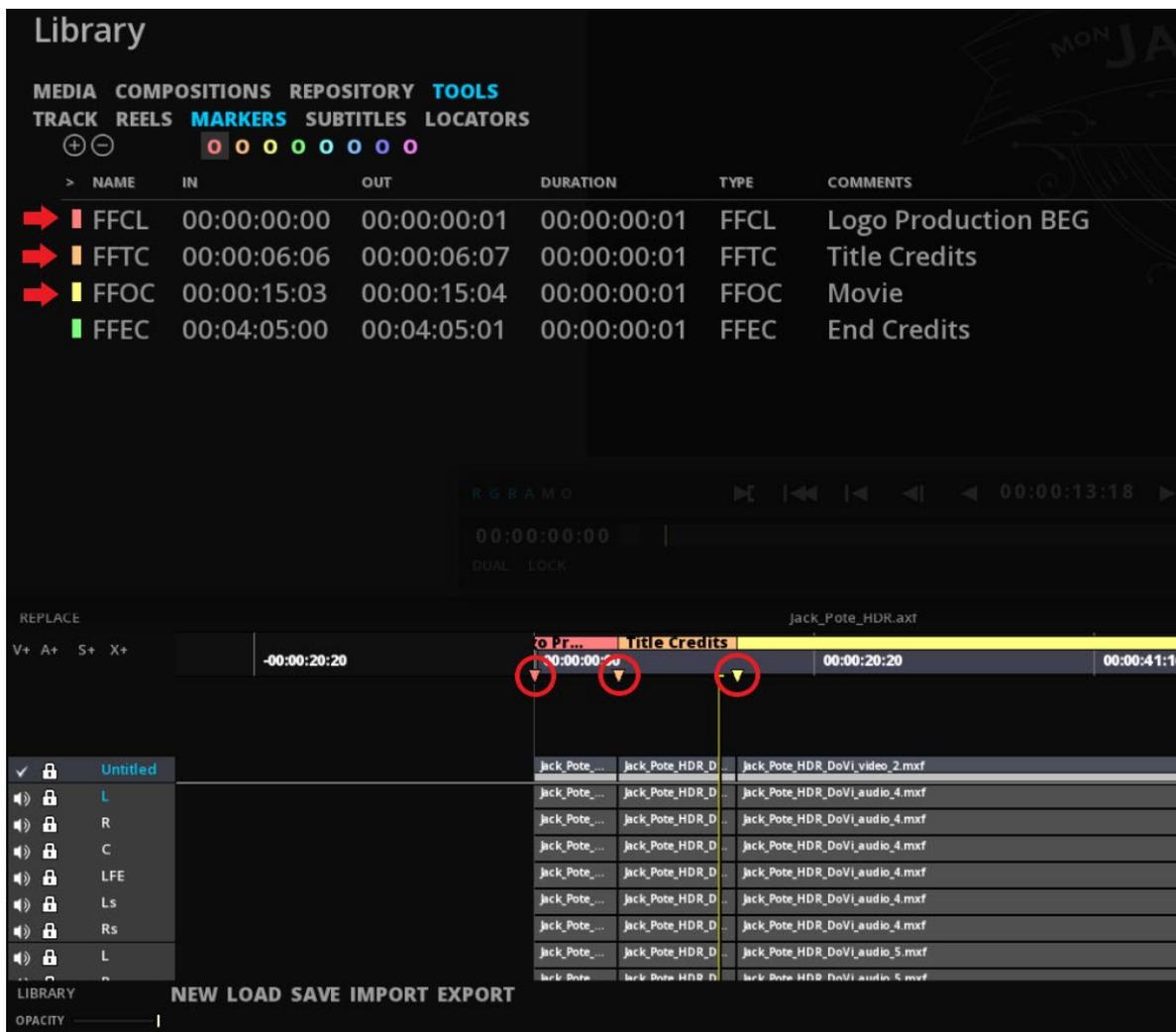
Markers define regions of a composition that have a specific meaning.

ICE recognizes the Markers present in a DCP for example and automatically display them on the TimeLine. It is also possible to manually set the Markers.

- To access the Markers panel, click on the **TOOL** button from the Library access:



Markers are represented in the TimeLine by colored triangles.



6.10.1. Adding markers

- To Add a Marker, position the Playhead on the desired timecode and in the Markers panel select a color and click the + button. The Marker is set for a default duration of 1 sec.
- To mark a range, first define your range and in the Market panel click the + button.
- To delete a Marker, select it in the Markers' list and click the - button

6.10.2. Navigating through Markers

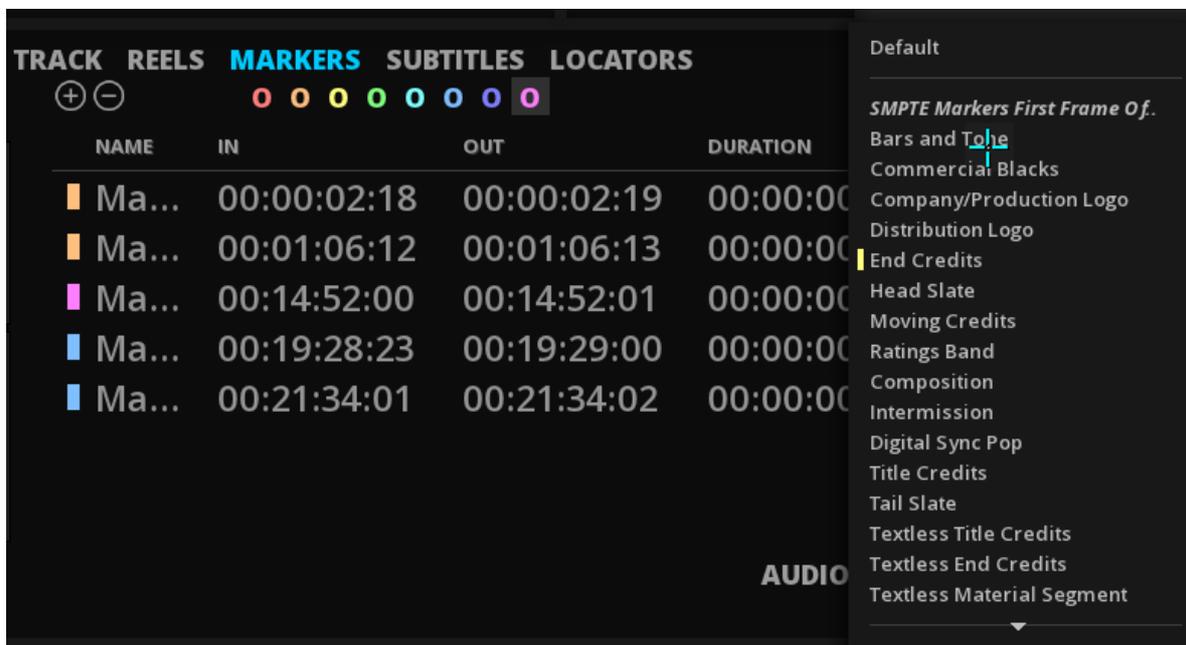
You can navigate from Marker to Marker with a double click on a time code in the Markers list.

ICE will automatically jump to the chosen frame in the TimeLine.

6.10.3. Defining a markers

ICE supports the SMPTE markers labels. to set them, select the desired Marker in the list and click on Default on the **Type** column.

This action display the Markers drop down menu.



You can also add custom comments.

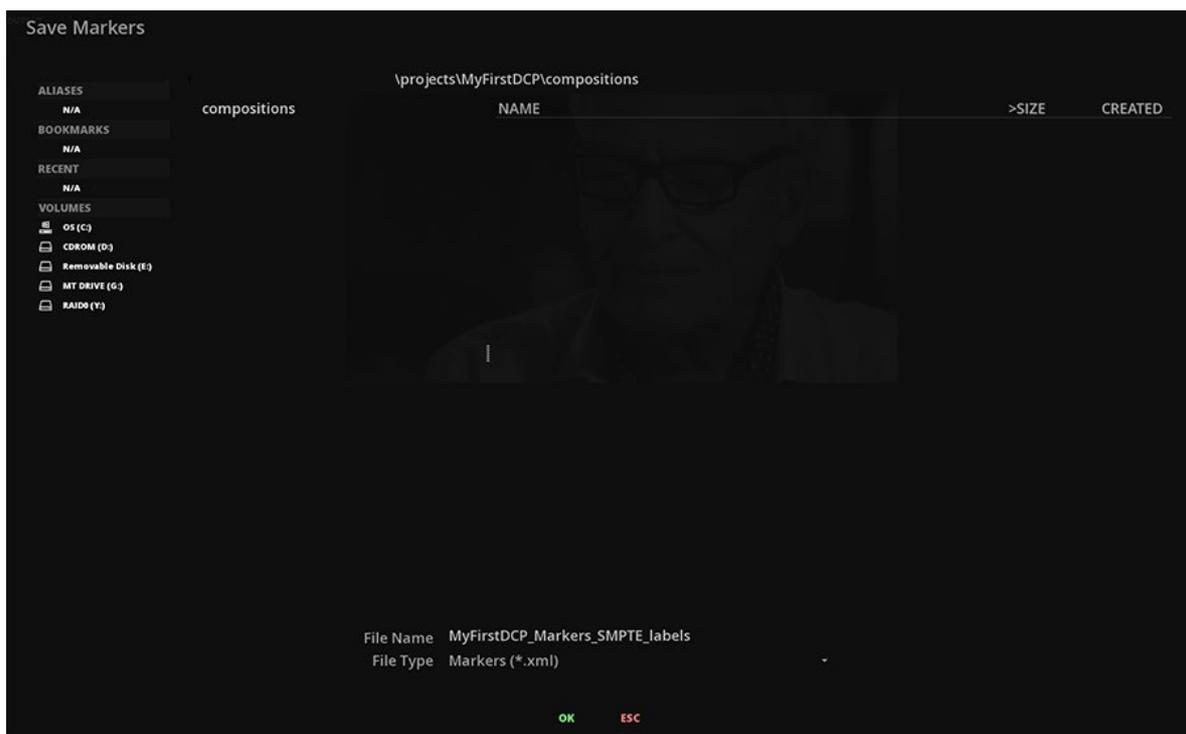
Select the desired Marker in the list and click on Default on the **Comments** column and add your custom text.

6.10.4. Exporting / Importing Markers

Save Markers

ICE allows to export the markers information in XML.

- Click on the [**SAVE**] button on the lower right corner of the Markers panel to enter the Save Markers window.
- Choose a location for your file and enter a name.
- Finish with [**OK**].



Import Markers

- To import a Markers file, click on the [**LOAD**] button on the right of the Markers panel.
- Browse the folder tree on your left, select the file and click [**OK**].

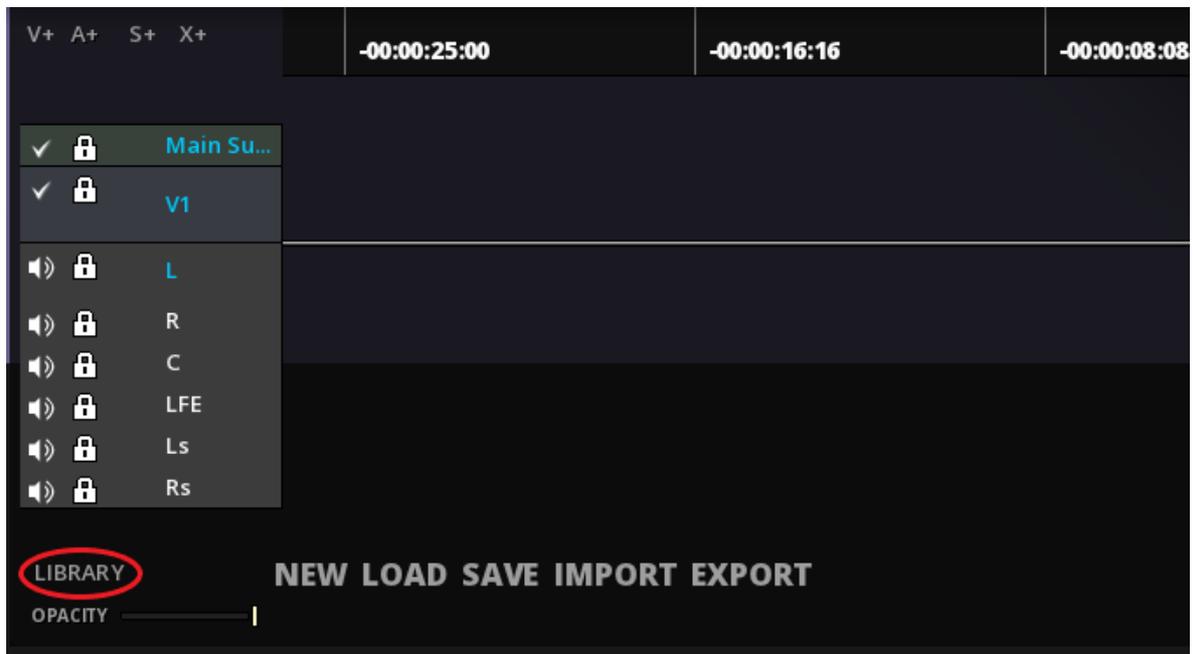


Only Markers created using ICE or MIST can be loaded. If you want to import an external file, you can use the [Locators](#).

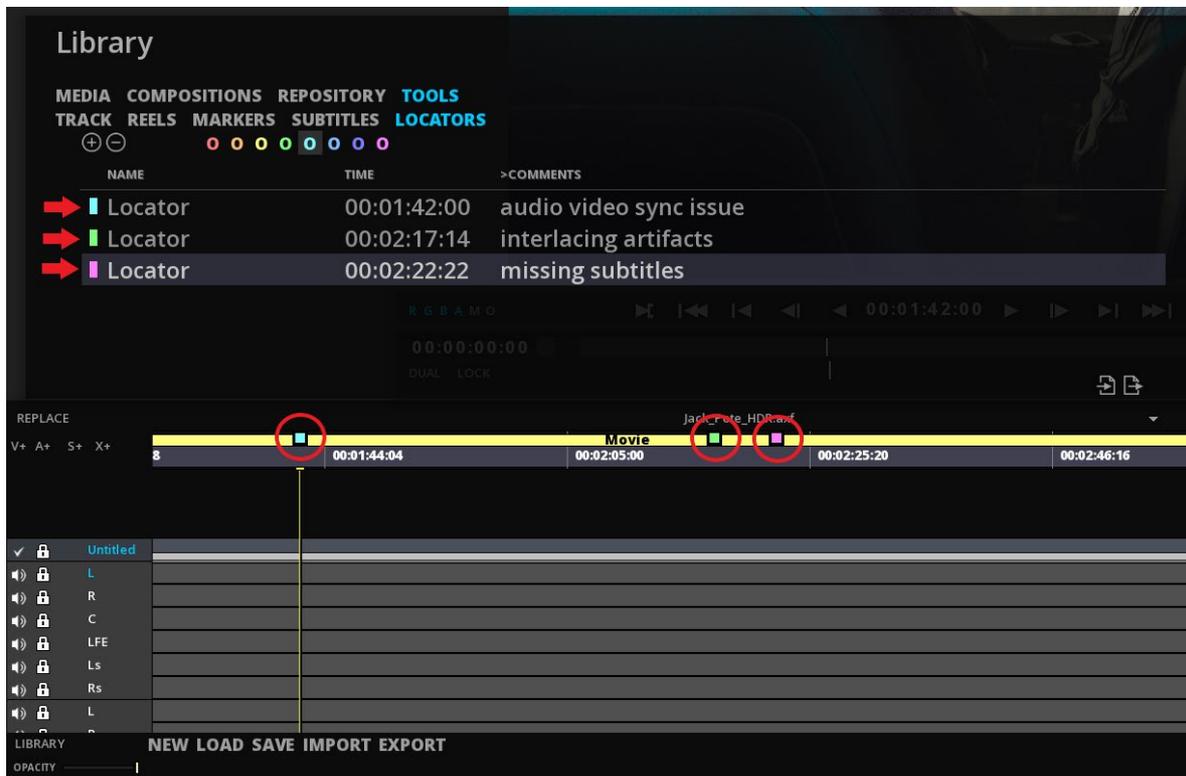
6.11. Locators

If they are similar to the Markers, Locators are only used for custom comments.

- To access the Markers panel, click on the **TOOL** button from the Library access:



Locators are represented in the TimeLine by colored squares.



6.11.1. Adding Locators

- To Add a Locator, position the Playhead on the desired timecode and in the Locators panel select a color and click the + button.
- To delete a Locator, select it in the Locators' list and click the - button



You can create several Locators at the same timecode, however on the TimeLine only the last Locator entered will be displayed.

6.11.2. Navigating through Locators

You can navigate from Locator to Locator with a double click on a time code in the Locators list.

ICE will automatically jump to the chosen frame in the TimeLine.

6.11.3. Defining a Locators

- To rename a Locator, double click on its name and enter the new text.
- Select the desired Locator in the list and click on the empty field in the **Comments** column and add your custom text.

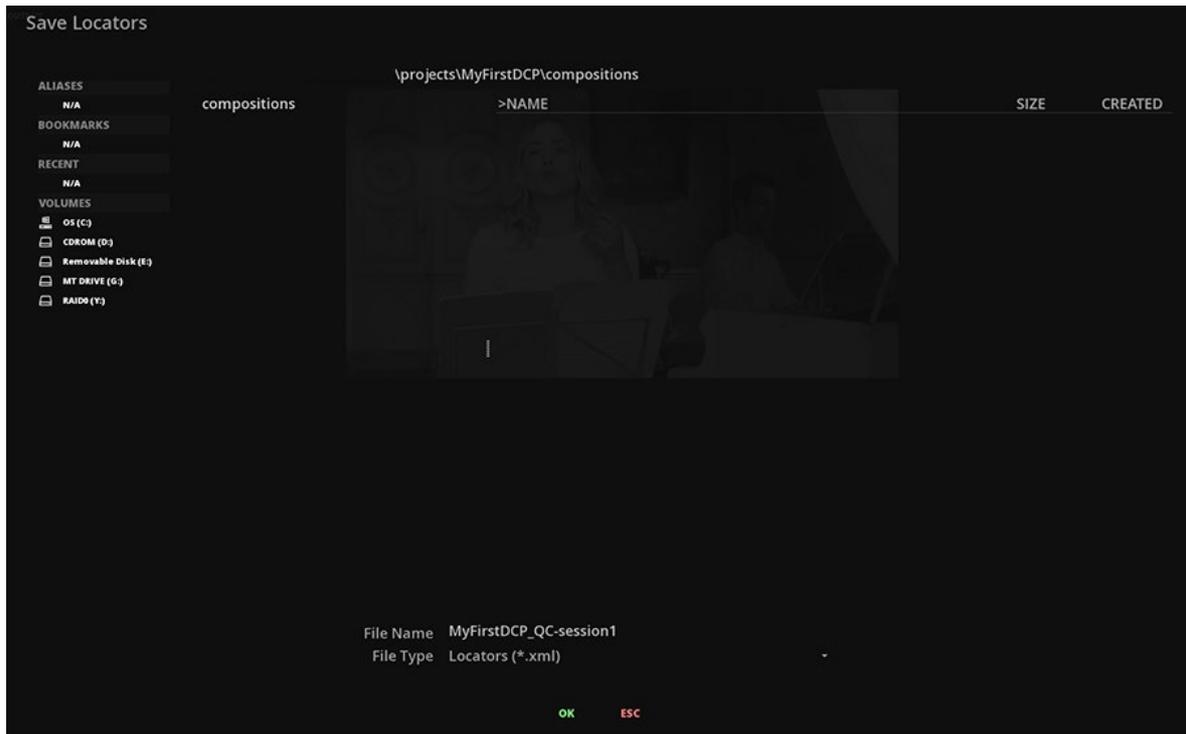
6.11.4. Exporting / Importing Locators

Save Locators

ICE allows to export the Locators information in XML.

- Click on the [**SAVE**] button on the lower right corner of the Locators panel to enter the Save Locators window.
- Choose a location for your file and enter a name.

- Finish with [**OK**].



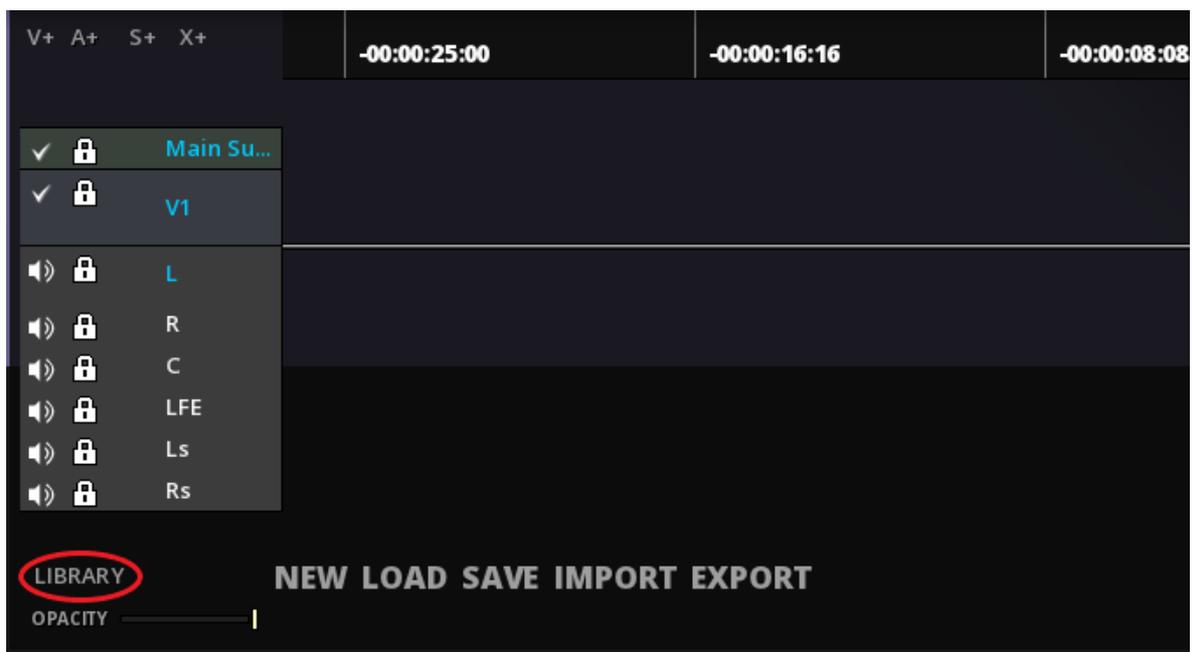
Import Locators

- To import a Locators file, click on the LOAD button on the lower right corner of the Locators panel.
- Browse the folder tree on your left, select the file and click [**OK**].

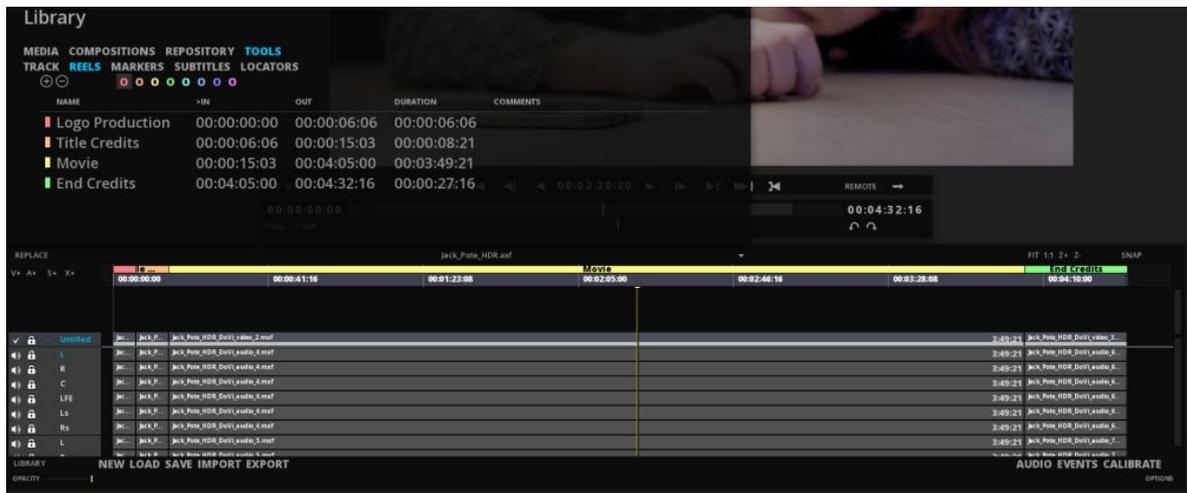
6.12. Reels Management

Reels or Segments are often present in DCP or IMF packages.

- To access the Markers panel, click on the **TOOL** button from the Library access:



In ICE, the reels or segments are identified by a colored bar on the TimeLine.



6.12.1. Navigating through Reels

You can navigate from Reel to Reel with a double click on a time code in the Reels list.

ICE will automatically jump to the chosen frame in the TimeLine.

7. AUDIO MANAGEMENT

7.1. Immersive Audio

7.1.1. Importing Immersive Audio files

in ICE, the Immersive Audio files are not managed as regular audio tracks.

When importing an immersive audio track into the Quick Library, ICE recognizes the metadata and display a different image icon for the file:



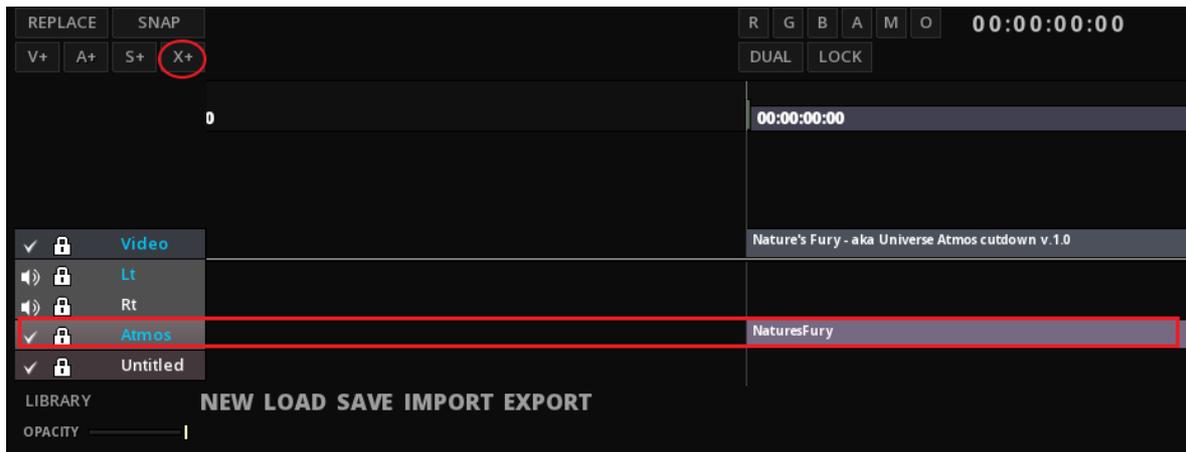
The immersive audio files must be placed on an Auxiliary data track on the timeline.



if ICE has detected immersive audio metadata in the file, it will prevent the drop of the file on a regular audio track.

- Create a new Auxiliary data track by clicking on the **X+** button on the left side of the timeline and drop the file on

this track.



7.1.2. Dolby Atmos

ICE is supporting Dolby Atmos technology and allows the QC and the playback of the Atmos files.

Supported Formats

ICE supports the following Atmos formats:

- DAMF (Dolby Atmos Master Format)
- BWF ADM (Broadcast Wave Format with Audio Definition Model)
- IAB (Immersive Audio Bitstream) for DCP (including encrypted files) and IMF

These files can be imported in the timeline as stand-alone files or wrapped in an IMF or a DCP package (IAB).

When importing a DAMF in stand-alone, select in the directory the file with the extensions .atmos and drop it into ICE:



View			
PC > New Volume (E:) > DolbyAtmos > Nature's Fury > DAMF			
Name	Date modified	Type	Size
NaturesFury.atmos	3/13/2019 9:23 AM	ATMOS File	3 KB
NaturesFury.atmos.audio	3/13/2019 9:23 AM	AUDIO File	2,104,132 KB
NaturesFury.atmos.metadata	3/13/2019 9:23 AM	METADATA File	4,152 KB

Dolby Atmos QC

Dolby Atmos Playback

It is possible to playback all supported Atmos files through the integrated Dolby Atmos Renderer, **to the exception of encrypted IAB files for Digital Cinema Package.**

The Dolby Atmos Renderer permits the following channel based audio outputs:

- 2.0
- 5.1
- 7.1
- 7.1.4

Atmos Metadata Inspection

Dolby Atmos metadata are displayed in the Metadata Inspector Panel:

The screenshot shows a software interface with a dark theme. At the top, there are tabs for 'MEDIA', 'COMPOSITIONS', 'REPOSITORY', 'TOOLS', and 'METADATA'. Below these are sub-tabs for 'PROPERTIES', 'STATIC', and 'DYNAMIC'. The main area is divided into two columns. The left column is a metadata inspector showing a tree view for an 'Untitled' project. It lists various properties and their values, with 'First Action Tim...' highlighted. The right column is a large video preview window showing a dark scene with many small, glowing blue particles. At the bottom, there is a control bar with buttons for 'REPLACE', 'SNAP', 'V+', 'A+', 'S+', 'X+', 'R', 'G', 'B', 'A', 'M', 'O', 'DUAL', and 'LOCK'. A timeline is visible with a playhead at 00:00:00:00 and a duration of 00:00:20:20. Below the timeline, there are tracks for 'Video' (Nature's Fury - aka Universe Atmos cutdown v.1.0), 'Lt', 'Rt', 'Atmos' (NaturesFury), and 'Untitled'. At the very bottom, there are buttons for 'LIBRARY', 'NEW', 'LOAD', 'SAVE', 'IMPORT', and 'EXPORT', along with an 'OPACITY' slider.

>PROPERTY	VALUE
Untitled	
Video	Nature's Fury - aka Univ...
Audio	N/A
Subtitles	N/A
Aux	NaturesFury
Program Metadata	
Creation Tool	v0.0.0
Monitor Renderer	Undefined
Source Master ...	Dolby Atmos Master File
Content Type	Home Theatre
Video Frame Rate	24 fps
Start Time (Seco...	3594.06
First Action Tim...	5.94308
Monitored Spati...	Undefined

7.2. Audio Analysis

ICE offers a full set of Audio monitoring tools for the quality control. Refers to the chapter [Audio Monitoring](#) for details about the different audio scopes.

7.3. Audio Routing

In ICE it is possible to modify the way the audio channels are distributed through the SDI output. This is done using the audio routing matrix:

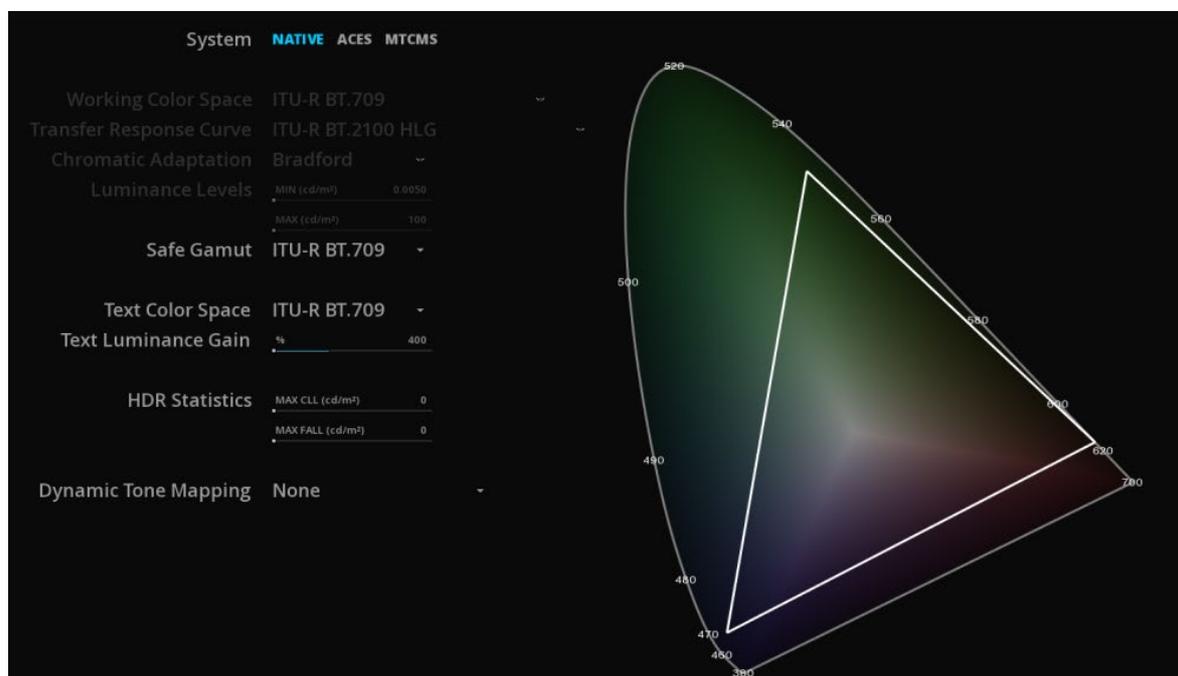
- In the Library panel, select TOOLS then ROUTING.
- To change the channel assignment, select a layer and click on the desired channel.

The Matrix is divided per audio layout for a clear representation of all the audio soundfiles present on the timeline.

8. COLOR MANAGEMENT

8.1. Setting the CMS

The Color Management System defines the working color space of the composition. It is possible to mix the color pipelines within the same project, however a composition can only refer to one CMS.



In ICE, color management is done in two steps:

1. define the properties of the source in order to be interpreted appropriately by the color management of ICE, whose internal color processing works in 32-bit floating point.
2. define the target output according to the CMS chosen.



The selection of the Color Management System is done in the **Composition Settings**.

- To access the composition settings, refer to [Composition Settings](#).

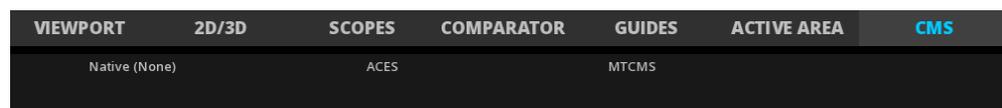
8.1.1. Color Systems

First, you need to define which color system you want to use for working in your composition.

ICE supports 3 different color management systems :

- the Native CMS of the content.
- the ACES color management.
- MTCMS, the custom color management of ICE.

You can quickly switch from one color system to another by calling the Viewport Hotbox by pressing **Alt** + Right mouse click on the Viewport then go to the CMS tab.



Native CMS

This system uses the native color space of the source clip and allows you to encode your content without any color conversion (e.g. when using a source already encoded in XYZ for DCP output). ICE manages the media as is.



This means that no processing is applied to the source media unless you decide to simulate a color space conversion or use a LUT.

ACES

ACES, for Academy Color Encoding System, has been developed by AMPAS (Academy of Motion Picture Arts and Sciences) with the intend to help preserve the color integrity of the content from shooting to archiving.

Specific algorithm allows any kind of source to be processed within the controlled environment of the ACES color space and for a specific output.



Input Device Transform

When selecting the ACES CMS, it is necessary to define the correct Input Device Transform. ICE will scan the media to select the best IDT possible.

ICE has a non exhaustive list of IDTs including the ones defined for cameras and a list of main inverse ODTs.

From the **GRADE PANEL** in the **Source** tab, choose the IDT corresponding to the properties of each of your clips:

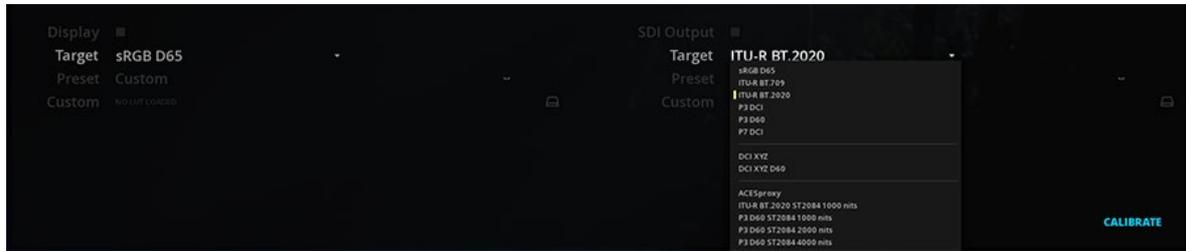
Output Device Transform

In ACES system, you need to choose an Output Device Transform to display properly your content. ODTs are defined for standard outputs only not specific pieces of equipment.

ICE can manage two different Output Transforms: one for the computer display, and one for the SDI Output.

The ODTs are managed in the [Calibrate](#) panel.

- To select the desired Output Transform, click on the **Target** and pick it from the drop-down menu:



Please refer to the chapter in relation to the type of export you wish to do in order to know which ODT to select for your ACES composition (e.i. DCP, IMF and Render module).

MTCMS

The ICE Color Management System is a custom color management system.

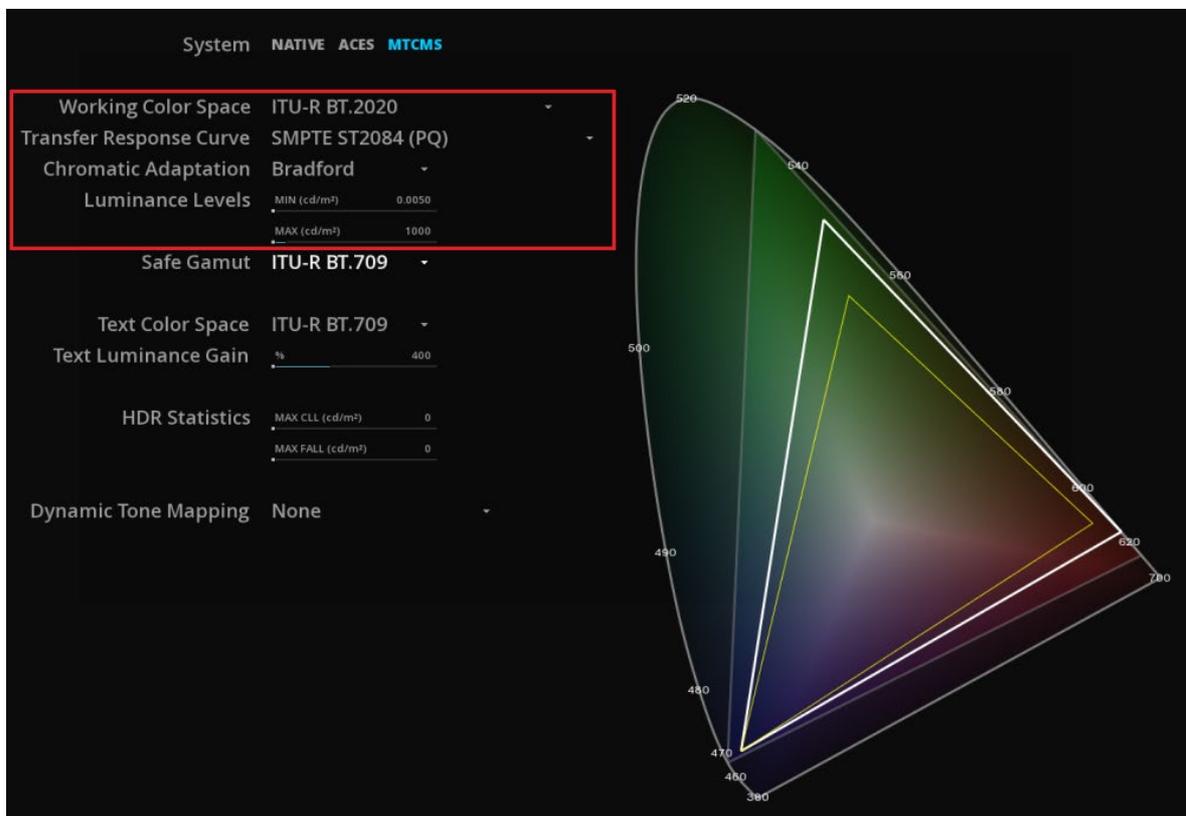


For more precision and reliability, the MTCMS uses current standards to compute on the fly the exact values for every possible color. No interpolation is done like it used to be the case with the LUTs.

If you select MTCMS, then you must select the working color space, the transfer curve and characterize the source via the **GRADE** panel. By default source parameters are set on Rec709 unless other metadata exists in the media.

MTCMS settings

If you select MTCMS, you must specify the working color space and the transfer curve:



Working Color Space

Select the color space of your composition from the drop down menu.

Transfer Response Curve

Select the desired Transfer Curve from the drop down menu. The transfer response curve is also called EOTF or gamma curve.

Chromatic Adaptation

ICE supports different chromatic adaptation also called Color Appearance Model (CAM). This adaptation make it possible to match the original RGB color coordinates of the DSM to equivalent CIE XYZ coordinates. These colors are not matching from a colorimetric point of view but rather from a perceptual point of view. This is why ICE offers different methods that will meet the needs of each project. Select a method to apply for adapting the white point of your source media to the one set in the MTCMS:

- XYZ Scaling: XYZ Scaling is an old algorithm generally considered to be less efficient than the new ones.
- Bradford: Bradford is most advanced than Von Kries and XYZ. Because of the varying color constancy of the samples, the algorithm was designed so that corresponding colors represented the same appearance under the different illumination sources, and not necessarily the same sample.
- Von Kries: The algorithm assumes that chromatic adaptation is indeed an independent gain control of the cone responses of the human visual system and that the scaling is based on the ratio of the cone responses of the illuminants.

Luminance Levels

Define the minimum and the maximum luminance levels of your composition from 48 to 10 000 nits.

The display of the CIE diagram on the right graphically reflects the settings used. The bright, borderless triangle is relative to your working color space while the white triangle is relative to your Mastering Display settings. Finally the yellow triangle allows you to view a safe gamut.

8.1.2. Safe Gamut

Select a color space from the drop-down menu to change the safe gamut. This setting allows you to compare two different gamut.

8.1.3. Text Color Space

when using subtitles for HDR content, select the original color space of text via the drop-down menu. By defining the text color space, the conversion to a Rec 2020 HDR color space will be performed properly, especially in case of burned-in subtitles.

8.1.4. Text Luminance Gain

HDR requires the ability to characterize the luminance of subtitles. Indeed, this function is useful when converting SDR to HDR in order to adjust the subtitle signal level or to avoid any violent "overshoot" effect on viewing.

ICE allows to manage their luminance independently of the video track. This setting is effective only in the case of an HDR composition (i.e using an EOTF PQ or HLG) and using the **MTCMS** system.

By default, a factor of 4 is applied in ICE (e.g. a 100 nits subtitle will appear at 400nits.) It is possible to check the luminance of the subtitles using the waveform scope.



When performing an HDR analysis remember that displayed subtitles are taken into account for the analysis.

8.1.5. HDR Statistics

The MAX CLL and MAX FALL values of the composition are reported here after a global analysis. It is also possible to postpone them manually or to acquire them automatically if these metadata exist in the media (e.g from an IMF).

Refer to the chapter [HDR Global Analysis](#) for further informations.

8.1.6. Dynamic Tone Mapping

In case of dynamic HDR mastering, use the drop-down menu to select the technology of your choice and thus unlock access to operations specific to them.

8.2. Mastering Display

The Mastering display is used to describe the capabilities of the display used to master the content : CIE (x,y) chromaticity coordinates for RGB primaries, White Point, and min/max luminance of the mastering display.

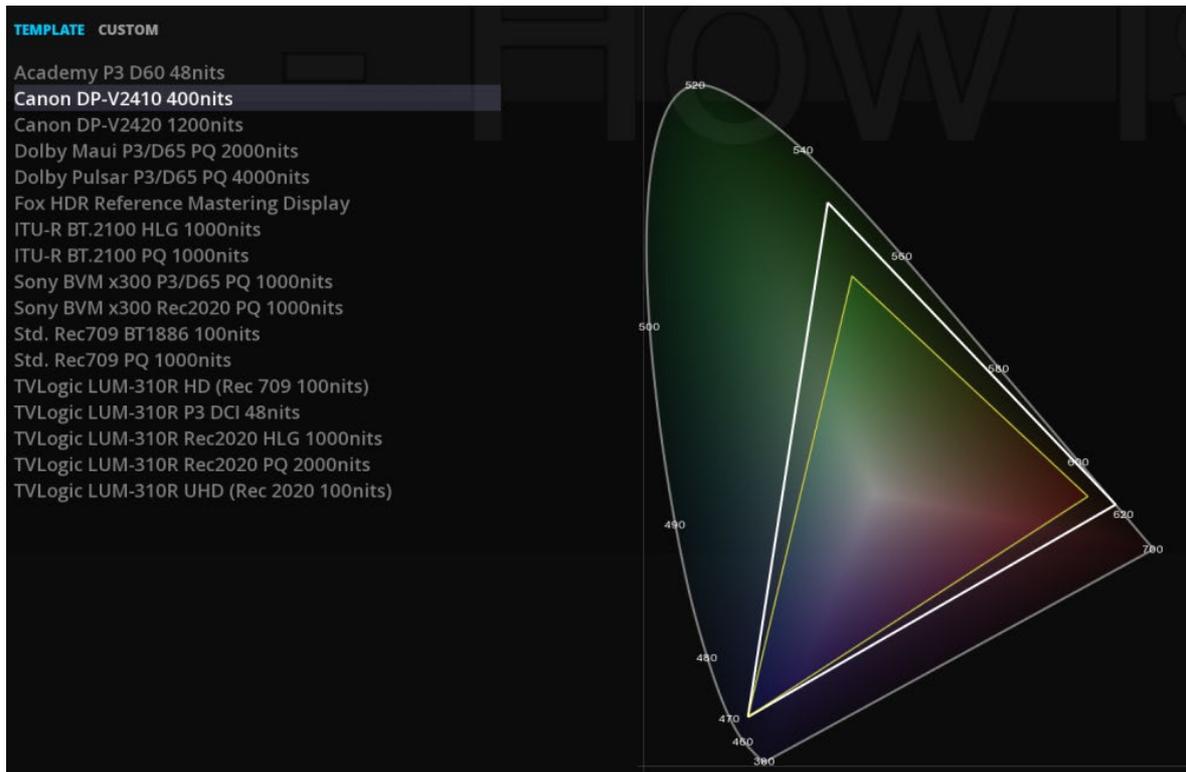
The characterization of the mastering display based on the SMPTE ST-2086 standard is a key element when working in PQ (ST-2084) and Dolby Vision. These statics metadata are critical for HDR mastering and ICE allows to care these informations through the whole process.

ST-2086 metadata is stored per composition, so in a project with multiple compositions, you can have different metadata settings for the mastering display.

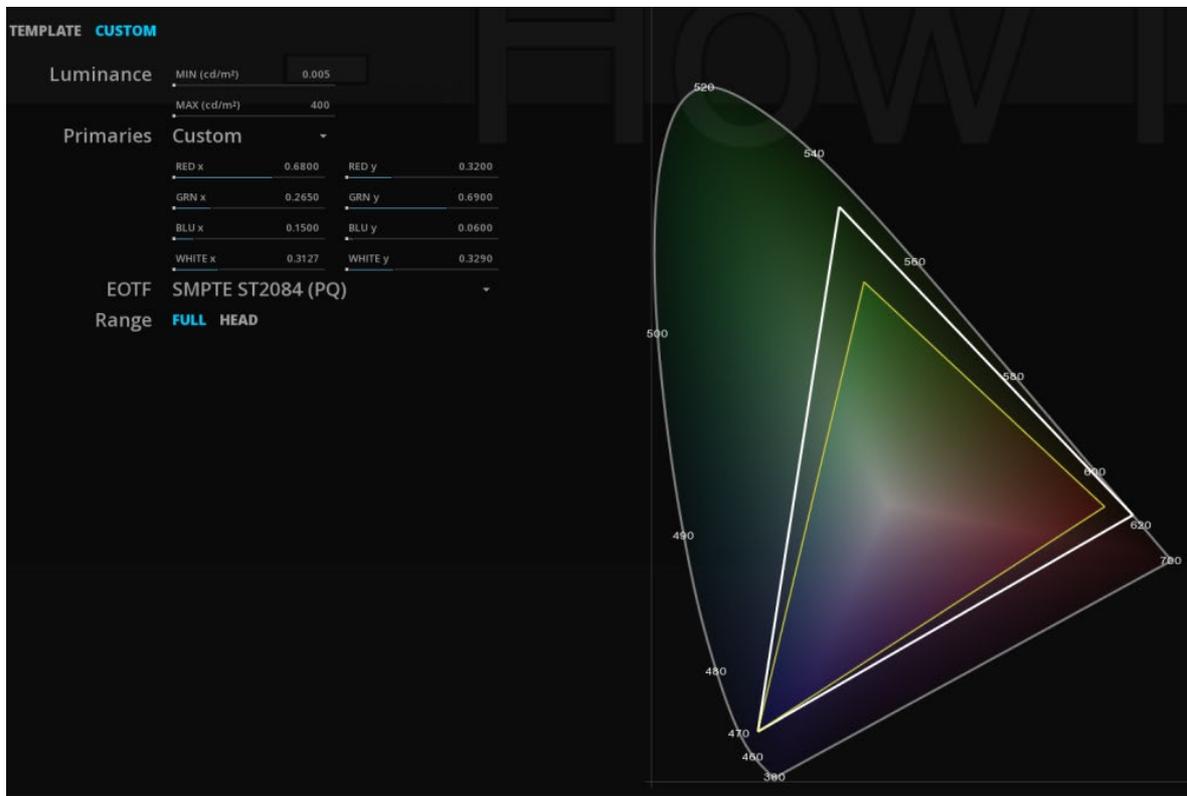
However, ICE does not support only the mastering display metadata in files but also control the display device via their proprietary protocols to send the right metadata and avoid forcing the users to use the monitor menus.

When loading a composition (or changing its settings) ICE will communicate the parameters to the display.

- Select an existing template monitor:



Or custom your setting:



If your monitor is not in the template list, you can create your own mastering display XML by using an existing sample and by editing it. This XML has to be placed in

`\program files\Marquise Technologies\ICE\resources\displays`

The following monitor support the ICE's protocol:

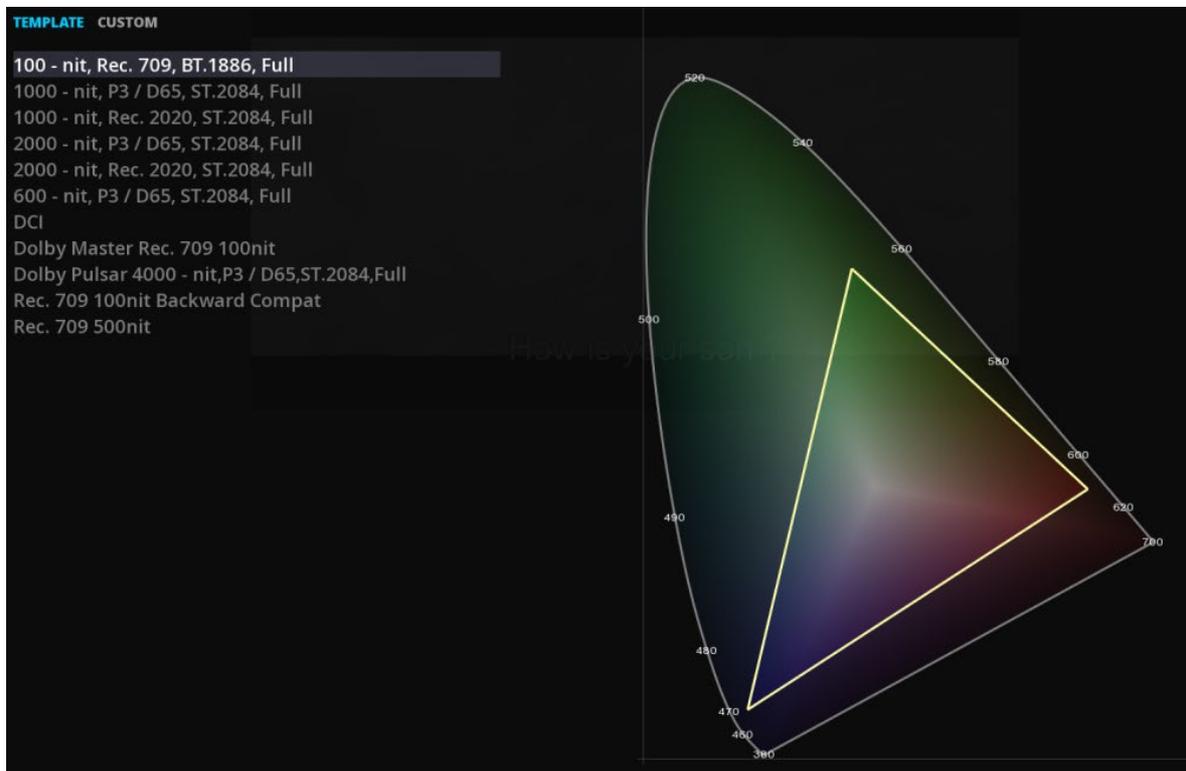
- Canon HDR 4K monitors
- Eizo HDR 4K monitors
- TVLogic HDR 4K monitors

Color space, EOTF, luminance levels are automatically set to the correct value.



If the monitor list is empty, it might be a problem of Windows 'access rights on the folder. In order to fix it, go to the ICE folder, right-click on the displays folder and go to Properties then Security to give the Full control.

Be aware that the list of available monitors will be displayed according to the Dynamic HDR technology selected in the **CMS**. In the case of using Dolby Vision, the list will be displayed as follows:



Do not confuse the Mastering Display of the composition settings for ST-2086 metadata with the Mastering Display settings in the Projects settings. These allow to configure the communication between ICE and the display.

8.3. Source settings

As explained previously in the chapter [Setting the CMS](#), the color management in ICE requires to fill in the colorimetric information concerning the sources placed on the timeline of our composition. With this information, ICE will be able to manage them appropriately for all preview operations (e.g. simulation conversions.). Source settings can be managed individually.

The purpose is to translate its color properties into the working color space.

ICE reviews existing metadata of media. By default, settings are set on Rec709 and BT.1886 but if there is any color metadata present in the file, ICE will automatically load it as Source settings. If not, you need to characterize the source manually.

- To do this, you must access the **GRADE** panel (**F9**) at the bottom right of the timeline.
- In the **Source** tab, select the source parameters.

From one [colorimetric system](#) to another, the required information may vary slightly.

8.3.1. in NATIVE mode



When you are in **NATIVE** mode, the most important setting you really need to pay attention to, is the **Range**.

Setup the Range

ICE always compute in **FULL** range internally meaning that:

- If **HEAD** range is selected, ICE will scale the legal range to fill the **FULL** range.
- If **FULL**, range is selected, ICE will keep the native range of the media.

That's why if no information of range is present in the media, the **FULL** range will be set by default. This avoid any additional compression if the source is indeed encoded as **FULL** content but with no metadata saying.

Be careful with this setting or your output may have levels that are not correct.

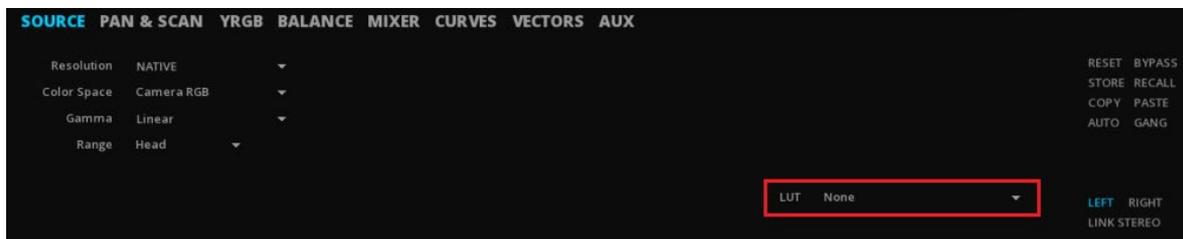


Use the Histogram (**SHIFT+H**) and check the **SMPTE** box option to see the scale of your source.

Applying a LUT

With the **NATIVE** mode only, it is possible to apply a Look Up Table per clip.

- Select the LUT using the drop-down menu on the right:



You can add your own LUTs in **.cube** (IRIDAS), **.3dl** (3d LUT) and **.xml** (ARRI) format by placing them in the folder

`\program files\Marquise Technologies\ICE_x.x.x.x\luts`

8.3.2. in ACES mode



If you're working in ACES, select via the drop-down menu the corresponding IDT to your source content.

8.3.3. in MTCMS mode



- If you use the MTCMS system, select the color space, the EOTF and the range corresponding to the nature of your source via the drop-down menu.
- When converting SDR to HDR content, the **HDR Gain** is used to raise the levels of an SDR source. The percentage gain corresponds to its equivalence in nits (e.i 100 nits = 100%).

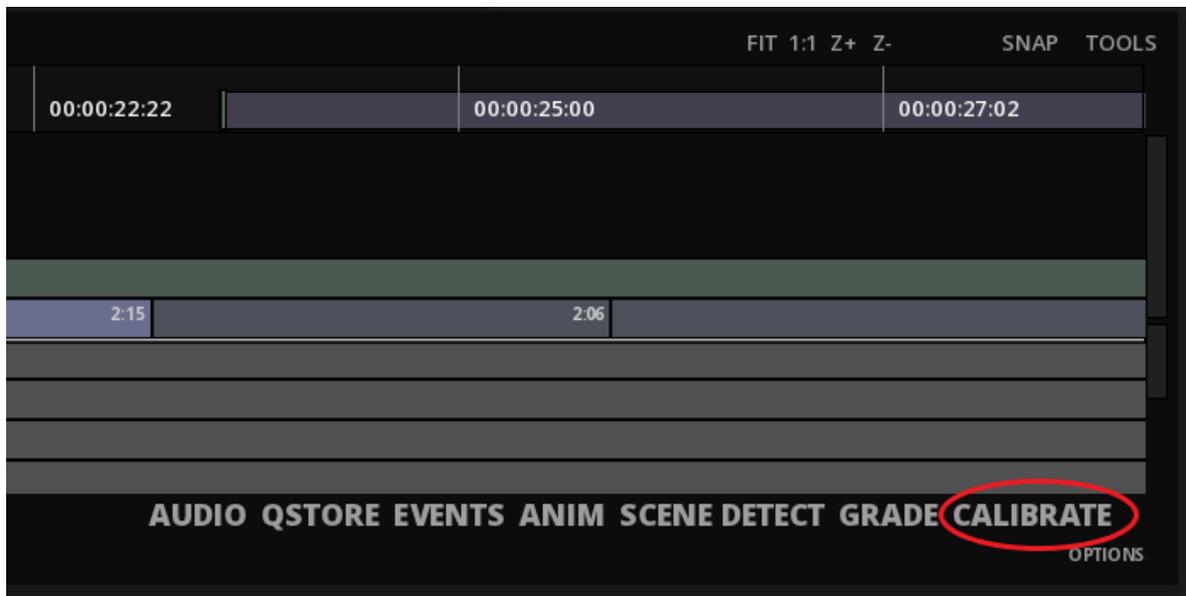
8.4. Calibrate

This panels allows to set display LUTs or ACES ODTs.

ICE can manage two different LUTs / ODTs to display content: one for the computer display and a second one for the SDI output.

8.4.1. Accessing the Calibrate panel

- To access the Calibrate panel, click [**CALIBRATE**] at the bottom right of the timeLine :



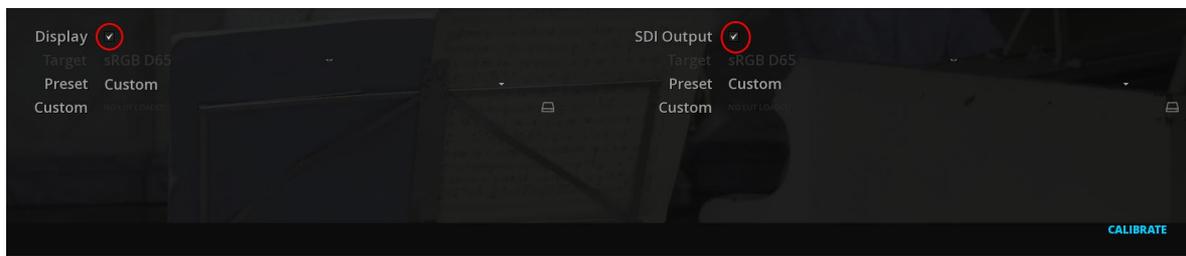
- To close the **CALIBRATE** panel, click on the button again.

8.4.2. Using Display LUTs



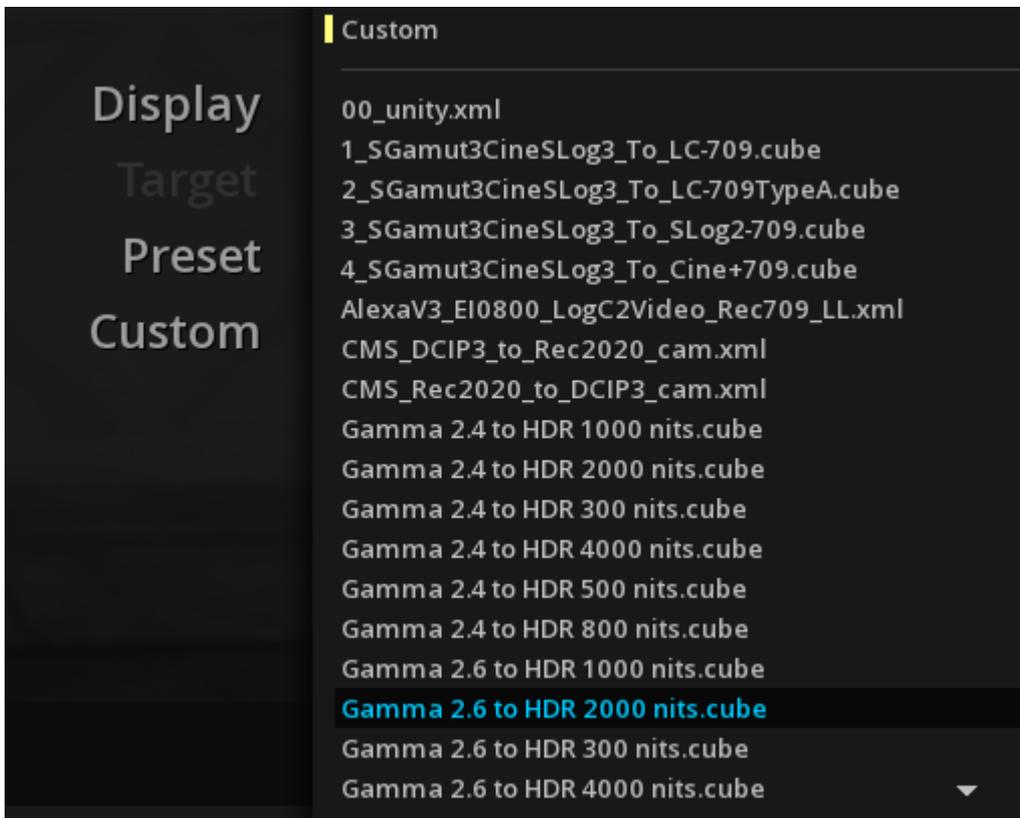
This option is only available with the **NATIVE CMS** system mode.

- Enable the LUT by checking the box of the Display and/or the SDI output:



Using a preset LUT

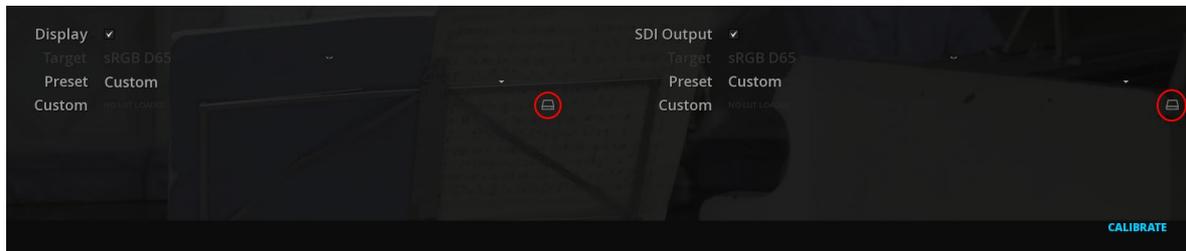
- Select a default LUT using the **Preset** drop down menu :



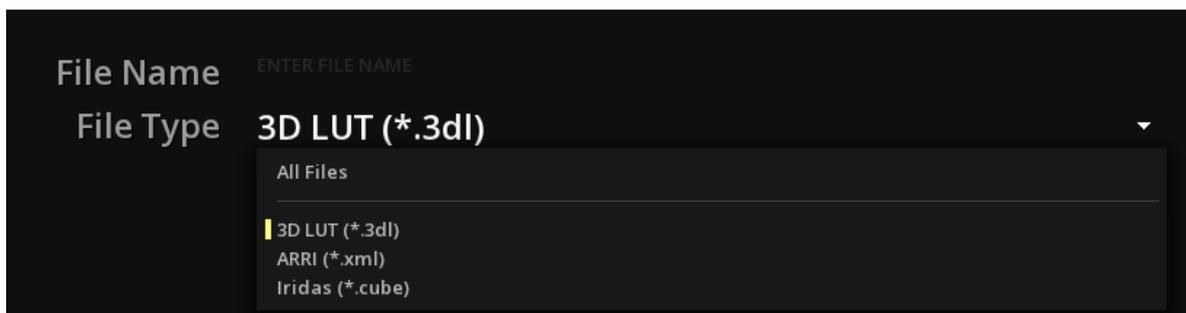
Using a custom LUT

ICE allows you to load your own custom Look Up Table :

- on the Preset drop-down menu select **Custom**
- click on the Disk icon to browse the system folder tree and load your Look Up Table:



As explained previously, ICE supports different formats of LUTs including 3D LUT (.3dl), ARRI LUT (.xml) and Iridas LUT (.cube). Select the desired one from the the File Type drop-down menu to facilitate the search in your system:



9. ANALYSIS TOOLS

ICE offers a variety of video scopes and audio meters for the QC of your content.

9.1. Accessing the scopes & meters

You can access the scopes and meters using the Viewport Hot Box.

- Position the mouse on the Image Viewport and press **Alt** + **Right mouse** button.
- Keep the right mouse button pressed, navigate to the **SCOPES** tab and select the scope you need to display.
- Alternatively, you can use the keyboard shortcut for each scope.

VIEWPORT	2D/3D	SCOPES	COMPARATOR	GUIDES	ACTIVE AREA
Histogram		Vectorscope	Waveform		Audio Levels
Bitrate Meter		Luminance Meter	Color Picker		Extra Info



Remember that you can change the default appearance of the Scopes in the [Project Settings](#).

Each scope can be shown or hidden independently.

They can be moved and adjusted across the Image Viewport at the operator's convenience.

- To adjust the size of the scopes, position the mouse cursor on the corner of the panel and use click & drag up or down.
- To move the scope, position the mouse on the scope panel and simply click & move.
- To modify the scope transparency, use the opacity scroll bar.
- Select **OPTIONS** at the bottom of the scope to display its available options.
- To close the Options settings, re-click on **OPTIONS**.
- To close a Scope, click **CLOSE** or use the Scope's hotkey again.

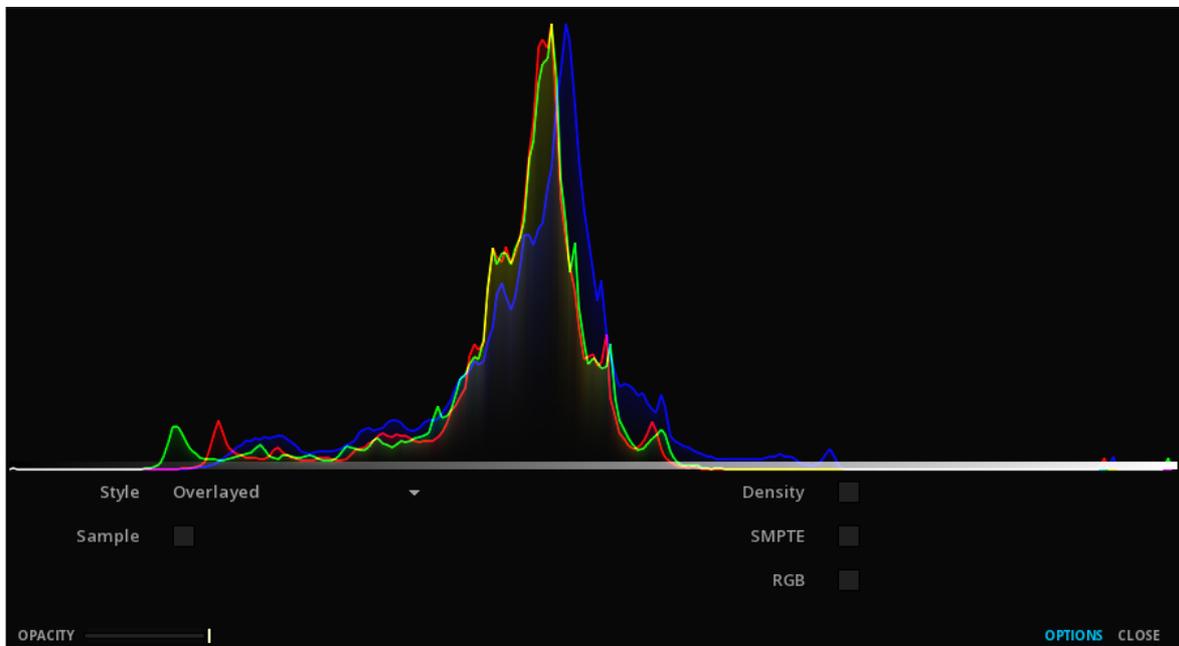
9.2. Image Analysis

For analyzing the image you can use the different image analysis tools of ICE.

9.2.1. The Histogram

A histogram is a graphical representation of the tonal distribution in a digital image. It plots the number of pixels for each tonal value. By looking at the histogram for a specific image one is able to judge the entire tonal distribution at a glance.

- You can use **Shift** + **H** to display the Histogram.



Style The Histogram can be set to display RGB information separately or overlaid (red, green and blue together).

Sample Show the position in the Histogram of the pixel at the cursor's location

Density For film:
 Line 1 = Ref. black
 Line 2 = Ref. Grey
 Line 3 = Ref. white

SMPTE Show Video Range (aka Head/Legal).

RGB Show minimum and maximum values per color channel.

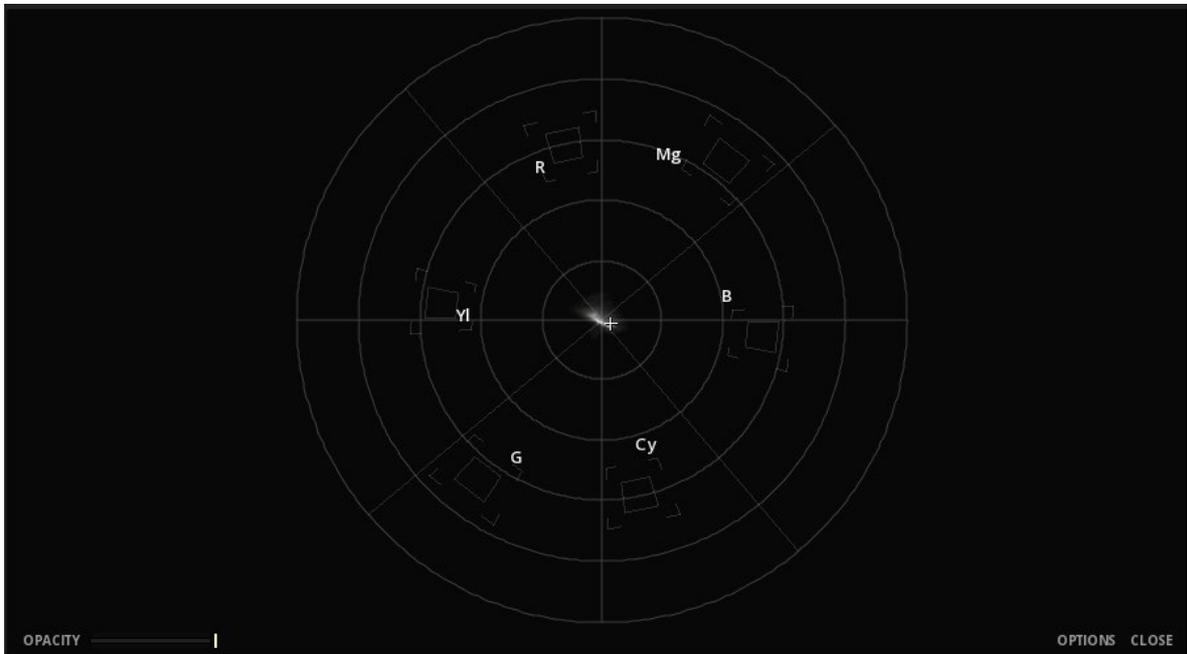
9.2.2. The Vectorscope

There is two styles of Vectorscopes: the video Vectorscope, and the CIE 1931 chromaticity diagram.

- You can use **Shift** + **V** to display the Vectorscope.

Video Style

The video vectorscope is used to visualize chrominance, which is encoded into the video signal as a subcarrier of specific frequency: it plots the Cb and Cr channels against each other, for the purpose of measuring and testing television signals.



Matrix Defines the colorimetric transformation from RGB to YCbCr. Select the one applying to your content.

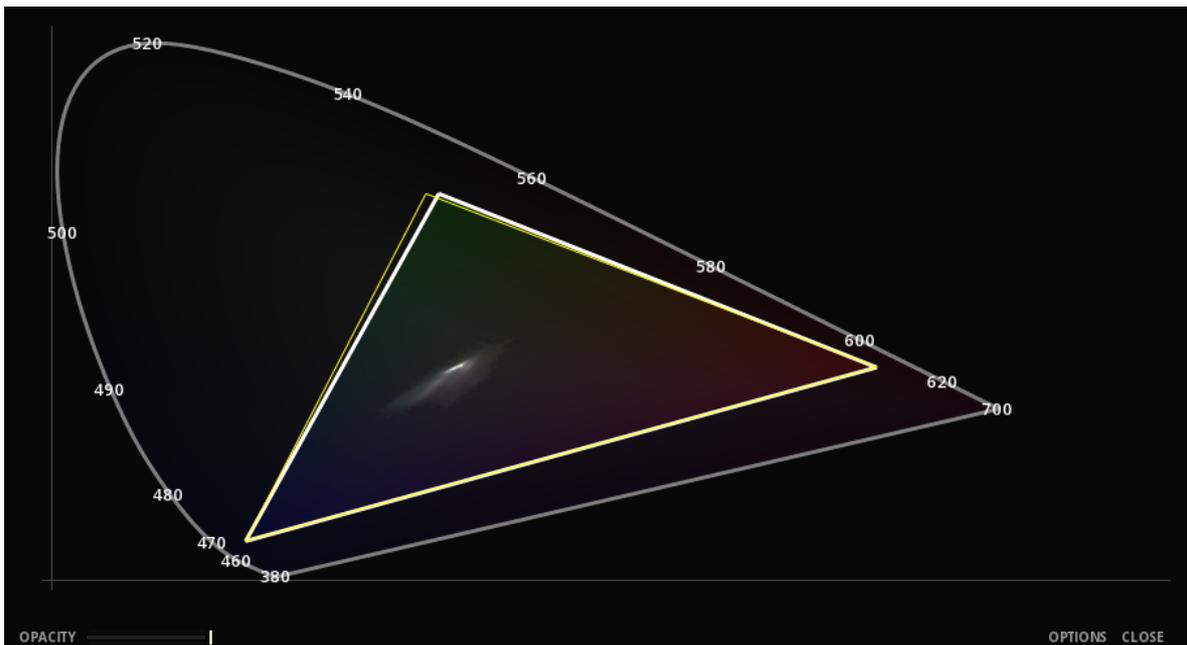
Labels Show/Hide the color labels.

Targets Show/Hide the color targets. They represent the maximal values according the Matrix chosen.

Sample Show the position in the Vectorscope of the pixel at the cursor's location.

CIE 1931 Style

This diagram allows you to see how the signal is displayed within the color space chosen.



Color Space Select the working color space for your content.

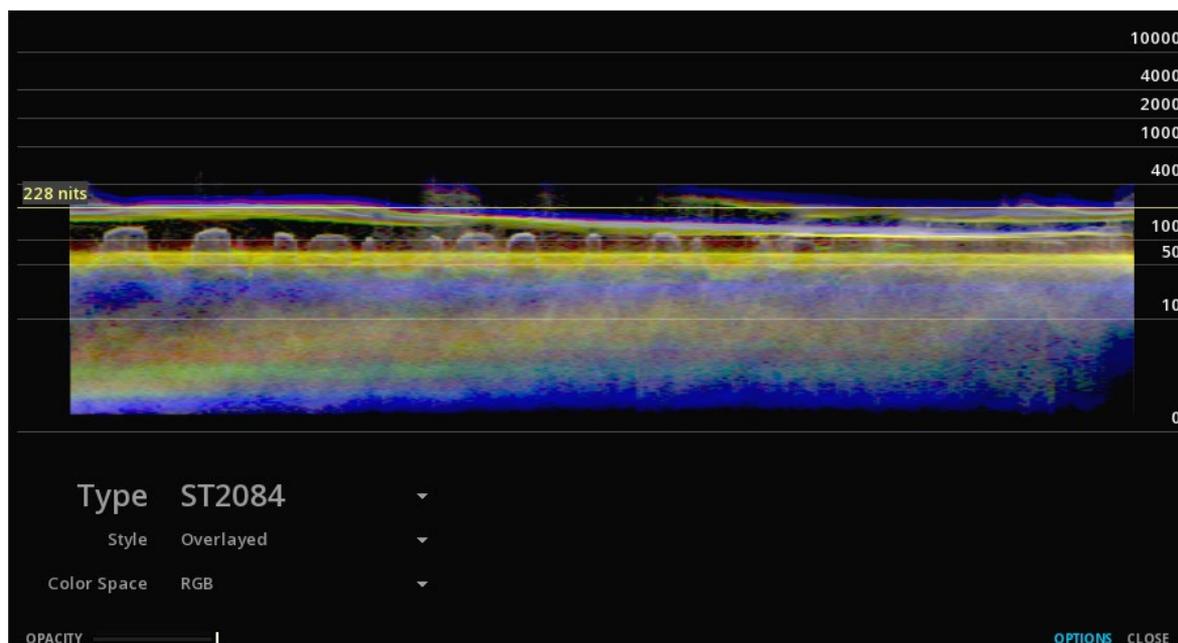
Safe Area (Yellow triangle). Display the safe area for a particular color space .

Mastering Display (White triangle). Display the capabilities of the Mastering Display . Refer to the [Mastering Display](#) section for more information.

9.2.3. The Waveform

The Waveform is used to measure and display the level of the brightness, or luminance, of the part of the image being drawn onto a screen at the same point in time.

- You can use **Shift** + **W** to display the Waveform.



Type You can switch between the traditional video waveform and the ST2084 mode used for monitoring HDR content.

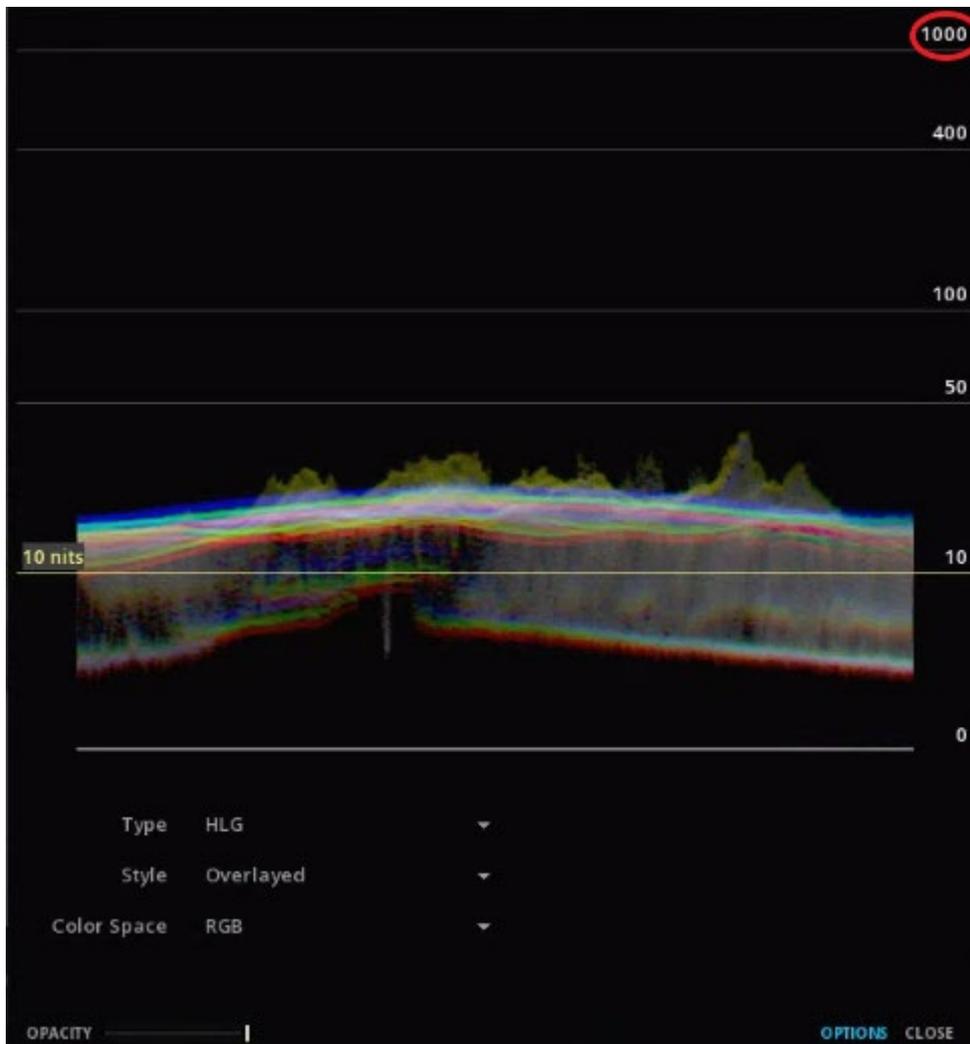
Style the Waveform can be set to display RGB information separately or overlaid (red, green and blue together).

Color Space You can choose between the RGB or YCbCr color spaces.

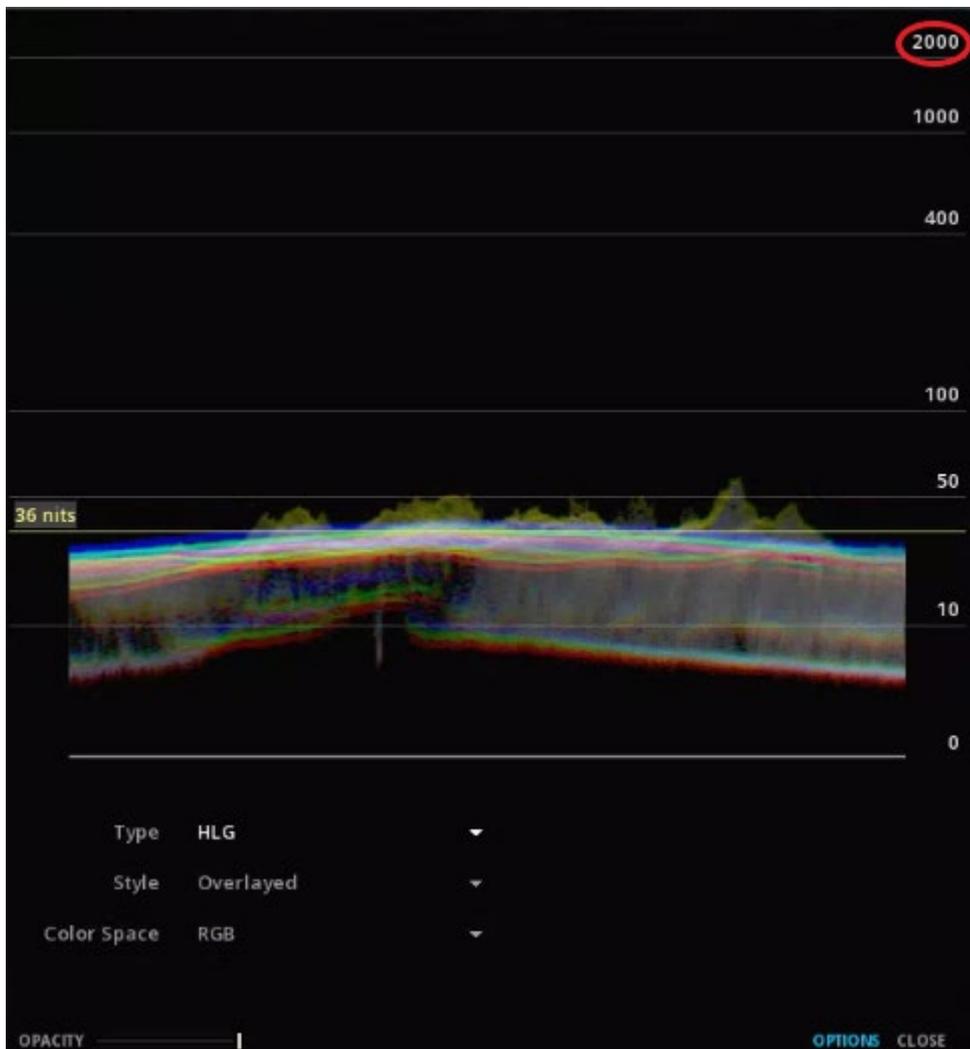
Sample Move the mouse on the image to show the level at the cursor's position (yellow line). This value is displayed in percentage in video mode, or in Nits (Candela/sqm) in ST2084 mode.

The waveform will display the scale in relation to the settings selected in the [Mastering Display](#).

- Mastering Display Rec2020 HLG 1000 nits selected:



- Mastering Display Rec2020 HLG 2000 nits selected:



9.2.4. Zebra patterning

This tool is very similar to the camera zebra mode for controlling the exposure.

The Zebra mode displays in blue the pixels below the boundaries, and in red those above:



- to display the Zebra, use **Alt** + **Z**



The Zebra boundaries are defined by the [Mastering Display](#) parameters in the Composition Settings. You can also set your own maximal and minimal Luminance values by choosing **Custom** Mastering display.

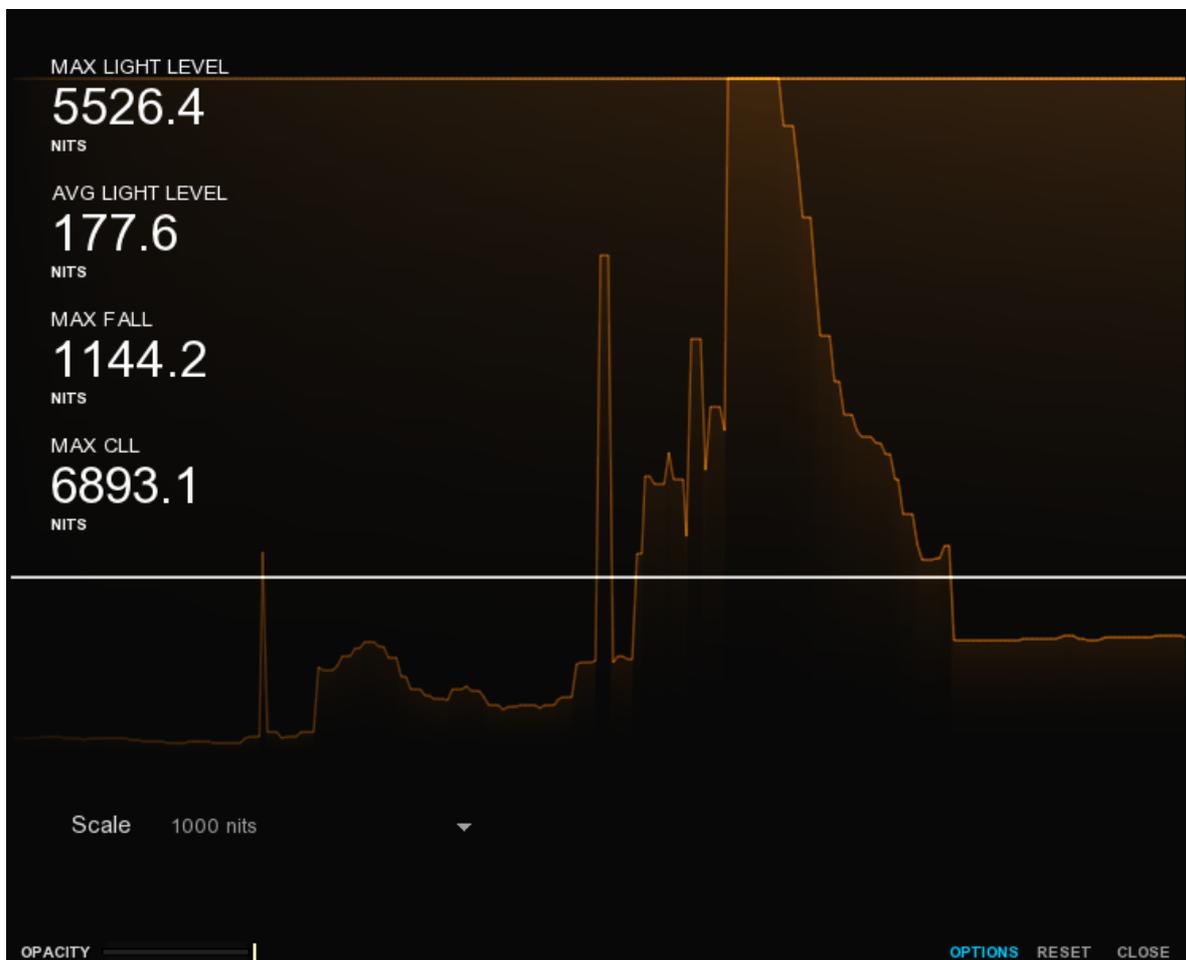


The image scopes are affected by the Zebra display, as they analyse the additional red and blue information on the image.

9.2.5. The Luminance Meter

The Luminance meter is used to measure the photometric brightness of an HDR image. It measures the amount of light that strikes a surface in the picture.

- You can use **Shift** + **N** to display the Luminance meter.



Max Light Level

Informs you about the higher light level on the current frame.

AVG Light Level

Informs you about the average light level on the current frame.

MaxFALL Indicates the highest frame average brightness per frame (entire content).

MaxCLL Indicates the brightest pixel (entire stream).

Sample Move the mouse on the image to show the level at the cursor's position (white line).

Live view Analyses on the fly the MaxFALL and MaxCLL values of the content while it is playing. You can have different nit scales by selecting the desired one with the drop-down menu.

Global view Allows you to display the full graph statistics values after the launch of a global analysis. For more details refer to the section [HDR](#).

9.2.6. Color Pickers

You can display detailed color information for a specific area of the image (pixel accuracy).

Access the Color Pickers

- To display or hide the color pickers panel information, use **Alt** + **K**.



The information are displayed per color channel (R, G, B and A).

The first value refers to the picker 1 on the left, second value refers to picker 2 on the right.

X and Y indicate picker 1 coordinates in the image.

By default the color values are displayed in 32-bit floating point.

You can display the color values in 8-bit, 10-bit, 12-bit, 16-bit or 32-bit floating point formats:

- to change the values format, use **Alt** + **Shift** + **K** several times.

Reference Picker

To compare two different areas of the image, click at the desired location. Color information is memorized as a reference on picker 2.

- To compare, move the mouse on the image (color information is displayed on picker 1).

9.3. Audio Monitoring

There is a full set of Audio monitoring tools for the quality control.

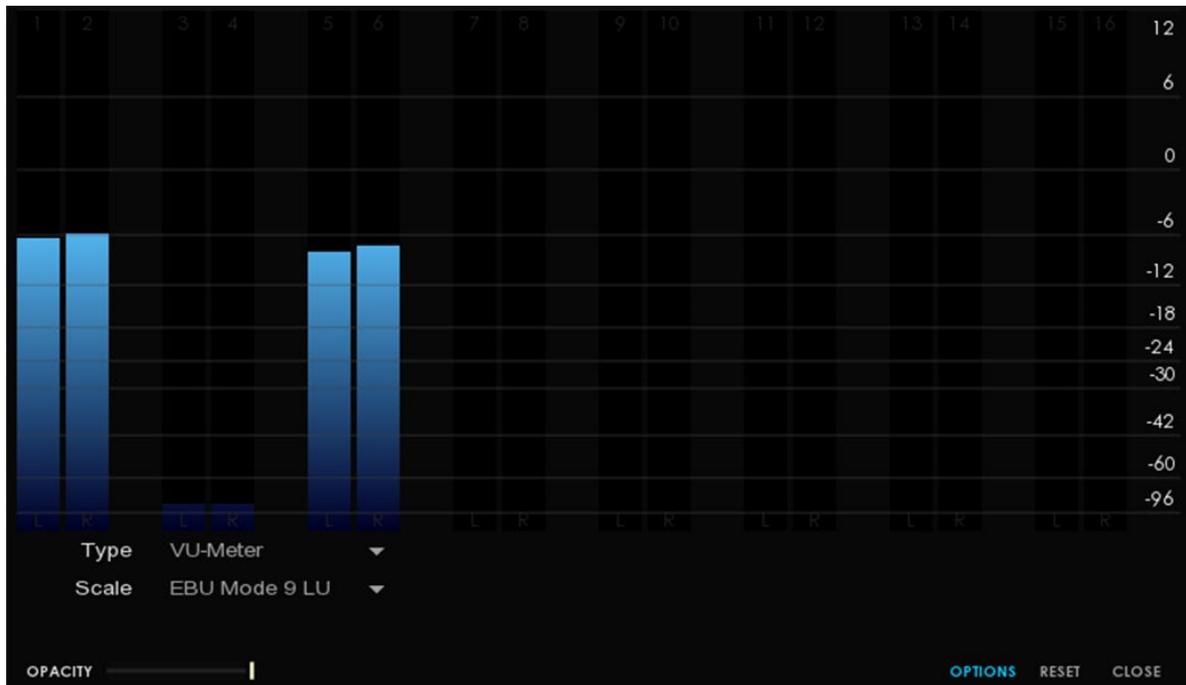
- You can use **Shift** + **A** to display the Audio meter.

Select a Type of meter and the desired scale for the meter:

- Click on OPTION to toggle the meters.

9.3.1. VU-Meter

The VU-Meter displays a representation of the signal level per audio channel.

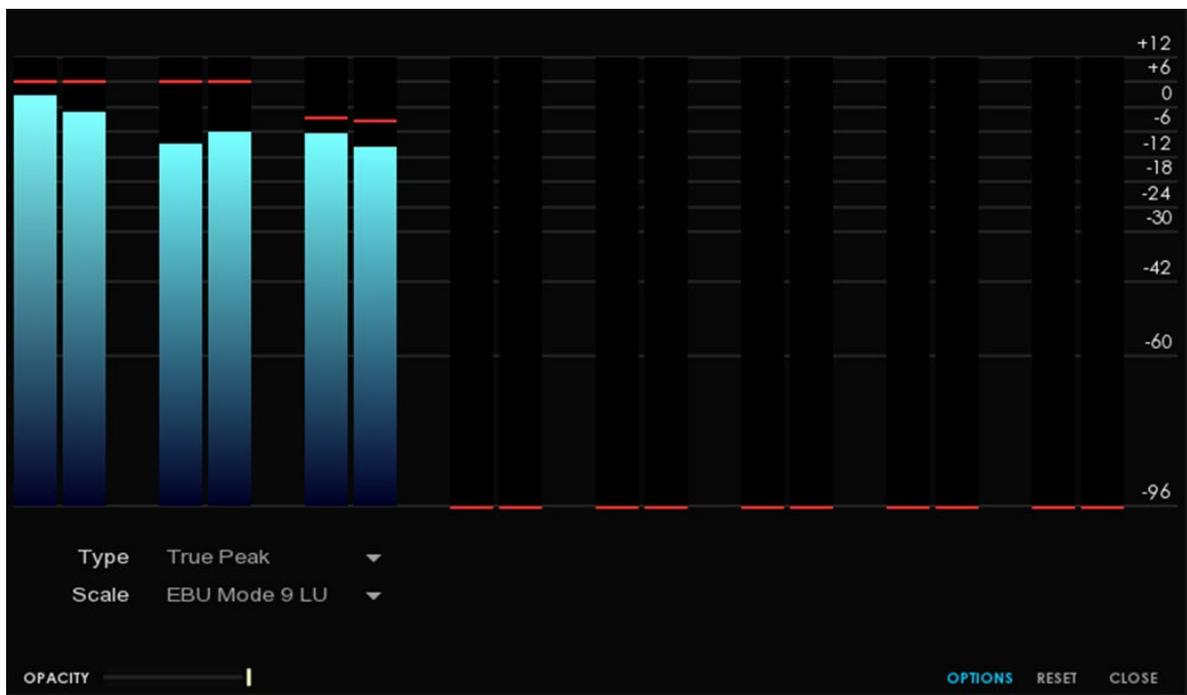


9.3.2. Peak Meters

You can display Peak Meters information, Sample Peak and True Peak.

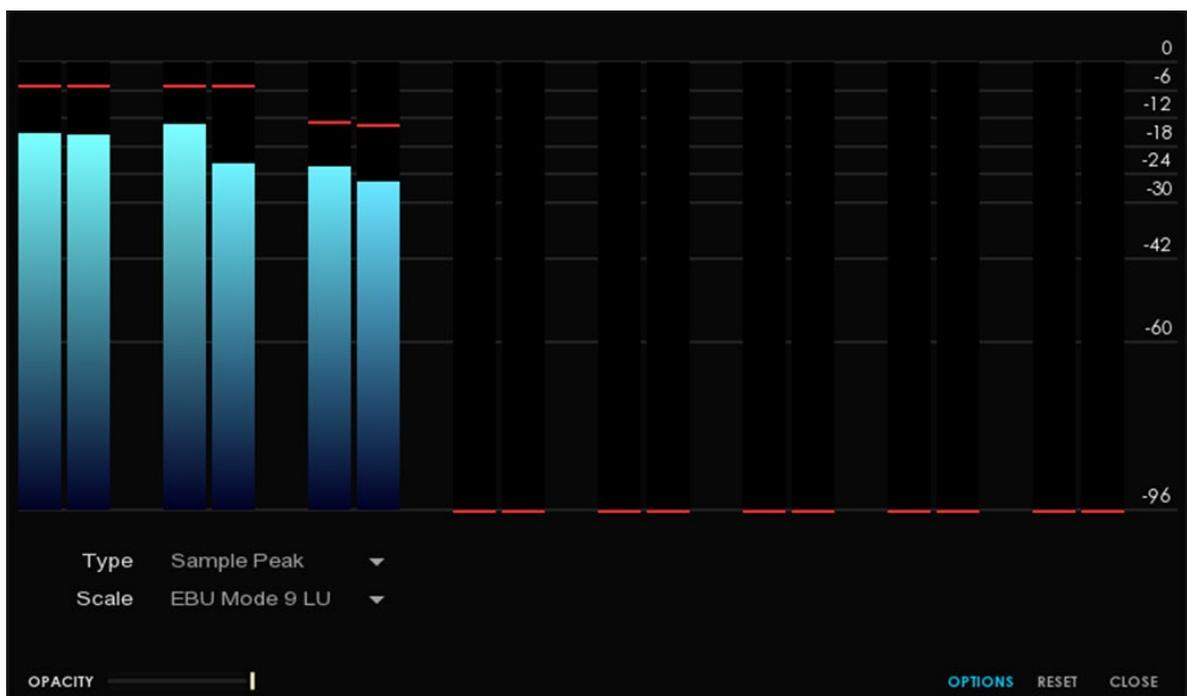
True Peak

This shows the peak level of the waveform no matter how brief its duration.



Sample Peak

This meter shows only peak sample values, not the true waveform peaks.



9.3.3. Loudness Meter

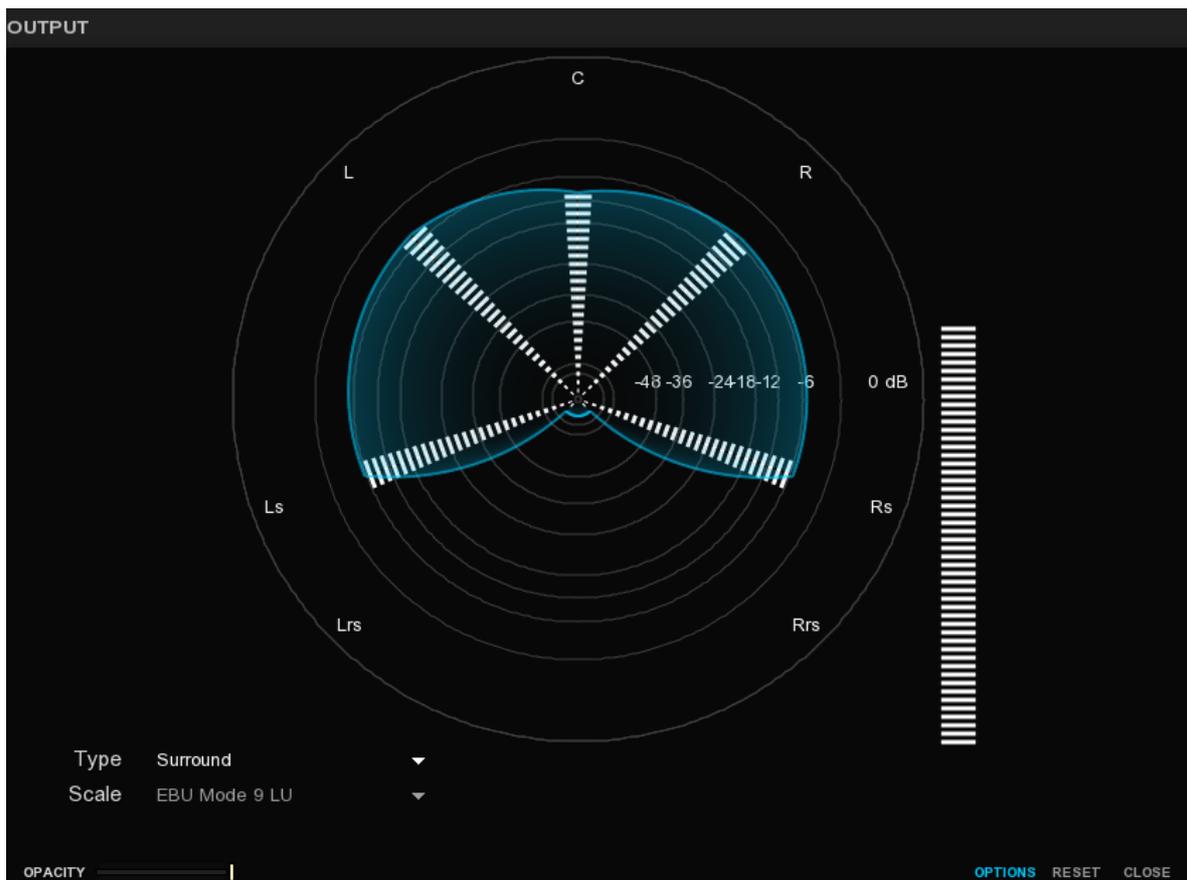
The Loudness meter measures the human perceived loudness of an audio content.

Here the Loudness Meter is based on the EBU R128 Loudness recommendation.



9.3.4. Surround Meter

In this meter, the positions of the full range loudspeakers are marked on a graticule and the amplitude distribution of the sound-field is used to modulate a visual representation, also called "jellyfish display".



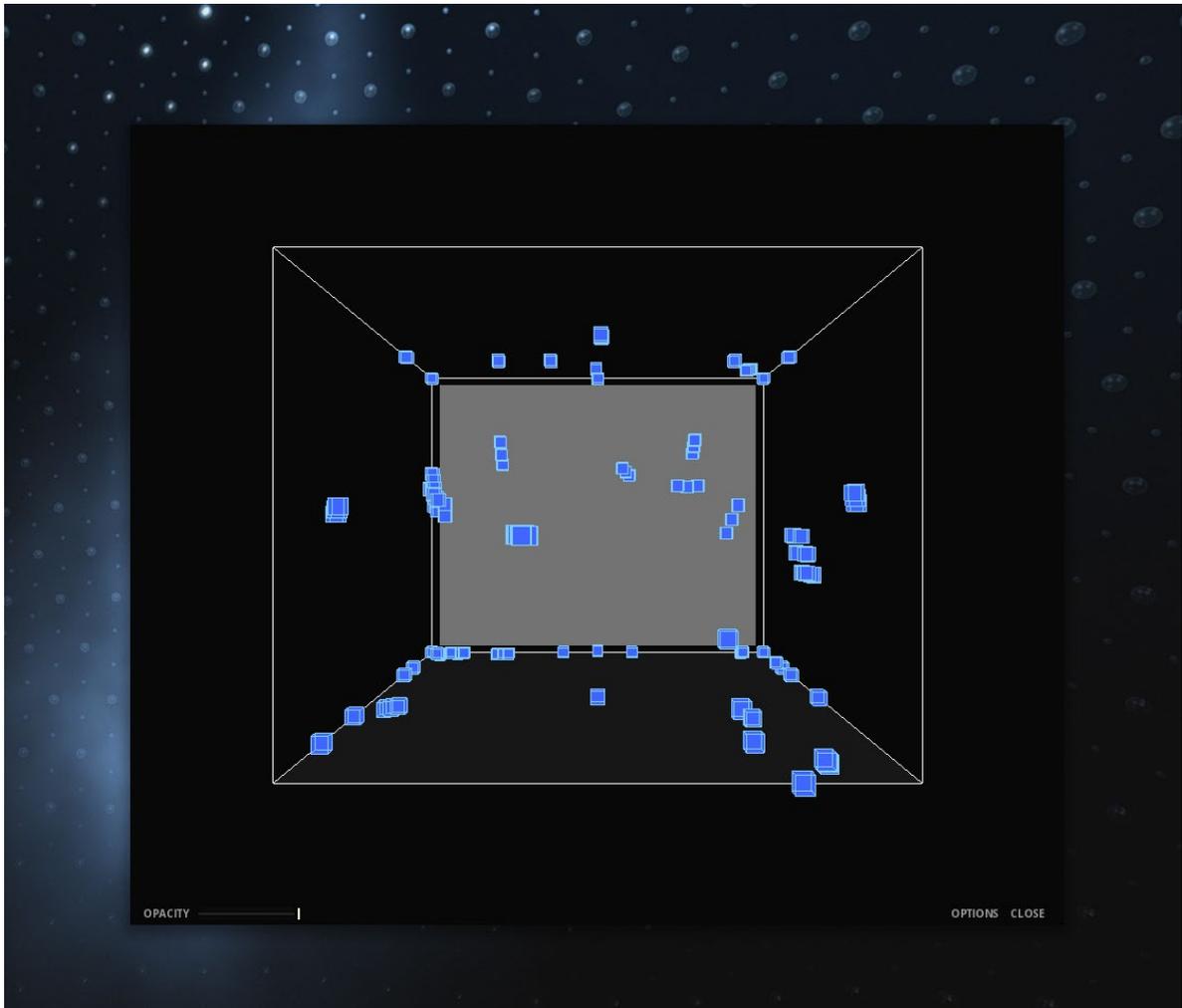
9.3.5. Phase Meter

The phase relationships that exist between channels of a multi-channel audio system represent critical information to a quality-control engineer.



9.3.6. Room Meter

This meter allows a real-time 3D visualization of the immersive audio objects positions in the room.



- Click anywhere in the scope with **Alt** pressed for orienting the room in any direction.

9.4. Other Monitoring Tools

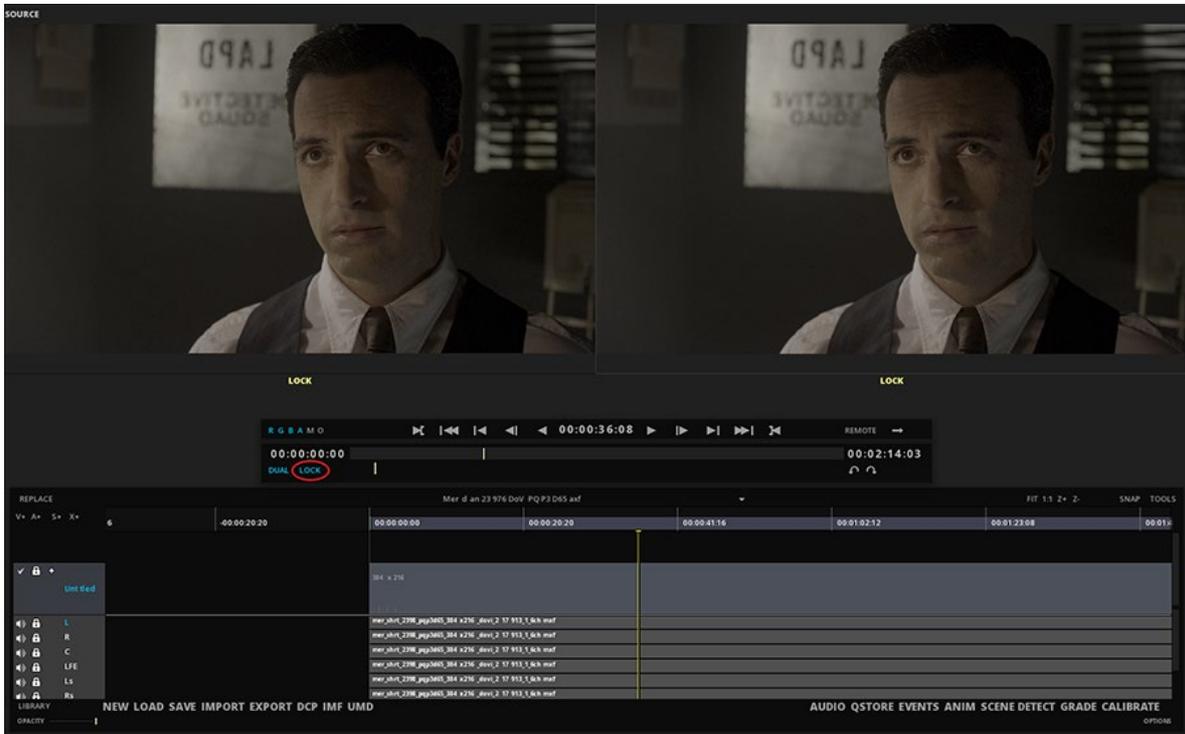
9.4.1. Peak Signal-to-Noise Ratio

The PSNR computes the peak signal-to-noise ratio, in decibels, between two images. This ratio is often used as a quality measurement between the original and a compressed image. Using the same set of tests images, different image enhancement algorithms can be compared systematically to identify whether a particular algorithm produces better results. The higher the PSNR, the better the quality of the compressed, or reconstructed image.

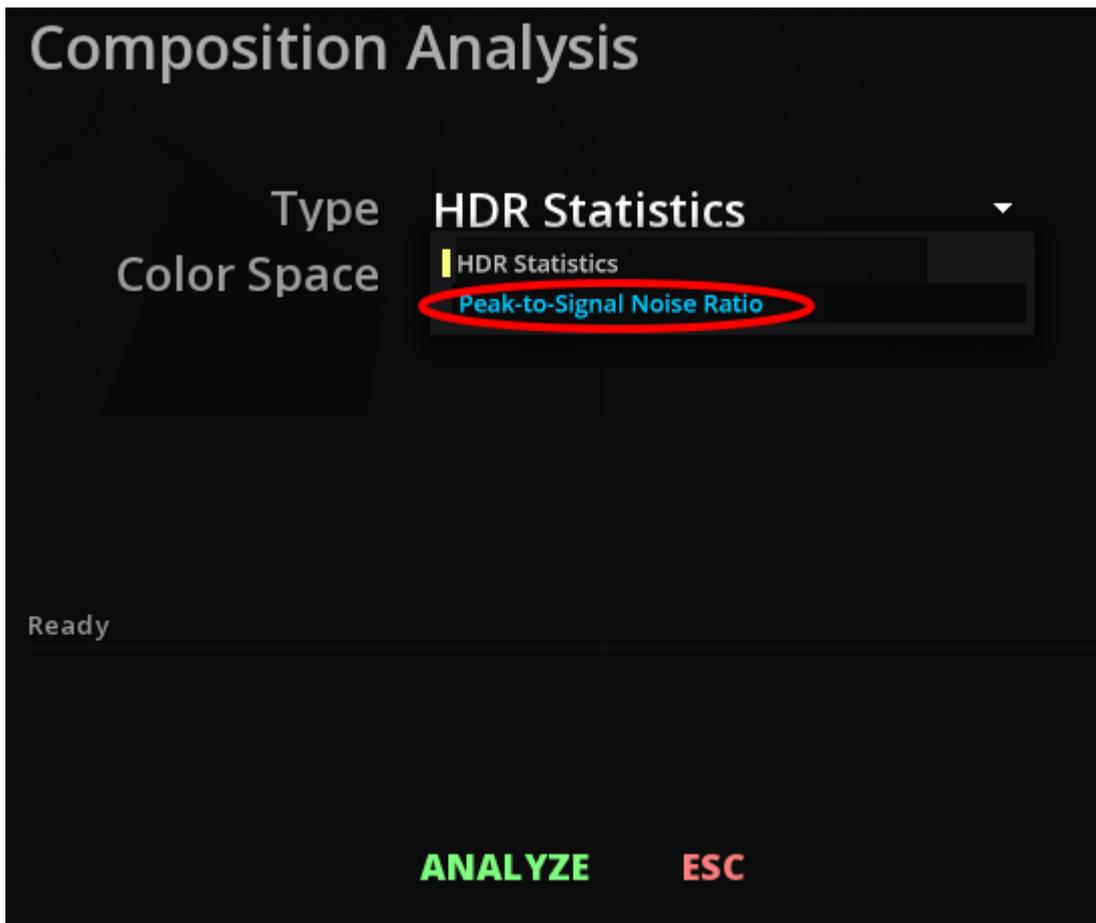
The PSNR is usually expressed in logarithmic decibel scale. However, you must follow the requirements given by the company asking you a PSNR report. Each company has its own specifications.

Launch a PSNR analysis

- To launch a PSNR analysis, you need to have the two sources to compare in the Library. The two sources must come from the same content part and have to be of different quality.
- Open it into the Dual Viewport. For further information, please read the [Dual Viewport](#) chapter.
- Proceed to a [Frame Matching](#) and click on the **LOCK** button.



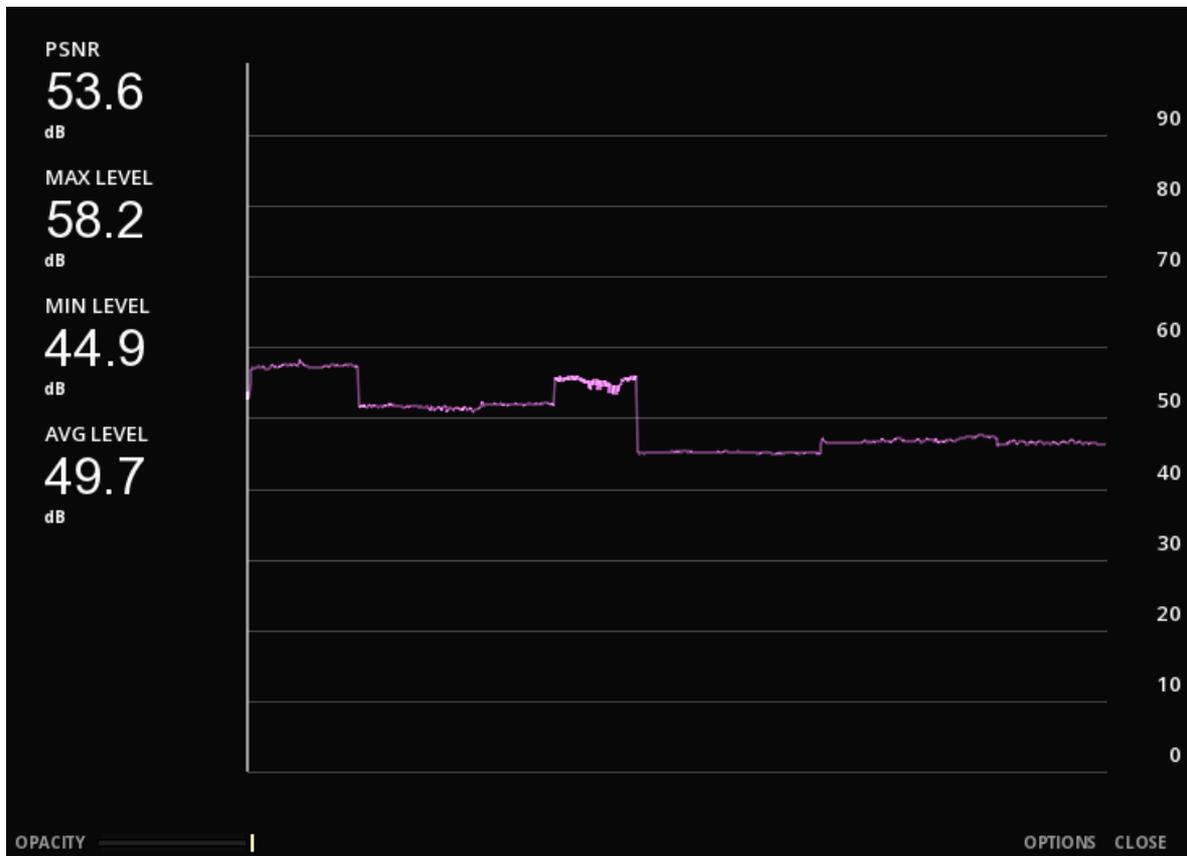
- Go to the Composition Analysis tool by pressing **F6** and select PSNR from the **Type** drop-down menu.



- Click on the **ANALYZE** button to launch the analysis.

Open the PSNR scope

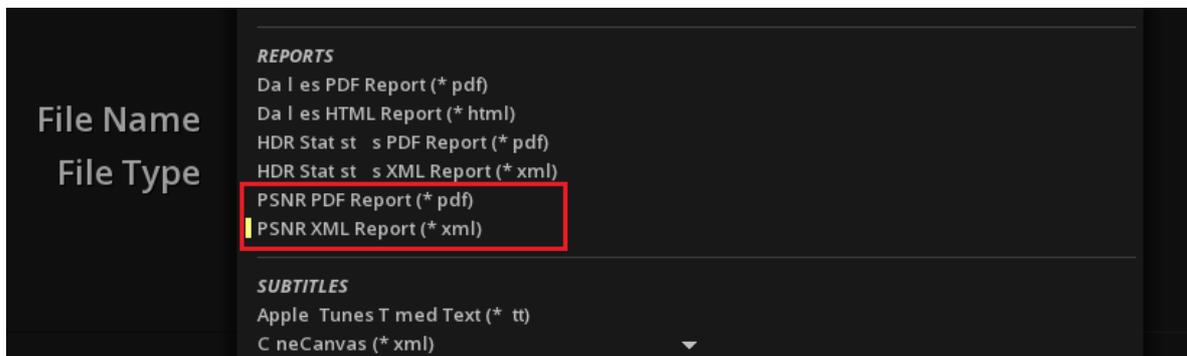
As soon as the progress bar has finished, you can read the results of the analysis via the PSNR scope. To access it, press **Shift** + **P**.



Export a PSNR Report

If you want to export the PSNR report as a PDF file or an XML file, click the **EXPORT** button from the timeline.

Then choose the file type from the **File Type** drop-down menu.



9.4.2. Bitrate Meter

The Bitrate Meter is used to measure the bitrate of the content playing. For now, it only support IMF and DCP content.

- You can use **Shift** + **B** to display the Audio meter.



Bitrate Indicates the current bitrate in MBP/s when playing.

Max / Min Indicates the maximum and minimum bitrate in MPB/s recorded by the meter.

Average Shows the average analysed bitrate.



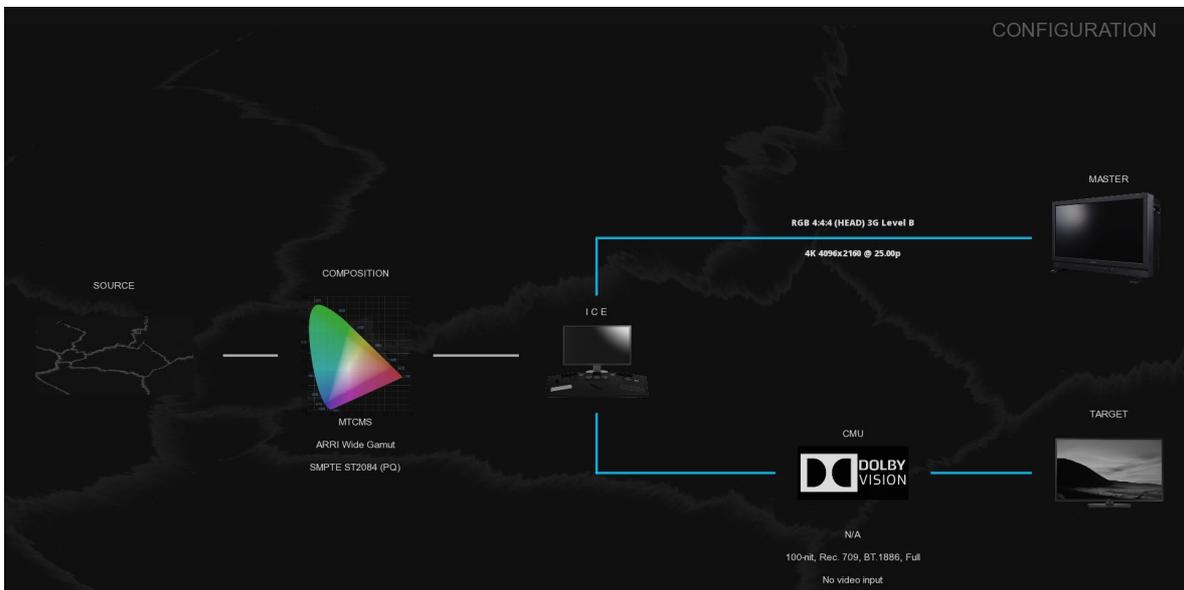
the Bitrate meter is active only when you launch the playback. If you stop the playback, the counter will be reset.

- You can select the desired scale of reference to read the measures in the drop-down menu.

9.4.3. Video Pipeline Diagram

The Video Pipeline Diagram allows you to have a quick look at the video pipeline set up of ICE.

- press **Alt** + **F6** to display the diagram:



This very useful tool gives you an immediate view of your displays connection settings as well as your color pipeline.

10. FILE BASED QC

ICE integrates with automated file based QC solutions for providing a human review of the error reports.

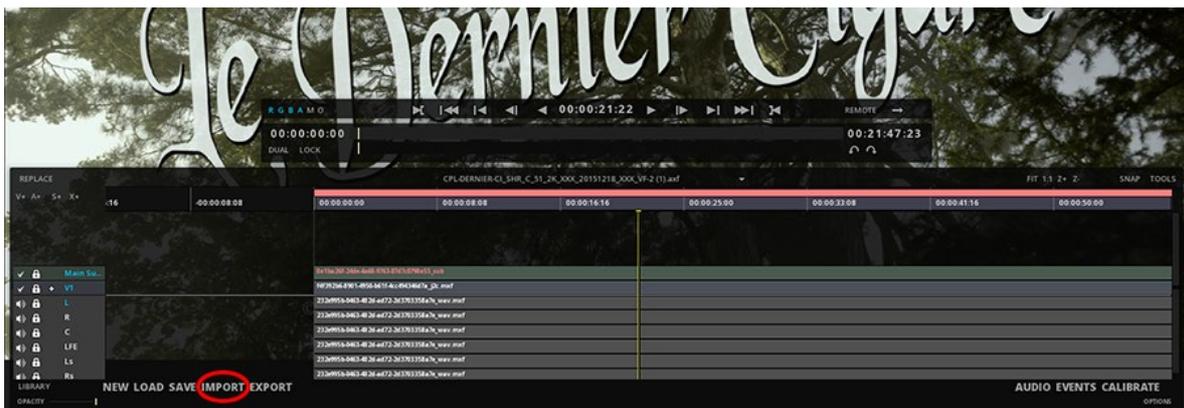
10.1. Manual Import of QC Reports

Currently ICE supports the following automated QC reports:

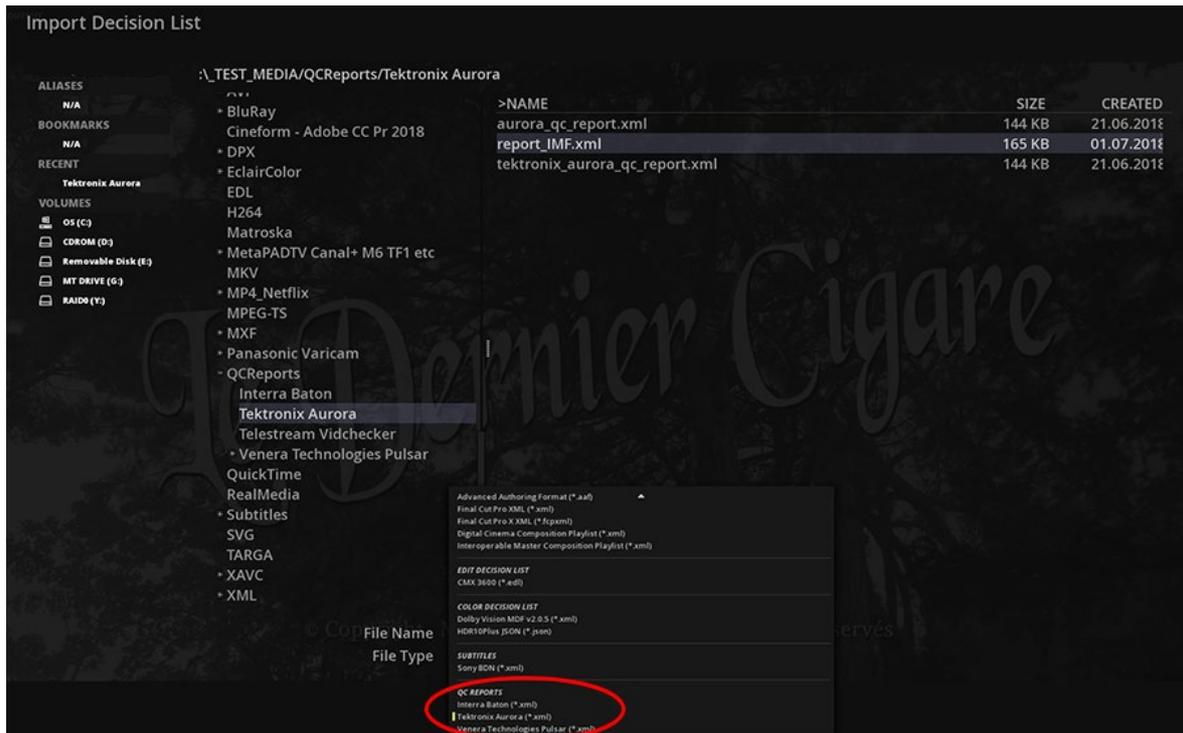
- Aurora (Tektronix)
- Baton (Interra)
- Pulsar (Venera)
- Vidchecker (Telestream)

ICE can load the XML reports from these automated QC solutions and allows the operator to manually inspect the errors of a media by navigating on the timeline from error to error.

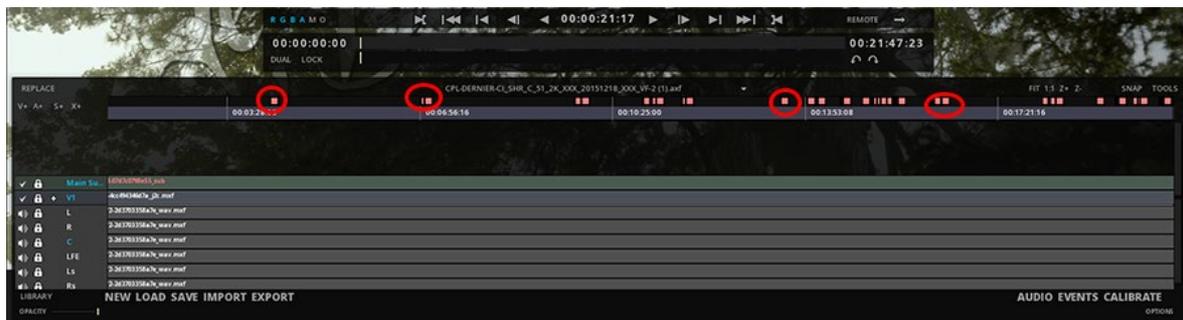
- To load manually a QC report for the content you have on the TimeLine, click on the IMPORT button:



- Browse your directories to select the error report and select in the FILE TYPE drop-down menu the desired QC tool :



ICE displays the location of the errors in the TimeLine using red squares:



- To navigate from error to error, open the **TOOLS** panel from the Library access then go to the **LOCATORS** tab.
- Click on a specific Timecode to jump to the location of the error.
- To display the full error title click on the line in the **Comments** column.

11. HDR CONTENT

This chapter describes how to use ICE for HDR content quality control.

11.1. About HDR

11.1.1. What is High Dynamic Range?

“High dynamic range is specified and designed for capturing, processing, and reproducing scene imagery, with increased shadow and highlight detail beyond current SDR video and cinema systems capabilities.” (Society of Motion

Picture and Television Engineers® (SMPTE® Study Group Report High-Dynamic-Range (HDR) Imaging Ecosystem)).

HDR offers the ability to capture, process, distribute, and display large contrast ranges, resulting in more realistic images. The images are not just brighter with contrasts artificially dilated.

The brilliances of the objects are more faithful and the details in the high and the low lights are better represented.

HDR makes it possible to have images with more depth and better saturated highlights. Differences in brightness between indoor and outdoor scenes make more sense.

High Dynamic Range moving images capture is a reality since the first high-end digital cameras. RAW images have naturally a very high dynamic range, with an average of 14 stops for the ARRI Alexa and the SONY F65. Those camera manufacturers already offer wide gamut capture, 6K or 8K resolution at up to 120 frames per second. The bottleneck for HDR was the post-production workflows, not ready because not yet standardized, and no capable display devices were available.

Now that some pioneers have lead the way, like Dolby, and that standardization committees and industry alliances have made great works to specify what HDR is, deliveries in HDR have become a reality, pushed by the consumer market opportunities.

- The Blu-ray association has already published specific metadata and requirements for HDR, based on the HEVC codec like the Ultra HD Blu-ray – HDR disc format using the HEVC, HDR10, and optionally Dolby Vision.
- The Interoperable Master Format Studio Profile applications have been extended to support HDR content and metadata (also referred as Application 2e+).

11.1.2. Standards

A variety of SMPTE standards specifies the different types of HDR.

SMPTE ST-2084 HDR

ST-2084 is based on the “perceptual quantizer” (PQ) initially proposed by Dolby. It defines the EOTF (for Electro Optical Transfer Function, a Gamma curve) for the HDR10 and the Dolby Vision formats.

This non-linear curve defines how Luminance is increasing above the standard white reference (100 nits), in the spectral highlights. ST-2084 is defined up to 10'000 nits. (Current HDR display devices support a maximum of 4'000 nits – Dolby Pulsar).

SMPTE ST-2086

“Mastering Display Color Volume Metadata Supporting High Luminance and Wide Color Gamut Images”, this standard accompany the ST-2084 and defines the static metadata embedded in the HRD content.

This metadata is used to describe the capabilities of the display used to master the content : CIE (x,y) chromaticity coordinates for RGB primaries, White Point, and min/max luminance of the mastering display.

This is a characterization of the hardware used and has nothing to see with the MaxFALL and MaxCLL metadata, which are statistical measures of the content.

These parameters are essential to know what you are looking at.

SMPTE ST-2094 Dynamic Metadata for Color Volume Transform

The metadata are intended for transforming high dynamic range (HDR) and wide color gamut (WCG) image essence for presentation on a display having a smaller color volume than that of the mastering display. The metadata are content-dependent and can vary scene by scene or image by image.

Four technologies have been currently specified, even though currently the Applications 1 and 4 are more spread.

ST 2094-10 DMCVT – Application #1

A standardization of Dolby's technology (Parametric Tone Mapping)

ST 2094-20 DMCVT – Application #2

A standardization of Philips' technology (Parameter-based Color Volume Reconstruction)

ST 2094-30 DMCVT – Application #3

A standardization of Technicolor's technology (Reference-based Color Volume Remapping)

ST 2094-40 DMCVT – Application #4

A standardization of Samsung's technology (Scene-based Color Volume Mapping)

HLG

Based on the ITU-R BT.2100, the Hybrid Log Gamma curve is coming from a joint study of both BBC and NHK. Their aim is to insure the backward compatibility with SDR devices and content, a key element for broadcasters in the adoption / transition to HDR. The main difference with ST-2084 is that definition reached 5'000 nits and that it does not carry specific mastering metadata.

HDR IMF

The ST 2067-21 Interoperable Master Format – Application #2 Extended has been extended to support HDR content and metadata (also referred as Studio Profile).

11.1.3. Vocabulary

Below you will have an overview of the vocabulary frequently used with the HDR technology used as well in ICE :

- WCG: Wide Color Gamut - Rec.2020 has 2x more colors than Rec.709.
- HDR: High Dynamic Range TV (ITU-R BT.2100)
- SDR: Standard Dynamic Range TV (Rec.601, Rec.709, Rec.2020)
- HFR : High Frame Rate (100 & 120 fps)
- HEVC: High-Efficiency Video Codec (H.265) - 2x more efficient than AVC
- PQ: Perceptual Quantizer Transfer Function for HDR signals (SMPTE ST 2084, ITU-R BT.2100)

- HLG: Hybrid Log Gamma Transfer Function for HDR signals (ITU-R BT.2100)
- HDR10: 10-bit HDR using BT.2020, PQ and static metadata
- DoVi: Dolby Vision – 12-bit HDR, BT.2020, PQ, Dolby Vision dynamic metadata
- DMCVT: Dynamic Metadata for Color Volume Transforms SMPTE ST 2094
- EOTF: Electro-Optical Transfer Function.

11.2. HDR Settings

It is important to first check that the composition settings are well set for the content:

- The HDR statistics
- The Mastering Display

11.2.1. Setting the HDR statistics

This information is mandatory for any content using PQ EOTF (Dolby Vision, HDR10, HDR10+).



The MAXFALL and MAXCLL metadata may or not may be present in the content, and ICE offers several methods for dealing with the different cases.

Case 1	HDR statistics are embedded in the file	ICE reads the metadata and displays them automatically in the Compositions Settings.
Case 2	HDR statistics are provided in a PDF report	Report the statistics manually in the Composition Settings.
Case 3	No existing information	Proceed to a HDR Global Analysis .

11.2.2. Setting the Mastering Display

The Mastering Display panel allows you to define ST-2086 metadata manually if they are not present in your content. This step is mandatory prior to any HDR analysis.

To get the information about the Mastering display if the metadata are not present in your content, refer to the facility where the content is originated from.

The Mastering Display panel is accessible from the Composition Settings:

To access the composition settings, refer to [Composition Settings](#).

ICE offers you a list of preset monitors:

- select your monitor in the list, and ICE will automatically apply the correct metadata.

If the monitor list is empty, it might be a problem of Windows access rights on the folder. In order to fix it, go to the ICE Resources folder:



C:\Program Files\Marquise Technologies\ICE\resources

Right-click on the **displays** folder and select Properties: in the Security tab, select the User to modify and add **Full Control** capabilities.

If your monitor is not listed, you can define custom settings by adding manually the necessary information to characterize the mastering display:

To add your monitor in the list, copy and modify a XML file from the **displays** folder, and add it back in the same folder:

C:\ProgramFiles\Marquise Technologies\ICE\resources\displays

11.3. HDR Tools

This sections details the different tools ICE offers for HDR content QC.

11.3.1. HDR Global Analysis

The HDR global analysis tool measures the light level of the composition range defined by the user to obtain the MaxFALL and the MaxCLL values.

Setting the Active Image Area

Before the launch of the analysis, you need to define the aspect ratio of the content to exclude any blanking area from the analysis which could affects the results:

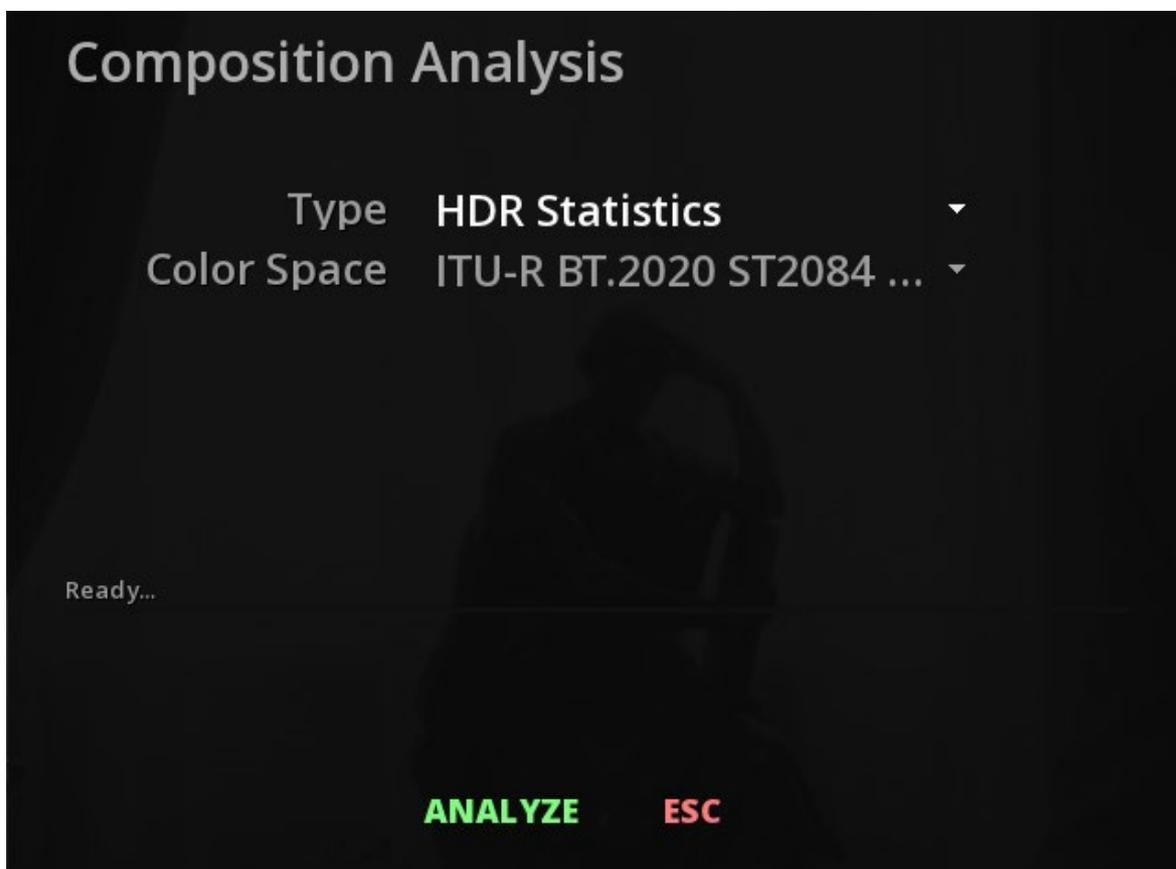
- In the Composition Settings, chose **Overlays** and select your frame aspect ratio.



To verify your settings display the Active Area guide using **Alt** + **B**

Starting the Global Analysis

- Use **F6** from the TimeLine to open the Composition Analysis panel:

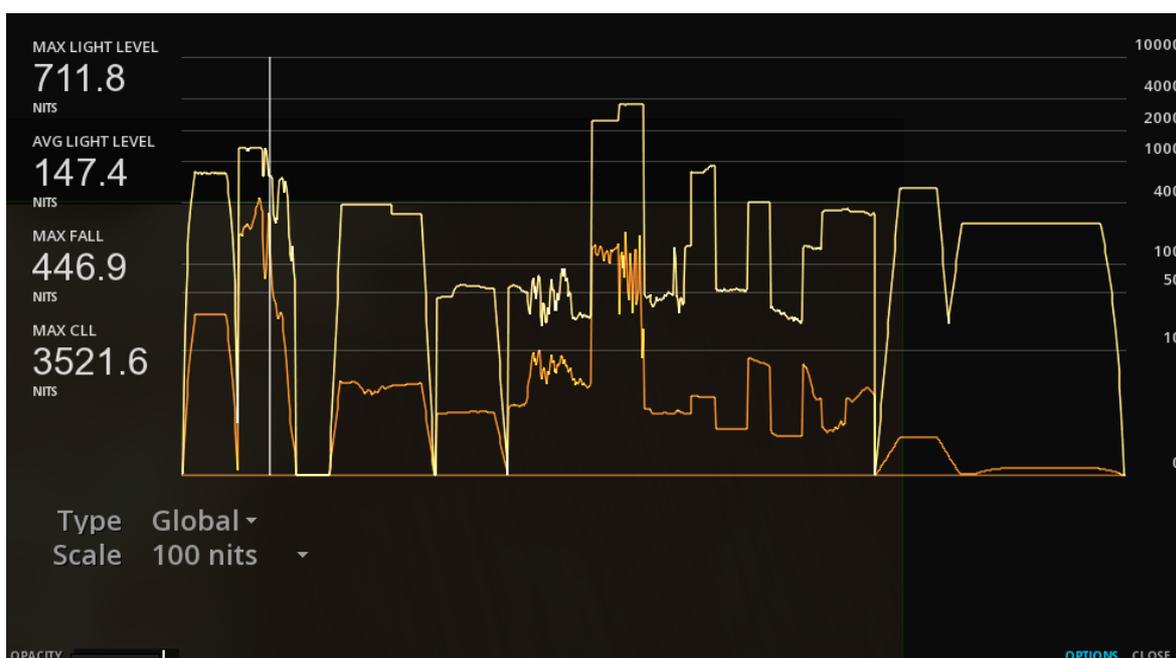


- Select the Source Color Space corresponding to the content and launch the analysis by clicking on the Analyze button.

Display analysis results

Once the analysis is completed, you can access the results using the Luminance Meter:

- Call the Luminance Meter using `shift + N`.
- Choose **Global** in the options menu to display the full graph of the analysis:



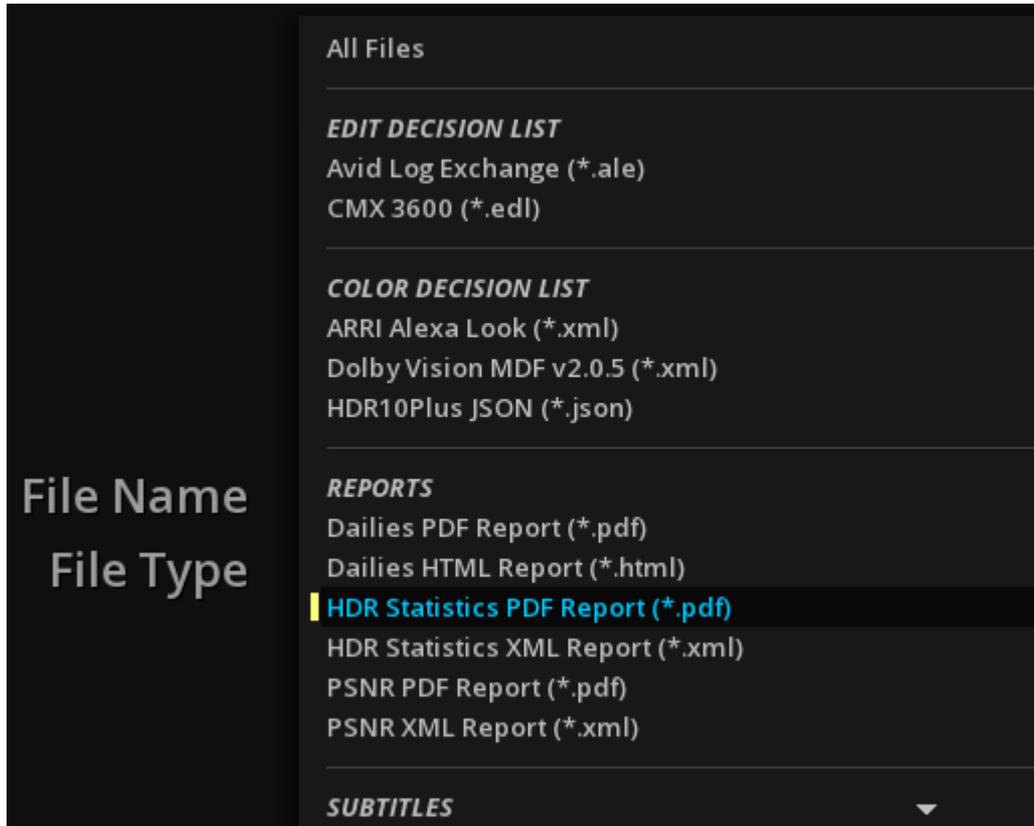
The first values displayed at the top left are the MaxFALL and MaxCLL values of the current image displayed on the viewport. The values below concern all the analyzed content.

The HDR statistics values are reported automatically after an analysis into the Composition Settings in the CMS tab.

Export an HDR statistics report

- To export the HDR statistics as a PDF or an XML file, click on the Export button.

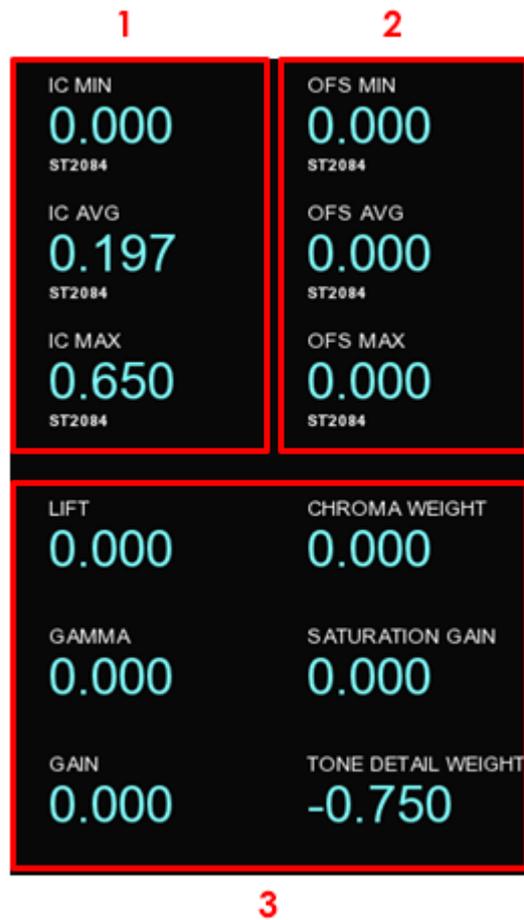
Define a file path, name the report and choose the desired File Type with the drop-down menu:



11.3.2. DMCVT Metadata Inspector

If the HDR content has DMCVT information, this dedicated Metadata inspector allows you to read them, whether they are embedded in the file or on a separated XML file.

- To display the DMCVT Metadata Inspector use **Shift** + **D**



1	shows the minimal, average and maximal values expressed in ST2084 PQ. These are the Image Characteristics values.
2	shows the offset for minimal, average and maximal values.
3	color-grading values of the HDR trim pass (i.e. lift, gamma, gain, chroma. saturation and tone detail).

11.4. Dolby Vision QC

Dolby Vision is an HDR technology developed by Dolby Labs using the PQ curve on the operating principle of Parametric Tone Mapping.

11.4.1. Dolby Vision Content Mapping versions

ICE supports the two versions of Dolby Vision's algorithms: the Dolby Vision Content Mapping version 2.9 (CMv2.9), and the Dolby Vision Content Mapping version 4 (CMv4).

- To select your desired version of the Content Mapping, go the **Composition Settings**, [CMS](#) tab.



Users should select CMv2.9 for new projects unless otherwise stated from the studio during the transition phase to CMv4 ecosystem adoption.



Projects started or created in one version cannot be converted to another version.

11.4.2. Content Mapping Unit (CMU)

The Dolby Vision Content Mapping Unit (CMU) is able to emulate a number of secondary display targets and aims to produce images adapted to those displays. It maps the content with the metadata for a specific display, could it be at a standard brightness (e.g. SDR 100 nits) or higher. The CMU is therefore essential for the creation of Dolby Vision metadata content, otherwise it is impossible to monitor. However, keep in mind that there is no picture encoding process done by the CMU.

The Dolby Vision PQ images as well as the color volume transform metadata are sent to the CMU which "renders" the images before they are outputted to a connected display device.

ICE supports the **eCMU** (external CMU), as well as the **iCMU** (internal CMU). Both requires a valid Dolby Vision license.

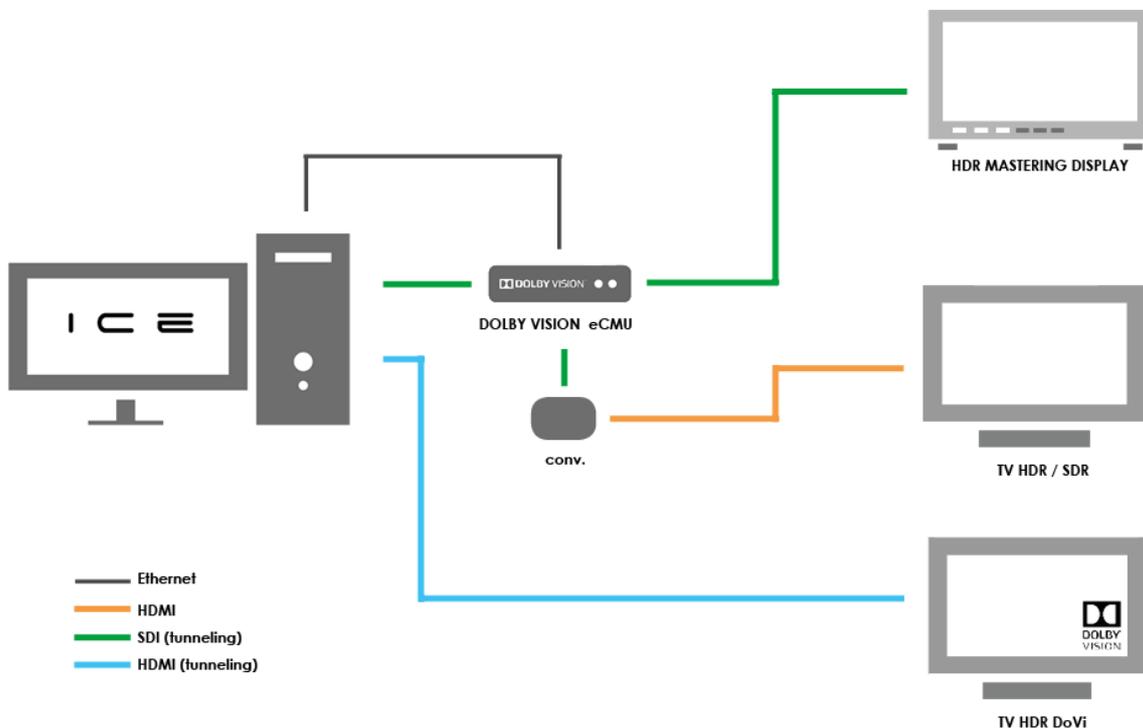


If you need to preview/QC the color processing of a Dolby Vision content, then a iCMU license or a eCMU is necessary. Inspecting the metadata only does not require Dolby's CMU.

Setup of the eCMU

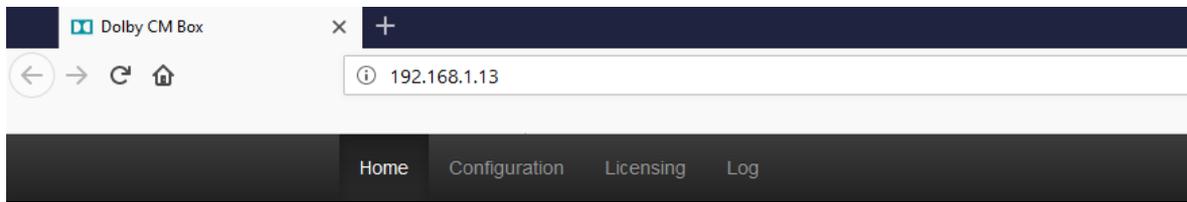
ICE outputs the Dolby Vision metadata over the SDI to the eCMU (also known as tunneling). An Ethernet connection allows ICE to control the eCMU.

The eCMU has to be setup following Dolby Vision CMU user's manual. The following picture shows a typical case to setup properly the displays:



To allow ICE to control the eCMU, select eCMU in the **Project Settings**, Dolby tab.

The good communication between ICE computer and the eCMU can be verified on the eCMU Home Page by typing its IP address into a web browser:



Operation



Status

Process State: Pass-Thru
Active Profile: 100-nit, Rec. 709, BT.1886, Full
SDI Input: NTV2_FORMAT_1080psf_2400



CMU Version 2.5.2



Sometimes the Firewall can interfere with the connection between the eCMU and ICE computer. Remember to configure it accordingly.



The eCMU's status is available into ICE thanks to the Video Pipeline Diagram by pressing **Alt** + **F6**.

Go to the eCMU Home Page to control the eCMU:

- To perform color corrections, the signal must be set on Normal.
- If **Pass through** is selected, the image is displayed without the corrections (bypass).

Setup of the Video Output with the eCMU

In order to display the Dolby Vision technology in an appropriate way, the video output settings into the **Project Settings** (F1) have to respect some rules:

Format The RGB 4444 format is mandatory

Transport Choose the SDI level B.

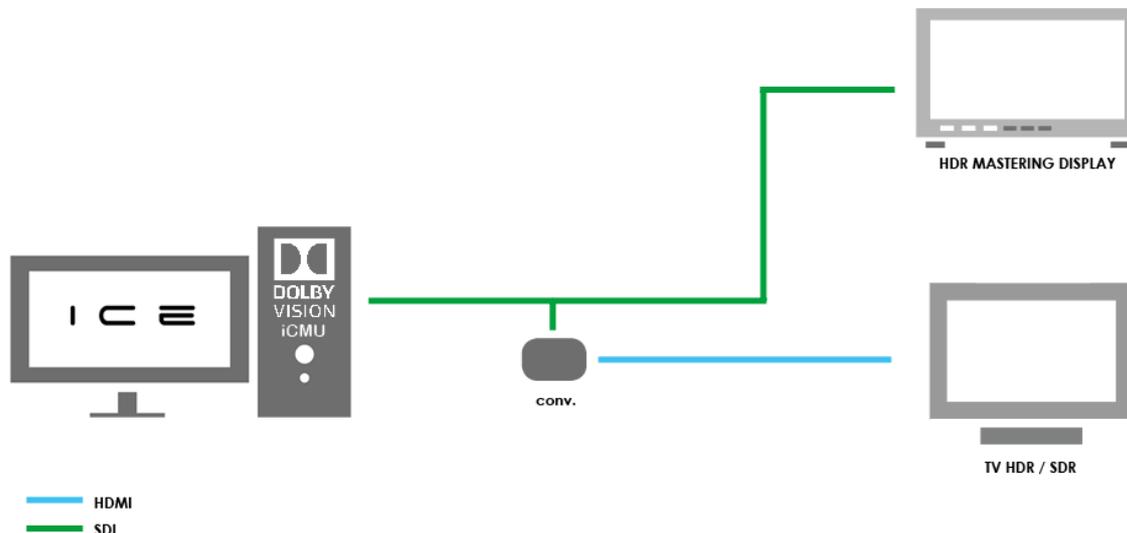
Scaling Scaling must be setup on HEAD

Pixel Format Dolby Vision requires a minimum precision of 12 bit. In ICE, select 16 bit.

Setup of the iCMU

- To opt for the internal CMU, in the Project Settings / Dolby tab select **iCMU**.
- Add the license number provided by Dolby.

When using the iCMU, the image output is already "rendered" before it is sent through the SDI.



About HDMI Tunneling

This feature refers to the capability of ICE to output the Dolby Vision metadata through HDMI using an AJA Kona5 or an AJA Corvid 88, directly to a Dolby Vision consumer TV device to simulate the behavior of the image.

However, for a proper QC, we recommend to use the iCMU or the eCMU.

11.4.3. Composition settings

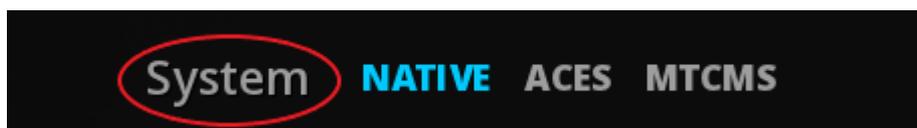
The Composition settings need to be carefully chosen for the QC of Dolby Vision content.

Setup the color pipeline for Dolby Vision

This chapter will only explain how to setup the CMS for Dolby Vision content.

If you need further information on Color Management in ICE, please read the chapter [Color Management](#).

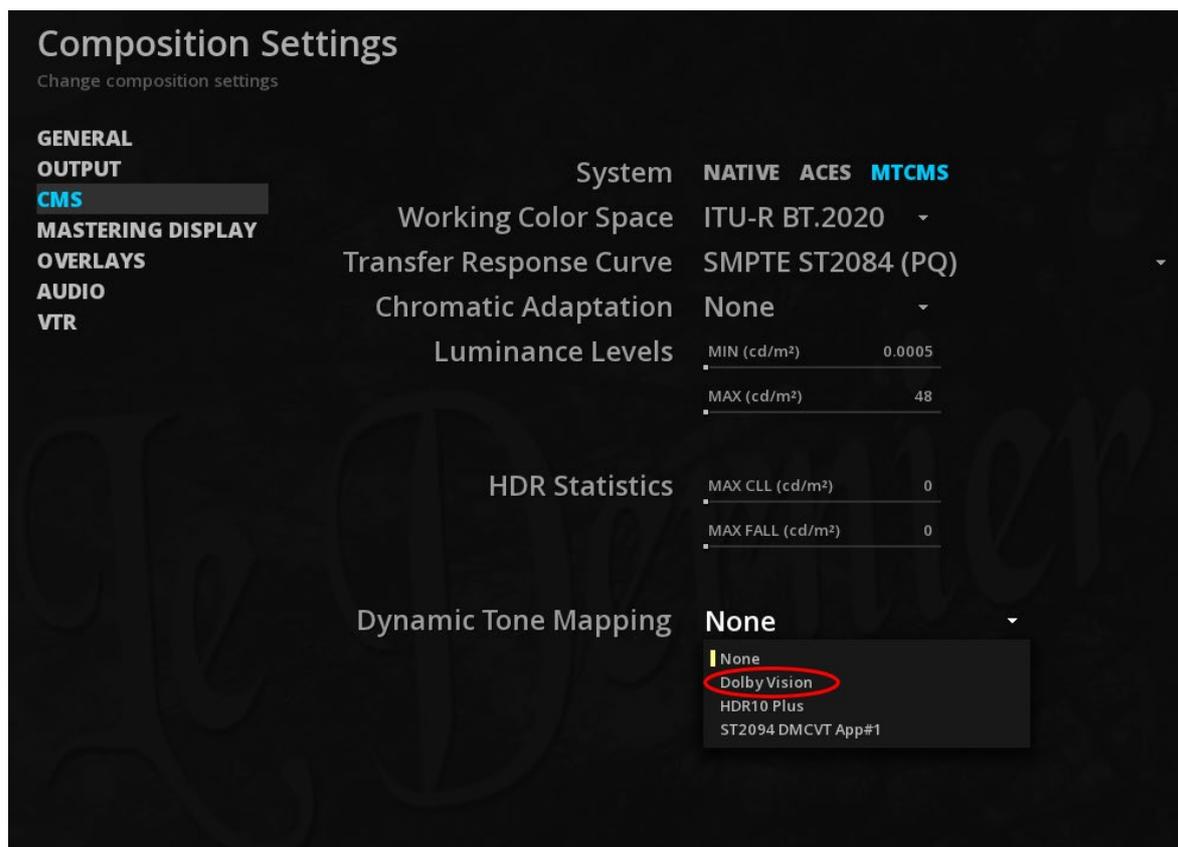
- To setup the Color pipeline, go to the Composition Settings by right-clicking on the viewport then go to **CMS** tab and choose a color system:



- NATIVE** Choosing the NATIVE mode in ICE for Dolby Vision content management requires a source in PQ rec2020 or P3. Also, be sure that no Look Up Table has been applied on it.

Select the Dynamic Tone Mapping technology

To enable Dolby Vision operations, the Dynamic Tone Mapping has to be set into the CMS of the Composition Settings for each new dynamic HDR composition created:



11.4.4. Inspecting Dolby Vision metadata

ICE allows to control the Dolby Vision metadata through the use of the DMCVT Metadata Inspector (please read the section [HDR Tools](#) for additional explanations.)

The color used to display the values of the metadata in the DMCVT Metadata Inspector is related to the origin of the metadata:

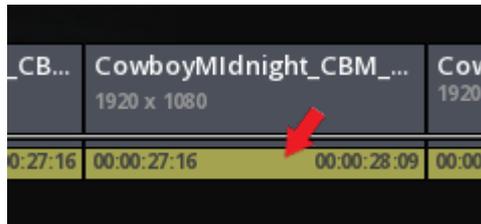
- Blue** the metadata can be edited in live.
- Yellow** the metadata is editable but the live mode is not active.
- White** the media is read-only.



If the CMU is connected, the values will always be displayed in blue:

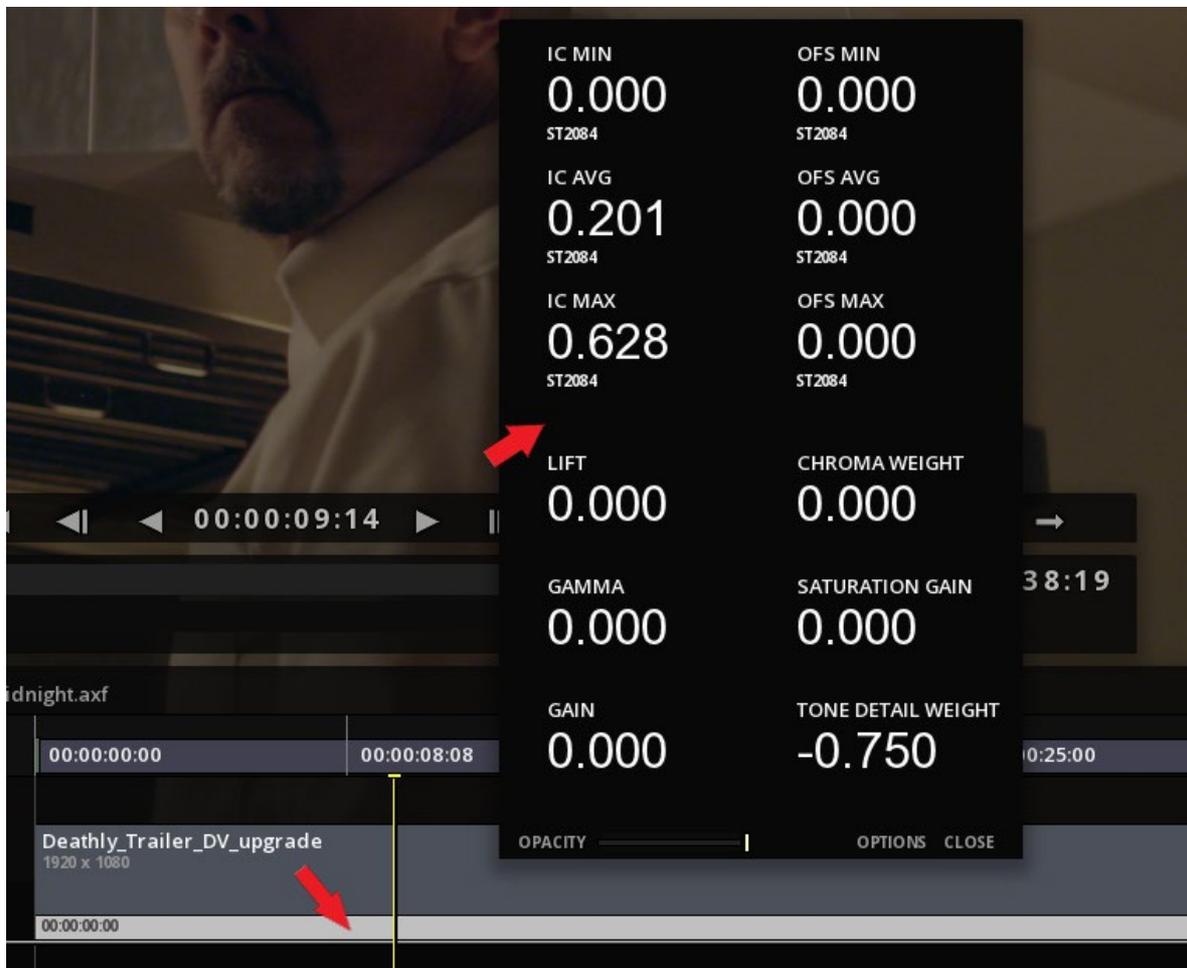


The presence of metadata into the timeline is shown as a color bar on each clip with metadata:



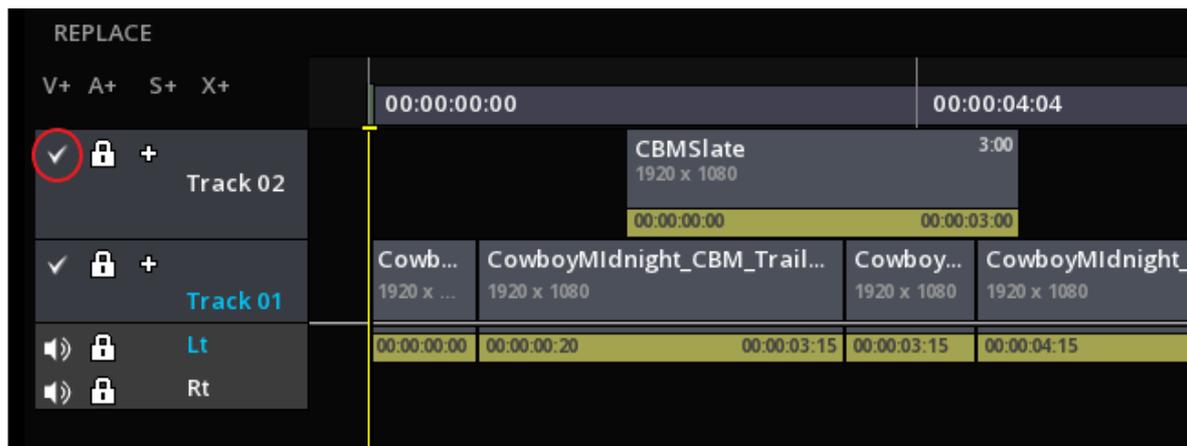
If there is no bar (and the dynamic tone mapping is well selected), it means that your content has no metadata or that the values have been reset.

The color of the bar is identical to the DMCVT Metadata Inspector colors.



In a case of overlapped tracks, ICE will always display the values of the top track into the DMCVT metadata tool but also when exporting the metadata.

If you want to be able to read the lower track metadata, you can hide the top track by clicking to the left of the padlock:



12. IMF QC

IMF packages require special tools for a proper QC and validation process. ICE has dedicated tools able to work with complex packages, including multi CPLs content, supplemental packages and sidecar files.

In addition of its own validation tools, ICE directly integrates Photon validation solution.

12.1. Supported IMF formats

ICE supports the following IMF formats:

Supported IMF Applications:

- Application 2, 2e (Studio Profile)
- Application 4 (Cinema Mezzanine)
- Application 5 (ACES)
- IMF ProRes RDD45
- IMF for Broadcast & Online

Supported JPEG 2000 profiles:

- Broadcast profiles, up to BPC L7
- IMF profiles, up to 16 bit

12.2. Importing IMF packages

There is two ways to import an IMF package into ICE:

1. Create a new project using the IMF Import tool.
2. Drag the IMF (root folder) directly into the Timeline or the Library of an existing project.

Once the IMF is imported within ICE, all the elements in the timeline are ready for screening, quality control, modification, tape layback and re-exporting as a new IMF or a video file.

12.2.1. Drag & Drop an IMF

This is the easiest way to import an IMF: select the IMF root folder in your file browser and drop into the TimeLine module.

ICE will automatically reference the media assets as well as the compositions in the Quick Library:

Media Assets



>NAME

My IMF Movie

mer_shrt_2398_pqp3d65_3840x2160_dovi_imf_201709...



mer_shrt_2398_pqp3d65_3...
Duration: 00:12:02:17 TC St...
3840 x 2160



mer_shrt_2398_pqp3d65_3...
Duration: 12 min 3.43 sec
6 channels @ 48000 Hz



mer_shrt_2398_pqp3d65_3...
Duration: 12 min 3.43 sec
2 channels @ 48000 Hz



Meridian_23976_DA_V3_with...
Duration: 00:09:43:05 TC Star...



meridian_23976_jp_2016082...
Duration: 00:00:00:02 TC Star...



meridian_23976_KO_V4.dfxp
Duration: 00:09:22:02 TC Star...



Meridian_Atmos_23.976.wav
Duration: 00:12:01:00 TC Star...



891f2c08-7c03-4f3c-a81b-904...
Duration: 00:12:02:17 TC Star...



f30942b0-4f23-4b99-a615-cbd...
Duration: 00:12:02:17 TC Star...

Compositions



- To load a particular CPL, double click on the desired composition: ICE will automatically build the timeline with all the assets.

12.2.2. Using the IMF Import Tool

The IMF Import tool within ICE automatically creates a Project and places the video, and audio essences of the IMF CPL into a ICE composition with each clip arranged in the timeline just as it is referenced by the IMF CPL.

- On the launch of ICE click on Import IMF button from the Start menu:

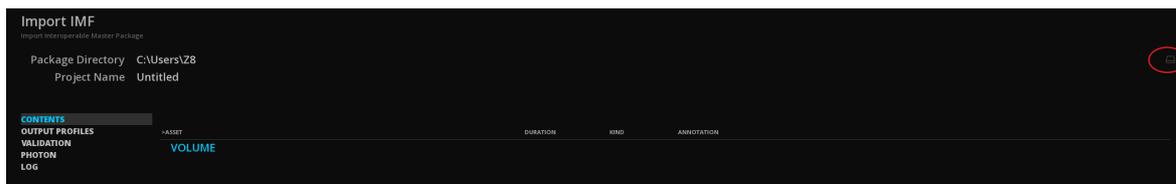


If the IMF has sub versions then their additional essences (if any) are imported to the same chosen media folder as the original IMF's essences. Each new version's CPL is used to create a new ICE Composition within the Project.

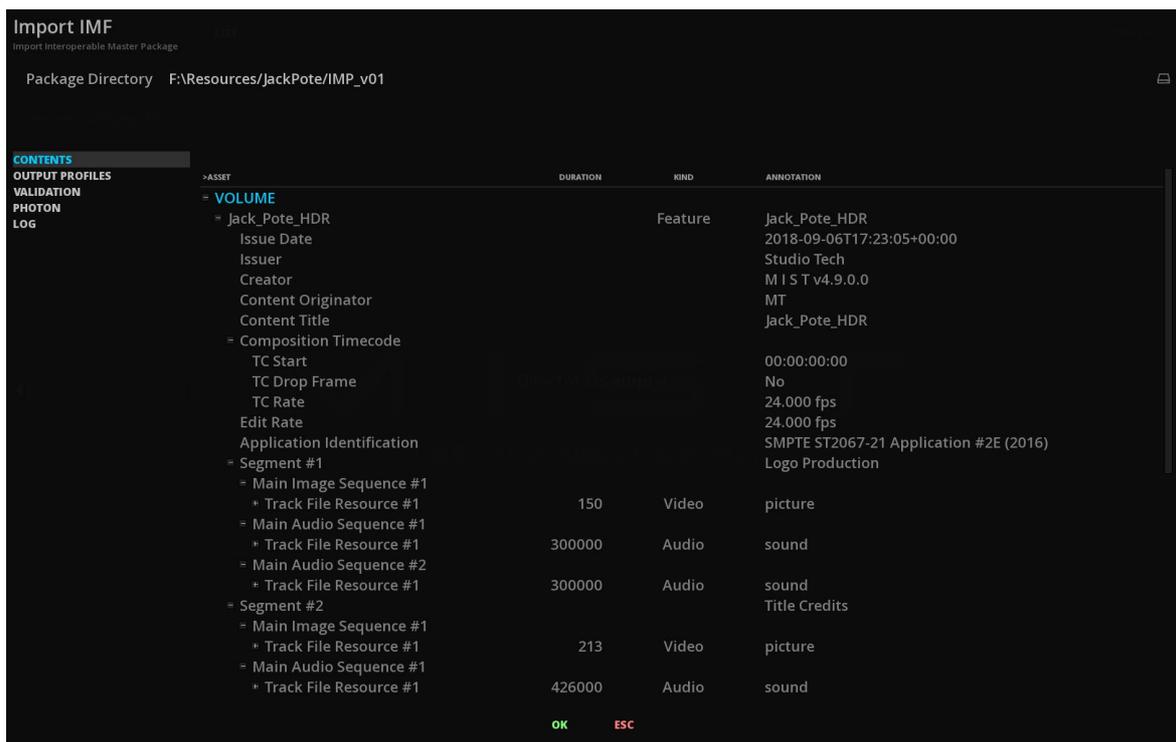
This way the ICE operator may import a multiple version IMF in a single process and easily switch between the different Compositions.

Select the Package Directory

- Select the IMF to import using the browse button:



Once you have selected the package folder, and pressed **OK**, the contents get quickly analyzed and the various elements are then displayed in the exploded directory tree-view. You may scroll through the directory tree and expand or collapse individual elements by clicking on the plus and minus signs to the left of each item:



Do not modify the folder's name or contents in any way or you risk destroying the IMF.

Project Name

This is where you chose a name for your Project that will contain the entire contents of the IMF you wish to import. By default ICE will choose the folder name of the IMF you chose in the previous step of defining the Packing Directory and fill in the "Name" text field with this name.

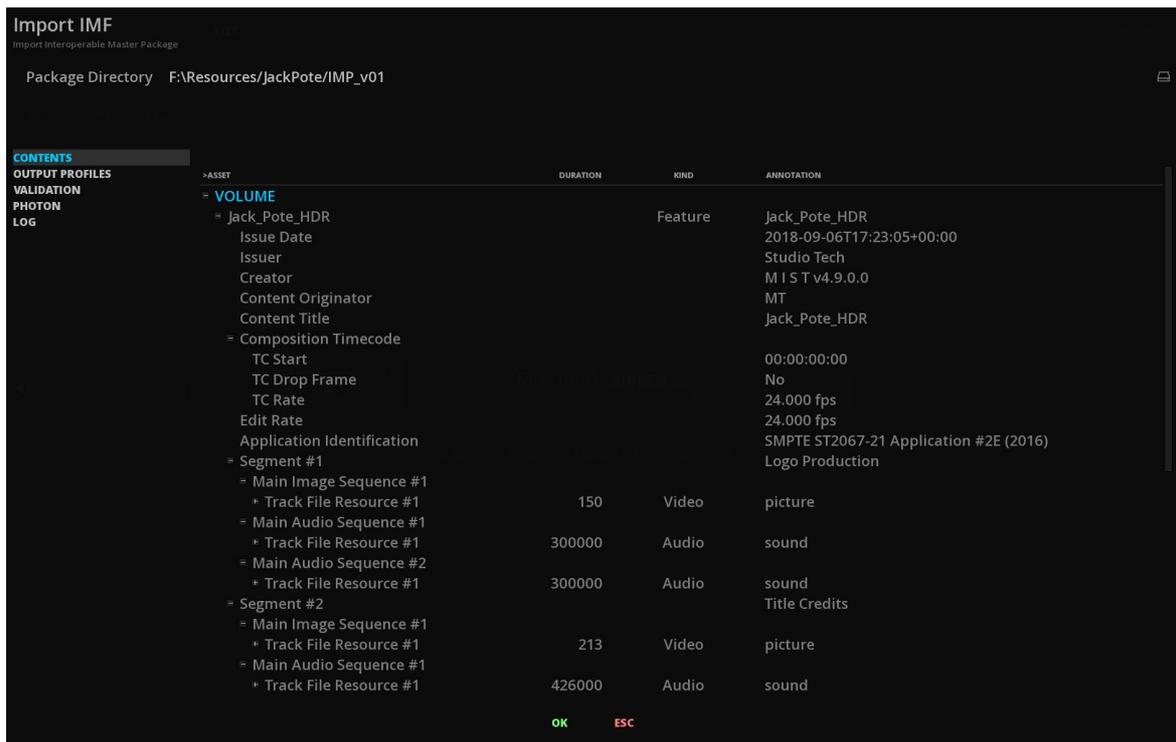
To enter the name of your ICE Project, simply click on the Name text field, enter a new name and press **ENTER** on your PC keyboard (or click outside of the Name text field).

12.2.3. Validate an IMF

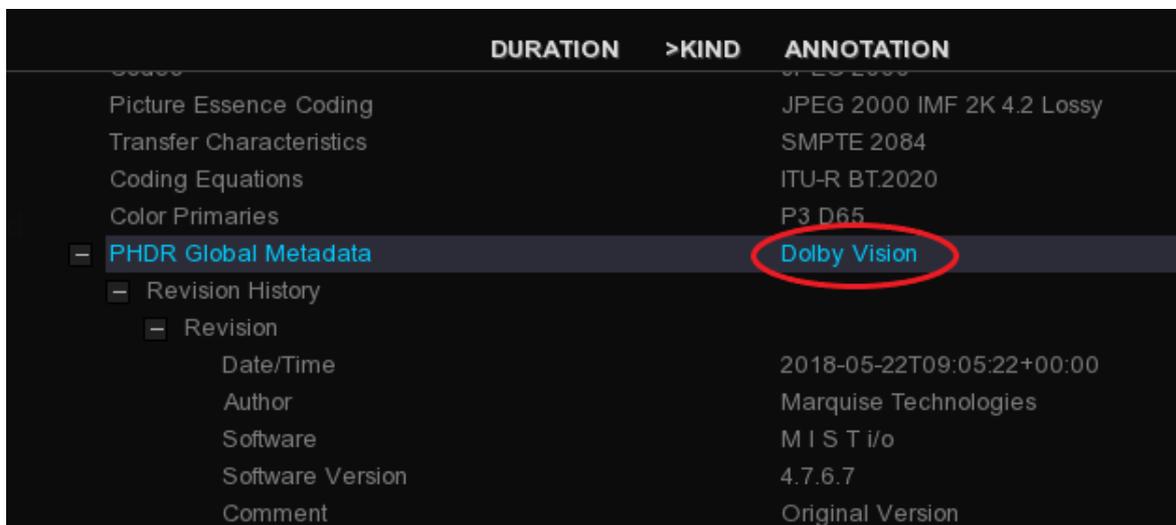
ICE has several steps to validate the IMF package to verify its integrity and compliance. The import window of the IMF is divided into several tabs.

Contents

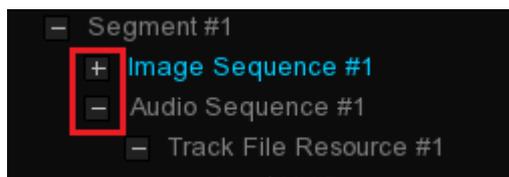
The Contents window displays what is present in the IMF: resources, sidecars, metadata are clearly displayed for an immediate overview of the package.



it can be very useful in the case of an HDR IMF to check the presence of metadata at this step:



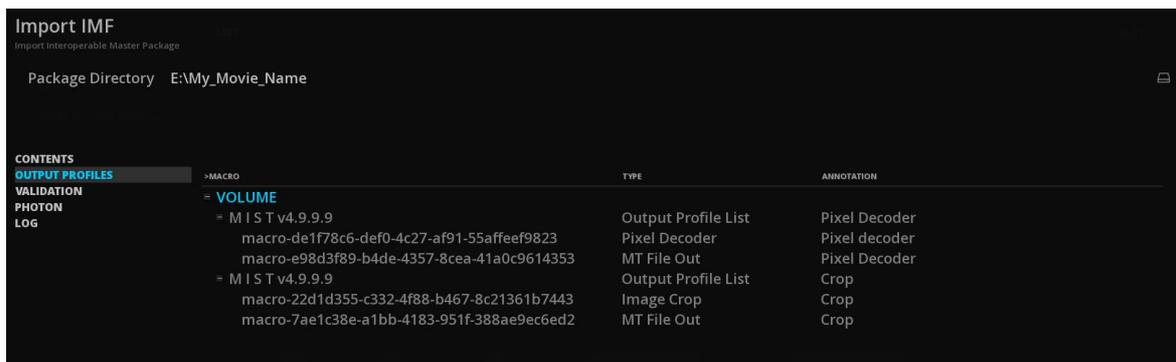
You can develop details for each resource by clicking on the "+" button or close it with the "-" button:



Use the mouse wheel to go down to the asset list.

Output Profiles

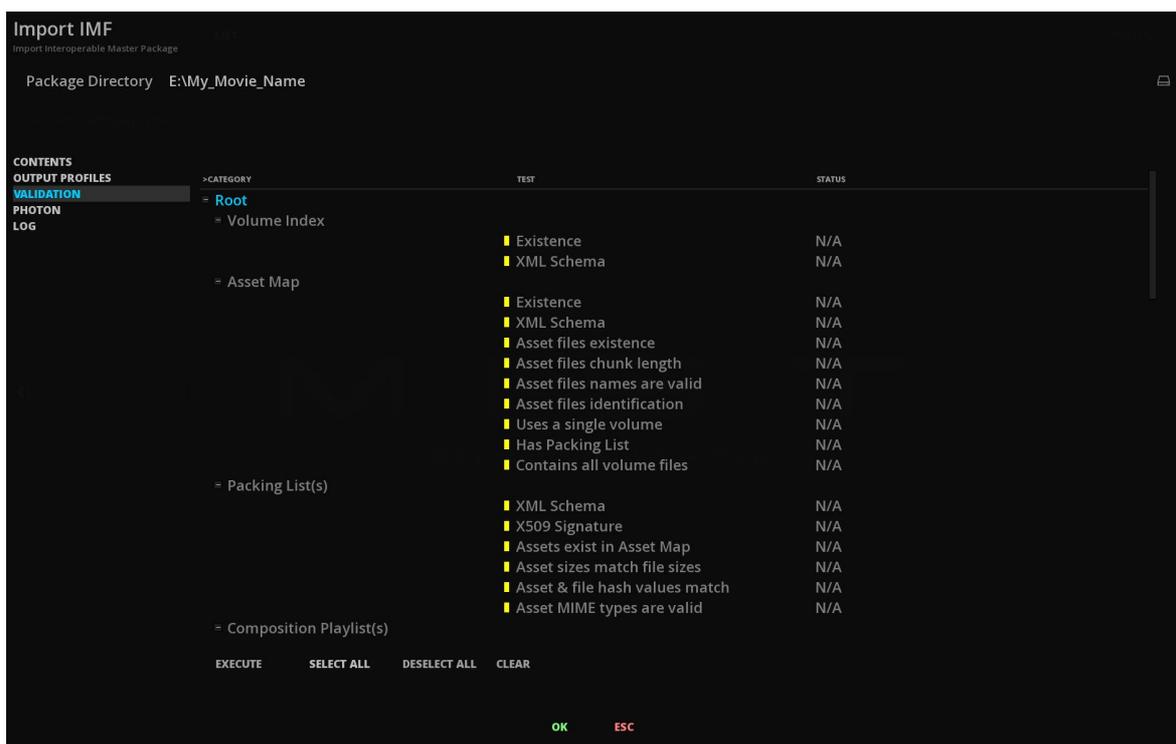
The Output Profiles tab display the list of the OPLs present in the package.



Validation

The ICE Validation tool allows to verify the integrity and compliance of the IMF package as well as the type of application used. This is done by launching for each category some analysis tests. Each test name is briefly described in the TEST column.

- You can do a full scan by clicking SELECT ALL. A small yellow line appears next to the tests to be performed. Click on EXECUTE to start the analysis tests:



Once the validation test is complete, ICE draws attention to the status of each of them using three labels:

PASSED the test was passed successfully.

WARNING the test is irrelevant. This does not cause the package to fail. It may mean that the package is not concerned by the test. For example, if an IMF does not use a digital signature, the X509 test will appear as a WARNING label in order to attract attention on it.

FAILED the test has failed.

NOT the test is not relevant for the type of package being scanned.

RELEVANT



The tests validating the Applications verify all supported applications. Therefore it is normal that the ones not concerned by the IMF package appears as fail. Note that it is possible that several applications are present in the package.

- You can save the results of the validation as a PDF file by clicking on the button **SAVE**. This file will detail all the test results with explanations of the tests done allowing you to know what test have failed.



An explanation of the validation tests performed by ICE can be found in the Appendix [IME Validation](#)

Photon

Photon is an open source tool for parsing, interpreting and validating constituent files that make an Interoperable Master Package. This validation test is a supplemental tool to check the IMP and is integrated into Netflix ingestion Pipeline among others companies. Because this validation test is critical for some deliveries, especially for Application 2e, ICE provides a frequently updated version of Photon.

- To start an analysis, click on **EXECUTE** at the bottom left corner of the window.



For now, Photon is not yet capable of validating an IMF Dolby Vision package.

LOG

If an IMF package is corrupted and ICE cannot open it, ICE will automatically opens the Log window and will details the errors found in the package.

Import

The ICE validation and the Photon validation are not mandatory steps for importing the package. At any time you can click on **OK** to finalize the import.

After the import, the IMF package is displayed in the Library and the first composition is imported on the TimeLine.

13. DCP QC

ICE offers special tools for a proper QC and validation process of DCP packages.

ICE is able to work with complex packages, including multi CPLs and multi PKLs content as well as supplemental packages.

ICE support INTEROP and SMPTE DCPs.

13.1. Importing a DCP

Importing a DCP into ICE is similar to the process of ingesting a DCP into a DCI compliant server. Each DCP has at least one composition playlist (CPL) for the original version and possibly a number of sub versions, each with its own CPL.

There is 2 ways to import a DCP package into ICE:

1. Create a new project using the DCP Import tool.
2. Drag the DCP (root folder) directly into the Timeline of an existing project.

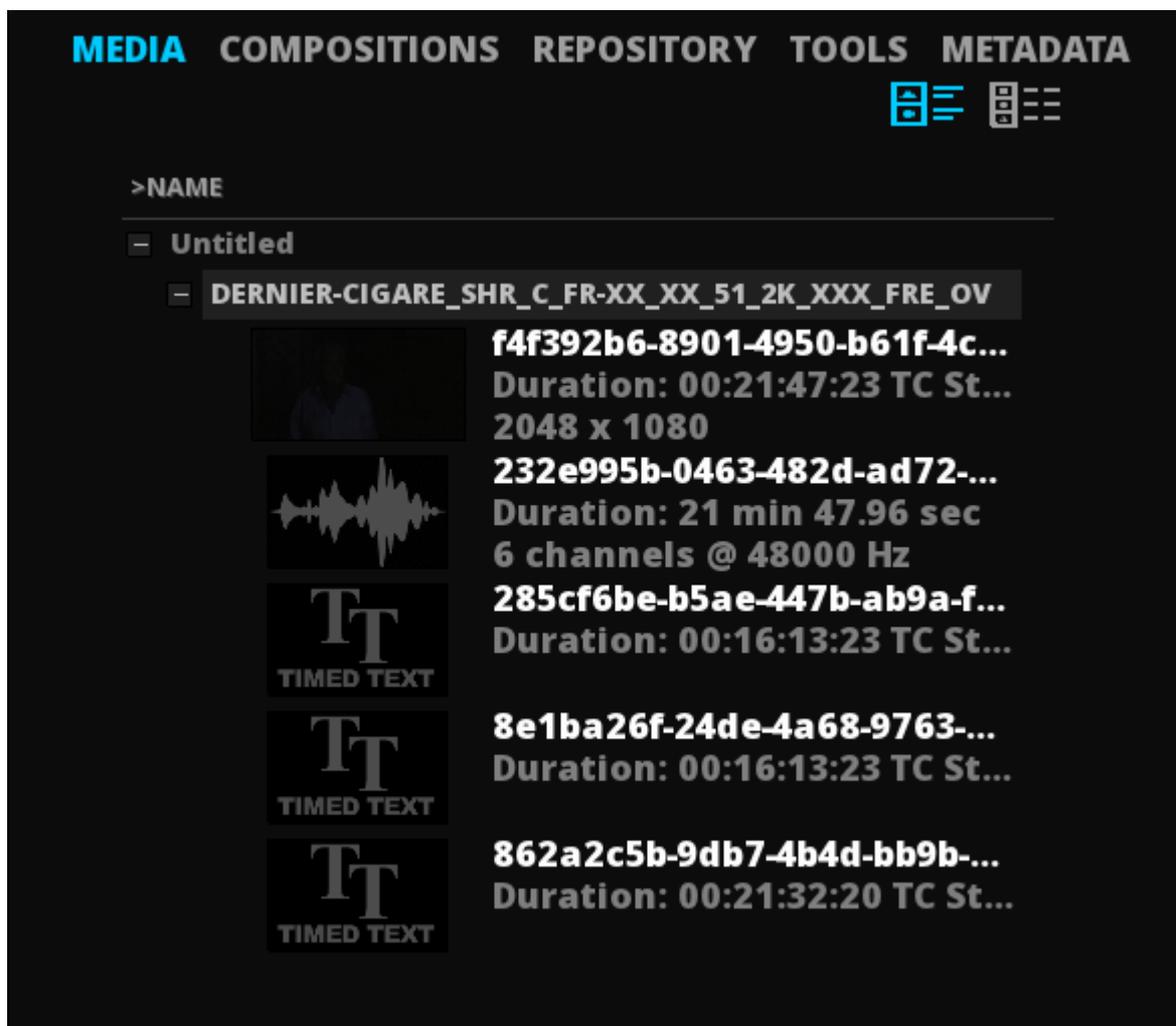
Once the DCP is imported within ICE, all the elements in the timeline are ready for screening, quality control, modification, tape layback and re-exporting as a new DCP, an IMF, an image sequence or a video file.

13.1.1. Drag & Drop a DCP

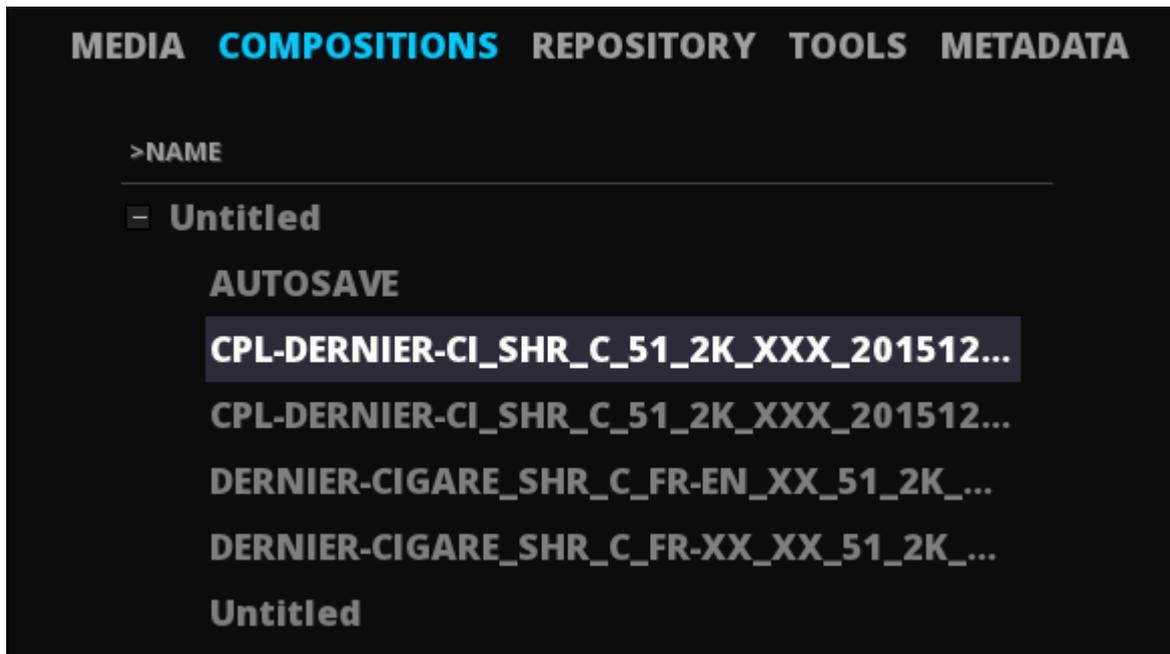
This is the easiest way to import a DCP: select the DCP root folder in your file browser and drop into the TimeLine module.

ICE will automatically reference the media assets as well as the compositions in the Library:

Media Assets



Compositions



- To load a particular CPL, double click on the desired composition: ICE will automatically build the timeline with all the assets.

13.1.2. Using the DCP Import Tool

The DCP Import tool within ICE automatically creates a Project and places the video, and audio essences of the DCP CPL into a ICE composition with each clip arranged in the timeline just as it is referenced by the DCP CPL.

- Click on DCP Import from the Radial Menu:

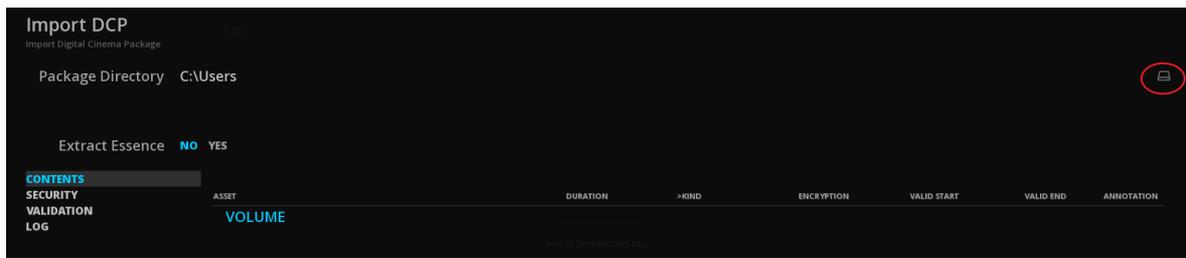


If the DCP has sub versions then their additional essences (if any) are imported to the same chosen media folder as the original DCP's essences. Each sub version's CPL is used to create a new ICE Composition within the Project.

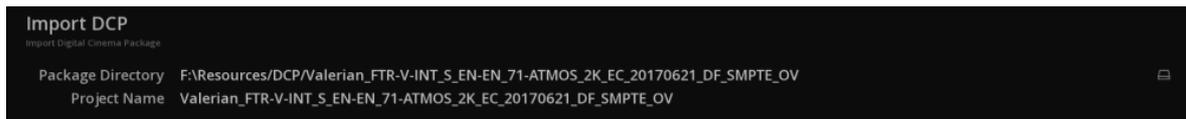
This way the ICE operator may import a multiple version DCP in a single process and easily switch between the different Compositions.

Package Directory

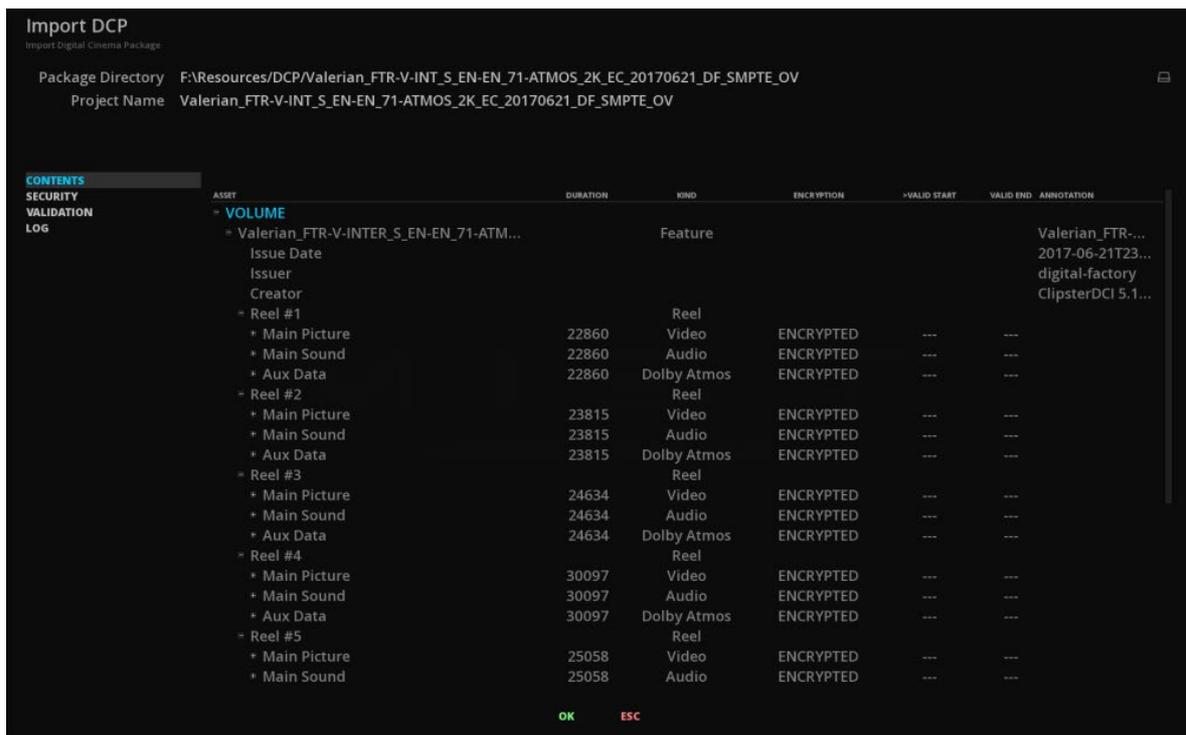
- Select the DCP to import using the browse button:



Once you have selected the package folder, and pressed **OK**, the contents get quickly analyzed and the various elements are then displayed in the exploded directory tree-view. You may scroll through the directory tree and expand or collapse individual elements by clicking on the plus and minus signs to the left of each item:



Do not modify the folder's name or contents in any way or you risk destroying the DCP.



In the screen shot above, the various composition playlists are displayed. Each of them contains one or more reels. These reels also contain a video track and optionally audio tracks and subtitles.

The name of each asset is displayed in the left most column while additional metadata is displayed in the remaining columns as available or relative to the asset itself. This may help to quickly identify the contents of a particular DCP and its sub versions before going through the actual process of importing it, especially if the DCP name does not provide the information you need to do so. This may be the case with sub versions or with multi-reel DCPs.

Project Name

This is where you chose a name for your Project that will contain the entire contents of the DCP you wish to import.

By default ICE will choose the folder name of the DCP you chose in the previous step of defining the Packing Directory and fill in the “Name” text field with this name.

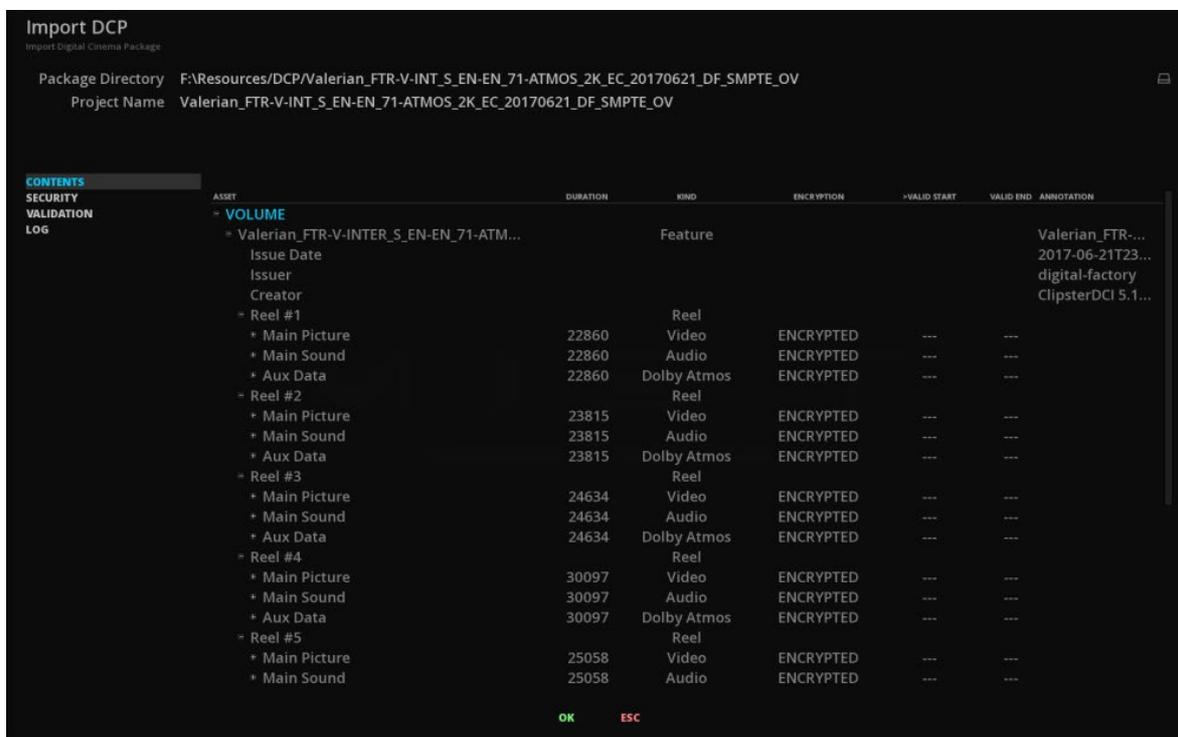
Project Name Valerian_FTR-V-INT_S_EN-EN_71-ATMOS_2K_EC_20170621_DF_SMPTE_OV

To enter the name of your ICE Project, simply click on the Name text field, enter a new name and press **ENTER** on your keyboard (or click outside of the Name text field).

13.1.3. Import DCP tool panel details

Contents tab

The **Contents** window displays what is present in the DCP: resources and metadata are clearly displayed for an immediate overview of the package. We can at a glance know how many CPLs are in the package with how many reels and for each of them, see the presence of video assets, audio and even auxiliary tracks (e.g. Dolby ATMOS). The **ENCRYPTION** column also allows us to know immediately if the content has been secured with a KDM.

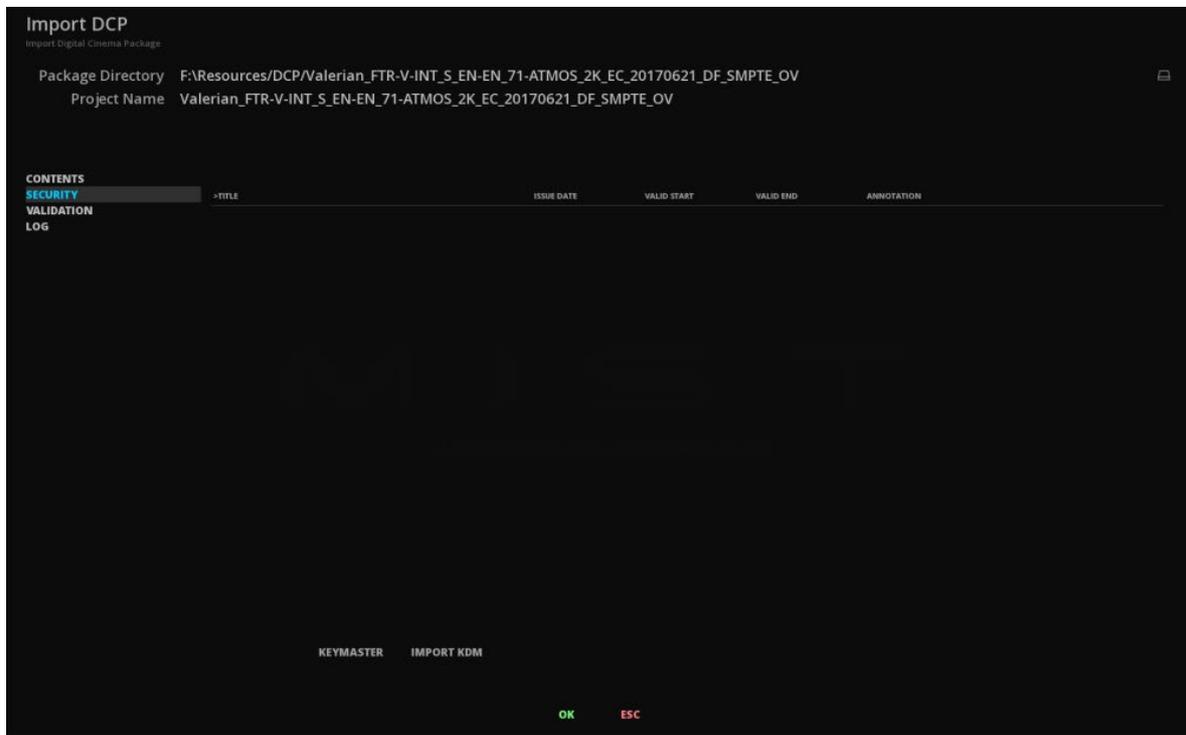


Click on the + and - of each category to extend the view of the tree or reduce it.

Security tab

This tab can be ignored if the DCP is not encrypted. This is where the DCP Key Delivery Message (KDM) are to be loaded **BEFORE** the DCP is imported.

Make sure that the KDM for the CPL our are imported has been made for your ICE QC Player. (see the chapter [Where to find certificates for ICE](#)).



There are two ways to import a KDM:

- By loading it from the Marquise Technologies platform "KEYMaster":

If you have a KEYMaster account and the KDM is available on the platform, ICE will import it up directly when clicking the **KEYMASTER** button.

- By importing a KDM from the System:

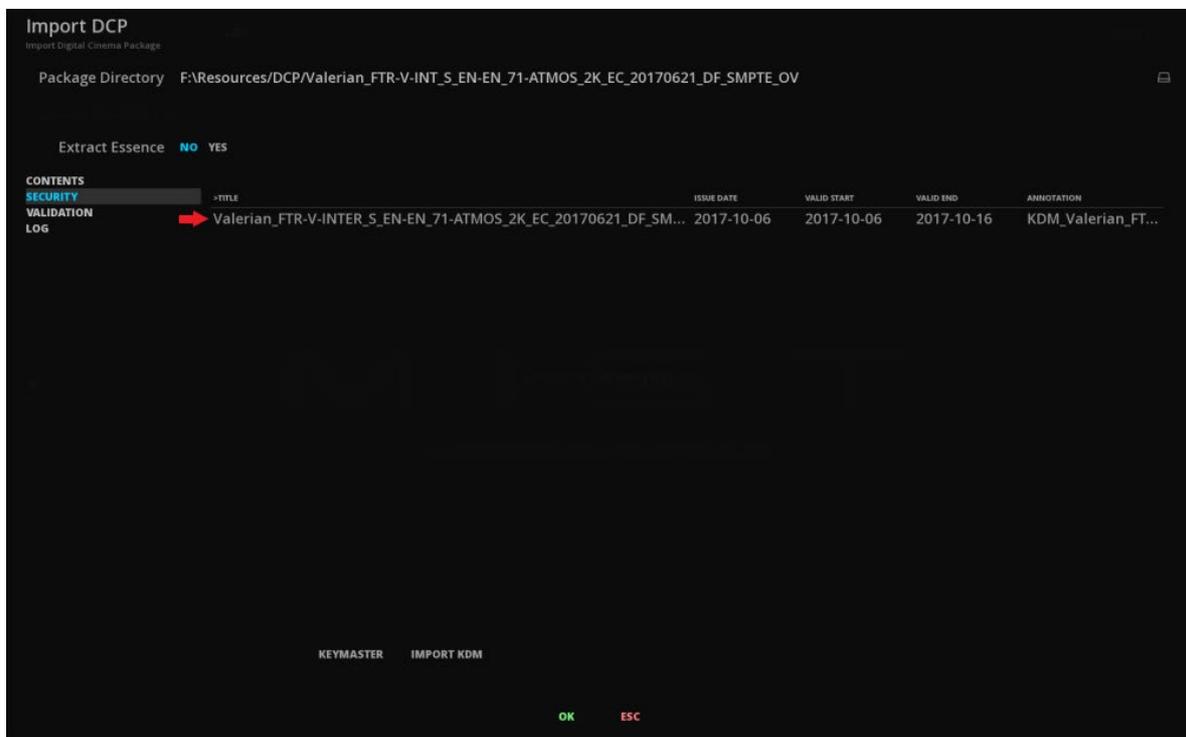
ICE scans the DKDM folder when you import a secure DCP to find the KDM referenced by the Secure DCP itself to decrypt its RSA and AES keys as well as the subsequently AES encrypted essences.

The following address shows where the DKDM folder is located in a ICE DCI mastering station:

C:\Users\your_login_name_here\AppData\Roaming\MarquiseTechnologies\dkdm

As long as the unaltered KDM is placed in this folder ICE will automatically parse the contents of this folder and determine the proper KDM for each DCP CPL it needs to decrypt. You may store as many KDMs in the DKDM folder as you like but it is a good idea to store the originals in another location and purge the DKDM folder periodically for the sake of organization.

- To import the KDM click on the **Import KDM** button then in the new opened window, navigate to find your KDM file through the system. The loaded key appears in the KDM list:

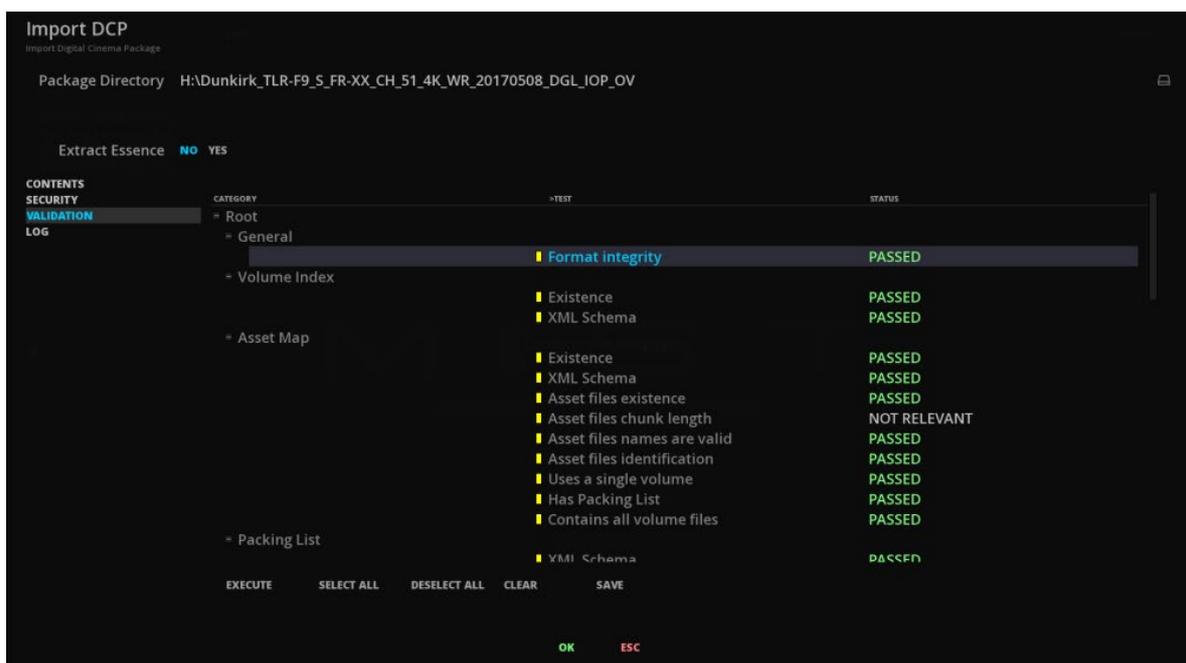


If the KDM is not correct and therefore can't unlocked the content, ICE will load the composition but from the Viewport, the file will appear as corrupted (i.e. noisy pictures etc).

Even if you can not access the content as it is read in case of a faulty key, ICE still allows you to import the package to access its structure.

Validation tab

When importing a DCP, it is possible to launch a Validation in order to check the integrity of the package. Test are based on standards used by DCI specifications.



- To run a validation test, click on **EXECUTE**. ICE then displays progress bars at the bottom of the window. The package is analyzed in its entirety and depending on its size, the time required to analyze one DCP from another may vary.

The **SELECT ALL** and **DESELECT ALL** buttons allow you to select and deselect the tests in the list. The **CLEAR** button is used to erase the last status of past tests.

As soon as the validation test is finished you have the possibility to export a detailed analysis as a PDF report. To do this, click **SAVE** and set the destination path for this report. The purpose of each test is detailed in the report in order to be able to rectify a possible error in case of failed test.

The report has several types of status:

- PASSED** Displayed in green. The test in question was successfully completed.
- FAILED** Displayed in red. The test has failed.
- WARNING** Displayed in yellow. Unlike the **FAILED**, this test result will not prevent the operation of the DCP. Nevertheless, it draws your attention to some results.
- NOT RELEVANT** Displayed in white. The test is not relevant to the package. It can not succeed or fail. (e.g. Key delivery test category for a non encrypted DCP).
- N/A** Test has not been performed yet.



An explanation of the validation tests performed by ICE can be found in the Appendix [DCP Validation](#).

Log tab

The **LOG** tab displays all informations regarding processes launched from the Import DCP tool with timestamp, severity and description. If a DCP package is corrupted and ICE cannot open it, ICE will automatically opens on the Log window and will details the errors found in the package.

TIMESTAMP	SEVERITY	ERROR	DESCRIPTION
2018 10 25 09...	Information		Trying to load H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/VOLI...
2018 10 25 09...	Information		Trying to load H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/ASSE...
2018 10 25 09...	Information		Loaded H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/PKL_259759...
2018 10 25 09...	Information		Loaded H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/CPL_a01e05...
2018 10 25 09...	Information		Found #1 CPL(s)
2018 10 25 09...	Information		Succeeded opening H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV ...
2018 10 25 09...	Information		Trying to load H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/VOLI...
2018 10 25 09...	Information		Trying to load H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/ASSE...
2018 10 25 09...	Information		Loaded H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/PKL_259759...
2018 10 25 09...	Information		Loaded H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/CPL_a01e05...
2018 10 25 09...	Information		Found #1 CPL(s)
2018 10 25 09...	Information		Succeeded opening H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV ...
2018 10 25 09...	Information		Trying to load H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/VOLI...
2018 10 25 09...	Information		Trying to load H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/ASSE...
2018 10 25 09...	Information		Loaded H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/PKL_259759...
2018 10 25 09...	Information		Loaded H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV/CPL_a01e05...
2018 10 25 09...	Information		Found #1 CPL(s)
2018 10 25 09...	Information		Succeeded opening H:\Dunkirk_TLR-F9_S_FR-XX_CH_51_4K_WR_20170508_DGL_IOP_OV ...

Confirm the import

If you don't need to run any validation test or load of KDM, you can go directly to this step. At this stage you are ready to begin the Import DCP process so click on the **OK** button.



Although each DCP CPL will generate a Composition in ICE, this does not apply to the media assets. In a DCP, a video, audio or subtitle track can be referenced by more than one composition. These tracks will only be imported once in the project library.



In the case of importing a Supplemental DCP, first import the original version **before** the supplemental version. Otherwise, some assets referenced by the supplemental version would be missing.

14. MISCELLANEOUS

14.1. About ICE configuration

An ABOUT section in ICE gives you the essential overview about your system configuration.

It displays information the installed version of the system and its release date. When asking for some support, this information panel will help the user answering the first question: “on what version of ICE are you working on?”

- The ABOUT section is accessible by pressing the keyboard key **F12**.

14.1.1. Release

This panel displays the version number of ICE currently running:

14.1.2. License Information

This panel recaps what options are included with the current License (if any).

14.1.3. System Information

This panel displays information about the system that runs ICE, like number of processors used or the type of GPU.

14.1.4. Plugins

This panel displays the plugins (options) that are currently installed with your version of ICE:

14.1.5. System Certificates

This panel displays information about the digital certificate that has been automatically created for your ICE and where it is located. This certificate needs to be given to create KDMs for ICE.

14.2. Where to find certificates for ICE

14.2.1. Public Certificate containing its Public Key and Digital Signature

Name	ICE.cert.sha256.crt
Location	C:\Users\your_login_name_here\AppData\Roaming\Marquise Technologies\certificates
Purpose	This file contains ICE's public key and digital signature. It must to be sent to any DCI mastering station that needs to create a secure DCP for use by ICE.

14.2.2. Public Certificate Chain

Name	ICE.chain.sha256.pem
Location	C:\Users\your_login_name_here\AppData\Roaming\Marquise Technologies\certificates
Purpose	This file contains the entire certificate chain of digital signatures of the ICE. It is required if the certificate needs to be verified. It may be distributed freely in accompaniment with the Public Leaf Certificate. .pem = Privacy-enhanced Electronic Mail.

14.3. Validation

In this section you will find some detailed explanations of the different validation tests performed by ICE for DCP and IMF Packages.

14.3.1. DCP Validation

Conformity

This test checks that the all assets including the ASSETMAP follow the VOLINDEX compliance (i.e. strictly either SMPTE or InterOp).



A failure on this tests may prevent ingest or playback.

Composition Playlist

Is TKR (Theatre Key Retrieval) Enabled

This test checks that Theatre Key Retrieval (TKR) is enabled for the Composition Playlist(s).



A failure on this test DOES NOT prevent ingest or playback.

Reel & Track Intrinsic Durations Match

This test checks that the reel intrinsic durations and track file intrinsic durations match.



A failure on this test could prevent ingest or playback.

Reel Durations Are Valid

This test checks that the reel durations match the asset durations. A failure on this test could prevent ingest or playback.

*Reel Tracks Are Homogeneous

This test checks that all the reels of a Composition Playlist have the same track configuration (i.e. picture/audio/subtitles).



A failure on this test could prevent ingest or playback on some systems.

Reels Have Audio

This test checks that the reels have an audio track.



A failure on this test could prevent ingest or playback.

Reels Have Picture

This test checks that the reels have a picture track.



A failure on this test could prevent ingest or playback.

Track Encryption is Homogeneous

This test checks that the tracks across the reels have a homogeneous encryption status.



A failure on this test should not prevent ingest or playback.

Key Delivery Message

Lifetime Is Valid

This test checks if the lifetime of the Key Delivery Message(s) matches the lifetime of the signing certificates.



A failure on this test will prevent the ingest of the KDM(s).

Metadata Is Valid

This test checks if the metadata in the Key Delivery Message(s) is valid.



A failure on this test will prevent the ingest of the KDM(s).

X509 Signature

This test checks for the presence of the X509 digital signature in the Key Delivery Message(s).



Digital signature is mandatory, if not present the KDM(s) is/are not valid and ingest will fail.

Trackfile(s)

Frame Boundaries Are Valid

This test checks that the first and last frame of the track file can be accessed. A failure on this test could prevent ingest or playback. This test checks that the first and last samples of the track file can be accessed.



A failure on this test could prevent ingest or playback.

Trackfile(s) last at least one second

This test checks that the trackfiles last at least one second.



A failure on this test could prevent correct playback on some old servers.

Picture Characteristics Are Valid

This test checks that the characteristics of the picture trackfiles are valid.



A failure on this test could prevent ingest or playback.

Picture Data Rate Is Valid

This test checks that the bitrate of the picture trackfiles is valid.



A failure on this test could prevent correct playback.

Sound Characteristics Are Valid

This test checks that the characteristics of the sound trackfiles are valid.

A failure on this test could prevent ingest or playback.

Subtitle Font File Resources Are Valid

This test checks that the font file resources are valid (i.e. must be OTF or TTF format).



A failure on this test could prevent ingest or playback.

Subtitle Font File Sizes Are Valid

This test checks that the font file sizes are valid (i.e. do not exceed 640kB for InterOp).



A failure on this test could prevent ingest or playback.

14.3.2. IMF Validation

Composition Playlist

Has Extension Properties

This test checks the presence of the application ExtensionProperties in the Composition Playlist(s).

Has Timecode

This test checks the presence of the timecode information inside the Composition Playlist(s).

Edit Rate Is Homogeneous

This test checks if the EditRate of the resource(s) matches the Edit Rate of the Composition Playlist(s).

Has At Least One Content Version ID

This test checks if at least one ContentVersion instance is present in the Composition Playlist(s).

Has At Least One Main Audio Virtual Track

This test checks if at least one MainAudio virtual track is present in the Composition Playlist(s).

Has Exactly One Main Image Virtual Track

This test checks if one and only one Main Image virtual track is present in the Composition Playlist(s).

Has Homogenous Virtual Track Durations

This test checks that all the virtual tracks in the Composition Playlist(s) has the exact same duration.

Segment Durations Are Valid

This test checks that the duration of segments is valid. The duration constraints depended on the edit rate. For non-integer edit rates the duration of a segment must be a multiple of 5 frames.

Output Profile List

Composition Playlist Exists In Volume

This test checks that the Composition Playlist referenced by the Output Profile List exists in the volume. A warning indicates that the Composition Playlist is external to this volume.

Has Exactly Once Preset Macro

This test checks that Simple OPLs contain a single Preset Macro instance.

OPLs with more than one Preset Macro are invalid and result in an ingest failure.



Macro Names Are Unique

This test checks that each macro in the Output Profile List(s) has a unique name.



Duplicate names will result in an ingest failure.

Preset Macro Is Defined

This test checks that Preset Macro(s) use a predefined URI known to the local host.



Unknown URIs will not trigger any preset macro processing.

X509 Signature

This test checks for the presence of the X509 digital signature in the Output Profile Lists(s).



Digital signature is optional, unless the assets are encrypted.

XML Schema

This test checks the XML schema of the Output Profile List file(s).



An error in the XML schema validation may result in an ingest failure.

Trackfile(s)

Essence Boundaries Are Valid

This test checks that the first and last frame/sample of the of a track file can be accessed.



A failure on this test could prevent ingest or playback.

Image Characteristics

This test checks the image characteristics of the track files against the the Application Specification constraints.



A failure on this test may prevent ingest and/or playback on some systems.

Asset Map

Contains All Volume Files

This test checks if all the files contained in the volume are referenced in the ASSETMAP file.



A volume that contains non referenced files might fail to ingest.

Exists

This test checks the presence of the ASSETMAP file at the root directory of the volume.



A package cannot be opened without this file.

File Names

This test checks that all the files listed in the ASSETMAP have a name that is compliant with the restrictions listed in ST429-9:2014 Annex A. These restrictions imply that path segments and file name do not contain other characters than: {a..z, A..Z, ., -, _}.



File names that does not follow the rules listed in ST429-9:2014 Annex A may fail to ingest and/or prevent playback.

File Sizes

This test checks that all the files listed in the ASSETMAP have a size that exactly matches the stored size.



A file with a size different from the one found in the ASSETMAP is probably corrupted and may fail to ingest.

15. Troubleshooting

15.1. General use

15.1.1. Sharing licenses between Windows users

The use of the software is possible between several Windows account. Nevertheless, it will be necessary for each new Windows user profile to re-install the license files as indicated in the chapter [Software Installation](#).

The licenses to install are the same as those that were provided to you regardless of the user of a same workstation.

Since the license file is installed in a directory folder specific to the Windows account in use, the license file can not be shared and used for another account.

15.2. User Interface

15.2.1. Reactivity

The software uses OpenGL for the user interface display. OpenGL refreshes the screen based on the driver settings.

While various driver features may affect the refresh rate of the screen, one of the most common reasons is the activation of the V-Sync (vertical sync). If the V-Sync is set on, then the user interface won't refresh faster than the maximum refresh rate of the screen mode in use (usually 60Hz, i.e. 60 fps).

Disabling the V-Sync can solve the problem. Please consult the section on the GPU configuration.

15.2.2. Screen Resolution

The user interface has been designed to use a resolution of minimum 1920 x 1200 pixels. The software will start even with a resolution of 1920 x 1080, but a warning message will be displayed. Resolutions lower than 1920 x 1080 are not supported and the software will refuse to start.

15.3. HDMI Output

15.3.1. No video output on HDMI

HDMI output must be enabled in the Video Output tab in the Project settings.

15.3.2. Video output does not work on some formats

Depending on the video I/O card used, some video formats (mostly UHD/4K) will prevent HDMI output when using a RGB 16bit pixel format. This issue is related to the lack of resources of the video I/O card. Please check your card manufacturer the limitations for the specific model you are using.

15.4. Audio output

15.4.1. No audio output available on any of the installed soundcards

The software does not support audio output on 3rd party soundcards. Currently audio output is only available through the video I/O card if one is installed in the system

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