videoQC

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About videoQC

videoQC is a video and audio analysis and playback tool with both visual and automated quality checking tools.

videoQC GUI

videoQC is a file and IP stream player, with support for a wide range of broadcast and production files, as well as various IP stream input types.

videoQC can take files coming into your facility and perform a series of tests on the video, audio and metadata values. It can analyze the audio and video in the files and compare your files against a template or a known good file.

It includes metadata extraction, comparison and templating tools, intuitive charting of audio and video metrics, a full set of audio and video waveform/vectorscope/phase tools, db and PDF reporting, file to file visual comparison and clipping and exporting tools. The standard database format allows seamless and instant sharing of analysis results. Hot folders allow automation, optimizing those in the QC workflow

videoQC's automated server components can run headless (no interface) for analysis tools. Integration with Net-X-Code suite provides quality control for IP based workflows.

Each level of videoQC was designed to fill a particular part of the Quality Control workflow, from intern to master QC operators and even back end servers.

videoQC Versions

videoQC is available in as a desktop application in four versions:

videoQC Workstation

- Automated video and audio metric generation, HTTP remote control and monitoring, Single ended analysis of metadata and audio/video, PSNR, SSIM, MS-SSIM analysis, and Full Reference Comparisons - original to source
- File clipping and export, Audio routing, Automated metadata comparison to template, Video and audio metric charting, PDF of results, RS-422 serial control as a VTR.
- R.128 Loudness audio meters, Closed caption display, CEA-608, CEA-708, OP-47, Subtitle formats, SDI HDMI output with AJA, Bluefish444 or Blackmagic card, Full set of audio and video scopes, Hex/decimal pixel display.
- Player/View, most standard broadcast and post production files. Supports SD, HD, 2K, QHD, 4K., 8K Provides Time code, metadata display, RMS/Peak Audio meters.

videoQC Inspect

- File clipping and export, Audio routing, Automated metadata comparison to template, Video and audio metric charting, PDF of results, RS-422 serial control as a VTR.
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videoQC Pro

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videoQC View

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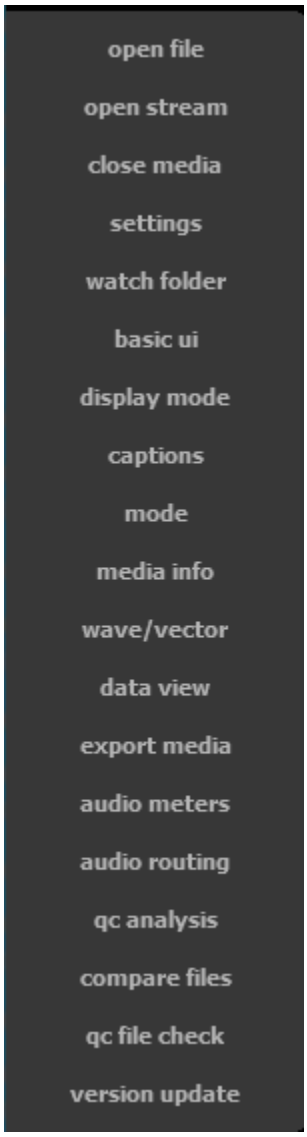
Options

There are options to add the licensable codecs: CineForm, and Avid DNxHD/DNxHR.
There is also an option to purchase annual support, which provides enhanced support and includes all version updates.

Controls and Displays

Using the Main Menu

The main menu is conjured whenever the user moves their mouse near the left edge of the GUI. Here is the main menu:



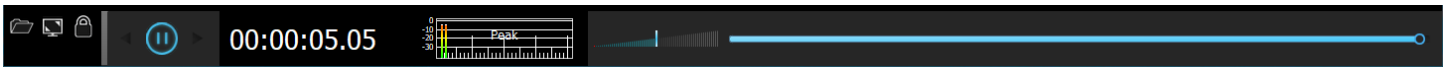
Transport Controls and Displays

The transport controls and displays are located along the bottom of the videoQC GUI.

videoQC has two modes for its main display: Basic mode and Advanced mode. The user can switch between the two modes using the main menu.

Basic Mode

Basic Mode features a limited set of controls for more viewing area:



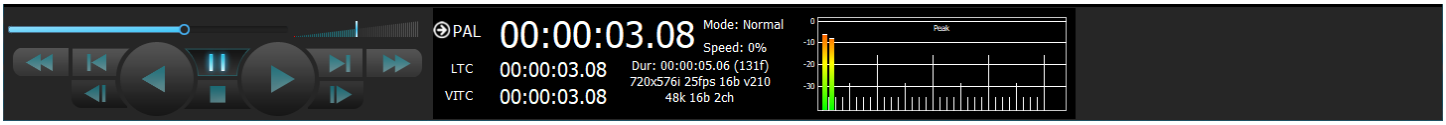
Basic Mode display

From left to right, the controls are:

- **Load Media** – opens a browser so the user can load media to play and analyze.
- **Toggle Fullscreen** – switch between full screen mode and less than full screen.
- **Toggle Lock/Unlock –** switch between having the controls docked, or separate.
- **Reverse Play, Pause, Play** buttons – The most basic transport controls are presented. Note that the standard j-k-l keyboard transport controls are always available.
- **Time Code** display – provides the current time code location.
- **Audio** meters – provides audio meters to confirm levels during playback for up to 16 audio meters showing peak/RMS or r.128/1194 EBU loudness levels. The line 0 corresponds to -24 decibels.
- **Volume** slider – allows the user to adjust their playback level. Zero volume would be slid to the left, and as the slider is moved to the right, the volume is increased. The center of the slider indicates 100%, or normal playback level. Sliding all the way to the right sets the volume to 200%.
- **Position** slider – shows the current position within the file. Clicking on the Position Bar cues the clip to that relative location. To scrub through the file, 'grab' the pointer and 'drag' it toward the relative location you're looking for.

Advanced Mode

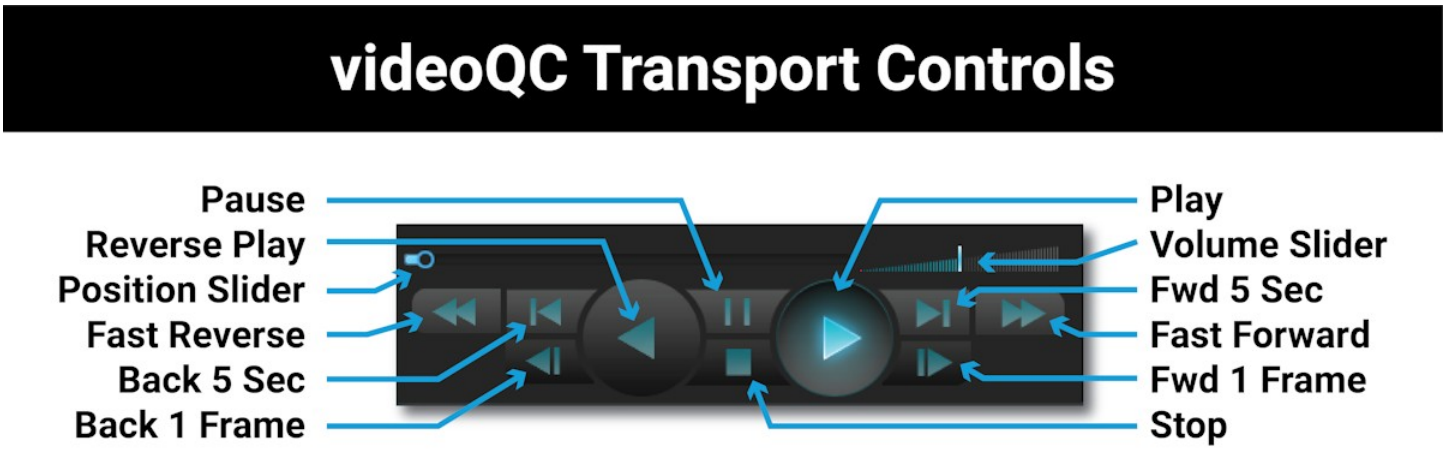
Advanced Mode features a more comprehensive set of controls and displays for media transport.



Advanced Mode Display

The interface can be changed between the two modes using the Basic/Advanced menu setting.

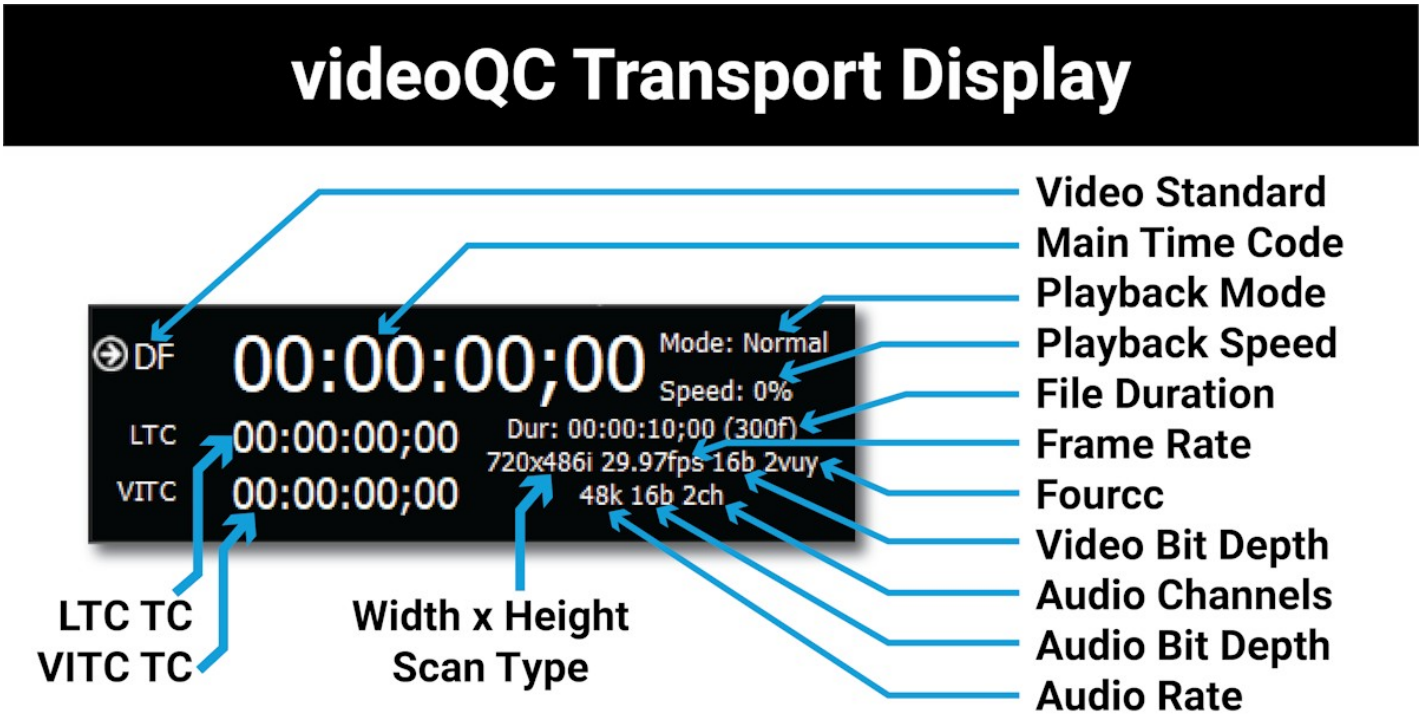
Under windows, the menu is available on the left pop out menu. Under macOS and Linux, it is the first menu under the View menu.



Transport section

Pause button - Stop any playback and display the frame at the current location.
Reverse Play button - Play the clip in reverse at negative normal play speed (-100%).
Position Slider - The pointer indicates the current position in the clip. Clicking on the Position Bar cues the clip to that relative location. To scrub through the file, 'grab' the pointer and 'drag' it toward the relative location you're looking for.
Fast Reverse button - Play the clip from the cued point in reverse at the fastest possible speed.
Back 5 Seconds button - Cue to a point 5 seconds prior to the current location, or the beginning if the current location is less than 5 seconds into the clip.
Back One Frame button - Cue the frame immediately prior to the current frame.
Play button - Play the clip forward at normal play speed (+100%).
Volume slider – May be used to adjust the volume of the audio during playback. Zero volume would be slid to the left, and as the slider is moved to the right, the volume is increased. The center of the slider indicates 100%, or normal playback level. Sliding all the way to the right sets the volume to 200%.
Forward Five Seconds button - Cues to a point 5 seconds after the current location, or the end if the current location is less than 5 seconds before the end of the clip.
Fast Forward button – Play the clip from the cued point forward at the fastest possible speed.
Forward One Frame button - Cue the frame immediately after the current frame.
Stop button - Stop any playback in progress and cue the first frame of the clip.

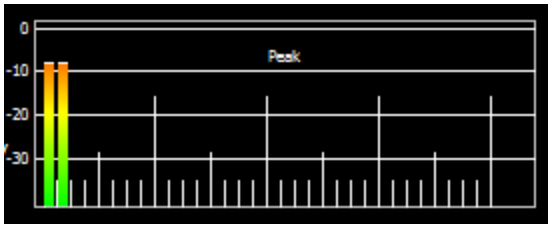
Time Code Display advanced mode display:



LTC time code display – longitudinal time code if present
VITC time code display – vertical interval time code if present
Width, Height, and **Scan** method – height and width in number of pixels, and where available, whether the file is Progressive, Progressive Segmented Frame, or Interlaced
Video Standard – displays the current video standard, and allows the user to choose which time code source is displayed in the Main Time Code window. Sources include TC (time code), LTC, VITC, and Frame.
Main Time Code display - displays the current time code location, based on which source has been selected. The time code may be copied using Ctrl+C, and pasted into another application. Alternately a time code location may be pasted into this field to cue up a specific location.
Playback Mode – choices include Normal, Loop, and Palindrome
Playback Speed – as a percentage of 100.
File Duration – length of the file, displayed as HH:MM:SS:FF, also displayed as number of video frames.
Frame Rate – number of frames per second
Fourcc (Codec) identifier – an internal identifier for the specific codec used
Video Bit Depth - the number of bits used for each color component of a single pixel
Number of Audio Channels – how many audio channels are currently set up
Audio Bit Depth - the number of bits of information in each sample
Audio Rate – the audio sample rate in kHz

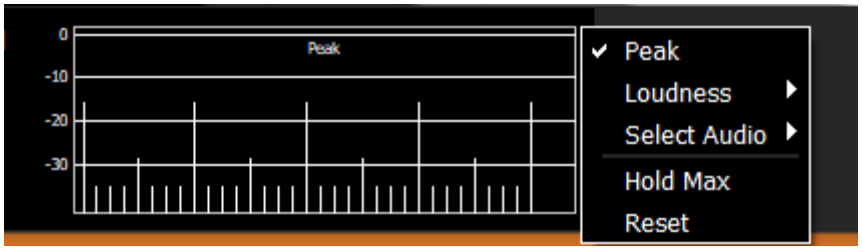
Audio Monitor Setup

The audio monitor setup is available in either the basic ui or the advanced ui by clicking on the audio meters.



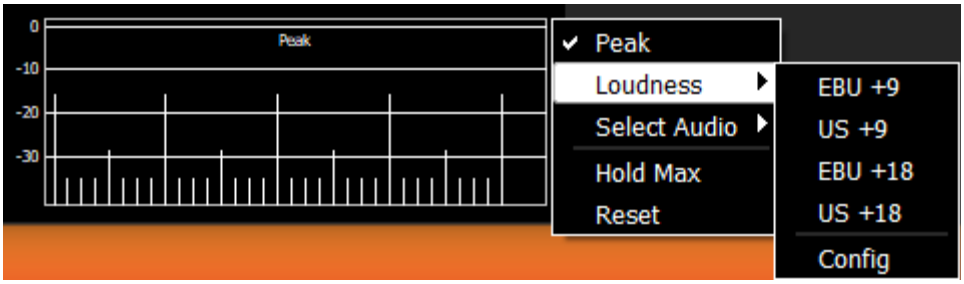
Audio Meters display advanced mode - Up to 16 audio meters showing dBFS RMS audio.

Clicking on the audio meters offers setup control for the audio output.



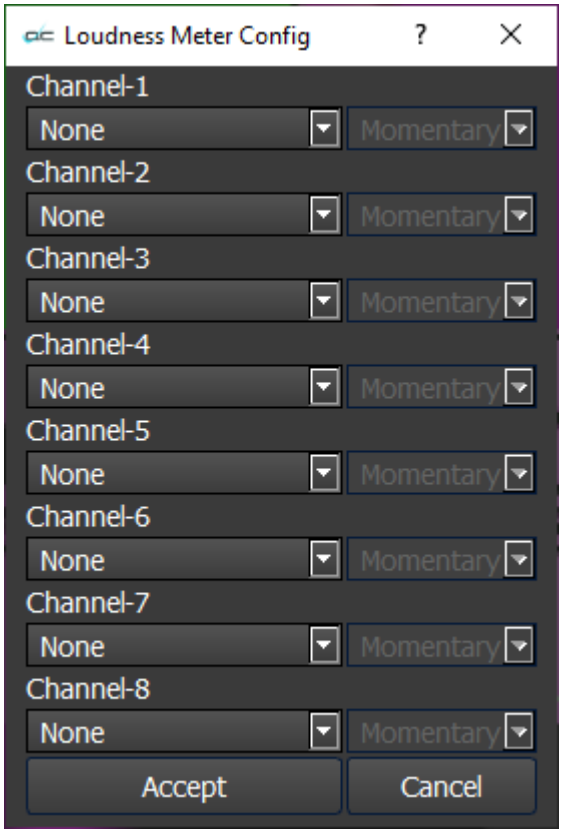
The Peak/RMS meters are selected using the link at the top, and will be checked when in Peak/RMS mode.

Clicking on the **Loudness** pulldown offers the following menu:



The **Loudness** configuration lets the user select between: EBU +9, US +9, EBU +18, and US +18 audio scale settings.

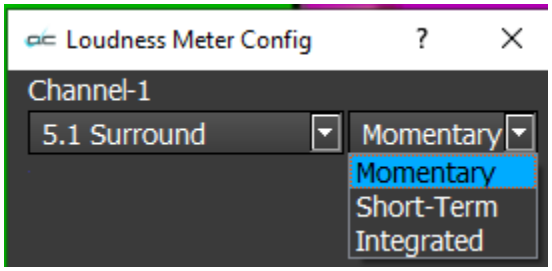
Selecting the **Config** option opens the audio output configuration dialog:



In the **Loudness Meter Config** dialog, the user can click on a Channel's pulldown menu to reveal the following audio loudness meter setup options:

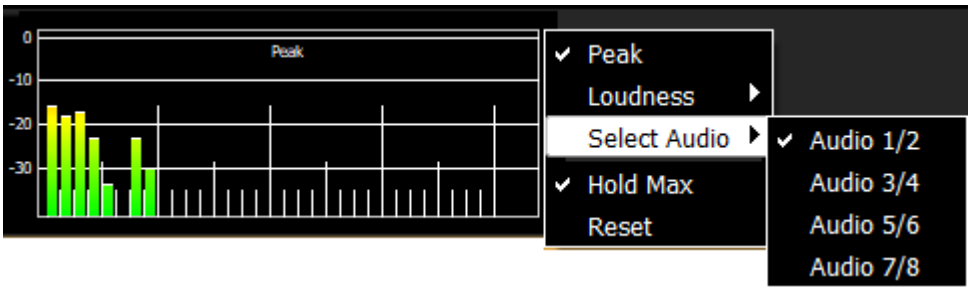
None
5.1 Surround
5.1-Pro Tools - L C R Ls Rs Lfe
5.1-Smpte - L R C lfe Ls Rs
5.1-AAC - C L R Ls Rs Lfe
5.1-DTS - L R Ls Rs C Lfe
Stereo Pair 1
7.1-Surround
7.1-Pro Tools - L C R Lss Rss Lsr Rsr Lfe
7.1-Smpte - L R C Lfe Lss Rss Lsr Rsr
7.1-EXT - L R C Lfe Lsr Rsr Lss Rss
7.1-Dolby - L C R Ls Rs Lfes Bsl Bsr
Stereo Pair 2

With a loudness setting selected for the channel, the user can set the peak indicator behaviour.



Momentary – momentarily allow the white peak indicators to remain at their highest level, then allow them to fall back down to the top of the channel level.
Short Term – Hold peak for 4 seconds, then drop to the top of the channel level.
Integrated – leave the white peak indicators at the top of the channel level.

The **Select Audio** pulldown lets the user select between available audio channels to monitor. This also sets which audio pair is fed to the audio scopes.

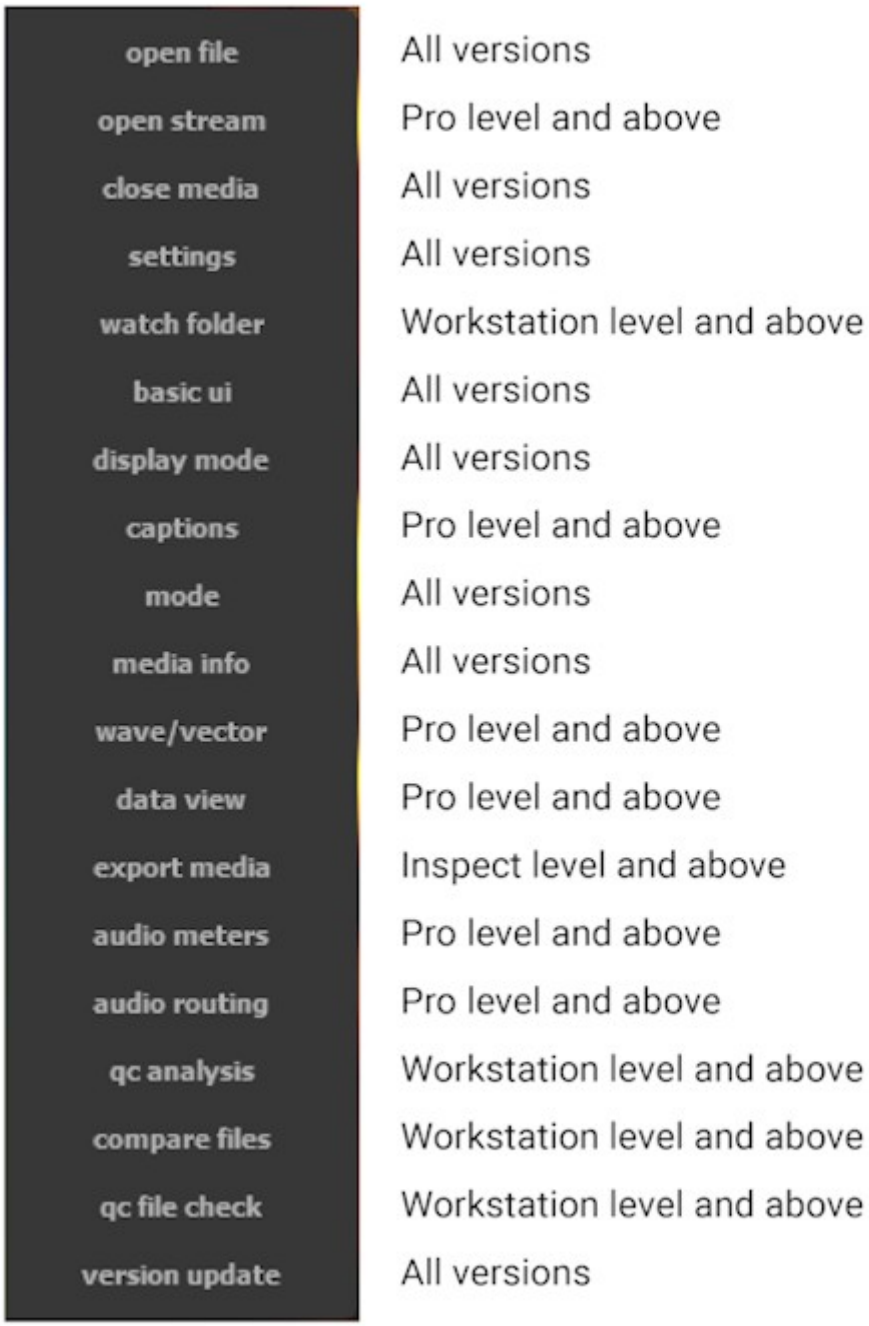


Hold Max – when selected, the peak indicators will remain at the highest level the channel has reached.

Reset – clear any audio loudness settings and return to default values for audio monitoring.

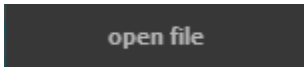
Controls Available via the Main Menu

In Windows, the main menu is displayed upon opening. It arises on the left side of the display area when the user moves their mouse toward the left edge of the GUI. A number of controls and displays can be accessed through the menu. Not all features are present in all versions. So depending on the level of videoQC licensed, some of the below controls seen below will be disabled.

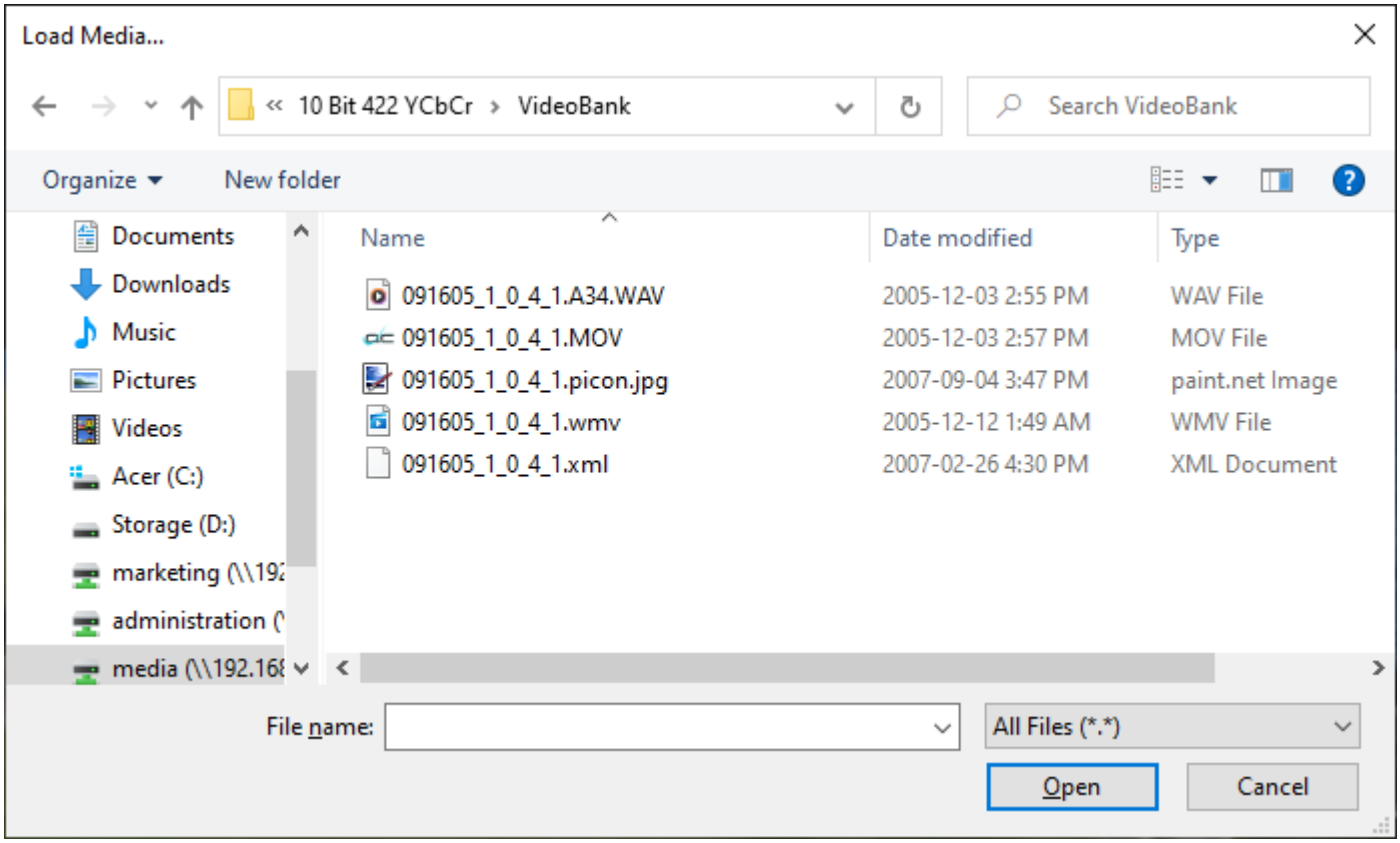


Once video has been loaded, the menu disappears but can be called up by moving the mouse to the left of the display area. The menu offers access to a wide range of system controls, settings dialog boxes, and signal analysis tools.

Open File

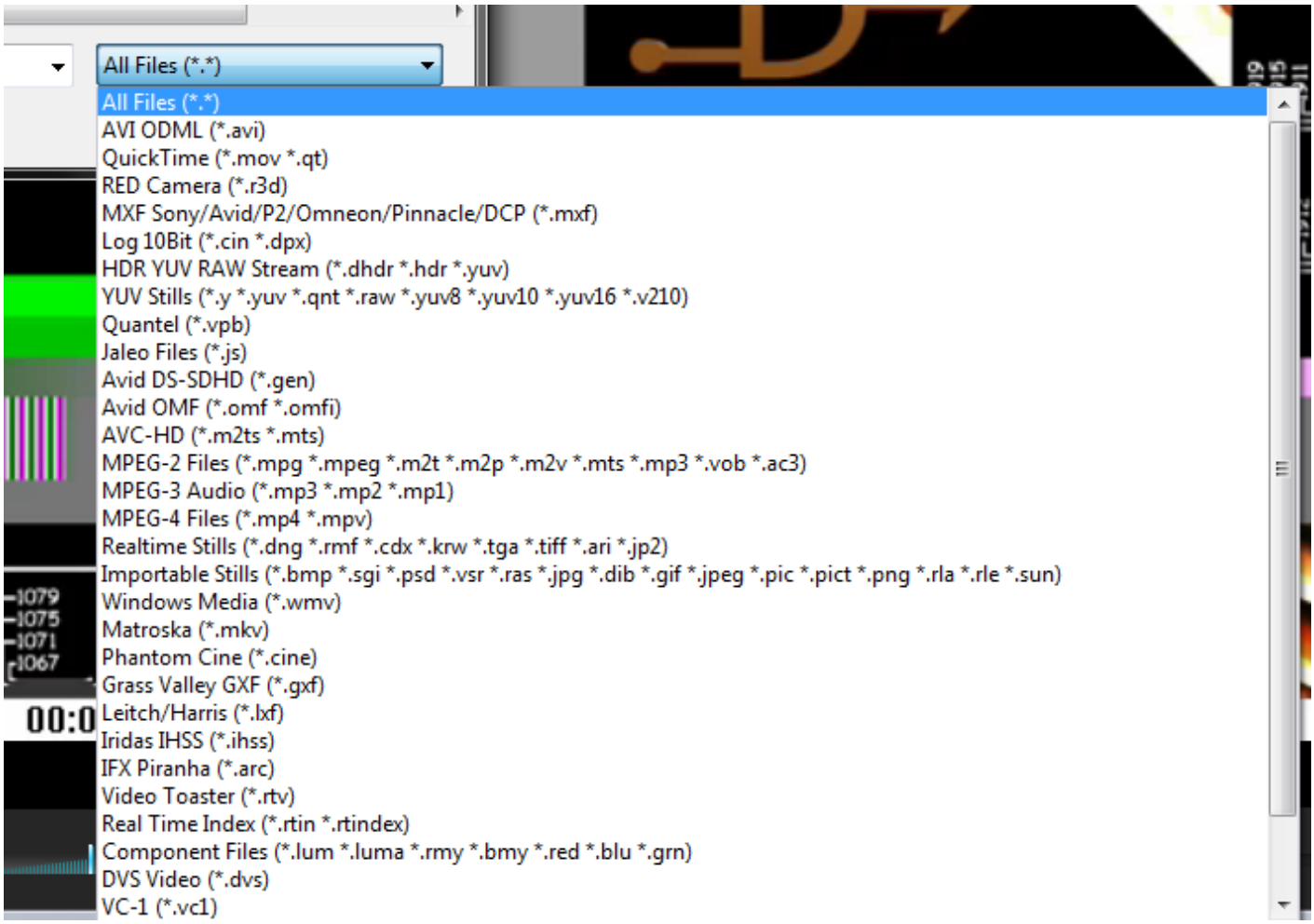


Open File button - pressing the Open File button opens the **Load Media** window, which allows the user to browse to an accessible media file and load it into videoQC.



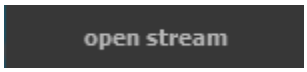
Load Media window

Load Media File Type Filter

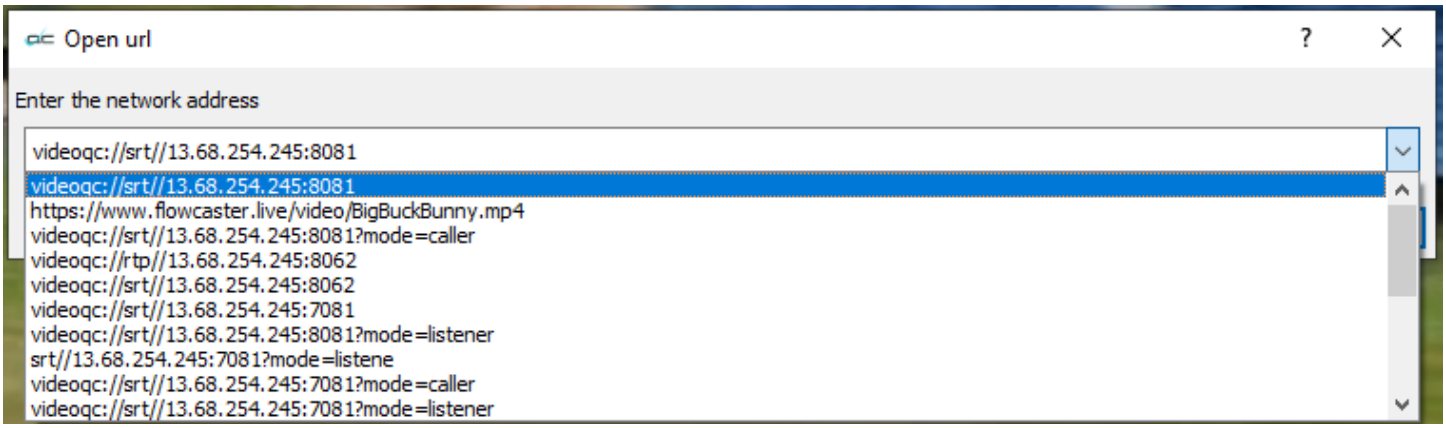


Pressing the **All Files*** button reveals a list of file types. Selecting a file type from this list lets the user search by specific file type, to help locate files more quickly.

Open Stream



Open Stream button - Opens the **Open url** window, which allows the user to select between the available streams or video assets online. This list will be populated by the most recent sources selected. You can also enter a known IP stream string via the keyboard to search for it.

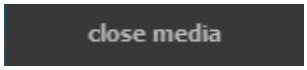


Once the user has entered the network address into the URL field, pressing the **OK** button loads the stream for viewing.

For tips on using IP Streaming URLs in videoQC, please see:

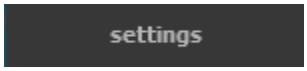
Using Video IP Streaming

Close Media

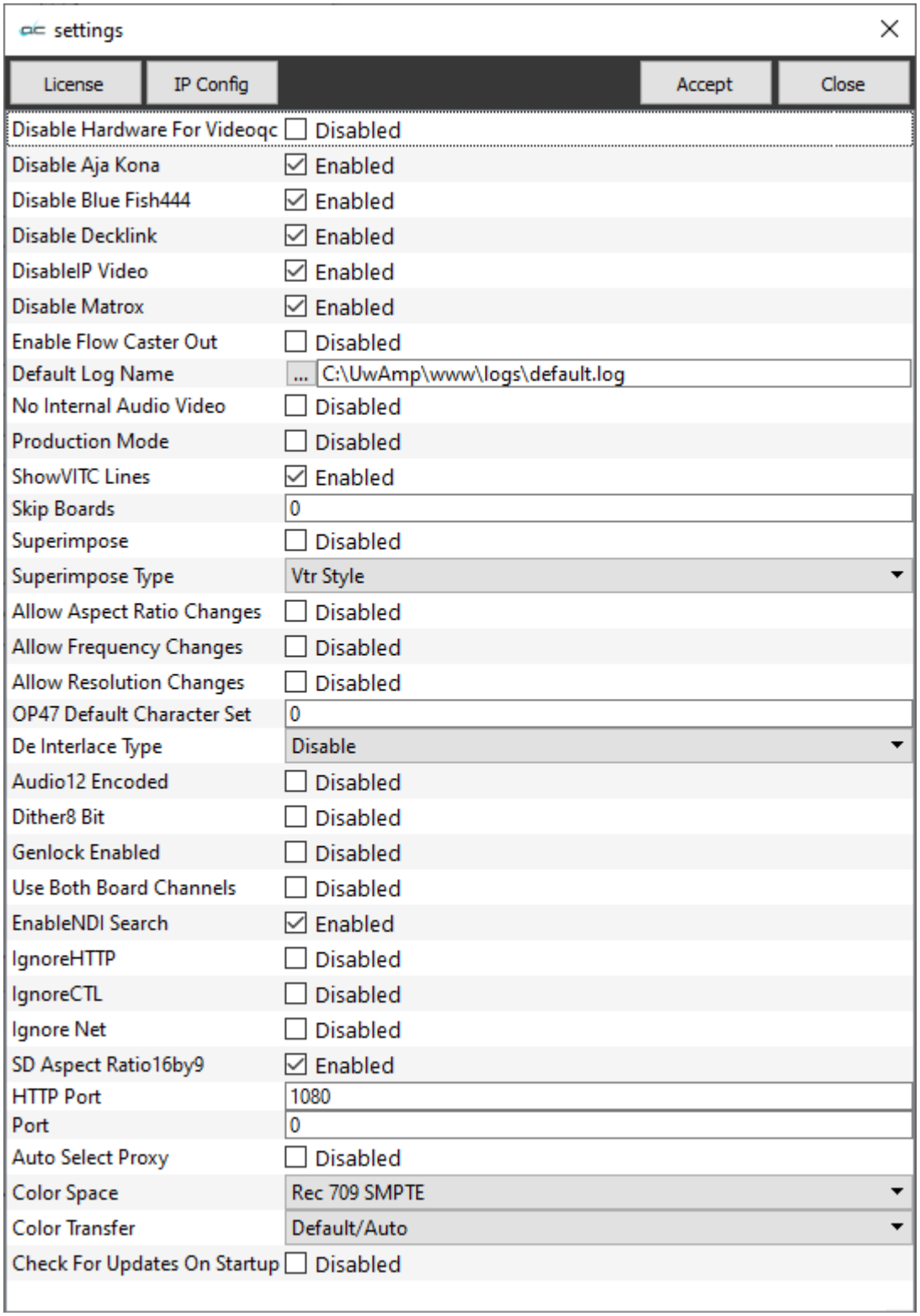


Close Media button - Close the current file. This action does not clear the screen, but it does release the file itself, so it may be moved, renamed, deleted, etc.

Settings

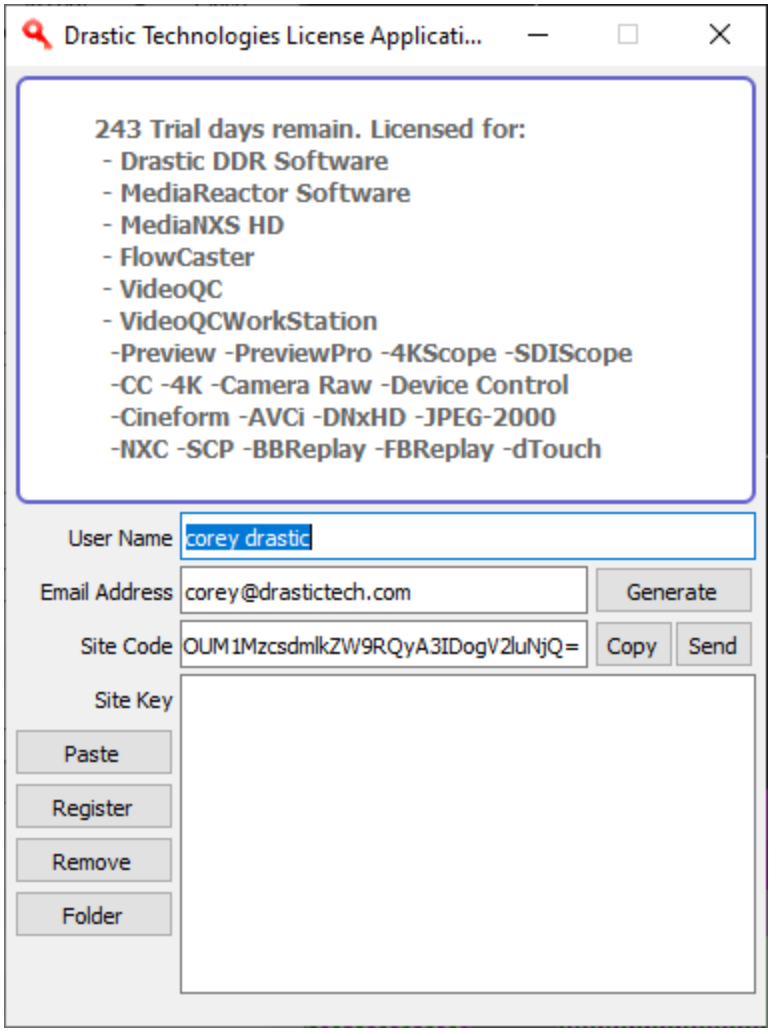


Settings button - Open the **Settings** window



License

On the Settings window, press the **License** button to open the licensing dialog.



The top field displays the current status of the license.
The **User Name** field allows the user to type in a first and last name during the licensing process.
The **Email Address** field allows the user to type in the email at which they would like to receive the site key for their license.
Once the name and address fields have been filled out, pressing the **Generate** button populates the **Site Code** field with a string of alphanumeric characters. This string is the Site Code.
The **Site Code** field is where the site code displayed during the licensing process. Ths user may select the site code and use Ctrl+C to copy it to the clipboard, or use the **Copy** button. The user will need to send the site code to Drastic Authorization to get a Site Key to enable the license.
If the system has been set up with email, pressing the **Send** button will open a new email to Drastic Authorization, with the site code in the body of the email.
Once a reply email containing the **Site Key** has been returned by Drastic Authorization, the user may select it and copy it, then paste it into the Site Key field either using the **Paste** button or Ctrl+V.
Once the Site Key has been pasted into the **Site Key** field, pressing the **Register** button registers the license. The system may need to be restarted for the change in license status to be updated.

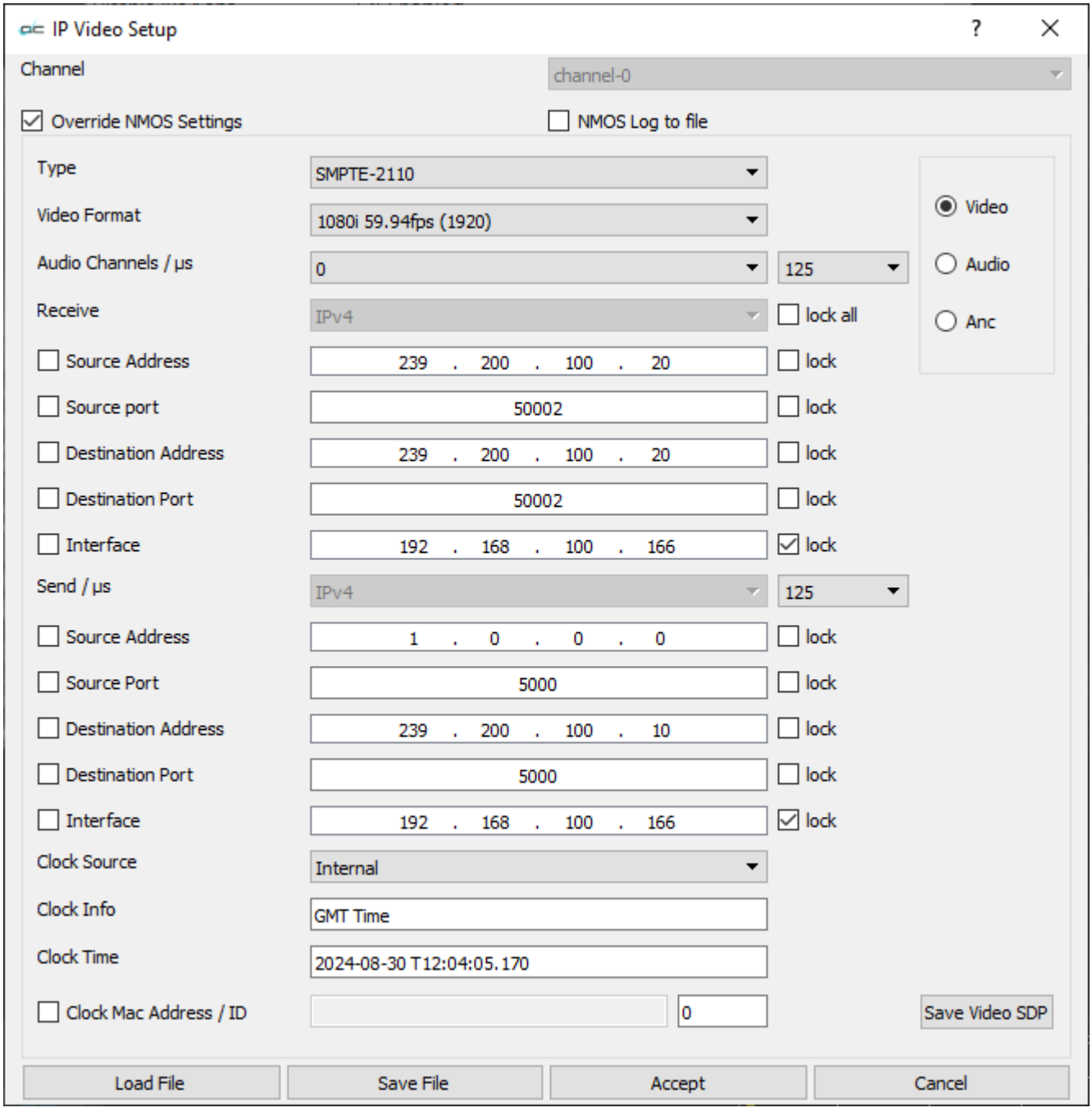
IP Config

Press the IP Config button to open the IP Video Setup window.

IP Video Setup controls the settings for ST-2110, ST-2022, and TR-01 streams. Note that these stream formats require capable hardware – please contact Drastic for more info.

There are separate settings for Video, Audio, And Ancillary data streams.

IP Video – Video Stream Settings



Channel pulldown menu – for multichannel systems, select between available channels.
Override NMOS Settings checkbox – disable any default NMOS (Networked Media Open Specification) settings.

Type pulldown menu – select between available internet stream types. This dialog is for setting up ST2110, ST2022-6, and optionally TR-01 streams.

Video Format – provides a pulldown menu to set the video input, whether HD, Quad HD, 4K etc.

Audio Channels / µs – provides a pulldown menu to set the number of channels in the system, and a pulldown to select between microsecond settings.

Receive pulldown menu and **Lock All** checkbox – select between available internet protocol types to receive. The Lock All checkbox locks all the IP addresses together.

Receive Source Address field and **Lock** checkbox – type in the receive source IP address. The Lock checkbox locks this IP address.

Receive Source Port field and **Lock** checkbox – type in the receive source port. The Lock checkbox locks this IP address.

Receive Destination Address field and **Lock** checkbox – type in the receive destination source IP address. The Lock checkbox locks this IP address.

Receive Destination Port field and **Lock** checkbox – type in the receive destination source port. The Lock checkbox locks this IP address.

Receive Interface field and **Lock** checkbox – type in the receive interface IP address. The Lock checkbox locks this IP address.

Send pulldown menu – select between available internet protocol types to send

Send Source Address field and **Lock** checkbox – type in the send source IP address. The Lock checkbox locks this IP address.

Send Source Port field and **Lock** checkbox – type in the send source port. The Lock checkbox locks this IP address.

Send Destination Address field and **Lock** checkbox – type in the send destination IP address. The Lock checkbox locks this IP address.

Send Destination Port field and **Lock** checkbox – type in the send destination port. The Lock checkbox locks this IP address.

Send Interface field and **Lock** checkbox – type in the send interface IP address. The Lock checkbox locks this IP address.

Clock Source pulldown menu – select between available clock sources

Clock Info field – displays the time setting

Clock Time field – displays the time in YYYY/MM/DD THH:MM:SS:FFF

Clock Mac Address / ID – Enter the clock mac (Media Access Control) address, and the system ID.

Video/Audio/Anc radio buttons – select between the IP Video Setup for the Video, Audio, or Ancillary stream.

Audio Channel Use Single Flow checkbox and radio buttons – with the Use Single Flow checkbox selected, all channels are sent as a single flow. With the Use Single Flow checkbox unselected, the user can click to select as many channels as the system has set up. This is limited by how many channels are set in the Audio Channels pulldown.

Save Video SDP – opens a standard save as browser, so the user can save a (.sdp) Session File to recall the element for later retrieval.

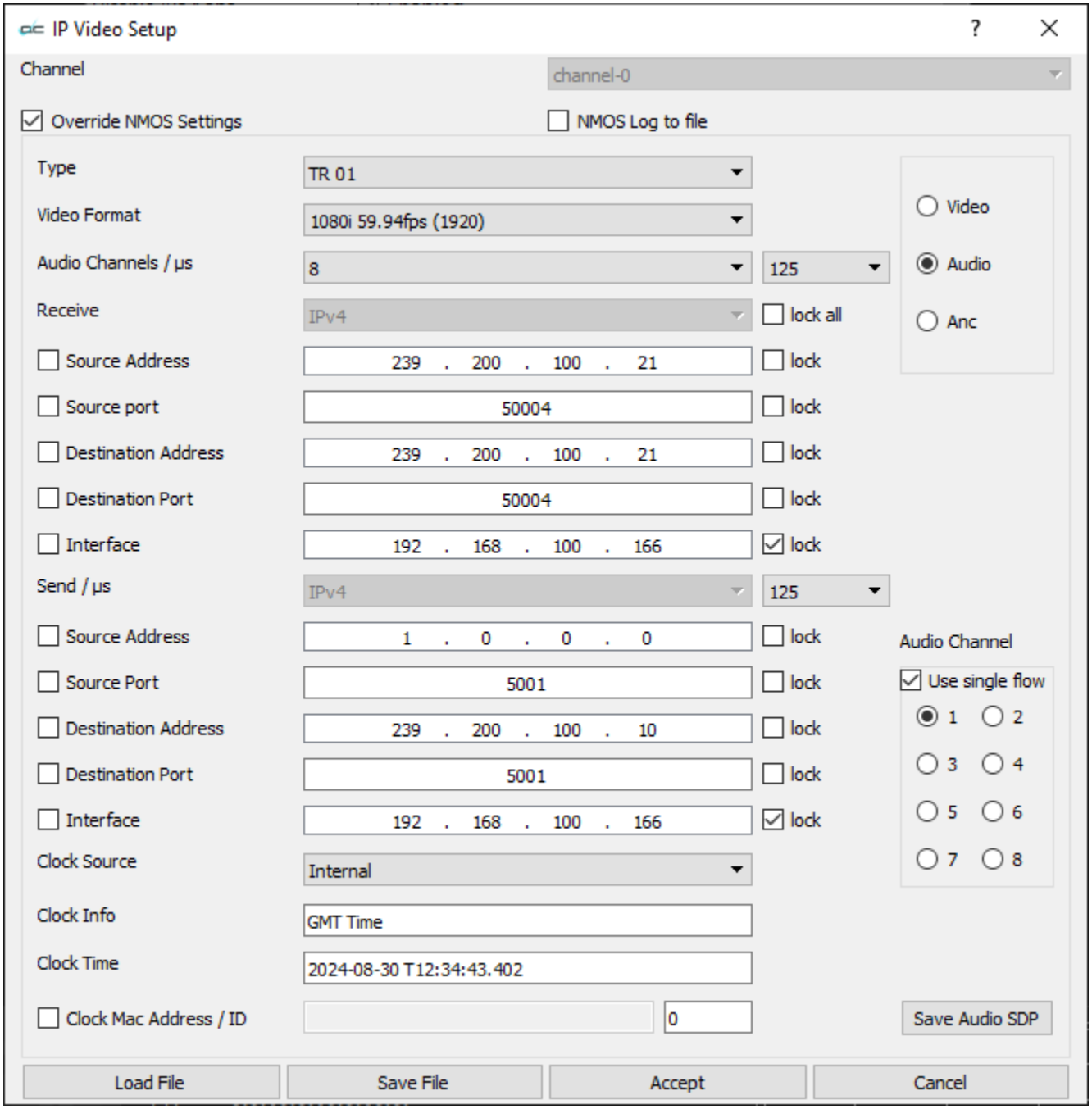
Load File button – load a (.ini) IP settings file to use its settings.

Save File button – save the current IP settings as a (.ini) file for later retrieval.

Accept button – Press the **Accept** button to accept any changes that have been made, and close the IP Video Setup window.

Cancel button – Press the **Cancel** button to close the IP Video Setup window without making any settings changes.

IP Video – Audio Stream Settings



Channel pulldown menu – for multichannel systems, select between available channels.

Override NMOS Settings checkbox – disable any default NMOS (Networked Media Open Specification) settings.

Type pulldown menu – select between available internet stream types. This dialog is for setting up ST2110, ST2022-6, and optionally TR-01 streams.

Video Format – provides a pulldown menu to set the video input, whether HD, Quad HD, 4K etc.

Audio Channels / µs – provides a pulldown menu to set the number of channels in the system, and a pulldown to select between microsecond settings.

Receive pulldown menu and **Lock All** checkbox – select between available internet protocol types to receive. The Lock All checkbox locks all the IP addresses together.

Receive Source Address field and **Lock** checkbox – type in the receive source IP address. The Lock checkbox locks this IP address.

Receive Source Port field and **Lock** checkbox – type in the receive source port. The Lock checkbox locks this IP address.

Receive Destination Address field and **Lock** checkbox – type in the receive destination source IP address. The Lock checkbox locks this IP address.

Receive Destination Port field and **Lock** checkbox – type in the receive destination source port. The Lock checkbox locks this IP address.

Receive Interface field and **Lock** checkbox – type in the receive interface IP address. The Lock checkbox locks this IP address.

Send pulldown menu – select between available internet protocol types to send

Send Source Address field and **Lock** checkbox – type in the send source IP address. The Lock checkbox locks this IP address.

Send Source Port field and **Lock** checkbox – type in the send source port. The Lock checkbox locks this IP address.

Send Destination Address field and **Lock** checkbox – type in the send destination IP address. The Lock checkbox locks this IP address.

Send Destination Port field and **Lock** checkbox – type in the send destination port. The Lock checkbox locks this IP address.

Send Interface field and **Lock** checkbox – type in the send interface IP address. The Lock checkbox locks this IP address.

Clock Source pulldown menu – select between available clock sources

Clock Info field – displays the time setting

Clock Time field – displays the time in YYYY/MM/DD THH:MM:SS:FFF

Clock Mac Address / ID – Enter the clock mac (Media Access Control) address, and the system ID.

Video/Audio/Anc radio buttons – select between the IP Video Setup for the Video, Audio, or Ancillary stream.

Audio Channel Use Single Flow checkbox and radio buttons – with the Use Single Flow checkbox selected, all channels are sent as a signel flow. With the Use Single Flow checkbox unselected, the user can click to select as many channels as the system has set up. This is limited by how many channels are set in the Audio Channels pulldown.

Save Video SDP – opens a standard save as browser, so the user can save a (.sdp) Session File to recall the element for later retrieval.

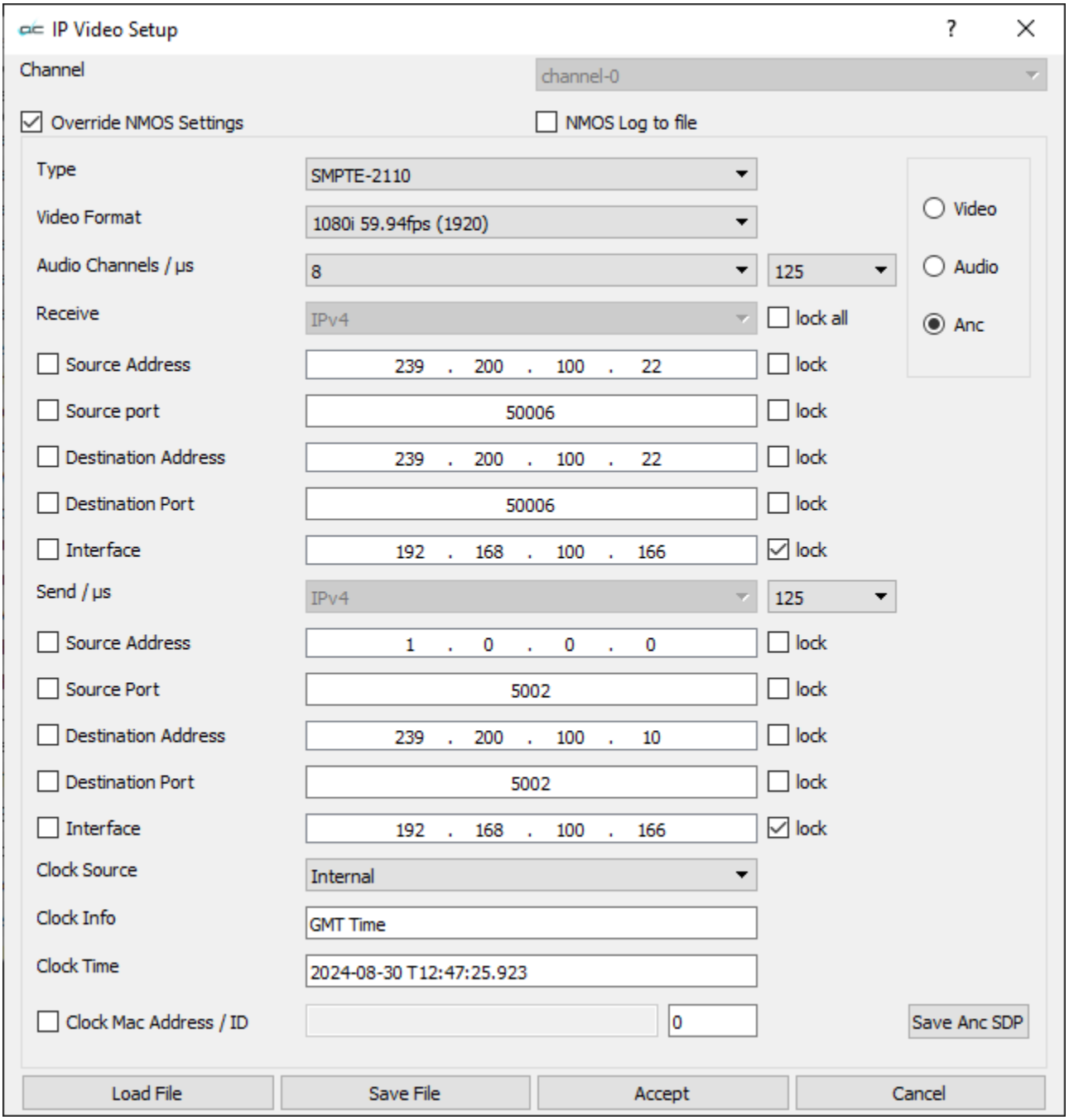
Load File button – load a (.ini) IP settings file for later retrieval.

Save File button – save the current IP settings fas a (.ini) file for later retrieval.

Accept button – Press the **Accept** button to accept any changes that have been made, and close the IP Video Setup window.

Cancel button – Press the **Cancel** button to close the IP Video Setup window without making any settings changes.

IP Video – Ancillary Stream Settings



Channel pulldown menu – for multichannel systems, select between available channels.
Override NMOS Settings checkbox – disable any default NMOS (Networked Media Open Specification) settings.
Type pulldown menu – select between available internet stream types. This dialog is for setting up ST2110, ST2022-6, and optionally TR-01 streams.
Video Format – provides a pulldown menu to set the video input, whether HD, Quad HD, 4K etc.
Audio Channels / µs – provides a pulldown menu to set the number of channels in the system, and a pulldown to select between microsecond settings.
Receive pulldown menu and **Lock All** checkbox – select between available internet protocol types to receive. The Lock All checkbox locks all the IP addresses together.
Receive Source Address field and **Lock** checkbox – type in the receive source IP address. The Lock checkbox locks this IP address.

Receive Source Port field and **Lock** checkbox – type in the receive source port. The Lock checkbox locks this IP address.

Receive Destination Address field and **Lock** checkbox – type in the receive destination source IP address. The Lock checkbox locks this IP address.

Receive Destination Port field and **Lock** checkbox – type in the receive destination source port. The Lock checkbox locks this IP address.

Receive Interface field and **Lock** checkbox – type in the receive interface IP address. The Lock checkbox locks this IP address.

Send pulldown menu – select between available internet protocol types to send

Send Source Address field and **Lock** checkbox – type in the send source IP address. The Lock checkbox locks this IP address.

Send Source Port field and **Lock** checkbox – type in the send source port. The Lock checkbox locks this IP address.

Send Destination Address field and **Lock** checkbox – type in the send destination IP address. The Lock checkbox locks this IP address.

Send Destination Port field and **Lock** checkbox – type in the send destination port. The Lock checkbox locks this IP address.

Send Interface field and **Lock** checkbox – type in the send interface IP address. The Lock checkbox locks this IP address.

Clock Source pulldown menu – select between available clock sources

Clock Info field – displays the time setting

Clock Time field – displays the time in YYYY/MM/DD THH:MM:SS:FFF

Clock Mac Address / ID – Enter the clock mac (Media Access Control) address, and the system ID.

Video/Audio/Anc radio buttons – select between the IP Video Setup for the Video, Audio, or Ancillary stream.

Audio Channel Use Single Flow checkbox and radio buttons – with the Use Single Flow checkbox selected, all channels are sent as a single flow. With the Use Single Flow checkbox unselected, the user can click to select as many channels as the system has set up. This is limited by how many channels are set in the Audio Channels pulldown.

Save Video SDP – opens a standard save as browser, so the user can save a (.sdp) Session File to recall the element for later retrieval.

Load File button – load a (.ini) IP settings file to use its settings.

Save File button – save the current IP settings fas a (.ini) file for later retrieval.

Accept button – Press the **Accept** button to accept any changes that have been made, and close the IP Video Setup window.

Cancel button – Press the **Cancel** button to close the IP Video Setup window without making any settings changes.

Accept button - Press the **Accept** button to accept any changes that have been made, and close the **Settings** window.
Close button – close the **Settings** window without making any changes
Disable Hardware for Videoqc – when set, the software will ignore any hardware in the system
Disable Aja Kona – when set, the software will ignore any AJA cards
Disable BlueFish444 – when set, the software will ignore any BlueFish444 cards
Disable Decklink – when set, the software will ignore any Blackmagic cards
DisableIP Video – when set, the system will not use IP video streams
Disable Matrox – when set, the software will ignore any Matrox cards
Enable Flow Caster Out – when set, enable stream output via FlowCaster.
Default Log Name – if logging to a file is enabled, this is where the log file will be saved
No Internal Audio Video – if set, this forces the audio to an external audio card, rather than the internal audio of the AJA, BlueFish444 or Blackmagic card
Production Mode – if set, then playback will continue even if frames are dropped. Otherwise, dropped frames will cause playback to pause.
ShowVITC Lines – show any vertical blank area in the applications video window
Skip Boards – the number of cards in the system to skip. This allows videoQC to use the second card in the system, and allow another software to use the first one
Superimpose – if set, then time code and user bits will be displayed/burned into the video
Superimpose Type – choose between **Film Style** or **VTR Style** time code display on the overlay.

In the image below, the VTR style time code is displayed on the left screen. It shows absolute, LTC, and VITC time codes simultaneously. On the right screen, Film style time code is displayed.

Time Code Overlay

Allow Aspect Ratio Changes – when set, the aspect ratio will remain fixed
Allow Frequency Changes – when set, the frequency will not change as new files are loaded
Allow Resolution Changes – when set, the resolution will not change as new files are loaded
OP47 Default Character Set – OP-47 decoders have a setting which allows the user to specify the default alternate character set when it is not specified by the sender. This is normally the character set of the local language.

- 0 – (Latin) English, French, German, Swedish, Finnish, Hungarian, Italian, Portuguese, Spanish, Czech, Slovak
- 1 – (Latin) Polish
- 2 – (Latin) Turkish
- 3 – (Latin) Serbian, Croatian, Slovenian, Romanian
- 4 – (Latin) Estonian, Lettish, Lithuanian
- 4 – (Cryillic) Serbian, Croatian, Russian, Bulgarian, Ukrainian
- 6 – Greek
- 10 – Hebrew

De Interlace Type – When working with interlaced material, the display on the progressive VGA monitor:

- **Default** - use the default deinterlacing implied by the file type

- **Discard** - discard one field
- **Blend** - blend the two fields
- **Duplicate Invert** - duplicate the non dominant field
- **Split** - split the fields, upper and lower
- **Duplicate** - duplicate one field
- **Process** - process for motion detect deinterlaced
- **Disable** - disable processing, show interlace on progressive

Audio 12 Encoded – should be set if using Dolby encoded audio on the first pair of channels

Dither8 Bit – on AJA hardware, if set, 8 bit files will be up dithered to 10 bit on SDI output

Genlock Enabled – use the incoming genlock signal to lock the SDI output

Use Both Board Channels – if a board supports more than one channel, allow multiple channels to use the same board

Enable NDI Search – allow searching for NDI sources.

Ignore HTTP – disable HTTP control of videoQC

Ignore CTL – disable RS-422 serial control of videoQC

Ignore Net – disable network control of videoQC

SD Aspect Ratio 16by9 – if set, then all SD files will be treated as 16:9 instead of 4:3

HTTP Port – custom port value to use for the HTTP server

Port – custom port value to use for the Net server

Auto Select Proxy – when a high resolution and proxy resolution file reference pair are dropped from an Adobe web bin, automatically load the proxy file rather than the high res file. If not set, the high resolution file will be loaded.

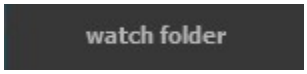
Color Space – select 708 or 2020 as the default color space for 4K/QHD signals. The options in this pulldown menu allow the user to set the color space being used. Options may include:

- Rec 709 SMPTE
- Default/Auto
- CCIR 601 Full
- Rec 709 Full
- BT 2020 Full
- CCIR 601 SMPTE
- BT 2020 SMPTE

Color Transfer – select either HDR-10 PQ ST-2084 or HDR HLG, as transfer characteristics for 4K/QHD signals, or leave it set to the Default/Auto setting.

Check for Updates on Startup – allows the user to keep current with the latest build by checking the installed version against the version on the web each time videoQC is run.

Watch Folder



Pressing the **Watch Folder** button opens a dialog to allow the user to set up a watch folder, to analyze files and create RTIndex files and Reference Movies.

The **Watch Folder** window allows the user to select a source stream, and perform one of three actions. The following controls are available:

Source – press the Source button to set the folder you will watch. Opens a browser for you to select a source folder. When selected, the source folder will be displayed in the source field.

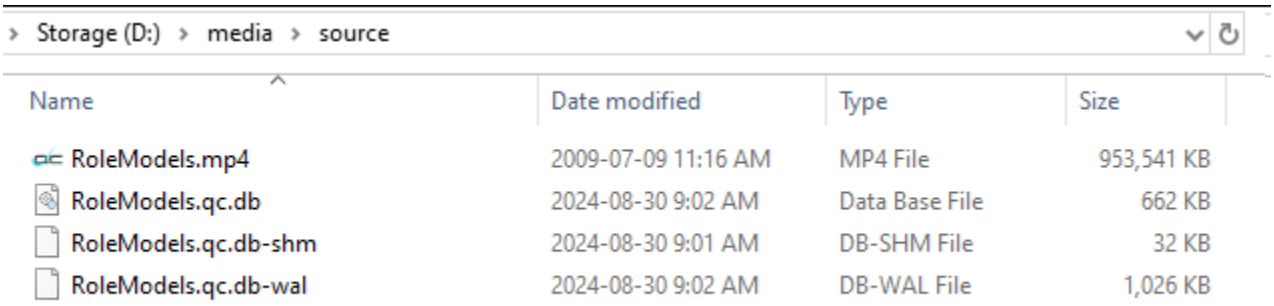
Target – press the Target button to set the folder where either the Analysis, Real Time Index file, or QuickTime Reference file will be created. Opens a browser for you to select a target folder. When selected, the target folder will be displayed in the target field.

The **Action** pulldown menu lets you choose what happens when a file arrives in the watch folder.

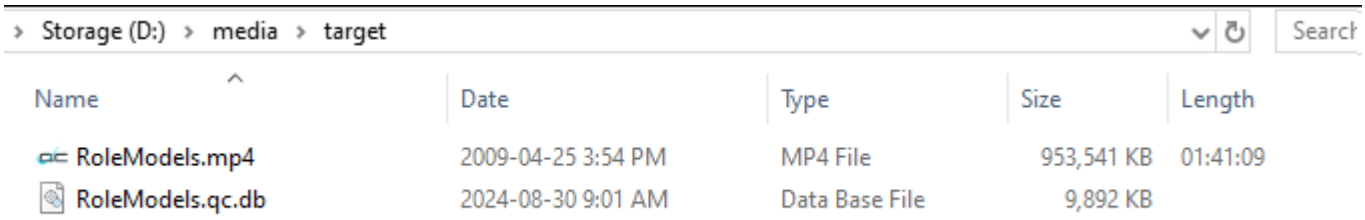
Analysis – analyze the loaded file.
Make RTIndex – make a real time index file for the source stream.
Make Reference Movie – make a QuickTime Reference Movie from the source stream.
Watch button – press to activate the watch folder functionality.

To use the **Watch** folder function, once the folders are set up and the Action has been selected, press the Watch button.

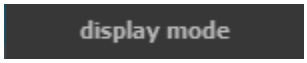
In this example a file has been dropped into the source folder. Immediately 3 temp files are created in the source folder while the file is being analyzed.



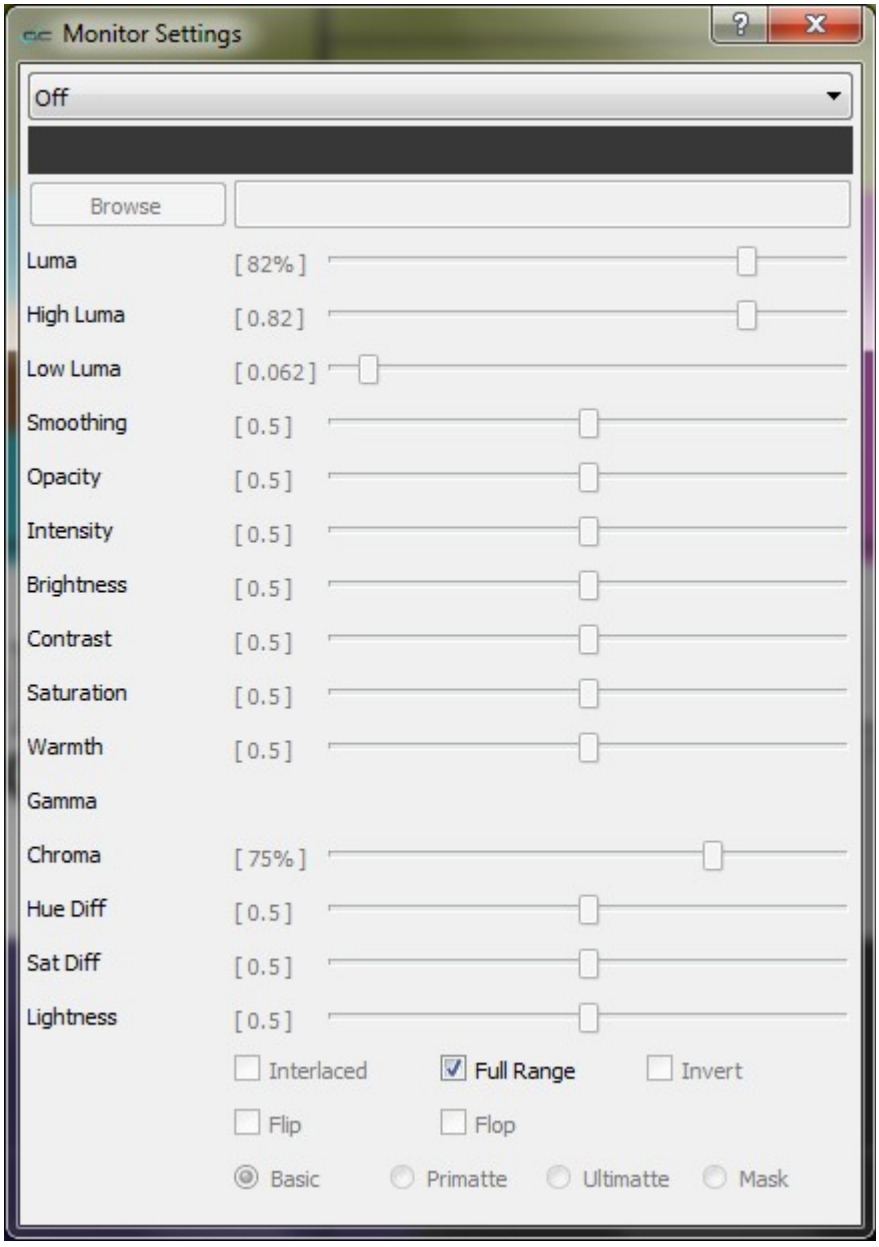
After the analysis has been completed, the target folder now has the analysis file along with the source file, and the source folder is empty.



Display Mode



Display Mode button – opens the Monitor Settings window, which allows the user to fine tune their display settings, and adjust chroma/luma keys, correct focus, view signal level excursions, etc.

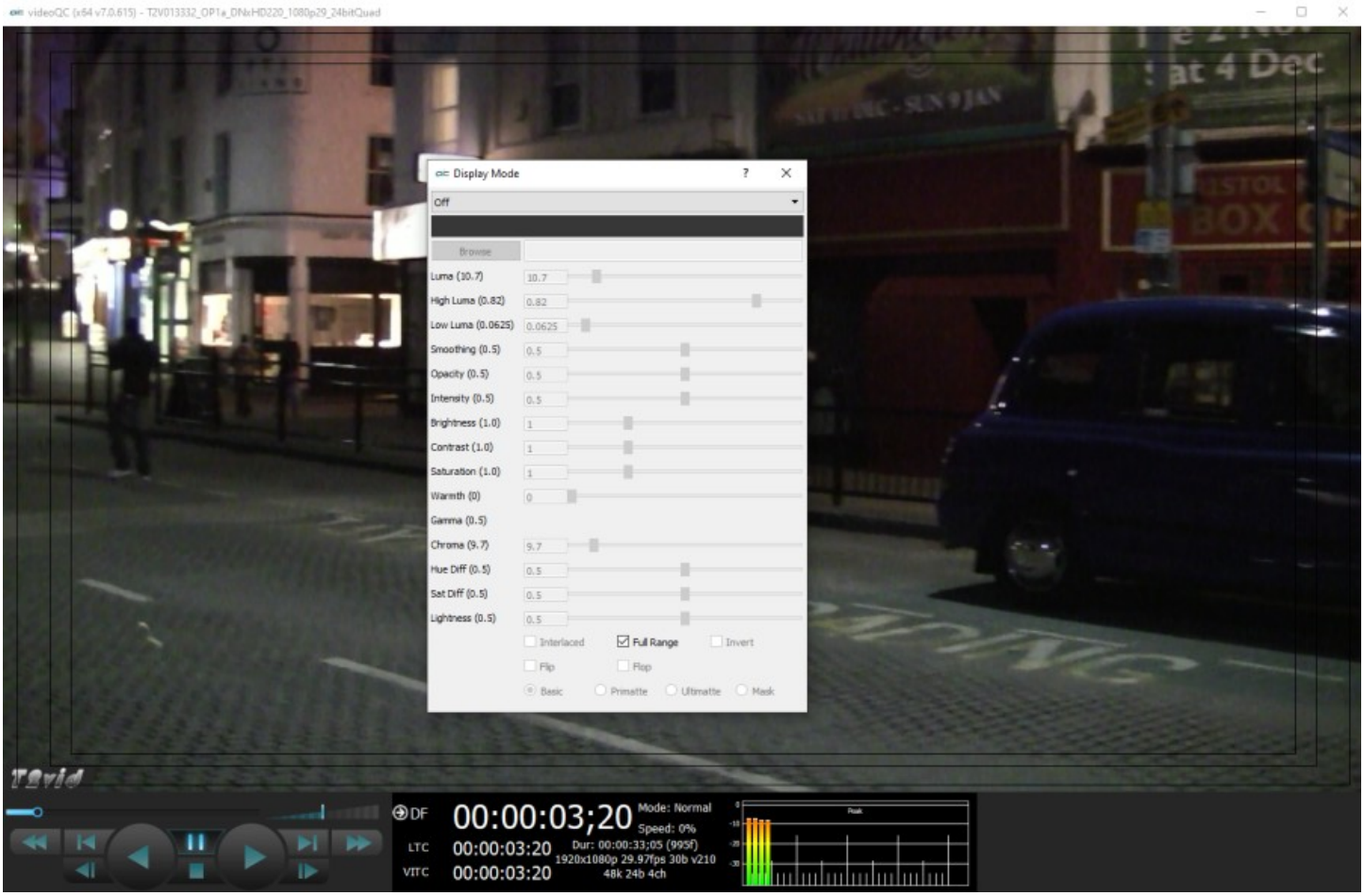


The pulldown menu at the top allows the user to select between various display modes.

Display Modes include:

Off

Display the signal normally

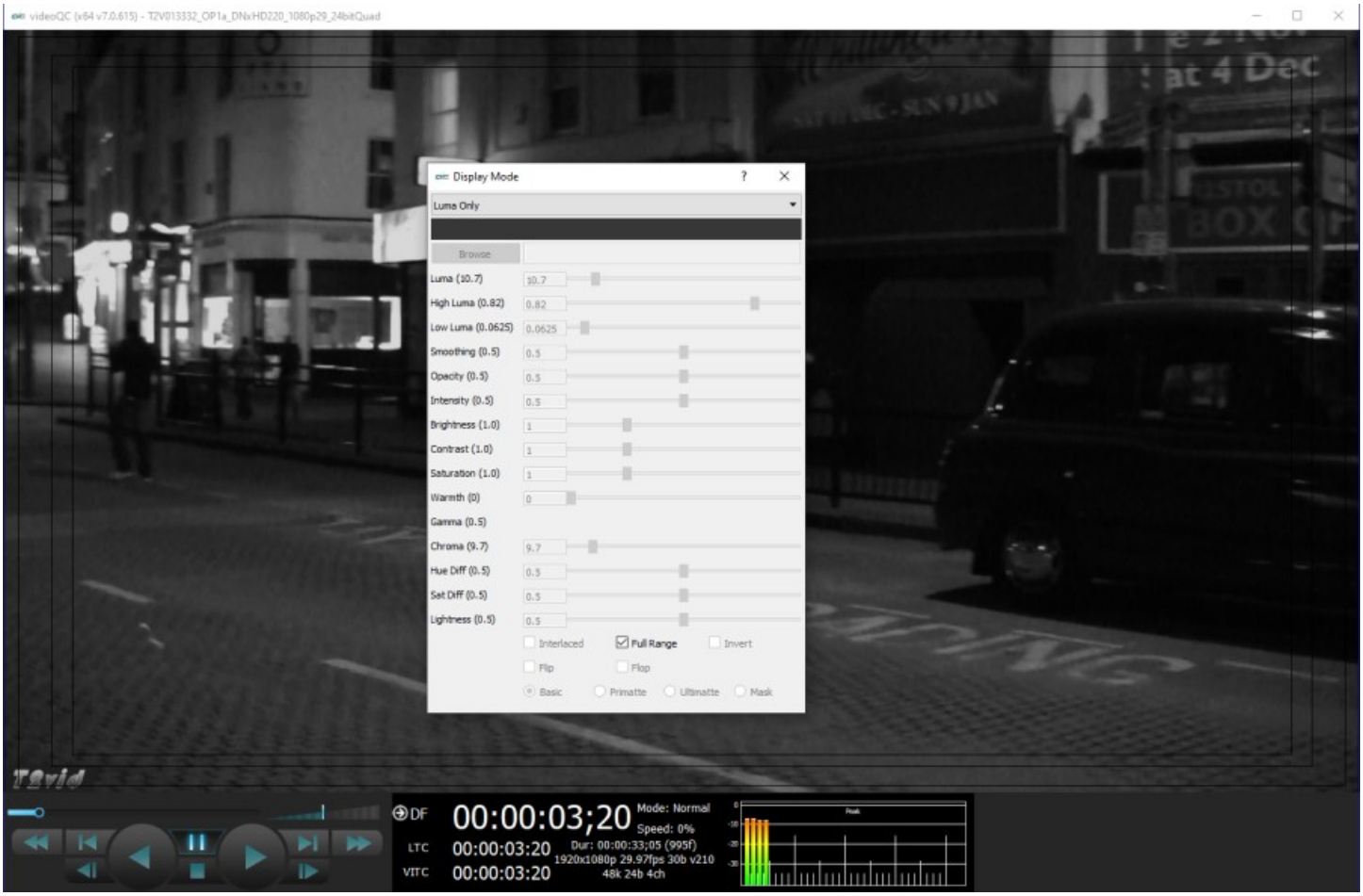


The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

This display mode provides no processing and is used to turn the display modes Off.

Luma Only

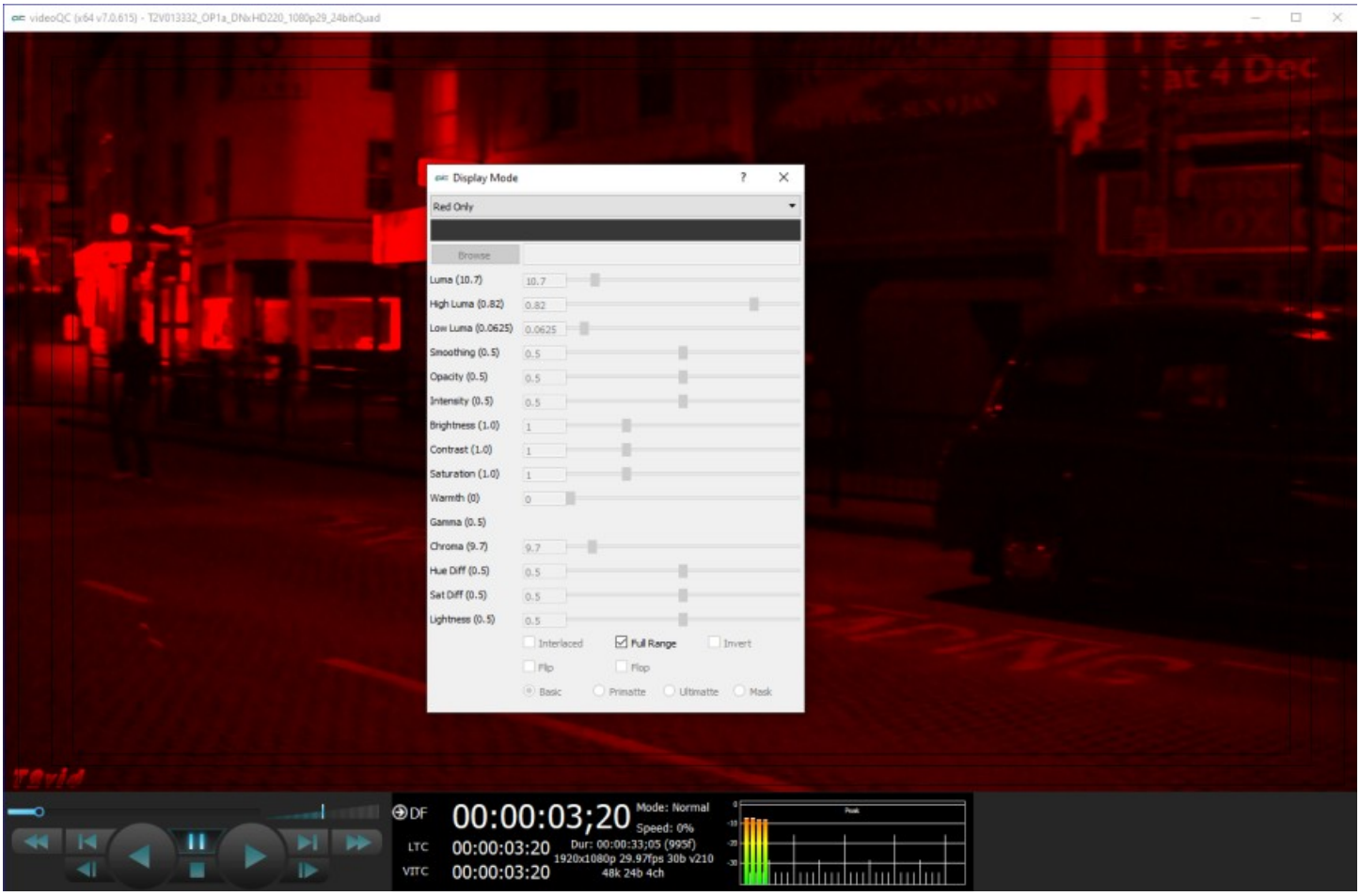
Show only the Y or brightness of the picture.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Red Only

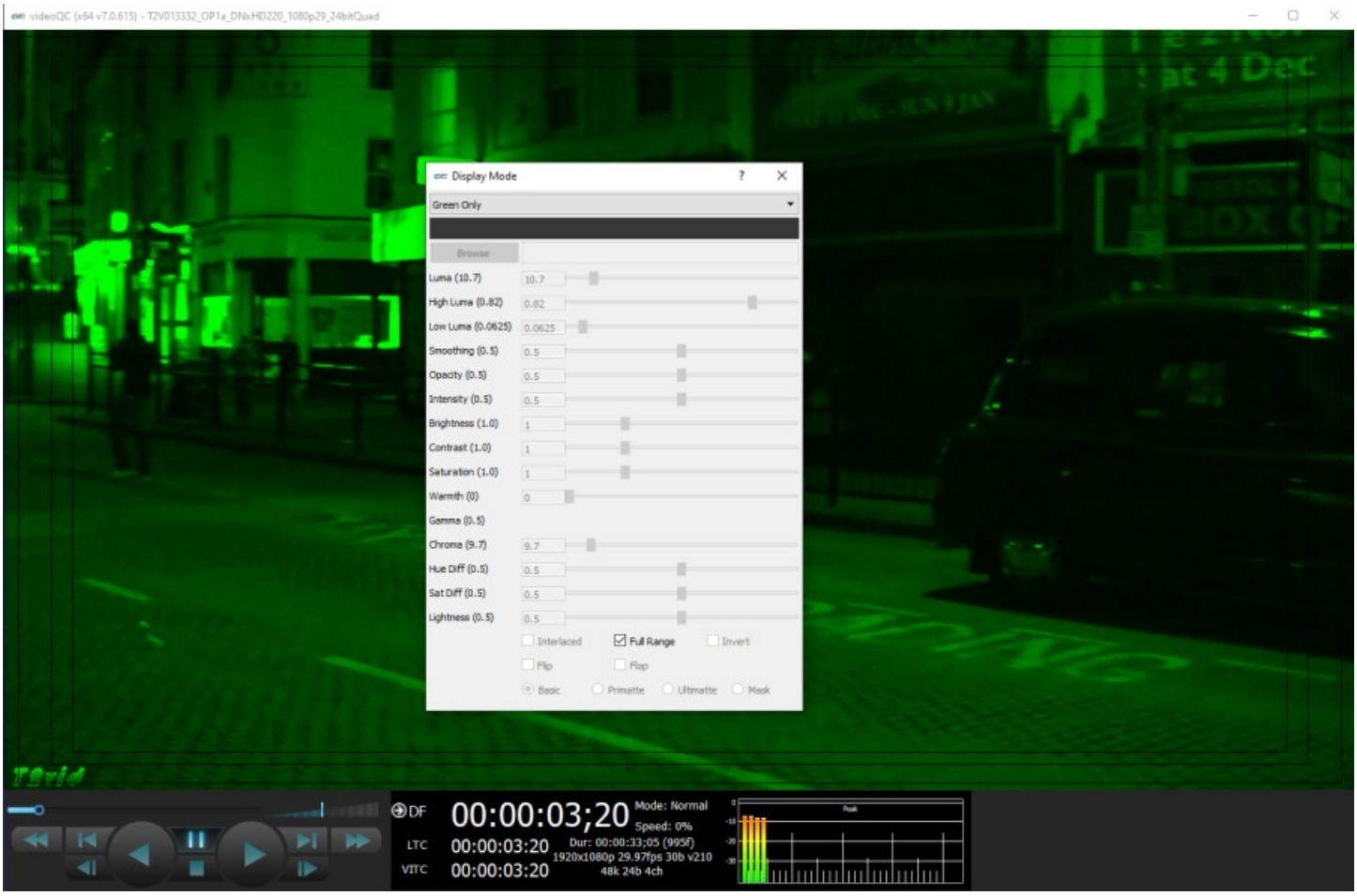
Show only the red channel



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Green Only

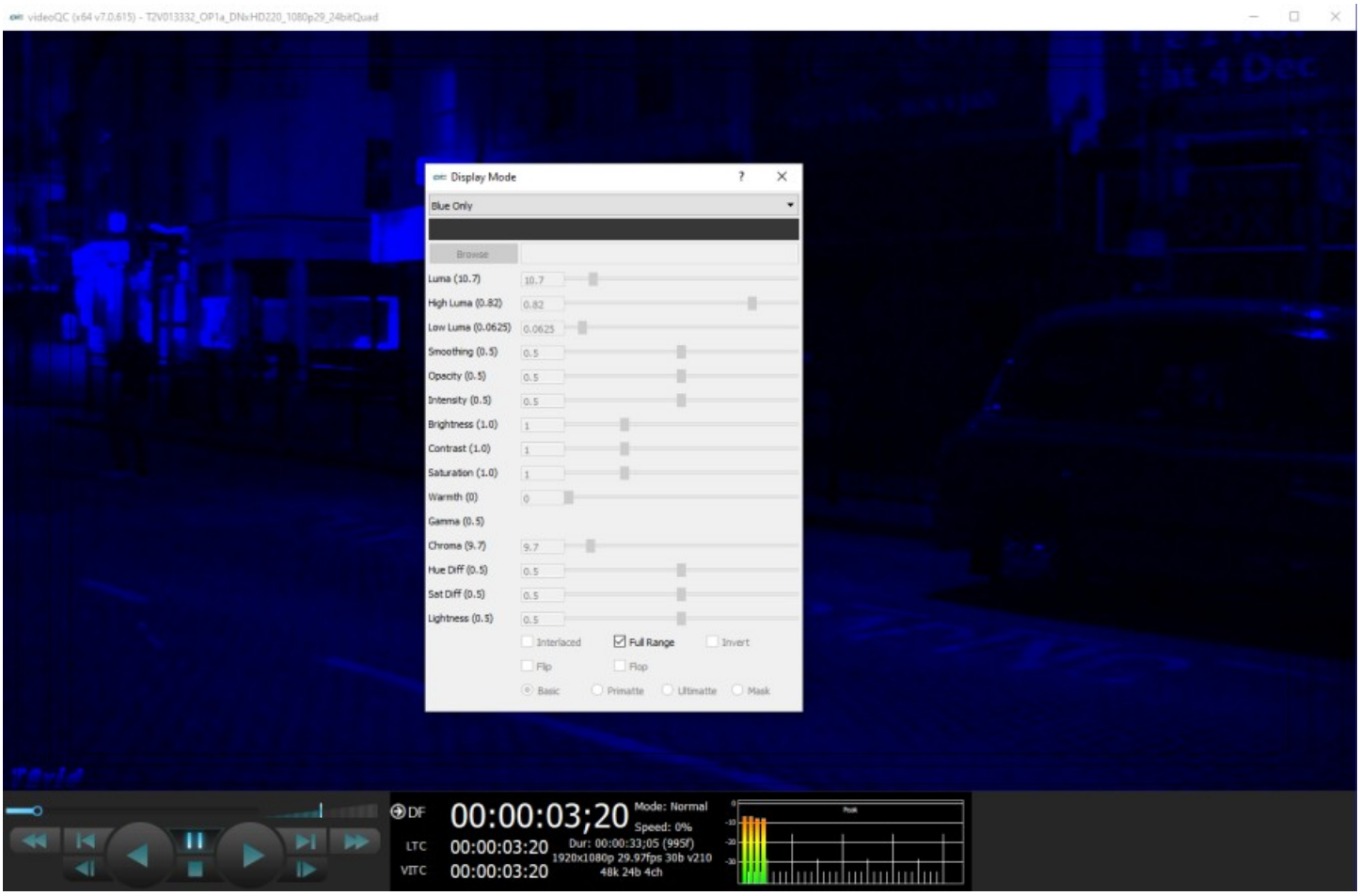
Show only the green channel



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Blue Only

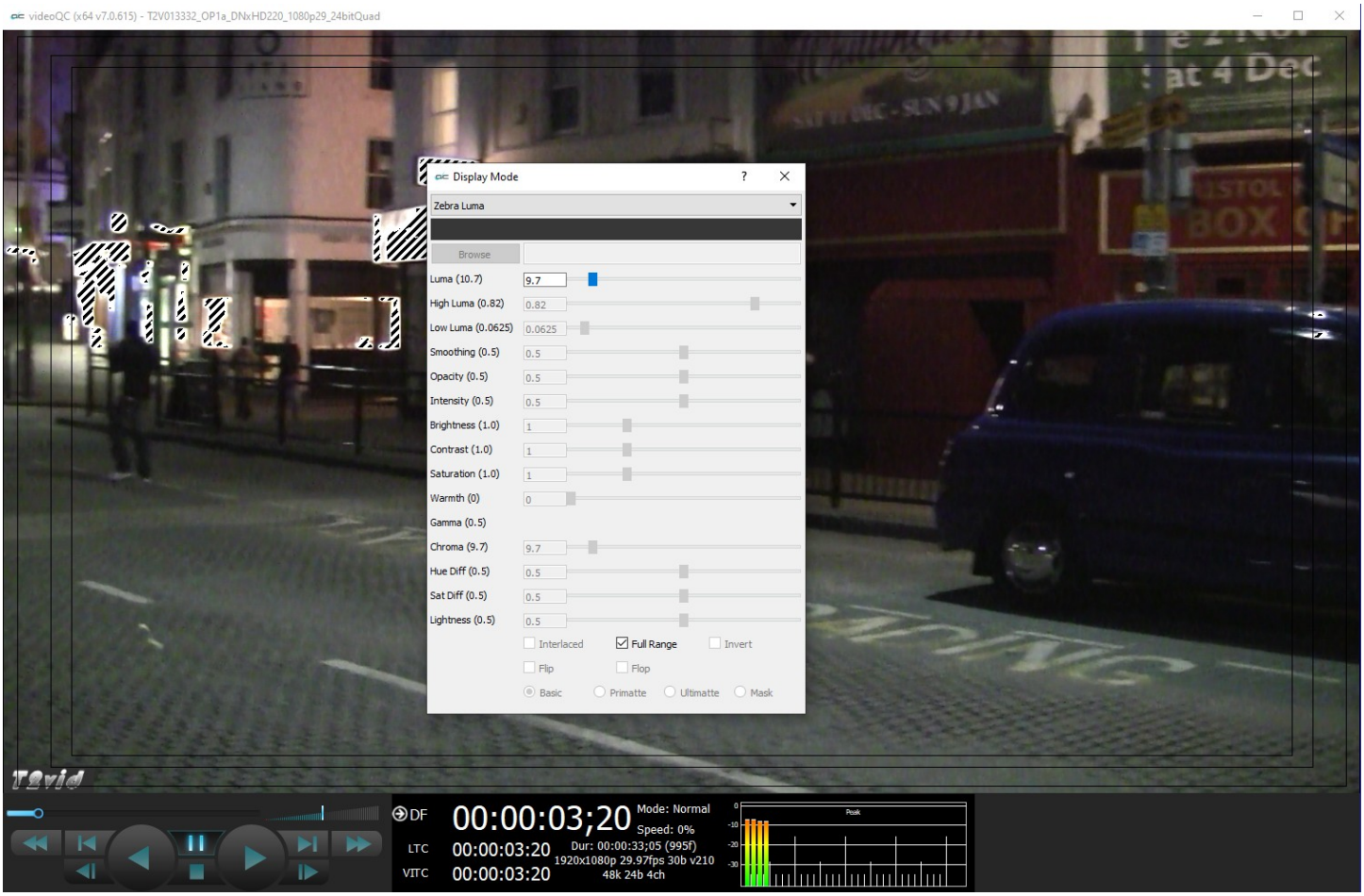
Show only the blue channel



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Zebra Luma

Draw zebra bars where the luma is too high or too low.

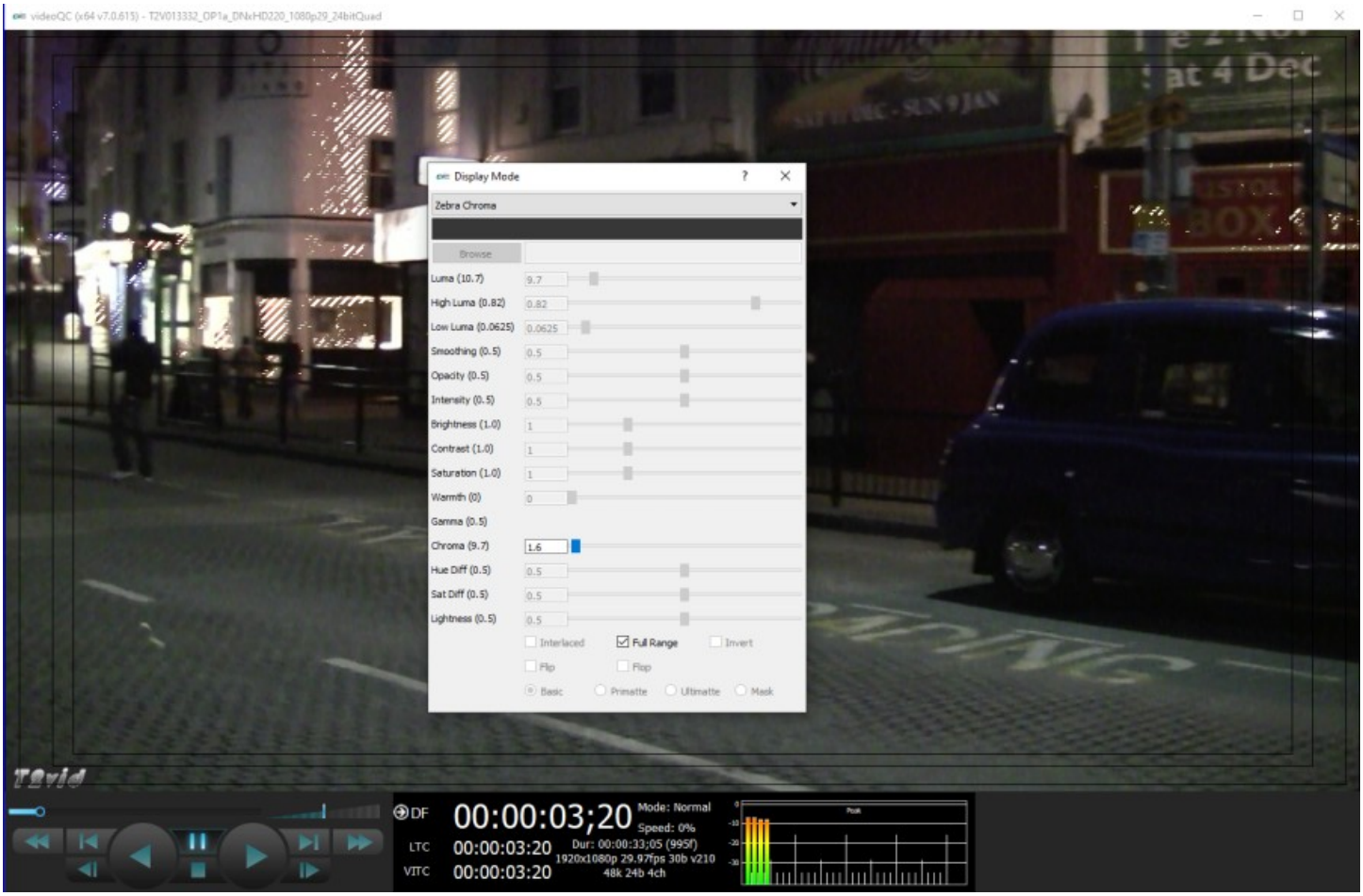


Activates the **Luma** slider, which allows the user to adjust the luma setting. When active, Luma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in tenths. Click on the slider and use the < and > keys.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Zebra Chroma

Draw zebra bars where the chroma is out of range.

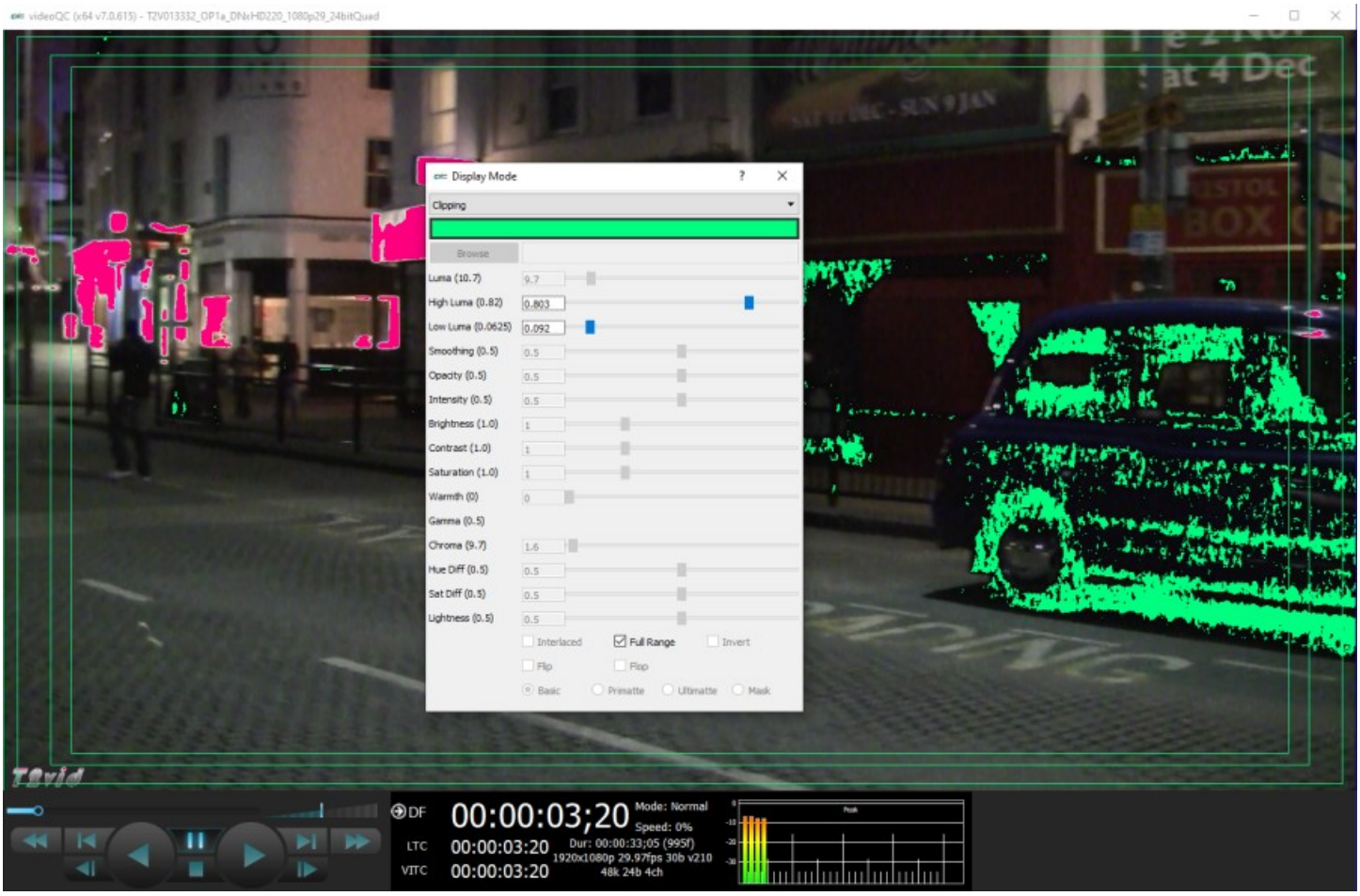


Activates the **Chroma** slider, which allows the user to adjust the chroma setting. When active, Chroma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in tenths. Click on the slider and use the < and > keys.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Clipping

Draw green anywhere the signal is too low, or red anywhere it is too high. If a signal is too low, the blacks will become muddy and lose detail. If it is too high, the whites will bleach out and lose detail.



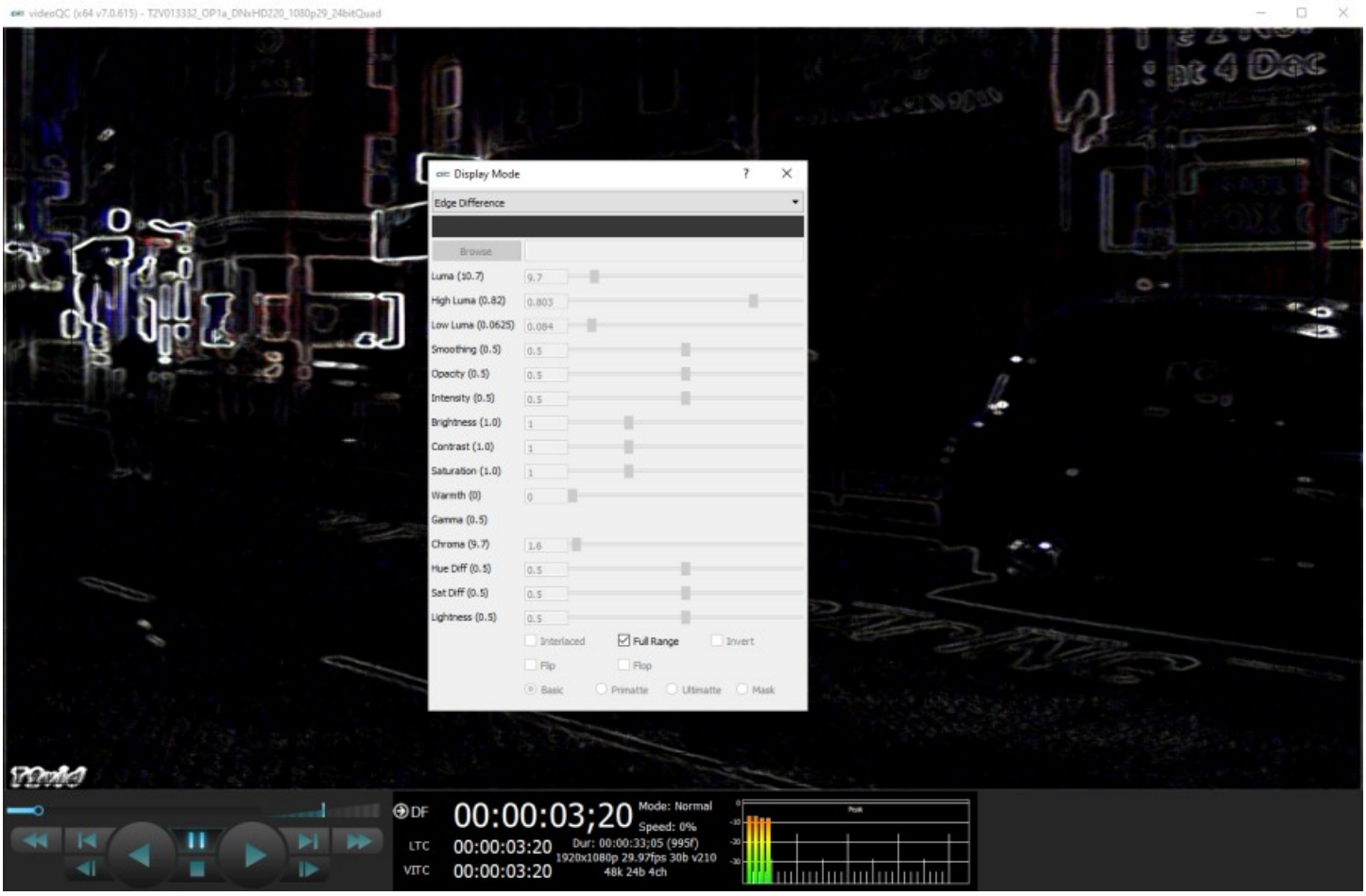
Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose a primary (too low) color other than green. The secondary (too high) color is automatically generated to be a contrasting color to the primary color. To open the color picker, click on the bar, or press <ENTER>.

Activates the **High Luma** slider and the **Low Luma** slider, allowing the user to adjust these settings. When active, High Luma and Low Luma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Edge Difference

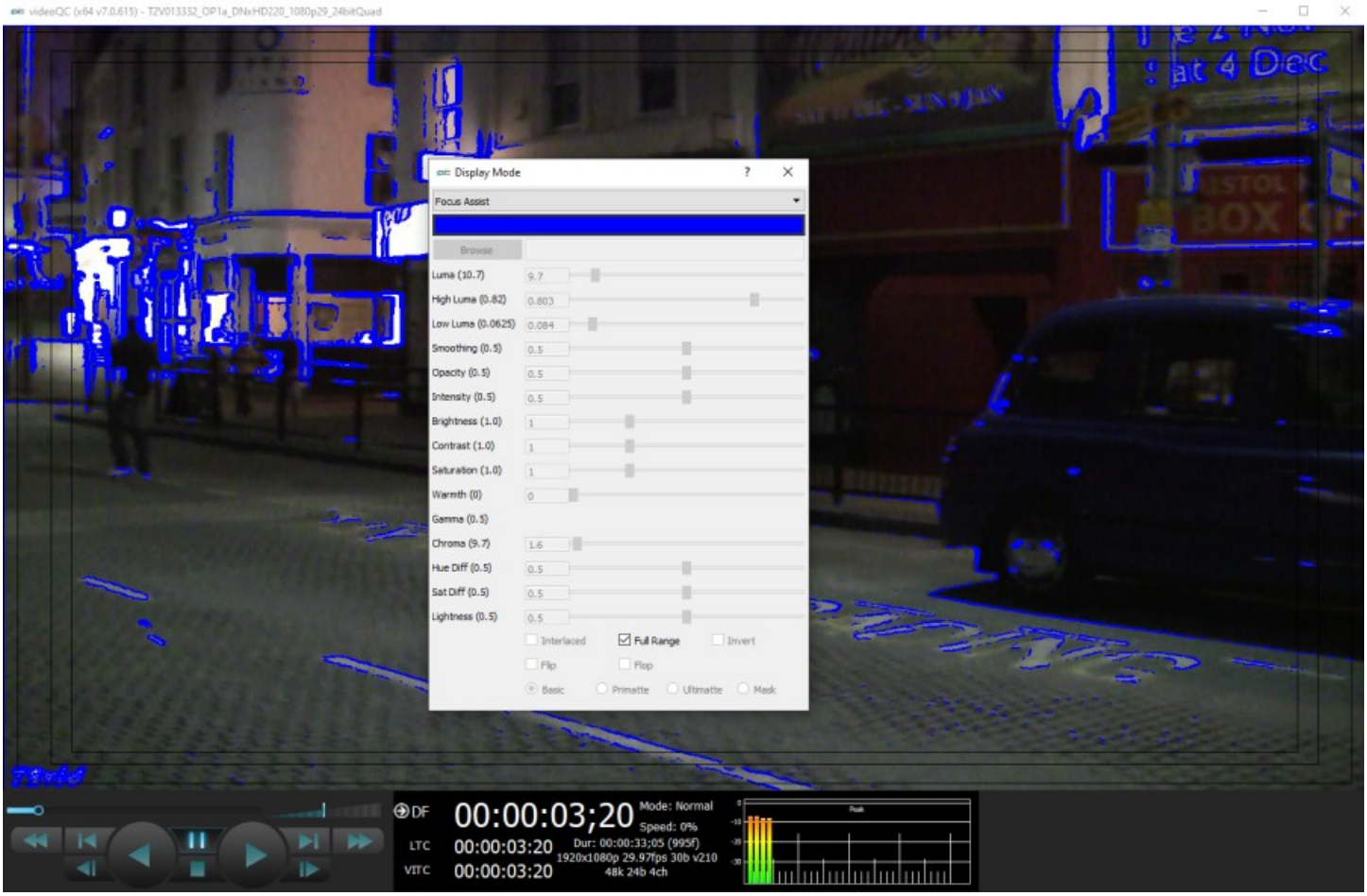
Highlight every edge in the picture, and turn the rest of the picture black.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Focus Assist

Paint areas of the image that are in focus with the selected color. This setting allows fine tuning of camera focus settings by making the in-focus areas obvious.

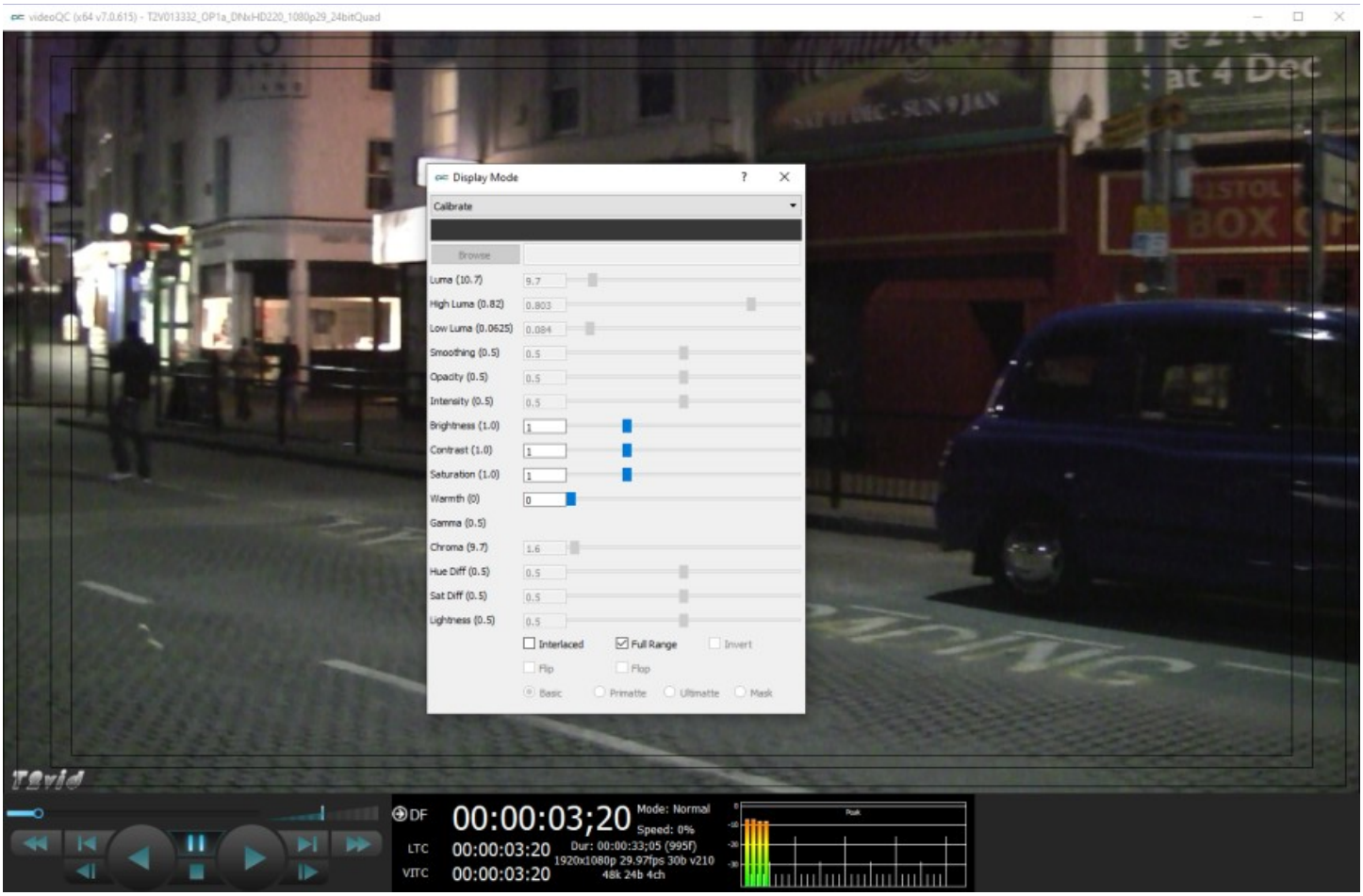


Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose an appropriate color to contrast from the general hue of the picture. To open the color picker, click on the bar, or press <ENTER>.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Calibrate

Allows the user to calibrate the display settings. Initially this will show the normal picture view. However, as you move the individual sliders, you can adjust the way the image is displayed to optimize the capabilities of your monitor setup.



Activates the **Brightness**, **Contrast**, **Saturation**, **Warmth**, and **Gamma** sliders, allowing the user to adjust these settings. When active, Brightness, Contrast, Saturation, Warmth, and Gamma can be adjusted by pulling the sliders with the mouse, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

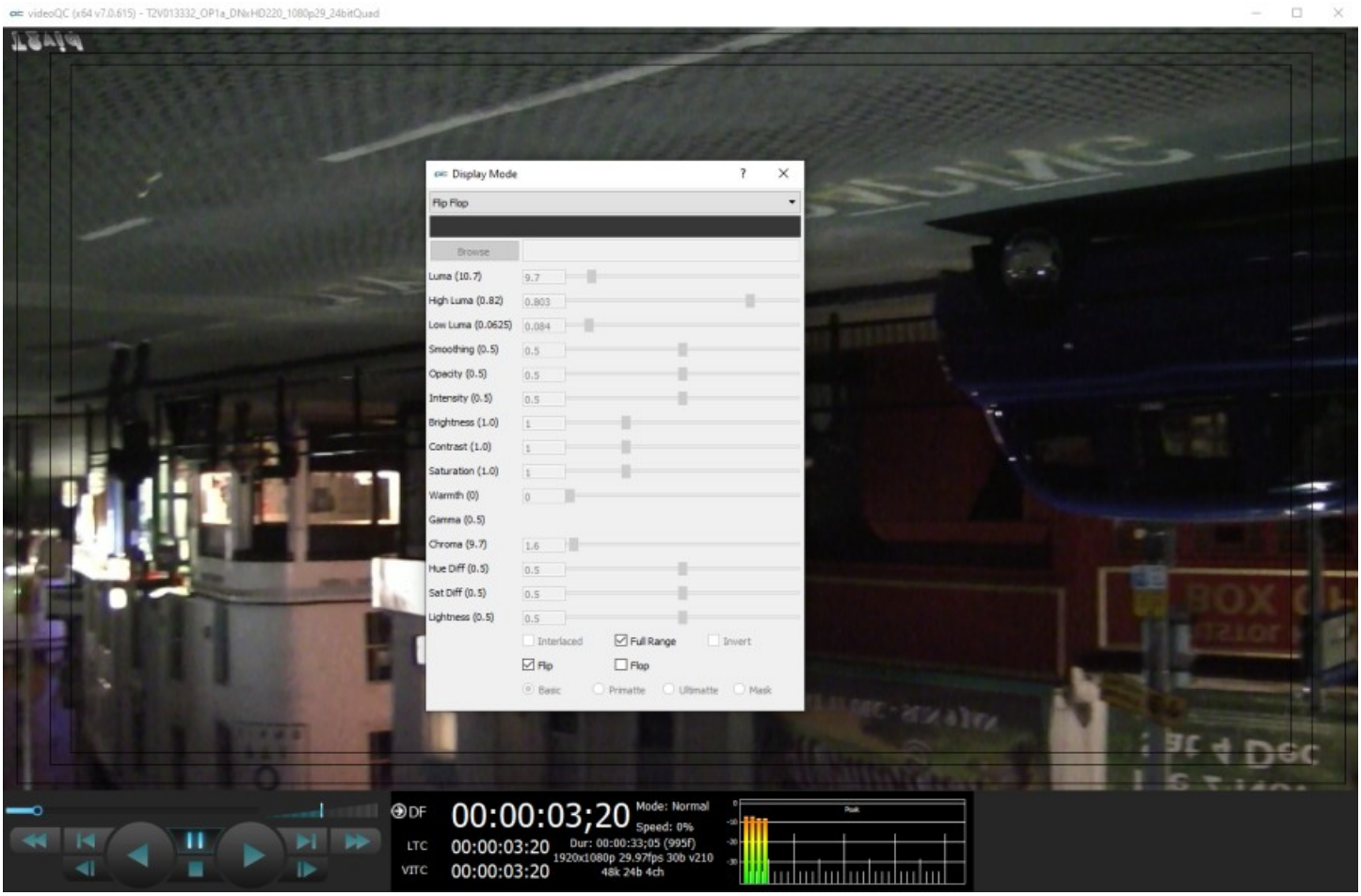
Activates the **Interlaced** checkbox, which allows the user to specify interlaced (checked) or progressive (unchecked) standards to display.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

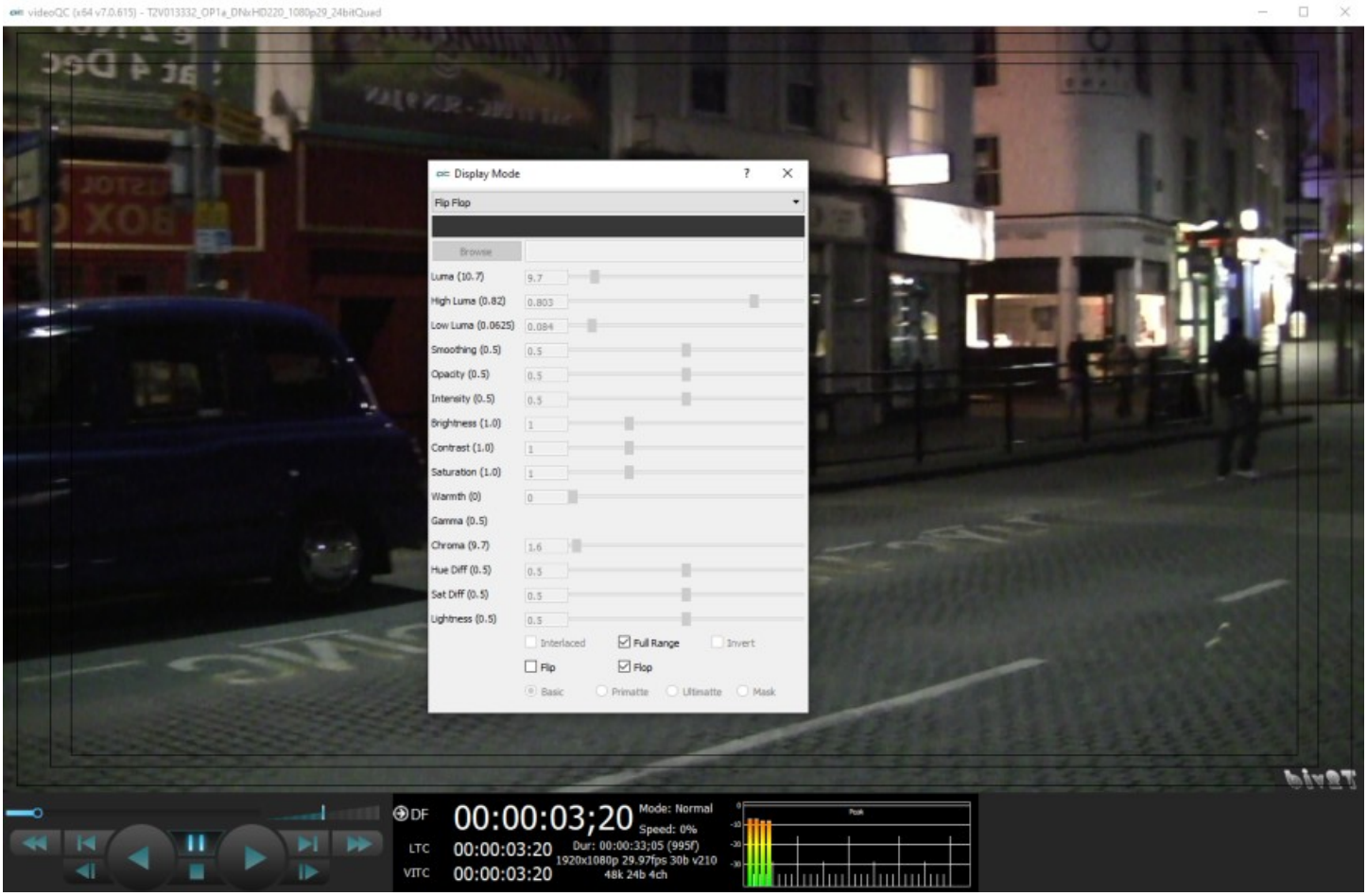
Flip Flop

Reverse the picture horizontally or vertically.

Activates the **Flip** checkbox, which allows the user to reverse the image top to bottom.



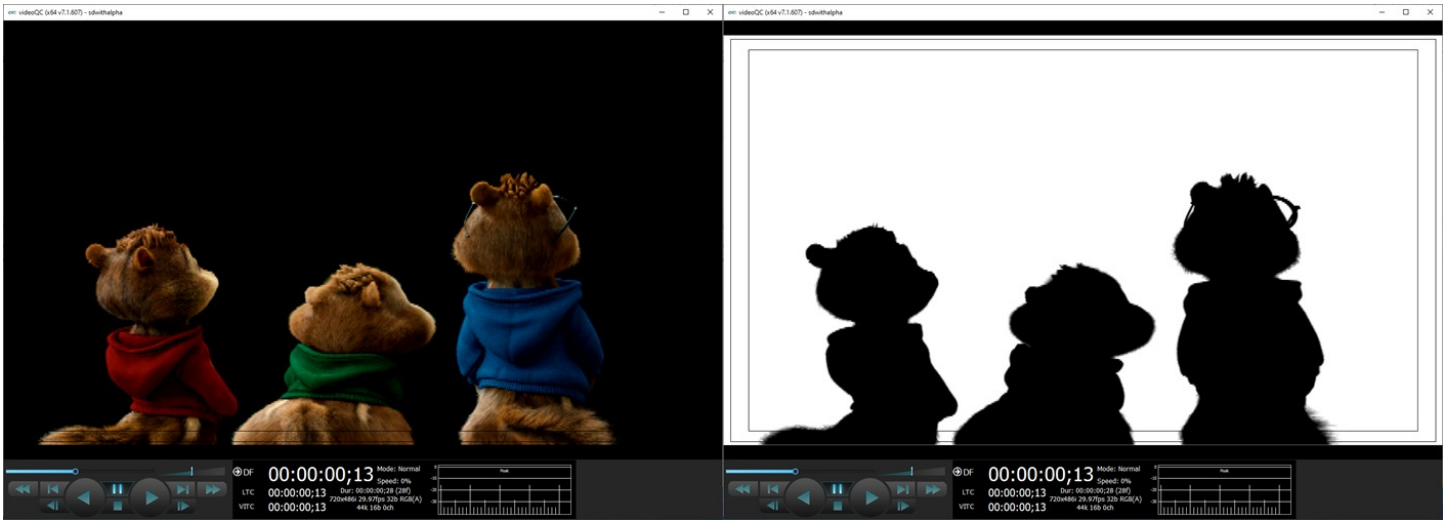
Activates the **Flop** checkbox, which allows the user to reverse the image left to right.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Show Alpha

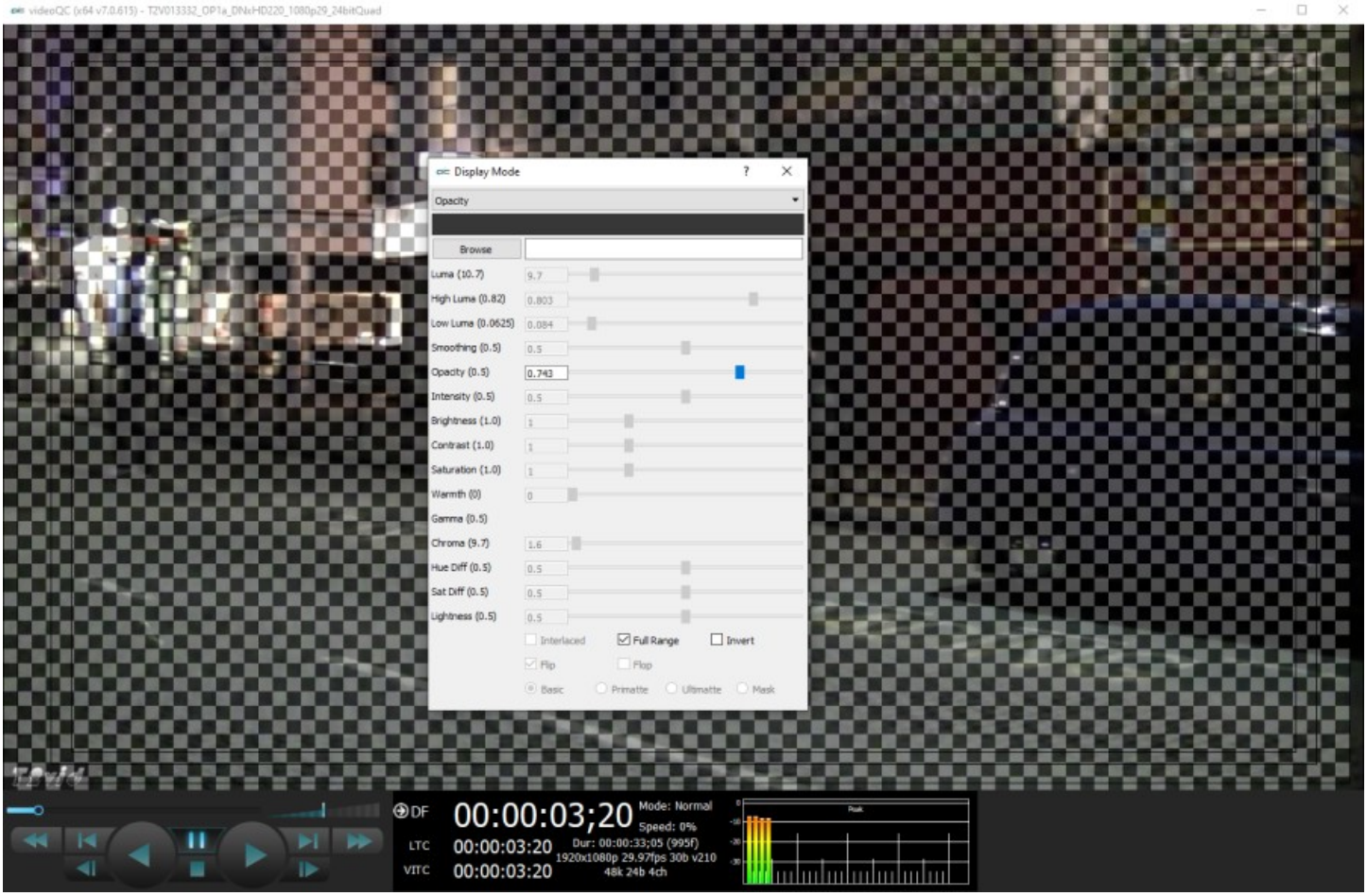
Show the alpha component of an RGBA or YCbCr+A signal. The below example shows an RGBA file, with the scene on the left and the alpha channel display on the right.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Opacity

Mix the signal with a loaded still image for reference, using a checkerboard mix. This setting can be used to compare two images to match a camera position from an existing shot with a new camera, where additional shots are needed for a scene and a new camera needs to match its position.



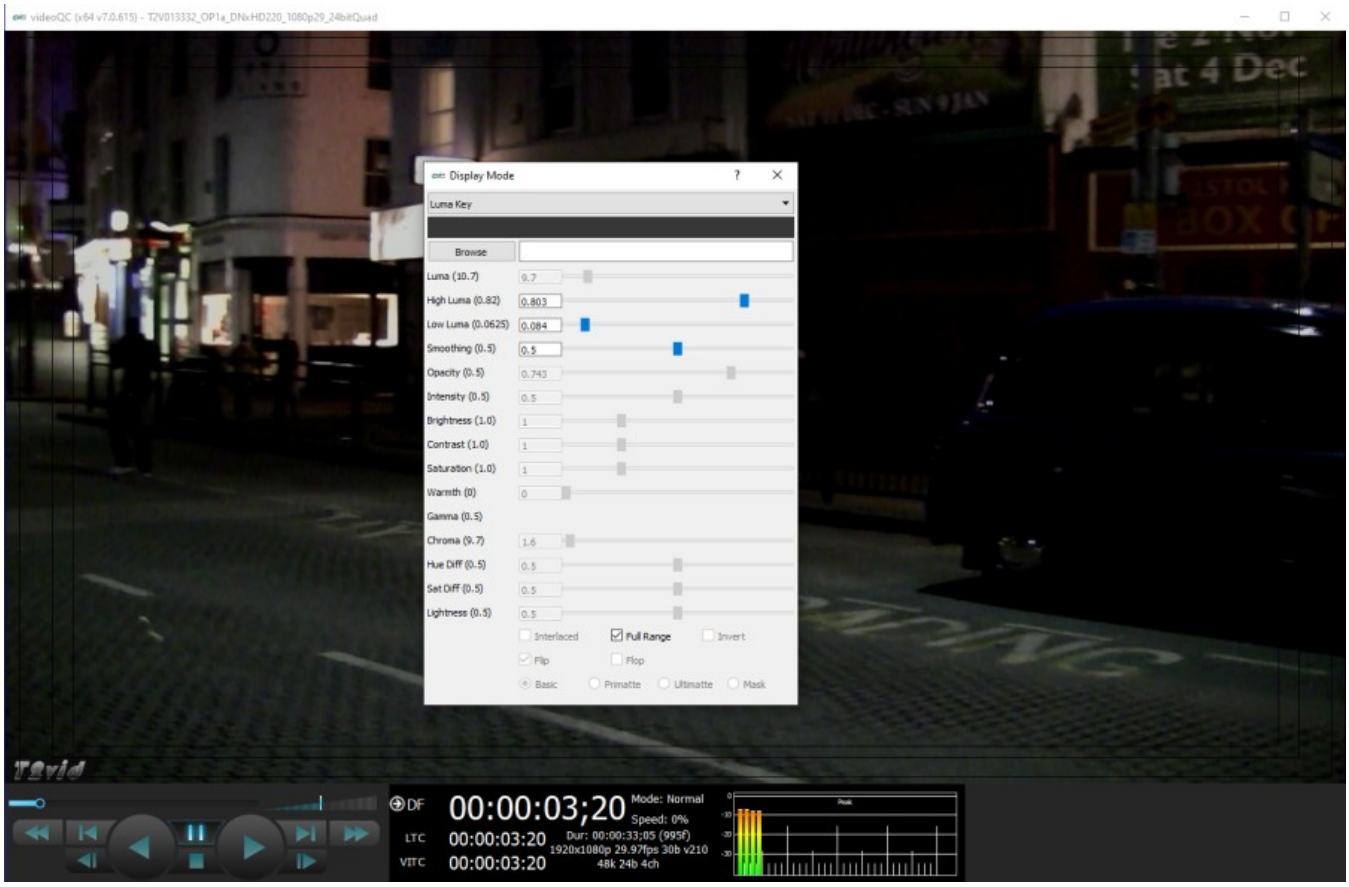
Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background to compare live video to the existing image.

Activates the **Opacity** slider, and the **Invert** checkbox, which allows the user to set the opacity level, and Invert the display.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Luma Key

Show the video luma keyed over a checkerboard or image.



Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background for the luma key, instead of the checkerboard.

Activates the **High Luma** slider, so the user can adjust the high luma settings. When active, can be adjusted by pulling the slider, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

Activates the **Low Luma** slider, so the user can adjust the low luma settings. When active, can be adjusted by pulling the slider, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

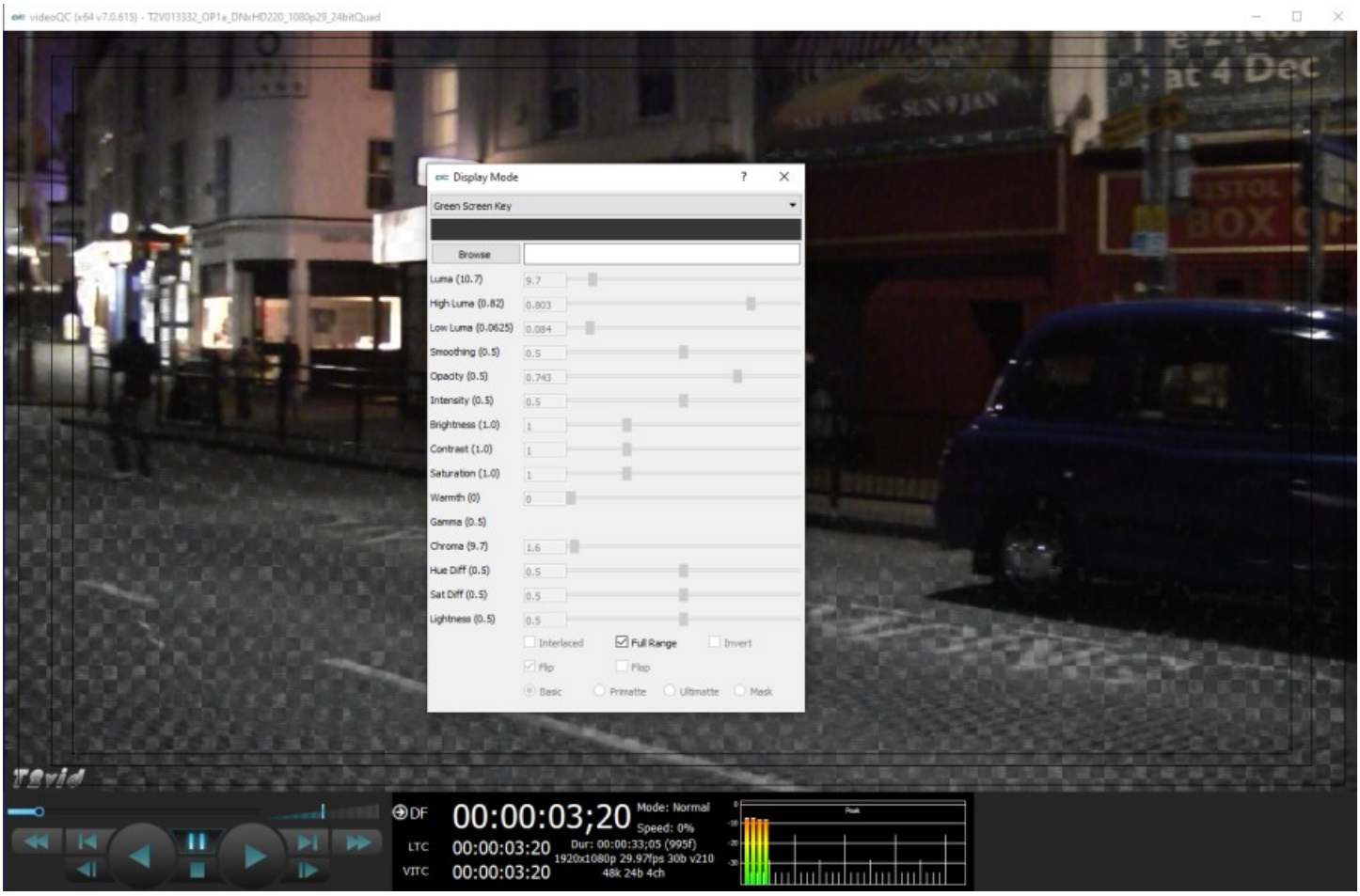
Activates the **Smoothing** slider, so the user can adjust the smoothing settings. When active, can be adjusted by pulling the slider, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

Activates the **Invert** checkbox. The user can check this box to Invert the key.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Green Screen Key

Show the image green screen keyed over a checkerboard.



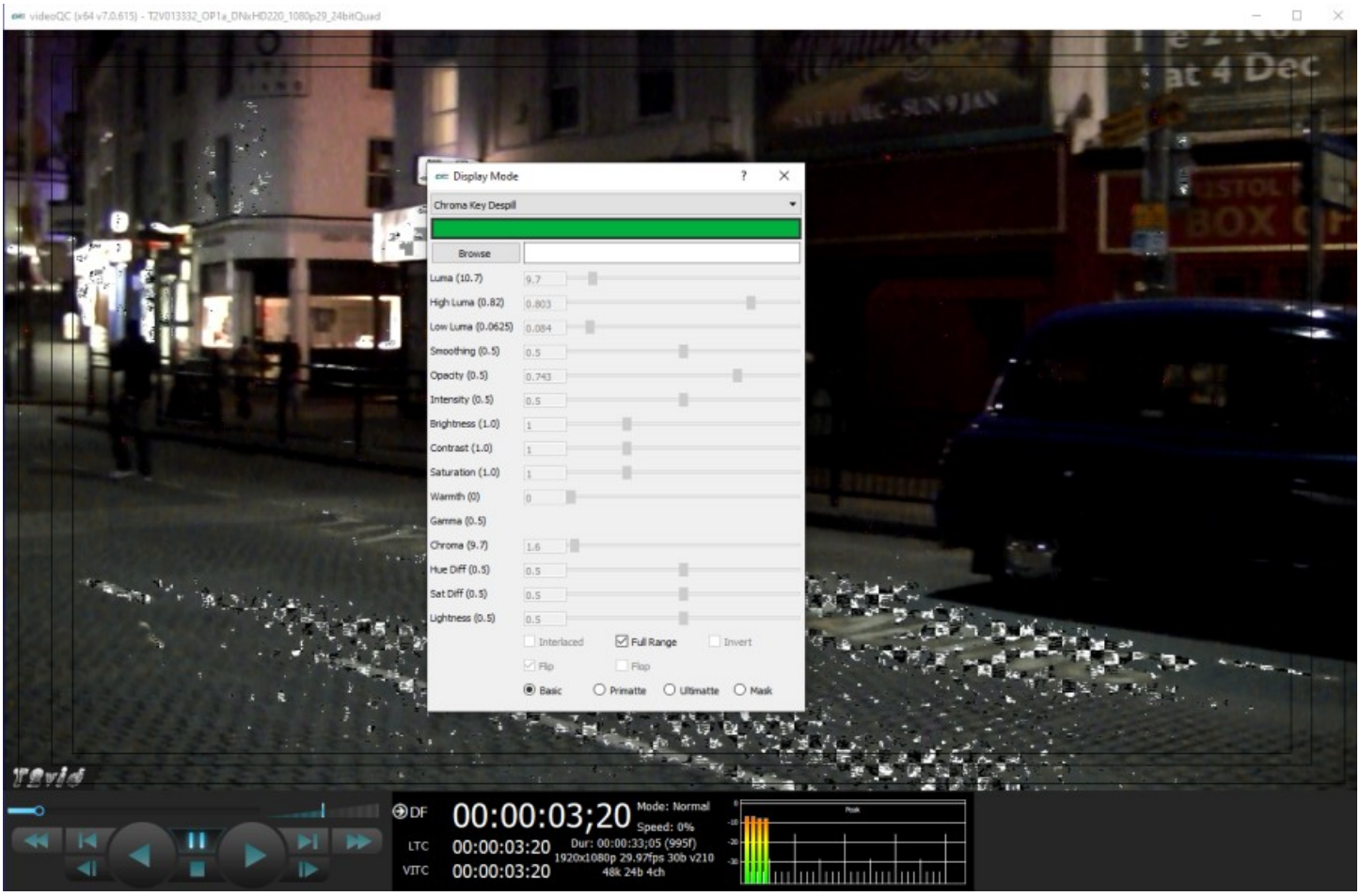
Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background for the green screen key, instead of the checkerboard.

Activates the **Invert** checkbox. The user can check this box to Invert the key.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Chroma Key Despill

Chroma Keys are applied to pass through background for a particular color. Green screen and blue screen are specific chroma keys. The Despill applies a mix to the pixels at the edge of the color and any objects in the scene.



Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can fine tune the green, or any color used for the chroma key. To open the color picker, click on the bar, or press <ENTER>.

Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background for the chroma key despill, instead of the checkerboard.

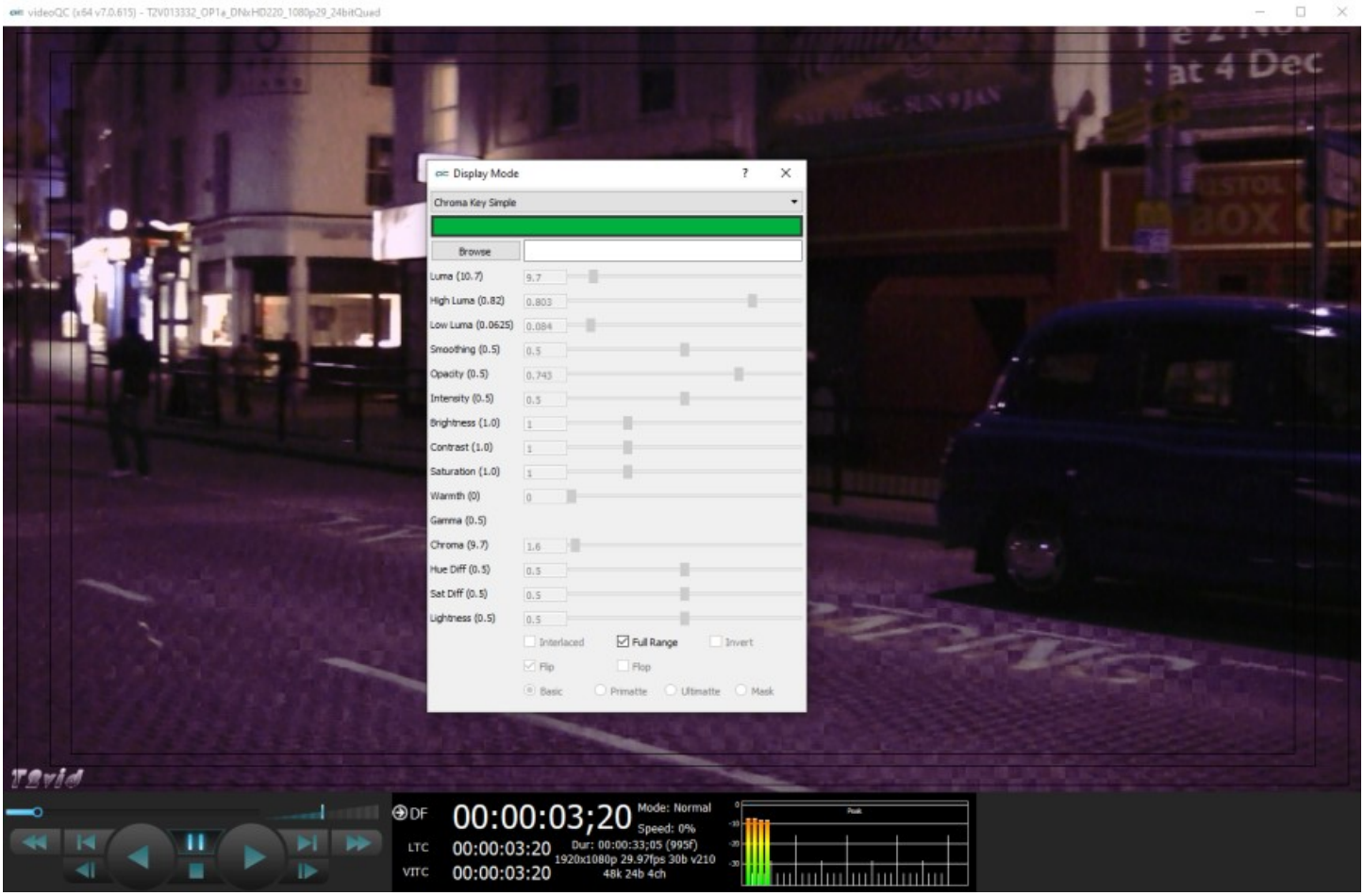
The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Activates the **Invert** checkbox. The user can check this box to Invert the key.

Activates the **Basic**/**Primatte**/**Ultimatte**/**Mask** radio buttons, which are chroma key despill types/settings. The user may select between these 4 settings using the radio buttons – when one is selected, the rest are automatically deselected.

Chroma Key Simple

Show the image green screened over a checkerboard or image. Chroma Keys are applied to pass through background for a particular color. Green screen and blue screen are specific chroma keys. The Simple looks at each pixel.



Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose a primary (too low) color other than green. The secondary (too high) color is automatically generated to be a contrasting color to the primary color. To open the color picker, click on the bar, or press <ENTER>.

Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can fine tune the green, or any color used for the chroma key.

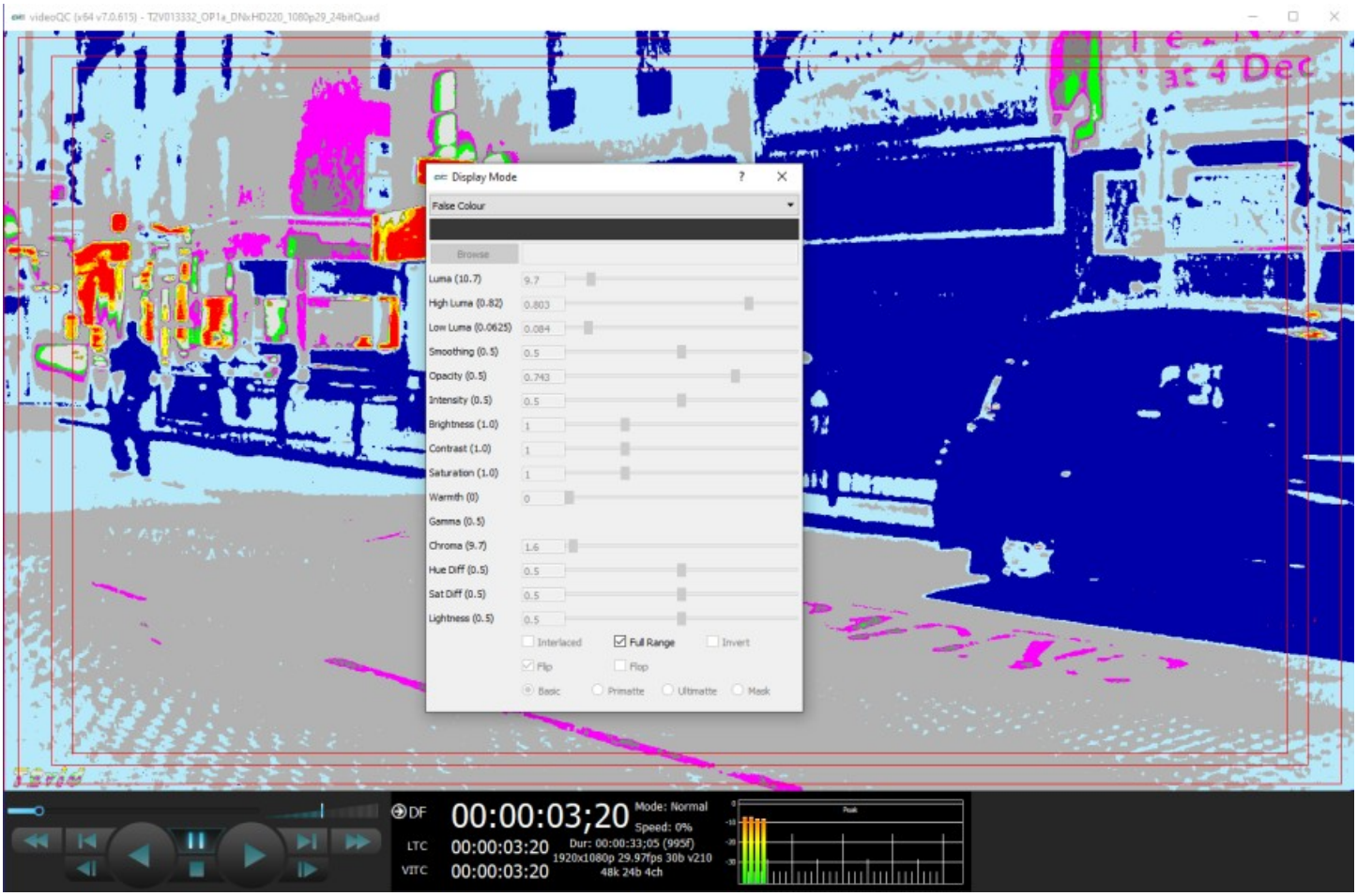
Activates the **Browse** button. This opens a standard browser, which allows the user to navigate to…

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Activates the **Invert** checkbox. The user can check this box to Invert the key.

False Colour

Show each exposure level as a color. Here is an example:



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range).

Here are the IRE Breakpoints in False Colour display mode:

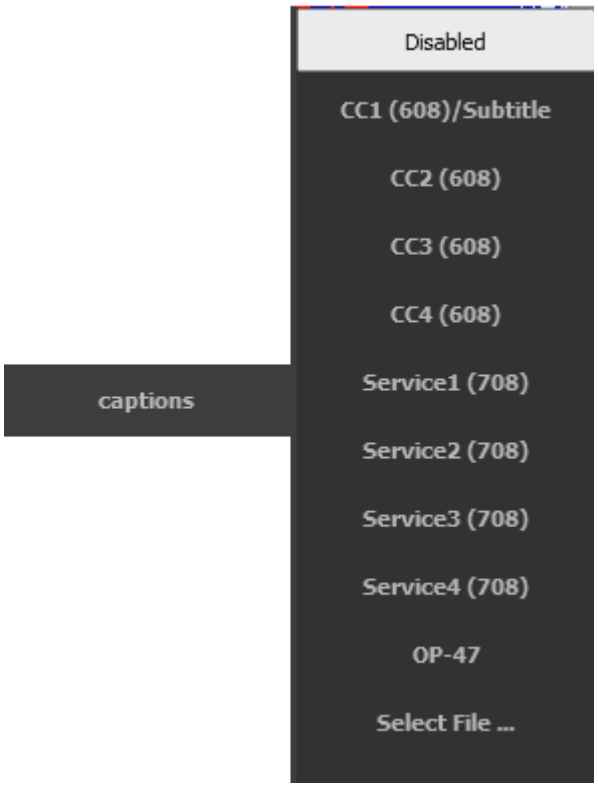
0 to 1.65	Red	Too low
1.65 to 10	Blue	Underexposed
10 to 20	Light Blue	
20 to 42	Dark Grey	
42 to 48	Bright Purple	
48 to 52	Medium Grey	
52 to 58	Green	
58 to 78	Light Grey	Skin Tones
78 to 84	Dark Yellow	
84 to 94	Dark Yellow	
94 to 92	Orange	Overexposed
92 to 100	Red	Too High

The following controls on the **Monitor Settings** window are reserved for future development:

Intensity slider – reserved for future development.
Hue Diff slider – reserved for future development.
Sat Diff slider – reserved for future development.
Lightness slider – reserved for future development.

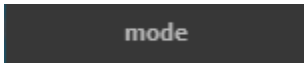
Captions

Opens the Captions pullout menu, to select between the available types of closed captions, or to browse to a closed caption file to open. Whichever closed caption type is selected will be rendered on the VGA display, if it is available.

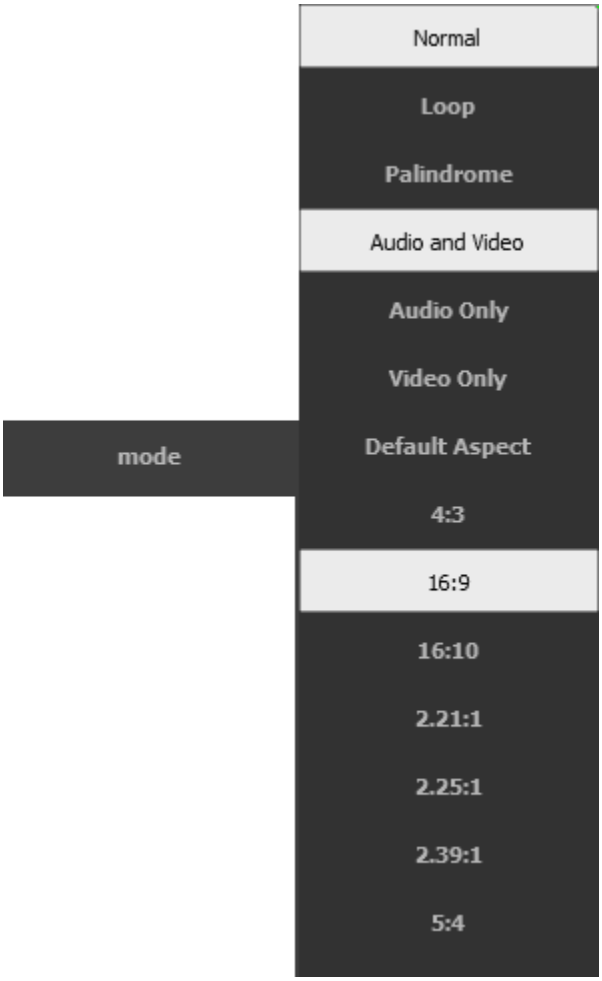


Disabled – select to turn off closed caption display
CC1 (608)/Subtitle – this is either the first cc channel in SD, the first compatibility byte channel in HD 708, or the subtitle file, if it has been loaded
CC2 (608) – either the second channel in SD or 708 compatibility bytes
CC3 (608) – either the third channel in SD or 708 compatibility bytes
CC4 (608) – either the fourth channel in SD or 708 compatibility bytes
Service1 (708) – the first service in 708
Service2 (708) – the second service in 708
Service3 (708) – the third service in 708
Service4 (708) – the fourth service in 708
OP-47 – Display OP-47 teletext
Select File... - select a subtitle file to be displayed with the video playback

Mode



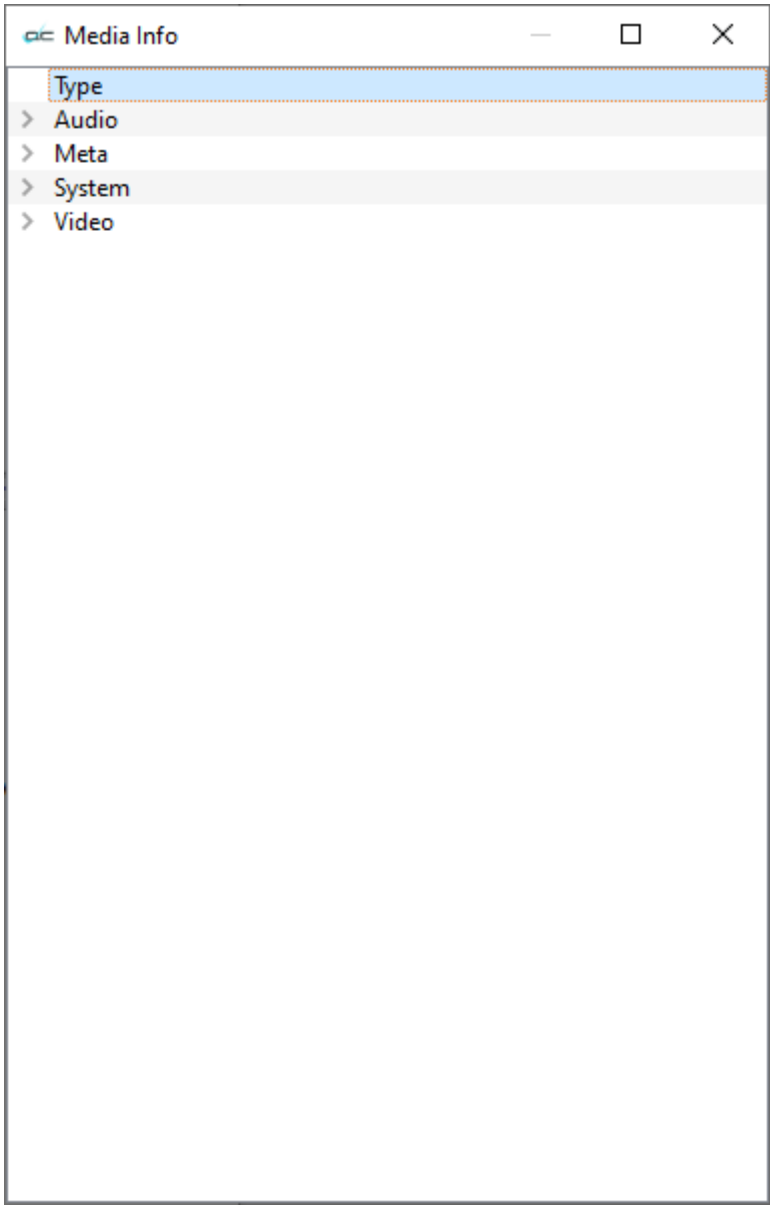
Opens the **Mode** pullout window, to select between the available types of playback mode. Choices include normal, loop, palindrome, audio and video, audio only, and video only. The aspect ratio can also be reset here.



- **Normal** – standard playback
- **Loop** – continue playing from the beginning when the end is reached
- **Palindrome** – play forwards from the start and then backwards from the end
- **Audio and Video** – play both audio and video
- **Audio Only** – play the audio, but not the video
- **Video Only** – play the video, but not the audio
- **Default Aspect –** use the default aspect ratio
- **4:3** – display in 4:3 (1.33:1) SD aspect ratio
- **16:9 –** display in 16:9 HDTV Full HD and SD TV aspect ratio
- **16:10 –** display in 16:10 HDTV and widescreen SDTV aspect ratio
- **2.21:1 –** display in 2.21:1 cinema aspect ratio
- **2.25:1 –** display in 2.25:1 cinema aspect ratio
- **2.39:1 –** display in 2.39:1 anamorphic aspect ratio
- **5:4** - display in 5:4 (large format computer display) aspect ratio

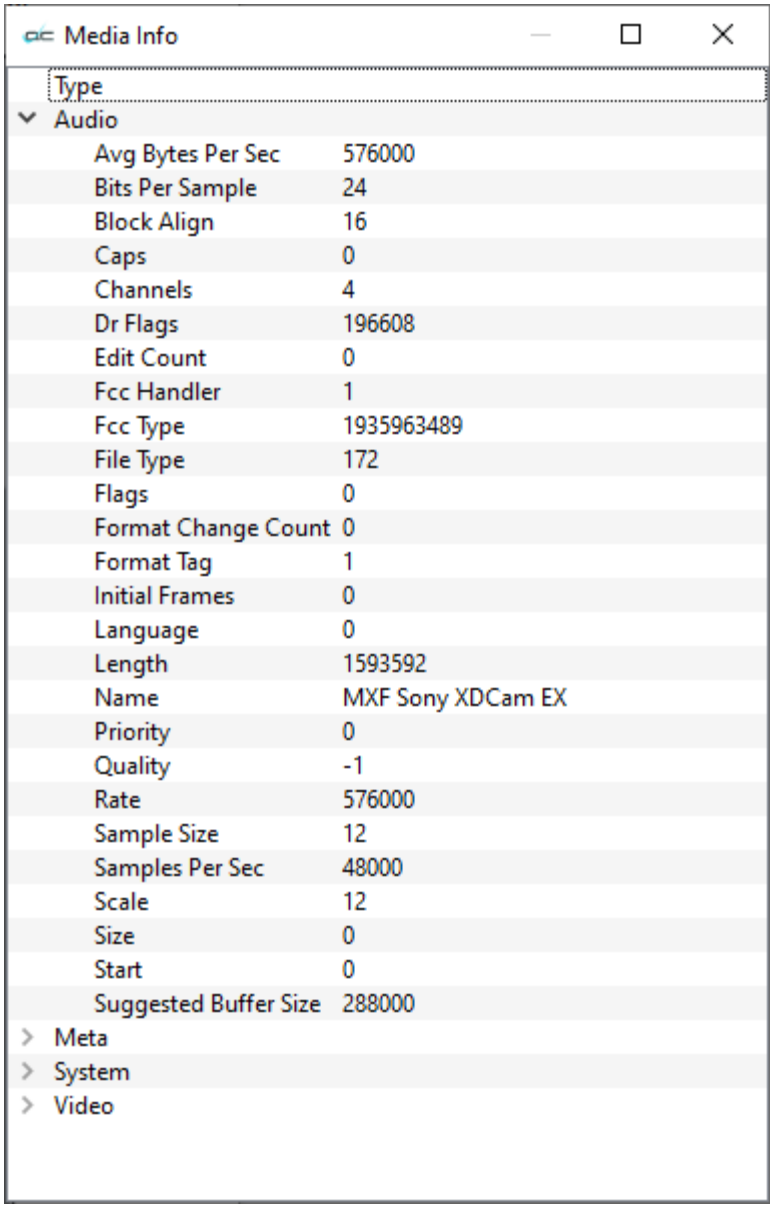
Media Info

Media Info button - opens the Track Info window, which displays information about the track's audio, metadata, system details, and video. Note: the metadata elements described below may not be present in all files, and there may be metadata elements that are not mentioned in the below list of metadata elements.



Media Info - Audio

Clicking on the Audio Tab reveals the information associated with the audio in the selected media file.

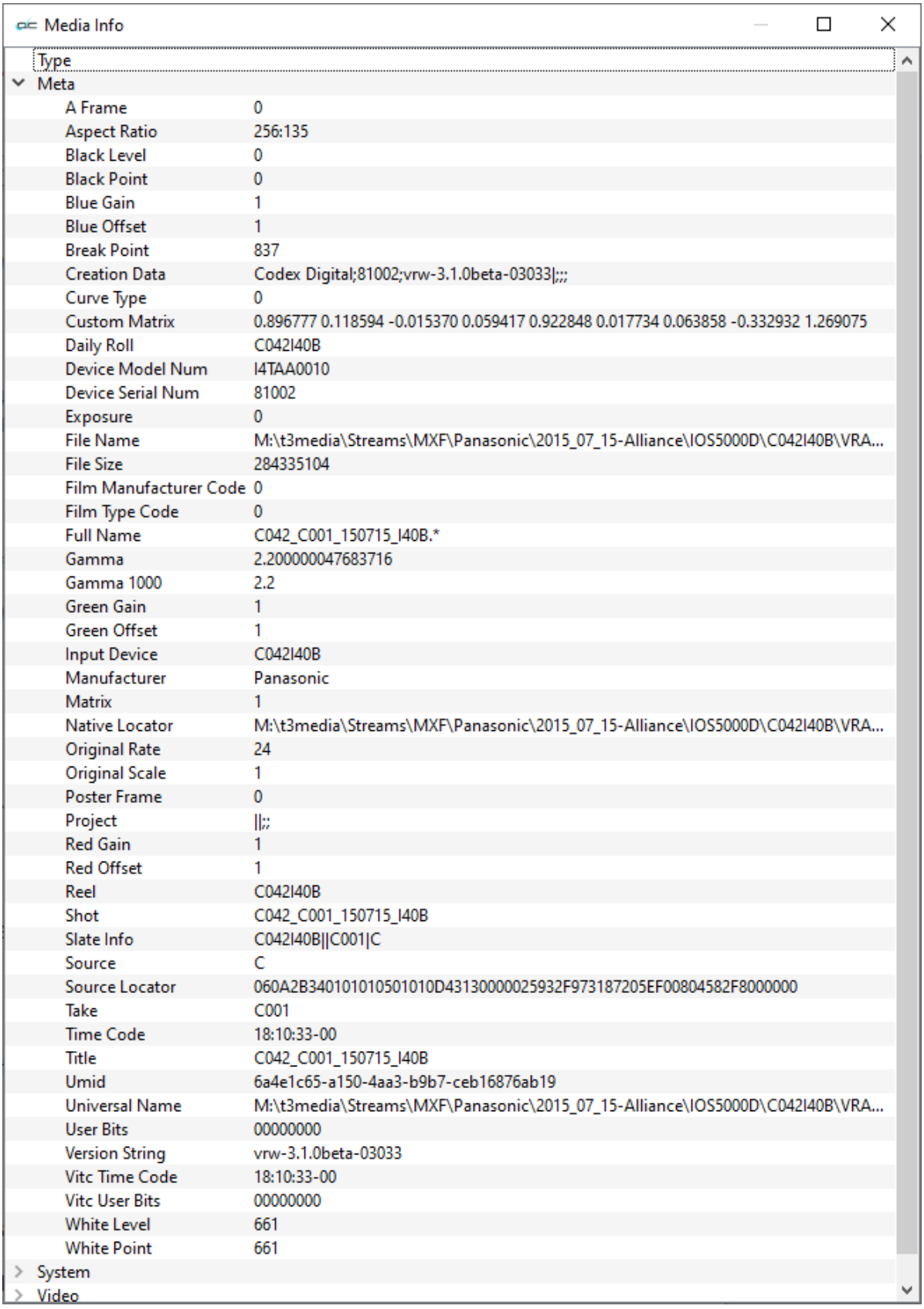


Avg Bytes Per Sec - the average number of bytes per second
Bits Per Sample - number of bits per audio sample
Block Align - Size in bytes of a sample set (all channels in that stream) of audio
Caps - Capabilities
Channels - number of audio channels
Dr Flags - Internal Drastic flags
Edit Count - Number of edits that have been performed on the file
Fcc Handler - Handler used for the FCC type
Fcc Type - Type of Audio/Video FourCC Compression Code
File Type - Name for the Drastic file type
Flags - Flags setting
Format Change Count - Number of times the file's format has been changed
Format Tag – Number used to tag the type of audio format; 1 if PCM, other for various compressed formats
Initial Frames - Amount of audio in the file before video commences
Language - Language setting

Length – Number of audio samples in the sile
Name - Name of the reader for this file type
Priority - Priority of the selected video or audio stream in relation to other streams in the file
Quality - Quality used by the compressor
Rate - Frame rate setting
Sample Size - Size, in unsigned chars, of a single data sample
Samples Per Sec - Samples per second in frequency (48000, 44100, etc.)
Scale - Scale of the frame
Size - Size of sample in bytes, but is not set generally
Start - Delay in units for this stream to start before video commences
Suggested Buffer Size - Recommended buffer size
Size - The size of any extra info on the audio compression
Format Tag - Windows format type (if applicable)
Start - Delay in units for this stream to start before video commences
Samples Per Sec - number of samples per second

Media Info - Meta

Clicking on the Meta Tab reveals the metadata information associated with the selected media file.

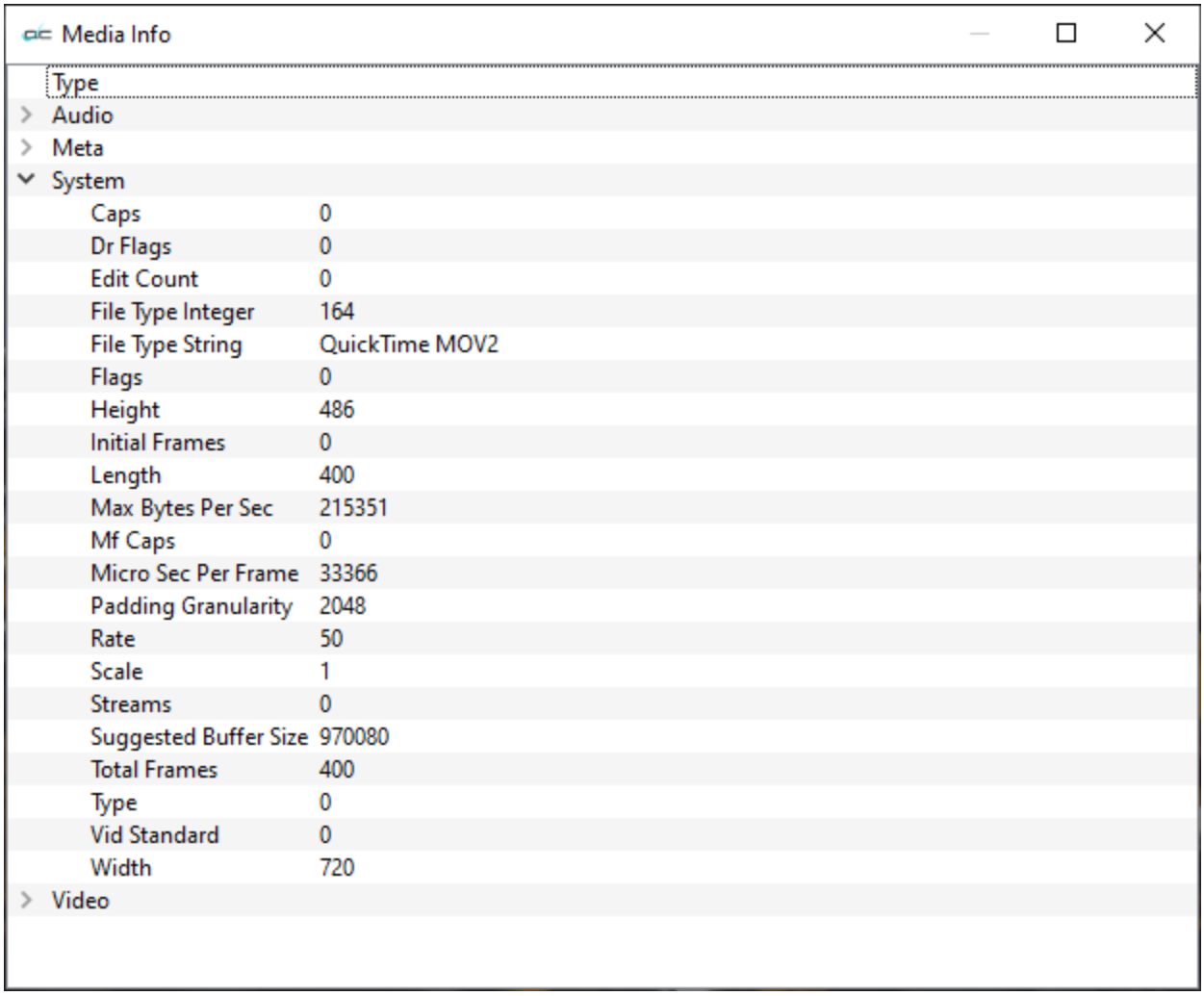


A Frame - A frame indicator for 3/2 cadence

Aspect Ratio - Video aspect ratio
Black Level – recommended black level
Black Point – break point for black level
Blue Gain – recommended blue gain level
Blue Offset – recommended blue offset
Break Point – break point for curve
Conversions – number of times the file has been converted/transcoded
Creation Data – when the file was created
Curve Type – type of LUT applied
Custom Matrix – custom matrix value
Daily Roll - name of the Daily Roll (edited day's run) associated with the content
Device Model Num – input device model number
Device Serial Num – input device serial number
Exposure – recommended exposure level
File Name - Network path plus file name plus file extension
File Size – file size in bytes
Film Manufacturer Code -
Film Type Code – the code used to describe tye type of film or media used
Full Name - Content's full name
Gamma – the level of any gamma correction that has been applied
Gamma 1000 – gamma of media times 1000
Green Gain – recommended green gain level
Green Offset – recommended green offset
Input Device – for CIN/DPX, the Telecine name
Ltc Time Code Type - LTC time code type for the counter/ctl
Manufacturer – manufacturer name
Matrix – the video matrix setting, if required
Native Locator - Native path plus file name plus file extension
Original Rate - Original rate/scale
Original Scale - Original rate/scale
Poster Frame - Frame from which a thumbnail is created for the content
Project – name of the project
Red Gain – recommended red gain level
Red Offset – recommended red offset
Reel – reel name from the content’s source reel/tape
Slate Info – slate information from the shot/take
Source - Source of the file, whether VTR, Betacam, Satellite etc.
Source Locator - System locator for file source, in UnversalLocator, NativeLocator, FileName order
Take – take number or identifier
Time Code - Starting time code of the file
Time Code Type - Time code type for the counter/ctl
Title - title of the content
Total Length – length of file in frames
Total Streams – total number of streams
Umid - SMPTE Universal Media Identifier
Unique ID – unique identifier
Universal Name - Network path plus file name plus file extension
User Bits - 32 bit DWORD of user bits stored in the file
Version String – content version in human readable form
Vitc Time Code - Vertical Interval Time Code
Vitc Time Code Type - VITC time code type for the counter/ctl
Vitc User Bits - Vertical Interval User Bits
White Level – recommended white level
White Point – white point level

Media Info - System

Clicking on the System Tab reveals the information associated with the system in the selected media file.

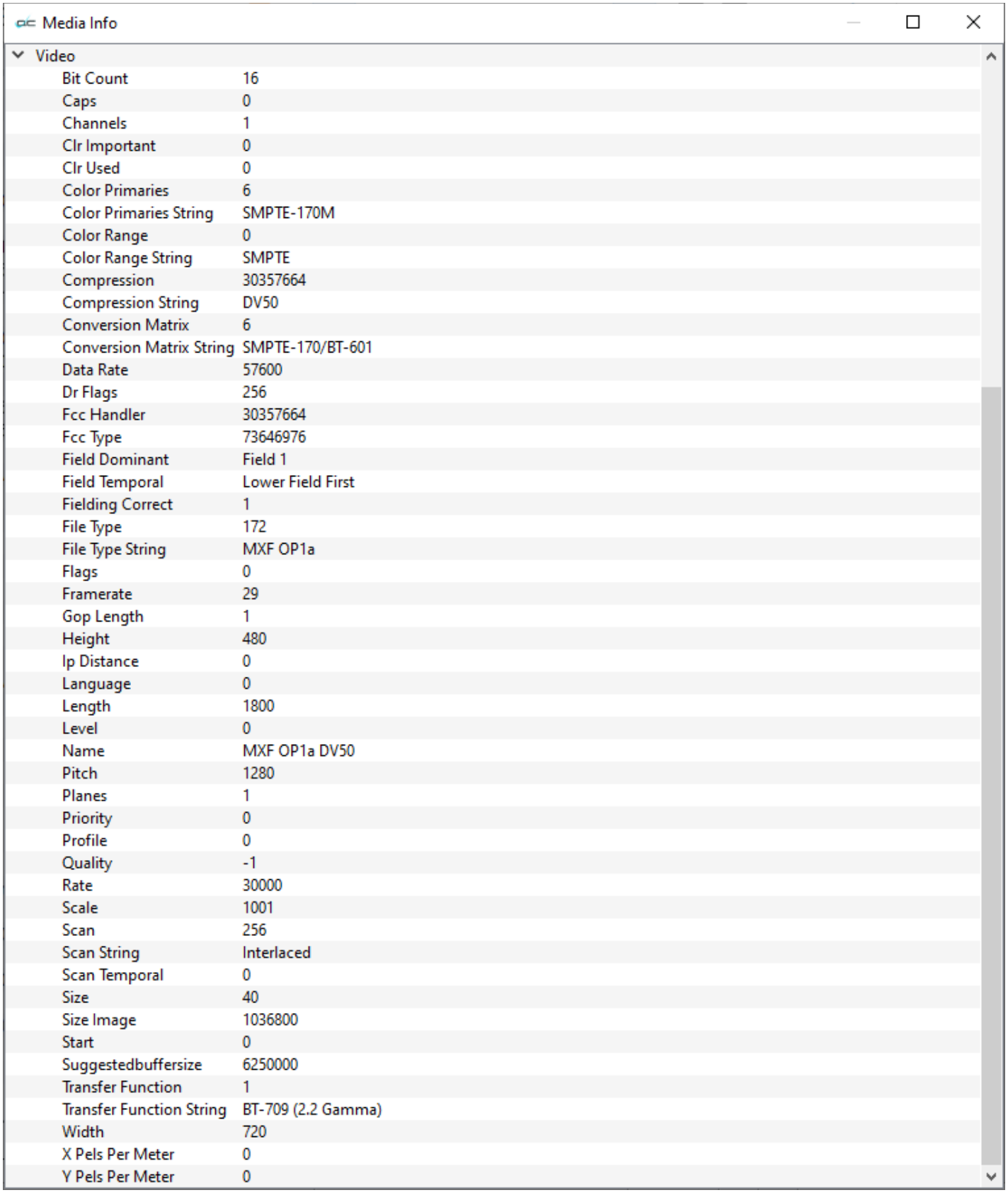


Caps - Capabilities
Dr Flags - Internal Drastic flags
Edit Count - Number of edits that have been performed on the file
File Type Integer - Numeric value of the file type reader
File Type String - Name of the file kind/type in human readable form
Flags - File flags – internal
Height - Height of video frame in pixels
Initial Frames - Amount of audio in the file before video commences
Length - Length of the video stream in frames
Max Bytes Per Sec - the maximum number of bytes per second
Mf Caps - MediaFile capabilities
Micro Sec Per Frame - number of microseconds per video frame
Padding Granularity - Minimum device block size - only important for tapes like LTO
Rate - Frame rate setting
Scale - Scale of the frame
Streams - Total number of streams
Suggested Buffer Size - Recommended buffer size
Total Frames - total number of video frames in the file
Type - Our internal numeric value for the file reader
Vid Standard - Video standard value (numeric representation of standards like 1080i29.97 for comparison)

Width - Width of video frame in pixels

Media Info - Video

Clicking on the Video Tab reveals the information associated with the video in the selected media file.



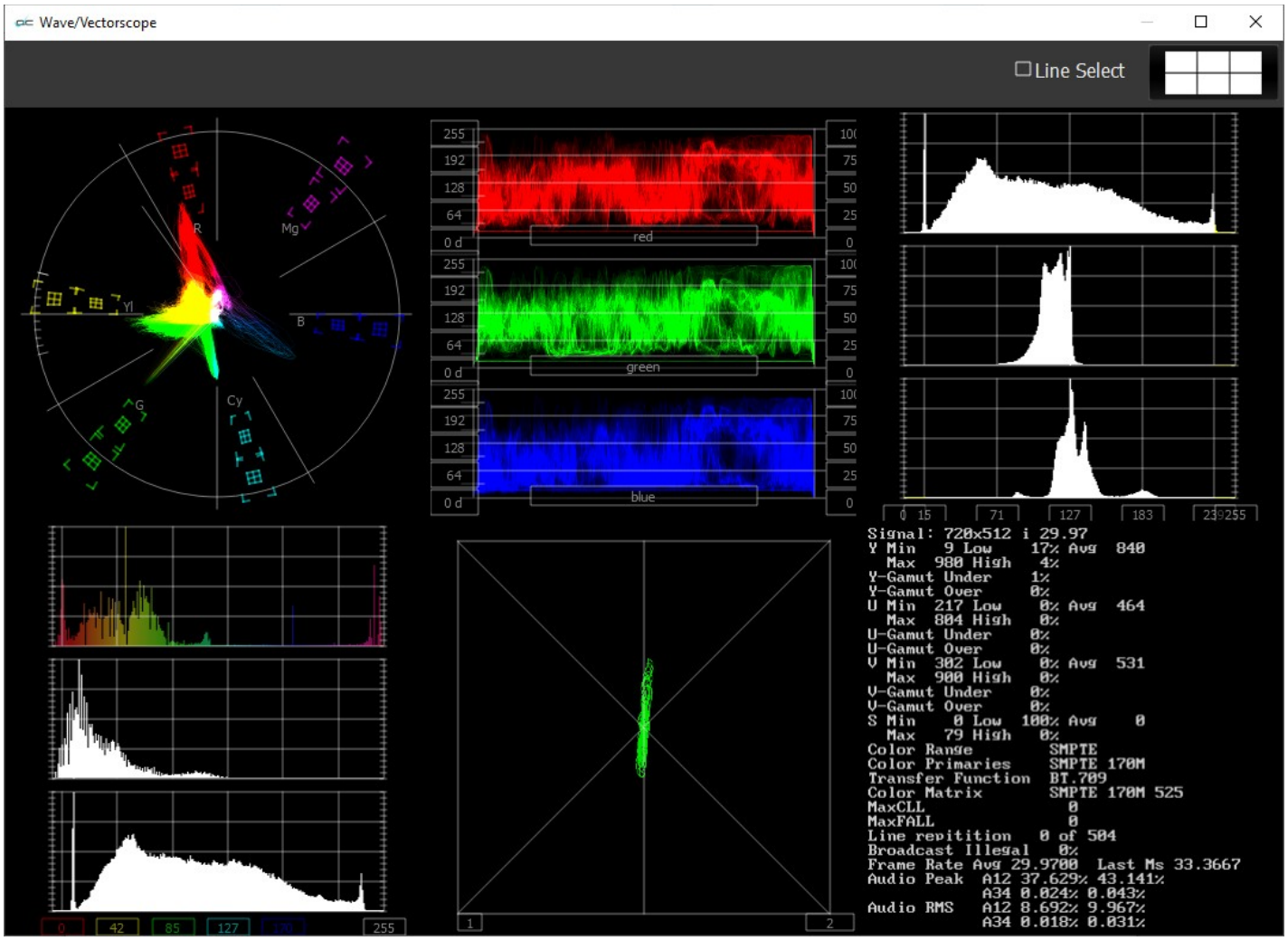
Bit Count - (or, Bit Depth) – Number of bits per pixel reported in video

Caps - Capabilities
Channels - number of channels
Clr Important - Number of RGBQUAD elements that are critical to display
Clr Used - For color tables, the number of RGBQUAD elements used
Color Primaries - the color primaries and white point of the Mastering Monitor/Display used for the project
Color Primaries String - the color primaries and white point of the Mastering Monitor/Display used for the project displayed in human readable form
Color Range - the color range used. Some common color models include RGB, YUV 4:4:4, YUV 4:2:2, and YUV 4:2:0
Color Range String – the color range used, displayed in human readable form
Compression - Compression setting - a fourcc usually, but not always equal to fccHandler. Denotes compression type of frame
Compression String - Name of the compression type in human readable form
Conversion Matrix – the conversion matrix used to convert from RGB to YCbCr
Conversion Matrix String – the conversion matrix in human readable form
Data Rate - the data rate of the file in bits per second
Dr Flags - Internal Drastic flags
Fcc Handler - Handler used for the FCC type
Fcc Type - Type of Audio/Video FourCC Compression Code
Field Dominant - Which field of an interlaced signal is on top
Field Temporal - Which field of an interlaced signal comes first
Fielding Correct - Is the fielding for an interlaced standard correct, or inverted
File Type - Name for the Drastic file type
File Type String - Name of the file kind/type in human readable form
Flags - Flags setting
Framerate – frames per second
Gop Length – Group of Pictures length (MPEG-2, H.264, and H.265 formats)
Height - Height of video frame in pixels
Ip Distance - the distance between your system IP address and the IP address of a source stream
Language - Language setting
Length - Length of the video stream
Level - The MPEG-2 systems level defines two types of streams: the program stream and the transport stream
Name - Name of the reader for this file type
Pitch - Video line pitch, or image pitch, which is the length, in bytes, of one line of the video image
Planes - Number of RGB groups (like Photoshop layers)
Priority - Priority of the selected video or audio stream in relation to other streams in the file
Profile – (MPEG-2) Simple profile, Main profile, SNR scalable profile, Spatial scalable profile, 4:2:2 profile, Multiview profile
Quality - Quality used by the compressor
Rate - Frame rate setting
Scale - Scale of the frame
Scan - Interlaced, progressive or progressive segmented frames (PsF)
Scan String – scan type in human readable form
Scan Temporal - In an interlaced or Progressive Segmented Frame, a numerical signifier for the scanning method used
Size - the size of the video description structure. 40 and 68 are common. Other sizes indicate 'out of band' video codec configuration material.
Size Image - Size of the Image in unsigned chars
Start - Delay in units for this stream to start before video commences
Suggestedbuffersize - Recommended buffer size
Transfer Function - opto-electronic transfer function method used
Transfer Function String – opto-electronic transfer function in human readable form
Width - Width of video frame in pixels
X Pels Per Meter - specifies the horizontal print resolution, in pixels per meter, of the target device for the bitmap.

Y Pels per Meter - specifies the vertical print resolution, in pixels per meter, of the target device for the bitmap.

Wave/Vector

Wave/Vector - press the Wave/Vector button to view the selected file through various scope tools.



There are various layout options, and a range of scope tools.

Layout Options

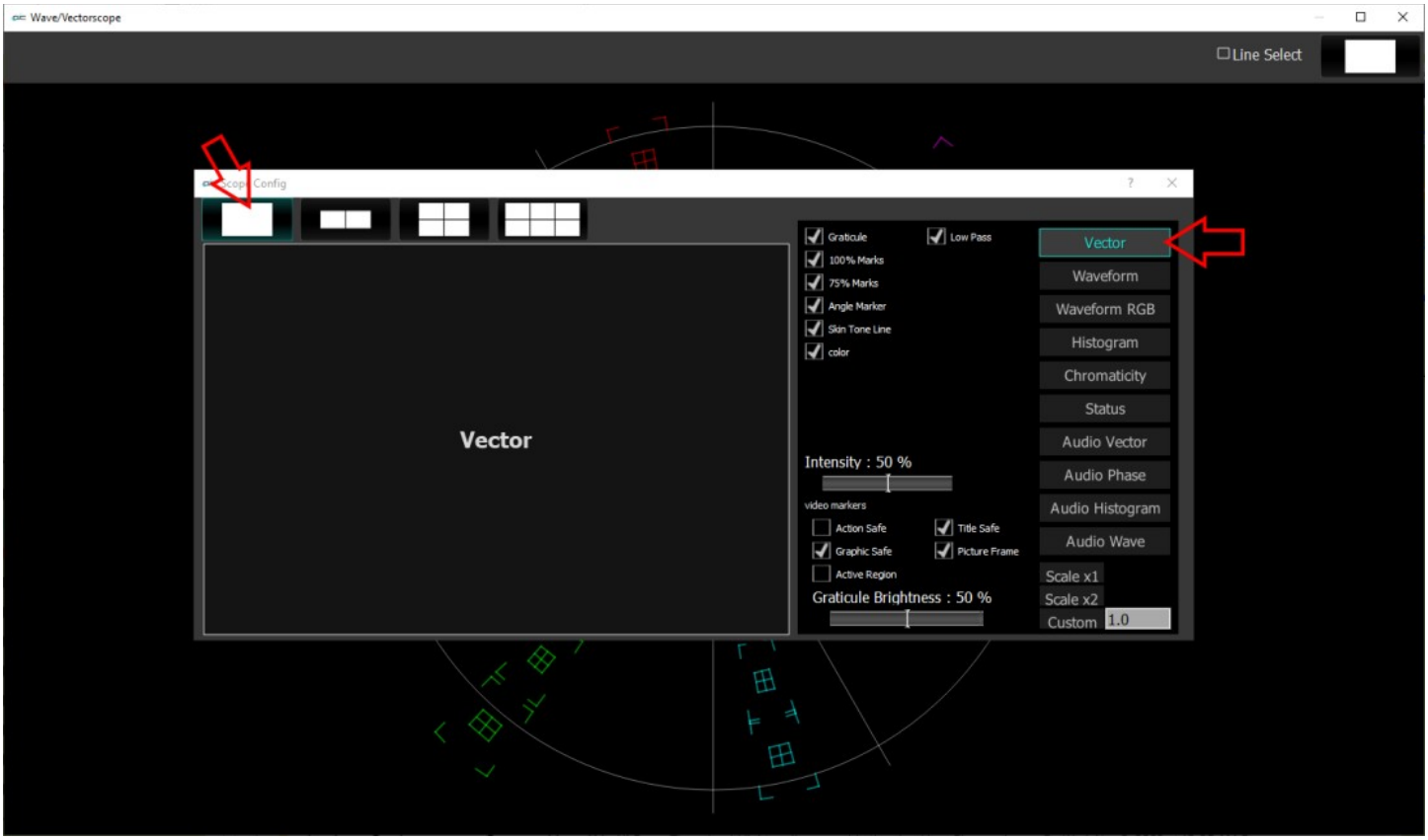
At the top of the scopes window at the very right is the **Setup** button. The button shows you the number of scopes that are set up. In the above example, a 6 up layout has been selected.

Press the **Setup** button, and use the four buttons at the top of the Setup window to select the layout that suits your workflow.

The choices are: 1 scope (single), 2 scopes (side by side), 4 scopes (2 x 2 grid), or 6 scopes (two rows of three scopes).

Single Scope Layout

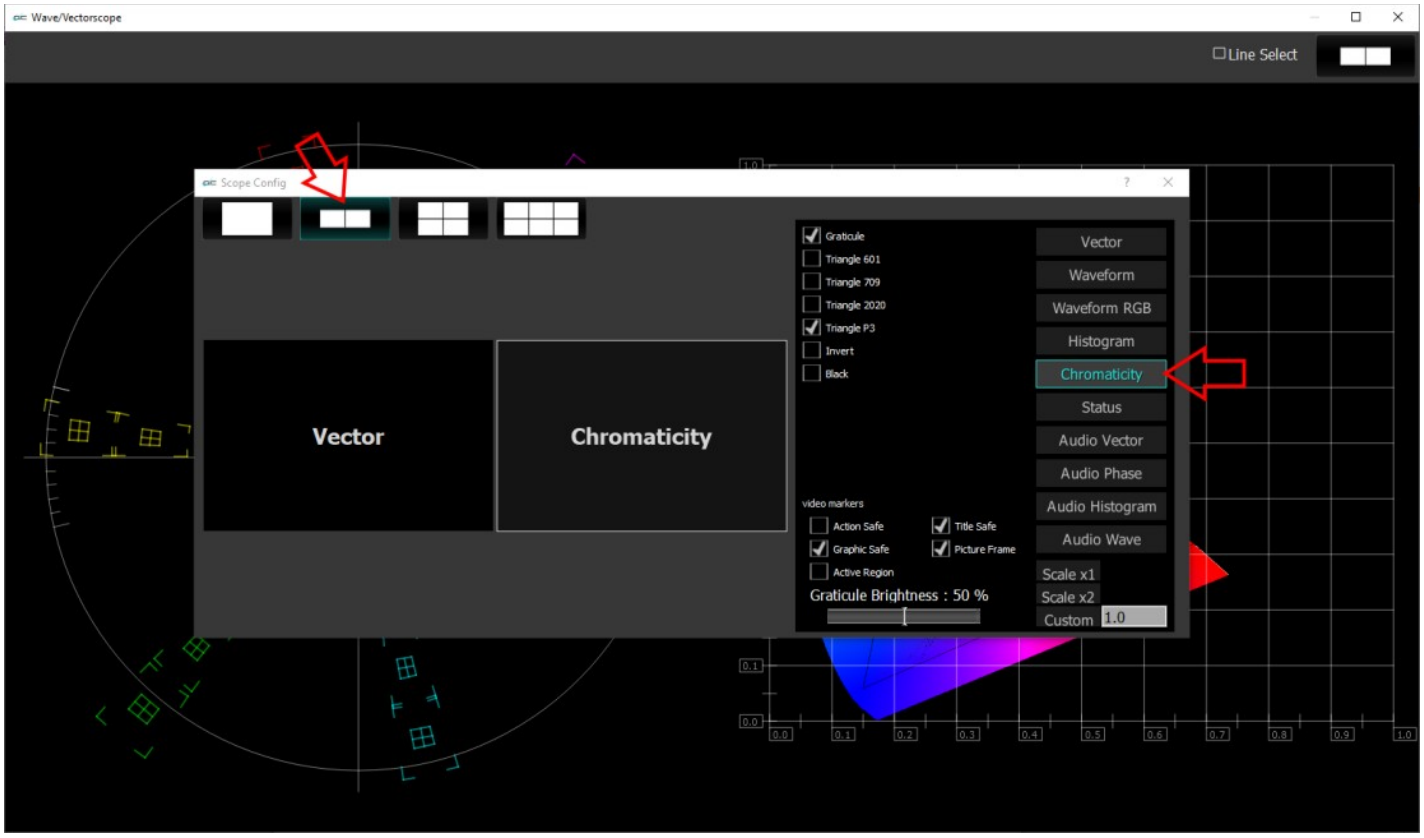
A single scope layout has been selected.



The arrow on the left shows the button used to select the single scope layout. The example shown displays the selection of a vectorscope. The arrow on the right shows the button used to select the vectorscope.

Two Scopes Layout

The two scopes layout has been selected.

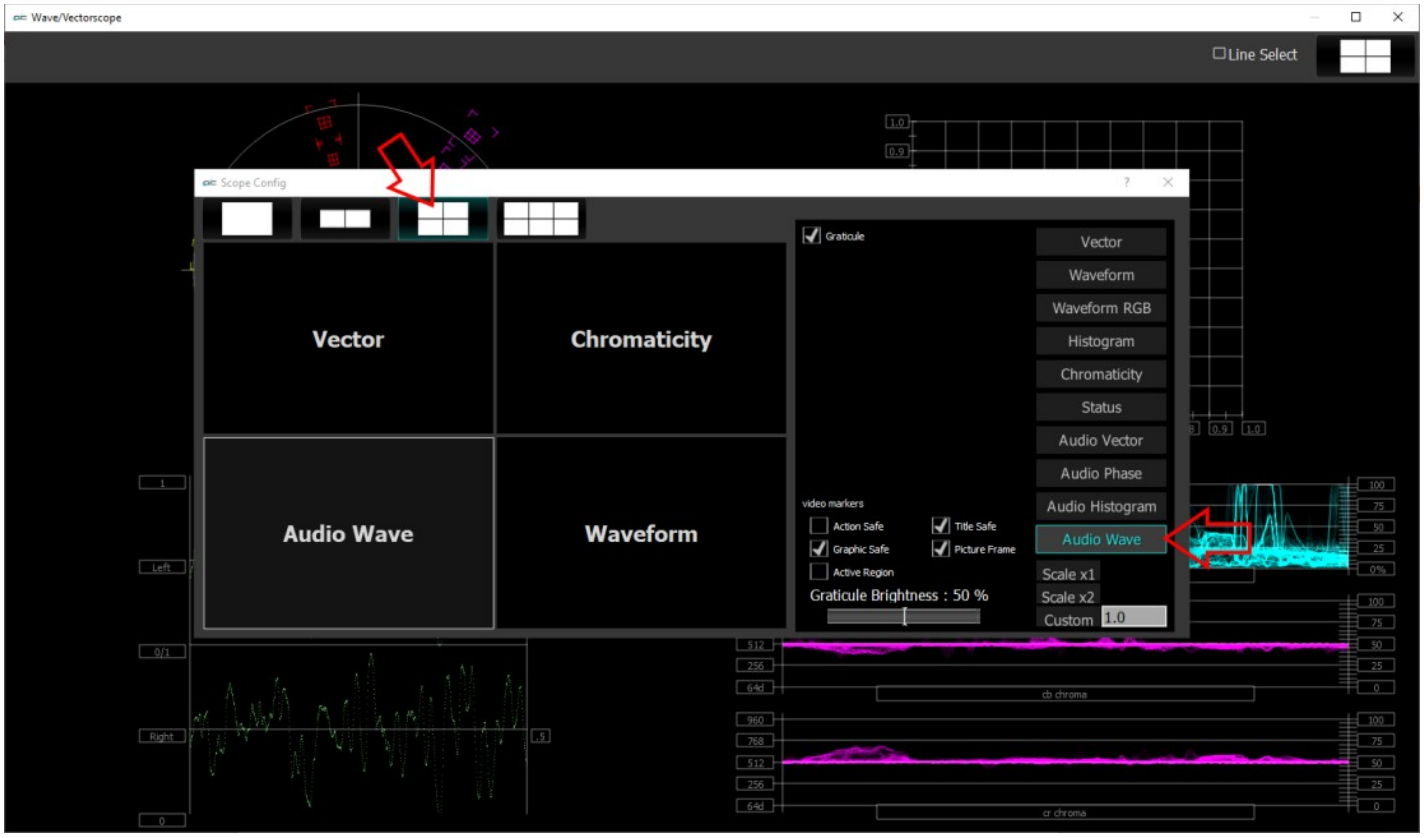


The arrow on the left shows the button used to select the two scopes layout. The example shown features the vectorscope and chromaticity scope. The arrow on the right shows the button used to select the chromaticity scope.

To change which scope appears in a panel, click on it and use the selection buttons on the right to choose the scope. For example if you would like a waveform monitor on the left panel, you would click on the left panel, and click on the appropriate waveform button.

Four Scopes Layout

The four scopes layout has been selected.

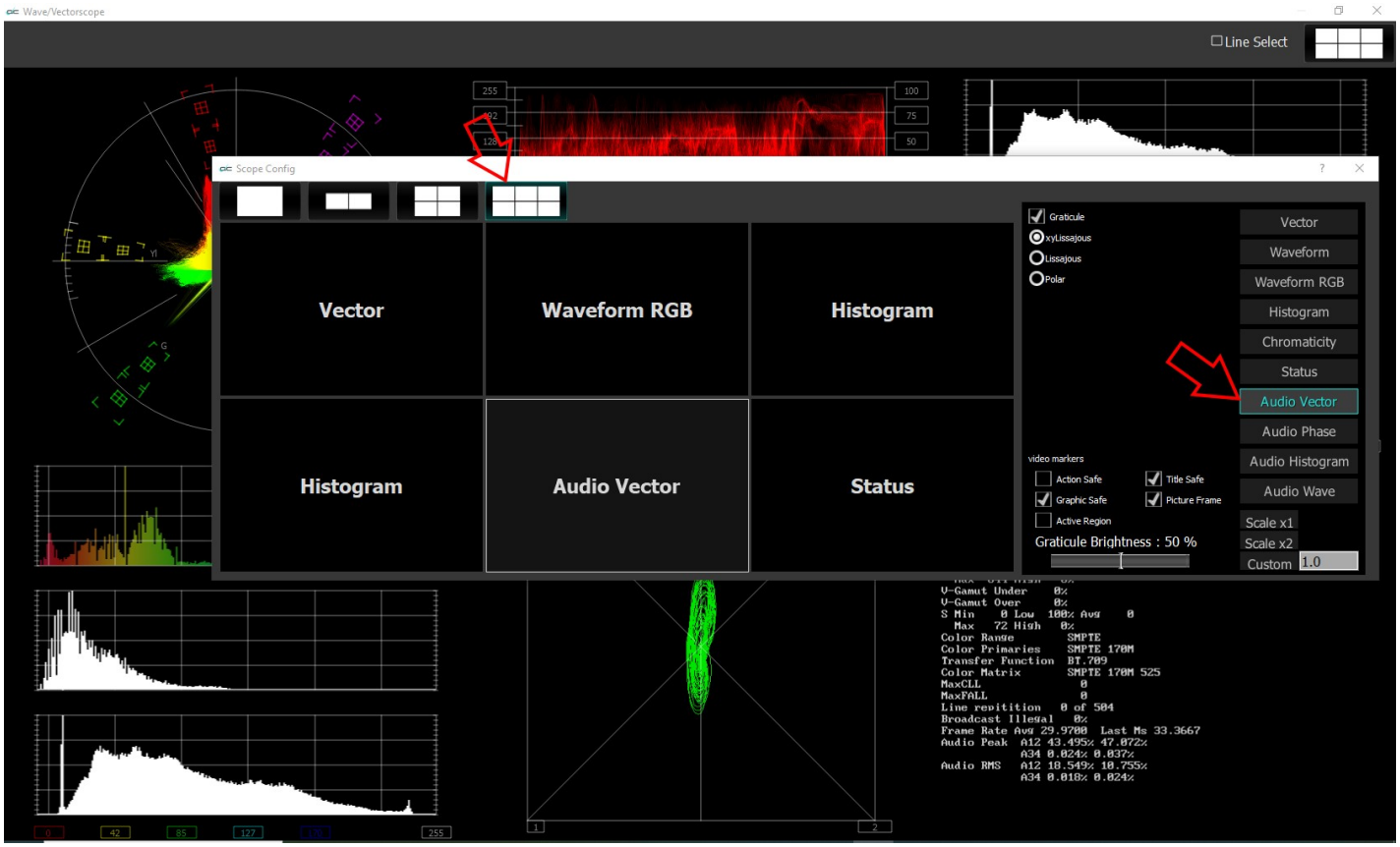


The arrow on the left shows the button used to select the four scopes layout. The example shown features the vectorscope, the chromaticity scope, the audio waveform, and the YCbCr waveform. The arrow on the right shows the button being used to select the audio waveform.

To change which scope appears in a panel, click on it and use the selection buttons on the right to choose the scope. For example if you would like a waveform monitor on the lower left panel, you would click on the left panel, and click on the appropriate waveform button.

Six Scopes Layout

The six scopes layout has been selected.

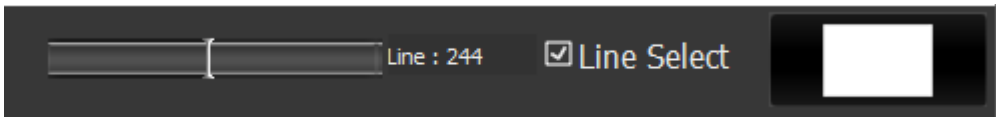


The arrow on the left shows the button used to select the six scopes layout. The example shown features the Vectorscope, RGB Waveform Monitor, YCbCr Histogram, HSV (hue/saturation/value) Histogram, Audio Vectorscope, and Status display. The arrow on the right shows that the Audio Vectorscope is selected (highlighted), and therefore its controls are displayed in the setup, and its settings can be changed.

To change which scope appears in a panel, click on it and use the selection buttons on the right to choose the scope. For example if you would like an audio waveform display on the lower left panel, you would click on the left panel, and click on the appropriate waveform button.

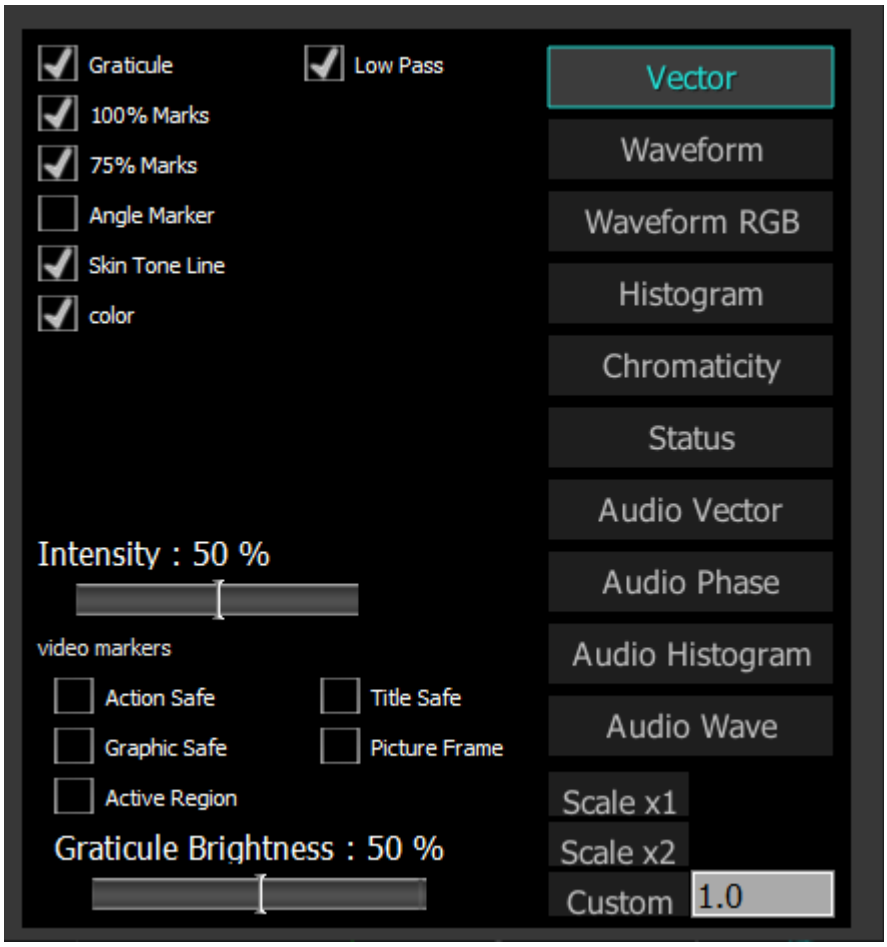
Line Select

Clicking the line select button produces a slider, which allows the user to select a single line of the video to view through the scopes. Deselecting the checkbox releases the line select, and hides the slider.



Vectorscope

To set up the Vectorscope, press the **Scope Config** button. This opens the Scope Config window. Click on the **Vector** button on the right. There are a number of options to set up the vectorscope:



Graticule checkbox – when selected, the graticule is laid over the Vectorscope. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.
Low Pass checkbox - when selected, smooth the scope with a 1/3 filter to remove single pixel anomalies.
100% Marks checkbox – when selected, the 100% Marks are displayed over the Vectorscope
75% Marks checkbox - when selected, the 75% Marks are displayed over the Vectorscope
Angle Marker checkbox - when selected, the Angle Markers are displayed over the Vectorscope
Skin Tone Line checkbox - when selected, the Skin Tone Line is displayed over the Vectorscope
Color checkbox – when selected, the lines, regions, and points of the signal in the vectorscope are drawn in their respective colors.
Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal th rough the Vectorscope. The current setting is displayed above the slider, as a percentage, 0% providing no display and 100% being maximum intensity.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Graticule Brightness slider - Moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size

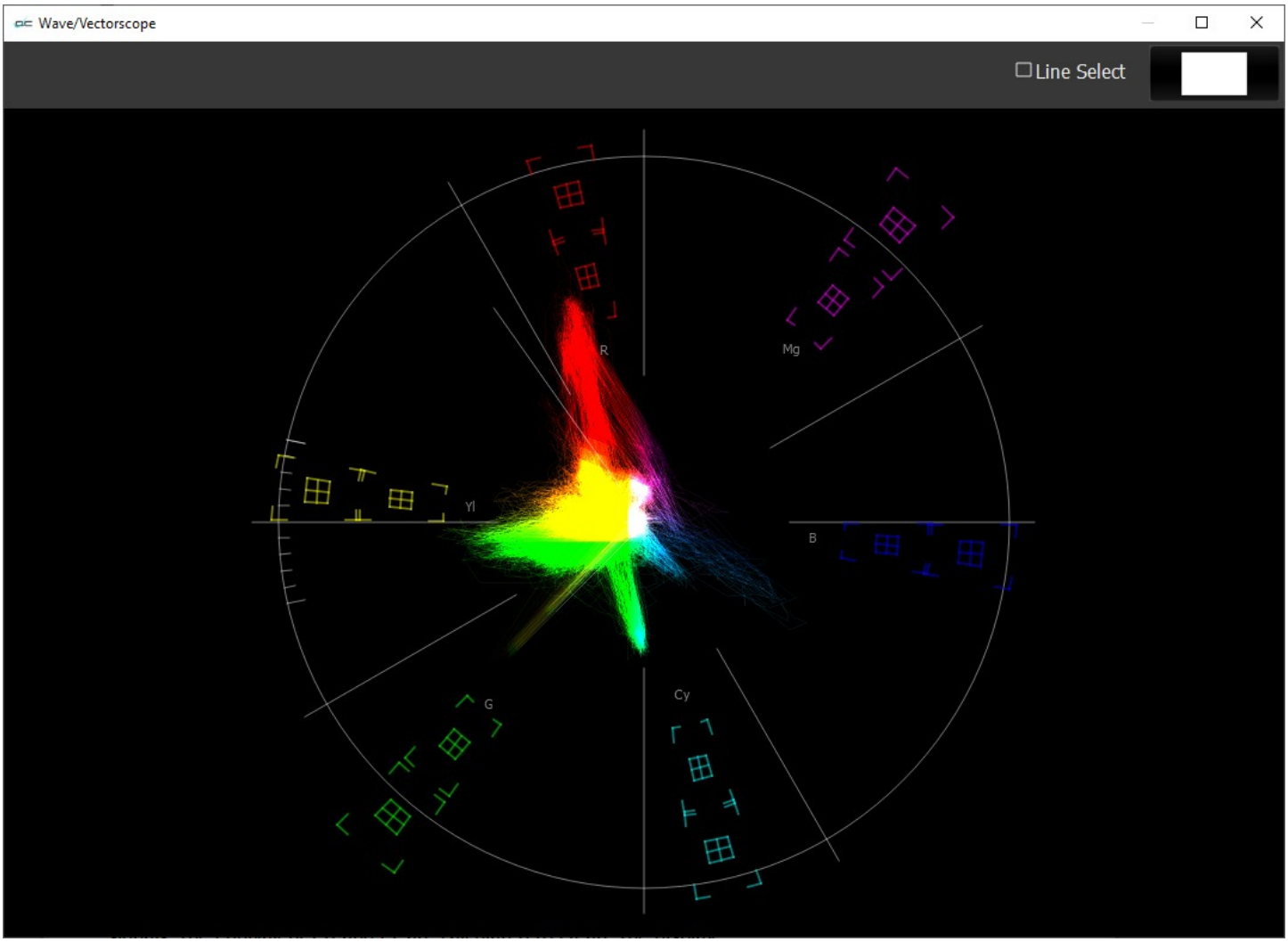
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Vectorscope Display

Here is the Vectorscope.



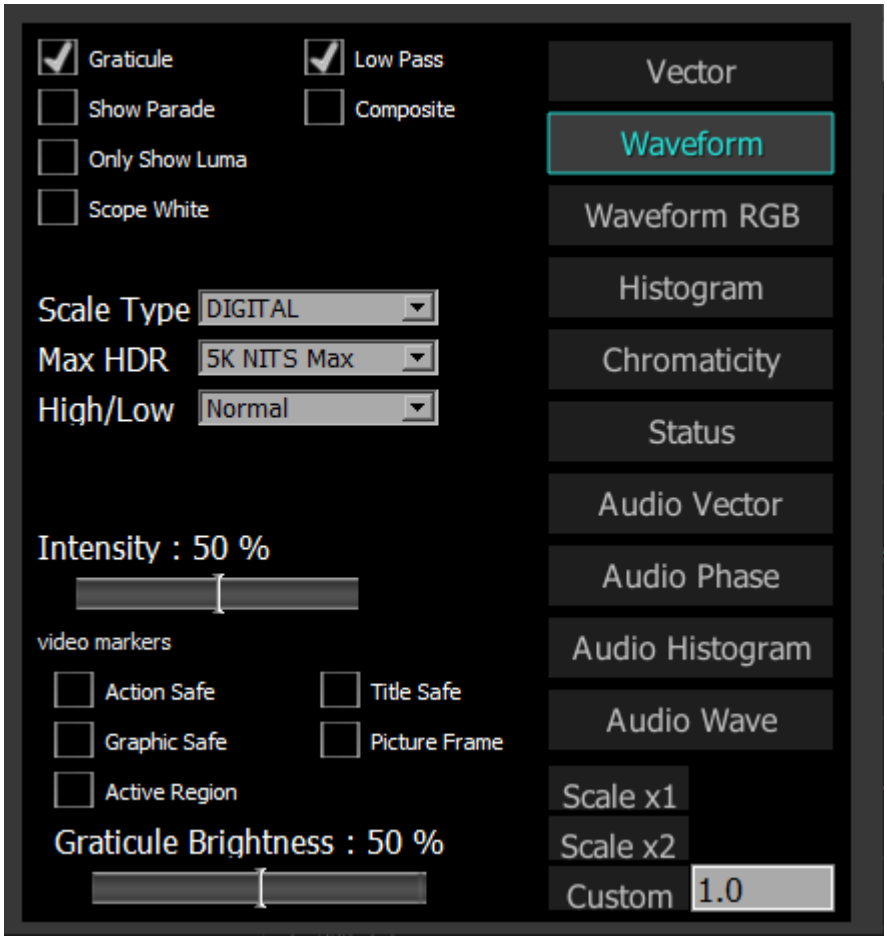
The **Vectorscope** displays a traditional Cb by Cr X-Y display with overlaid reference graticule. Color accurate graticules automatically switch between SD and HD color spaces. The markers include color points (for standard bar checks) at 75% and 100% saturation. All the standard points are boxed; red, magenta, blue, cyan, green and yellow. A skin tone/flesh line is provided to allow for easy hue adjustment as well as standard diagonals. Angle markers can be overlaid to indicate the tertiary color regions.

At all times a minimum and maximum value for each of the channels (Y, Cr and Cb) is displayed in 10 bit mode (0-1023). The color of the text for each channel indicates the following: in range (green), out of range but legal (yellow) and illegal/sync values (red).

For single link 8 and 10 bit YCbCr files, there is no color processing involved. For dual link 4:4:4 RGB signals, the equivalent Cb and Cr are calculated to create the display.

Waveform YCbCr

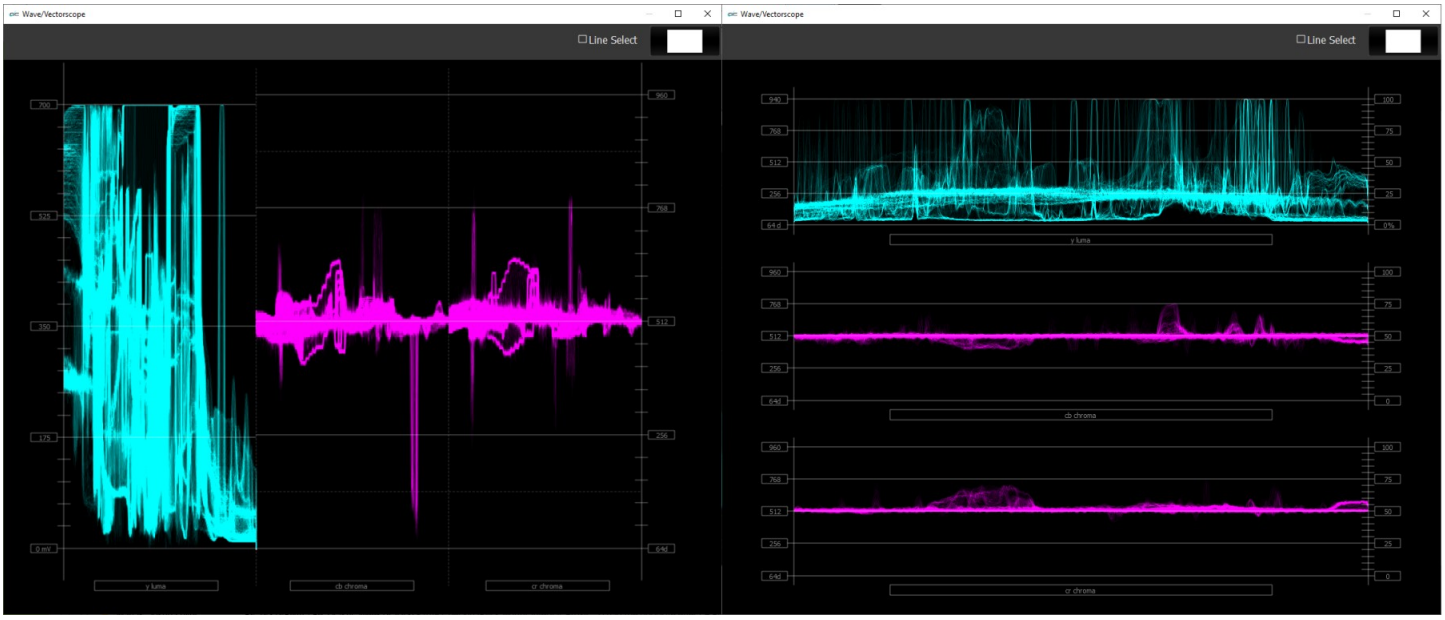
To set up the **Waveform YCbCr**, press the **Scope Config** button. This opens the Scope Config window. Click on the **Waveform** button on the right. There are a number of options to set up the Waveform YCbCr:



Graticule checkbox – when selected, the graticule is laid over the Waveform YCbCr display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.

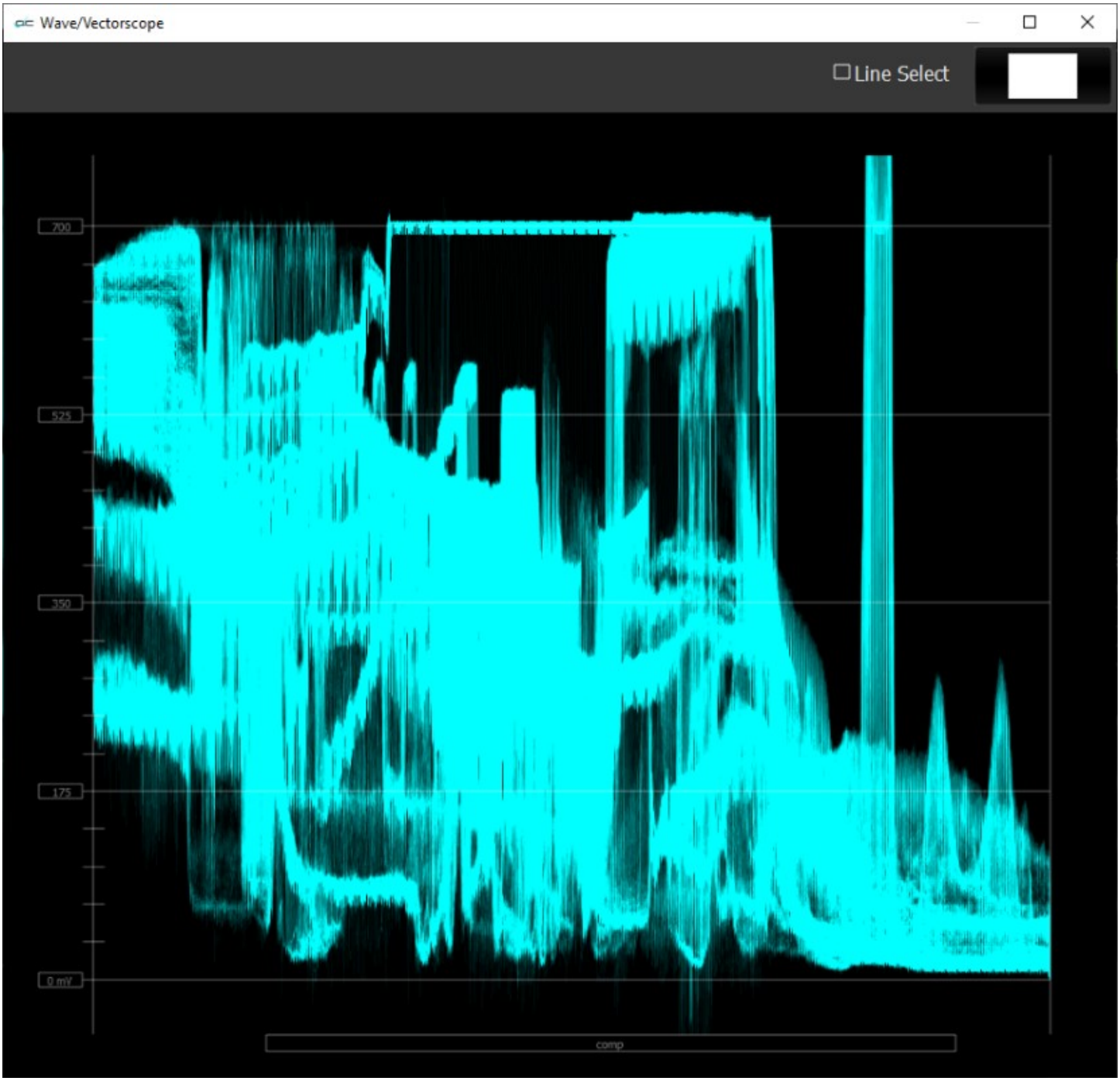
Low Pass checkbox – when selected, smooth the scope with a 1/3 filter to remove single pixel anomalies.

Show Parade checkbox – when selected, the display is from left to right. When not selected, the display is stacked top to bottom. In the image below, the parade view is on the left, and the stacked view is on the right.



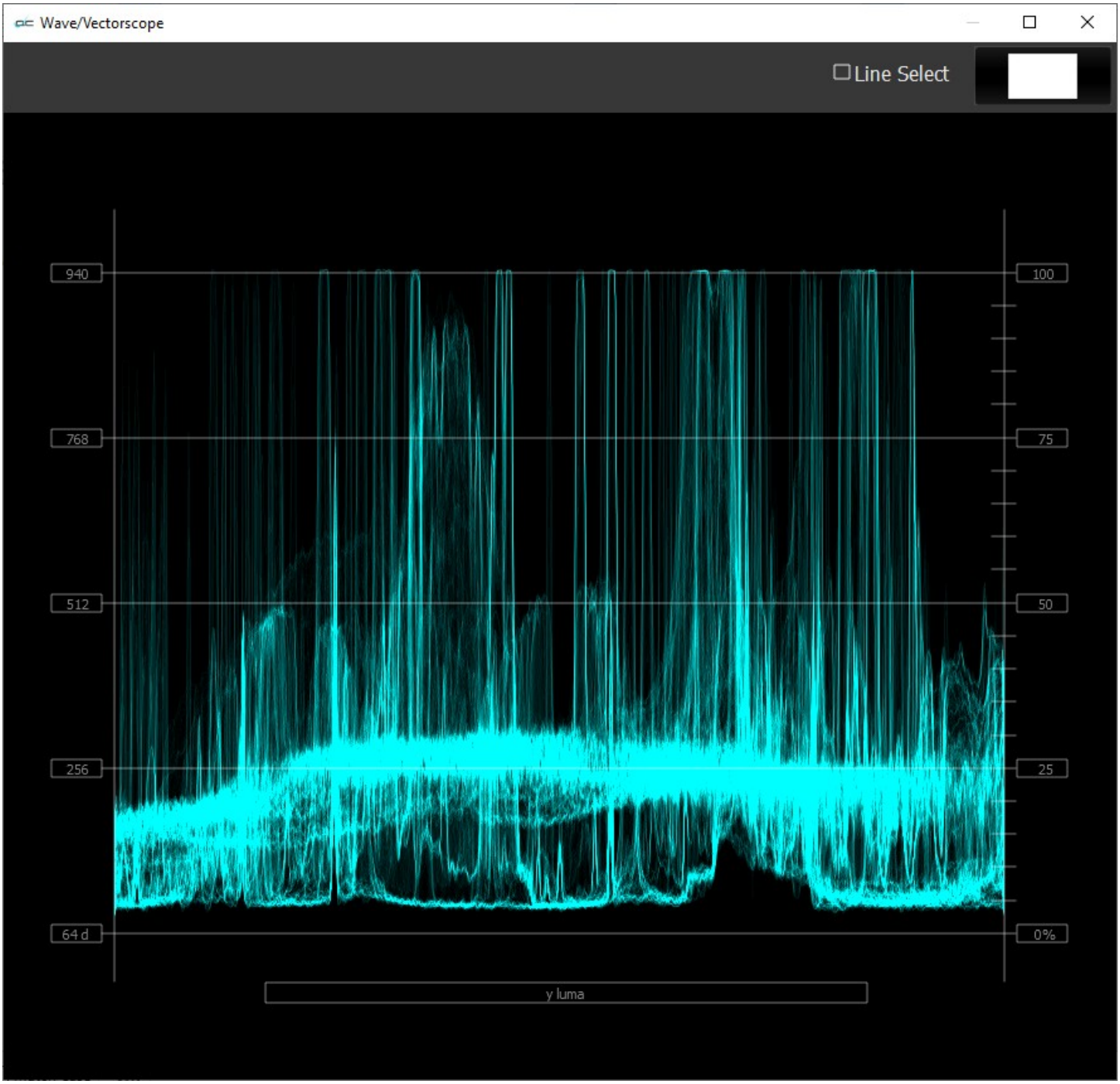
Parade View and Stacked View

Composite – display all three channels (Y, or luma, and the Cb and Cr color difference channels) overlaid on the same graticule.



YCbCr Waveform Composite View

Only Show Luma checkbox – when selected, displays only the luminance of the signal.



Luma Scope

Scope White checkbox – turns the display white.
Scale Type pulldown – set the type of scale used to draw the histogram. Choices include:

- **Digital** - the actual 0..255. 0..1023 or 0..4095 numeric values of the signal.
- **MV** - the equivalent millivolts value of the signal if it was converted to analog.
- **IRE** – Institute of Radio Engineers units, spanning 0..100.

Max HDR pulldown – set the maximum NITS level. One nit is equal to one candela (one candlepower) per square meter (1cd/m2). Available choices include:

- **10K NITS Max**
- **5K NITS Max**
- **4K NITS Max**

- **3K NITS Max**
- **2K NITS Max**
- **1K NITS Max**
- **200K NITS Max**

High/Low pulldown – Show only the high and low portions of the signal, cutting out the middle. Choices include: Normal, 2x zoom, 3x zoom.

Intensity slider – Moving the Intensity slider brightens or dims the display of the trace through the Vectorscope. The current setting is displayed above the slider, as a percentage, 0% providing no display and 100% being maximum intensity.

Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.

Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output

Active Region checkbox - when selected, the Active region graticule is displayed over the video output

Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.

Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.

Graticule Brightness slider - Moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.

Scale x1 button – clicking this button sets the display to standard size

Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Waveform YCbCr Display

Here is the Waveform YCbCr.

The YCbCr Waveform Monitor displays the levels of the Y, Cb and Cr from the left of the picture to the right of the picture with all the lines summed into one graph. The Y, or luma/luminance, graph provides accurate white and black level information, as well as the range in between. The Cb and Cr display the +/- 512 levels of chroma of both types. This provides a visual representation of the chroma range of the signal.

Critical for downstream color correction is the need to ensure proper luminance levels at the stage of initial capture, so any corrections will not muddy or wash out the signal information.

At all times a minimum and maximum value for each of the channels (Y, Cr and Cb) is displayed in 10 bit mode (0-1023). The color of the text for each channel indicates the following: in range (green), out of range but legal (yellow) and illegal/sync values (red).

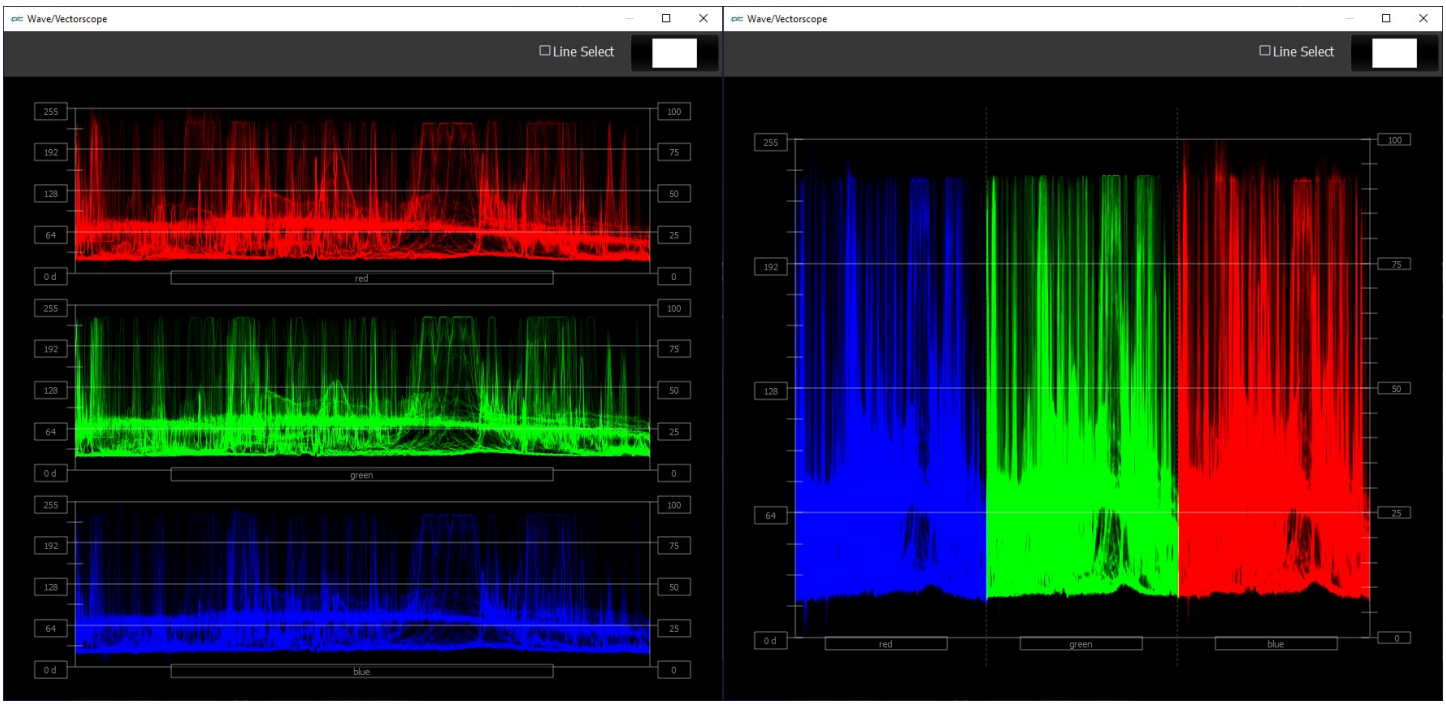
Waveform RGB

To set up the **Waveform RGB**, press the **Scope Config** button. This opens the Scope Config window. Click on the **Waveform RGB** button on the right. There are a number of options to set up the Waveform RGB:

Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.

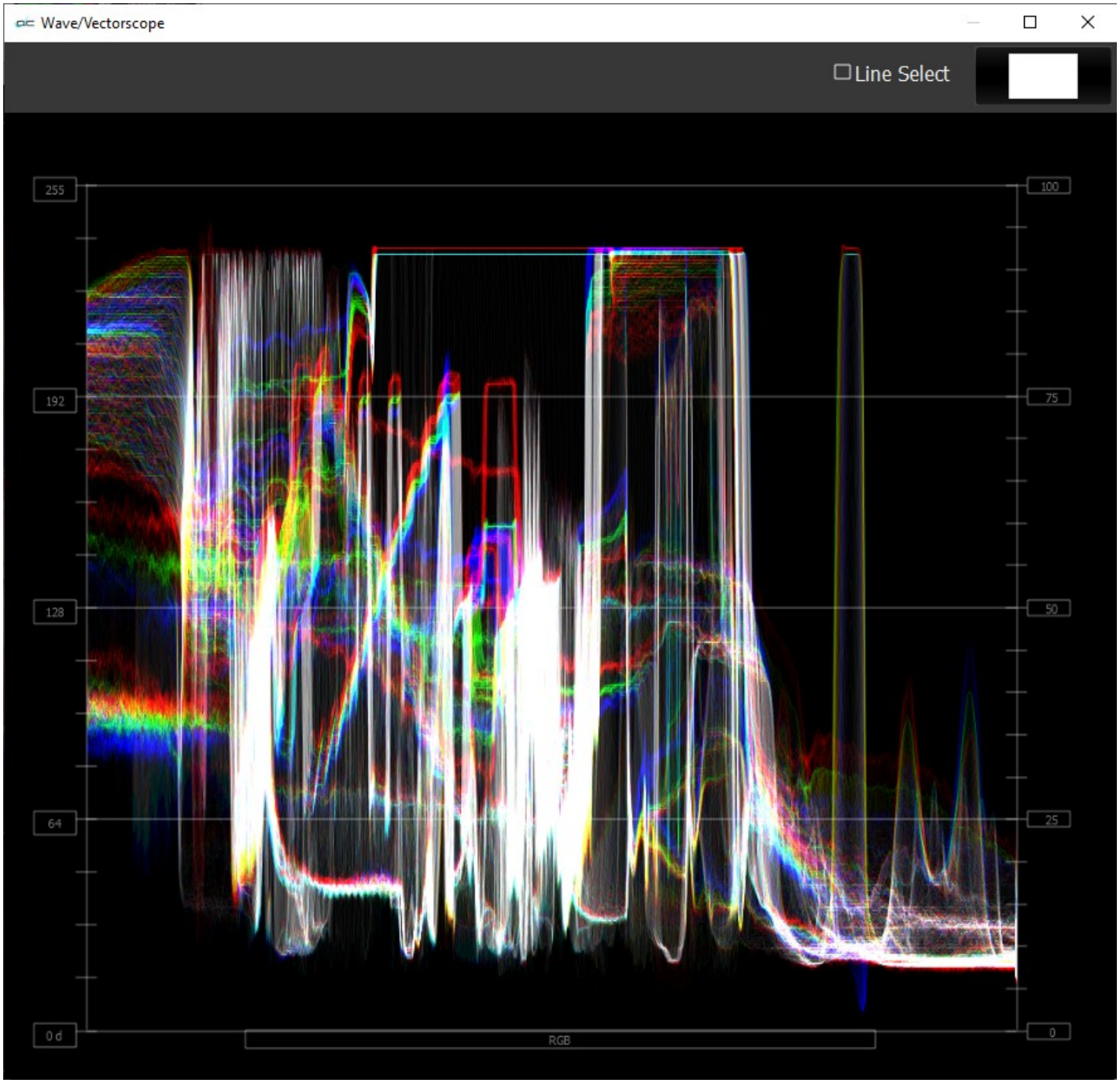
Low Pass checkbox – when selected, smooth the scope with a 1/3 filter to remove single pixel anomalies.

Show Parade checkbox – when selected, the display is from left to right. When not selected, the display is stacked top to bottom.



Stacked View and Parade View

Composite – show all three channels overlaid on the same graticule.



RGB Waveform Composite View

Full Scale checkbox – RGB, by default, will be sRGB. The range of each color will be from 16 to 240 (in 8 bit), so the scale will place white at 240 and black at 16 in normal scale. If in full scale, white will be placed at 255 and black at 0.
Scope White checkbox – turns the display white.
Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal. The current setting is displayed above the slider, as a percentage, 0% providing no display and 100% being maximum intensity.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.

Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.

Graticule Brightness slider - Moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.

Scale x1 button – clicking this button sets the display to standard size

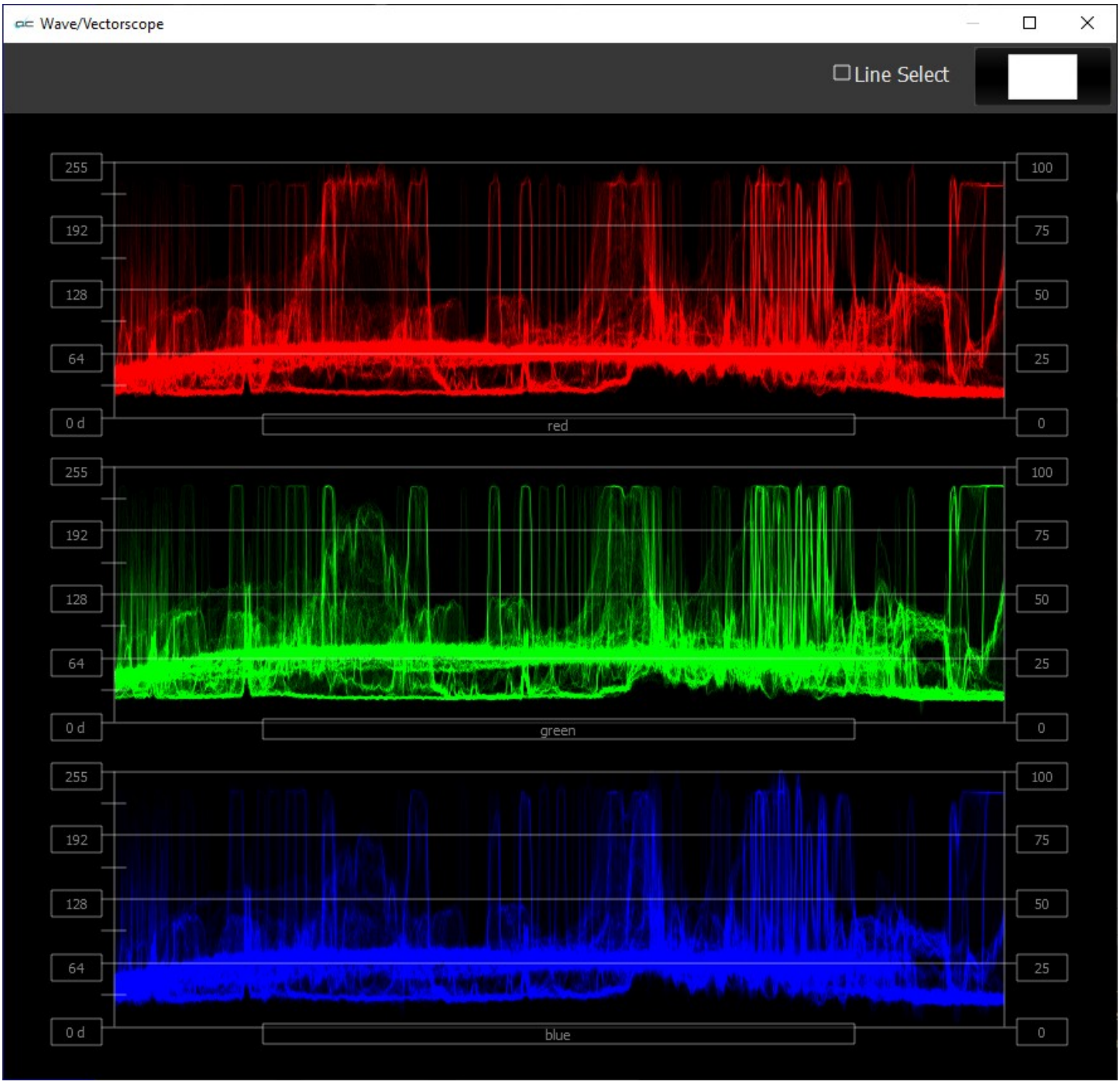
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Waveform RGB Display

Here is the Waveform RGB.



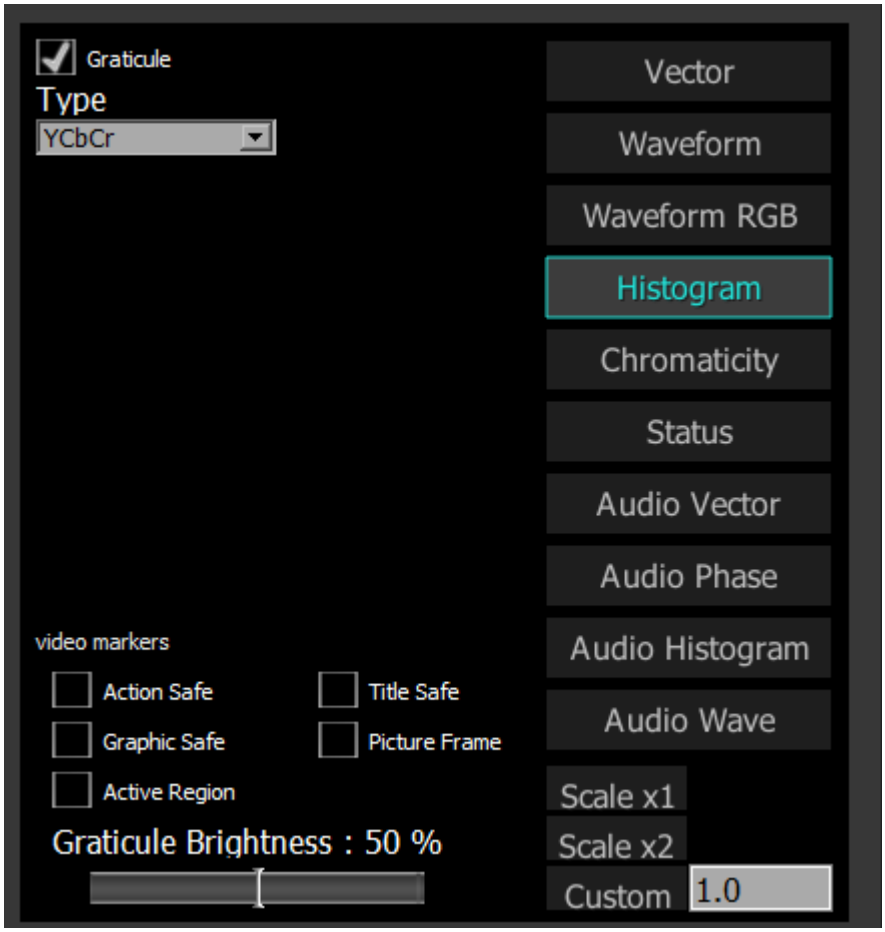
The RGB Waveform Monitor shows each of the red, green and blue signals as independent graphs, displaying the RGB, or chrominance/color values associated with the file.

At all times a minimum and maximum value for each of the channels (R, G and B and A) is displayed in 10 bit mode (0-1023).

For dual link RGB, the original RGB 10 bit values are used unprocessed. For single link YCbCr, they are first converted to RGB before being analyzed and displayed.

Histogram YCbCr

To set up the **Histogram YCbCr**, press the **Scope Config** button. This opens the Scope Config window. Click on the **Histogram** button on the right. Use the **Type** pulldown menu to select YCbCr. There are a number of options to set up the Histogram YCbCr:

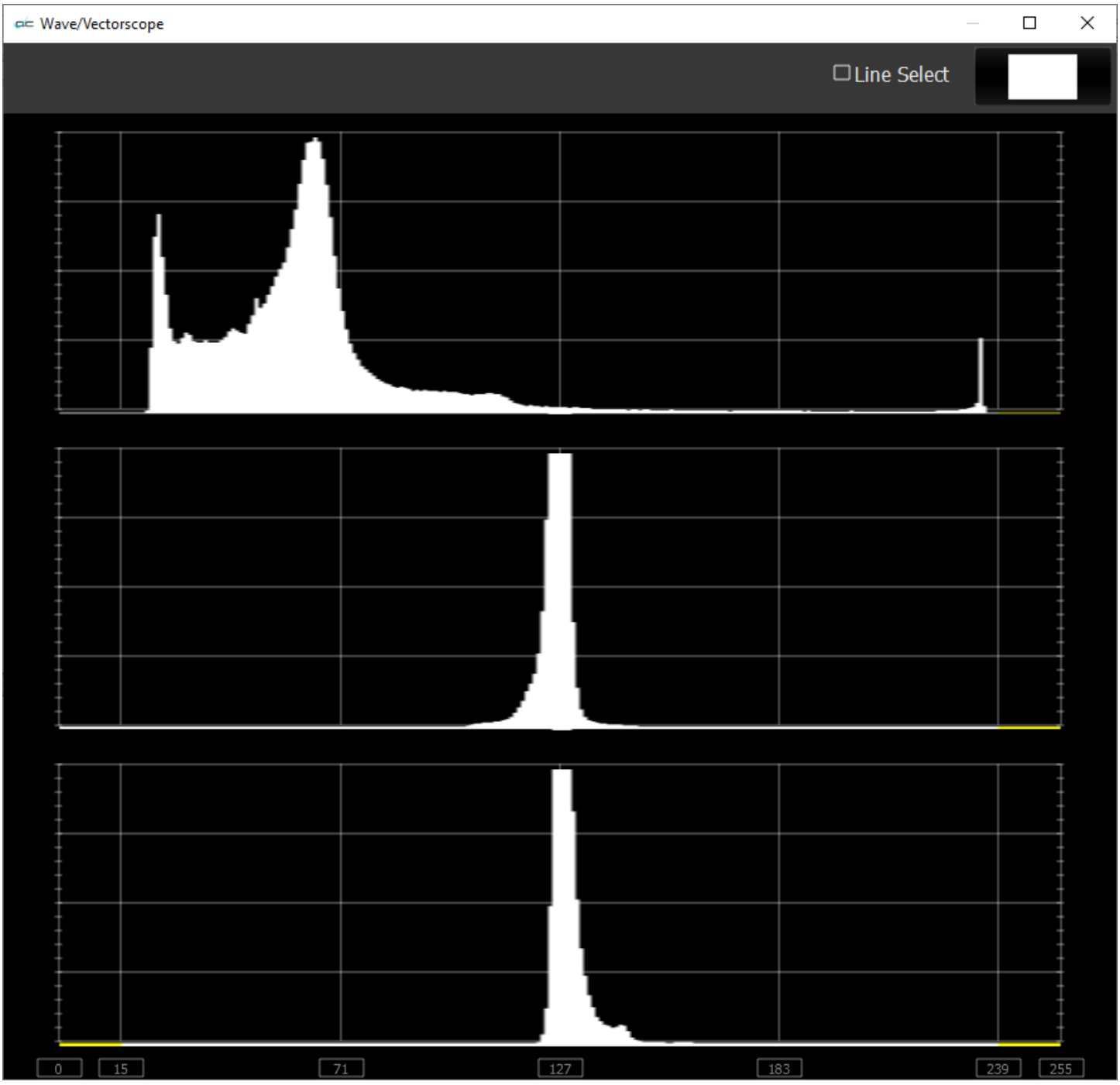


Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the Graticule Brightness slider described below.
Type pulldown menu – use the Type pulldown menu to select between available histogram types.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Histogram YCbCr Display

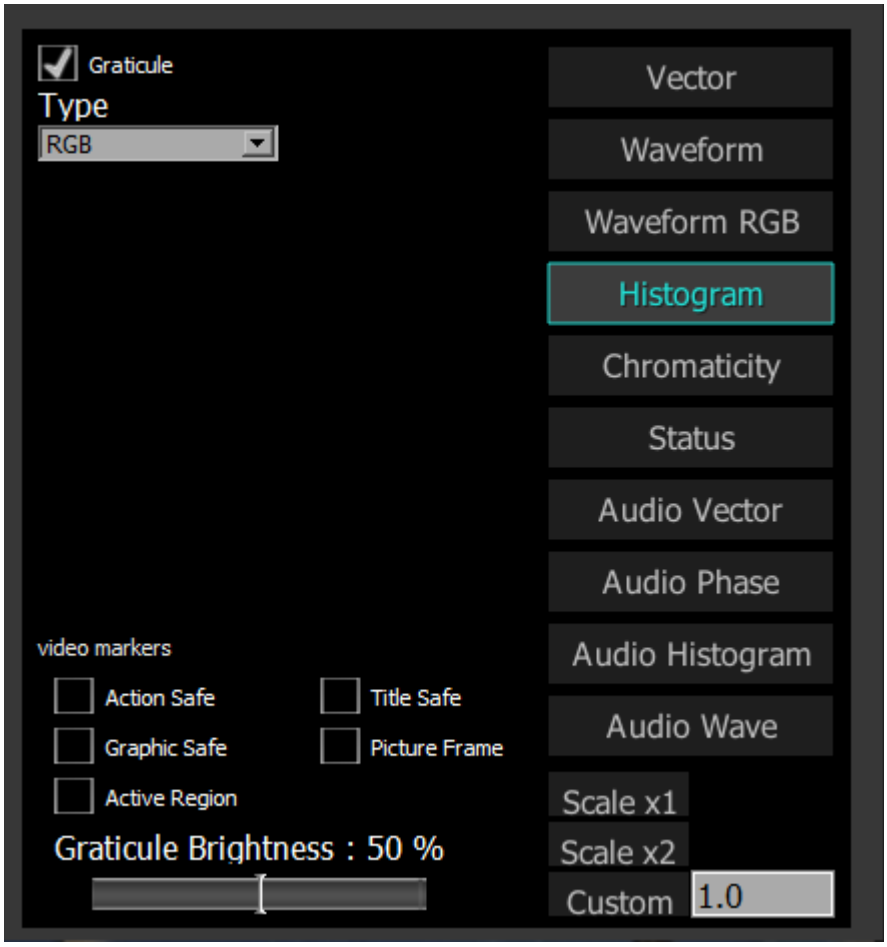
Here is the Histogram YCbCr.



YCbCr - display a YCbCr range. This histogram breaks up the signal in into luma and chroma components. The top histogram represents the luma power of the various levels in the signal. The Cb and Cr histograms that follow show the power distribution for those two components.

Histogram RGB

To set up the **Histogram RGB**, press the Scope Config button. This opens the Scope Config window. Click on the **Histogram** button on the right. Use the **Type** pulldown menu to select RGB. There are a number of options to set up the Histogram RGB:

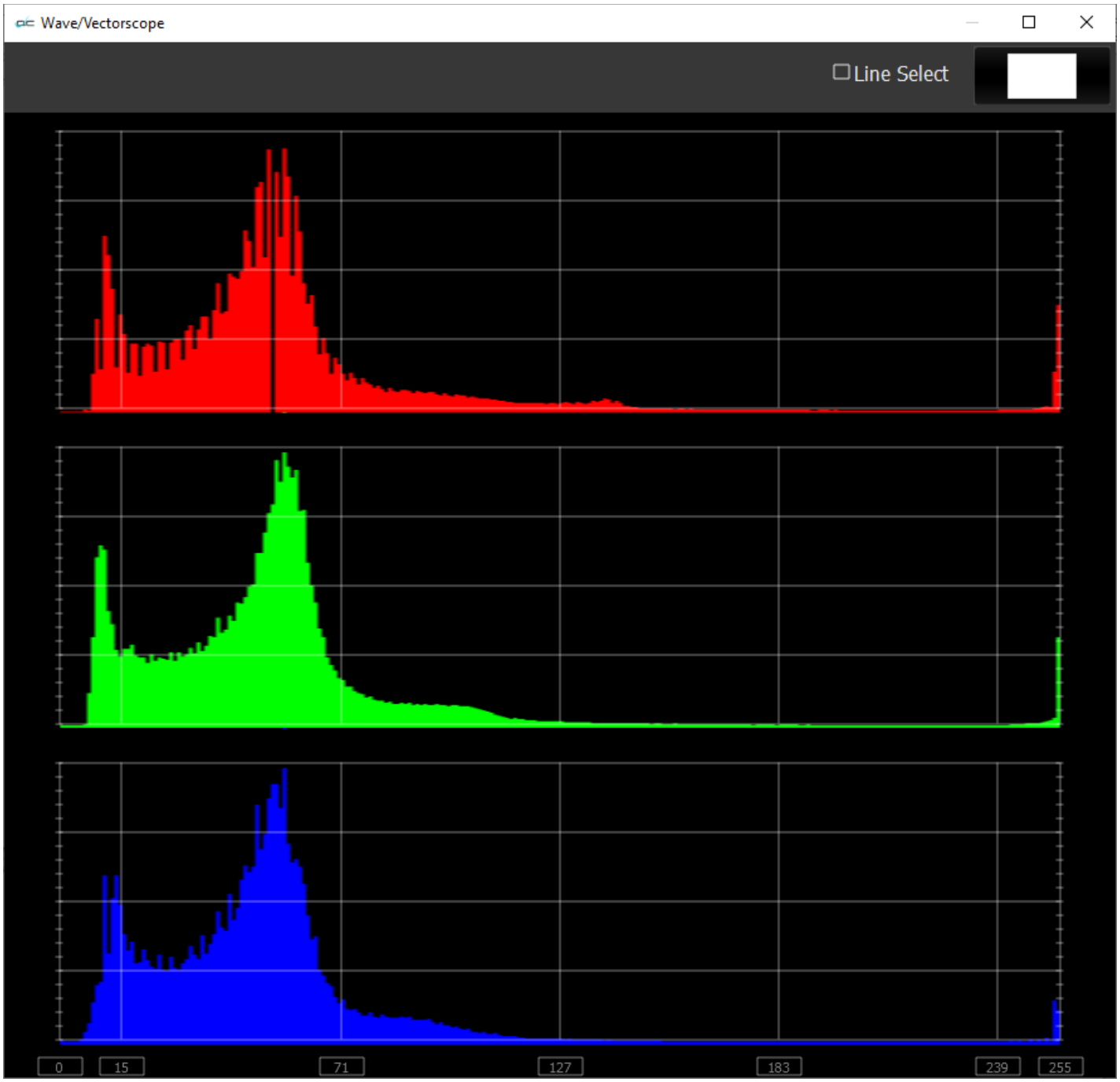


Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the Graticule Brightness slider described below.
Type pulldown menu – use the Type pulldown menu to select between available histogram types.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Histogram RGB Display

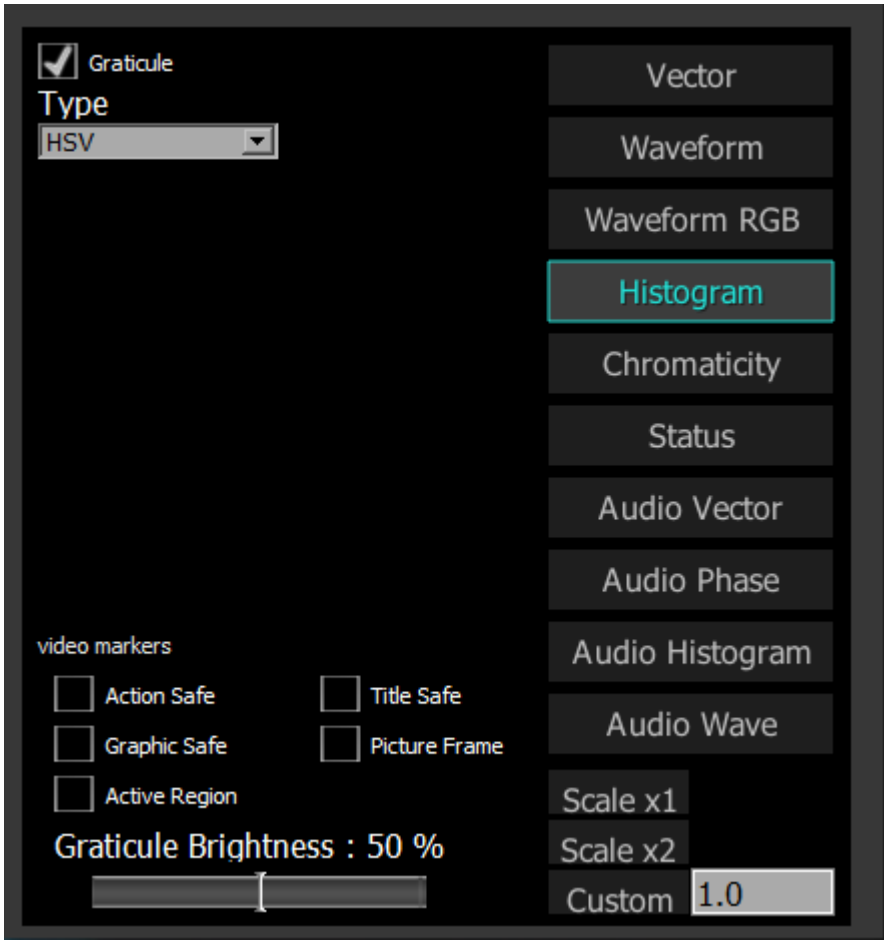
Here is the Histogram RGB



RGB – display an RGB range. Shows the distribution of red/green/blue within the signal as a series of discrete bars that make a continuous graph for each color. This display provides an overview of the tonal range of each color in the picture. Each bar is the count of the number of pixels for one of the 256/1024/4096 possible bins.

Histogram HSV

To set up the **Histogram HSV**, press the Scope Config button. This opens the Scope Config window. Click on the **Histogram** button on the right. Use the **Type** pulldown menu to select HSV. There are a number of options to set up the Histogram HSV:

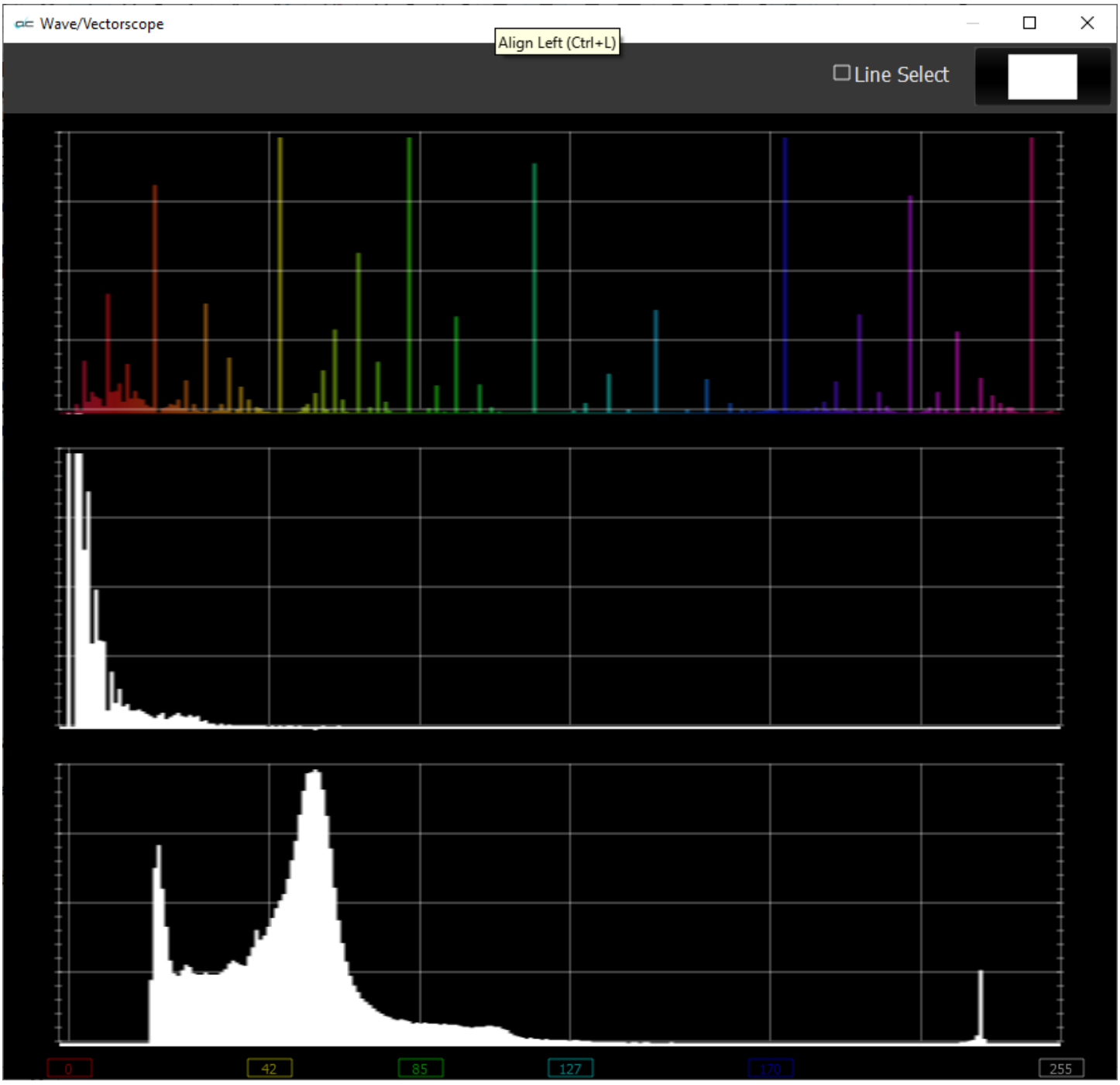


Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the Graticule Brightness slider described below.
Type pulldown menu – use the Type pulldown menu to select between available histogram types.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Histogram RGB Display

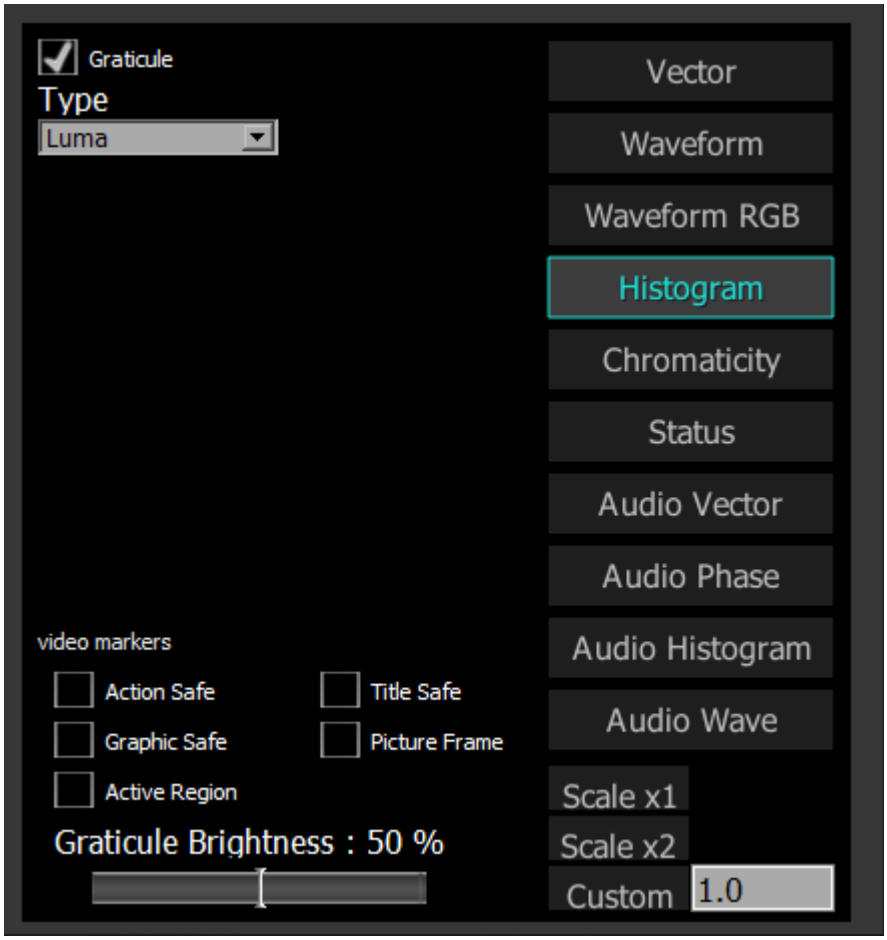
Here is the Histogram RGB



HSV – display Hue, Saturation, and Value levels. The top range shows the strength of each hue, the middle section displays the saturation levels of the hues, and the lower section displays the value, or darkness/lightness levels.

Histogram Luma

To set up the **Histogram Luma**, press the Scope Config button. This opens the Scope Config window. Click on the **Histogram** button on the right. Use the **Type** pulldown menu to select Luma. There are a number of options to set up the Histogram Luma:

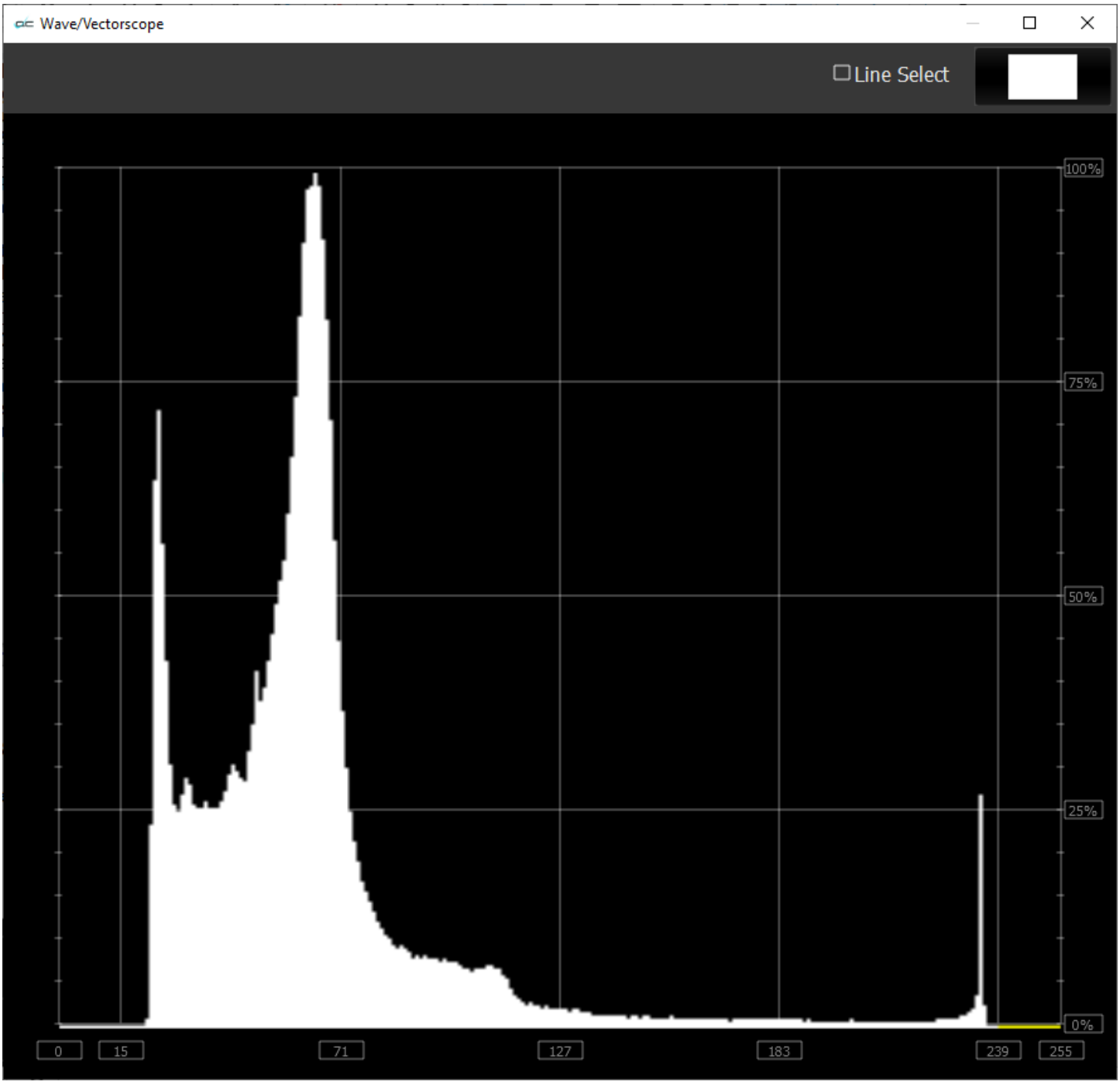


Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the Graticule Brightness slider described below.
Type pulldown menu – use the Type pulldown menu to select between available histogram types.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Histogram Luma Display

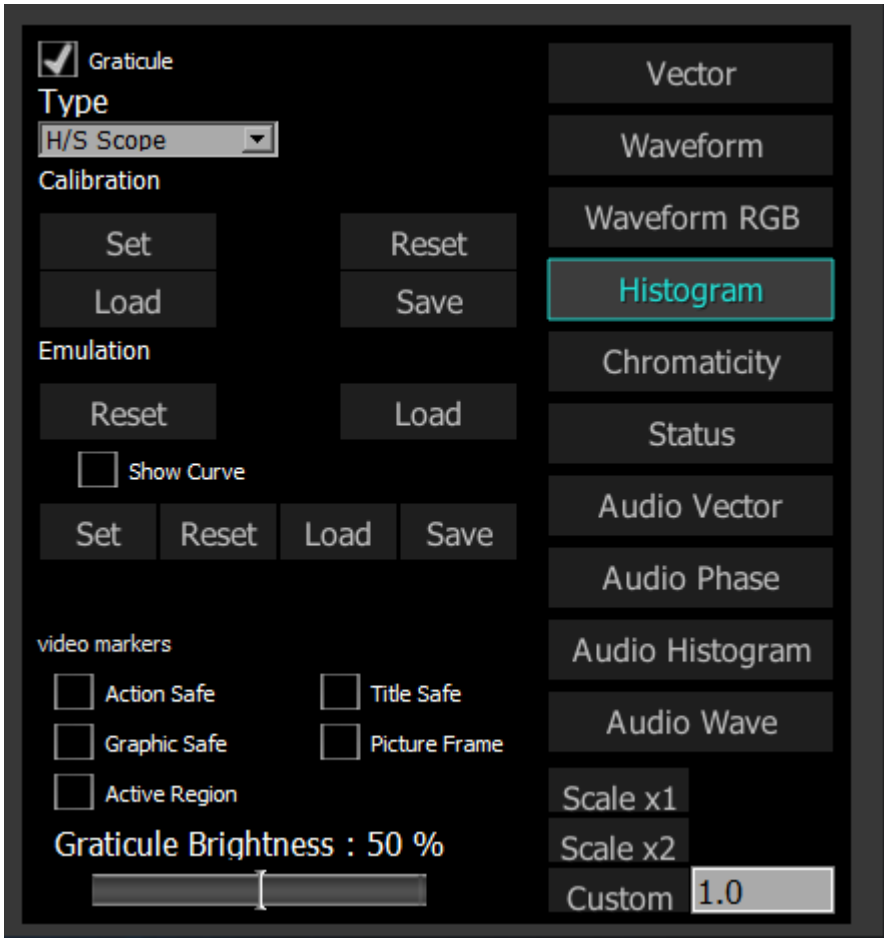
Here is the Histogram Luma



Luma – display only the luma in the signal

Histogram H/S Scope

To set up the **Histogram H/S Scope**, press the Scope Config button. This opens the Scope Config window. Click on the **Histogram** button on the right. Use the **Type** pulldown menu to select **H/S Scope**. There are a number of options to set up the **Histogram H/S Scope**:



Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the Graticule Brightness slider described below.
Type pulldown menu – use the Type pulldown menu to select between available histogram types.
Calibration section – choices include:

- **Set –** set the current calibration.
- **Load –** opens a browser which allows the user to browse to and load a saved calibration file.
- **Reset –** reset the calibration back to default settings.
- **Save –** opens a save as window which allows the user to select a location and save the current calibration settings as a file.

Emulation section – choices include:

- **Reset** – reset the emulation values back to default.
- **Load –** load an emulation file.

Show Curve section – choices include:

- **Set** – set the current curve.
- **Clear** – clear the current curve and return to default settings.
- **Load** – opens a browser which allows the user to browse to and load a saved curve file
- **Save** - opens a save as window which allows the user to select a location and save the current curve settings as a file.

Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output
Active Region checkbox - when selected, the Active region graticule is displayed over the video output
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.

Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.

Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.

Scale x1 button – clicking this button sets the display to standard size

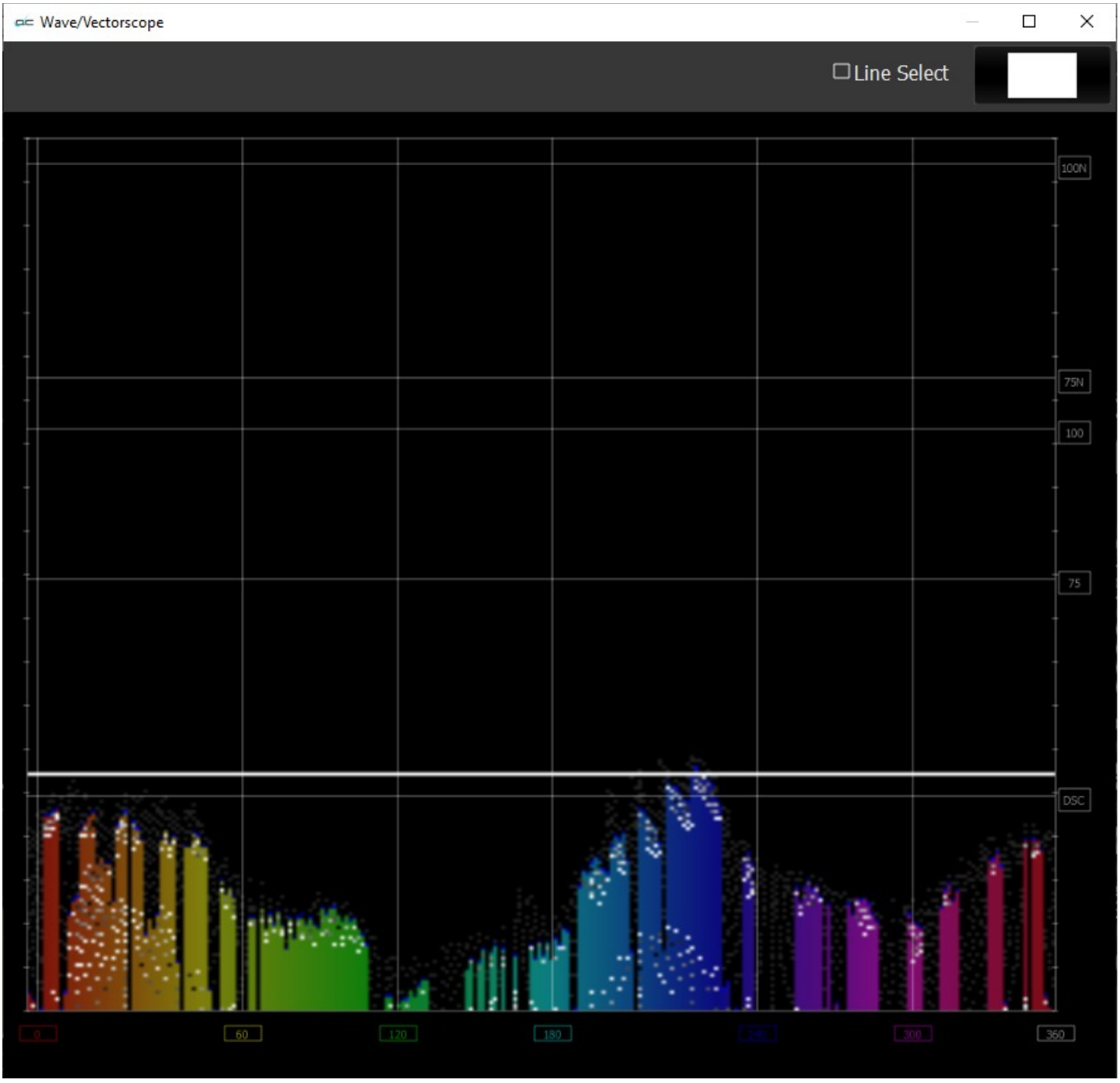
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Histogram H/S Scope Display

Here is the Histogram H/S Scope.



The H/S (Hue/Saturation) Scope is designed to assist in calibrating lighting between cameras, or between different lighting setups. There is an instructional video located here:

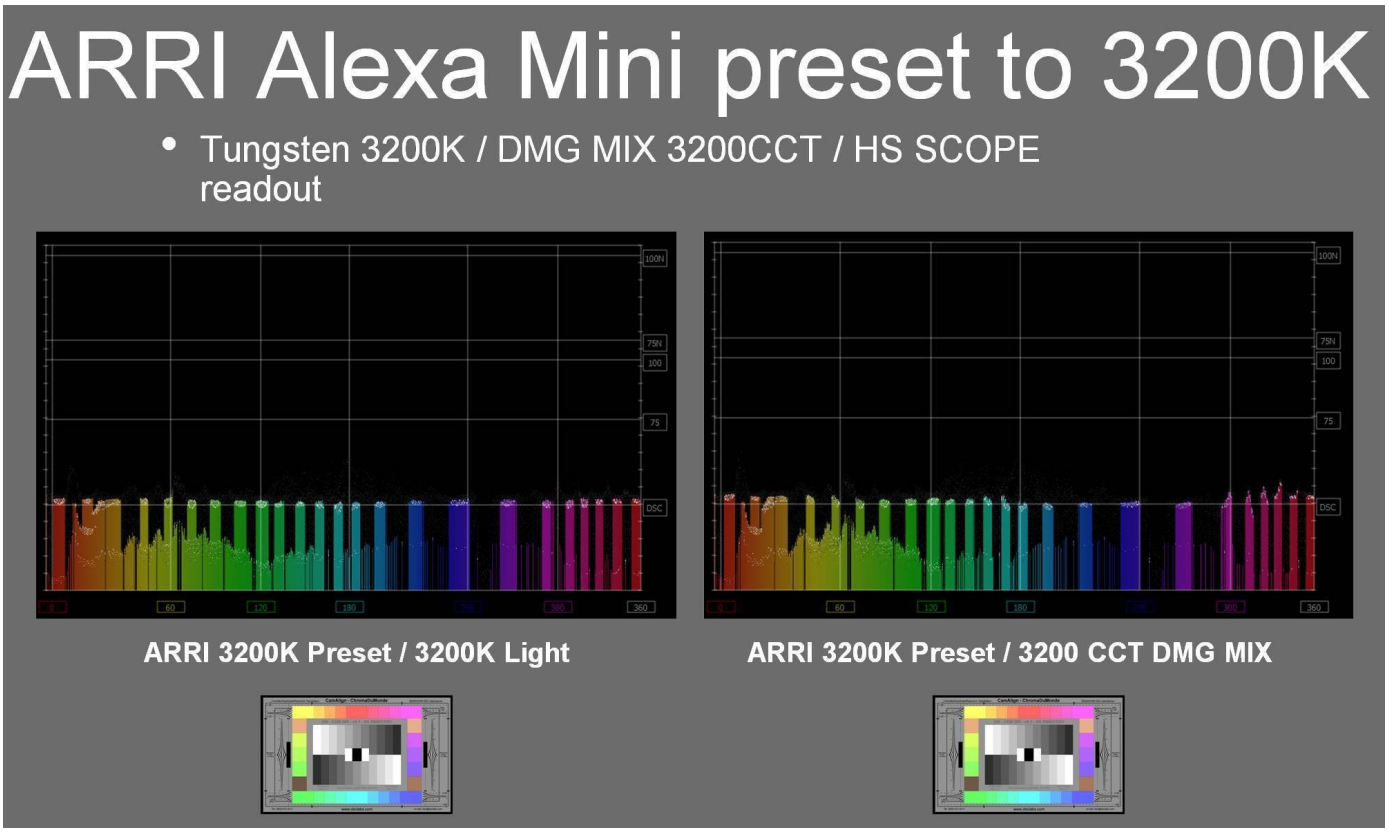
https://www.youtube.com/watch?v=or835LLlqVU

and a similar one here:

https://www.youtube.com/watch?v=nHg-_yCxooU

H/S Scope Example

Here is an example where the H/S Scope reads the chroma signal response from a camera, to evaluate the Rosco DMG MIX LED fixture.

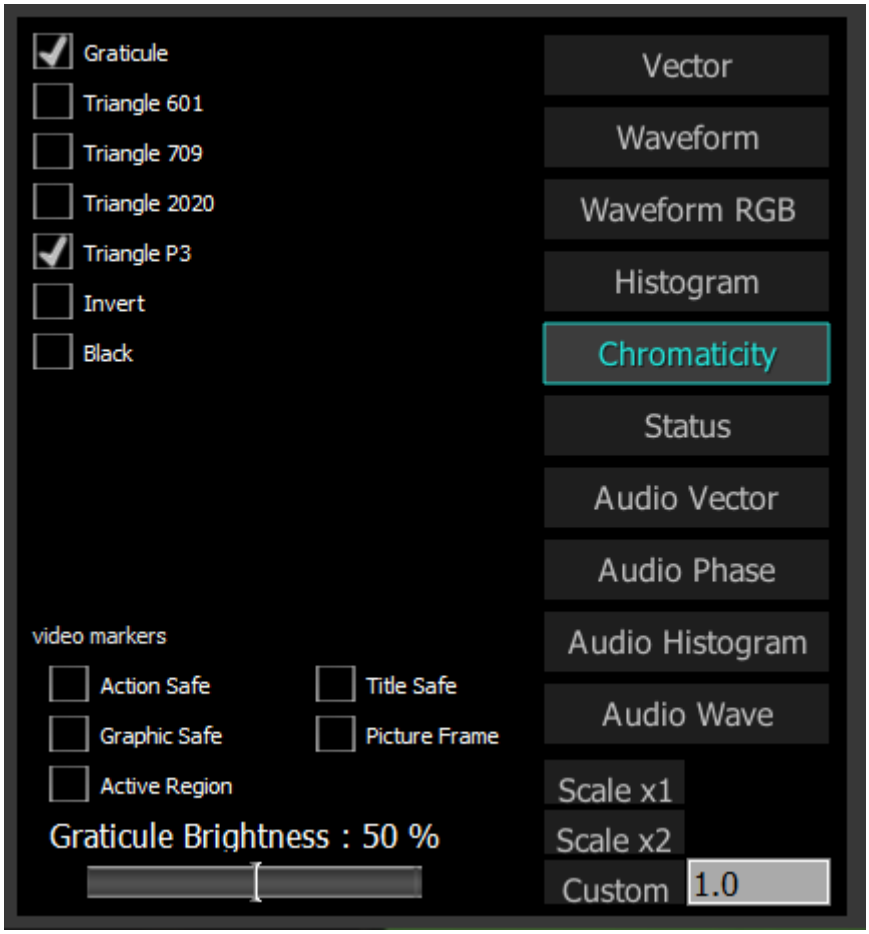


We used an ARRI and RED camera, preset to 3200K rec 709, for our tests, shooting a DSC ChromaDuMonde 24 + 4R chart. A Tungsten light source was the target reference for the Rosco DMG MIX to match on camera. This allowed the team to quantify their calibration work on the MIX. The results were encouraging as both on the RED and ARRI the on-camera chroma differences between the actual tungsten source and the MIX were very slight, based on the multiple points of the DSC chart. The H/S Scope is a good tool for evaluation and calibration for an LED source for on-camera use. Should adjustments to the spectrum be needed they can be adjusted in real time using the H/S Scope reference, thus getting camera accurate results.

Each color has its own graph. The color's levels are represented from left to right, with the absolute left being 0 and the absolute right being 1024. The scale is presented as a percentage to allow for extremely bright or dark pictures to be analyzed without truncating.

Chromaticity

To set up the **Chromaticity Scope**, press the Scope Config button. This opens the Scope Config window. Click on the **Chromaticity** button on the right. There are a number of options to set up the Chromaticity **Scope**:



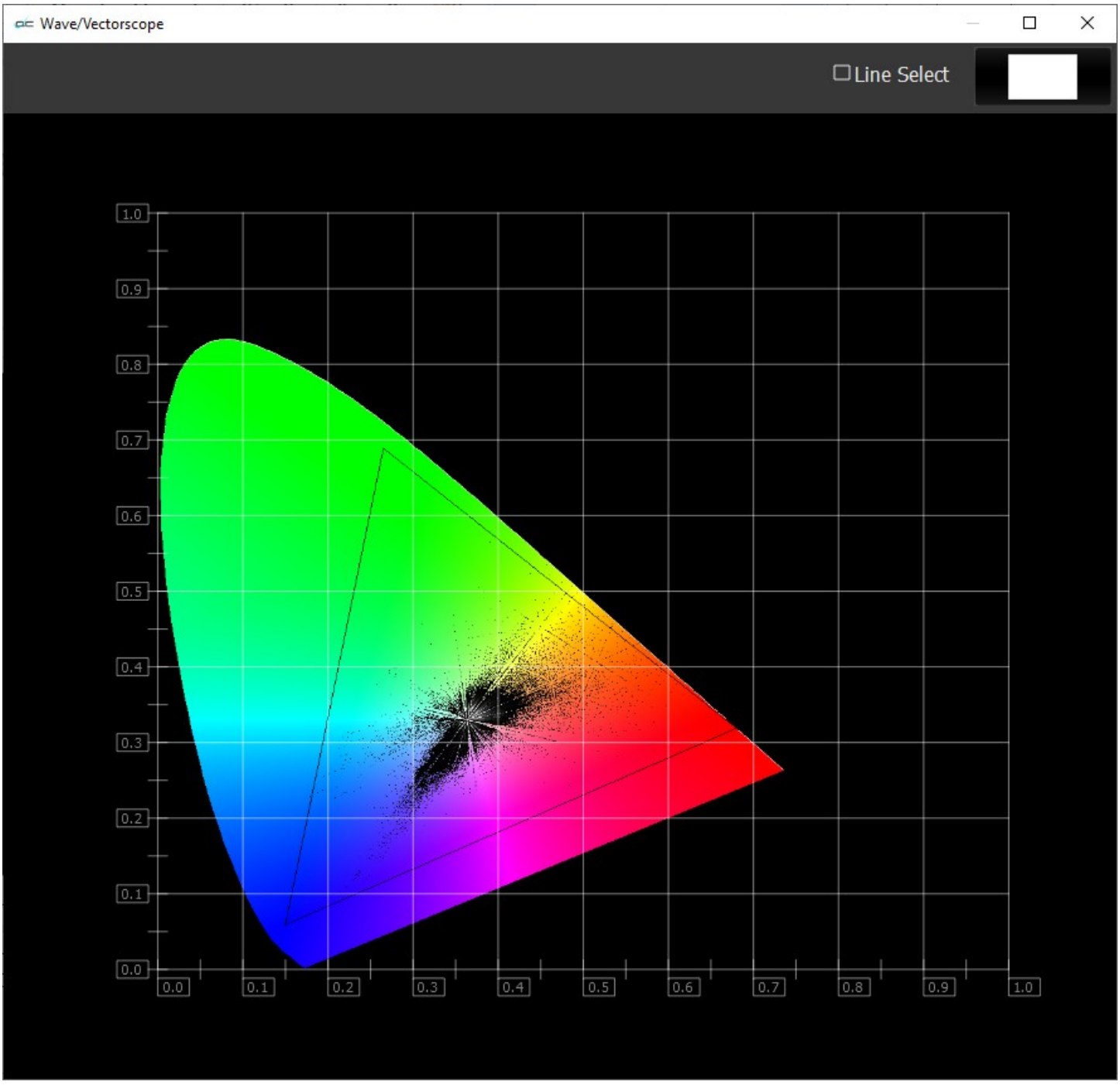
Graticule checkbox – when selected, the graticule is laid over the Histogram display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.
Triangle 601 checkbox – when selected, displays the CCIR-601 triangle.
Triangle 709 checkbox – when selected, displays the Rec.709 triangle.
Triangle 2020 checkbox – when selected, displays the BT.2020 triangle.
Triangle P3 checkbox – when selected, displays the P3 triangle.
Invert checkbox – when selected, displays the video signal over a black background instead of the Chromaticity hued background.
Black checkbox – when selected, display the signal in black
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

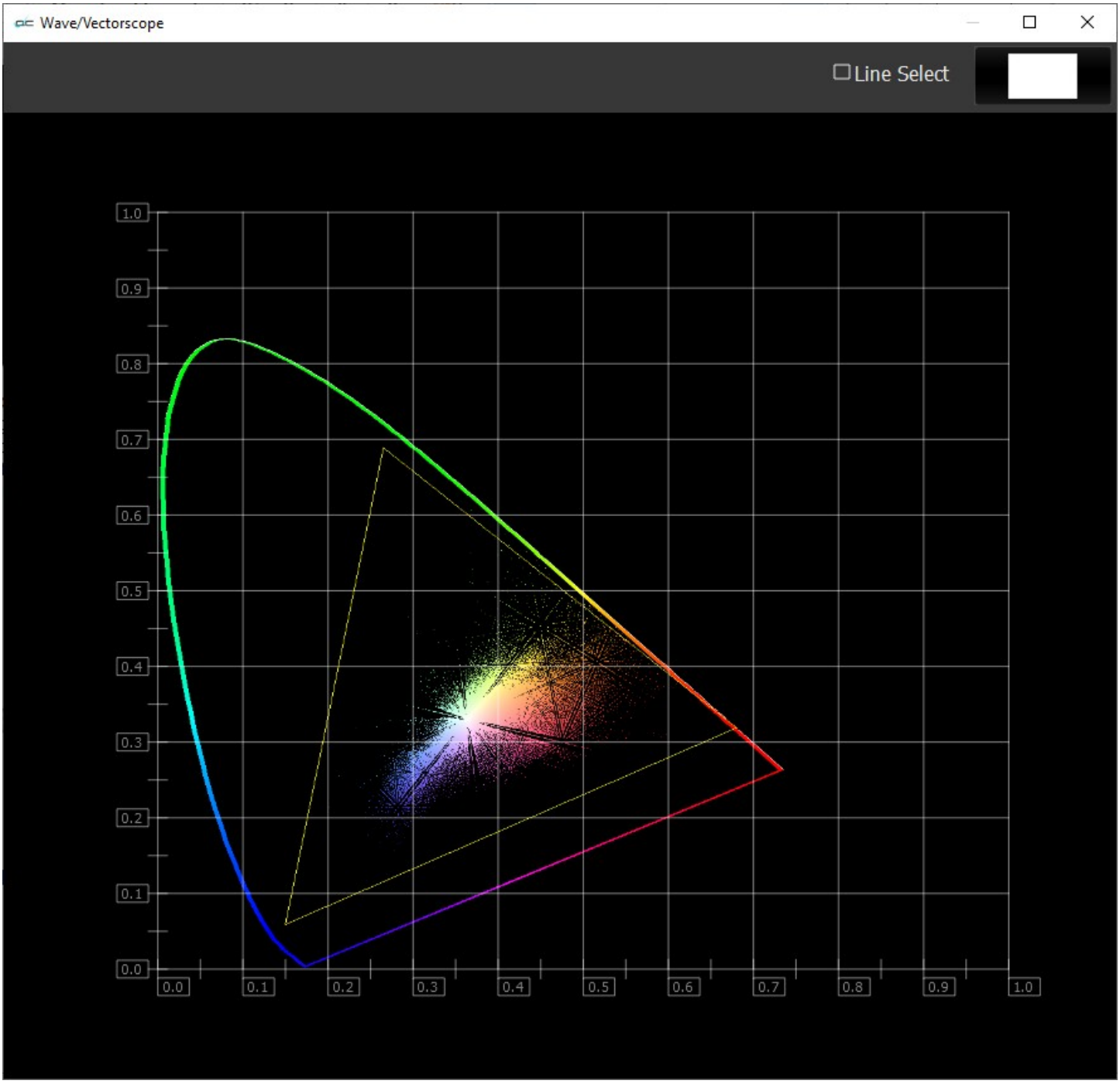
Pressing the x in the upper right corner will close the Scope Config window.

Chromaticity Display

Here is the Chromaticity window.



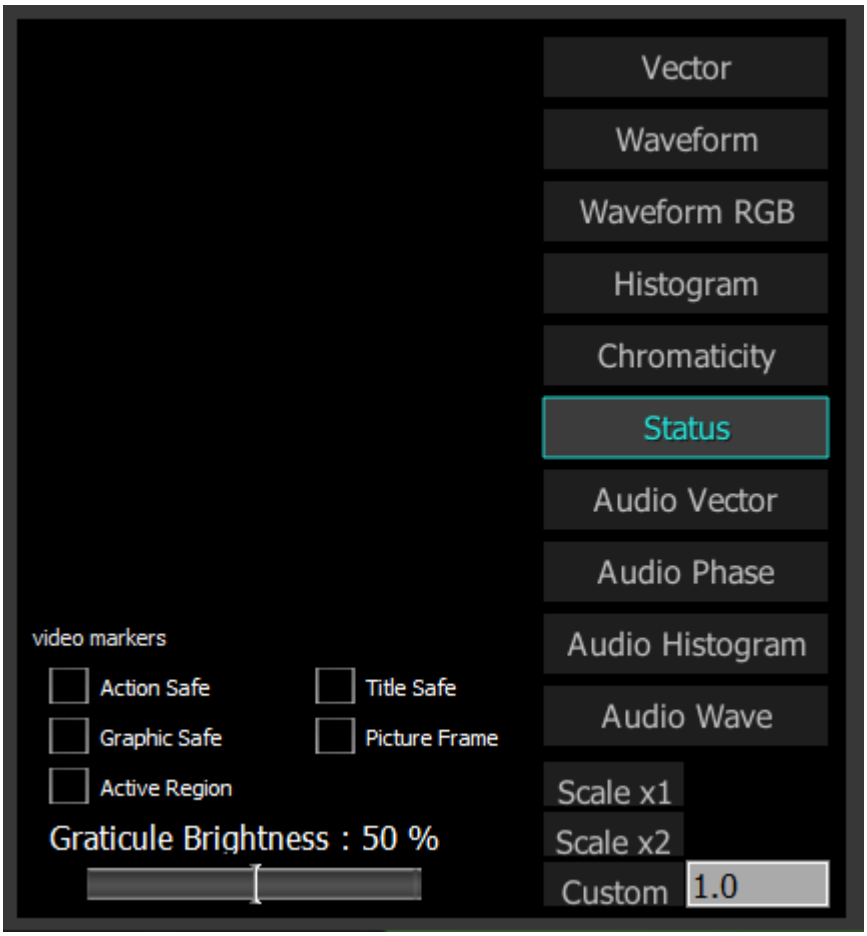
The Chromaticity scope provides a visual representation of the color in a video across all the colors of visible light. For a particular YCbCr range (BT.2020, P3, Rec.709, CCIR-601) a triangle can be superimposed. This will delineate the colors that fall within the acceptable range and those that are outside it. The color of the video within the CIE 1931 color display can be white, black, or the chromaticity hued background.



The display can also be inverted to use black as the background, and the colors (or white) to show the trace.

Status

To set up the **Status**, press the Scope Config button. This opens the Scope Config window. Click on the **Status** button on the right. There are a number of options to set up the **Status** display:

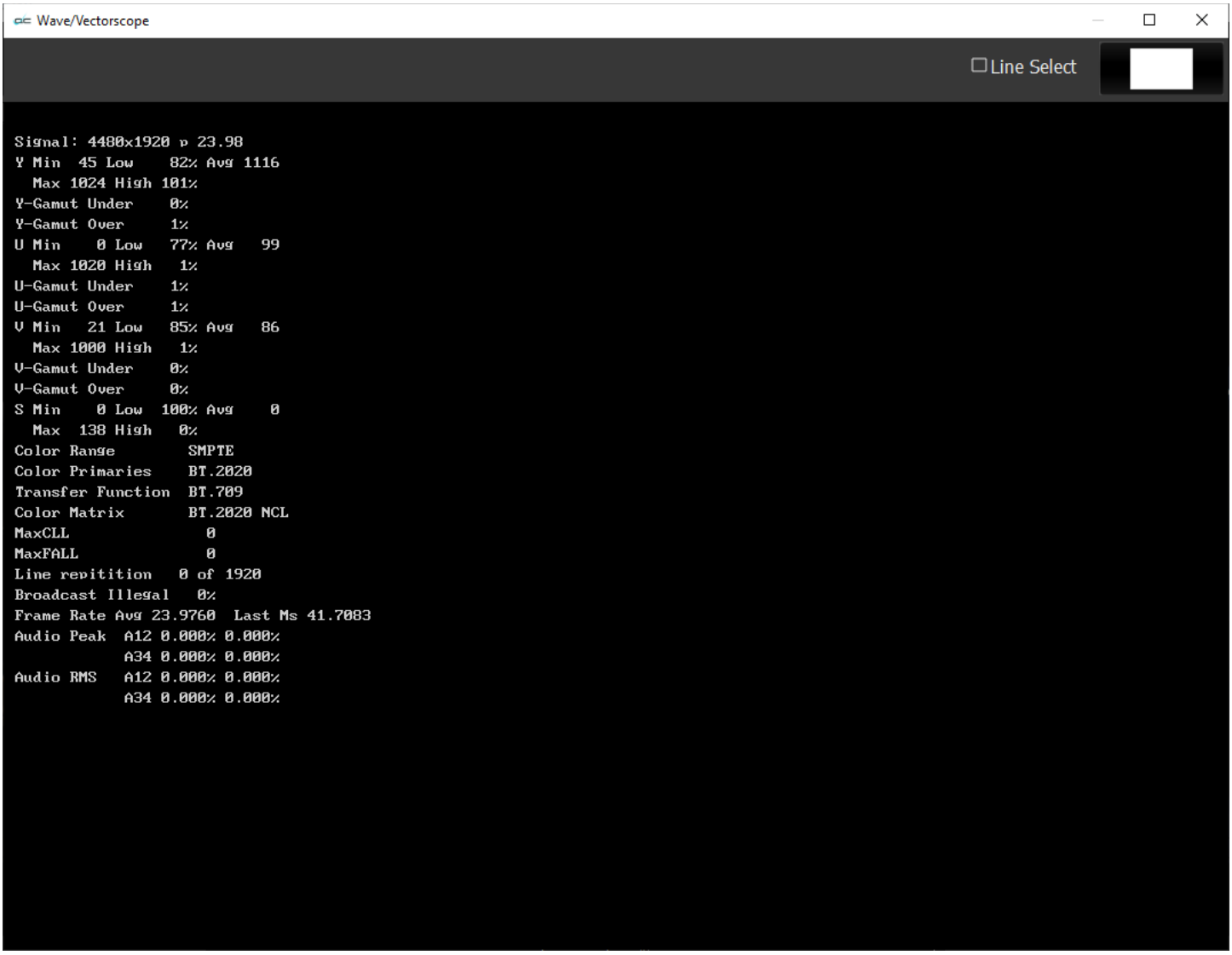


Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.
Graticule Brightness slider – this slider is present in all of the scopes. In the Status window there is no graticule, so this slider has no effect.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Status Display

Here is the Status Window.



The Status window displays:

Signal: displays the current signal type
Y: The Y component. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values
U: The U component. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values
V: The V component. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values
S: Saturation. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values
Color Range: Full or SMPTE (Limited).
Color Primaries: BT 709 (HD), BT 470BG (PAL), SMPTE 170M (NTSC), BT 2020 (WCG). An index into a table specifying the CIE 1931 xy chromaticity coordinates of the white point and the red, green, and blue primaries. The table of primaries specifies the white point and the red, green, and blue primary color points for a video system.
Transfer Function: BT 709 (HD), SMPTE 170M (PAL/NTSC), SMPTE 2084 (HDR10/PQ), ARIB B67 (HLG). Defines an index into a table specifying the nonlinear transfer function coefficients that

translate between RGB color space values and Y´CbCr values. The table of transfer function coefficients specifies the nonlinear function coefficients that translate between the stored Y´CbCr values and a video capture or display system.

Color Matrix: BT 709 (HD), BT 479BG (PAL), BT 601 (NTSC), BT 2020 (WCG). An index into a table specifying the transformation matrix coefficients that translate between RGB color space values and Y´CbCr values. The table of matrixes specifies the matrix for the translation.

MaxCLL: In HDR10 mode, Maximum Content Light Level

MaxFALL: In HDR10 mode, Maximum Frame – Average Light Level

Line repetition in number of lines over total possible lines

Broadcast illegal in percentage

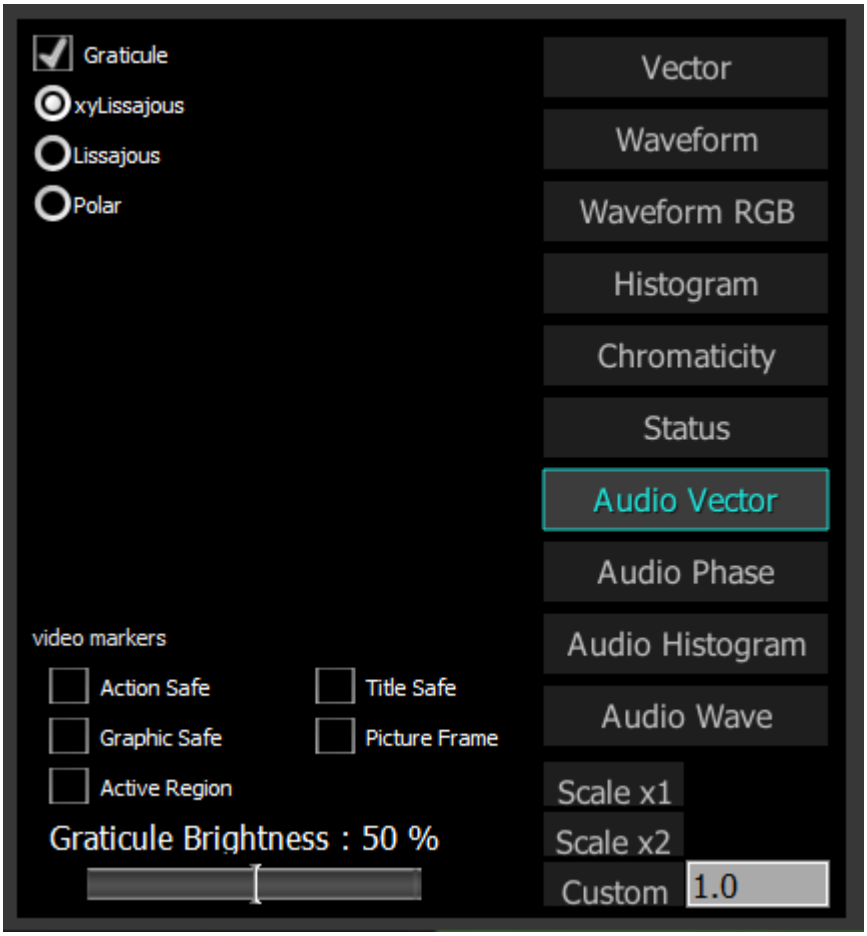
Frame Rate: Displays Average, and Last Ms.

Audio Peak per channel pair

Audio RMS per channel pair

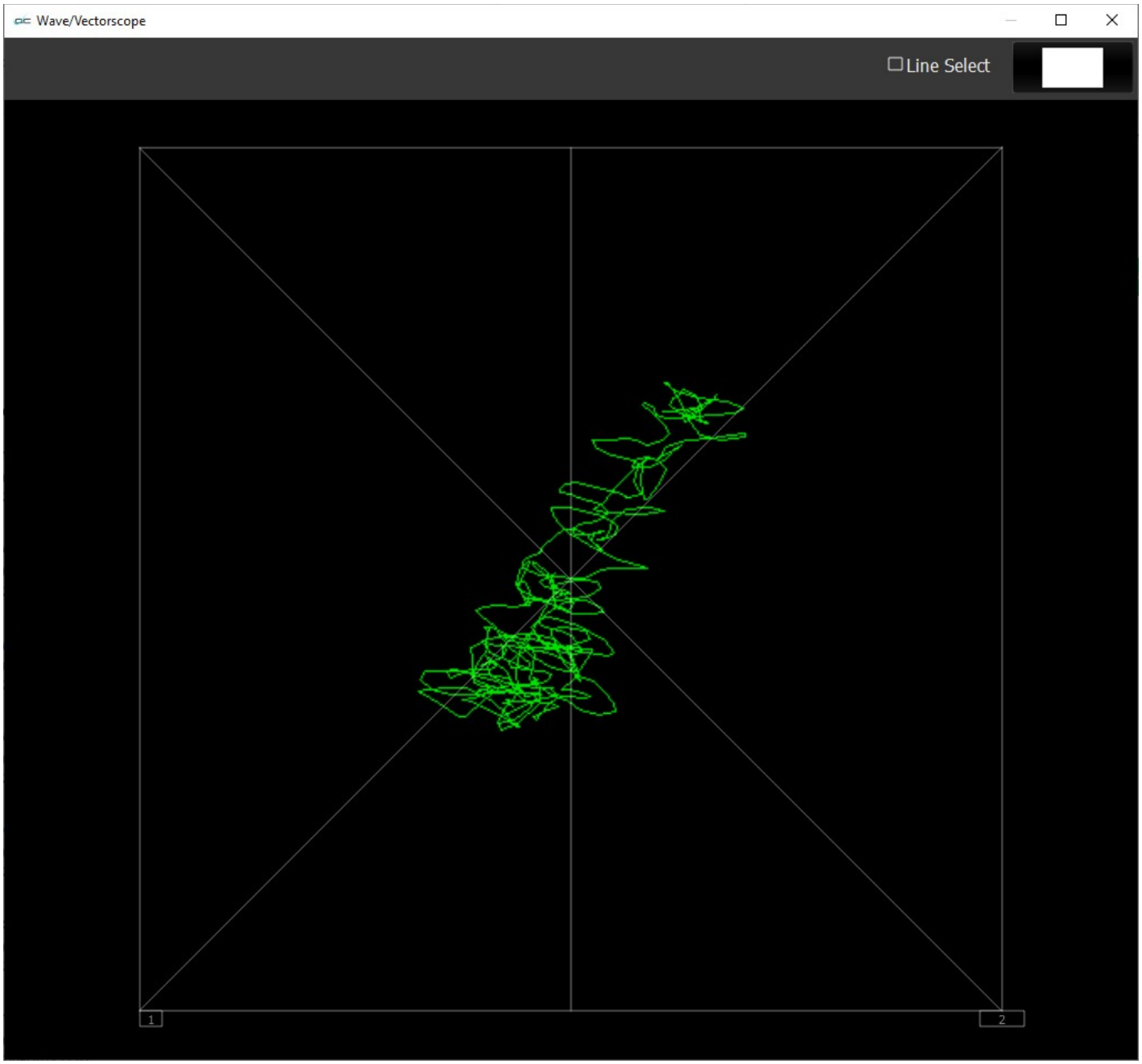
Audio Vector

To set up the **Audio Vectorscope**, press the Scope Config button. This opens the Scope Config window. Click on the **Audio Vector** button on the right. There are a number of options to set up the **Audio Vectorscope** display:

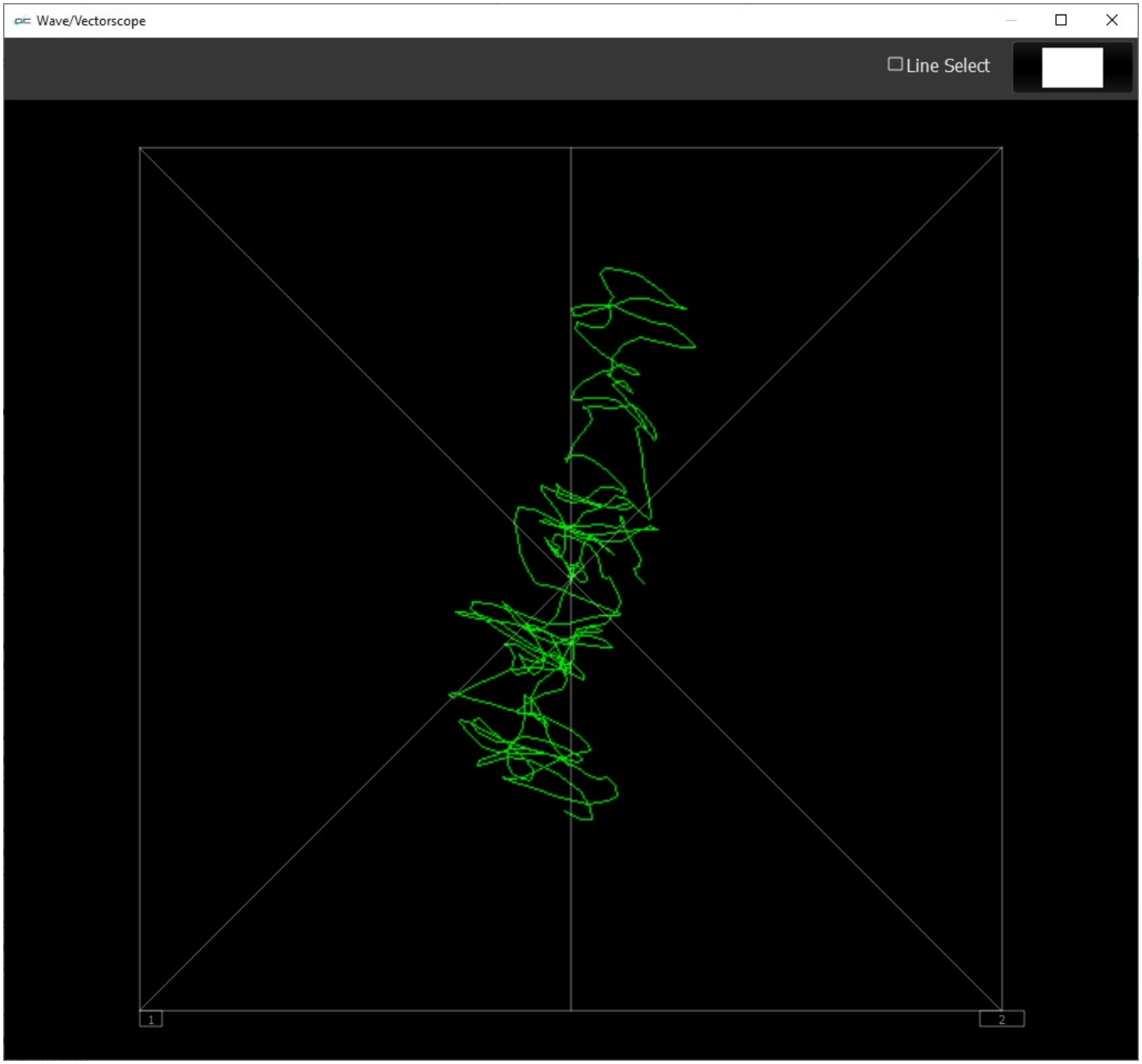


Graticule checkbox – when selected, the graticule is laid over the Histogram display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.

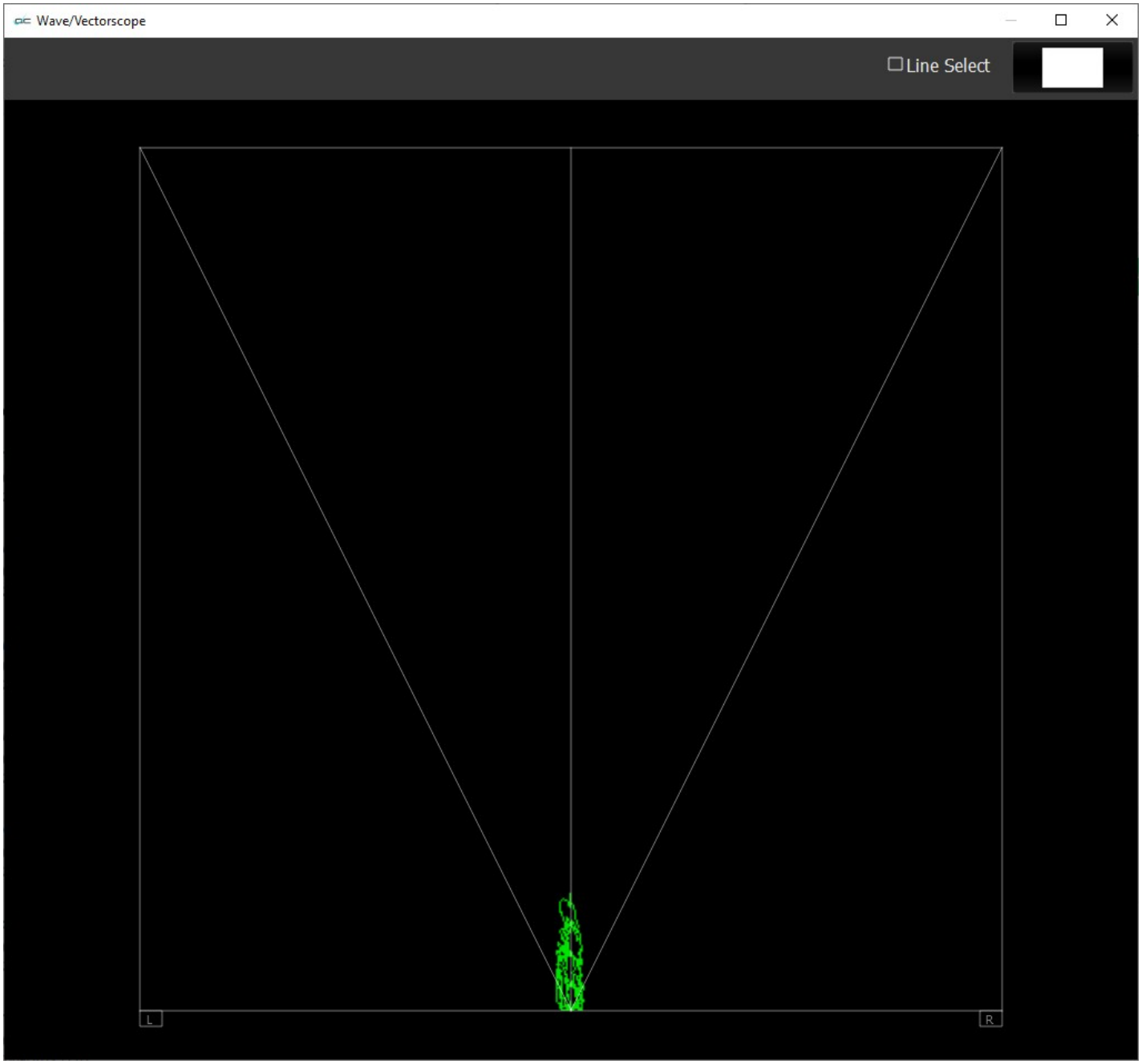
xyLissajous checkbox – when selected, displays the relative phase of the selected audio pair in Lissajous XY mode, oriented around the diagonal axis from lower left to upper right, with zero at the center. Higher levels expand outward from the center, and the left and right channels are distributed to the top and bottom of the diagonal axis.



Lissajous checkbox – when selected, displays the relative phase of the selected audio pair in Lissajous mode, oriented around the center axis, with zero at the center. Higher levels expand outward from the center, and the left and right channels are distributed to the right and left of the center line.



Polar checkbox – when selected, displays the relative phase of the selected audio pair in Polar mode, oriented around the vertical axis, with zero at the bottom center. Higher levels expand upward and the left and right channels are distributed to the right and left of the center line.



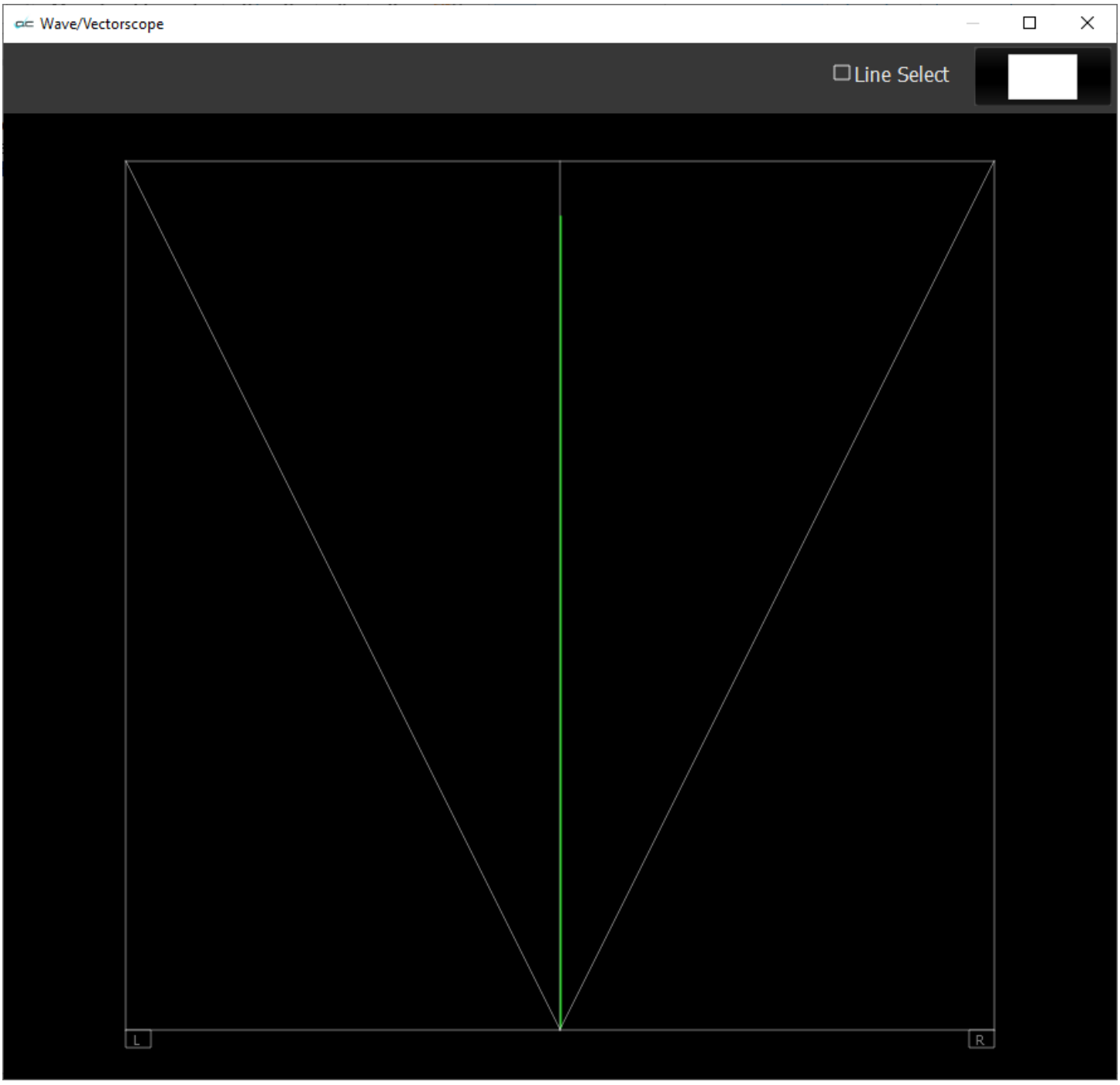
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Audio Vector Display

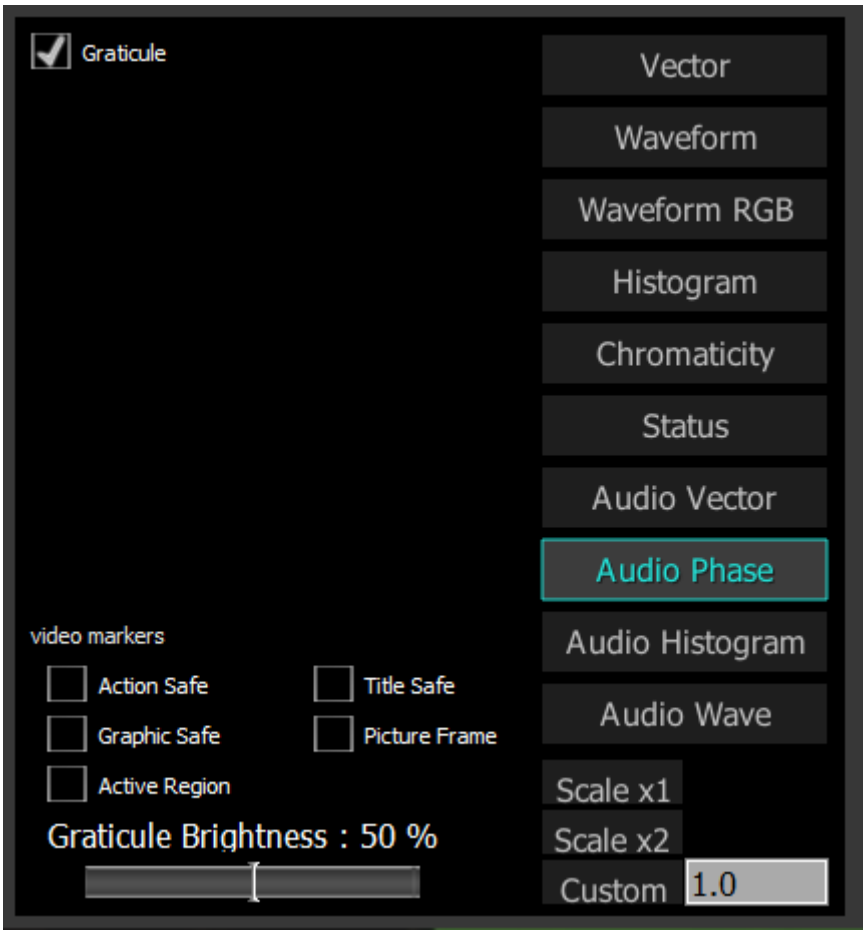
Here is the Audio Vector window.



The audio vectorscope measures the difference between channels of a stereo pair. One channel drives the horizontal and the other the vertical deflection. This will show the relative phase of the two channels. This can be shown in Lissajous XY, Lissajous or Polar modes. Any pair may be selected in the setup.

Audio Phase

To set up the **Audio Phase**, press the Scope Config button. This opens the Scope Config window. Click on the **Audio Phase** button on the right. There are a number of options to set up the **Audio Phase**:

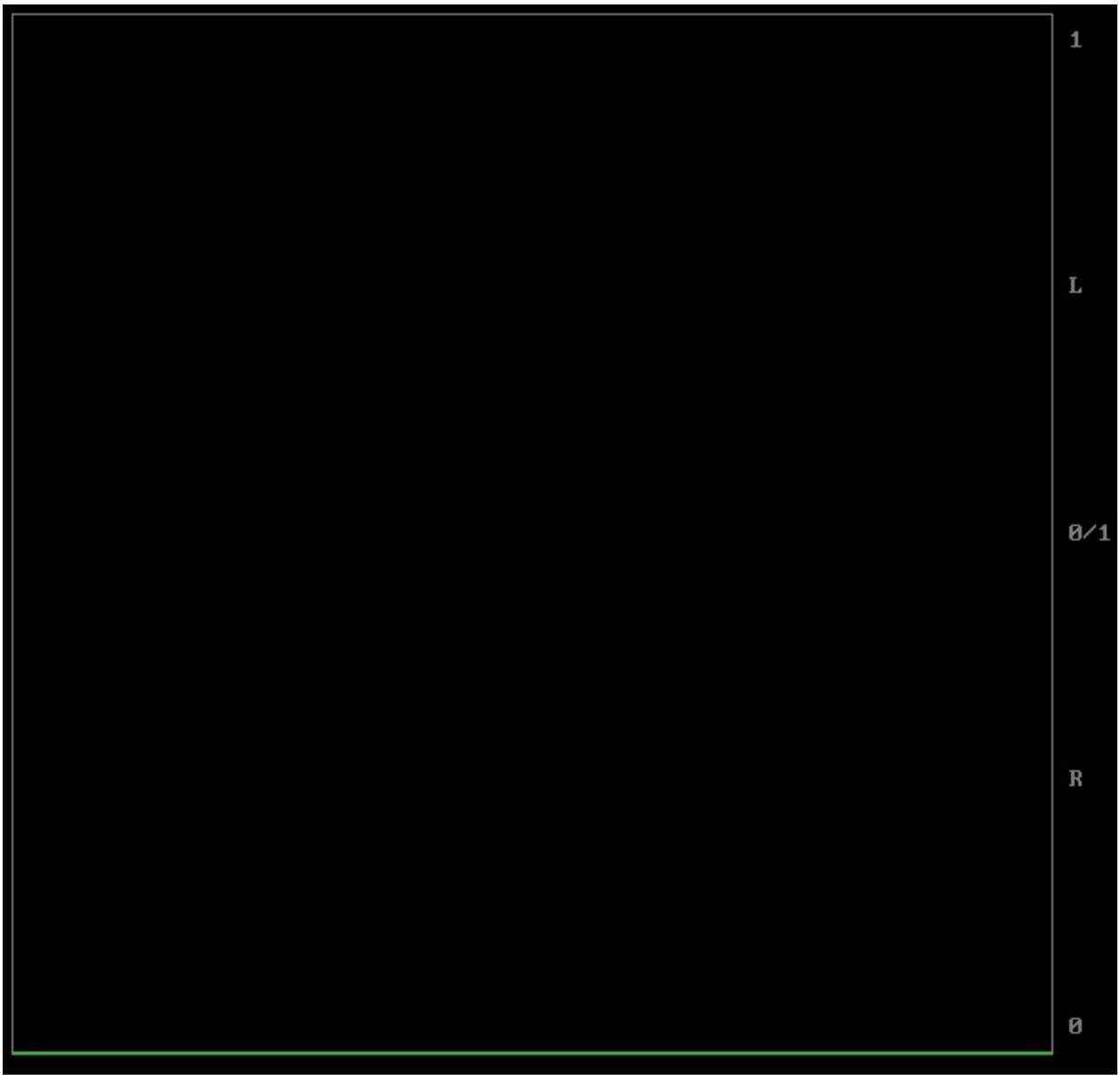


Graticule checkbox – when selected, the graticule is laid over the Histogram display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Audio Phase Display

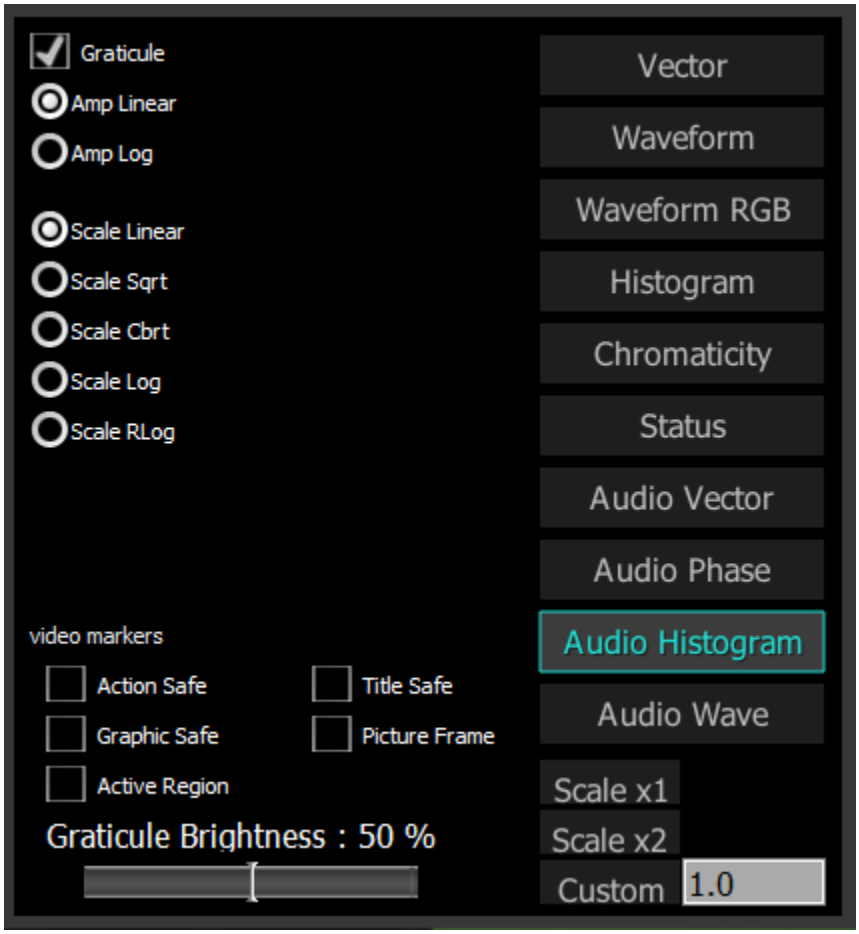
Here is the Audio Phase window.



The audio phase meter shows the relative density of two audio channels and the relative loudness as a line moving towards the louder channel.

Audio Histogram

To set up the **Audio Histogram**, press the Scope Config button. This opens the Scope Config window. Click on the **Audio Histogram** button on the right. There are a number of options to set up the **Audio Histogram**:



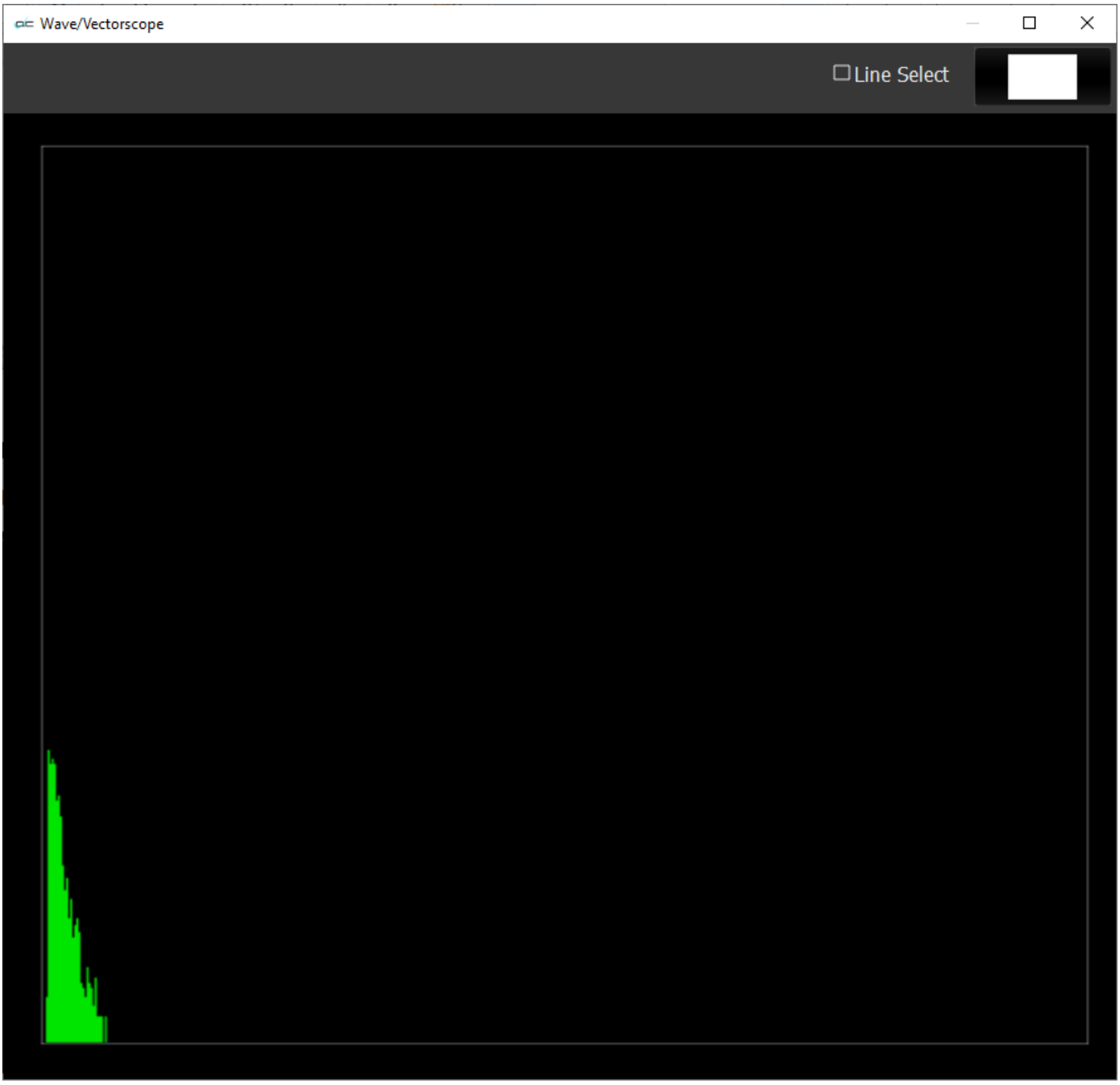
Graticule checkbox – when selected, the graticule is laid over the Histogram display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.
Amp Linear selector – clicking in the Amp Linear checkbox sets the Amp to linear
Amp Log selector – clicking in the Amp Log checkbox sets the Amp to logarithmic.
Scale Linear – clicking in the Scale Linear checkbox sets the scale to linear.
Scale Sqrt – clicking in the Scale Sqrt checkbox sets the scale to sqrt.
Scale Cbrt – clicking in the Scale Cbrt checkbox sets the scale to cbrt.
Scale Log – clicking in the Scale Log checkbox sets the scale to logarithmic.
Scale RLog – clicking in the Scale Rlog checkbox sets the scale to R logarithmic.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Audio Histogram Display

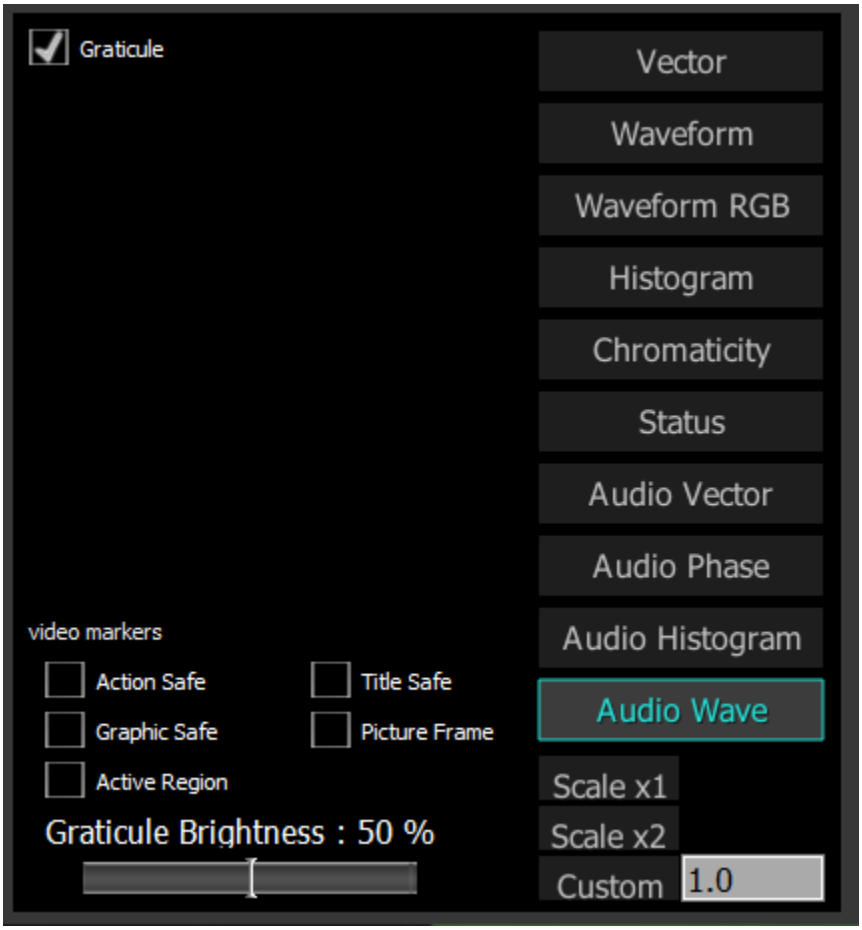
Here is the Audio Histogram window.



The audio histogram displays a bar chart of the levels of the components of an audio signal. This can be displayed as linear or logarithmic. The scale can be set as linear, square root, cubed root, log or reverse log.

Audio Wave

To set up the **Audio Waveform Monitor**, press the Scope Config button. This opens the Scope Config window. Click on the **Audio Histogram** button on the right. There are a number of options to set up the **Audio Histogram**:

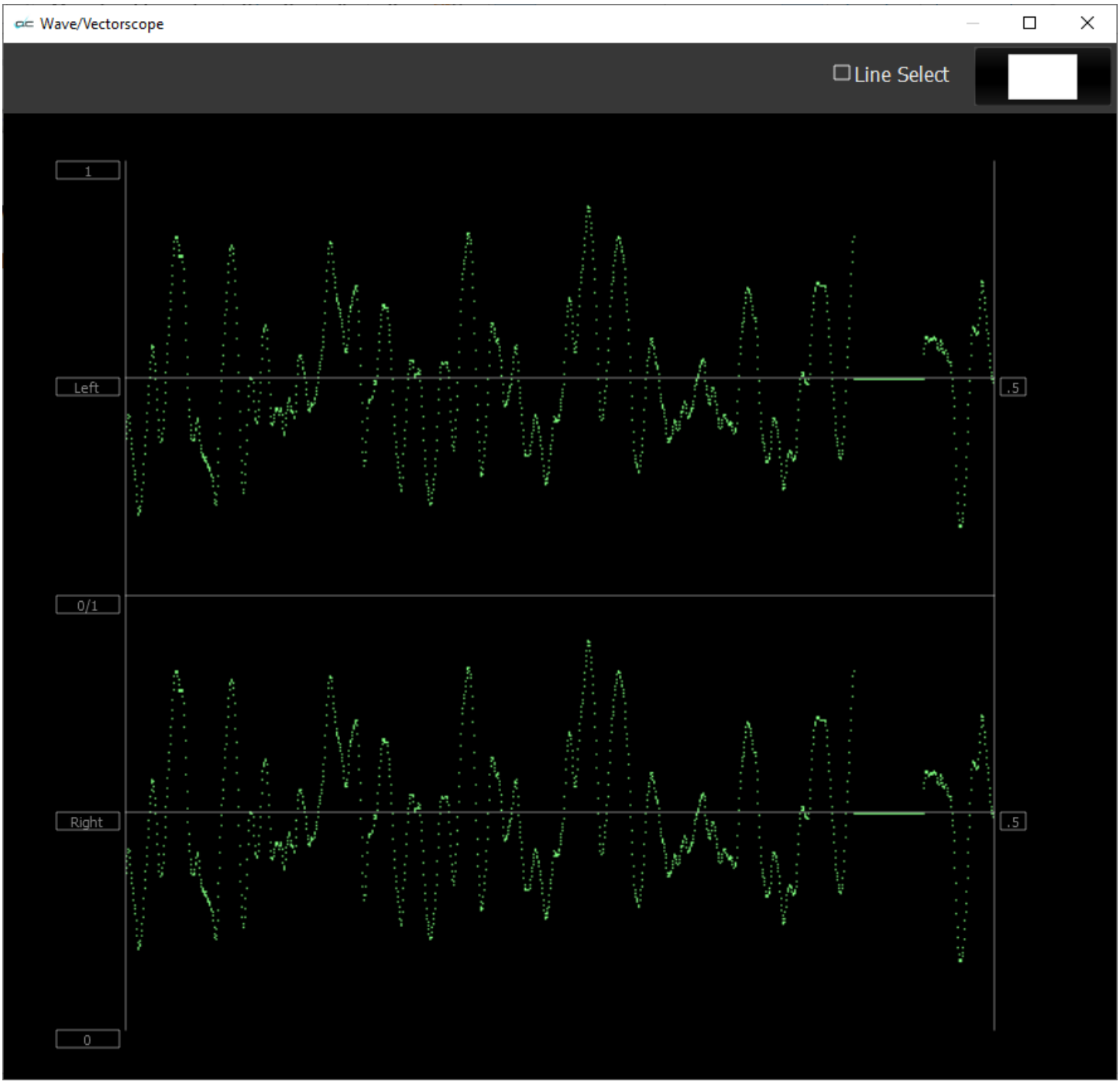


Graticule checkbox – when selected, the graticule is laid over the Histogram display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.
Graticule Brightness slider – moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Scale x1 button – clicking this button sets the display to standard size
Scale x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

Pressing the x in the upper right corner will close the Scope Config window.

Audio Wave Display

Here is the Audio Wave window.



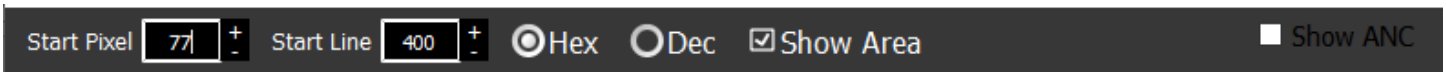
The audio waveform of any pair of channels can be displayed in real time.

Data View

The **Data** display may be selected by clicking on the **Data** button in the side menu. During playback, every time a pixel value changes, its value is displayed in red. So, a paused frame would display all the values in white.

Data view

Across the top the following controls are available:

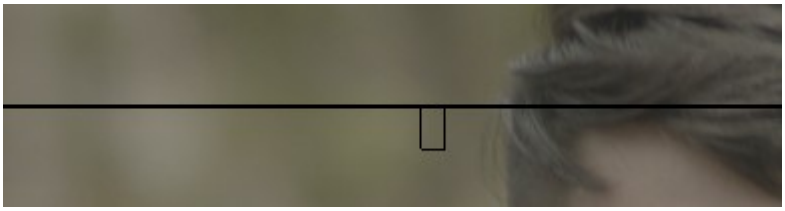


Start Pixel field and buttons – the field shows the current start pixel, or 0 if none has been set. Pressing the + and - (plus and minus) buttons increments the start pixel up or down.

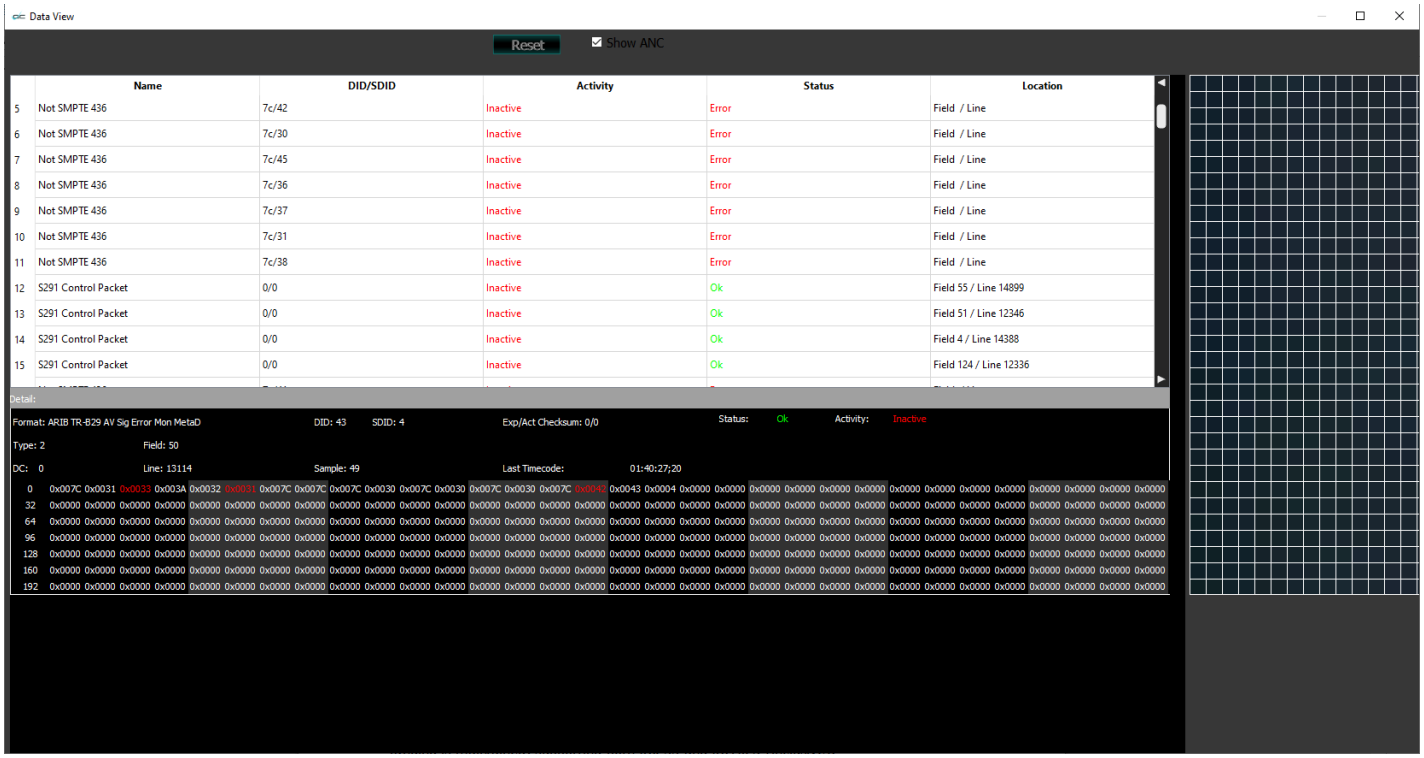
Start Line field and buttons – the field shows the current start line, or 0 if none has been set. Pressing the + and - (plus and minus) buttons increments the start line up or down.

Hexadecimal/Decimal radio buttons – select between hexadecimal and decimal using these two buttons. Selecting one button deselects the other.

Show Area checkbox – select to draw a box around the selected area, if one has been set. The start pixel is displayed as a straight line across the screen. If **Show Area** is set, a box will be drawn to show the pixel area being analyzed in the Data View. This is also the section of the image whose pixels are displayed to the right of the Data View. The below image shows the box, and the line drawn across the screen.

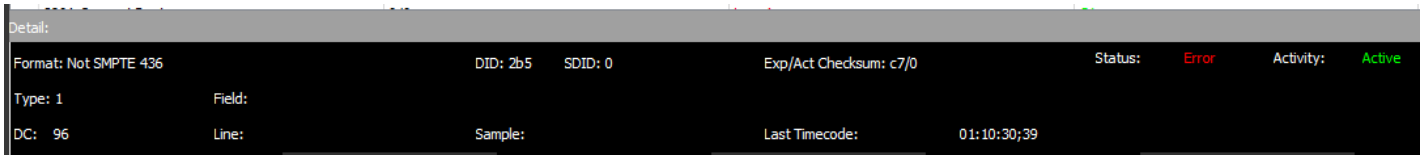


Show ANC checkbox – select to show ancillary data details.

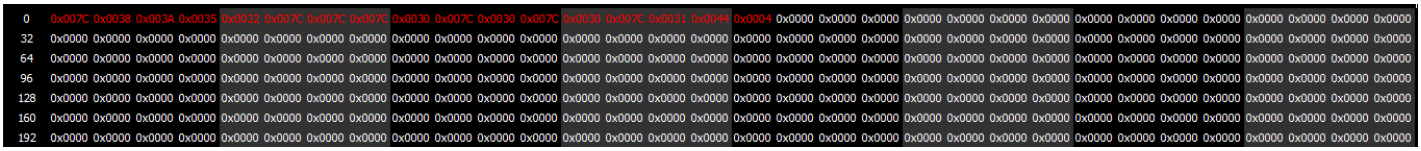


Ancillary data packets are used to transmit non-video information (such as digital audio, closed captioning, teletext, etc.) during the blanking intervals. Clicking on one of the rows will display the data associated with the entry. The below details are provided for each entry, where they exist. If the category has no data, the field will be left blank.

Format – ancillary data format description
DID - Data Identifier
SDID - Secondary Data Identifier
Expected vs Actual checksum – displays the expected checksum (a data integrity benchmark) versus the actual checksum detected
Status – whether the data is OK, or has one or more errors
Activity – Active (current), Stale (has not been active for a little while), or Inactive (has not been for a longer time)
Type – ancillary data type (numeric)
Field – in interlaced content, which field is implicated by the row details
DC – Data count (numeric)
Line – in progressive content, which line is implicated by the row details
Sample - Sample indicates what sample contains the data; Y channel, or Cr/Cb channel, or both. It will probably almost always be 4 which means Y channel.
Last time code – the time code location at which the event being described by the row happened.



The parameters of the data stream are displayed in red, if they have recently changed, and in white where the value has remained the same for a while.



The Data view allows access to the raw pixel values being monitored on the HDMI or SDI input. Values are captured and displayed in their raw values, with no manipulation by the software. Capture card ranging is maintained, supporting both 0..255 and 0..1023 (inclusive).

For YCbCr signals, the Y/Cb and Y/Cr pairs are displayed next to each other with no interpolation. For dual link RGB, the 0..1023 components are also displayed directly. This mode is perfect for checking vertical blank signaling and metadata, as well as picture issues like inner line sync markers or out of range colors.

Pixel starts can be selected, along with lines, in the edit boxes above the data area. Pixels can also be 'picked' by clicking on the video image to set both pixel and line start. Hanging the mouse over the picture, will pop up a tool tip with the R, G and B percentage as well as the pixel X and Y position.

Progressive files vs. Interlaced files in the Data View

Progressive files provide sequentially numbered scan lines, whereas interlaced files show both frames interlaced, where the first field goes from 0/1/2..562, and the second field goes from 564/565..1125.

Here are examples:

Progressive

0 px	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U
0	0x0078	0x0036	0x0089	0x0033	0x0077	0x0033	0x0089	0x0035	0x0077	0x0034	0x0089	0x0033	0x0077	0x0034	0x0089	0x0035	0x007A	0x0034	0x0089	0x0034	0x007
1	0x0077	0x0034	0x0089	0x0033	0x0076	0x0033	0x0089	0x0034	0x0077	0x0033	0x0089	0x0033	0x0076	0x0033	0x0089	0x0033	0x0077	0x0034	0x0089	0x0034	0x007
2	0x0077	0x0033	0x0089	0x0033	0x0077	0x0033	0x0089	0x0033	0x0078	0x0033	0x0089	0x0033	0x0076	0x0033	0x0089	0x0033	0x0075	0x0034	0x0089	0x0034	0x007
3	0x0079	0x0035	0x0089	0x0033	0x0078	0x0033	0x0089	0x0034	0x0079	0x0033	0x0089	0x0032	0x0076	0x0033	0x0089	0x0033	0x0075	0x0033	0x0089	0x0033	0x007
4	0x0079	0x0034	0x0089	0x0033	0x0079	0x0034	0x0089	0x0034	0x007A	0x0034	0x0089	0x0033	0x0076	0x0034	0x0089	0x0034	0x0074	0x0034	0x0089	0x0034	0x007
5	0x0079	0x0033	0x0089	0x0033	0x0079	0x0034	0x0089	0x0034	0x007A	0x0034	0x0089	0x0034	0x0075	0x0034	0x0089	0x0033	0x0073	0x0034	0x0089	0x0034	0x007
6	0x0078	0x0035	0x0089	0x0035	0x0078	0x0035	0x0089	0x0034	0x007A	0x0033	0x0089	0x0034	0x0077	0x0033	0x0089	0x0032	0x0076	0x0032	0x0089	0x0032	0x007
7	0x0079	0x0034	0x0089	0x0033	0x0078	0x0034	0x0089	0x0035	0x0079	0x0034	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x007A	0x0035	0x0089	0x0034	0x007
8	0x0078	0x0034	0x008A	0x0033	0x0077	0x0033	0x008A	0x0034	0x0078	0x0035	0x0089	0x0035	0x007A	0x0035	0x0089	0x0035	0x007B	0x0035	0x0089	0x0033	0x007
9	0x0078	0x0034	0x0089	0x0034	0x0078	0x0034	0x008A	0x0033	0x0079	0x0033	0x0089	0x0034	0x007A	0x0034	0x0089	0x0034	0x007B	0x0036	0x0089	0x0034	0x007
10	0x0077	0x0034	0x0089	0x0034	0x0078	0x0035	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x007A	0x0034	0x0089	0x0034	0x007A	0x0035	0x0089	0x0034	0x007
11	0x0076	0x0033	0x0089	0x0033	0x0077	0x0034	0x0089	0x0035	0x0079	0x0034	0x0089	0x0034	0x007A	0x0033	0x0089	0x0034	0x007A	0x0034	0x0089	0x0034	0x007
12	0x0076	0x0034	0x0089	0x0034	0x0078	0x0035	0x0089	0x0035	0x007A	0x0034	0x0089	0x0033	0x007A	0x0033	0x0089	0x0033	0x0079	0x0033	0x008A	0x0033	0x007
13	0x0078	0x0034	0x0089	0x0035	0x007A	0x0035	0x0089	0x0034	0x007A	0x0034	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x0078	0x0033	0x008A	0x0033	0x007
14	0x0078	0x0033	0x008A	0x0034	0x007A	0x0034	0x0089	0x0033	0x0079	0x0034	0x0089	0x0034	0x0078	0x0034	0x008A	0x0033	0x0077	0x0034	0x008A	0x0034	0x007
15	0x0077	0x0034	0x008A	0x0033	0x0079	0x0034	0x0089	0x0035	0x0078	0x0036	0x0089	0x0035	0x0077	0x0033	0x008A	0x0033	0x0077	0x0033	0x008A	0x0034	0x007
16	0x0078	0x0035	0x008A	0x0034	0x0077	0x0034	0x0089	0x0035	0x0079	0x0035	0x008A	0x0034	0x0077	0x0033	0x008A	0x0033	0x0077	0x0035	0x008A	0x0034	0x007
17	0x0078	0x0034	0x008A	0x0033	0x0077	0x0033	0x0089	0x0035	0x0078	0x0034	0x008A	0x0034	0x0077	0x0034	0x008A	0x0033	0x0078	0x0034	0x0089	0x0035	0x007
18	0x0079	0x0033	0x0089	0x0033	0x0078	0x0033	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x0078	0x0034	0x008A	0x0033	0x0079	0x0034	0x0089	0x0034	0x007
19	0x007A	0x0035	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x007A	0x0034	0x0089	0x0035	0x0079	0x0035	0x0089	0x0034	0x0079	0x0033	0x0089	0x0034	0x007
20	0x007A	0x0035	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x007A	0x0034	0x0089	0x0035	0x007A	0x0035	0x0089	0x0034	0x0079	0x0033	0x0089	0x0033	0x007
21	0x0078	0x0035	0x0089	0x0034	0x0078	0x0033	0x0089	0x0033	0x007A	0x0034	0x0089	0x0035	0x0079	0x0035	0x0089	0x0034	0x0079	0x0034	0x0089	0x0034	0x007

Interlaced

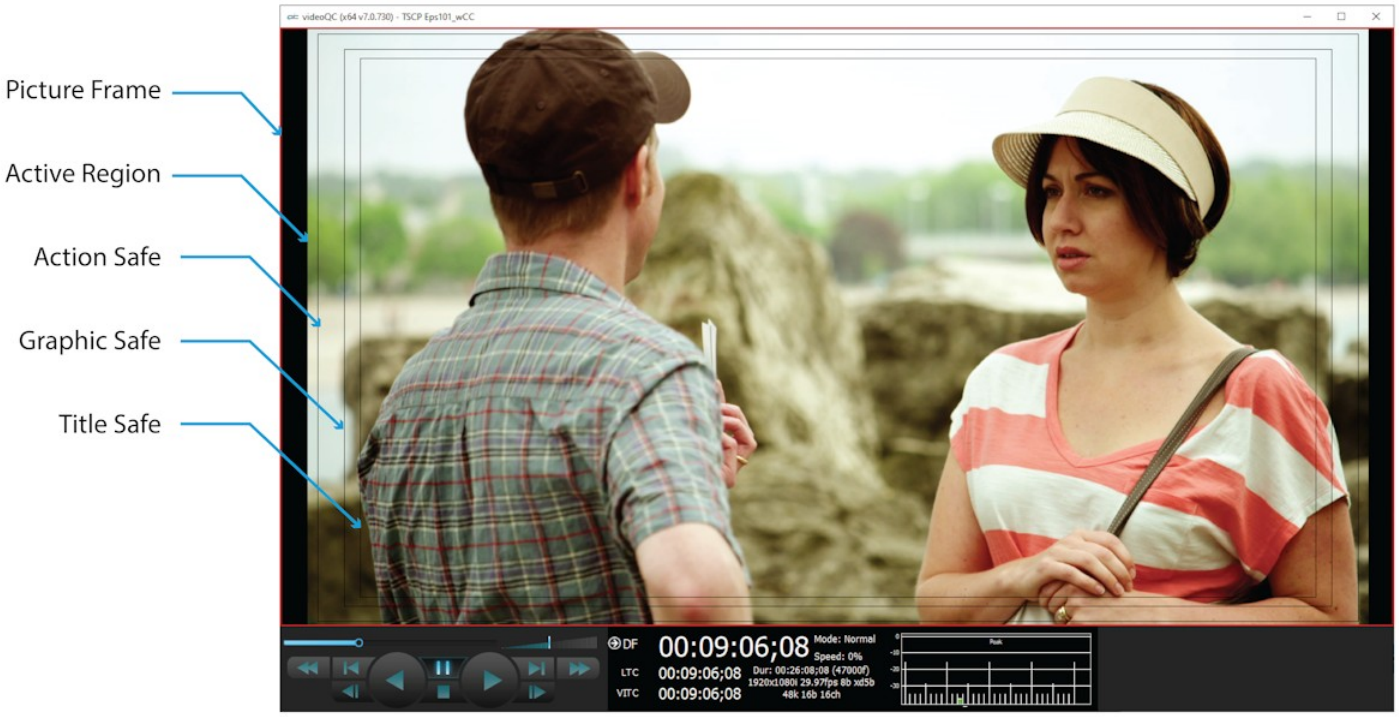
0 px	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U
0	0x0075	0x0045	0x00A2	0x0048	0x0075	0x004A	0x00A9	0x004A	0x0074	0x004A	0x00AA	0x004B	0x0074	0x004D	0x00A7	0x004E	0x0075	0x004E	0x00A3	0x004C	0x007
564	0x0075	0x0047	0x00A1	0x0049	0x0075	0x004B	0x00A8	0x004B	0x0074	0x004B	0x00A9	0x004C	0x0074	0x004D	0x00A6	0x004E	0x0075	0x004E	0x00A2	0x004D	0x007
1	0x0075	0x0049	0x00A0	0x004B	0x0075	0x004C	0x00A7	0x004C	0x0075	0x004B	0x00A8	0x004B	0x0074	0x004C	0x00A4	0x004D	0x0076	0x004C	0x00A0	0x004B	0x007
565	0x0075	0x004B	0x009F	0x004D	0x0076	0x004D	0x00A5	0x004C	0x0075	0x004A	0x00A5	0x0049	0x0075	0x0048	0x00A2	0x0048	0x0076	0x0047	0x009E	0x0046	0x007
2	0x0076	0x004B	0x009D	0x004C	0x0076	0x004C	0x00A3	0x0049	0x0076	0x0046	0x00A3	0x0044	0x0076	0x0042	0x009F	0x0042	0x0077	0x0040	0x009C	0x003F	0x007
566	0x0076	0x0049	0x009B	0x0049	0x0077	0x0048	0x00A1	0x0045	0x0077	0x0041	0x00A0	0x003E	0x0077	0x003C	0x009D	0x003C	0x0078	0x003A	0x009A	0x003A	0x007
3	0x0077	0x0044	0x0099	0x0044	0x0078	0x0043	0x009F	0x003F	0x0078	0x003C	0x009E	0x0039	0x0078	0x0038	0x009A	0x0038	0x0079	0x0038	0x0098	0x0039	0x007
567	0x0078	0x003F	0x0097	0x003F	0x0078	0x003E	0x009C	0x003B	0x0079	0x0038	0x009B	0x0037	0x0079	0x0037	0x0098	0x0038	0x0079	0x0038	0x0097	0x003A	0x007
4	0x0078	0x003C	0x0095	0x003C	0x0079	0x003C	0x009A	0x0039	0x007A	0x0037	0x0099	0x0037	0x007A	0x0038	0x0096	0x0039	0x007A	0x003A	0x0096	0x003C	0x007
568	0x0079	0x003A	0x0093	0x003B	0x007A	0x003B	0x0098	0x003A	0x007B	0x0039	0x0098	0x0039	0x007B	0x003A	0x0096	0x003A	0x007B	0x003B	0x0095	0x003B	0x007
5	0x0079	0x003A	0x0090	0x003B	0x007A	0x003C	0x0096	0x003B	0x007B	0x003B	0x0097	0x003B	0x007B	0x003B	0x0095	0x003A	0x007C	0x0039	0x0095	0x0039	0x007
569	0x007A	0x003A	0x008E	0x003B	0x007B	0x003C	0x0095	0x003C	0x007C	0x003B	0x0096	0x003B	0x007C	0x003A	0x0095	0x0039	0x007C	0x0037	0x0096	0x0037	0x007
6	0x007A	0x003A	0x008D	0x003B	0x007B	0x003B	0x0093	0x003B	0x007D	0x003A	0x0096	0x003A	0x007D	0x0039	0x0095	0x0039	0x007D	0x0038	0x0096	0x0038	0x007
570	0x007A	0x003A	0x008B	0x003B	0x007C	0x003B	0x0092	0x0039	0x007D	0x0038	0x0095	0x0039	0x007D	0x0039	0x0095	0x003A	0x007D	0x003A	0x0097	0x003B	0x007
7	0x007A	0x003B	0x008B	0x003B	0x007C	0x003B	0x0092	0x0039	0x007D	0x0038	0x0095	0x0039	0x007E	0x003A	0x0096	0x003C	0x007E	0x003D	0x0097	0x003F	0x007
571	0x007B	0x003C	0x008C	0x003C	0x007C	0x003C	0x0092	0x003A	0x007D	0x0039	0x0096	0x003A	0x007D	0x003B	0x0096	0x003D	0x007D	0x003E	0x0097	0x0040	0x007
8	0x007C	0x003D	0x008E	0x003D	0x007C	0x003D	0x0092	0x003B	0x007C	0x003A	0x0096	0x003B	0x007C	0x003B	0x0097	0x003C	0x007D	0x003D	0x0097	0x003F	0x007
572	0x007C	0x003C	0x008E	0x003C	0x007D	0x003C	0x0092	0x003B	0x007C	0x003A	0x0096	0x003A	0x007C	0x003A	0x0097	0x003A	0x007D	0x003A	0x0096	0x003B	0x007
9	0x007C	0x003A	0x008E	0x003B	0x007D	0x003B	0x0092	0x003A	0x007D	0x0039	0x0095	0x0039	0x007C	0x0039	0x0096	0x0038	0x007D	0x0037	0x0095	0x0038	0x007
573	0x007C	0x0039	0x008F	0x0039	0x007D	0x003A	0x0092	0x0039	0x007D	0x0038	0x0095	0x0037	0x007D	0x0037	0x0096	0x0037	0x007D	0x0036	0x0094	0x0037	0x007
10	0x007C	0x0039	0x008F	0x003A	0x007D	0x003A	0x0092	0x0039	0x007D	0x0037	0x0095	0x0037	0x007D	0x0037	0x0095	0x0037	0x007D	0x0037	0x0093	0x0038	0x007
574	0x007D	0x003A	0x008F	0x003B	0x007D	0x003B	0x0092	0x003A	0x007D	0x0038	0x0094	0x0038	0x007D	0x0038	0x0094	0x0038	0x007E	0x0038	0x0092	0x0039	0x007

Video Markers

Here are the video markers displayed over the picture.

They can be enabled or disabled in the scopes setup window. To set up the video markers, click the **wave/vector** option in the main menu. This opens the Waveform/Vectorscopes. Press the setup icon in the upper right corner, and use the **video markers** section to set up the overlays.

Here are the available markers.



Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output. Shows the border of the frame.

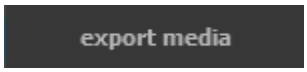
Active Region checkbox - when selected, the Active region graticule is displayed over the video output. Shows the area that provides video signal.

Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output. Shows the area to which action in a frame should be constrained so that it can be viewed from all angles on most displays.

Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output. In television broadcasting, a rectangular area which is far enough in from the borders, such that graphics display neatly, with a margin and without distortion.

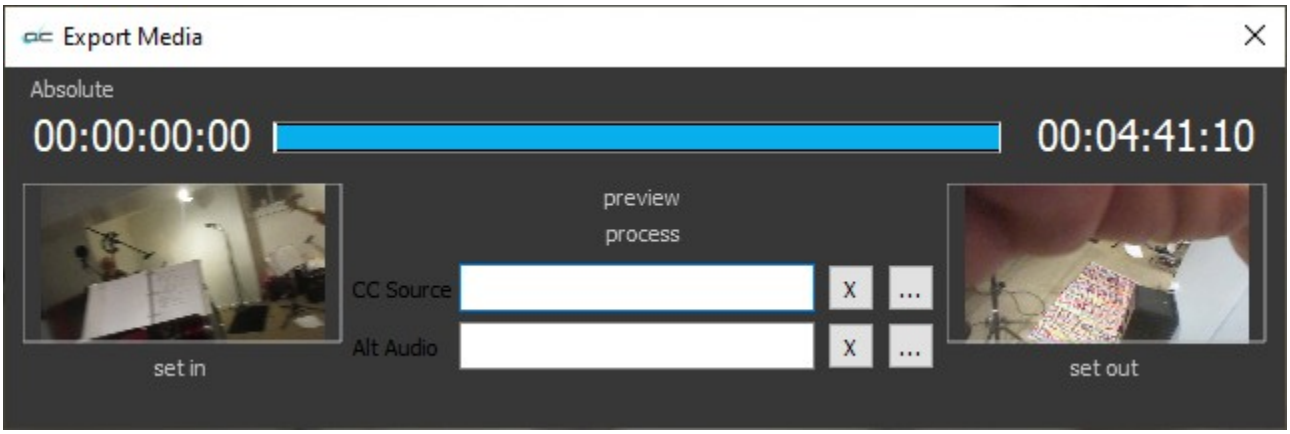
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output. In television broadcasting, a rectangular area which is far enough in from the borders, such that text shows neatly, with a margin and without distortion.

Export Media



Export button - opens the export window, which allows the user to take the file they are viewing and export some or all of it. The position slider may be clicked on and repositioned to set in and out points.
This feature is added at the videoQC Workstation level.

Please note, IP stream sources are not supported for export.



The **Export** Window offers the following controls and displays:

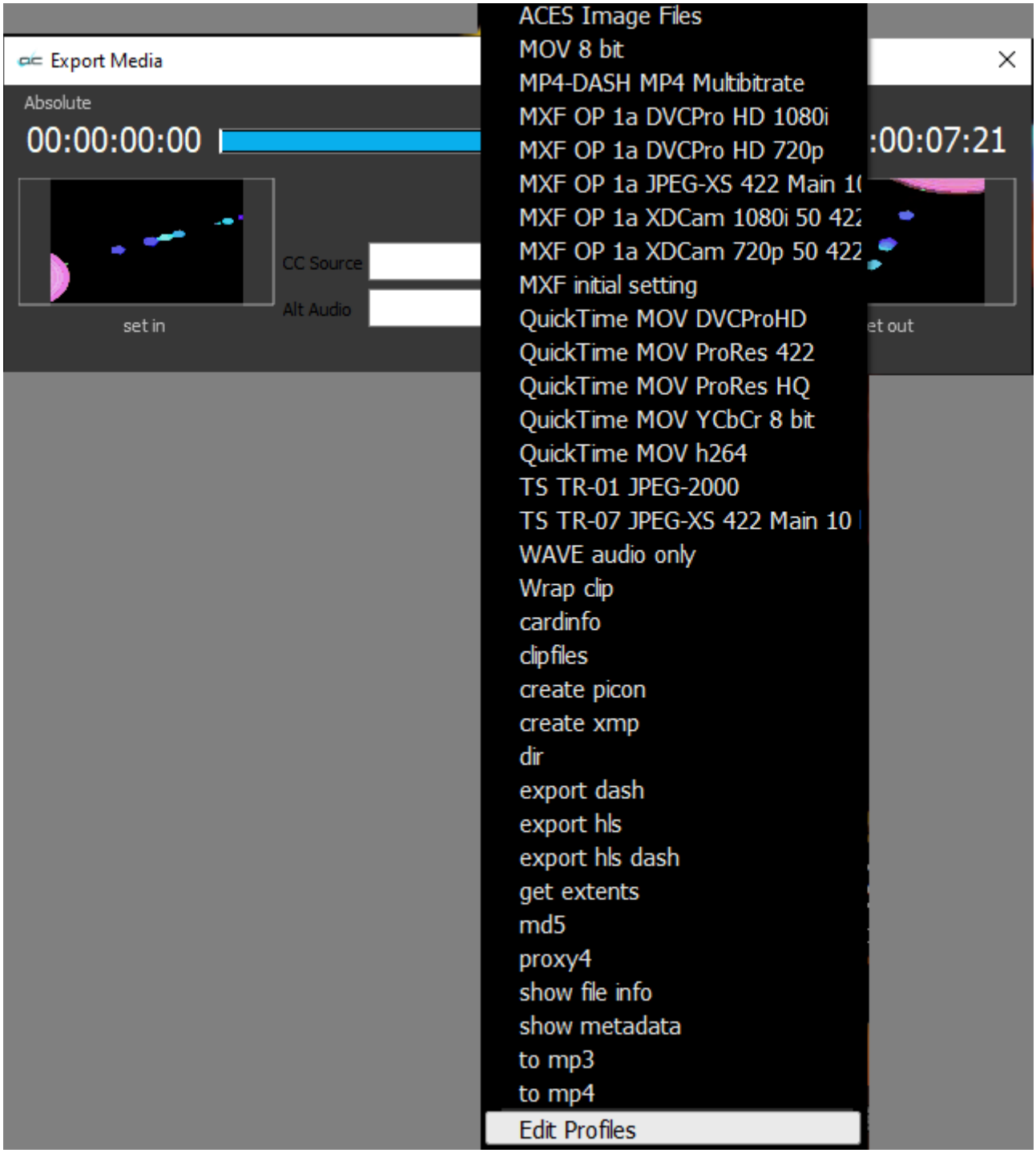
TC Type – displays the type of time code being used. Clicking on the time code type pulls up the following menu, where the user can select between available time code types.

In field – displays the current In frame.
Position Slider – displays the entire clip as blue when the clip is first loaded. Hovering over the white line at the beginning and end of the blue bar in the position slider produces a left/right arrow, which allows the user to edit either the In or Out point. Once a new In or Out point has been set, displays the amount of the clip that will be exported in blue, and the portions that will not be included in the export will be displayed in black.
Out field – displays the current Out frame.
In picon and **Set In** button – a picon of the current In frame is displayed. Setting a new In frame will update the image. To set a new In frame, play or cue the file to a new in point, and press the **Set In** button.

Out picon and **Set Out** button – a picon of the current Out frame is displayed. Setting a new Out frame will update the image. To set a new Out frame, play or cue to a new out point, and press the **Set Out** button.

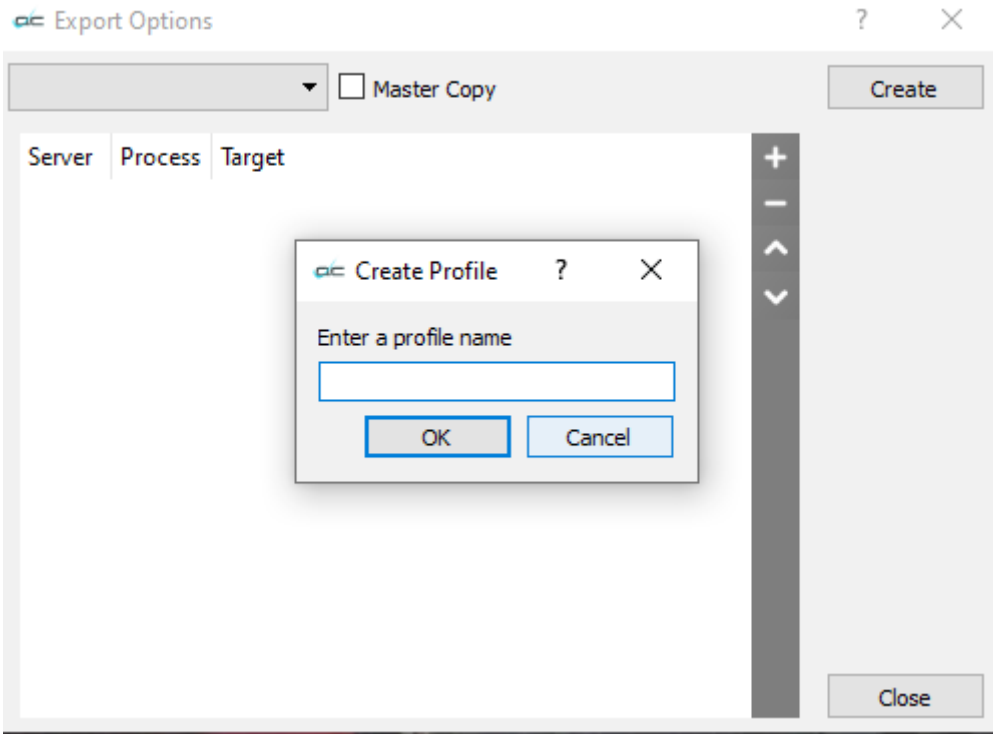
Preview – pressing this control will play the portion of the clip set to be exported.

Process – pressing this control begins the export process by opening the **Create Profile** Window. If you have set up profiles, you would be able to select between them for the export:

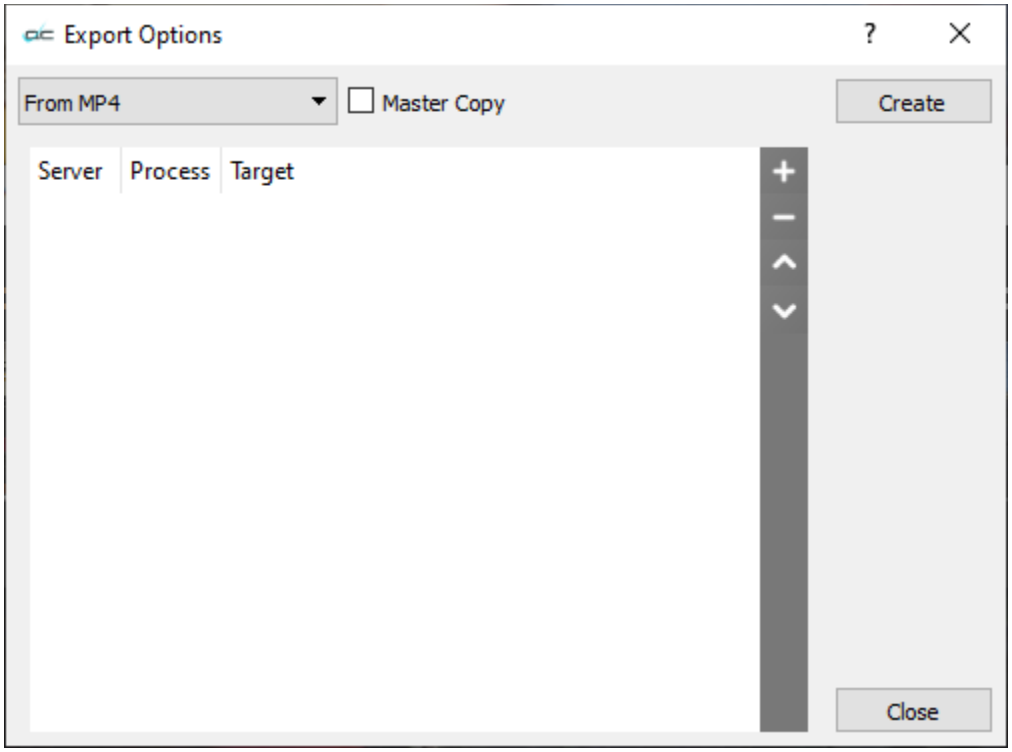


In all cases the **Edit Profiles** option will be available at the bottom of the list so the user can set up a new profile. Selecting **Edit Profiles** opens the Export Options window:

To create a new profile, press the **Create** button at the top right. This opens the **Create Profile** window. Enter a name for the profile and press the **OK** button. *Note: it helps to name the profile after the type of file you intend to create, so you can find it easily when you need it next time.*

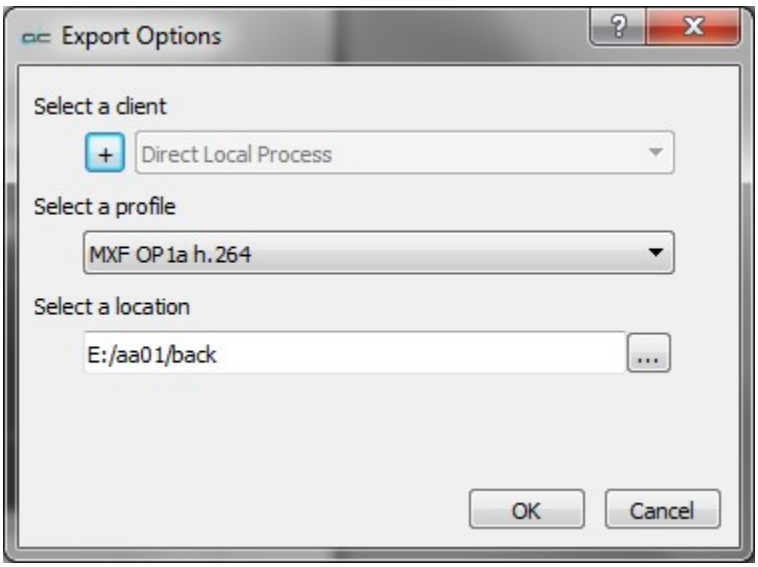


This opens the **Export Options** window.

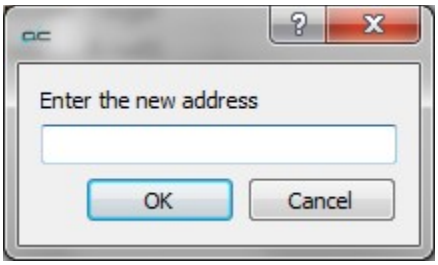


- The **Export Options** window offers a **Profile** pulldown menu which allows the user to select between profiles that have been created. The user can edit existing profiles this way.
- Clicking the **Master Copy** checkbox opens a **Select Target Window** browser which allows the user to set where the master copy of the export should be saved.

- Clicking on the + control opens a further **Export Options** window, which allows the user to set up a process for the export.



- Pressing the **+** by the **Select a Client** field opens the **Enter a New Address** window. This allows the user to select a Net-X-Code Server client for the export. Where more than one client has been set up, the field becomes a pulldown menu, allowing the user to select between available clients.



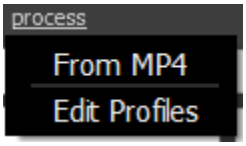
- Pressing the **Select a Profile** pulldown menu allows the user to select between available file format types for the export. Available types include:

ACES Image Files	this is an information request
cardinfo	this is an information request
clipfiles	this is an information request
dir	this is an information request
DNxHD	1080p 25, 29, 30
DNxHD	720p 50, 59, 60
DNxHD	1080i 25, 29, 30
DNxHR	10 Bit
DNxHR	HQ
DNxHR	SQ
examine	this is an information request
getCopyInOut	this is an information request
h264 transport stream	MOV ProRes LT
md5	this is an information request
metadata	this is an information request
MKV	FFV1 Lossless

MOV	MPEG-2 50 4:2:2
MP3	bit rate 128k
MP4	any resolution with a target bitrate of 10 mbs
MP4	any resolution with a target bitrate of 7.5 mbs
MP4	any resolution with a target bitrate of 5 mbs
MP4	HD360p with a target bitrate of 1.25 mbs
MP4	HEVC Any resolution...target bitrate of 10 mbs
MP4	Multiple MP4 Output
MP4	Scaledown to 480x2... target bitrate of 500kbits
MP4	Scaledown to 960x5... target bitrate of 2mbits
MP4	Sony XAVC-S 4:2:0
MP4	Sony XAVC-S 4:2:2
MP4-DASH	MP4 Multibitrate
MXF	AS-02 h.264 50 mbs
MXF	AS-11 HD DPP
MXF	Avid Media DNxHD 1080 Writer
MXF	Avid Media HQX 10 Writer
MXF	Avid Media Low Quality Writer
MXF	Avid Media Proxy Writer
MXF	Avid Media Standard Quality Writer
MXF	Avid Media Uncompressed Writer
MXF	Avid Media XDCam Writer
MXF	Avid Media High Quality Writer
MXF	OP1a DVCPro HD 1080i
MXF	OP1a DVCPro HD 720p
MXF	OP1a h.264
MXF	OP1a HBR 264 10 bit 50mbs
MXF	OP1a HDF 50 4:2:2
MXF	OP1a JPEG-2000 4:2:2
MXF	OP1a MPEG 50 4:2:2
MXF	OP1a XDCam 1080i 35 4:2:0
MXF	OP1a XDCam 1080i 50 4:2:2
MXF	OP1a XDCam 1080p 35 4:2:0
MXF	OP1a XDCam 720p 35 4:2:0
MXF	OP1a XDCam 720p 50 4:2:2
MXF	RDD-25 Proxy Writer
picon	creates a small jpg image
QuickTime	DVCProHD
QuickTime	MOV h264
QuickTime	MOV ProRes 4:4:4
QuickTime	MOV ProRes HQ
QuickTime	MOV ProRes LT
QuickTime	MOV ProRes Proxy
QuickTime	MOV ProRes XQ
QuickTime	MOV YCbCr 8 Bit
TS	TR-01 JPEG-2000 (special setup required)
TS-h264	h.264 4:2:0/passthrough transport stream (special setup required)

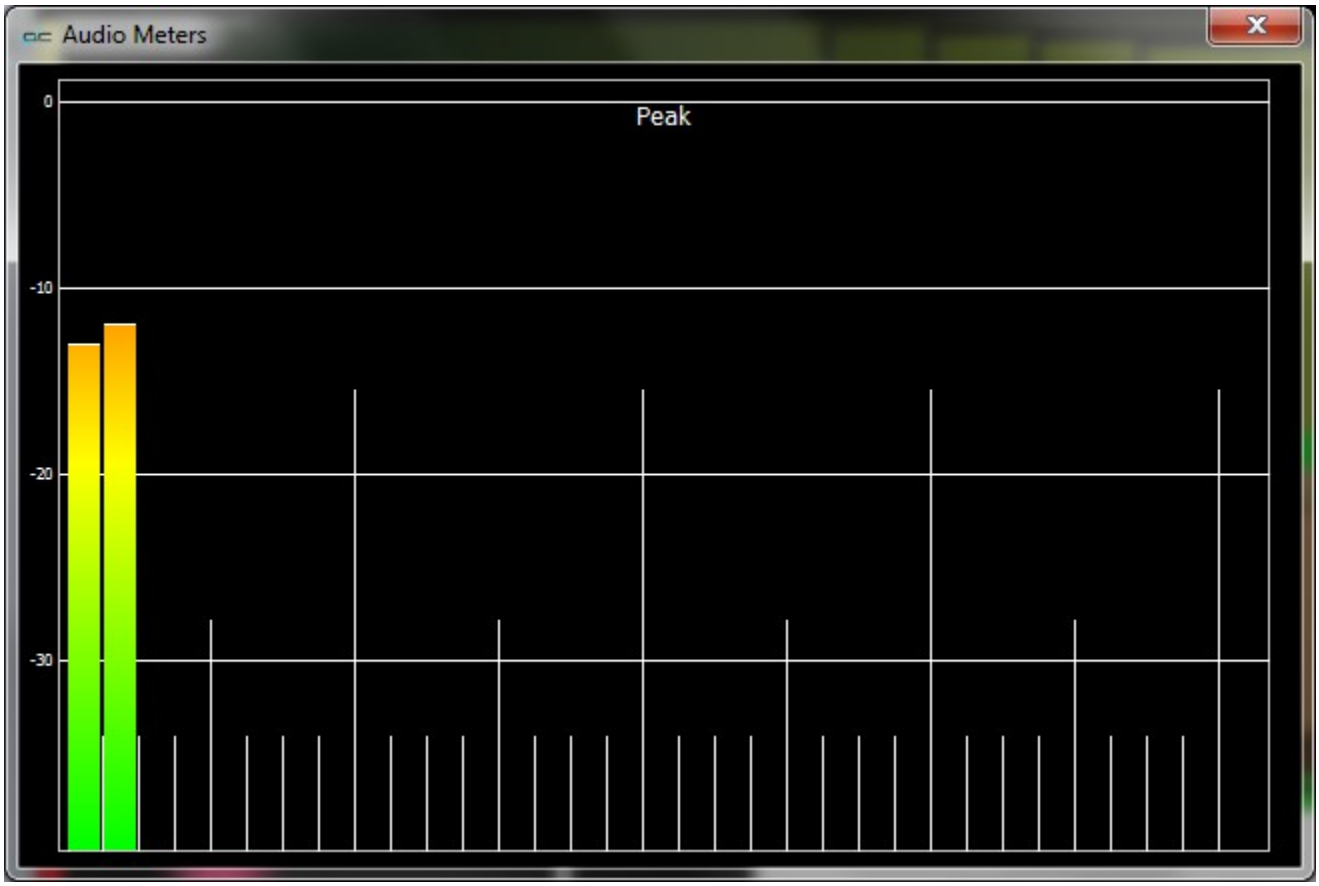
TS-HLS	Multibitrate (special setup required)
TS-MPEG2	MPEG-2 4:2:2:...rough transport stream
WAVE	audio only
Wrap clip	same as source
xmp	this is an information request

- Pressing the **Browse** button at the right of the **Select a Location** control opens a standard browser, which allows the user to set the location the exported file will be saved in.
- Once all the parameters have been set, pressing **OK** closes the **Export Options** window. The user can then press the **Process** control to reveal the available profiles (see if Net-X-Base is present), and the **Edit Profile** (go back to the Export Options window).



Audio Meters

Audio Meters button - Open the audio meters display. This display shows relative audio levels during source passthrough or file output. The line 0 corresponds to -24 decibels.

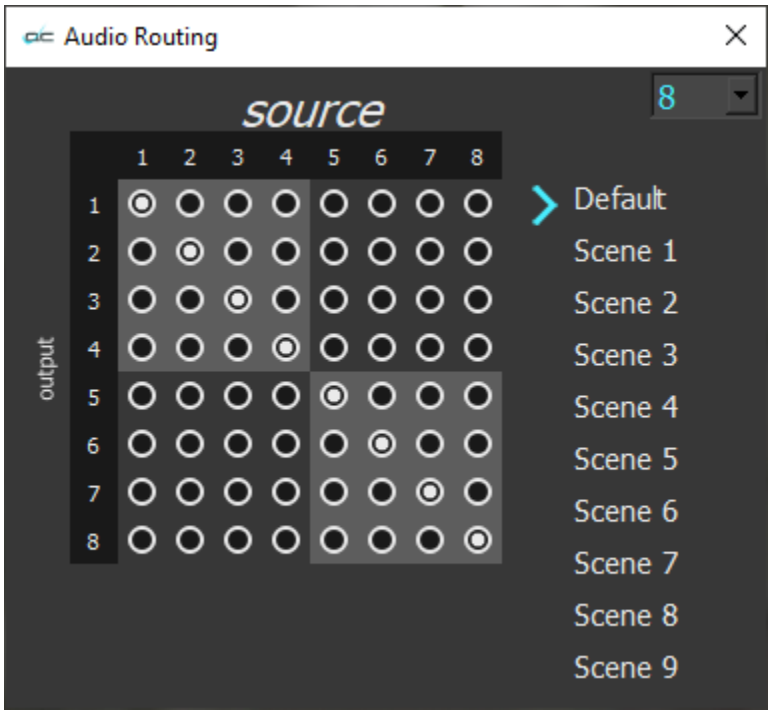


Audio Meters window

Audio Routing

Audio Routing button - Opens the audio routing window. This window allows the user to reroute the output of up to 16 channels of audio. The source audio channels come in at the top. In the diagram below, the routing has not been changed from the default. With the setup below, audio channel 1 goes out on audio output 1, audio channel 2 goes out on audio output 2, etc.

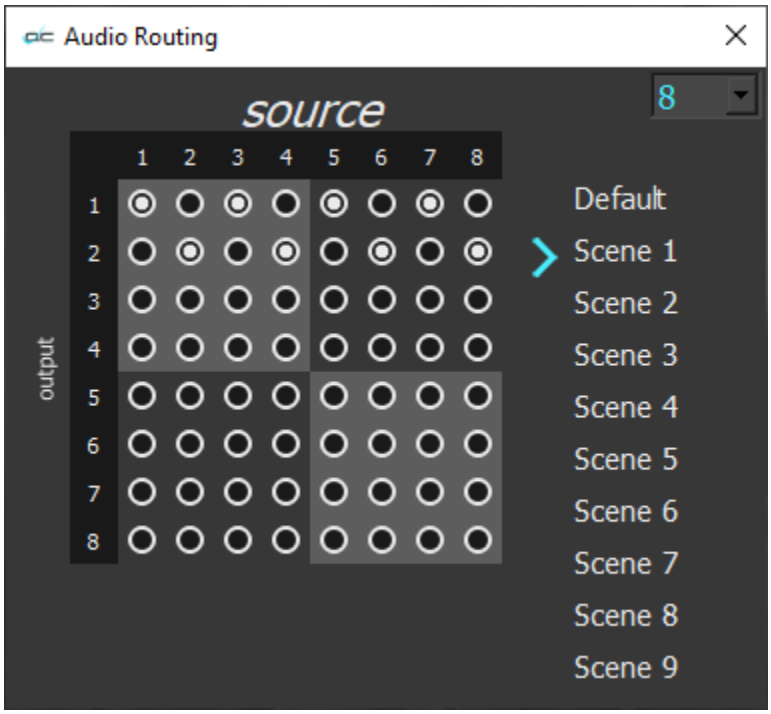
To change the routing, click on one of the "Scenes", and set each channel to suit your monitoring requirements. Once that has been set up, clicking on the scene will load that setup. Clicking the Default control will reset everything back to the default (unrouted) setting.



Audio Routing window default

Example: In the following diagram, starting at audio output 3, the audio channels are routed as stereo pairs to the output of audio channels 1 and 2.

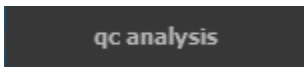
This method would allow a user to route the audio output of channels 3 and 4, channels 5 and 6, and channels 7 and 8, to audio output channels 1 and 2. The convenience here is that the user can confirm all their audio channels exist, and play acceptably, using their system speakers. Otherwise they would need hardware capable of breaking out 8 audio channels, plus a mixer/monitor setup.



Audio Routing window revised

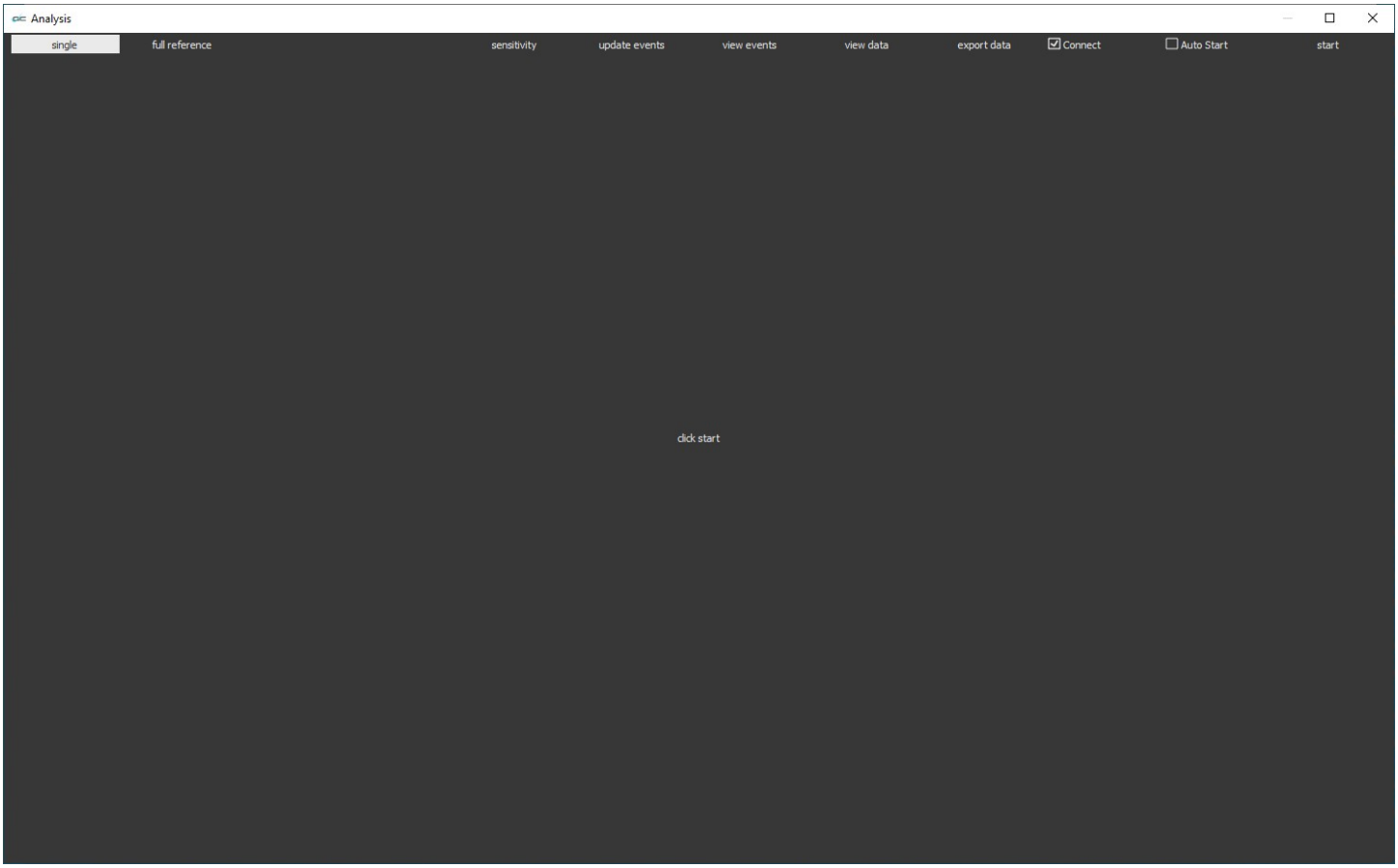
Note: during routing, the audio output may appear diminished, depending on what is on each channel. In order to avoid the potential distortion of summing the output of a number of channels, we divide the volume of each channel by the total volumes of the patches on that channel. If some patches are silent, the channel with signal will get quieter.

QC Analysis



QC Analysis button - Open the Analysis window, which allows the user to perform single sided or full reference analysis.

Load a file, and press the QC Analysis button. This opens the **Analysis** window.



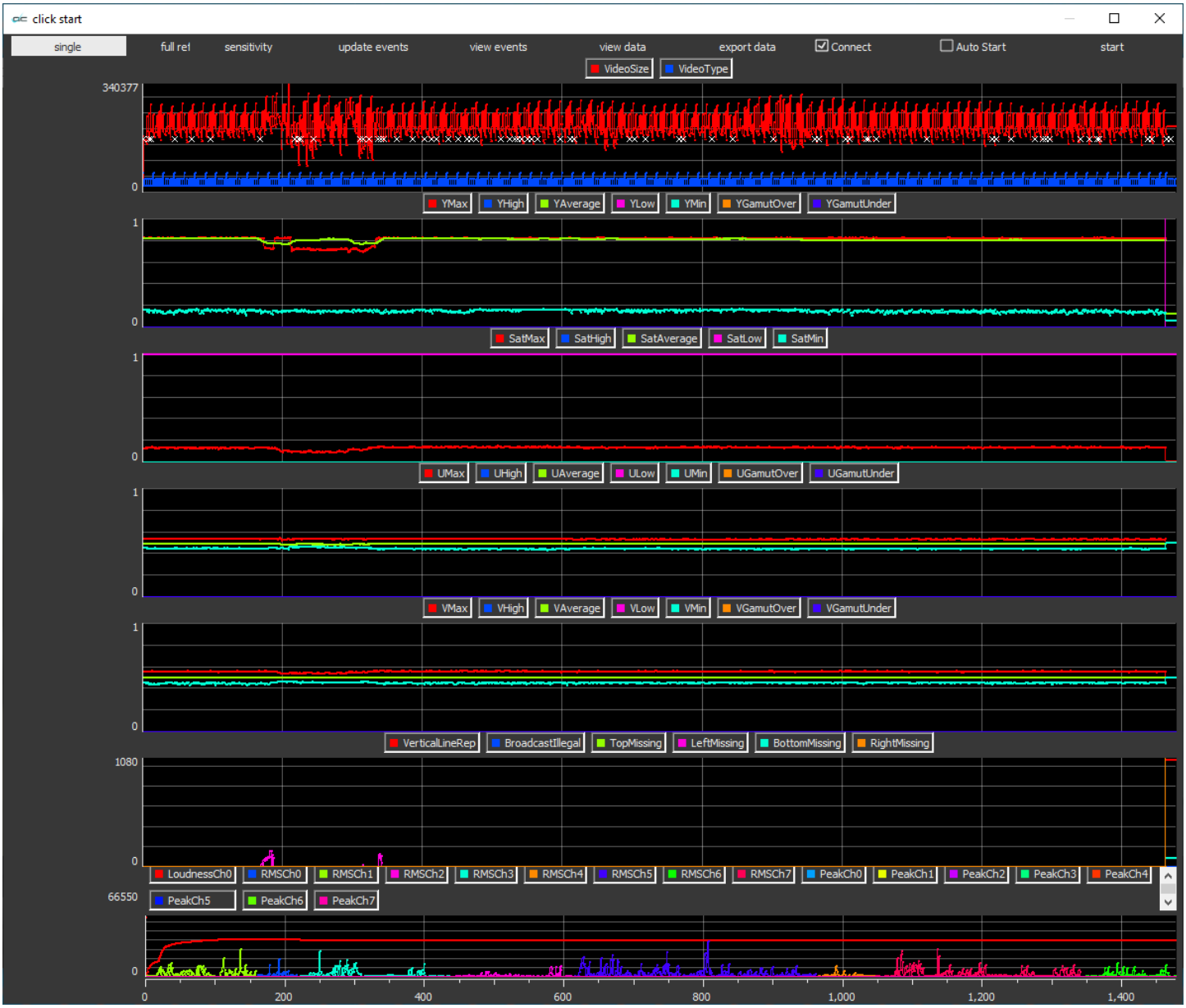
Single Sided Analysis

To perform a single sided analysis, press the **Start** button in the upper right corner.

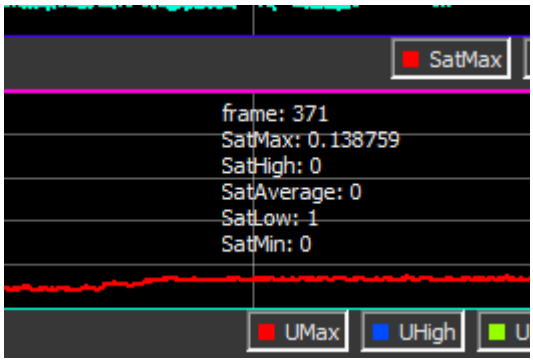
The Analysis process will then begin to analyze the current file.

Note, if the Auto-start checkbox has been checked, the process will start upon selecting the QC Analysis option.

The analysis is provided in an intuitive graphical layout, grouped by section.



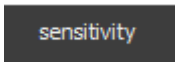
During analysis, or after, the user can mouse over a portion of the analysis to see details regarding that particular frame of the video.



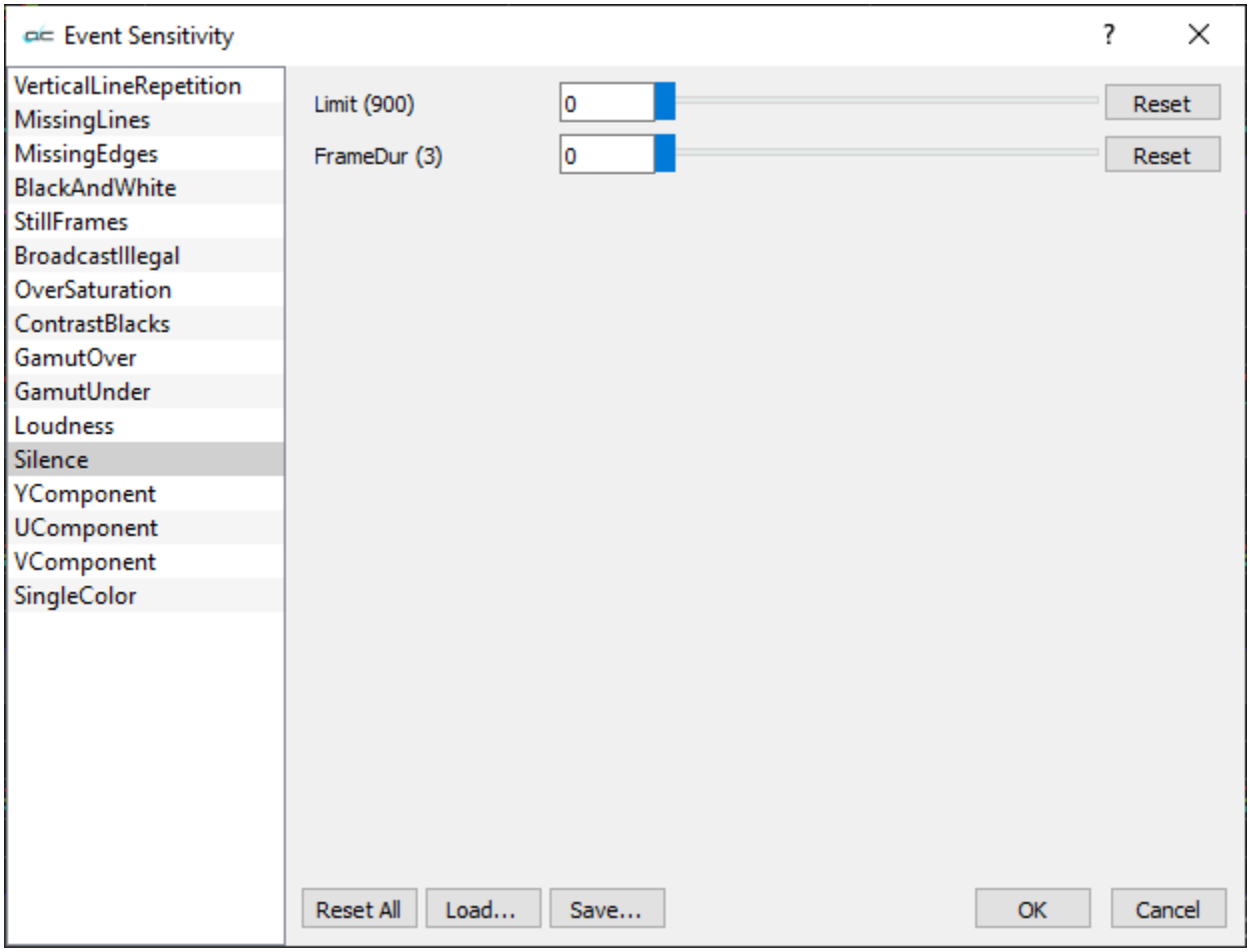
The following controls are available along the top of the Analysis window:

Type of Analysis – confirm **single** is selected and press the **Start** button to begin the analysis. The Full Reference analysis is set up through the **compare** option in the main menu.

Sensitivity Window



Sensitivity button – opens the Event sensitivity window, which displays current settings and allows the user to edit these values.



Event Sensitivity window – provides the following adjustable parameters:

Vertical Line Repetition – adjust number of lines and frame duration
Missing Lines – adjust number of lines and frame duration
Missing Edges – adjust the Top, Top Max, Top Frame Duration, Bottom, Bottom Max, Bottom Frame Duration, Left, Left Max, Left Frame Duration, Right, Right Max, Right Frame Duration
Black and White – adjust the Chroma Max and Frame Duration
Still Frames – adjust the Limit, Diff Max, PSNR Check Y, Frame Duration
Broadcast Illegal – adjust the Broadcast Illegal and Frame Duration
Over Saturation – adjust the Maximum and Frame Duration
Contrast Blacks – adjust the Minimum and Frame Duration
Gamut Over – adjust the Maximum and Frame Duration
Gamut Under – adjust the Maximum and Frame Duration
Loudness – adjust the LKFS (Loudness, K-weighted, relative to full scale)
Silence – adjust the Limit and Frame Duration
Y Component – adjust the Maximum, Maximum Frame Duration, Minimum, and Minimum Frame Duration
U Component – adjust the Maximum, Maximum Frame Duration, Minimum, and Minimum Frame Duration

V Component – adjust the Maximum, Maximum Frame Duration, Minimum, and Minimum Frame Duration

Single Color – adjust the Black Frame max/dur, White Frame min/dur, Single Color Range, Dingle Color Frame dur

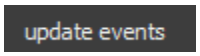
Reset All – return the settings to their defaults

Load – opens a browser, which allows the user to select a saved Sensitivity settings file

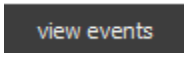
Save – opens a Save As window, which allows the user to Save the current Sensitivity settings to a file for later retrieval.

OK – Save any changes and close the Sensitivity window

Cancel – close the Sensitivity window without making any changes.



Update Events button – refresh the Events window



View Events button – opens the Events window. This window displays information about any parameters that merit a notice, and its location on the timeline.

events

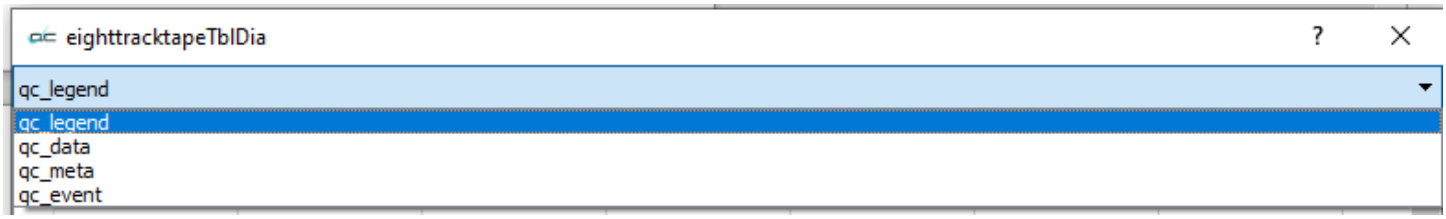
Export	Event	Start TC	TC String	Start	End	I Value	F Value	Severity	Type	Location	Details
☑	Silence	8	00:00:00;08	8	11	678	0	3	2		
☑	Silence	46	00:00:01;16	46	49	840	0	3	2		
☑	Silence	96	00:00:03;06	96	107	786	0	3	2		
☑	Silence	217	00:00:07;07	217	221	288	0	3	2		
☑	Silence	226	00:00:07;16	226	235	824	0	3	2		
☑	Silence	244	00:00:08;04	244	247	646	0	3	2		
☑	LeftMissing	315	00:00:10;15	315	316	16	0	3	1		
☑	Silence	310	00:00:10;10	310	319	686	0	3	2		
☑	Silence	323	00:00:10;23	323	327	814	0	3	2		
☑	Silence	340	00:00:11;10	340	343	208	0	3	2		
☑	Silence	363	00:00:12;03	363	369	836	0	3	2		
☑	Silence	386	00:00:12;26	386	390	428	0	3	2		
☑	Silence	402	00:00:13;12	402	410	838	0	3	2		
☑	Silence	413	00:00:13;23	413	419	898	0	3	2		
☑	Silence	450	00:00:15;00	450	459	846	0	3	2		
☑	Silence	476	00:00:15;26	476	481	742	0	3	2		
☑	Silence	524	00:00:17;14	524	528	554	0	3	2		
☑	Silence	531	00:00:17;21	531	534	736	0	3	2		
☑	Silence	535	00:00:17;25	535	541	812	0	3	2		
☑	Silence	556	00:00:18;16	556	563	638	0	3	2		
☑	Silence	564	00:00:18;24	564	574	554	0	3	2		
☑	Silence	597	00:00:19;27	597	607	782	0	3	2		
☑	Silence	611	00:00:20;11	611	615	136	0	3	2		
☑	Silence	696	00:00:23;06	696	701	834	0	3	2		
☑	Silence	703	00:00:23;13	703	708	606	0	3	2		
☑	Silence	814	00:00:27;04	814	818	660	0	3	2		
☑	Silence	843	00:00:28;03	843	851	740	0	3	2		
☑	Silence	961	00:00:32;01	961	965	248	0	3	2		
☑	Silence	1038	00:00:34;18	1038	1045	700	0	3	2		
☑	Silence	1049	00:00:34;29	1049	1074	868	0	3	2		
☑	Silence	1121	00:00:37;11	1121	1124	892	0	3	2		

Events are noted each time a parameter falls outside of its acceptable values. The Starting time code of the event is noted, by frame number.

View Data option – opens the View Data window.

This window details all the parameters measured by the Analysis process, and displays the values in an easy to read window.

For viewing data, the analyses are divided into four areas: **Legend**, **Data**, **Meta**, and **Event**. These are accessed using the pulldown menu at the top of the **View Data** window.



QC Legend Parameters

eighttracktapeTblDia

qc_legend

	id	name	type	min	max	minlegal	maxlegal	center	displayrule
2	1	VideoType	int	0	340377	0	340377		0
3	2	YMax	double	0	1	0	1		0
4	3	YHigh	double	0	1	0	1		0
5	4	YAverage	double	0	1	0	1		0
6	5	YLow	double	0	1	0	1		0
7	6	YMin	double	0	1	0	1		0
8	7	YGamutOver	double	0	1	0	1		0
9	8	YGamutUnder	double	0	1	0	1		0
10	9	SatMax	double	0	1	0	1		0
11	10	SatHigh	double	0	1	0	1		0
12	11	SatAverage	double	0	1	0	1		0
13	12	SatLow	double	0	1	0	1		0
14	13	SatMin	double	0	1	0	1		0
15	14	UMax	double	0	1	0	1		0
16	15	UHigh	double	0	1	0	1		0
17	16	UAverage	double	0	1	0	1		0
18	17	ULow	double	0	1	0	1		0
19	18	UMin	double	0	1	0	1		0
20	19	UGamutOver	double	0	1	0	1		0

Each legend parameter is displayed in its own row. For every measurement, the entry is provided with the following:

ID – an under the hood ID number associated with the name
Name – a plain text description of the parameter being measured
Type – a description of the type of measurement being used
Minimum – the minimum value, or zero if none
Maximum – the maximum value, or one if none
Minimum Legal – the minimum legal value, or zero if none
Maximum Legal – the maximum legal value, or 1 if none
Center – nominal value where applicable
Display Rule – whether to display the parameter

QC Data Parameters

eighttracktapeTblDia

qc_data

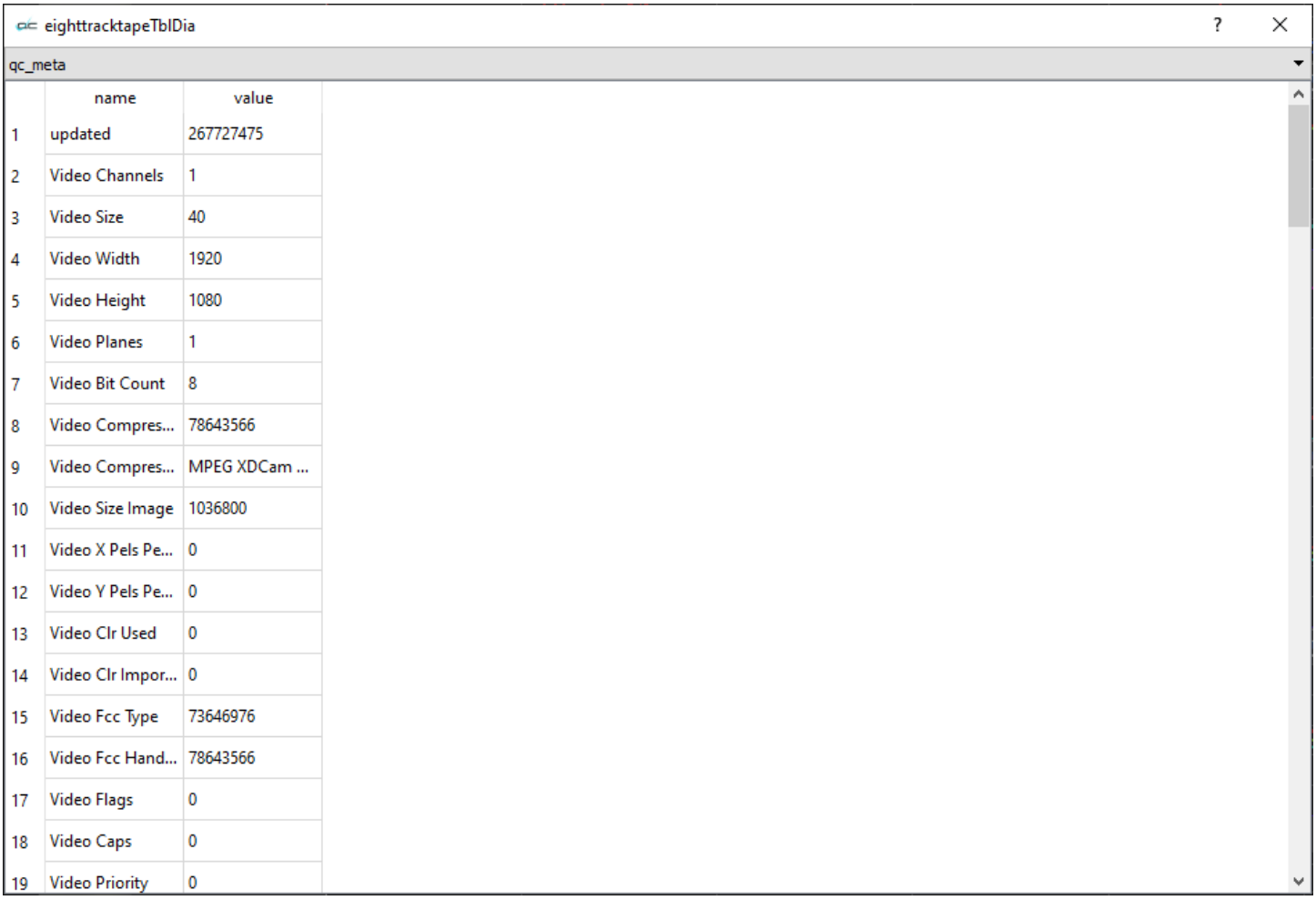
	id	VideoSize	VideoType	YMax	YHigh	YAverage	YLow	YMin	YGamutOver
2	1	33280	21273	0.835294	0	0.825557	0	0.164706	0
3	2	33792	21273	0.827451	0	0.8255	0	0.164706	0
4	3	165376	42546	0.827451	0	0.825384	0	0.164706	0
5	4	161792	21273	0.827451	0	0.825593	0	0.164706	0
6	5	152064	21273	0.827451	0	0.825367	0	0.168627	0
7	6	239104	42546	0.827451	0	0.825546	0	0.14902	0
8	7	195072	21273	0.827451	0	0.825425	0	0.156863	0
9	8	185856	21273	0.831373	0	0.825405	0	0.160784	0
10	9	250368	42546	0.827451	0	0.825521	0	0.137255	0
11	10	165376	21273	0.831373	0	0.82559	0	0.152941	0
12	11	195072	21273	0.831373	0	0.825311	0	0.152941	0
13	12	277504	42546	0.827451	0	0.825568	0	0.152941	0
14	13	200704	21273	0.827451	0	0.825485	0	0.156863	0
15	14	191488	21273	0.827451	0	0.825378	0	0.141176	0
16	15	246784	63819	0.827451	0	0.825723	0	0.137255	0
17	16	182784	21273	0.827451	0	0.825623	0	0.145098	0
18	17	174080	21273	0.827451	0	0.82572	0	0.164706	0
19	18	191488	42546	0.827451	0	0.825746	0	0.152941	0

Each data parameter is displayed in its own row. For each per-frame measurement, an entry is provided for the followings:

ID
Video Size
Video Type
Y Maximum
Y High
Y Average
Y Low
Y Minimum
Y Gamut Over
Y Gamut Under
Saturation Maximum
Saturation High
Saturation Average
Saturation Low
Saturation Minimum
U Maximum
U High
U Average
U Low
U Minimum
U Gamut Over
U Gamut Under

V Maximum
V High
V Average
V Low
V Minimum
V Gamut Over
V Gamut Under
Vertical Line Repitition
Broadcast Illegal
Top Missing
Left Missing
Bottom Missing
Right Missing
Loudness Ch0
RMS Ch0
RMS Ch1
RMS Ch2
RMS Ch3
RMS Ch4
RMS Ch5
RMS Ch6
RMS Ch7
Peak Ch0
Peak Ch1
Peak Ch2
Peak Ch3
Peak Ch4
Peak Ch5
Peak Ch6
Peak Ch7
Still Frame

QC Meta Parameters



	name	value
1	updated	267727475
2	Video Channels	1
3	Video Size	40
4	Video Width	1920
5	Video Height	1080
6	Video Planes	1
7	Video Bit Count	8
8	Video Compres...	78643566
9	Video Compres...	MPEG XDCam ...
10	Video Size Image	1036800
11	Video X Pels Pe...	0
12	Video Y Pels Pe...	0
13	Video Clr Used	0
14	Video Clr Impor...	0
15	Video Fcc Type	73646976
16	Video Fcc Hand...	78643566
17	Video Flags	0
18	Video Caps	0
19	Video Priority	0

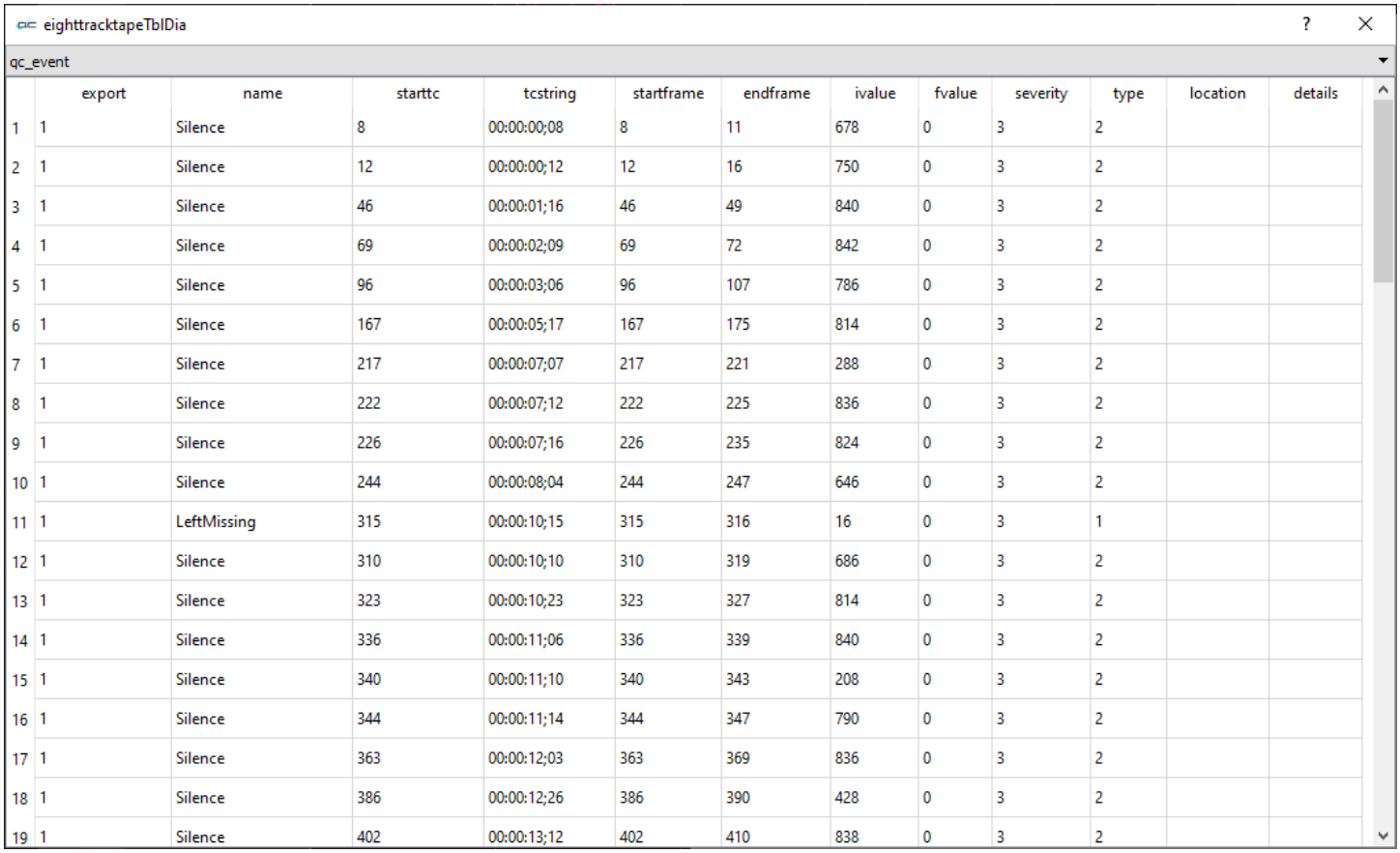
Each meta parameter is displayed in its own row. For each metadata element, an entry is provided for the following:

Updated
Video Channels
Video Size
Video Width
Video Height
Video Planes
Video Bit Count
Video Compression
Video Compression String
Video Size Image
Video X Pels Per Meter
Video Y Pels Per Meter
Video Clr Used
Video Clr Important
Video Fcc Type
Video Fcc Handler
Video Flags
Video Caps
Video Priority
Video Language
Video Scale
Video Frame Rate

Video Rate
Video Start
Video Length
Video Color Range
Video Color Primaries
Video Color Primaries String
Video Transfer Function
Video Transfer Function String
Video Conversion Matrix
Video Conversion Matrix String
Video IP Distance
Video Suggested Buffer Size
Video Quality
Video Data Rate
Video GOP Length
Video Profile
Video Level
Video Name
Video File Type
Video File Type String
Video Scan
Video Scan String
Audio Channels
Audio Format Tag
Audio Samples Per Sec
Audio Average Bytes Per Sec
Audio Block Align
Audio Bits Per Sample
Audio Size
Audio Fcc Type
Audio Fcc Handler
Audio Flags
Audio Caps
Audio Priority
Audio Language
Audio Scale
Audio Rate
Audio Start
Audio Length
Audio Initial Frames
Audio Suggested Buffer Size
Audio Quality
Audio Sample Size
Audio Edit Count
Audio Format Change Count
Audio Name
Audio Dr Flags
Audio File Type
System Micro Sec Per Frame
System Max Bytes Per Sec
System Padding Granularity
System Flags
System Total Frames
System Initial Frames
System Streams
System Suggested Buffer Size
System Width
System Height

System Caps
System Scale
System Rate
System Length
System Edit Count
System File Type String
System Type
System Mf Caps
System Vid Standard
System Dr Flags
System File Type Integer
Meta File Name
Meta Native Locator
Meta Universal Name
Meta Full Name
Meta Version String
Meta Time Code
Meta User Bits
Meta VITC Time Code
Meta VITC User Bits
Meta Poster Frame
Meta A Frame
Meta Aspect Ratio
Meta File Size
Meta Time Code Type
Meta LTC Time Code Type
Meta VITC Time Code Type
Audio Channel Groups
Count

QC Event Parameters



eighttracktapeTblDia

qc_event

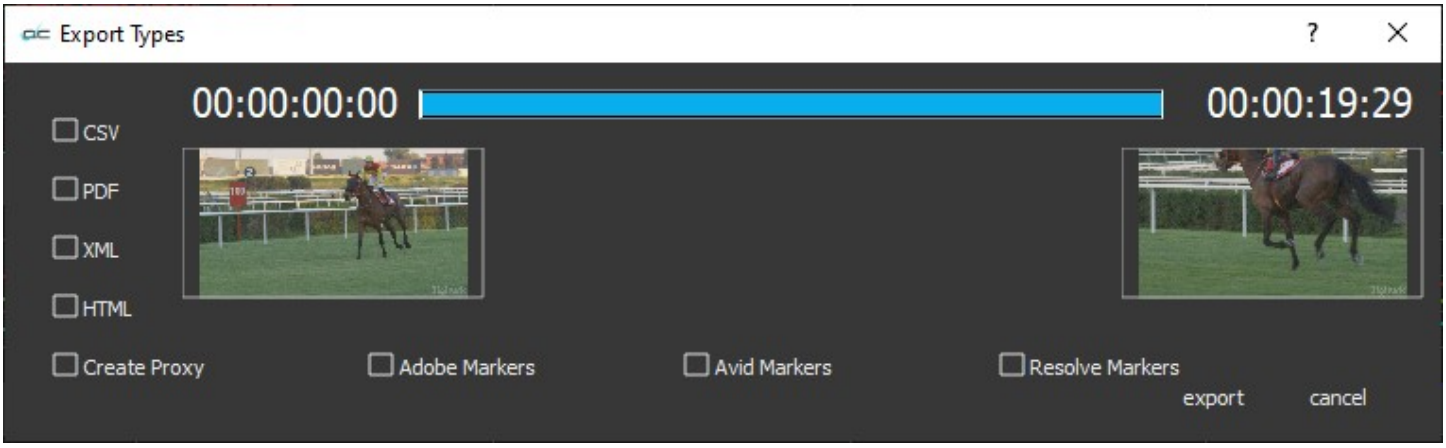
	export	name	starttc	tcstring	startframe	endframe	ivalue	fvalue	severity	type	location	details
1	1	Silence	8	00:00:00;08	8	11	678	0	3	2		
2	1	Silence	12	00:00:00;12	12	16	750	0	3	2		
3	1	Silence	46	00:00:01;16	46	49	840	0	3	2		
4	1	Silence	69	00:00:02;09	69	72	842	0	3	2		
5	1	Silence	96	00:00:03;06	96	107	786	0	3	2		
6	1	Silence	167	00:00:05;17	167	175	814	0	3	2		
7	1	Silence	217	00:00:07;07	217	221	288	0	3	2		
8	1	Silence	222	00:00:07;12	222	225	836	0	3	2		
9	1	Silence	226	00:00:07;16	226	235	824	0	3	2		
10	1	Silence	244	00:00:08;04	244	247	646	0	3	2		
11	1	LeftMissing	315	00:00:10;15	315	316	16	0	3	1		
12	1	Silence	310	00:00:10;10	310	319	686	0	3	2		
13	1	Silence	323	00:00:10;23	323	327	814	0	3	2		
14	1	Silence	336	00:00:11;06	336	339	840	0	3	2		
15	1	Silence	340	00:00:11;10	340	343	208	0	3	2		
16	1	Silence	344	00:00:11;14	344	347	790	0	3	2		
17	1	Silence	363	00:00:12;03	363	369	836	0	3	2		
18	1	Silence	386	00:00:12;26	386	390	428	0	3	2		
19	1	Silence	402	00:00:13;12	402	410	838	0	3	2		

Each event parameter is displayed in its own row. For each time a parameter has an illegal value, an entry is provided for the following:

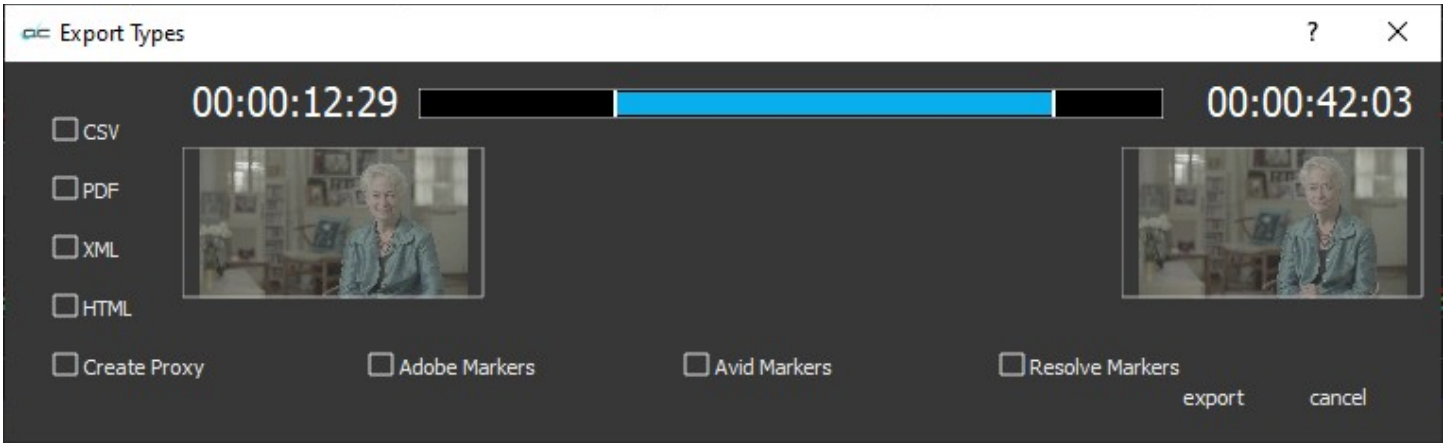
Export
Name
Start TC
TC String
Start Frame
End Frame
I Value
F Value
Severity
Type
Location
Details

Export Data

Pressing the Export Data control opens the Export Types window.



Across the top of the Export Types window, there is a position slider with the In and Out points of the frame displayed. The In and Out points can be edited to produce a report for only a section of the file.



Reports and Markers

CSV – produce a CSV (comma separated values) report
PDF – produce a PDF (personal document format) report
XML – produce an XML (expended markup language) report
HTML – produce an HTML (hypertext markup language) report
Create Proxy – generate a small MP4 from the file
Adobe Markers – export markers that Adobe creative software can import onto the timeline
Avid Markers – export markers that Avid creative software can import onto the timeline
Resolve Markers – export markers that Resolve creative software can import onto the timeline

Export button – export any specified reports, markers, and proxies.
Cancel button – exit the Export dialog without performing an export.

The **Connect** checkbox in the analysis window causes the lines in the graphs to be connected. Otherwise, they are just the actual data dots.

The **Auto Start** checkbox in the analysis window causes the analysis to start as soon as a file is loaded. If it is not set, then the analysis won't start until the analysis window is brought up.

The Types of File That Can Be Created in the Export

Database files generated by pressing the analysis button

filename.qc.db - Database file
filename.qc.db-shm - [temp file]
filename.qc.db-wal - [temp file]

CSV docs for MAM integration

filename.csv - CSV spreadsheet of per event analysis results
filename_frames.csv - CSV spreadsheet of per frame analysis results

PDF

filename.pdf - PDF of analysis results

XML docs for MAM integration

filename.xml - XML document of per event analysis results
filename_frames.xml - XML document of per frame analysis results

HTML

filename.html - html file (web page) of analysis results
[subfolder] css - stylesheets
[subfolder] images - images for the page
[subfolder] js - javascript file player

Create Proxy generates the following files:

filename.mp4 [Note: if the source file is an mp4, a proxy will not be created since videoQC thinks it already exists]
filename.ack - acknowledgment file
filename.mp4.ack - acknowledgment file of the proxy mp4
filename.rtin
filenameA.rtin

Adobe Markers

filename_Adobe.csv - CSV spreadsheet of Adobe markers

Avid Markers

filename_Avid - text file of Avid markers

Resolve Markers

filename_Resolve.edl - Resolve markers file

Source file

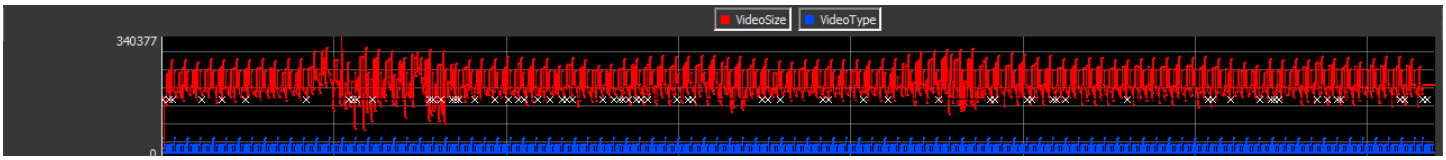
filename.mxf [If the source file is not an mp4, a proxy can be generated in the export dialog]

For every export:

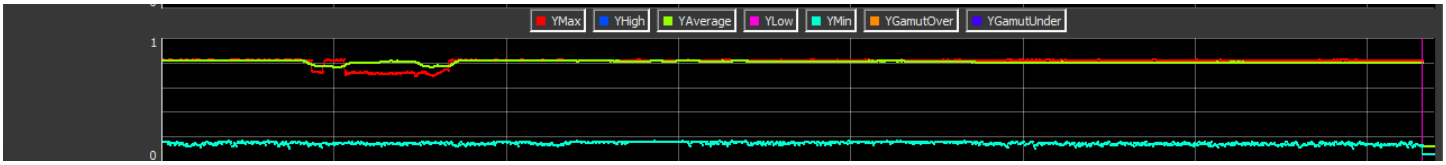
filename.ack - acknowledgment file

The Analysis window

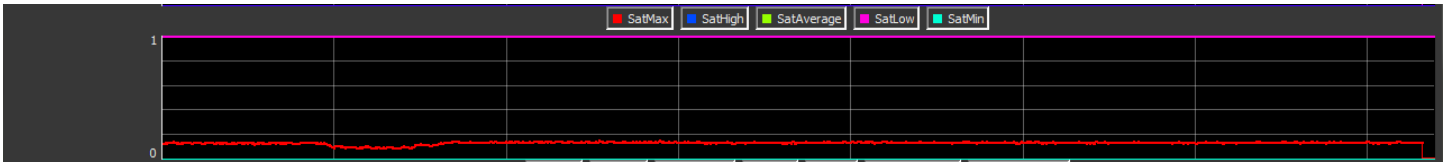
Several components of the file are displayed in the analysis window. At the top is the Video Size and Video Type details.



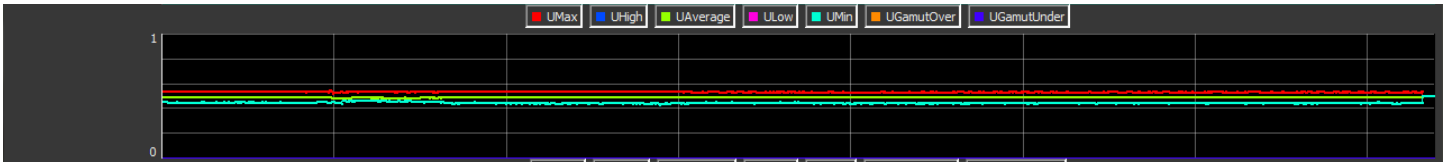
The top row details the video size and the video type. The **VideoSize** and **VideoType** buttons can be used to turn the display of each of these analyses off and on.



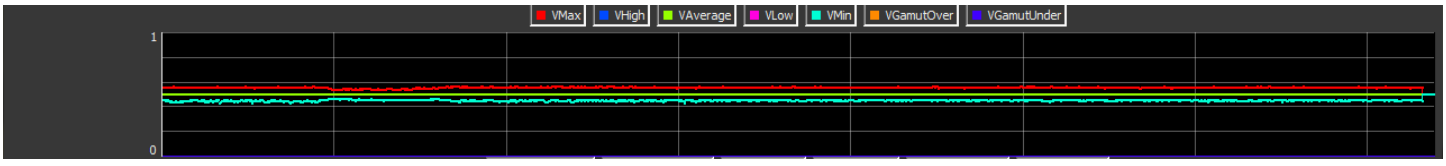
The next row shows the **Maximum**, the **High**, the **Average**, the **Low**, the **Minimum**, the **Gamut Over**, and the **Gamut Under** for the **Y** component of the video. The **YMax**, **YHigh**, **YAverage**, **YLow**, **YMin**, **YGamutOver**, and **YGamutUnder** buttons can be used to turn the display of each of these analyses off and on.



The next row details the **Maximum**, the **High**, the **Average**, the **Low** and the **Minimum** for the **Saturation** level of the video. The **SatMax**, **SatHigh**, **SatAverage**, **SatLow**, and **SatMin** buttons can be used to turn the display of each of these analyses off and on.

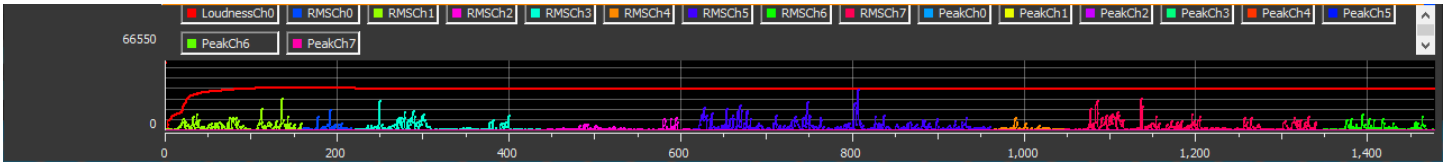


The next row details the **Maximum**, the **Minimum**, the **Average**, the **Low**, the **Minimum**, the **Gamut Over**, and the **Gamut Under** for the **U** component of the video. The **UMax**, **UHigh**, **UAverage**, **ULow**, **UMin**, **UGamutOver**, and **UGamutUnder** buttons can be used to turn the display of each of these analyses off and on.



The next row details the **Maximum**, the **High**, the **Average**, the **Low**, the **Minimum**, the **Gamut Over**, and the **Gamut Under** for the **V** component of the video. The **VMax, VHigh**, **VAverage**, **VLow**, **VMin**, **VGamutOver**, and **VGamutUnder** buttons can be used to turn the display of each of these analyses off and on.

The next row looks for **Vertical Line Repetition**, **Broadcast Illegal**, and checks for Top Missing, Left Missing, Bottom Missing, and Right Missing edge of frame issues. The **VerticalLineRep**, **BroadcastIllegal**, **TopMissing**, **LeftMissing**, **BottomMissing**, and **RightMissing** buttons can be used to turn the display of each of these analyses off and on.

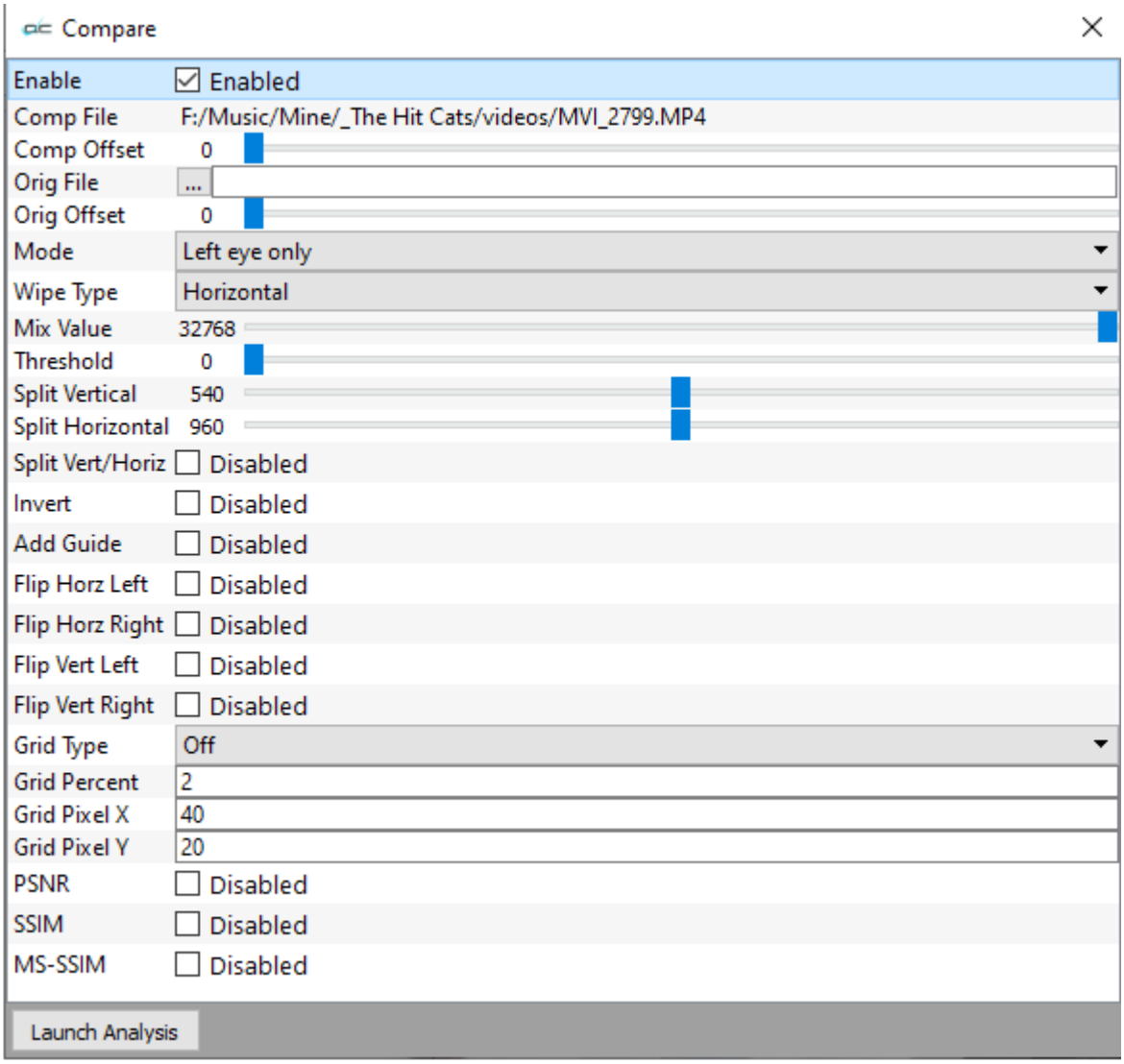


The eighth row looks at the audio in the file, and details the Loudness Left, Loudness Right, RMS Left, RMS Right, Peak Left, and Peak Right. The **LoudnessLeft, LoudnessRight**, **RMSLeft**, **RMSRight**, **PeakLeft**, and **PeakRight** buttons can be used to turn the display of each of these analyses off and on.

Along the bottom there are markers for frame locations.

Compare Files

Compare Files button - Opens the file compare window, which allows the user to compare a file with another file. This is useful for example in comparing a compressed file to its source file, to check the quality of the compression scheme.



- **Enable** – enable the visual compare mode, When unchecked, will display as Disabled.
- **Comp File** – the compressed file being compared
- **Comp Offset** – the frame offset into the compressed file to match the original file
- **Orig File** – the original file that the compressed file came from. The '...' brings up the file browser to select the original file. Enable must be checked to allow comparison.
- **Orig Offset** – the frame offset into the original file to match the compressed version
- **Mode** – see the Basic Compare Settings below
- **Wipe Type** – see the Wipe Settings below
- **Mix Value** – some of the compare settings (like dissolve) allow for a percentage mix value that is set by this slider
- **Threshold** – some of the compare settings (like A-B and difference) require a threshold value that is set by this slider
- **Split Vertical** – for seamless split, vertical, this sets the location of the split

- **Split Horizontal** – for seamless split, horizontal, this sets the location of the split
- **Split Vert/Horiz** – for compare modes like seamless splits and mirror, this sets the split either vertical or horizontally
- **Invert** – this inverts the compressed and original video in the compare display
- **Add Guide** – for compressed/original sets that are very close, it can be difficult to find the split between them. This setting puts a single pixel line at the split point
- **Flip Horz Left** – flip the left/compressed video horizontally
- **Flip Horz Right** – flip the right/original video horizontally
- **Flip Vert Left** – flip the left/compressed video vertically
- **Flip Vert Right** – flip the right/original video vertically
- **Grid Type** – set the grid overlay to percent, pixel of off
- **Grid Percent** – the percent size for the grid
- **Grid Pixel X** – the number of pixels horizontally between grid lines
- **Grid Pixel Y** – the number of pixels vertically between grid lines
- **PSNR** checkbox – select to enable PSNR (peak signal to noise ratio) analysis
- **SSIM** checkbox - select to enable SSIM (Structural Similarity Index Measure) analysis
- **MS-SSIM** checkbox - select to enable MS-SSIM (Multi Scale Structural Similarity Index Measure) analysis
- **Launch Analysis** button – if you have selected a PSNR, SSIM, or MS-SSIM analysis, pressing this button will begin the specified analysis.

Basic Compare Settings:

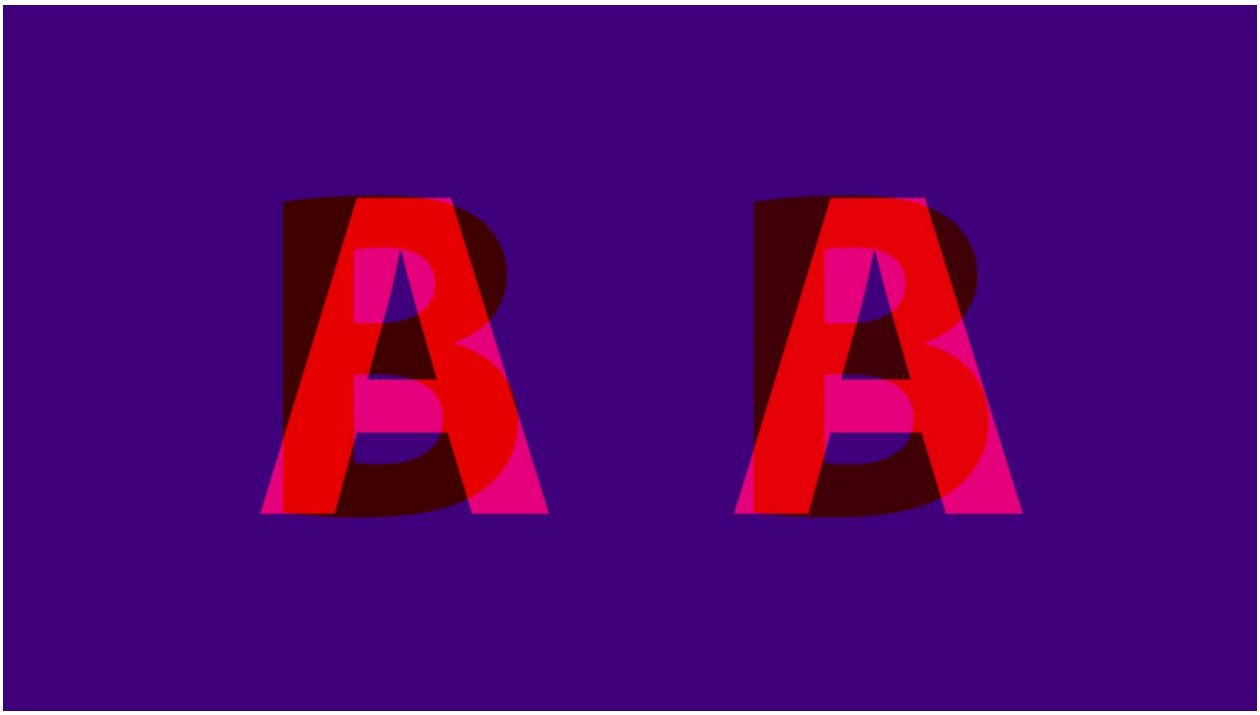
Left Eye Only:

This shows only the left, or the compressed, video signal.

Right Eye Only:

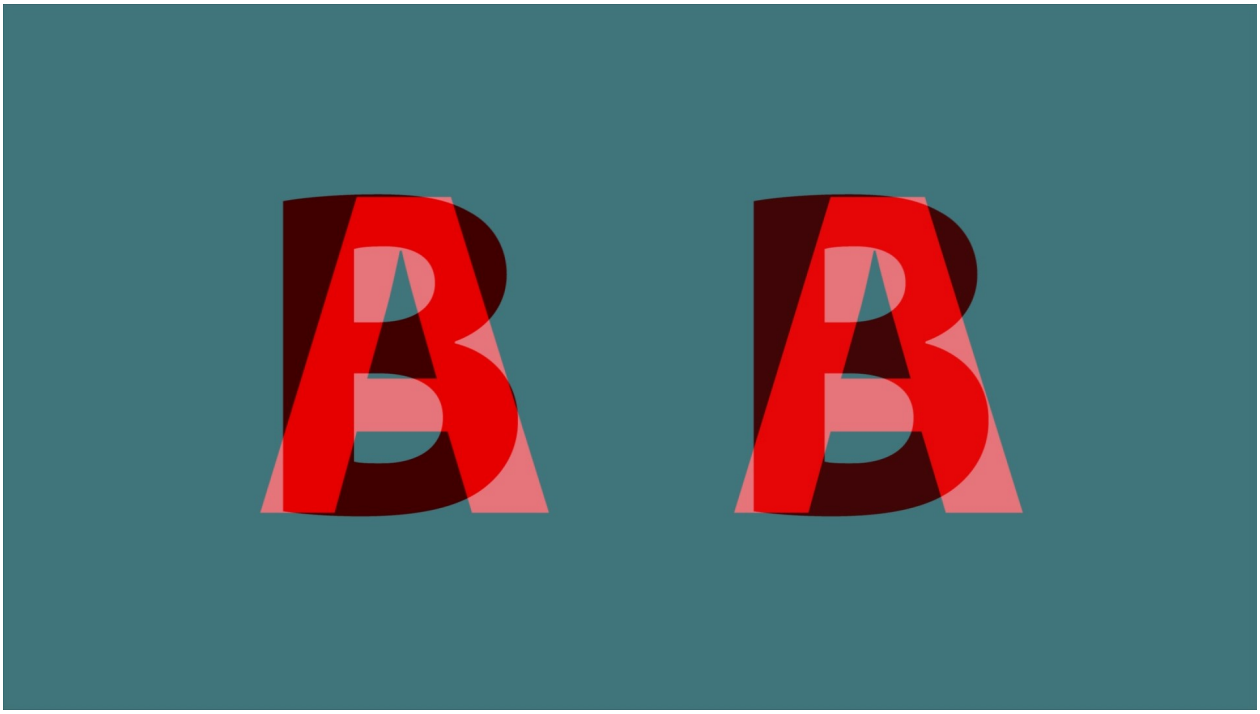
This shows only the right, or original, video signal.

Anaglyph Red-Blue:



For 3D glasses.

Anaglyph Red-Cyan:

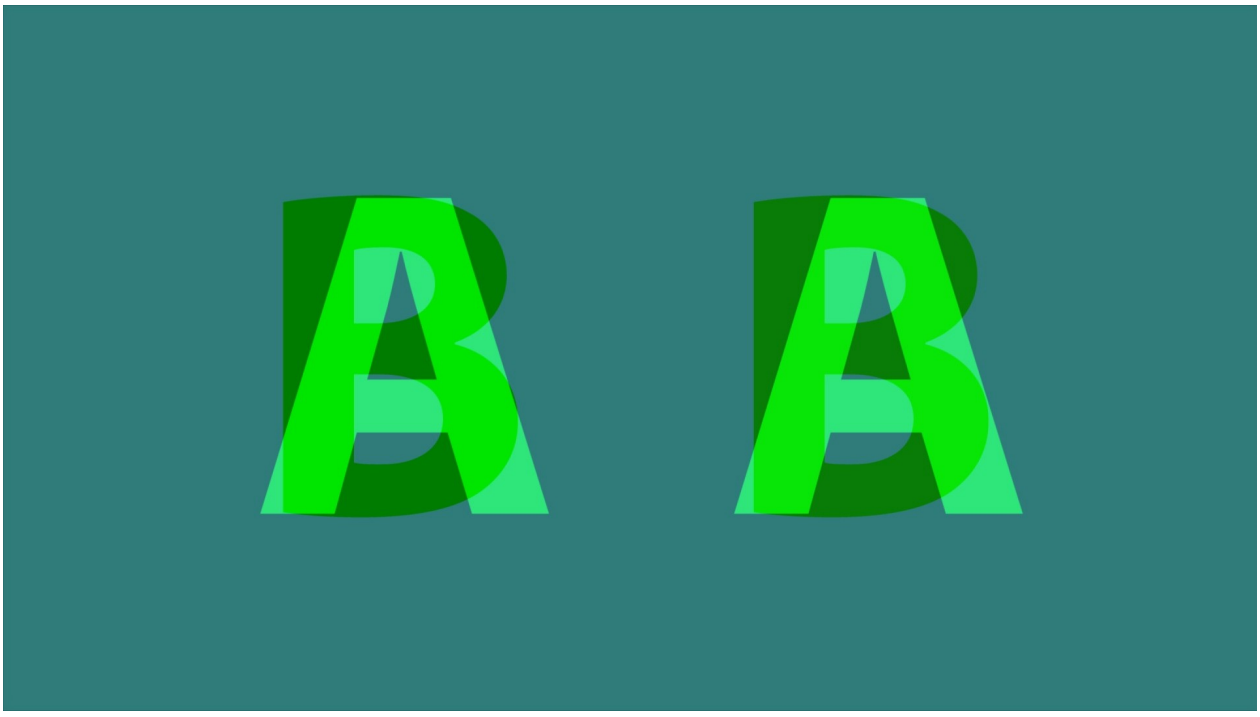


For 3D glasses.

Anaglyph Amber-Blue:

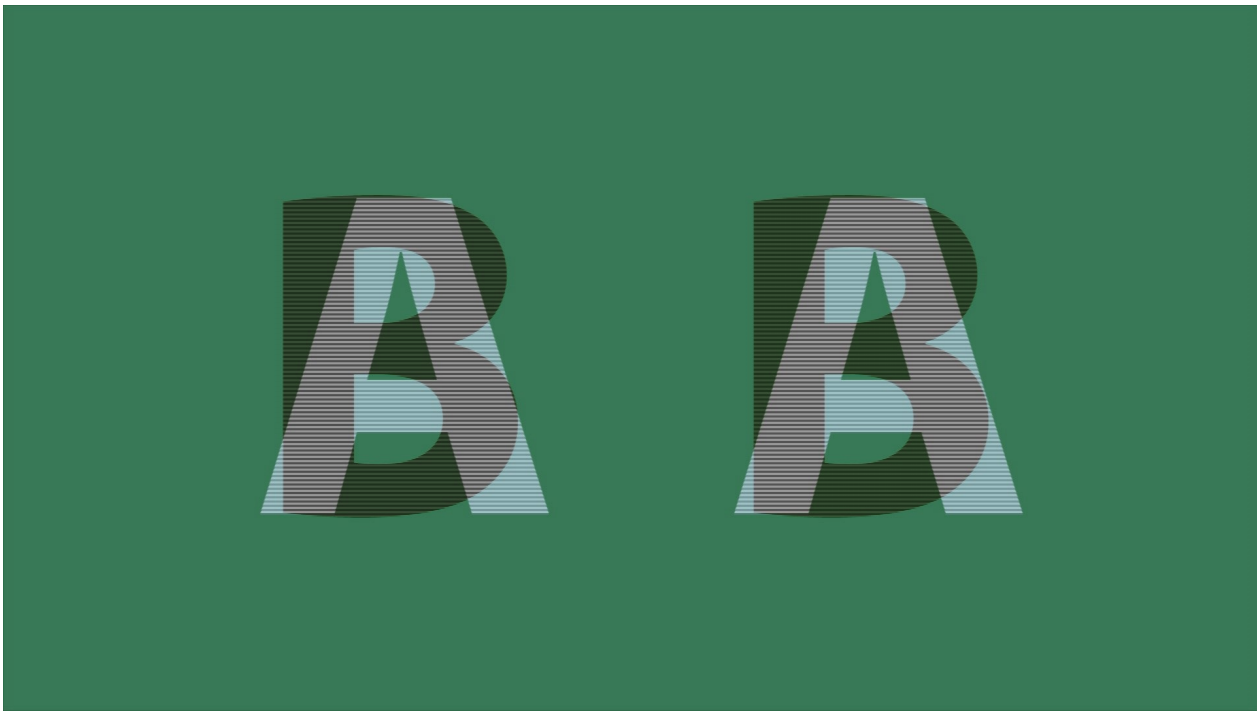
For 3D glasses.

Anaglyph Green-Magenta:



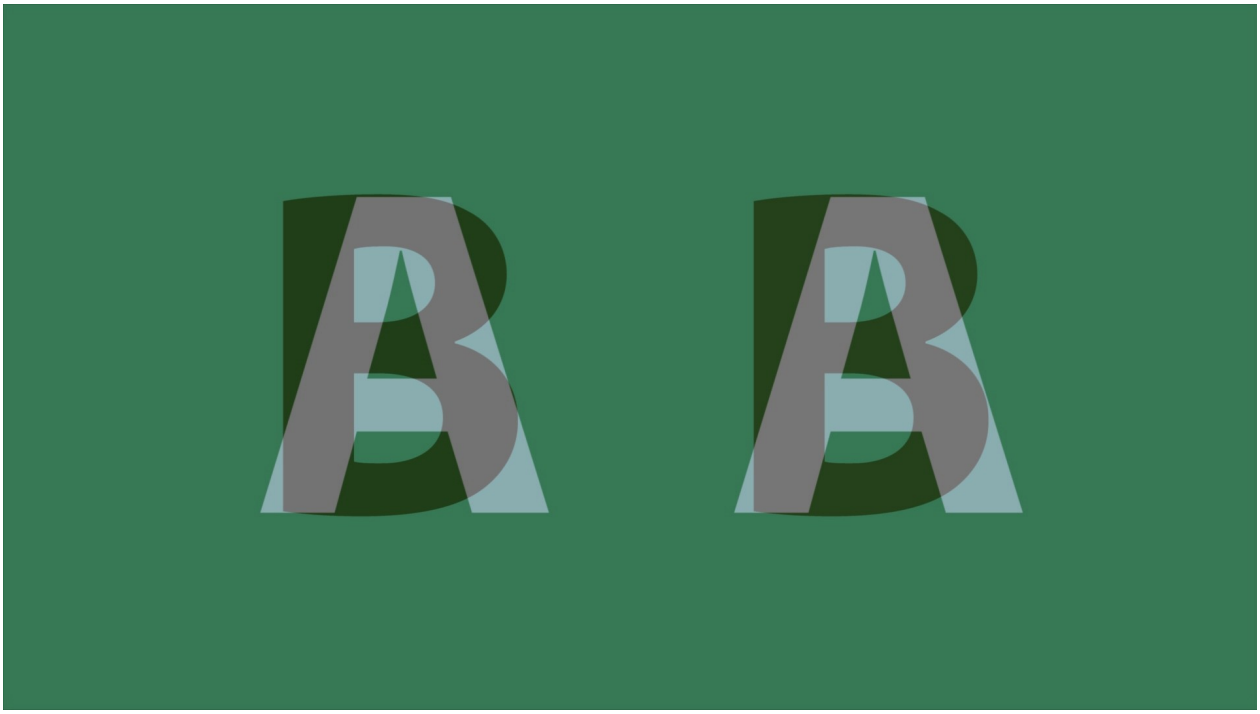
For 3D glasses.

Interlaced Eyes:



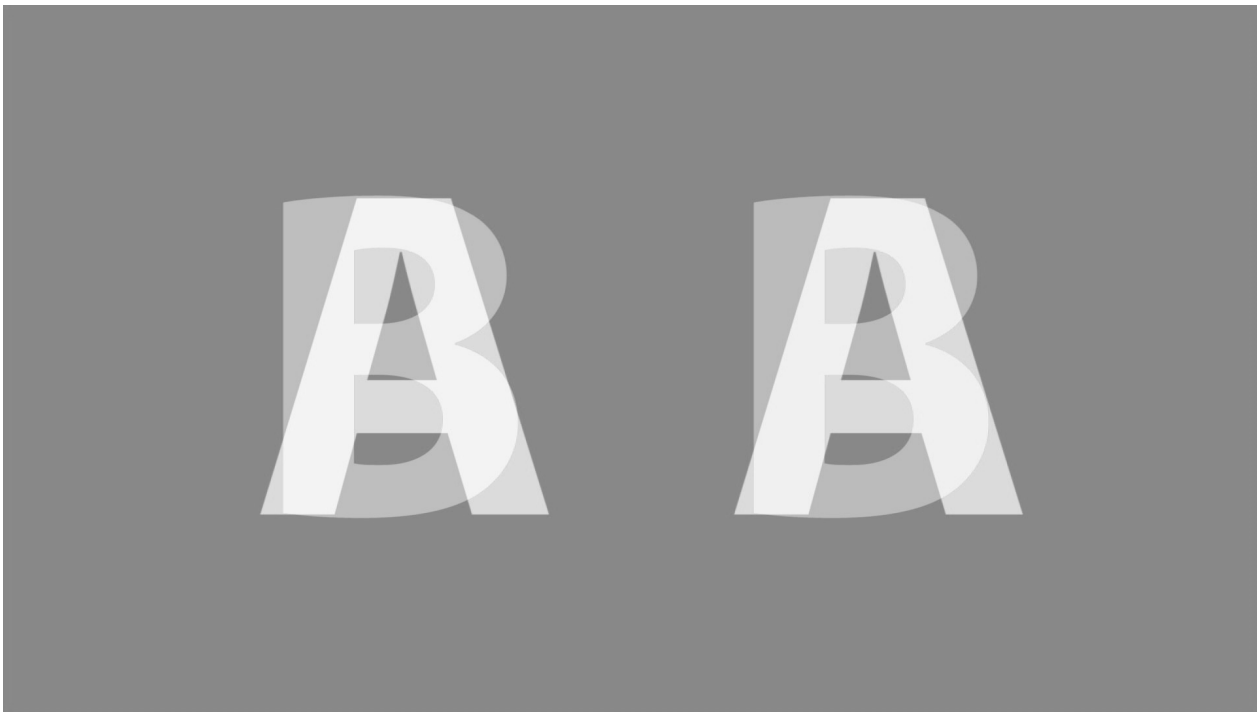
Show both signals on alternate lines, good for some 3D monitors.

Onion Skin:



Show 50% of each signal.

Difference with Threshold Multiplier:



Subtract the each pixel to show 50% gray when they are the same, and bright/dark where different. Threshold can be set by the threshold slider.

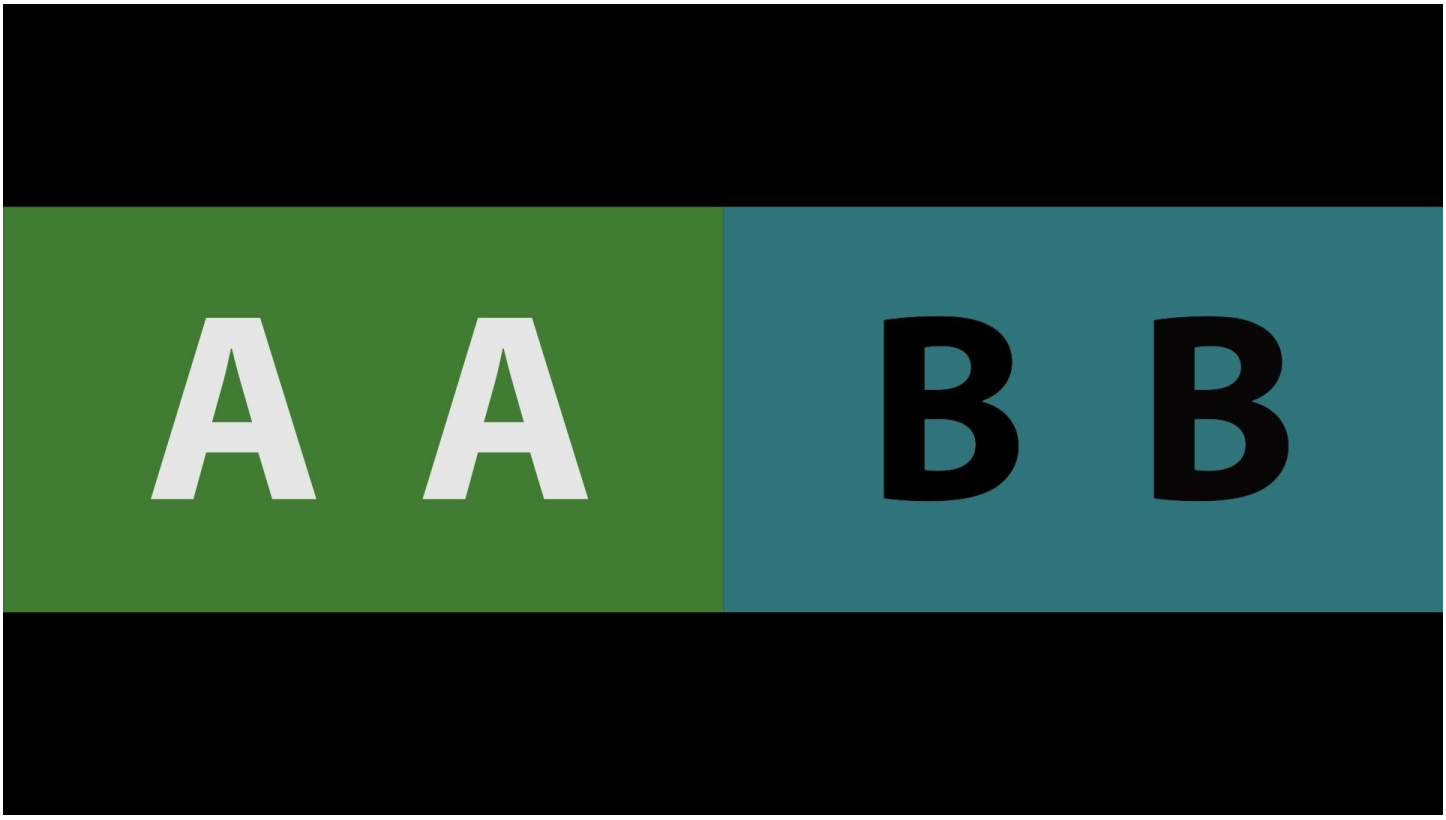
Over Under:

Show the compressed video and original scaled vertically.

Side by Side:

Show the compressed video and original scaled horizontally.

Side by Side – Full Picture:



Show both compressed and original video full image scaled to fit.

Side by Side – Same Side:

Show the same side of the compressed and original signal, movable.

Seamless Split – Vertical:

Show one half of the compressed and the other half of the original video.

Seamless Split – Horizontal:

Show one half of the compressed and the other half of the original video.

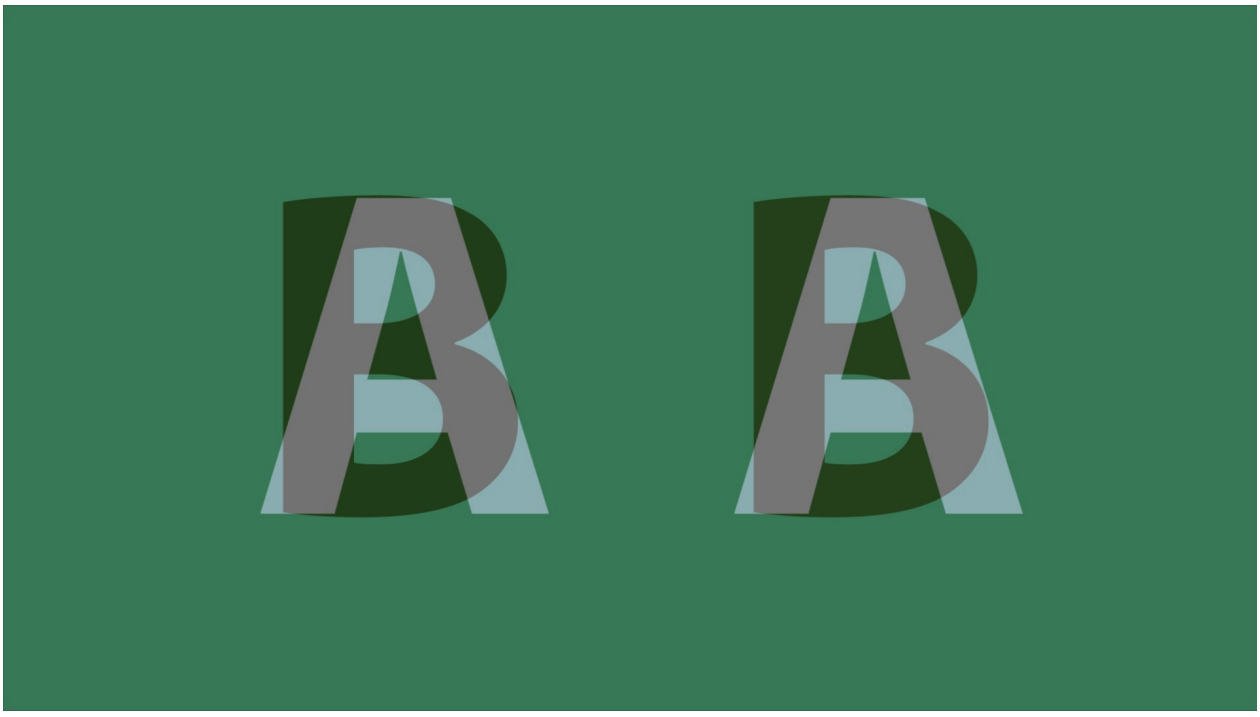
Mirror:

Mirror the compressed and original so they meet in the middle (vert or horiz)

A-B with Threshold:

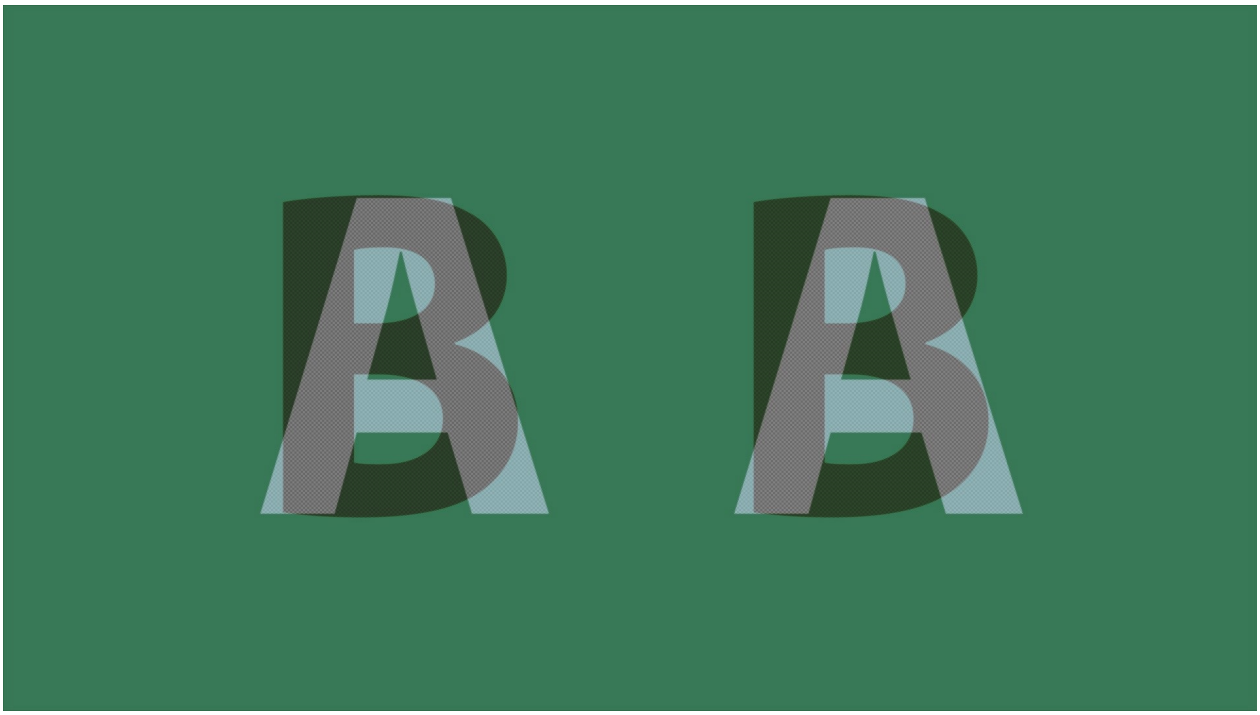
Subtract the two videos and show only the differences within a threshold.

Dissolve with Mix:



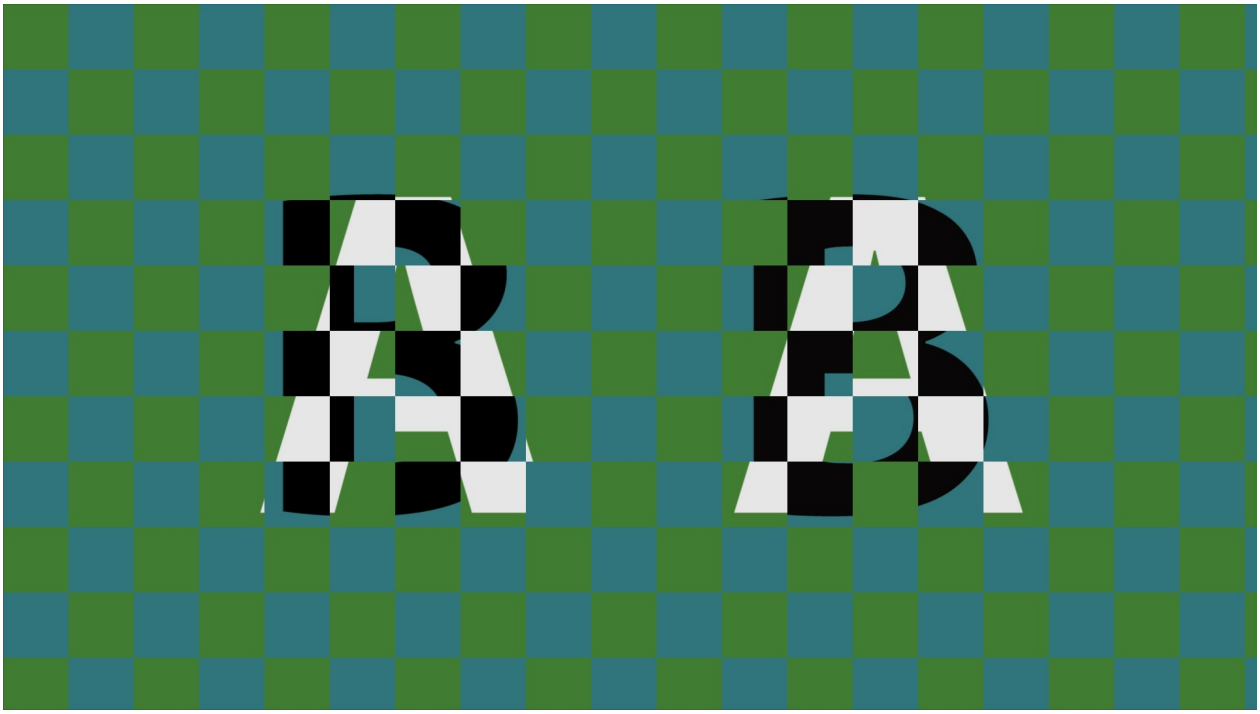
Dissolve back and forth between the compressed and original video.

Checkerboard 3D:



Show every other pixel from each video, useful for some 3D displays.

Boxes Sized by Mix:

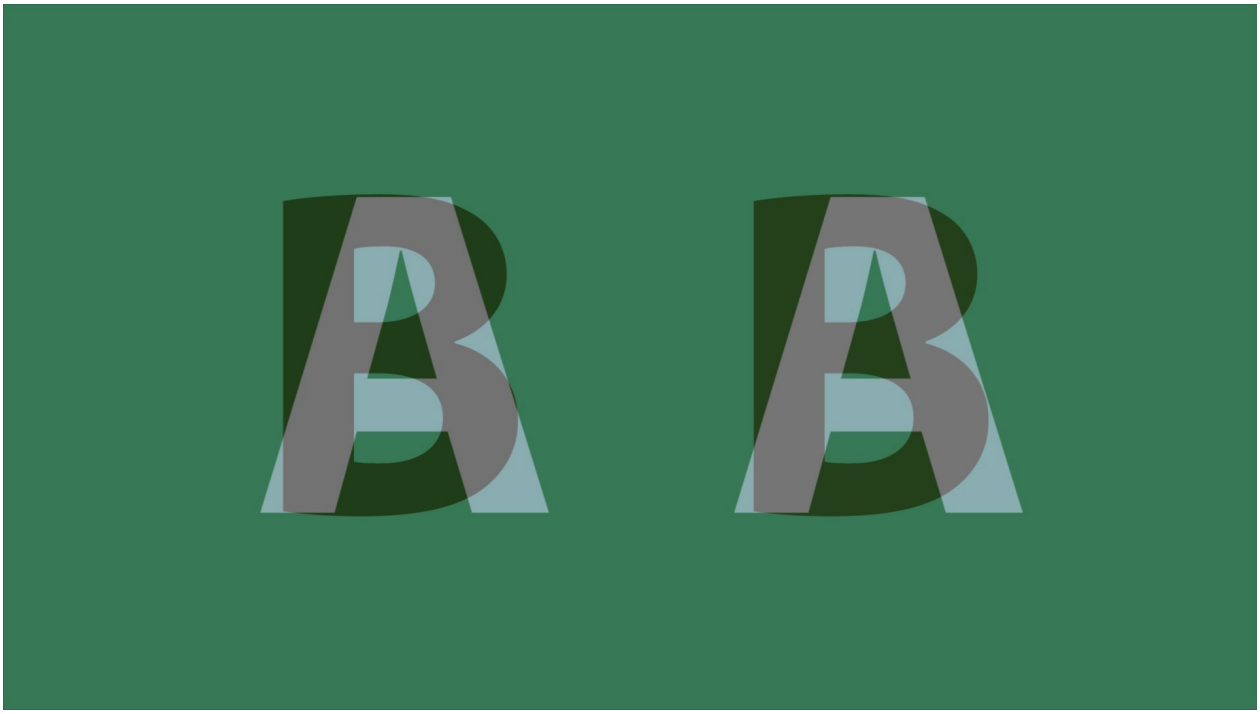


Create sizable, interleaving boxes with both videos.

Wipe with Mix Settings

The wipes provide less common ways of showing both video signals that may be useful under special circumstances.

Dissolve Wipe:



Dissolve between the two video signals depending on the mix slider.

Horizontal Wipe:

Horizontal wipe between the two video sources based on the mix slider position.

Vertical Wipe:

Vertical wipe between the two video sources based on the mix slider position.

Upper Left Wipe:

Upper left wipe between the two video sources based on the mix slider position.

Upper Right Wipe:

Upper right wipe between the two video sources based on the mix slider position.

Lower Right Wipe:

Lower right wipe between the two video sources based on the mix slider position.

Lower Left Wipe:

Lower left wipe between the two video sources based on the mix slider position.

Four Corners Wipe:

Four corners wipe between the two video sources based on the mix slider position.

Four Square Wipe:

Center square wipe between the two video sources based on the mix slider position.

Barn Doors Vertical Wipe:

Barn doors vertical wipe between the two video sources based on the mix slider position.

Barn Door Horizontal Wipe:

Barn doors horizontal wipe between the two video sources based on the mix slider position.

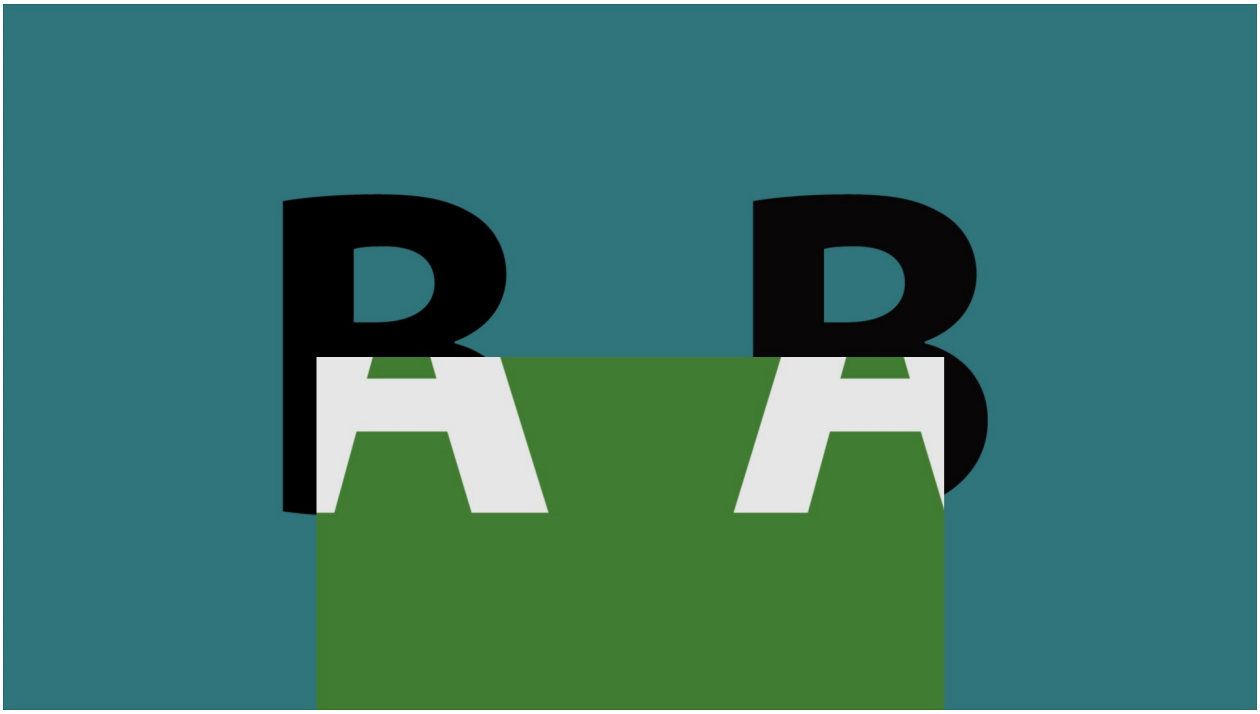
Top Center Wipe:

Top center wipe between the two video sources based on the mix slider position.

Right Center Wipe:

Right center wipe between the two video sources based on the mix slider position.

Bottom Center Wipe:

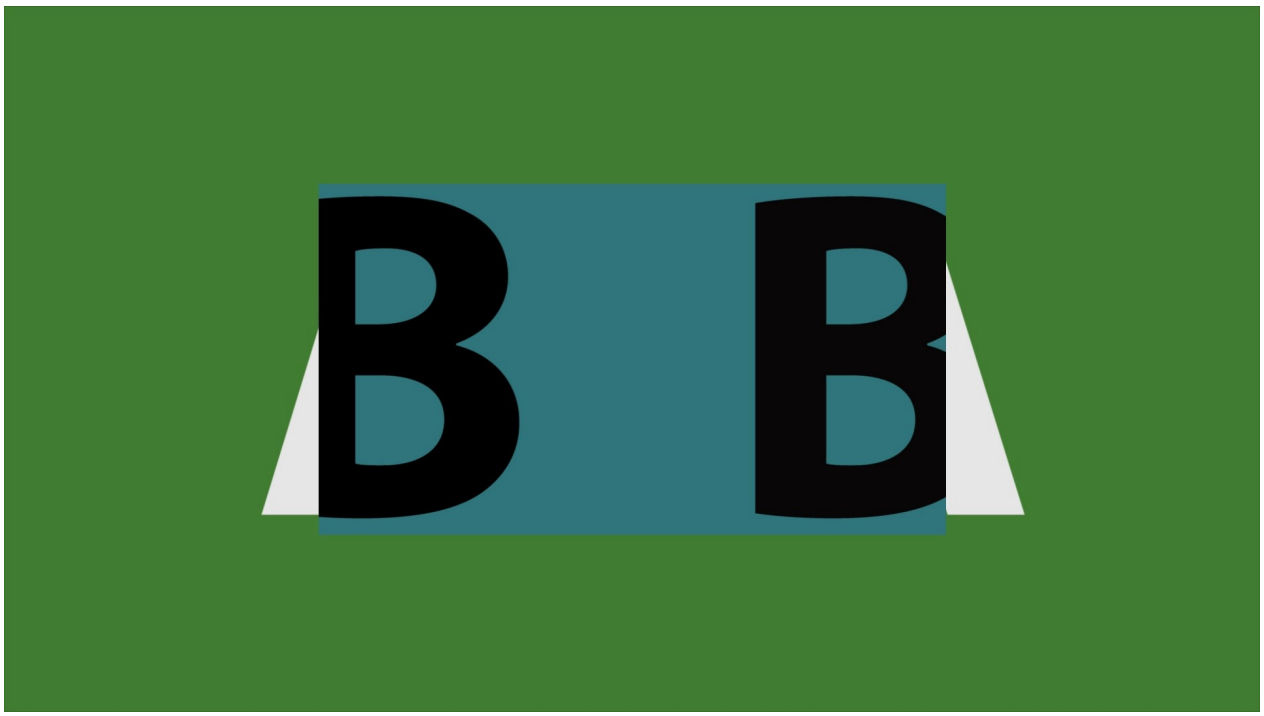


Bottom center wipe between the two video sources based on the mix slider position.

Left Center Wipe:

Left center wipe between the two video sources based on the mix slider position.

Box Wipe:



Box wipe between the two video sources based on the mix slider position.

Slide Up Wipe:

Slide up wipe between the two video sources based on the mix slider position.

Slip Left Wipe:

Slide left wipe between the two video sources based on the mix slider position.

Slide Down Wipe:

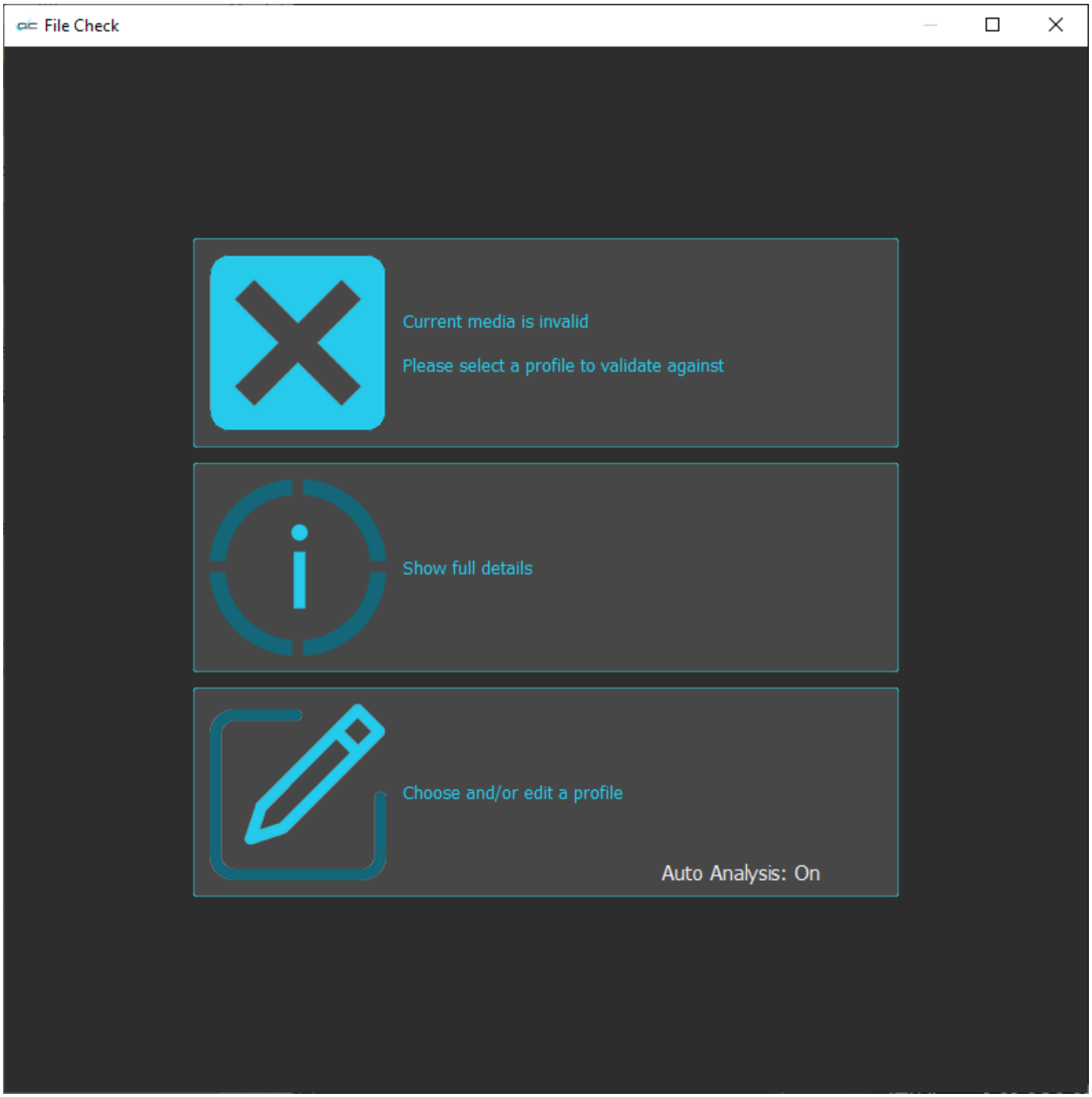
Slide down wipe between the two video sources based on the mix slider position.

Slide Right Wipe:

Slide right wipe between the two video sources based on the mix slider position.

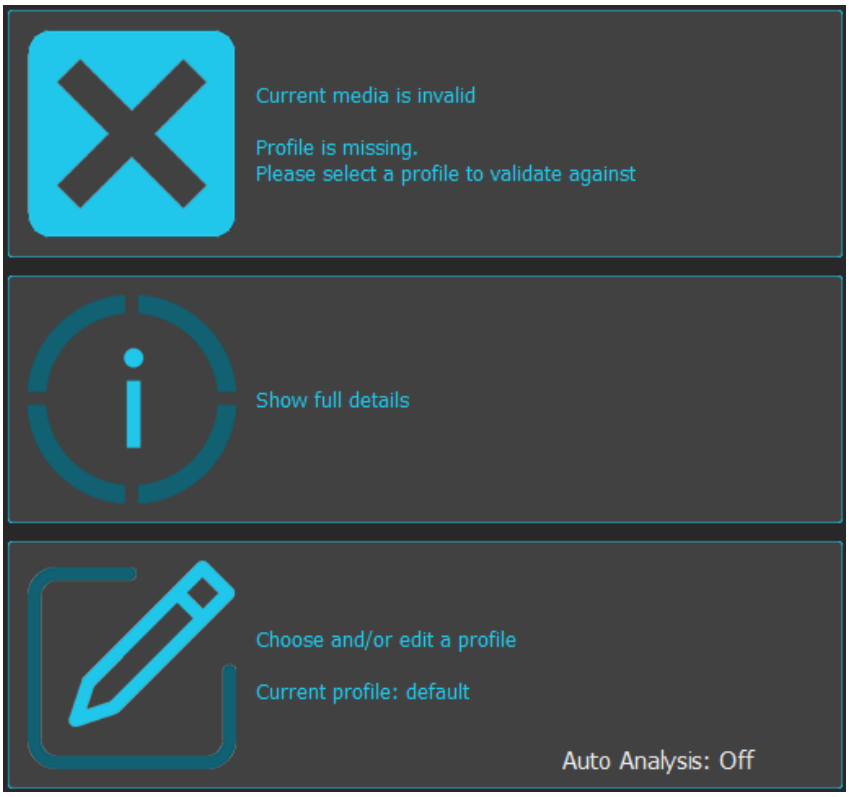
QC File Check

QC File Check button - Opens the file check window, which allows the user to load a file and compare it to a profile or to another file, with track info being highlighted when a difference is detected.



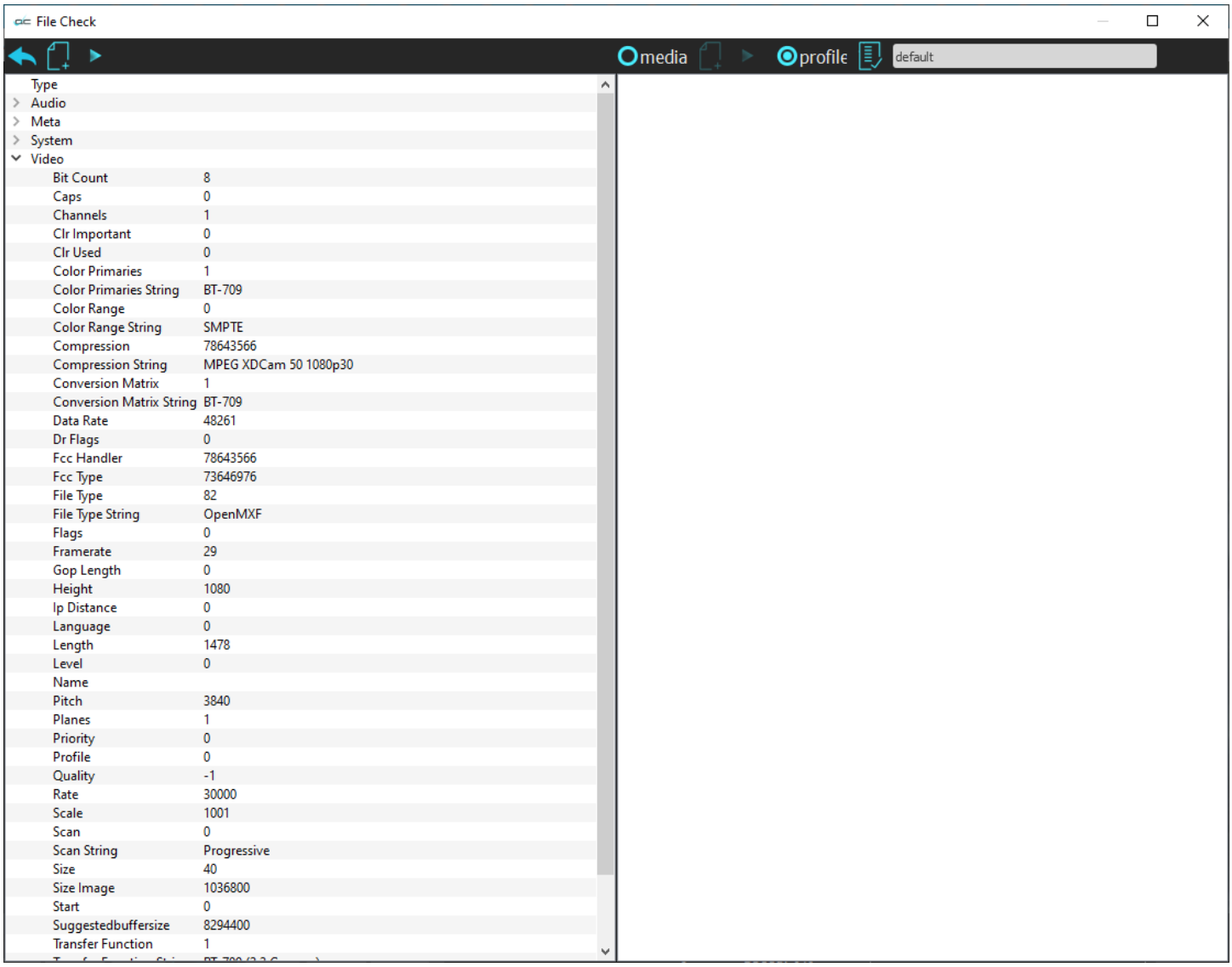
Select a Profile

Initially the top section will not have a profile to validate the media against. You will need to create a profile if you want to compare your source file against it.



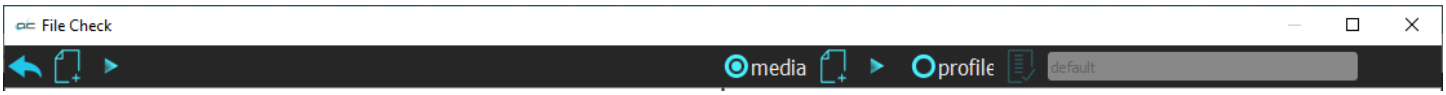
Where a profile has been set, the top section will show whether there is a match to the profile.

When there is no profile/media loaded, the details will have a blank page to compare against. Clicking the Show Details panel will open the **File Check** window.



To compare the selected file to a set of known good parameters, you can either specify a file, or set up/select a profile.

Specify Media

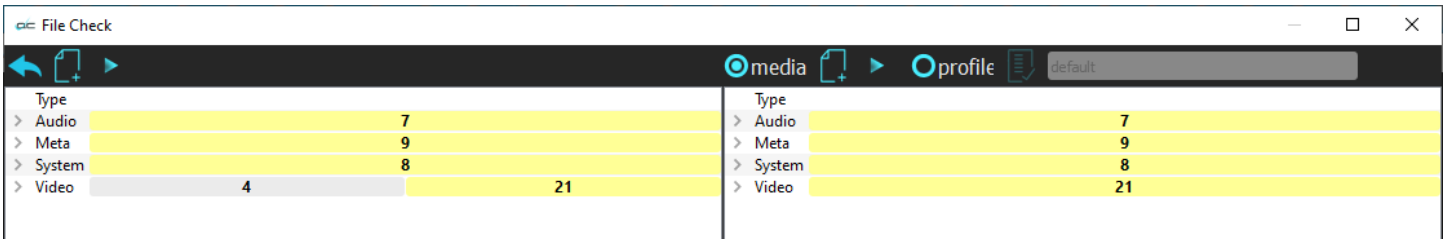


In the File Check window, confirm that Media is selected. Press the document icon to the right of the word "Media". This opens a browser so you can select a media file.

Specify Profiles

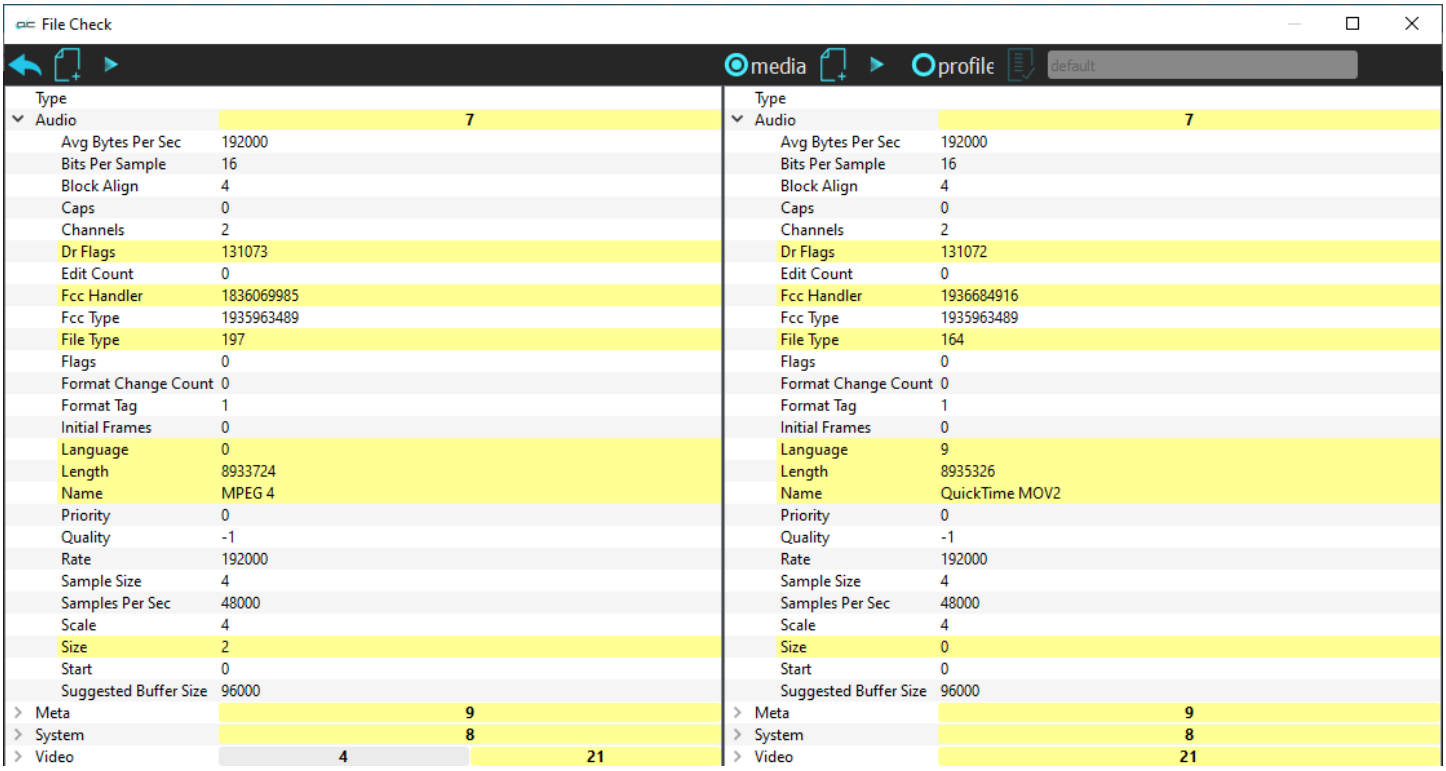
In the File Check window, confirm that Profile is selected. Press the document icon to the right of the word "Profile".

Once the user has selected either a known good file, or specified a profile, File Check will compare the parameters of the two, and highlight any differences.



The information is divided into tabs, with a tab for Audio, Metadata, System Info, and Video. In the above image, a compressed file has been compared to its source file.

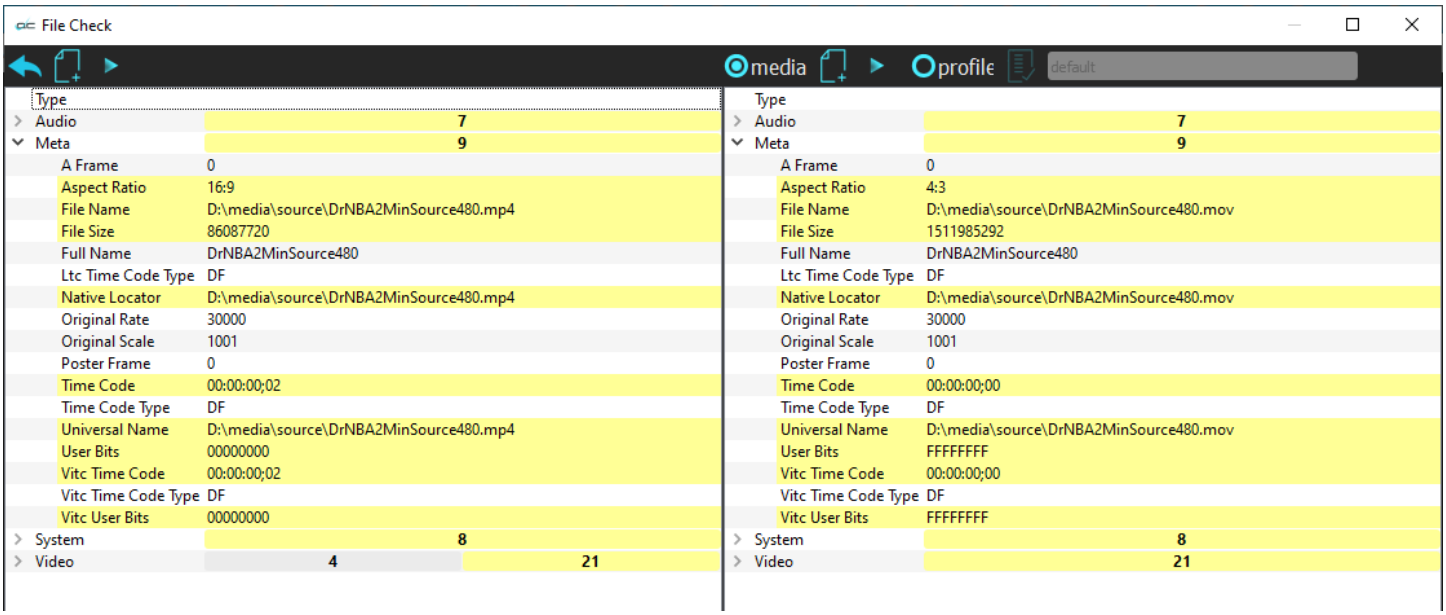
Audio Tab



Type			Type		
Audio	7		Audio	7	
Avg Bytes Per Sec	192000		Avg Bytes Per Sec	192000	
Bits Per Sample	16		Bits Per Sample	16	
Block Align	4		Block Align	4	
Caps	0		Caps	0	
Channels	2		Channels	2	
Dr Flags	131073		Dr Flags	131072	
Edit Count	0		Edit Count	0	
Fcc Handler	1836069985		Fcc Handler	1936684916	
Fcc Type	1935963489		Fcc Type	1935963489	
File Type	197		File Type	164	
Flags	0		Flags	0	
Format Change Count	0		Format Change Count	0	
Format Tag	1		Format Tag	1	
Initial Frames	0		Initial Frames	0	
Language	0		Language	9	
Length	8933724		Length	8935326	
Name	MPEG 4		Name	QuickTime MOV2	
Priority	0		Priority	0	
Quality	-1		Quality	-1	
Rate	192000		Rate	192000	
Sample Size	4		Sample Size	4	
Samples Per Sec	48000		Samples Per Sec	48000	
Scale	4		Scale	4	
Size	2		Size	0	
Start	0		Start	0	
Suggested Buffer Size	96000		Suggested Buffer Size	96000	
Meta	9		Meta	9	
System	8		System	8	
Video	4	21	Video	21	

In the above image, the audio tab is open. When collapsed, you could see there were 7 differences noted between the files. When open, you can view each parameter that is different, and what the details are.

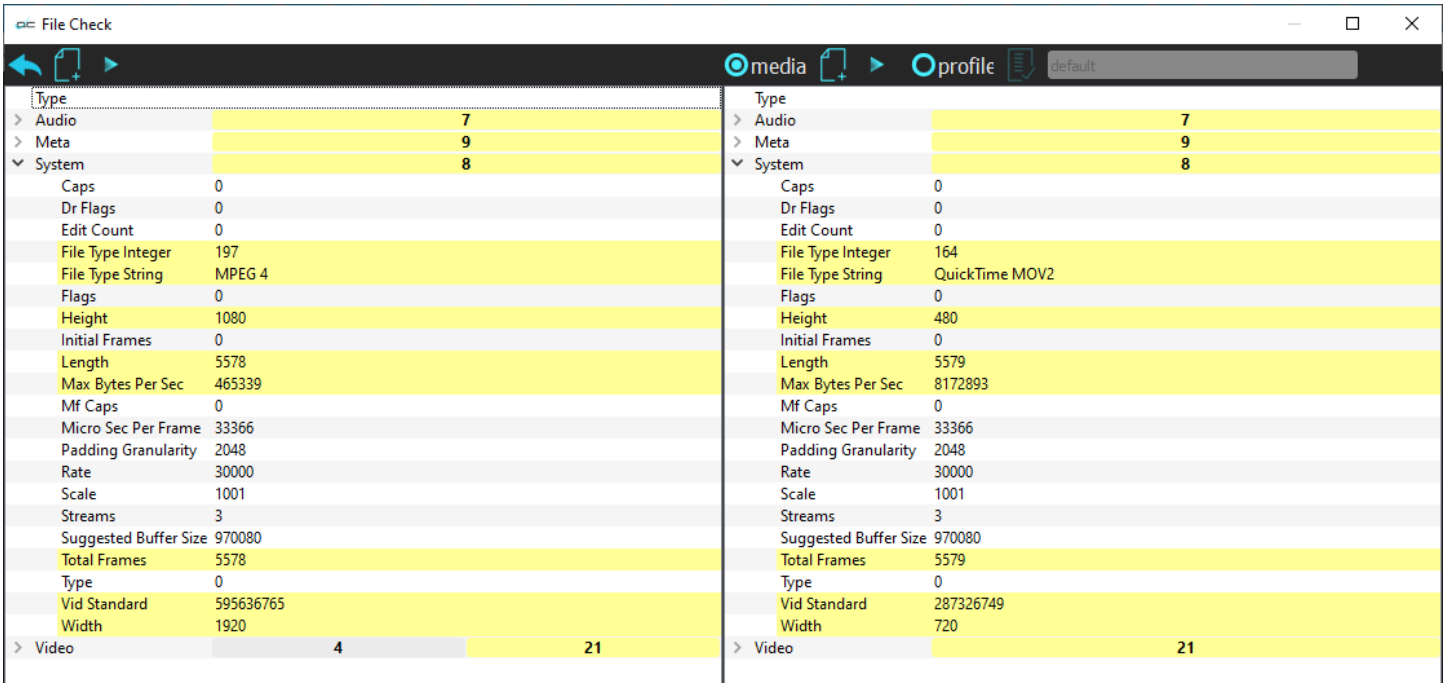
Metadata Tab



Type			Type		
Audio	7		Audio	7	
Meta	9		Meta	9	
A Frame	0		A Frame	0	
Aspect Ratio	16:9		Aspect Ratio	4:3	
File Name	D:\media\source\DrNBA2MinSource480.mp4		File Name	D:\media\source\DrNBA2MinSource480.mov	
File Size	86087720		File Size	1511985292	
Full Name	DrNBA2MinSource480		Full Name	DrNBA2MinSource480	
Ltc Time Code Type	DF		Ltc Time Code Type	DF	
Native Locator	D:\media\source\DrNBA2MinSource480.mp4		Native Locator	D:\media\source\DrNBA2MinSource480.mov	
Original Rate	30000		Original Rate	30000	
Original Scale	1001		Original Scale	1001	
Poster Frame	0		Poster Frame	0	
Time Code	00:00:00;02		Time Code	00:00:00;00	
Time Code Type	DF		Time Code Type	DF	
Universal Name	D:\media\source\DrNBA2MinSource480.mp4		Universal Name	D:\media\source\DrNBA2MinSource480.mov	
User Bits	00000000		User Bits	FFFFFFFF	
Vitc Time Code	00:00:00;02		Vitc Time Code	00:00:00;00	
Vitc Time Code Type	DF		Vitc Time Code Type	DF	
Vitc User Bits	00000000		Vitc User Bits	FFFFFFFF	
System	8		System	8	
Video	4	21	Video	21	

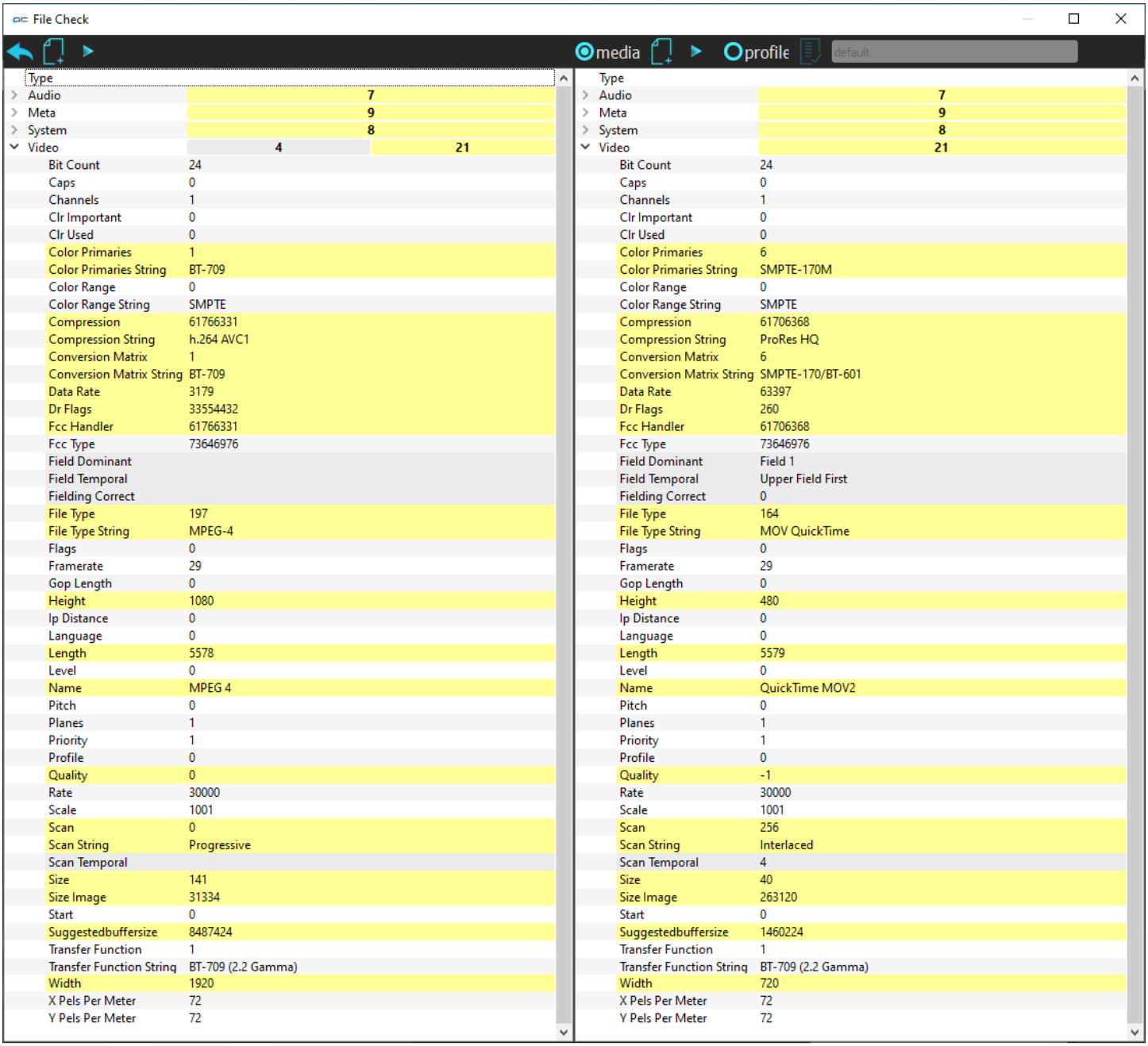
The metadata tab displays the differences between the two files' metadata.

System Details Tab



The system details tab displays the differences between the two files' systems.

Video Tab

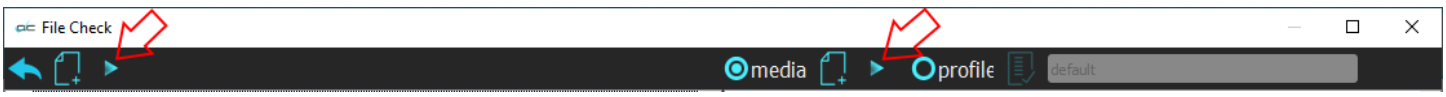


Type		
Audio	7	
Meta	9	
System	8	
Video	4	21
Bit Count	24	
Caps	0	
Channels	1	
Clr Important	0	
Clr Used	0	
Color Primaries	1	
Color Primaries String	BT-709	
Color Range	0	
Color Range String	SMPTE	
Compression	61766331	
Compression String	h.264 AVC1	
Conversion Matrix	1	
Conversion Matrix String	BT-709	
Data Rate	3179	
Dr Flags	33554432	
Fcc Handler	61766331	
Fcc Type	73646976	
Field Dominant		
Field Temporal		
Fielding Correct		
File Type	197	
File Type String	MPEG-4	
Flags	0	
Framerate	29	
Gop Length	0	
Height	1080	
Ip Distance	0	
Language	0	
Length	5578	
Level	0	
Name	MPEG 4	
Pitch	0	
Planes	1	
Priority	1	
Profile	0	
Quality	0	
Rate	30000	
Scale	1001	
Scan	0	
Scan String	Progressive	
Scan Temporal		
Size	141	
Size Image	31334	
Start	0	
Suggestedbuffersize	8487424	
Transfer Function	1	
Transfer Function String	BT-709 (2.2 Gamma)	
Width	1920	
X Pels Per Meter	72	
Y Pels Per Meter	72	

Type	
Audio	7
Meta	9
System	8
Video	21
Bit Count	24
Caps	0
Channels	1
Clr Important	0
Clr Used	0
Color Primaries	6
Color Primaries String	SMPTE-170M
Color Range	0
Color Range String	SMPTE
Compression	61706368
Compression String	ProRes HQ
Conversion Matrix	6
Conversion Matrix String	SMPTE-170/BT-601
Data Rate	63397
Dr Flags	260
Fcc Handler	61706368
Fcc Type	73646976
Field Dominant	Field 1
Field Temporal	Upper Field First
Fielding Correct	0
File Type	164
File Type String	MOV QuickTime
Flags	0
Framerate	29
Gop Length	0
Height	480
Ip Distance	0
Language	0
Length	5579
Level	0
Name	QuickTime MOV2
Pitch	0
Planes	1
Priority	1
Profile	0
Quality	-1
Rate	30000
Scale	1001
Scan	256
Scan String	Interlaced
Scan Temporal	4
Size	40
Size Image	263120
Start	0
Suggestedbuffersize	1460224
Transfer Function	1
Transfer Function String	BT-709 (2.2 Gamma)
Width	720
X Pels Per Meter	72
Y Pels Per Meter	72

The video tab displays the differences between the two files' video types.

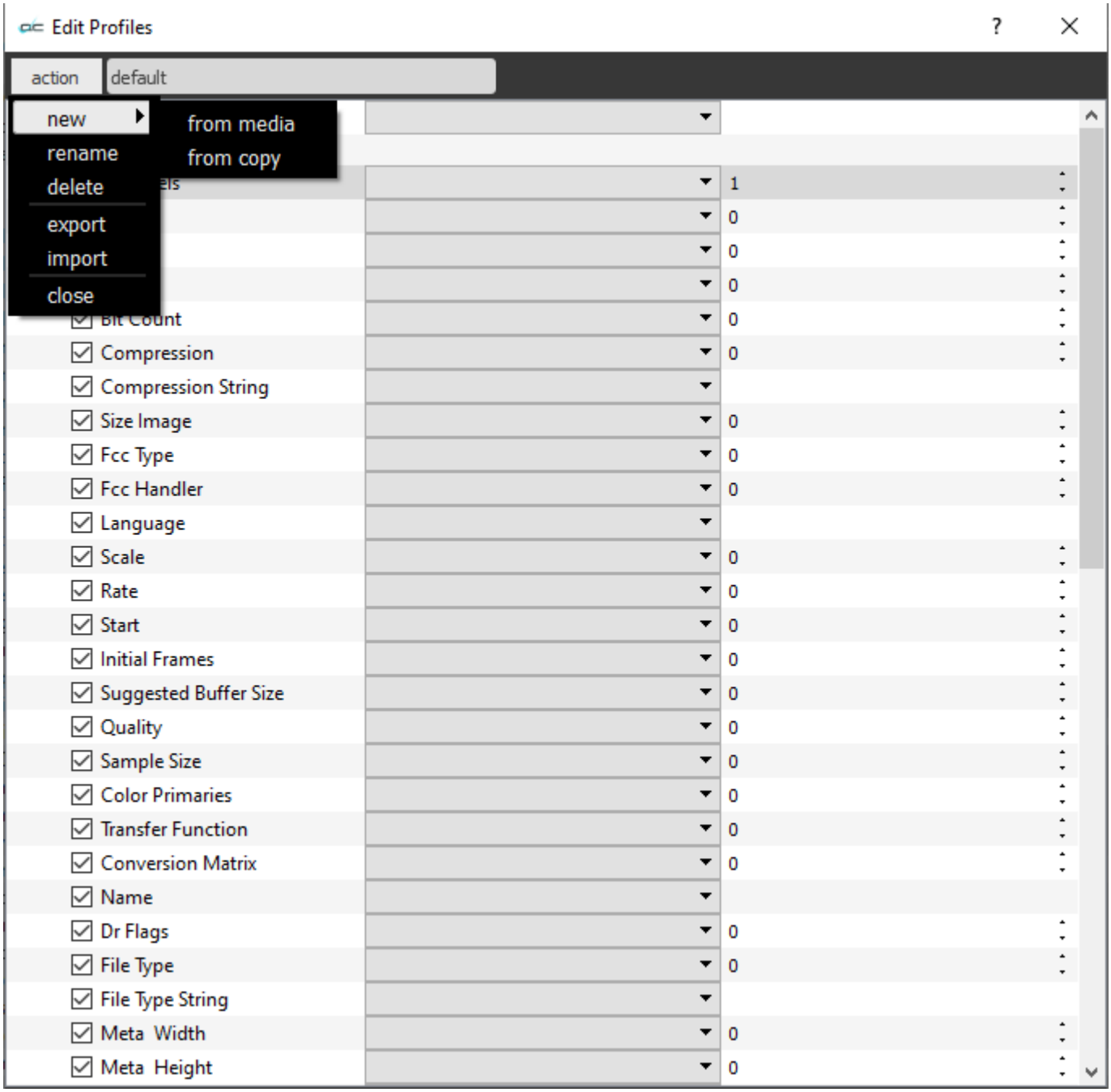
Play the File



The arrow next to the file load icon allows the user to play each of the files. On the left, it plays the loaded file. With the arrow to the right it plays the comparison file.

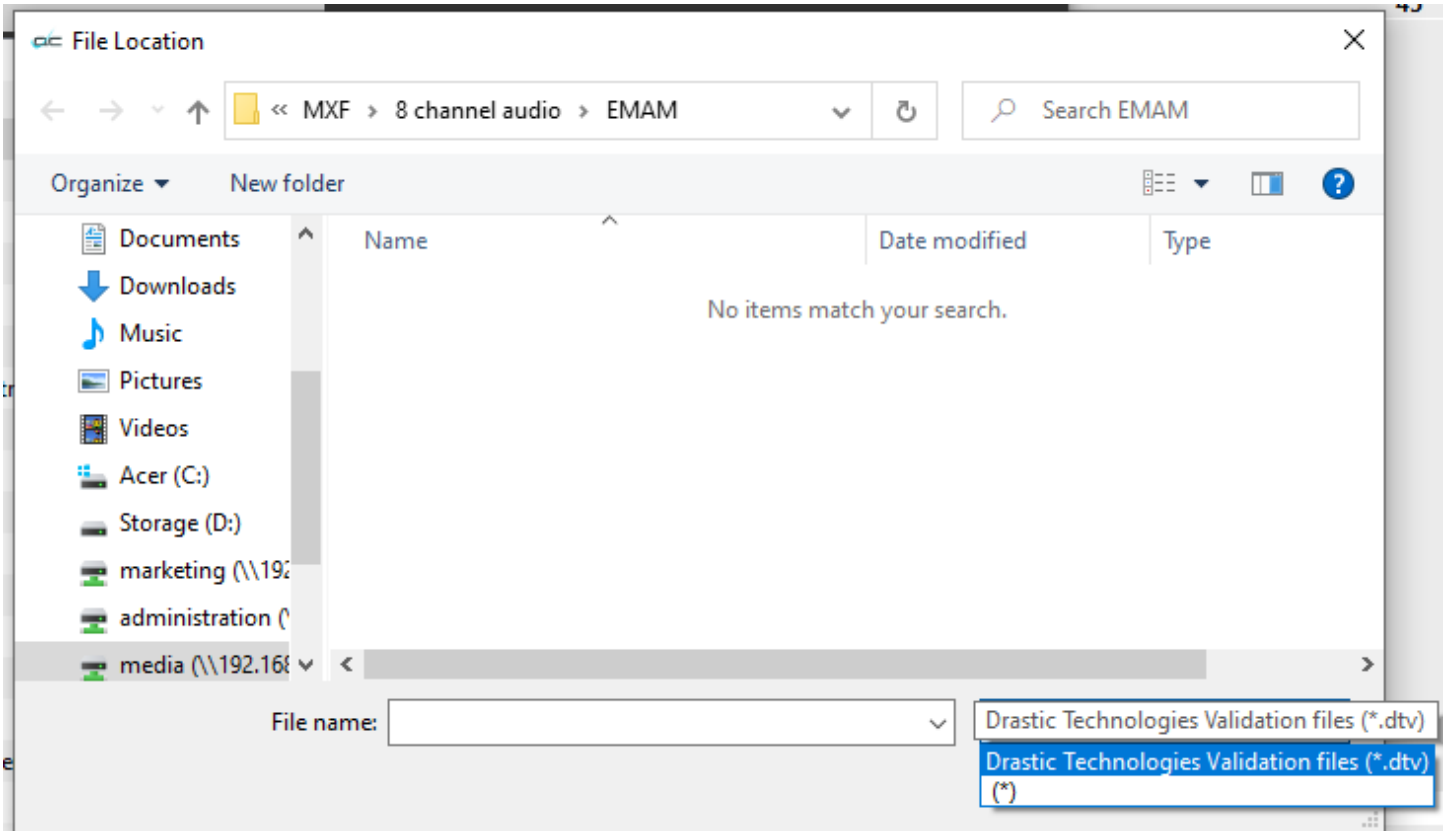
Edit Profiles window

The Edit Profiles window lets you set up a profile, element by element, or by using a known good media file. Each profile may be saved as a Drastic Validation file, in a location specified by the user.



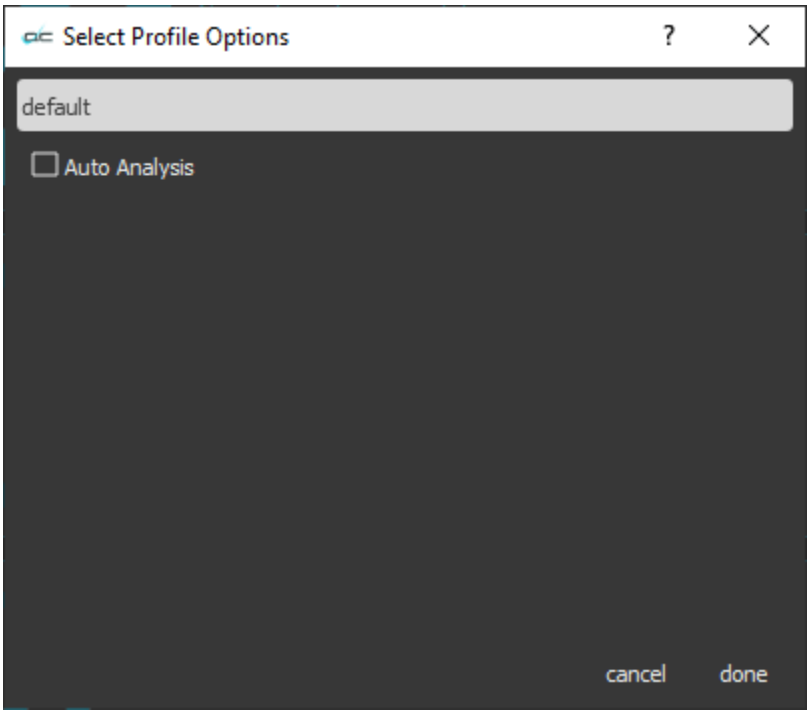
Validation files

The profiles are saved as Drastic Technologies Validation Files (*.dtv).

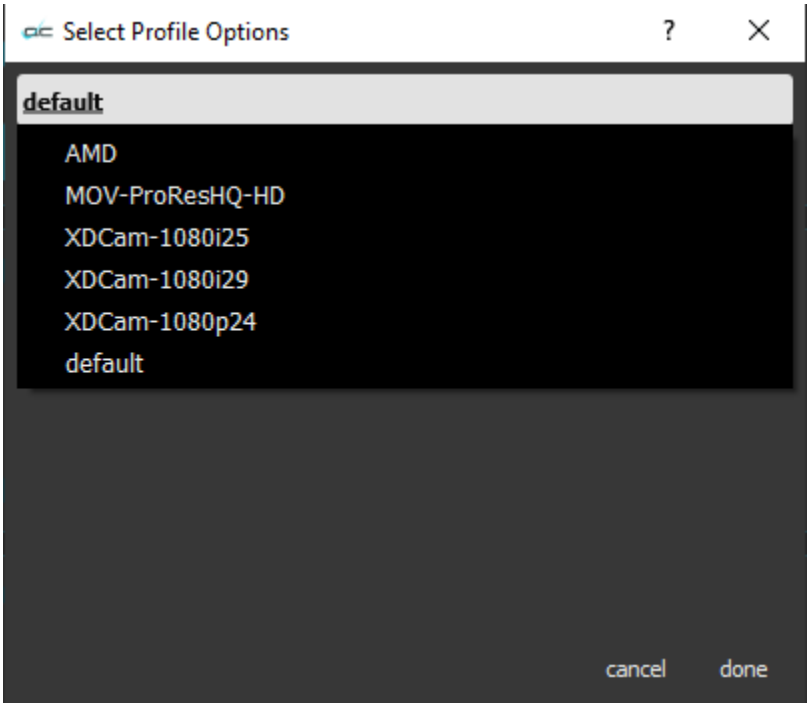


Select Existing Profiles

Pressing the **Choose and/or Edit a profile** button to select an existing profile. This opens the **Select Profile Options** window.



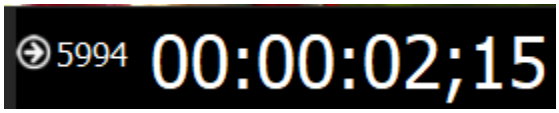
If there are existing profiles, they would appear in the pulldown menu available for selection.



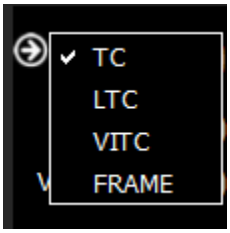
View Tips

Here is a list of handy playback and display shortcuts:

Use the **Scroll** button on the mouse to zoom in and out.
Left Click on the mouse and drag the pointer to move the image around the screen.
Right Click on the mouse to reset the picture to fit the application.
Middle Click on the mouse to set the picture to a 1:1 pixel size.
videoQC supports a full set of **keyboard commands**. Visit www.drastic.tv for more information.
Drag and Drop - Files can be added to videoQC by dragging them from a file explorer and dropping them on videoQC.
Enter time code to cue - Clicking on the main time code allows you to paste a time code location in to cue its location.
Copy time code location - Pressing <CTRL>-C will copy the current time code to the system clipboard.
Full screen mode - Pressing F will set videoQC to full screen
Full screen image only - Going full screen (F) and unlocking the transport will show only the image, so long as the mouse is not moved. Double Click the video display to toggle full screen to hide the controls.
Full screen mode time code display - To enable/disable the time code overlay in full screen press <SHIFT> + <T>.
Keyboard transport control - videoQC supports the J-K-L keys for basic transport control.
TC, LTC, VITC, and FRAME time code sources - Clicking on the arrow to the left of the time code (below example, just to the left of 59.94) opens the time code source window.



The user can click the displayed time code to select another time code source.



Toggle Play/Pause - The <SPACE BAR> will toggle between pause and play.

How to Use videoQC

Setup

Connect Hardware

videoQC software will generally install and run on most modern computers, but to support real time playback of specific file types, typically a powerful, fast system will be required. For this reason videoQC is offered as a demo so the user can qualify their system for the types of files they need to play.

To install and take advantage of some of the features of videoQC the system will need to be connected to various other hardware devices.

The system will need to be supplied with a dependable source of power. The user would do well to consider installing a UPS (uninterruptible power supply) device to provide power to the system so that software is not affected by any surge or drop in the power level.

The system will need to be set up with a monitor, keyboard and mouse. The monitor is required to view the interface, and the mouse and keyboard allow the user to input commands. The use of 2 monitors (if available) is recommended.

To view the output using an AJA, Bluefish444 or Blackmagic board, a supported board will have to be installed on the system, along with the required drivers. Typically the manufacturer will be the best source for a list of recommended hardware environments for their boards.

Recommended Hardware Environment

HD 1080p60
- A recent Intel, AMD or NVIDIA with at least 1G memory card is fine for the GPU
- A recent Quad Core i5/i7/AMD processor with at least 8G of ram

4K/QHD
- A gaming level NVIDIA or AMD (NVIDIA 1080 or better/AMD Vega 2 or better)
- Minimum 8 cores [16 virtual] Intel/AMD, recommended 8~12 cores with at least 8G ram

Installing the Software

How you will install videoQC on your system depends on your operating system:

Windows

Run the installer and follow the prompts. The installer will install it and make links in under the Start Menu and on the desktop. An uninstaller will also be created.

macOS

The macOS version is a single executable that does not require installing. Normally it should be unpacked and copied into the Applications folder. It can then be run by double clicking on it.

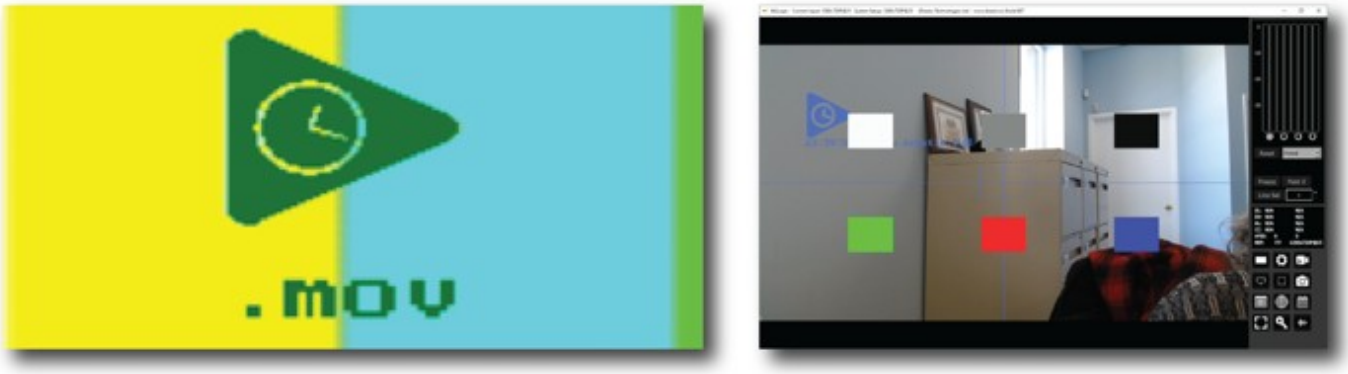
Linux

The installer's executable bit may need to be set (chmod a+x <installer>) to run it. Follow the install prompts and the videoQC executable link will be placed in the applications menus.

License the Software

How Do I Remove the Watermarks?

If you run Drastic software without a license, many of the features will be unavailable. Also, there will be watermarks you cannot remove (image below), 10 second media duration, length of run limitations, no hardware support, nag screen, auto-shutoff, and other significant limitations. To remove these limitations, you will need a valid license.



Sample watermarks

Here is how to obtain a license:

Open the **Settings** window, and click the **License** button at the upper left. This opens the licensing window:

To license the software:

- open the licensing application and enter a user name into the field to the right of the **User Name** label.
- enter an email address into the field to the right of the **Email Address** label.
- press the **Generate** button. This creates a Site Code (a string of alphanumeric characters) in the field to the right of the **Site Code** label.
- copy the Site Code to the clipboard using the **Copy** button. (or you can select it and use Ctrl+C)
- send the Site Code to us at authorization@drastictech.com. (if the system is set up with email, pressing the **Send** button should open a new email you can send containing the Site Code) We will send back an email containing a Site Key (another string of alphanumeric characters).
- copy the Site Key and paste it in the field to the right of the **Site Key** label using the **Paste** button. (or you can select it and use Ctrl+V).
- press the **Register** button.
- restart the system.

videoQC How To

How to Play Video

The video can be loaded by using the File | Open menu or by dragging and dropping the file on the interface. Once loaded, it can be controlled by the transport controls, the keyboard commands or by the optional http, serial or network interface.

Controlling videoQC

videoQC can be called by external applications with command line parameters, keyboard/mouse, cut/paste, and via a full REST/HTML command set. If there is already an instance of the application running, the parameters will be transferred to the running instance, and the called one will exit. This is especially useful where the workflow requires the system to display particular aspects of a clip in an automated fashion.

Command Line Parameters

videoQC -t <timecode> -c <framestart> -f -o -h -m -a -x -v -d -p -g -b -s [filename] [compare-filename]

-t 01:00:00:00 - Seek point in time code, based on the time code track in the file
-c 1800 - Seek point in frames, based on the absolute position in the file
-f - Start in full screen mode
-o - Disable time code overlay in full screen mode
-h - Disable hardware (AJA/Bluefish444/Blackmagic) output
-m - Do a file comparison
-a - Do a file analysis
-x - Reserved for running under Net-X-Code Server
-v - Enable validation - validate a file against a profile
-d - Type to check for plugin validation - IMF, DCP, XDCam, iTunes, etc.
-p - User validation profile name - "videoQC Demo"
-g - Target directory for files that pass validation - "E:\good files"
-b - Target directory for files that fail validation - "E:\bad files"
-s - Source file for validation - "E:\Record\Media\qc\bars1080\

Configuration Files

For selected time code source, display page (metadata, time code, etc.), audio meter type and other settings, they will be remembered between runs from the last selection. To modify these settings programmatically, the registry (Windows) or prefs (macOS) must be changed. The basic settings are:

Windows (registry)
HKEY_CURRENT_USER\Software\Drastic\videoQC

macOS (~\Library\Preferences\)
com.drastic.videoQC.plist

Linux (~\.config\)
videoQC.conf

Settings

actionsafe - what overlays, if any, are shown on the video
filter - the default file filter
filtercc - the default closed caption file filter
fullscreen - set for full screen mode
loadpath - last path a file was loaded from
loadpathcc - last path a closed caption file was loaded from
metertype - which audio meter type is displayed
scopemode - what video scope is displayed, if any
sdoutersafe - show the SD action safe

sdsafe - show the SD title safe
show_mini - show the mini transport controls, instead of the full set
titlesafe - show HD title safe
viewmode - information panel to display
SDAspectRation16by9 - if 0 then 4:3
last_altaudiopath - last alternate loaded audio path
last_ccpath - last alternate loaded closed caption path
net_source - list of recent network a/v sources (RTP, HTTP, RTSP, SMPTE2110, TR-01)
settings/Color Space - color space to use for 4K and greater playback (Rec 709, BT2020)
settings/Color Transfer - color transfer to use for 4K and greater playback (HD, 2084/HDR, HLG)

Keyboard/Clipboard Commands

videoQC has a full set of keyboard commands available. Key press events can be sent to control playback like:

c = play
v = pause
b = reverse play
z = fast reverse
x = fast forward

A full set of keyboard commands is available here:

http://www.drastic.tv/images/software/drastickeyboard.pdf

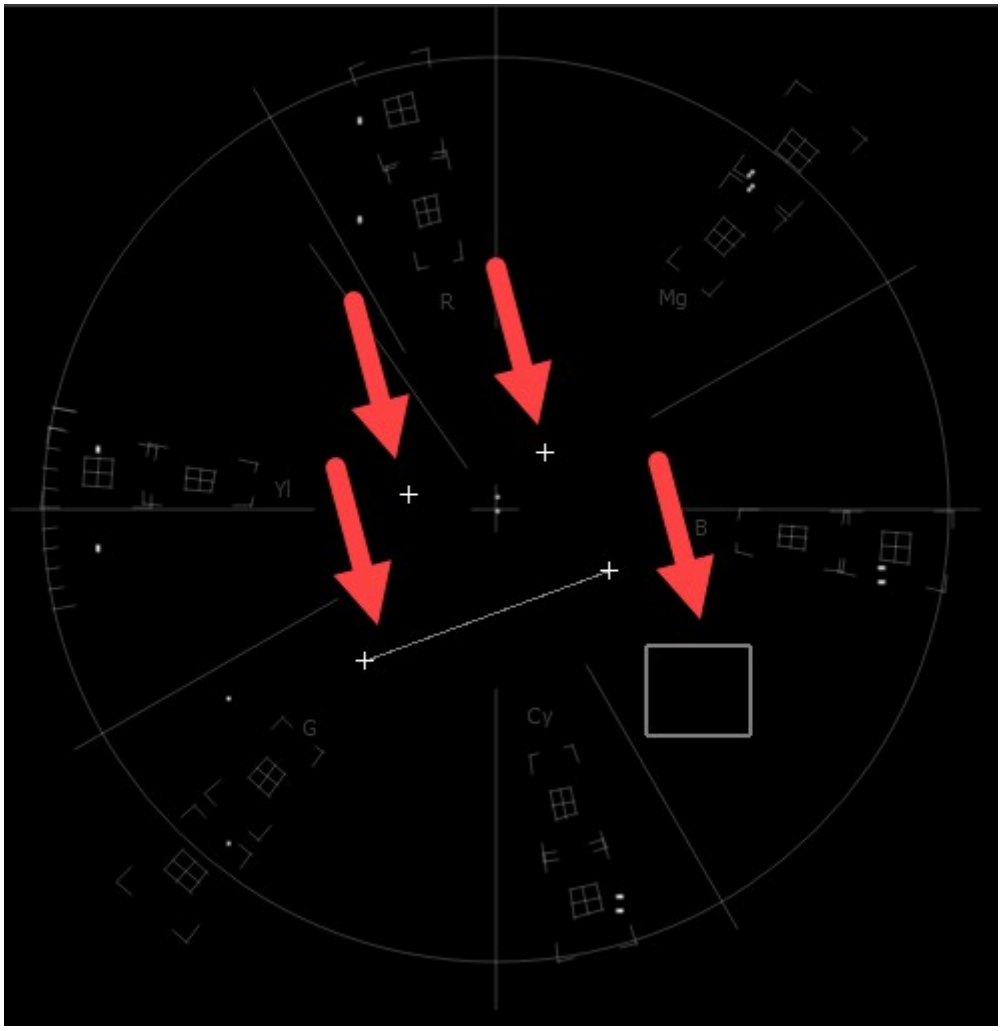
videoQC also supports using the system clipboard. A cut/copy on the application (via keyboard or programmatically) will pull the current time code in a ##:##:##:## format. Pasting a time code into the application will cause it to seek to that absolute (0 based) point in the file. If the pasted buffer contains a file URL, then that file will be loaded into that application.

Mouse Control

videoQC also features extended mouse controls. These include:

<MouseWheel> - zoom in and out
<CTRL><MouseWheel> - volume up and down (0..200%)
<CTRL><LeftClick> - volume to 100% (unity)
<CTRL><SHIFT><MouseWheel> - change background luminance
<LeftClick>Drag - pan and scan the video image in the app
<ALT><LeftClick> - view magnifying window
  <LeftClick> - bring up color selector with color under cursor
  <RightClick> - exit magnify mode
<DoubleLeftClick> - enter and exit full screen mode

<T> - enable or disable time code display in full screen



Making Marks/Guides (cross, line and box)

Marks, or guides, can be drawn over specific waveform/vectorscopes, to compare measurements between scenes, or between setups.

<SHIFT><LeftClick> - Make a point/cross
<SHIFT><ALT><LeftClick> - Undo last
<SHIFT><CTRL><LeftClick> - Drag to make a line
<SHIFT><CTRL><ALT><LeftClick> - Drag to make a box
<CTRL><ALT><LeftClick> - Drag to make an ellipse
<SHIFT><RightClick> - Clear all markers/guides

RESTful HTML AJAX API

videoQC (Workstation level and above) supports a full set of control and status requests via a built in HTML REST/AJAX command set. This powerful API allows full control over a videoQC instance from anywhere on your network. Commands include: transport control, time code and play status, audio metering, video preview retrieval and an optional full set of disk contents display and loading commands. There is an HTML page sample included in the install that uses the most common commands and can be used as a base for custom UIs.

The documentation for the REST API is available here:

VVW REST Command API

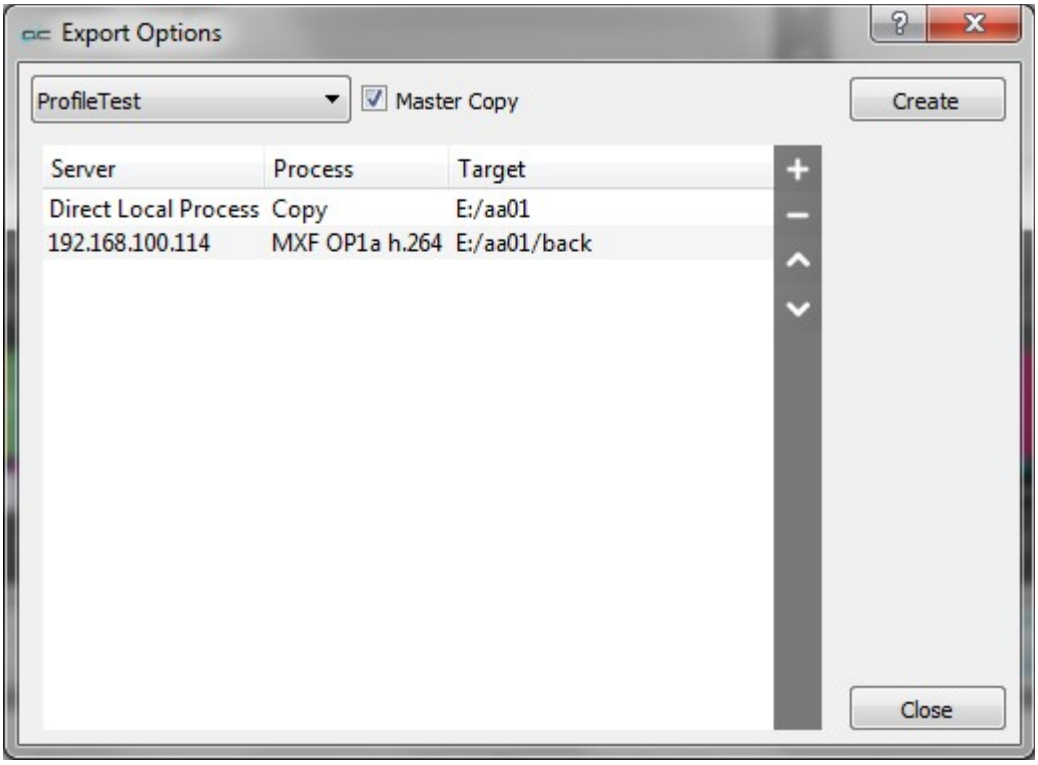
How to Play Video

The video can be loaded by using the File | Open menu or by dragging and dropping the file on the interface. Once loaded, it can be controlled by the transport controls, the keyboard commands or by the optional http, serial or network interface.

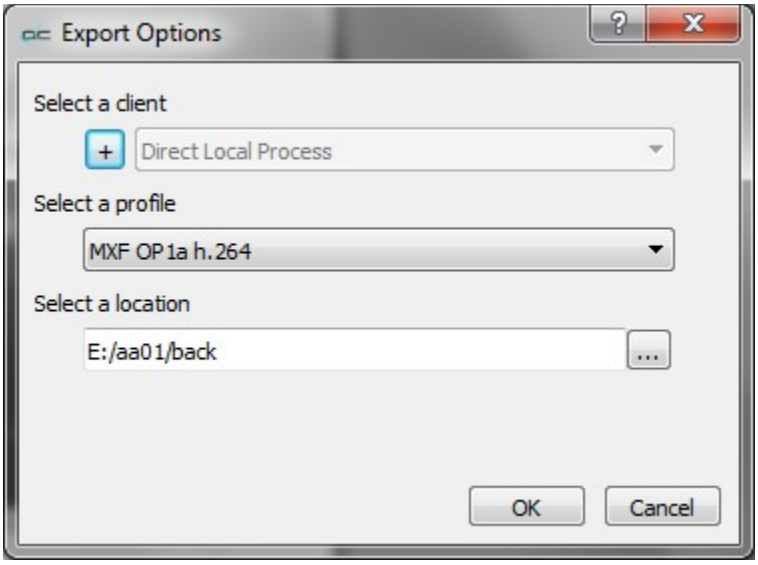
How to Export a File

videoQC (Inspect level and above) provides file export capabilities.

Press the Export control. This opens the **Export** window.
The In and Out points can be edited by cueing, and pressing the Set In and Set Out controls.
The profile can be selected or a new profile can be set up by pressing the **Process** control and selecting the **Edit Process** control. This opens the **Export Options** window. If the profile has already been set up, the user should be able to select it using the **Profile** pulldown menu.



To set up the current profile, press the + on the **Export Options** window. This opens up a further **Export Options** window.
To send the export job to a Net-X-Code Server, press the **+** button under **Select a Client**, and enter the Net-X-Code Server's IP address into the field. If you leave this field blank, videoQC will perform the transcode/export.
To set the type of file that is being created in the export, press the pulldown menu under **Select a profile**.
To set the location in which the export will be saved, press the browse button to the right of the field under **Select a location**.
Press OK to accept these choices and return to the original **Export Options** window.



The edit can be previewed by pressing the **Preview** control.

To add a closed caption file to the exported file, press the browse button to the right of the **CC Source** field, and browse to the file then select it. If a closed caption file has been added erroneously, the user can reset by pressing the X to the right of the **CC Source** field, and this will empty the field. To add a separate audio file to the exported file, press the browse button to the right of the **Alt Audio** field, and browse to the file then select it. If an audio file file has been added erroneously, the user can reset by pressing the X to the right of the **Alt Audio** field, and this will empty the field.

Once the settings are correct, the user may review the edit by pressing the **Preview** button. To export the selected media, press the **Process** button.

How to Use Video IP Stream Sources

Drastic software supports a number of IP video standards in videoQC (Pro level and above) , Net-X-Code Server, FlowCaster and other products. To access these streams, a URL style string is used to describe them. For some sources, like RTSP, this string is fairly standard. For others, like NDI, a URL style has been developed to allow those streams to be specified. Currently, udp://, rtp://, srt://, rist://, rtsp://, rtmp://, webrtc://, whip://, bls://, ndi://, cdi://, s2022:// and s2110:// are supported. This document describes the URLs' format in more detail. We have also added some application specific notes for connecting our software to other applications.

Basic IP Video URLs

An IP video URL will always start with the type of stream you are expecting. Some of the types include udp://, rtp://, rtsp://, ndi://, s2022:// and s2110://. This will be followed by an IP address or resolvable name for the address of the stream. For some streams there will be a port value, and then a description of the stream on that device. For videoQC, there is also a special form that can be used to launch videoQC, FlowCaster iOS Player or FlowCaster Android Player automatically from a browser link. For these, simply preface the link you want with videoqc:// and remove the extra colon from your link.

UDP and RTP

UDP and RTP streams can be elementary video or audio streams, or more commonly a transport stream with PMT/PAT and a number of streams within it. For UDP and RTP, you can specify a TCP (direct) address, but normally it will be a multicast group address, and also a port is normally specified. Here are a few examples:

udp://239.254.40.40:5004
rtp://239.100.20.20:50004

rtp://239.100.30:31:1234

SRT

SRT [Secure Reliable Transport] streams contain a transport stream with PMT/PAT and a number of streams within it. For SRT you can specify an address and a port. There are three modes for SRT: listener, caller and rendezvous. If you are a listener, you can only connect with a caller and vice versa. For Rendezvous, both the sender and receiver must be in rendezvous mode. A password for encrypted service can also be set. Here is some information on the modes:

listener - this has to be one of your local IP addresses, and acts as a server waiting for a connection, so it must be directly visible to the caller (not behind a firewall)
caller - this calls out to a remote IP that is running as a listener. You must be able to reach the IP directly (e.g. no firewall)
rendezvous - this connects bi directionally, allowing it to connect through firewalls without extra configuration. Each side of the rendezvous uses the external (internet facing) IP address of their internet connection. This allows the signals to connect and pass through the firewall

Here are a few examples:

srt://239.254.40.40:5004?mode=listener
srt://172.12.25.20:5006?mode=caller
srt://239.100.30:31:1234?mode=caller&password=thisisapassword&user=thisisauser

Possible parameters include

mode=
caller
listener
rendezvous
password=<string>
keylen=16|24|32
username=<string>
streamid=#
latency=#
buffering=#
maxbw=#

RIST

RIST [Reliable Internet Stream Transport] streams are UDP based self correcting connections. RIST supports three profiles: Simple, Main, and Advanced. Both the sender and the receiver must be in the same mode. The receiver will be the server and listen for a connection. The sender will be the client and connect to the receiver to send the data. The protocol will use two ports, the lower of which is specified in the URL and the higher which is the lower plus one. The lower port must be even.

Here are a few examples:

- rist://10.0.0.123:5000?mode=listener&profile=main
- rist://192.168.1.22?mode=caller&profile=simple

Possible parameters include:

- mode: listener (for server/receiver), caller (for client/sender) - Required
- profile: simple. main or advanced
- password: encryption key
- buffering: amount of buffer in milliseconds

RTSP

RTSP streams require not only the device address, but also the description of the source of the stream you are accessing on that device. RTSP are also often user/password protected, so you may have to send a user/password in the form "<user>:<pass>@" just before the device identifier. Here are a few examples, and their sources:

rtsp://192.168.100.10/axis-media/media.amp (an Axis camera)
rtsp://192.168.199.11/user:pass@/video1+audio1 (a Marshall camera, with password)
rtsp://192.168.160.20:/onvif/media.amp (an OnVIF source)
rtps://192.168.150:11/video1?videocodec=h264 (a Marshall camera, video only, force h.264)

RTMP

RTMP [Real-Time Messaging Protocol] is normally used to stream one video and one stereo audio channel to a website for distribution to multiple watchers. In modern sites, the RTMP is actually re-wrapped into HLS, which is then viewed by the end user. To connect to an RTMP site, like flowcaster.live, youtube.com, and twitch.com, you will need the URL/Link and the key/secret. For youtube, they are available after you 'go live' as the Stream URL and the Stream Key. Once you have them, you simply add a slash and the Stream Key to the Stream URL. For example:

Stream URL: rtmp://a.rtmp.youtube.com/live2
Stream Key: j2bg-a6ck-8t48-w2y2-aaaa
Final URL: rtmp://a.rtmp.youtube.com/live2/j2bg-a6ck-8t48-w2y2-aaaa

WebRTC

WebRTC [Web Real-Time Communication] is a browser native method of sharing video, audio and data. It is primarily used in chat programs, like Google Meet. When sending via WebRTC, FlowCaster appears as a person in the chat, with whatever video and audio it is receiving being sent to the chat.

Here is an example:

webrtc://flowcaster.live?meetingid=asre-dsec-asds-seff&name=flowcaster

WHIP

WHIP [WebRTC-HTTP ingestion protocol] is a simpler negotiation system for WebRTC. Currently in use by Millicast to receive streams for worldwide, low latency transmission, FlowCaster and Net-X-Code Server support sending video signals via WHIP. WHIP requires an auth code (available from the Millicast config pages) and a stream name. The stream name is added to the end of whip://director.millicast.com/api/whip/ and the auth token is a parameter that starts with auth=.

Here is an example

whip://director.millicast.com/api/whip/kwky3g6g?
auth=48ce3daa09cd8355f80fc0d37005f9422a62bebf9b6411b61cfb1cfb2fa

BLS (Bliss Protocol)

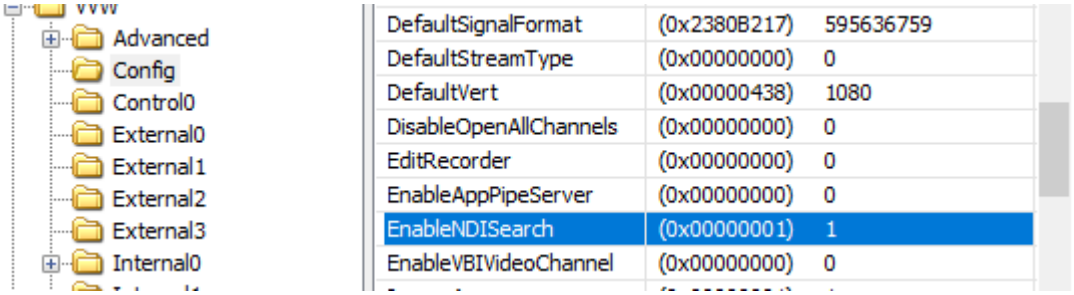
BLS [Browser Live Stream] is a protocol developed by Drastic to send live video via an encrypted channel directly to a user's browser. It allows for much higher quality video than WebRTC, while still not requiring any plugins or special setup to present audio and video directly in a modern, HTML5 browser.

Here are a couple examples:

bls://10.0.0.234:5000
blss://192.168.202.200:3000?password=kfiwgt84jsd&remoteip=120.32.54.6

NDI

NDI is NewTek's video over IP protocol. It requires a device name and a source name to access NDI sources. NDI source may also be searched on the local network. To enable the search, run DDRConfig and select the Advanced tab. Go to /VVW/Config and change EnableNDISearch = 1. If it does not exist, then create a new Numeric value for it.



To specify an NDI stream, use the device name, followed by a space, and then the source name within brackets.

ndi://USER-PC (Desktop [2])
ndi://TestCameraSource (ISO_1)
ndi://PC2 (Google Chrome [1])

If you are creating an NDI stream, with FlowCaster or Net-X-Code Server, for instance, only the stream name is specified. The Computer name is added automatically by NDI, and you cannot use brackets in the name

ndi://FlowCasterOut
ndi://SDI1Out
ndi://SMPTE2110_Group1

CDI

CDI [Cloud Digital Interface] is an advanced, fully uncompressed, protocol for use within Amazon VMs. It transports video in a number of formats, as well as audio, time code and other metadata. While it is possible to use CDI with Amazon's enhanced network backbone, it is safest and most efficient, within their network stacks. The URL will include a local IP and port, with an optional remote IP, adapter and ID.

Here are some examples:

cdi://10.0.0.2:6000
cdi://10.0.0.1:6000?remoteip=10.0.0.200&adapter=EFA&id=2

Possible parameters include:

remoteip: a remote computer to connect to exclusively
adapter: the transport, EFA (Elastic Fabric Adapter) or socket. EFA is the default.
id: a numeric value to specify the stream

ST-2022 and ST-2110

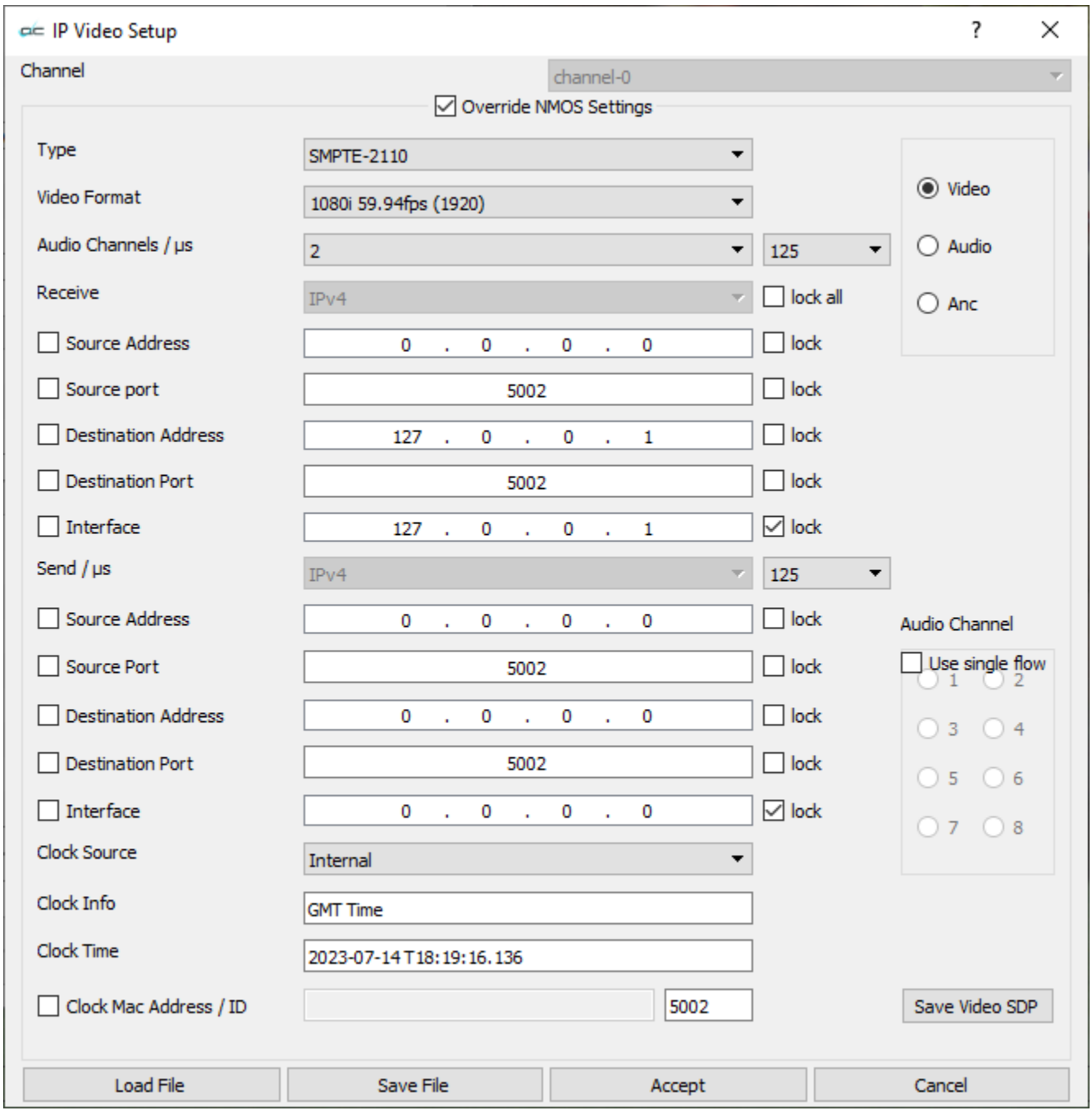
videoQC requires one of the following hardware environments to enable ST-2110:

- Matrox: ST 2110 Network Adapters
- AJA: Kona IP
- Mellanox NVIDIA Bluefield-2: (requires Rivermax license)

The SMPTE 2022-6 and SMPTE 2110 protocols can be accessed via SDP or manual setup. To access an SDP source:

s2202://192.168.101.200/channel1.sdp
s2110://mainsources.drastic.ca/crosspoint10.sdp

For some Drastic software, the source can be set up manually. For S2022, this is a single set of Source IP, Source Port, Destination IP, Destination Port and Interface address. One or any combination of these can be used the describe the source of the SMPTE 2022-6 stream, which contains all the video, audio and HANC/VANC channels. For SMTPE 2110, up to three sets of the same information are required to describe the video, audio and anc streams, which are all separate. A PTP grandmaster may also be specified. Here is the configuration dialog:



Separate settings are maintained for video, audio, and ancillary components of the file.

videoQC URL/URI From Browser
videoQC supports being run from a browser, if installed on a Windows or macOS computer, with the special videoqc:// URL/URI. This will also work on Apple and Android devices with our FlowCaster Player apps (available free from the app store). In the case of videoqc://, it is not a protocol itself, but rather it loads the player and passes the rest of the protocol to it. So if you wanted an automatic link to bring up the srt stream: srt://239.100.30:31:1234?mode=caller&password=thisisapassword&user=thisisauser, you would add this to the videoqc:// start and remove its colon, as below:

videoqc://srt//239.100.30:31:1234?mode=caller&password=thisisapassword&user=thisisauser

Application Specific Notes

VLC (version 3.0.8 and greater)

VLC supports a number of streaming formats from the menu Media | Open Network Stream. Here you can read UDP://, RTP:// and SRT://. If you are using multicast IP addresses (e.g. 239.#.#.#), VLC prefers that you add an at sign (@) before the ip, like:

rtp://@239.240.30.30:5004

You can also use the @ sign to receive on any address using just the port:

udp://@:5004

For SRT, VLC only supports the being a 'caller', so our software needs to be set up as a listener. A typical setup would be

SMPTE2NET: srt://172.16.12.25:5000?mode=listener

VLC: srt://172.16.12.25:5000

Assuming the IP 172.16.12.25 was the IP of the machine SMPTE2NET is running on.

OBS - Open Broadcast System

OBS supports UDP, RTP and SRT using its FFMPEG media reader. It will support both listener and caller modes in the latest versions (26.0.2 or greater). The reconnect is not 100% reliable, so if connection is lost, then you may have to open the source again to have it set up. To add a UDP, RTP or SRT source, click the + button in the Source panel and select MediaSource. In the Properties, unclick Local File, add the standard srt string, for listener or caller:

srt://172.16.12.25:5000?mode=listener

Set the input format to "mpegts" without the quotes, and set up the buffering and reconnect to taste.

Marshall and other Cameras

Most cameras we have tested operate as callers, so our software will have to be set up as a listener on the local IP the SRT stream is coming in on. Alternately, you can use the all addresses mode by using the 0.0.0.0 IP

srt://0.0.0.0:5000?mode=listener

Full Reference Analysis

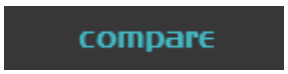
A full reference analysis is when you analyze both the original video material and the compressed video material. The original video provides the full reference for the compressed material.

Load the Compressed File

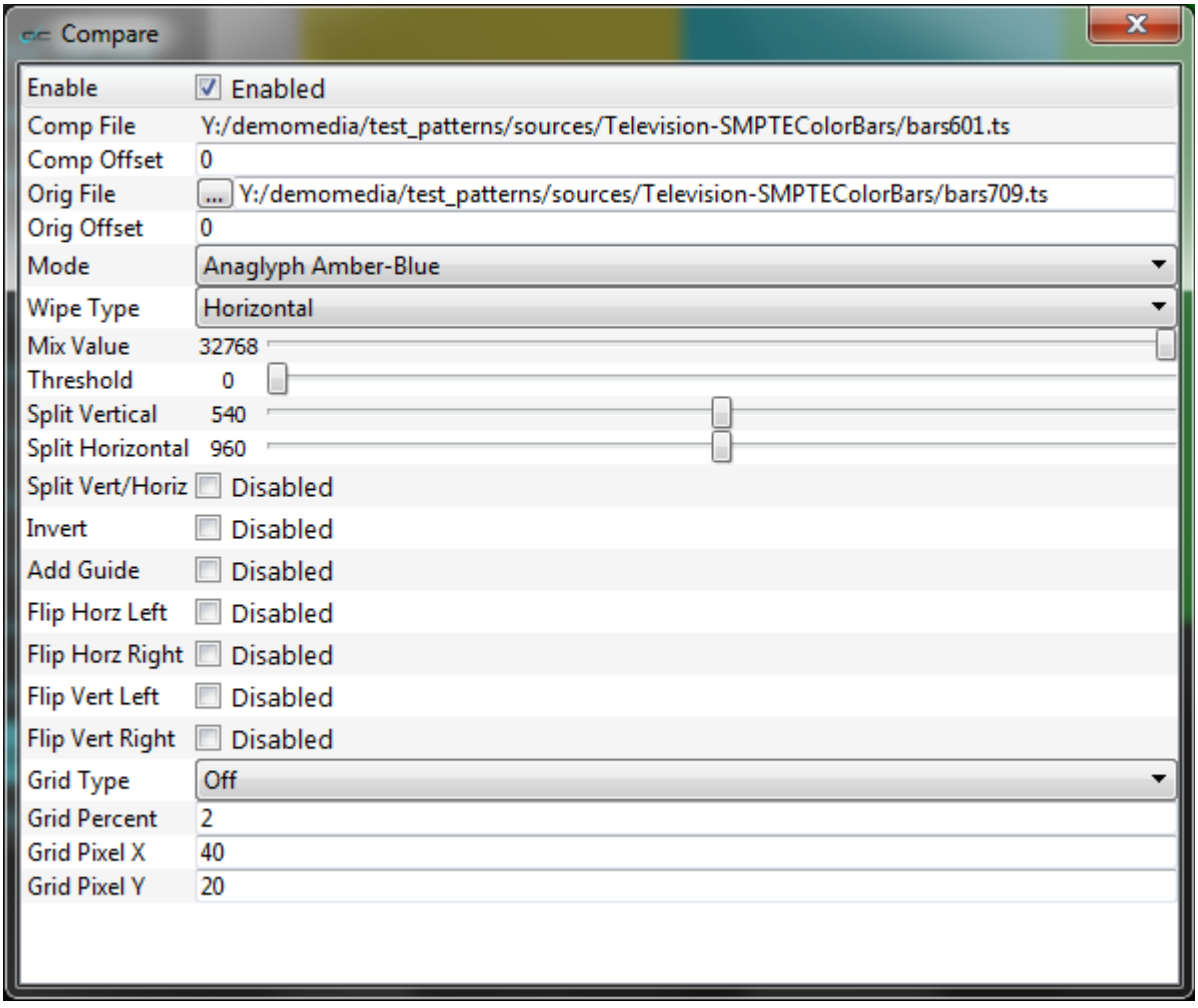
To get the analysis started, load the compressed version of the video into videoQC normally, either by the **File Open** menu, or by dragging and dropping the file on the interface.

Enable Compare Mode

Once it is loaded, bring up the view **Compare** dialog from the menu.



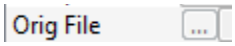
This opens the **Compare** dialog.



Click on the **Enable** checkbox at the top of the dialog to enable full reference mode.

Load the Original Reference File

To load the original, or reference video, click on the **...** button next to the **Orig File** label.

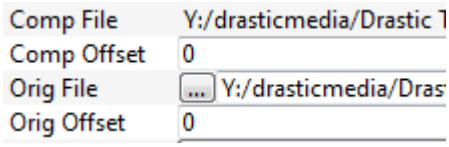


This opens a standard browser, which allows you to navigate to your file, and load it.

Synchronize the Files

Once it is loaded, click the **Mode** pulldown menu and select **Seamless Split**.

You can drag the position bar on the transport controls to check that the two files are in sync. If they are not, either file can be adjusted by dragging the slider next to its **Offset** label.



The DT3D File

Once both files are in videoQC, it will save a ***dt3d** file so that it can remember the file pair and its offsets. This file will be saved with the same name as the compressed file, in the same directory. This file can be loaded in the future for quick access to the file pair.

Analysis

Normally the next step would be to run an analysis. However if you are only doing visual comparison, this is not necessary. To run an analysis, select the analysis types you are interested in (PSNY, SSIM, MS-SSIM checkboxes), and click the **Launch Analysis** button. This will launch the MRAnalyse process to create a database of the analysis.

View the Full Reference Graph

Once it is complete, bringing up the Analysis dialog via the menus will display a graph of the results under the **Full Reference** tab. Clicking on the graph will cause videoQC to seek to that position for visual inspection.

Comparison Modes

To view both the original and compressed video at the same time, a large number of modes are available in the compare dialog. There are a number of 3D modes for 3D file viewing, including anaglyph, interlaced, over/under, side by side, and checkerboard 3D. There are also a group of wipe modes that are useful in special cases. The remaining modes are designed for comparison. These include:

- **Side by side** which scales both images horizontally by half
- **Side by side Same Side** which shows half of each image either vertically or horizontally. The half can be moved with the split vertical or split horizontal slider to show any part of the picture
- **Side by Side Full Picture** does a scale of both images fully, scaled down by half horizontally and vertically

- **Seamless Split** combines both images vertically or horizontally with a positional split point between them. To make the split easier to see, the **Add Guide** checkbox can be clicked to make a one pixel line at the split point. To change the split between horizontal and vertical, click the **Split Vert/Horiz** checkbox. To move the split, use the **Split Vertical** or **Split Horizontal** slider bars. To change which image is on which side of the split, click the **Invert** checkbox.
- The **Mirror Mode** inverts one of the images and joins them at the center of the frame. This is also known as **Butterfly Mode**.
- **Dissolve with Mix** can cross-dissolve between the two images based on the Mix Value slider. This allows you to go back and forth between the two images or do an **Onion Skin View** by setting the slider at 50%.
- **Difference with Threshold Multiplier** creates a difference value for each pixel that can then be multiplied to accentuate small differences when the two files are very similar.
- **A Minus B with Threshold** subtracts the inverse of the second image, and shows you only the points of difference. Here too a threshold can be applied to look for smaller errors.

The visual modes also support inverting, flipping, and overlaying a grid on any of the comparison modes.

Save Analysis

The analysis can be saved as a CSV, XML, or PDF file, as well as being usable from our standard SQLite database. There's also an HTML export that supports making a proxy of the original and compressed files for demonstration, and display on the internet, where videoQC may not be available.

This manual has been compiled to assist the user in their experience using **videoQC** software. It is believed to be correct at the time of writing. Every effort has been made to provide accurate and useful information. Any errors that may have crept in are unintentional and will hopefully be purged in a future revision of this document. We welcome your feedback.

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