videoQC

Version 6

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About videoQC

videoQC is a video and audio analysis and playback tool with both visual and automated quality checking tools. It is available in as a desktop application and as a server. This manual covers the workstation version. A separate manual is available for the server version. videoQC will take the media coming into your facility and perform a series of automated tests on the video, audio and metadata values against a template, then analyze audio and video.

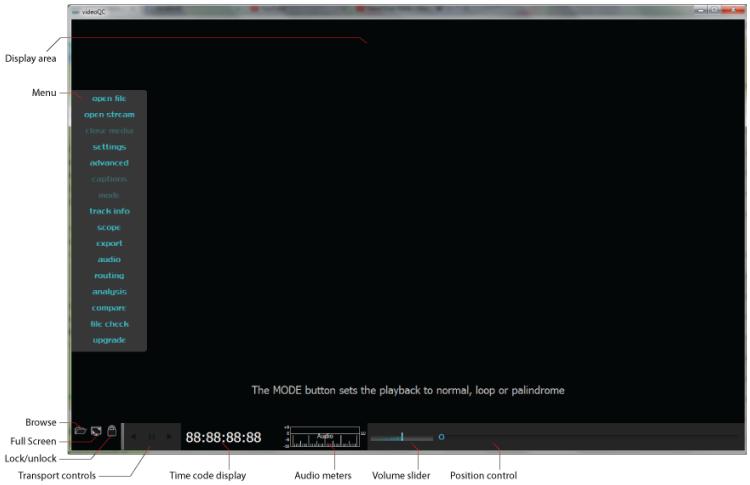
It includes metadata extraction, comparison and templating tools, intuitive charting of audio and video metrics, a full set of audio and video waveform/vectorscope/phase tools, db and PDF reporting, file to file visual comparison and clipping and exporting tools. The standard database format allows seamless 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. Specific features and codec support may be offered as options depending on the version of videoQC the user has licensed.

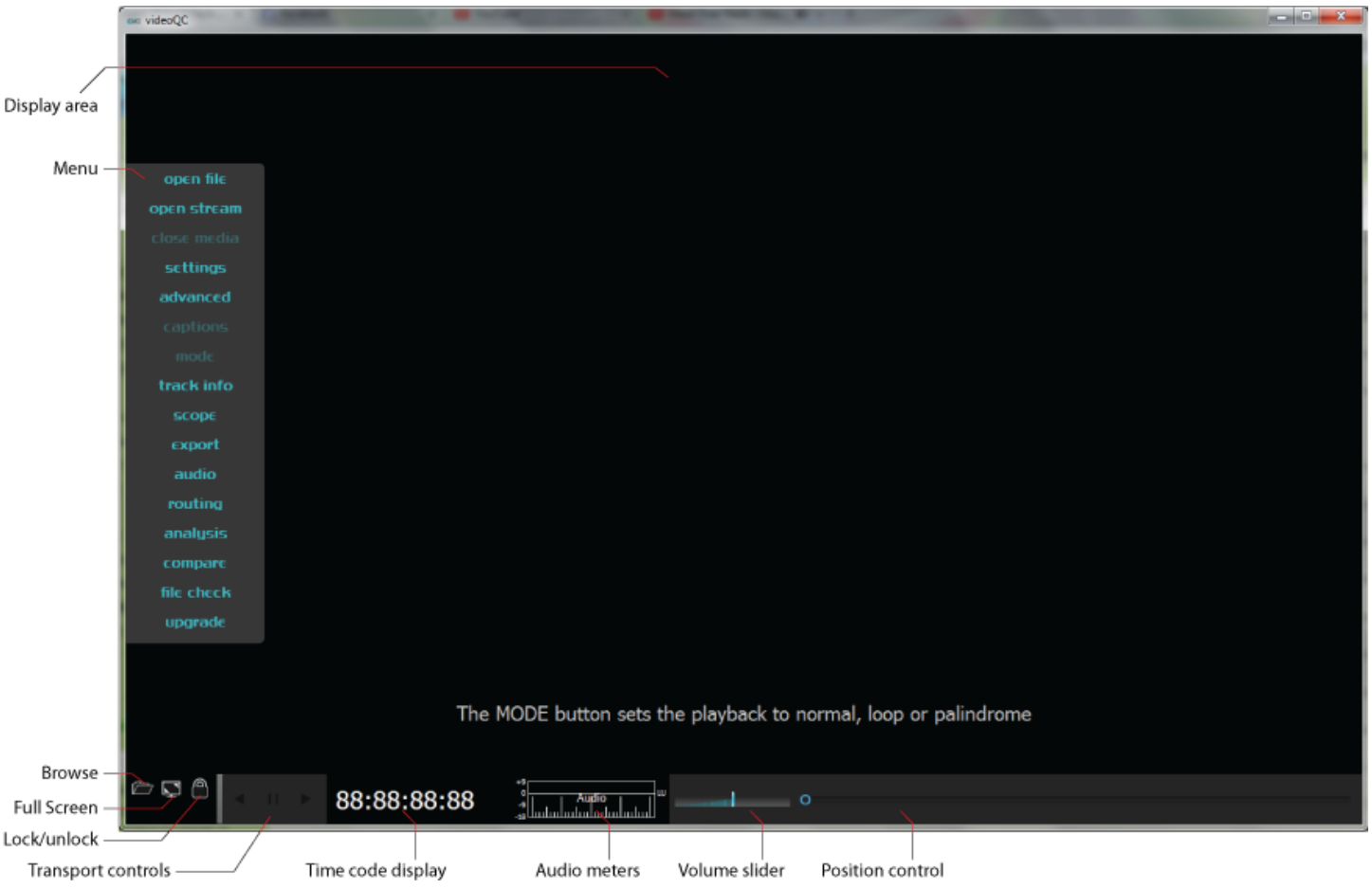
Controls and Displays

videoQC has two modes for its main display: Basic mode and Advanced mode.



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, or on the main menus by pressing the <F10> key. Under OS-X and Linux, it is the first menu under the View menu.

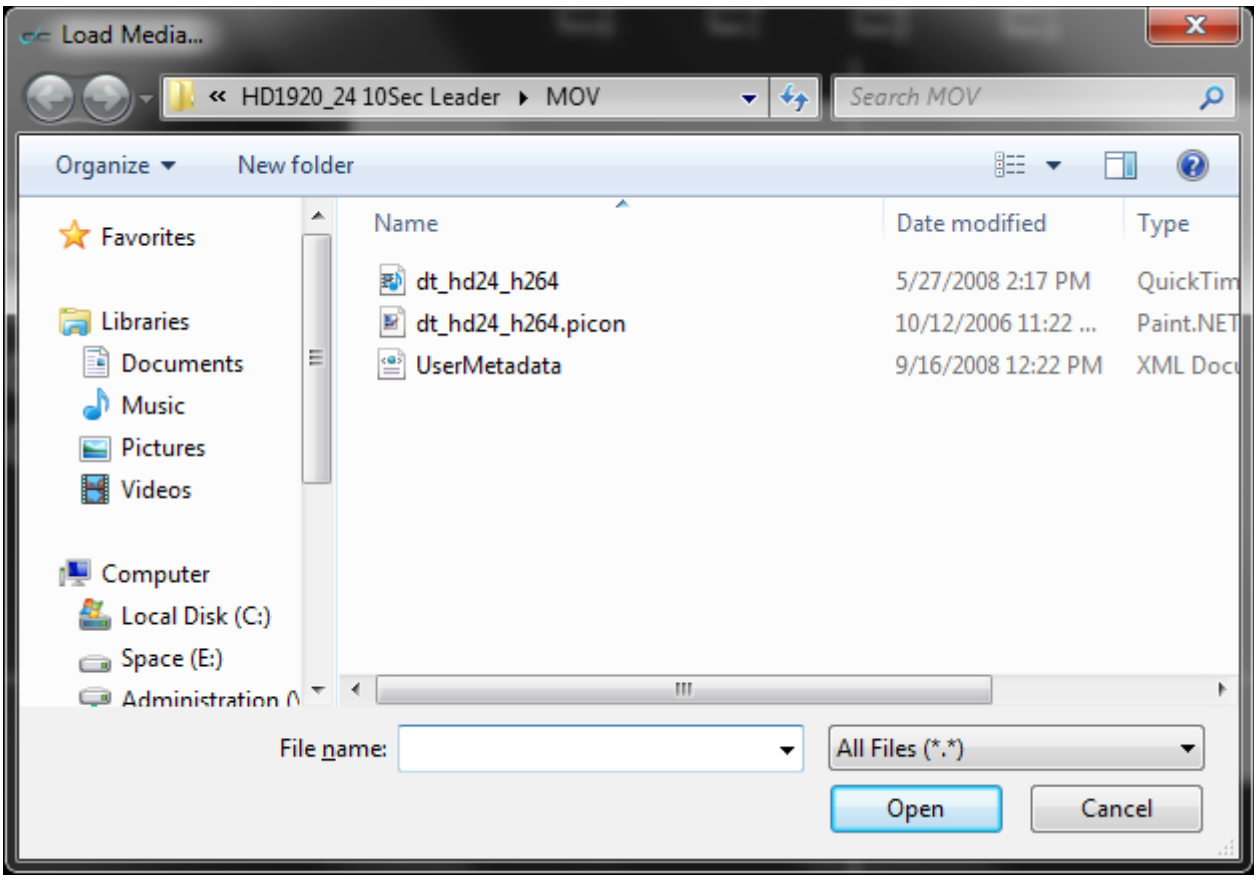
Main display – Basic Mode



Browse

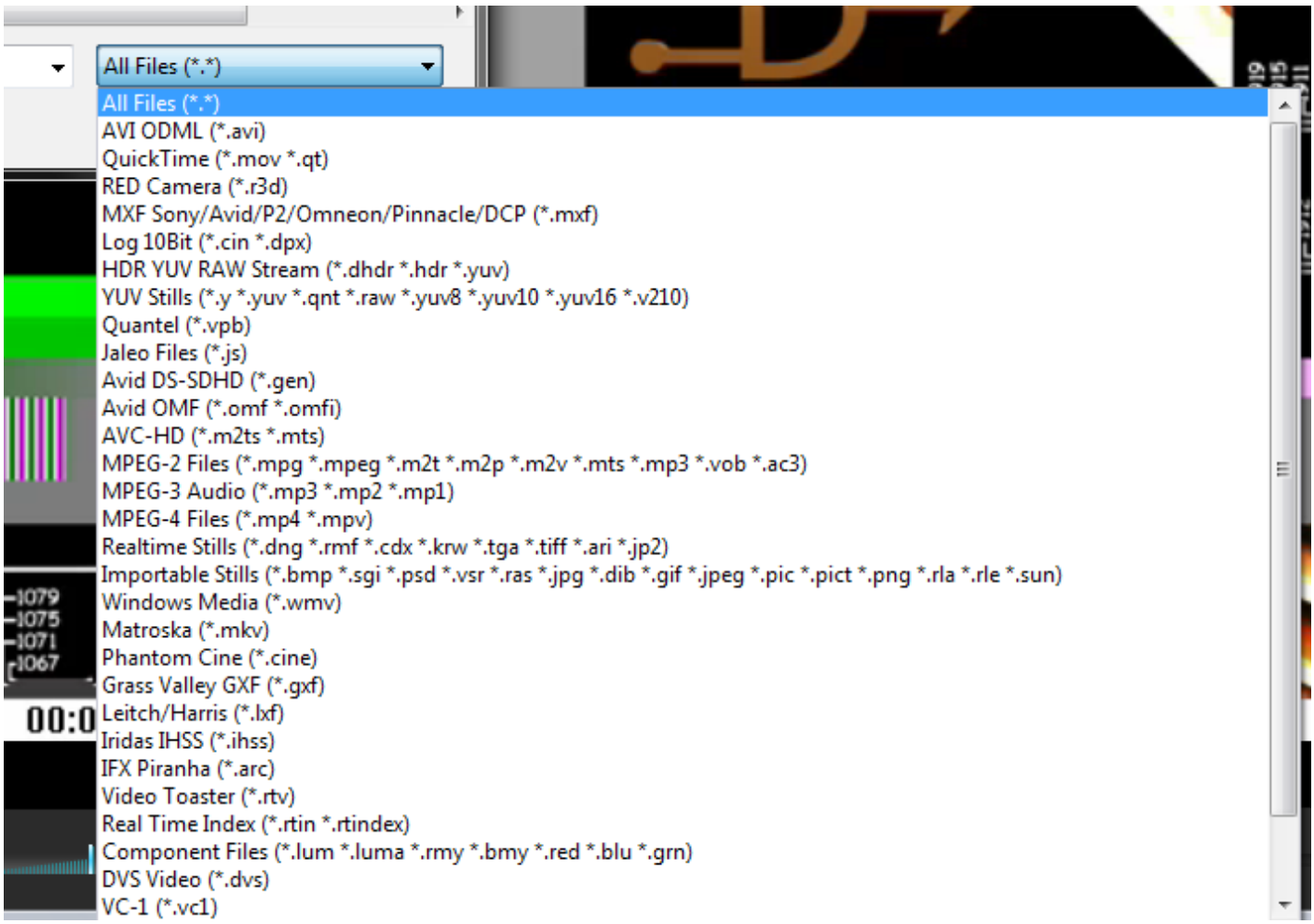
open the Load Media window, a standard browser which allows the user to load media files from storage or via network.

Load Media Window



The Load Media window provides a standard browser, which allows the user to find the correct media file and load it into videoQC.

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.

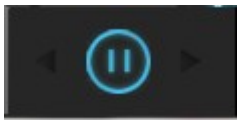
Full Screen

functions as a toggle – when in full screen mode, fills the entire monitor with the video display, except for the controls along the bottom of the GUI.

Lock/Unlock

If unlocked, the transport area will be removed when playing back for more video real estate. Moving the mouse will bring it back.

Basic Mode Transport Controls



Reverse Play		Play at normal speed, in reverse
Pause		Stop playback and display the current frame
Play		Play forward through the media at normal speed

Main display – Advanced Mode

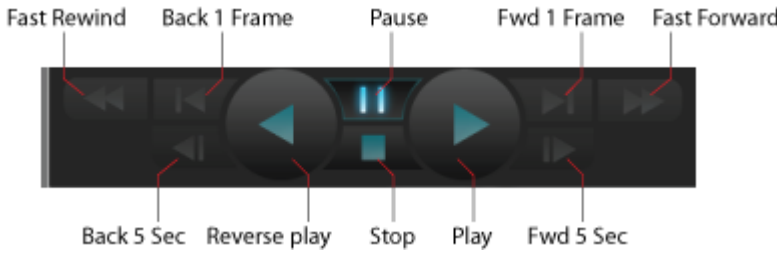
Display Area

an in-GUI video display

Menu

the menu is displayed upon opening. 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.

Advanced Transport Controls



Fast Rewind		Play in reverse, at the fastest speed possible
Back 1 Frame		Cue and display the frame of video 1 frame prior to the present location
Pause		Stop playback and display the current frame
Fwd 1 Frame		Cue and display the frame of video 1 frame after the present location
Fast Forward		Play forward, at the fastest speed possible
Back 5 Seconds		Cue and display the frame of video 5 seconds prior to the present location
Reverse Play		Play in reverse, at normal speed (-100%)
Stop		Stop playback and cue the first frame of video
Play		Play forward, at normal speed (+100%)
Forward 5 Seconds		Cue and display the frame of video 5 seconds after the present location

Time Code Display

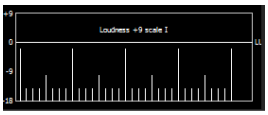
Time Code display basic mode		Displays the current time code location
Time Code display advanced mode		Displays the current time code location, along with alternate time code types, and track information

Audio Meters Display

Audio Meters display basic mode

Up to 16 audio meters showing peak/RMS or r.128/1194 EBU loudness levels. The line 0 corresponds to -24 decibels.

Audio Meters display advanced mode

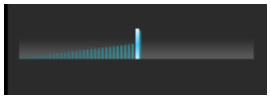


Up to 16 audio meters showing peak/RMS or r.128/1194 EBU loudness levels. The line 0 corresponds to -24 decibels.

Full/Restore toggle

Provides a quick way to toggle between full screen and optimized. The user may also press the "F" key to toggle between screen modes. When optimized, displays **Full**. When in full screen mode, displays **Restore**.

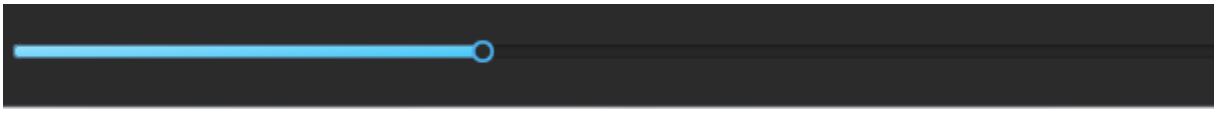
Volume Slider



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%

Position Control

shows the relative position within the video file, and can be 'grabbed' and moved to cue up another location within the file.



Open File

Opens the **Load Media** window, a standard browser which allows the user to load media files on their network. Provides filters for specific media types, to help in locating a particular type of file.

Open Stream

Opens the **Open url** window, which allows the user to enter a known URL to access a video stream.

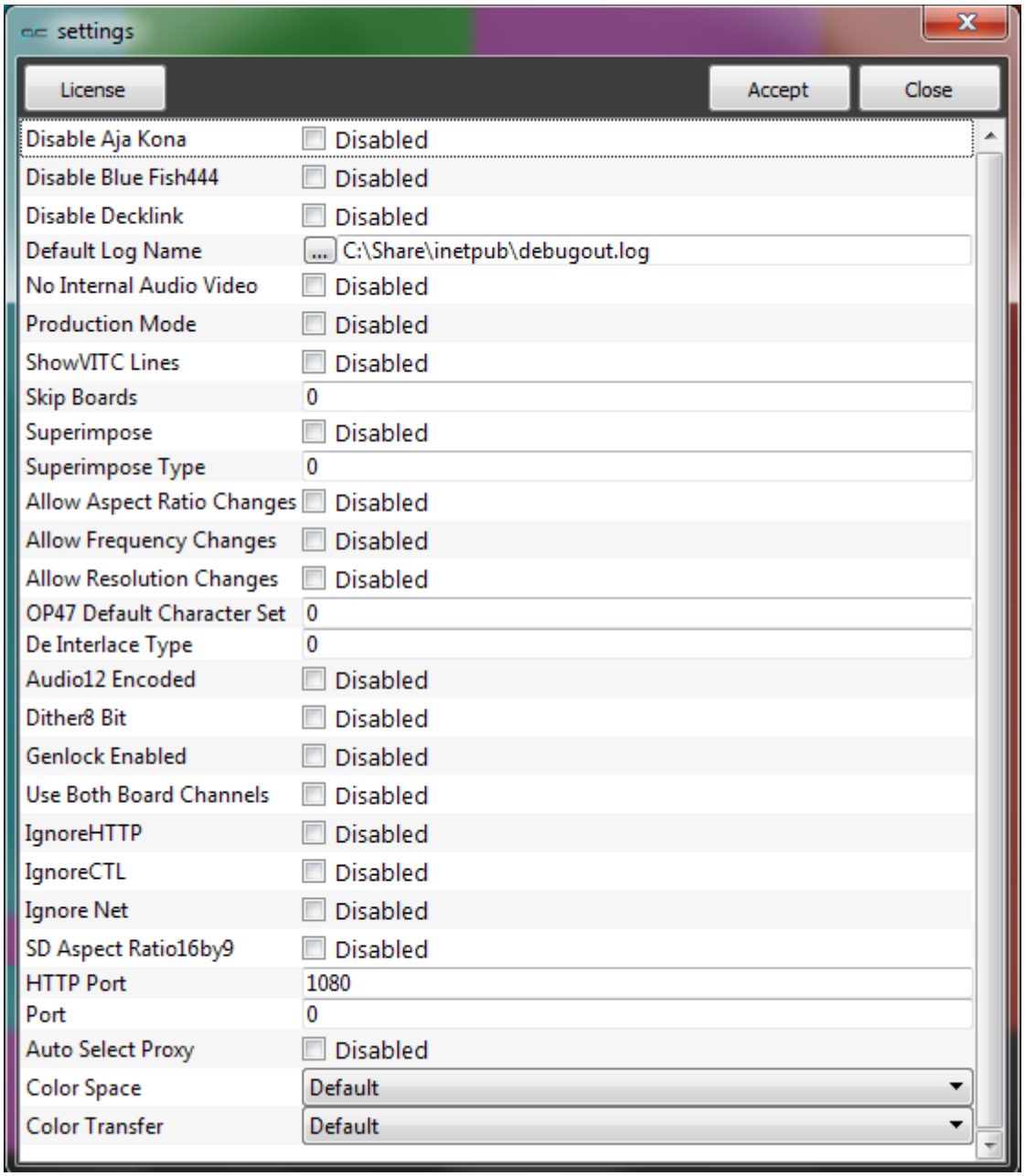
Once the user has entered the network address into the URL field, pressing the **OK** button loads the stream for viewing.

Close Media

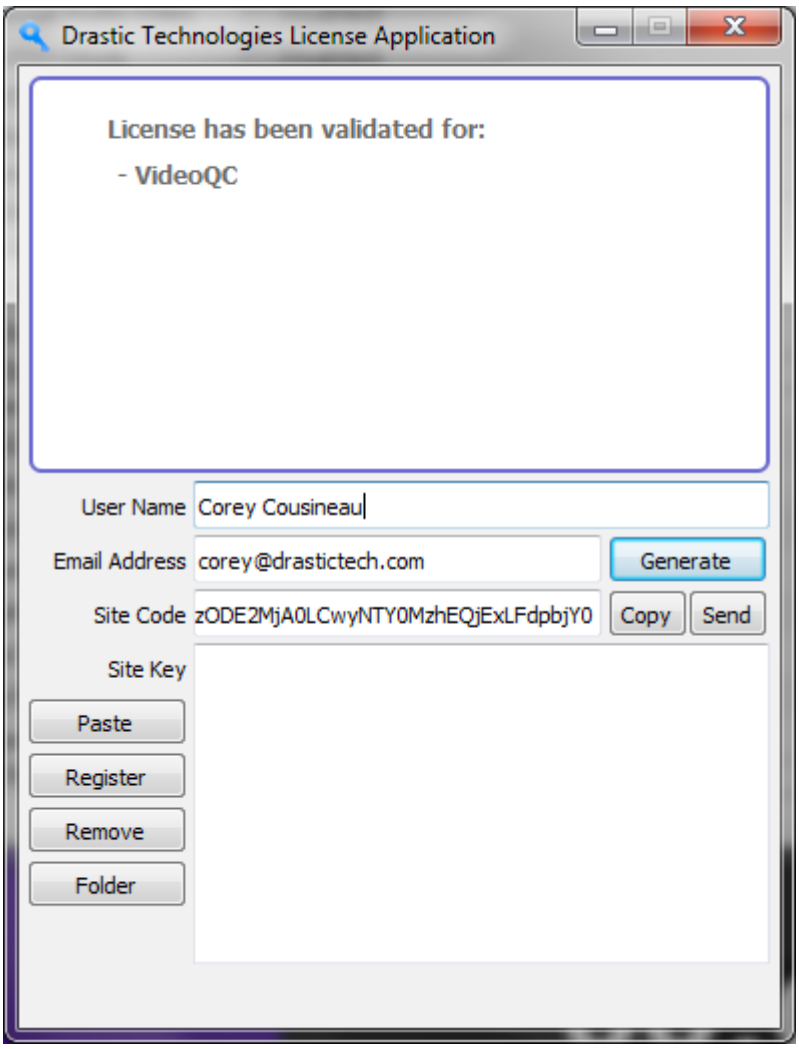
Close the current file

Settings

settings Open the **Settings** window



License
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.

Accept – Press the Accept button to accept any changes that have been made, and close the Settings window.
Close – Press the Close button to close the Settings window without changing the current setting.
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
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 timecode and user bits will be displayed/burned into the video
Superimpose Type – there are 3 layouts for video burn in/overlay available
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

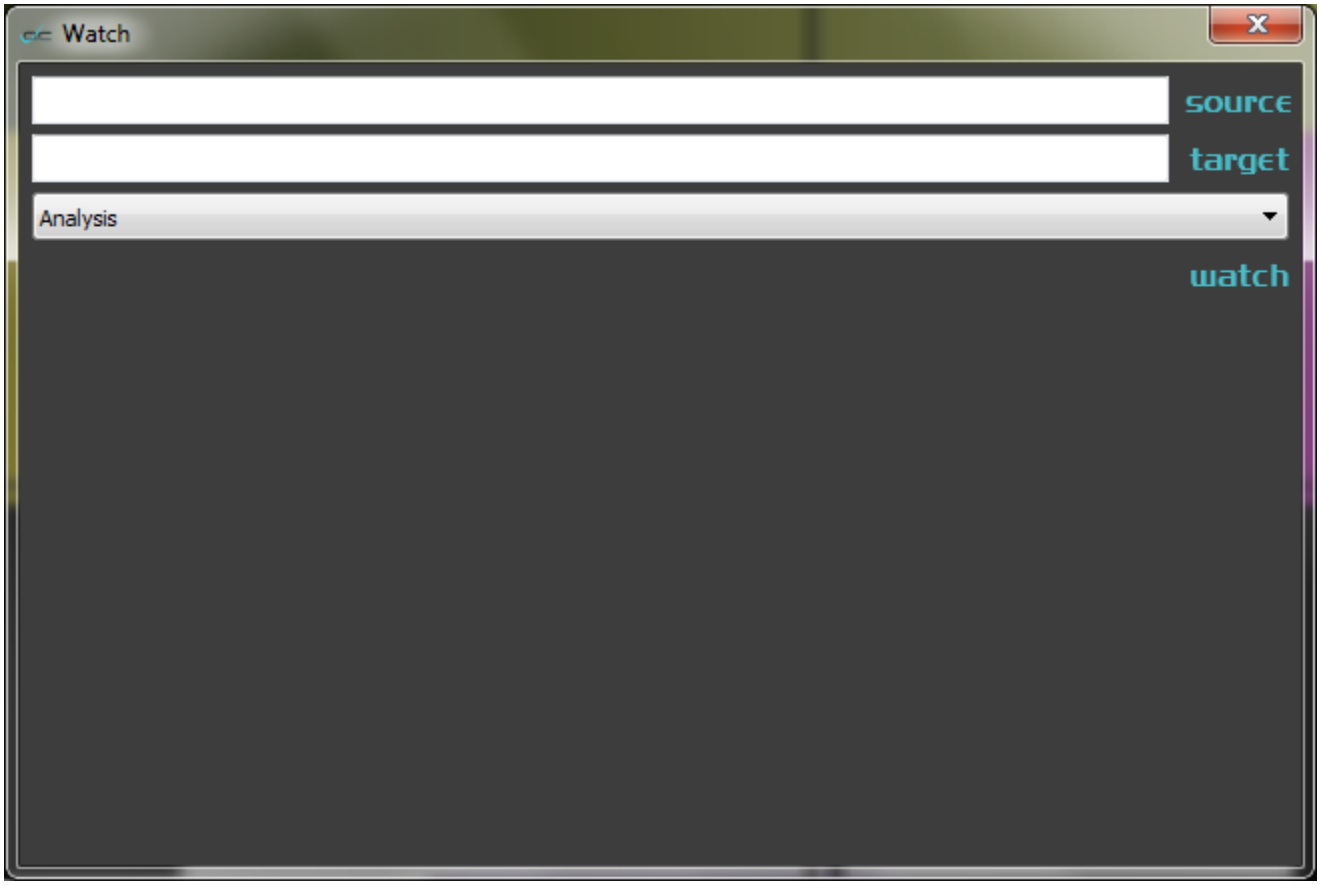
De-interlace Type – When working with interlaced material, the display on the progressive VGA monitor:

- 0 – default handling
- 1 – disable processing, show interlace on progressive
- 2 – discard one field
- 3 – duplicate one field
- 4 – duplicate the non dominant field
- 5 – blend the two fields

    - 6 – process for motion detect de interlaced
    - 7 – split the fields, upper and lower

Audio 1/2 Encoded – should be set if using Dolby encoded audio on the first pair of channels
Dither 8 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
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 16:9 – 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 then 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
Color Transfer – select standard of HDR-10/ST-2084 transfer characteristics for 4K/QHD signals

Watch



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

Source – enter a known video source stream location
Target – enter the target destination for the file created by the action selected in the Action pulldown menu.
The **Action** pulldown menu offers the following options:

- **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.

Advanced/Basic

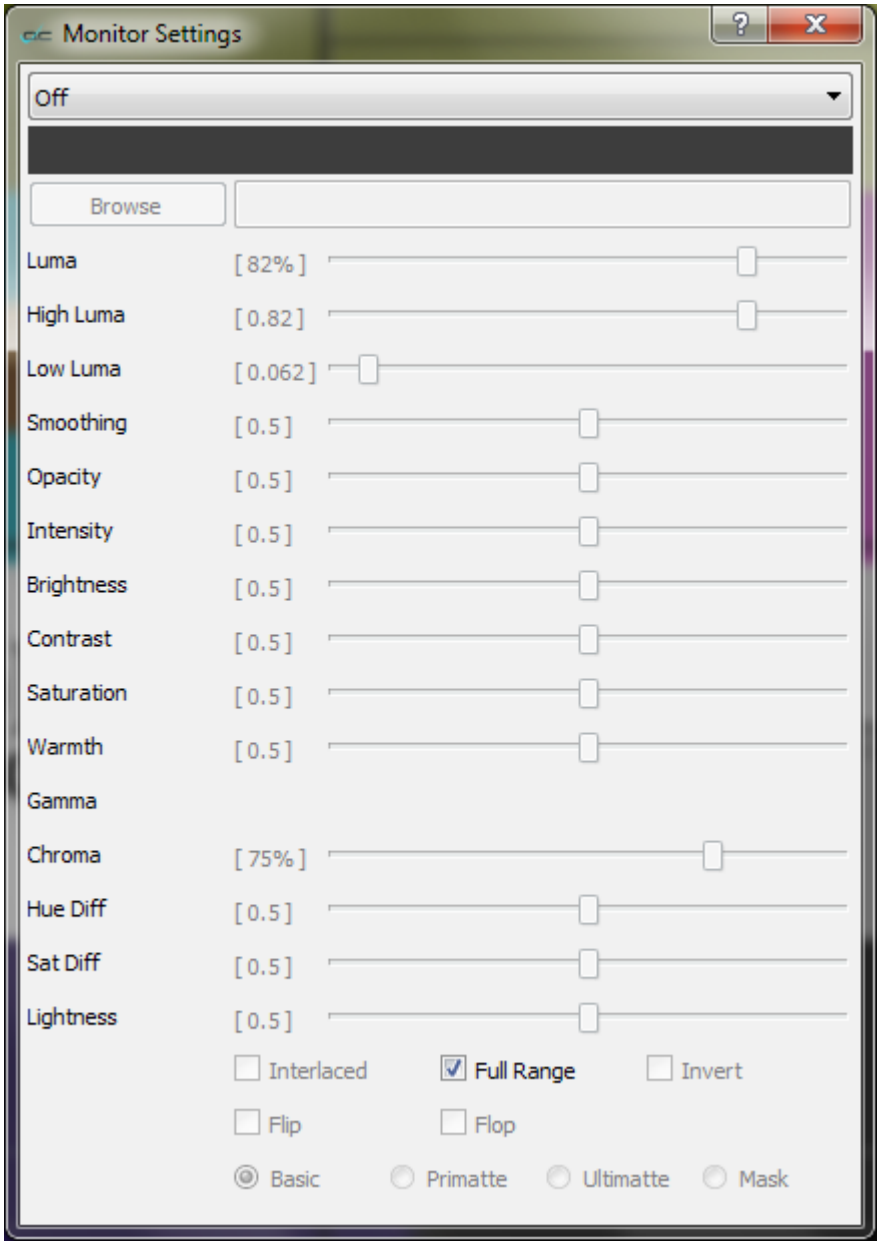
a toggle switch, which switches between displaying the basic controls along the bottom of the GUI, or displaying the advanced controls.

Basic Transport Controls - Provides a set of controls for playback/output. The user also may right click on the transport controls to switch between Basic and Advanced display. The Basic mode provides reverse, pause and play controls. There are reduced time code and audio displays. The volume control and position control are displayed to their right.

Advanced Transport Controls - The Advanced mode provide a larger set of controls and displays. The Open Media, Full screen toggle and the Lock/unlock are removed. Playback controls include fast reverse, reverse, five seconds back, 1 frame back, pause, stop, play, one frame ahead, five seconds ahead, and fast forward. The position slider and volume control are moved to the playback controls section. Video standard, time code, playback mode, playback speed, LTC time code, VITC time code, and track info (duration, size, frame rate, codec, and audio parameters) are displayed. The audio meters are increased in size.

Display

Opens the Monitor Settings window, which allows the user to fine tune their display settings.



The pulldown menu at the top offers the following options:

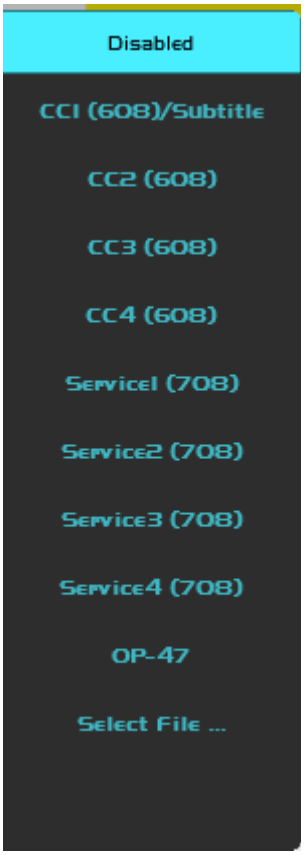
Luma Only – display only the luminance portion of the video
Red Only – display only the red portion of the video
Green Only – display only the green portion of the video
Blue Only – display only the blue portion of the video
Zebra Luma – display the video in zebra luma mode
Zebra Chroma – display the video in zebra chroma mode
Clipping – display the portions of the video which are clipping
Edge Difference – display the portions of the video where edges are detected
Focus Assist – magnify the area in focus

Flip Flop -
Show Alpha – show the alpha portion of the selected source stream
False Color – show the stream in false color

Color Selector – in Focus Assist mode, click to bring up the color selector.
Browse button
Luma slider
High Luma slider
Low Luma slider
Smoothing slider
Opacity slider
Intensity slider
Brightness slider
Contrast slider
Saturation slider
Warmth slider
Gamma (unpopulated)
Chroma slider
Hue Diff slider
Sat Diff slider
Lightness slider
Interlaced checkbox
Full Range checkbox
Invert checkbox
Flip checkbox
Flop checkbox
Basic
Primatte
Ultimatte
Mask

Captions

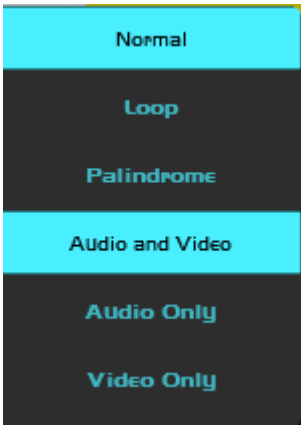
Opens the Captions pullout menu, to select between the available types of closed captions, or to browse to a closed caption file to open. Whichever closed caption type is selected will be rendered on the VGA display.



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 first service in 708
Service3 (708) – the first service in 708
Service4 (708) – the first 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.

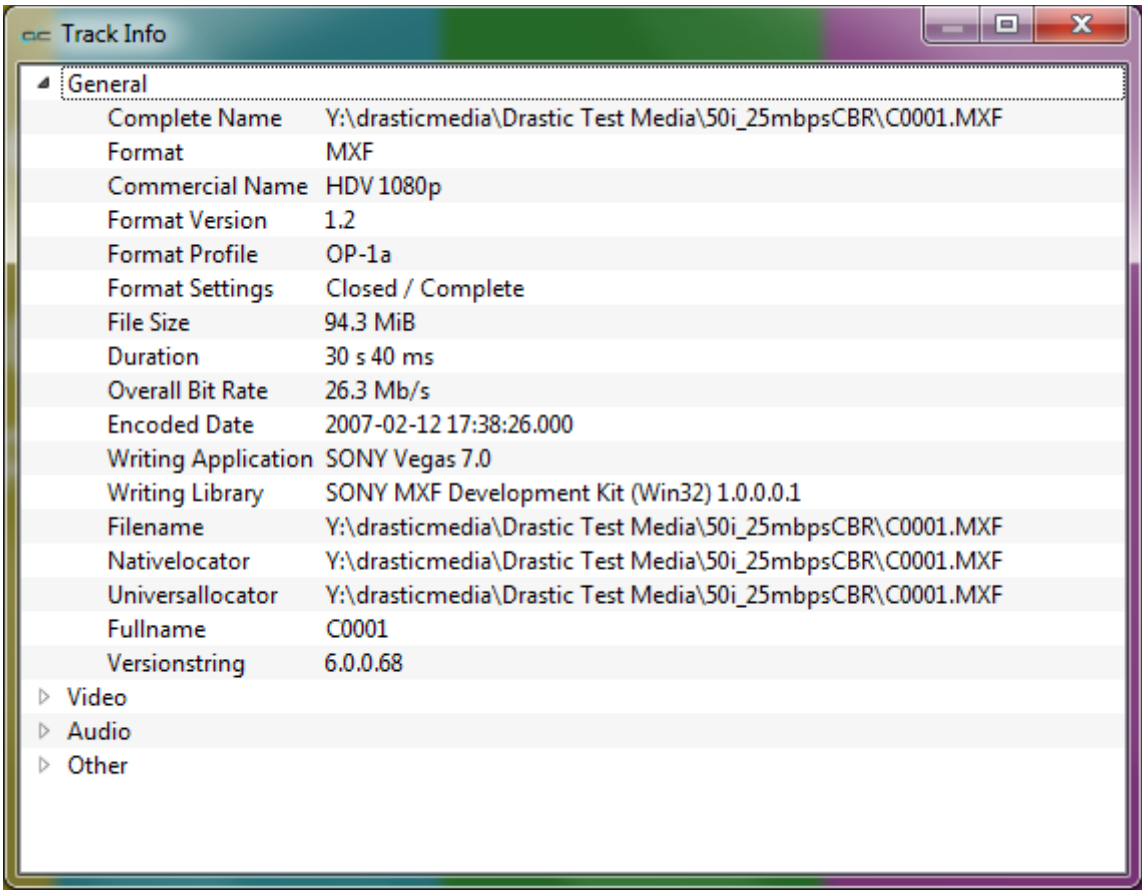


- **Normal** – standard playback
- **Loop** – continue playing from the beginning when the end is reached
- **Palindrome** – play forwards from the start and then backwards from the end
- **Audio and Video** – play both audio and video
- **Audio Only** – play the audio, but not the video
- **Video Only** – play the video, but not the audio

Track Info

opens the **Track Info** window, which displays information about the video, the audio, the computer system, and a comprehensive metadata display.

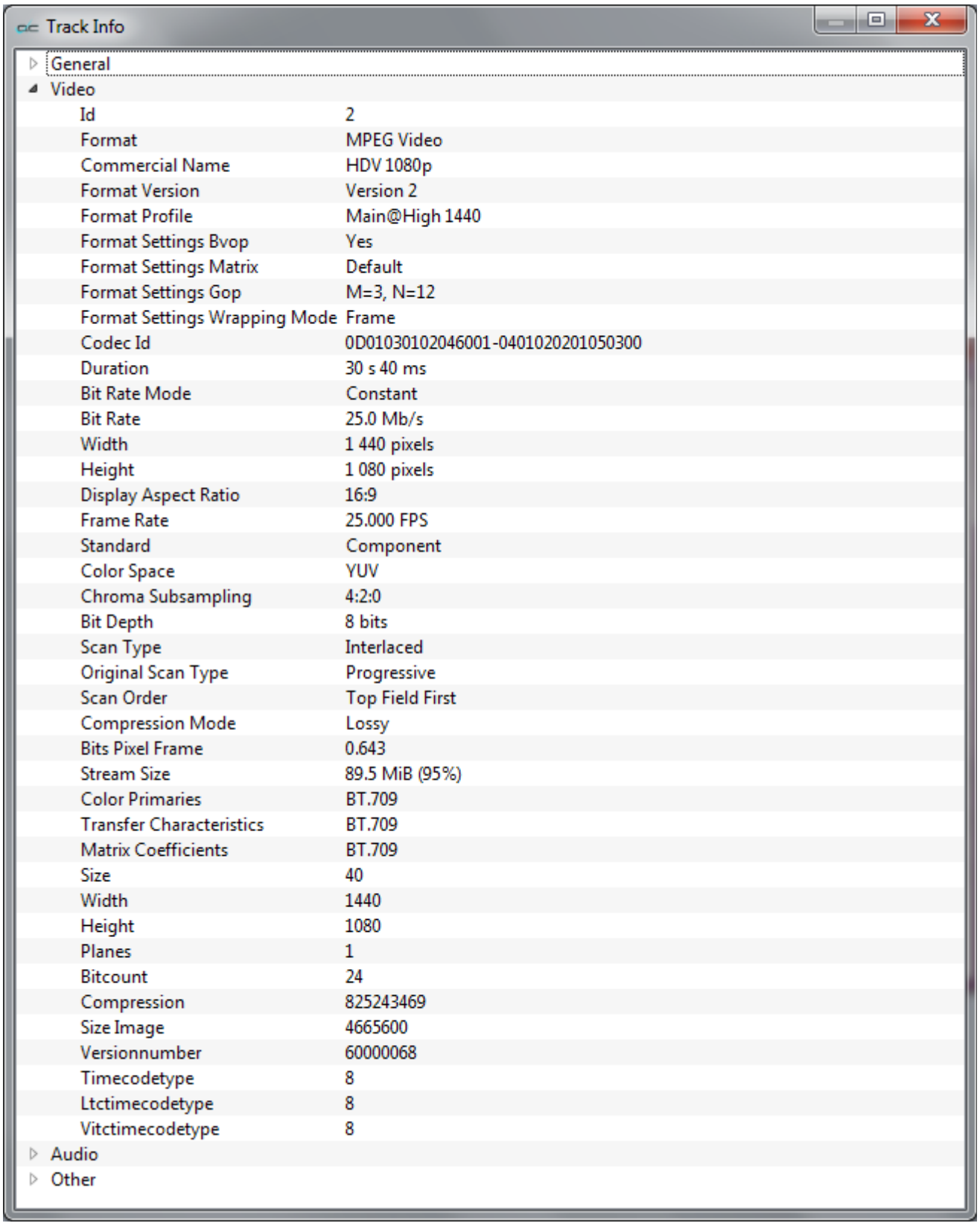
Track Info – General



The General tab displays the following:

- Complete name (file path and file name)
- Format
- Commercial Name
- Format Version
- Format Profile
- Format Settings
- File Size
- Duration (seconds and milliseconds)
- Overall Bit Rate (Mb/s)
- Encoded Date
- Writing Application
- Writing Library
- File Name
- Native Locator
- Universal Locator
- Full Name
- Version String

Track Info – Video

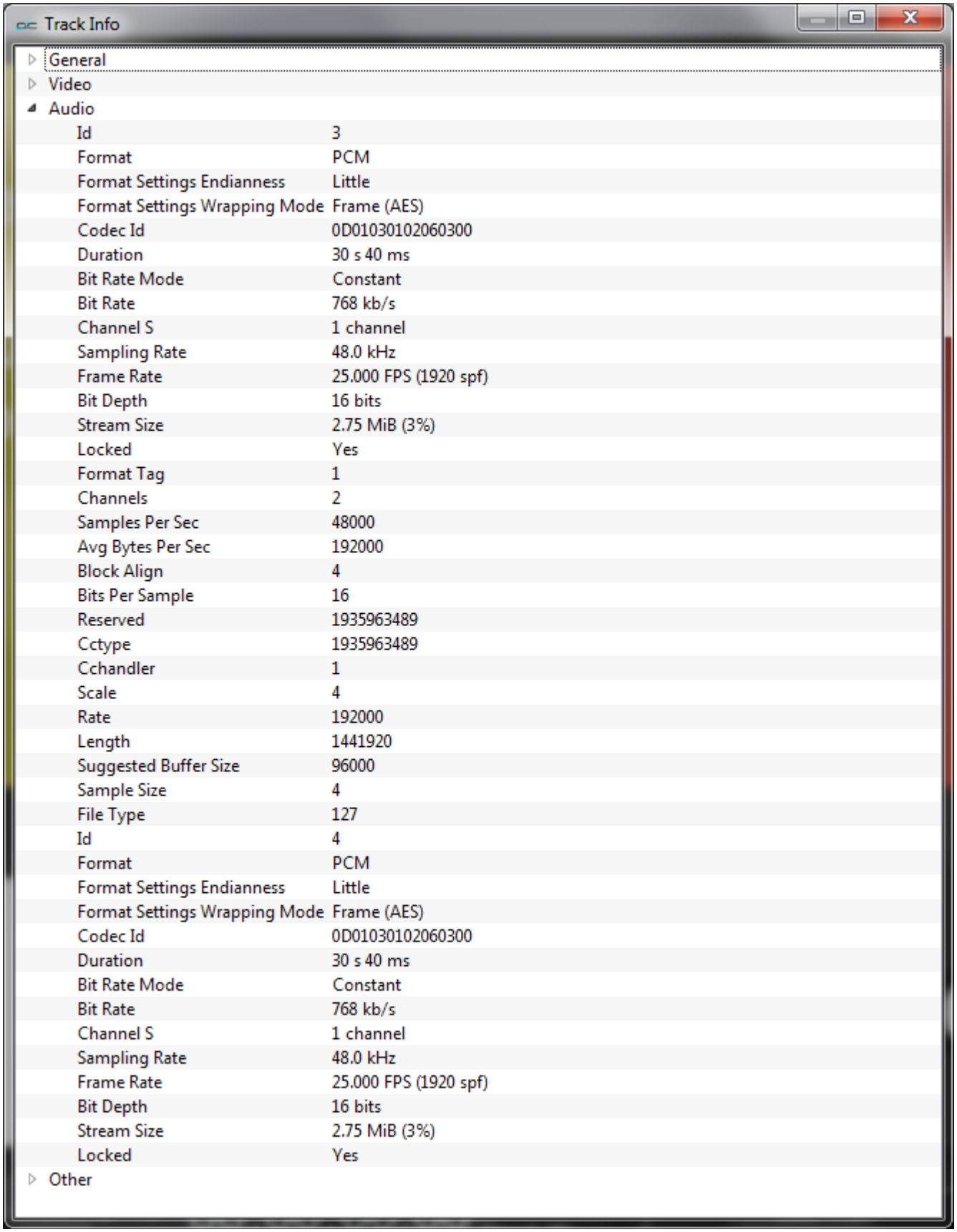


The Video tab displays the following:

- ID

- Format
- Commercial Name
- Format Version
- Format Profile
- Format Settings Bvop
- Format Setting Gop
- Format Settings Wrapping Mode
- Codec ID
- Duration
- Bit Rate Mode
- Bit Rate
- Width (pixels)
- Height (pixels)
- Display Aspect Ratio
- Frame Rate
- Standard
- Color Space
- Chroma Subsampling
- Bit Depth
- Scan Type
- Original Scan Type
- Scan Order
- Compression Mode
- Bits Pixel Frame
- Stream Size
- Color Primaries
- Transfer Characteristics
- Matrix Coefficients
- Size
- Width
- Height
- Planes
- Bit Count
- Compression
- Size Image
- Version Number
- Time Code Type
- LTC Time Code Type
- VITC Time Code Type

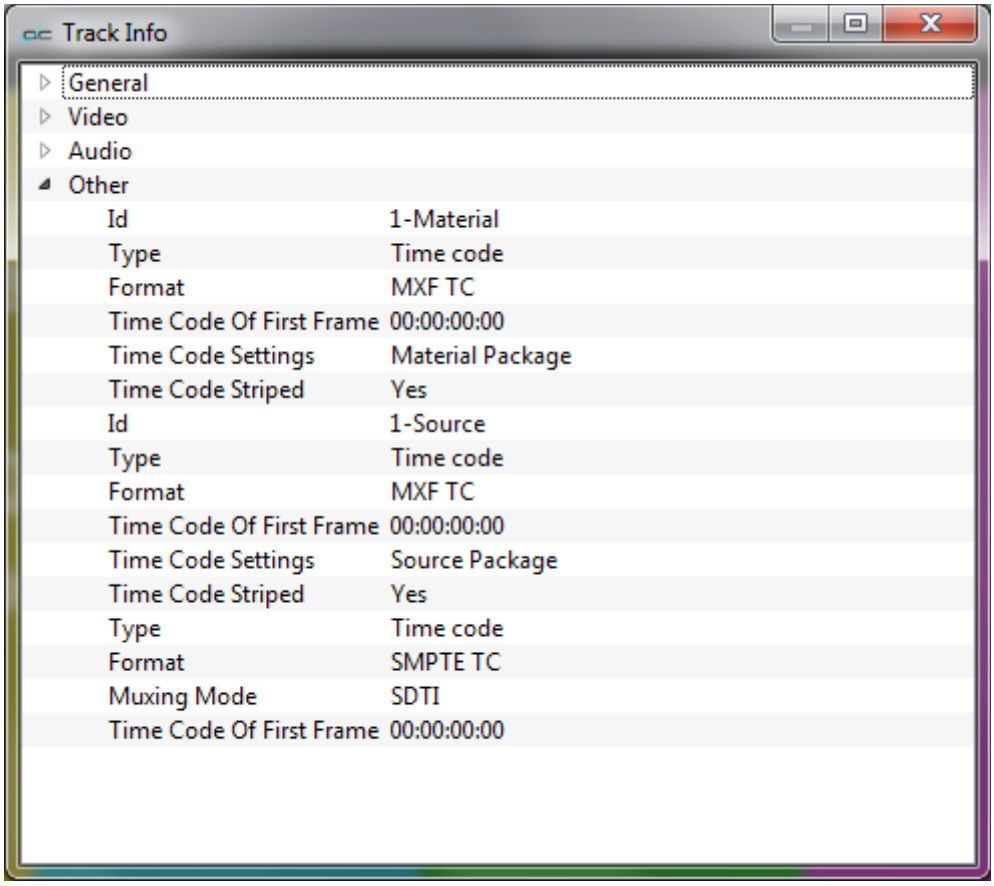
Track Info – Audio



The Audio tab displays the following:

- ID
- Format
- Format Settings Endianness
- Format Settings Wrapping Mode
- Codec ID
- Bit Rate Mode
- Bit Rate
- Channel S
- Sampling Rate
- Frame Rate
- Bit Depth
- Stream Size
- Locked
- Format Tag
- Channels
- Samples Per Second
- Average Bytes Per Second
- Block Align
- Bits Per Sample
- Reserved
- Closed Caption Type
- Closed Caption Handler
- Scale
- Rate
- Length
- Suggested Buffer Size
- Sample Size
- File Type
- ID
- Format
- Format Settings Endianness
- Format Settings Wrapping Mode
- Codec ID
- Bit Rate Mode
- Bit Rate
- Channel S
- Sampling Rate
- Frame Rate
- Bit Depth
- Stream Size
- Locked

Track Info – Other



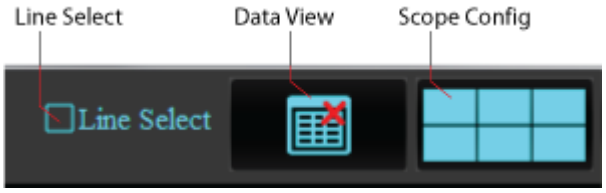
The Other tab displays the following:

- ID
- Type
- Format
- Time Code of First Frame
- Time Code Settings
- Time Code Striped
- ID
- Type
- Format
- Time Code of First Frame
- Time Code Settings
- Time Code Striped
- Type
- Format
- Muxing Mode
- Time Code of First Frame

Scope

opens the **Scope** window, which displays the video and/or audio scope or scopes that have been specified in the **Scope Config** window.

The Scope window



Along the top of the **Scope** window are the following controls:

Line Select – with the line select checkbox selected, a slider appears to allow the user to select which line will be highlighted in the Data View, or which line will be displayed in a particular video scope.

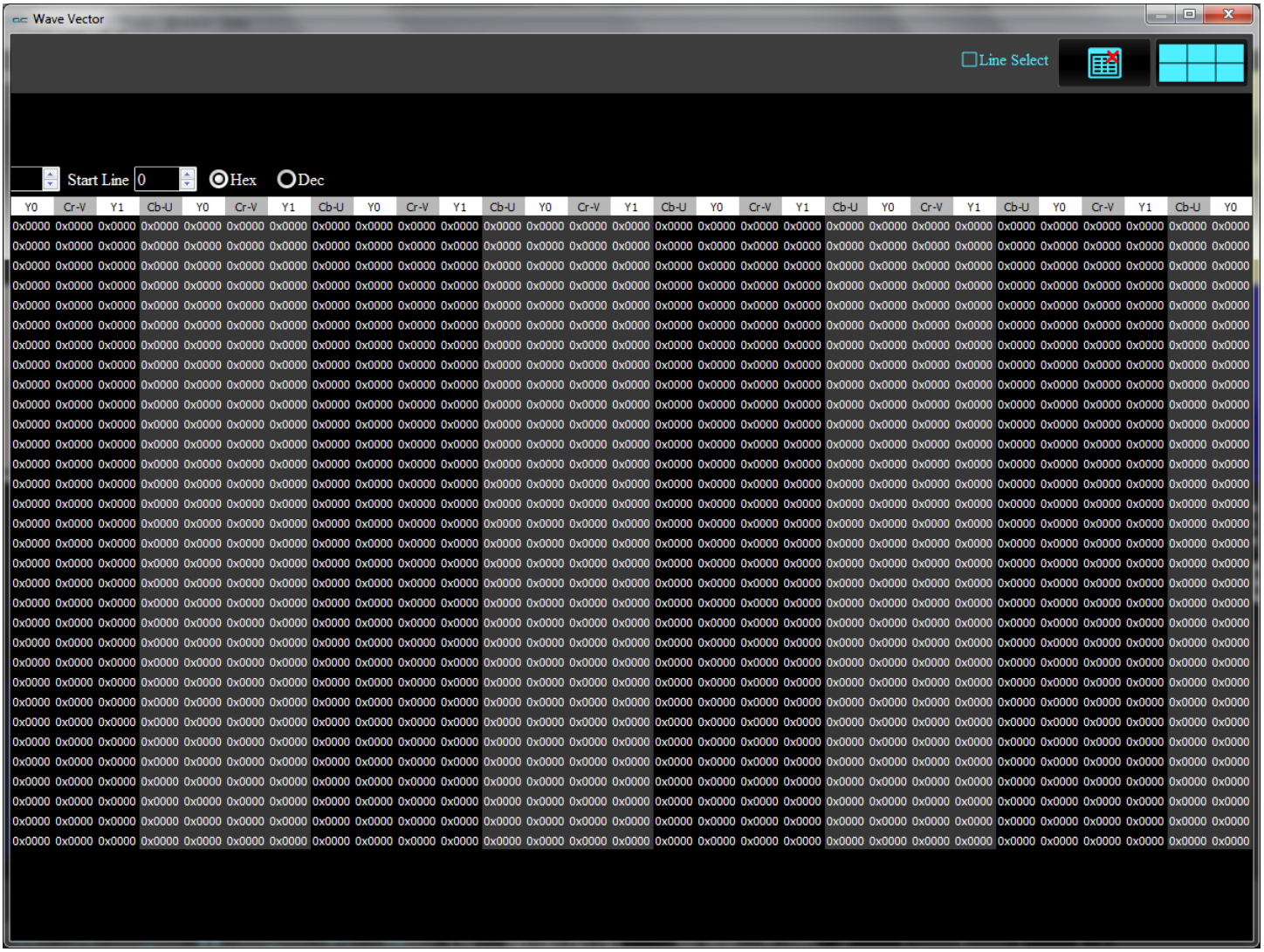
Data View – use this checkbox to display the data view.

Scope Config – click to open the **Scope Config** window, which offers controls to set up how many scopes are displayed, and to adjust the setup for each one.

Data View

To display the **Data View** in the scopes window, press the **Scope** button from the menu, to open the **Scope** window, and press the **Data view** icon along the top.

Here is the Data View.



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.

Vectorscope

To display the Vectorscope in a single scope layout, press the **Scope Config** button on the **Scope** window, and press the **Vector** button. To display the Vectorscope as one window of a multiple scope layout, press the **Scope Config** button on the **Scope** window, click on the desired layout, click on the window you want to use, and click on the **Vectorscope** button.

This opens the Vectorscope Setup section of the Scope Config window, which offers the following controls:

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.

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 Marker is displayed over the Vectorscope

Skin Tone Line checkbox - when selected, the Skin Tone Line is displayed over the Vectorscope

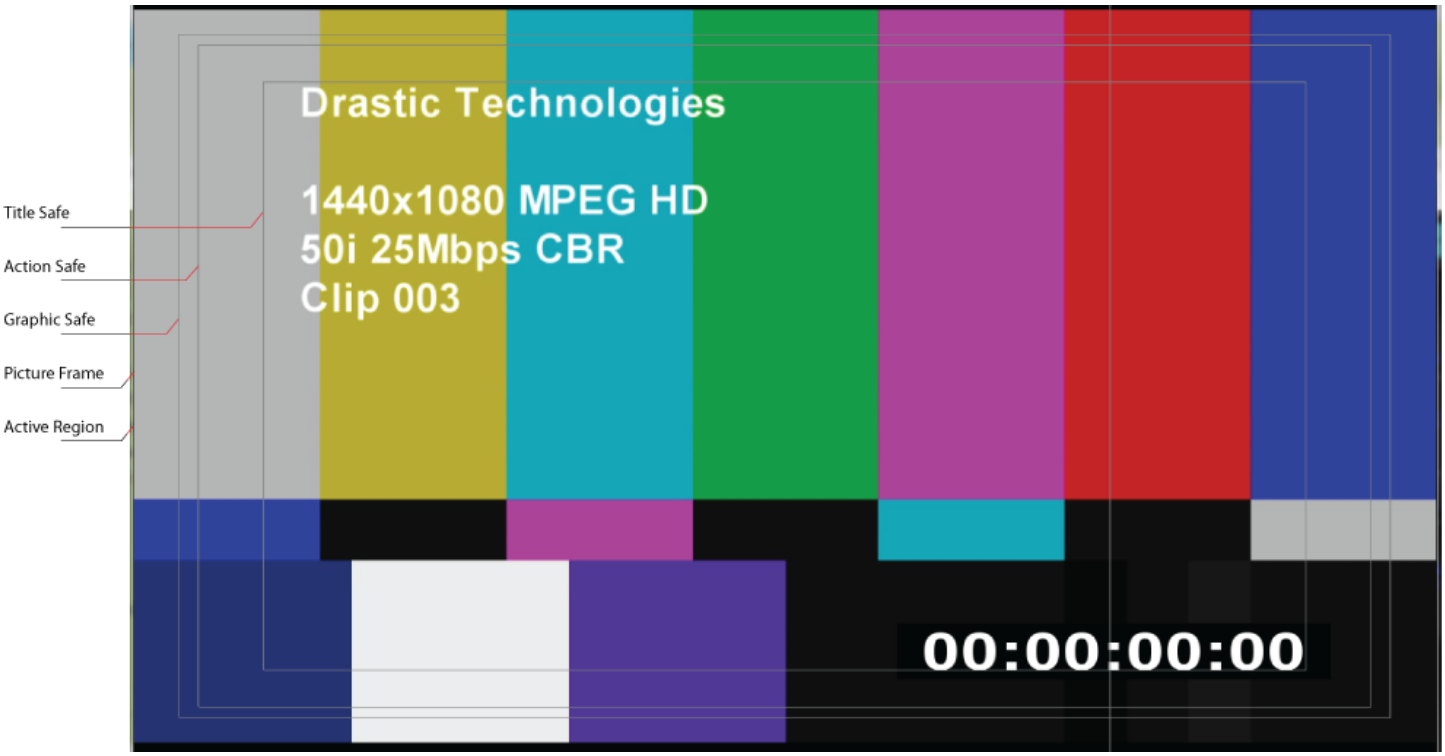
Connect checkbox - when selected, the outer points on the display are connected, useful for checking Color Bars.

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

Quality slider - Moving the Quality slider uses more or less of the data points to draw the video signal through the Vectorscope. The current setting is displayed above

the slider, as a percentage, 0% being rather poor indeed and 100% drawing every pixel. Where system resources are less capable, it may be useful to reduce the quality to allow the system to keep up.

Video Markers
Here are the video markers displayed over the picture.



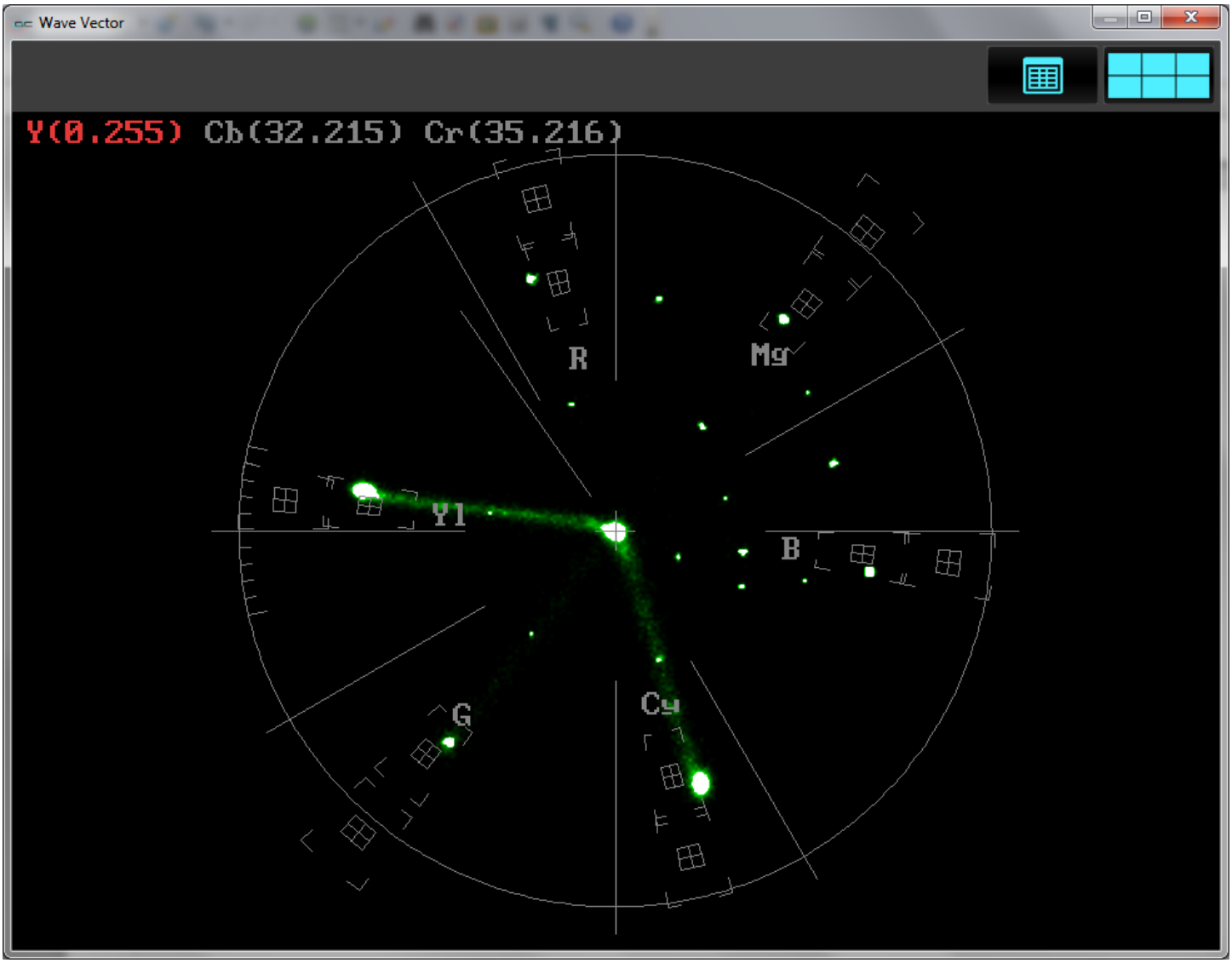
Action Safe checkbox - when selected, the Action Safe graticule is displayed over the video output.
Title Safe checkbox - when selected, the Title Safe graticule is displayed over the video output.
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.
Picture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

8 Bit Processing checkbox – when selected, 8 bit processing will be applied, otherwise it is 10 bit. 10 bit processing allows for finer analysis of the signal, and even detection of 8 bit signals in a 10 bit path. Smooth scopes on true 10 bit signals display every possible level in the signal. An 8 bit processing mode is also available in 10 bit mode, to allow for mixed mode scopes.
Graticule Brightness slider - Moving the Graticule Brightness slider adjusts the brightness of the graticule overlay, 0% providing no display and 100% being maximum brightness.
Mag control – use the control to set the level of magnification.
PanX control – use the control to set the pan to the left or right.

PanY control – use the control to set the pan up or down.

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

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.

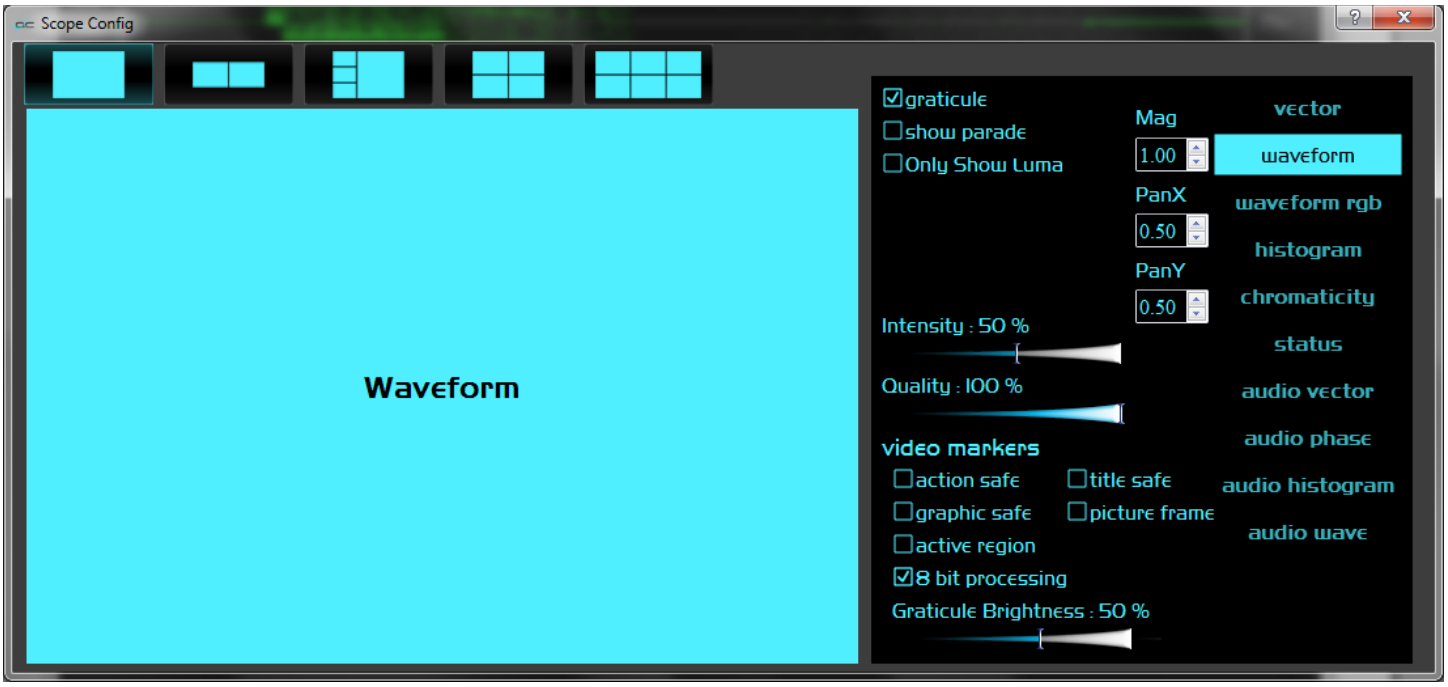
At all times a minimum and maximum value for each of the channels (Y, Cr and Cb) is displayed in 10 bit mode (0-1023). The color of the text for each channel indicates the following: in range (green), out of range but legal (yellow) and illegal/sync values (red).

For single link 8 and 10 bit YCbCr signals, 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 display the Waveform YCbCr in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Waveform** button. To display the Waveform YCbCr as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Waveform** button.

This opens the Waveform YCbCr Setup section of the Scope Config window, which offers the following controls:



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.

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

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

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.

Quality slider - Moving the Quality slider uses more or less of the data points to draw the video signal. The current setting is displayed above the slider, as a percentage, 0% being rather poor indeed and 100% drawing every pixel. Where system resources are less capable, it may be useful to reduce the quality to allow the system to keep up.

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.

8 Bit Processing checkbox – when selected, 8 bit processing will be applied, otherwise it is 10 bit. 10 bit processing allows for finer analysis of the signal, and even detection of 8 bit signals in a 10 bit path. Smooth scopes on true 10 bit signals display every possible level in the signal. An 8 bit processing mode is also available in 10 bit mode, to allow for mixed mode scopes.

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

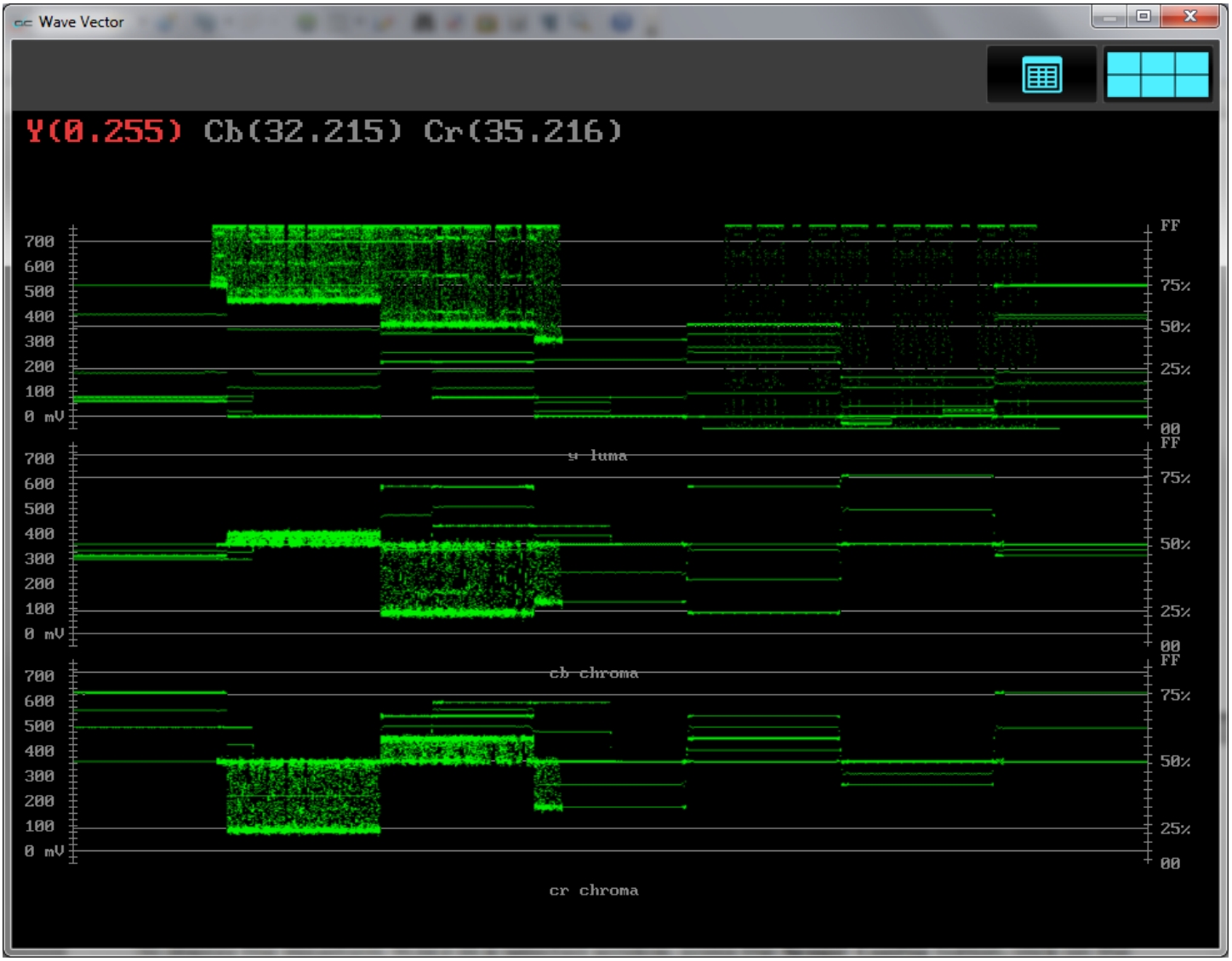
Mag control – use the control to set the level of magnification.

PanX control – use the control to set the pan to the left or right.

PanY control – use the control to set the pan up or down.

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

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.

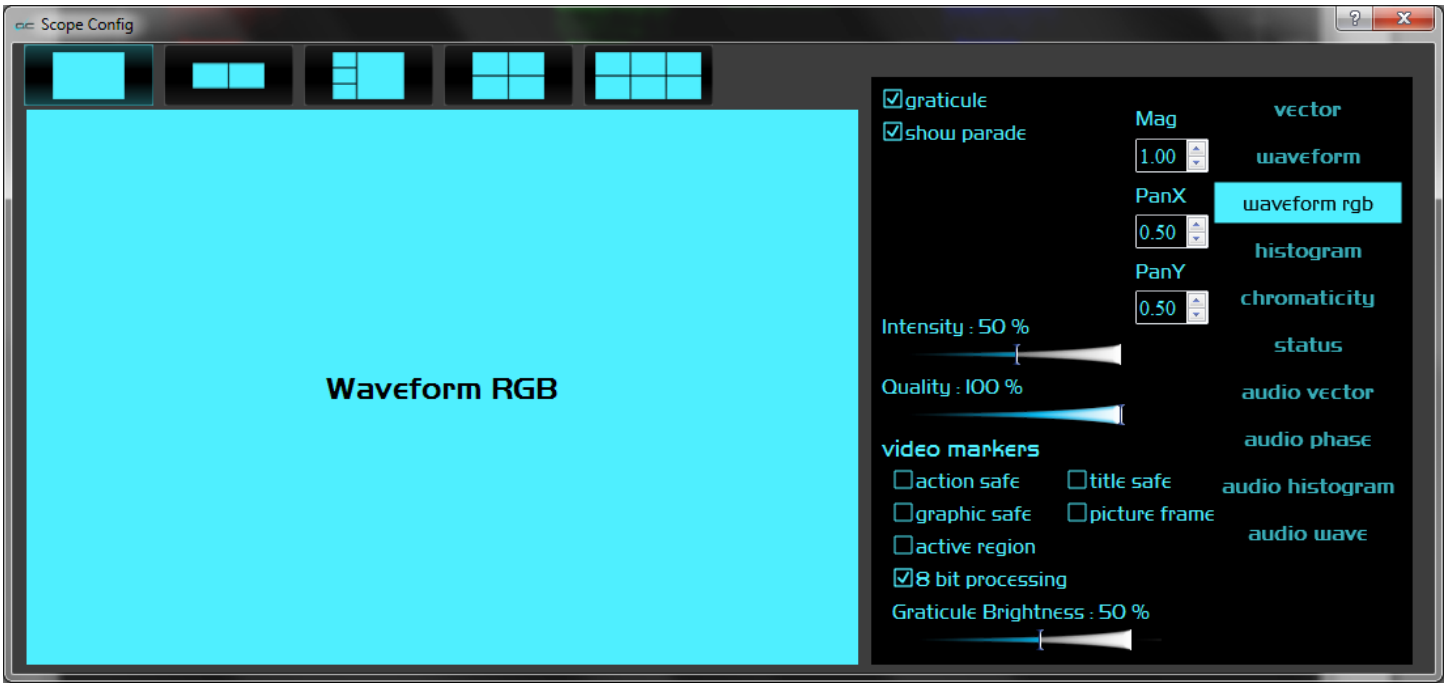
Critical for downstream color correction is the need to ensure proper luminance levels at the stage of initial capture, so any corrections will not muddy or wash out the signal information.

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 display the Waveform RGB in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Waveform RGB** button. To display the Waveform RGB as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Waveform RGB** button.

This opens the Waveform RGB Setup section of the Scope Config window, which offers the following controls:



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.

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

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.

Quality slider - Moving the Quality slider uses more or less of the data points to draw the video signal display. The current setting is shown above the slider, as a percentage, 0% being rather poor indeed and 100% drawing every pixel. Where system resources are less capable, it may be useful to reduce the quality to allow the system to keep up.

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.

8 Bit Processing checkbox – when selected, 8 bit processing will be applied, otherwise it is 10 bit. 10 bit processing allows for finer analysis of the signal, and even detection of 8 bit signals in a 10 bit path. Smooth scopes on true 10 bit signals display every possible level in the signal. An 8 bit processing mode is also available in 10 bit mode, to allow for mixed mode scopes.

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

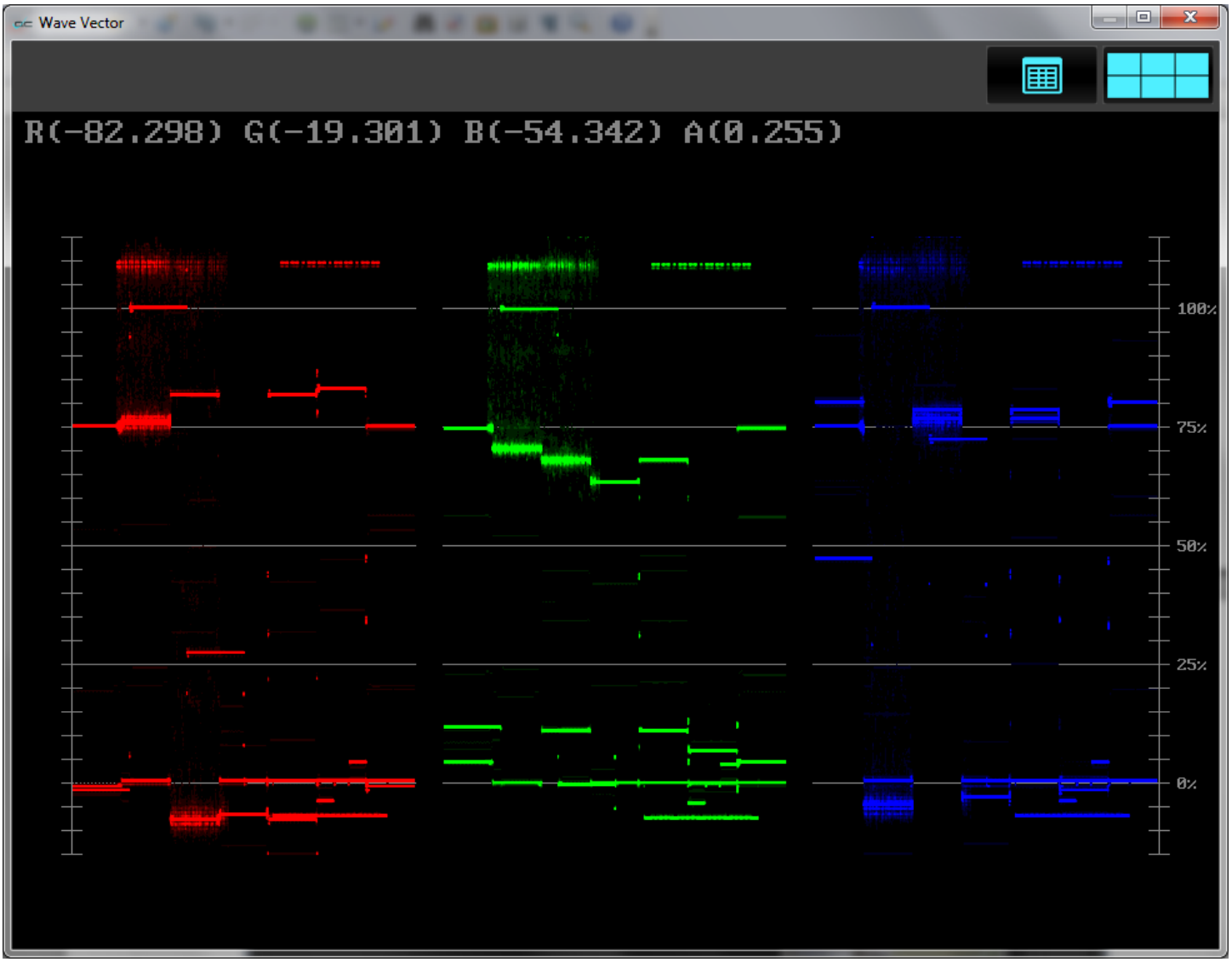
Mag control – use the control to set the level of magnification.

PanX control – use the control to set the pan to the left or right.

PanY control – use the control to set the pan up or down.

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

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 signal.

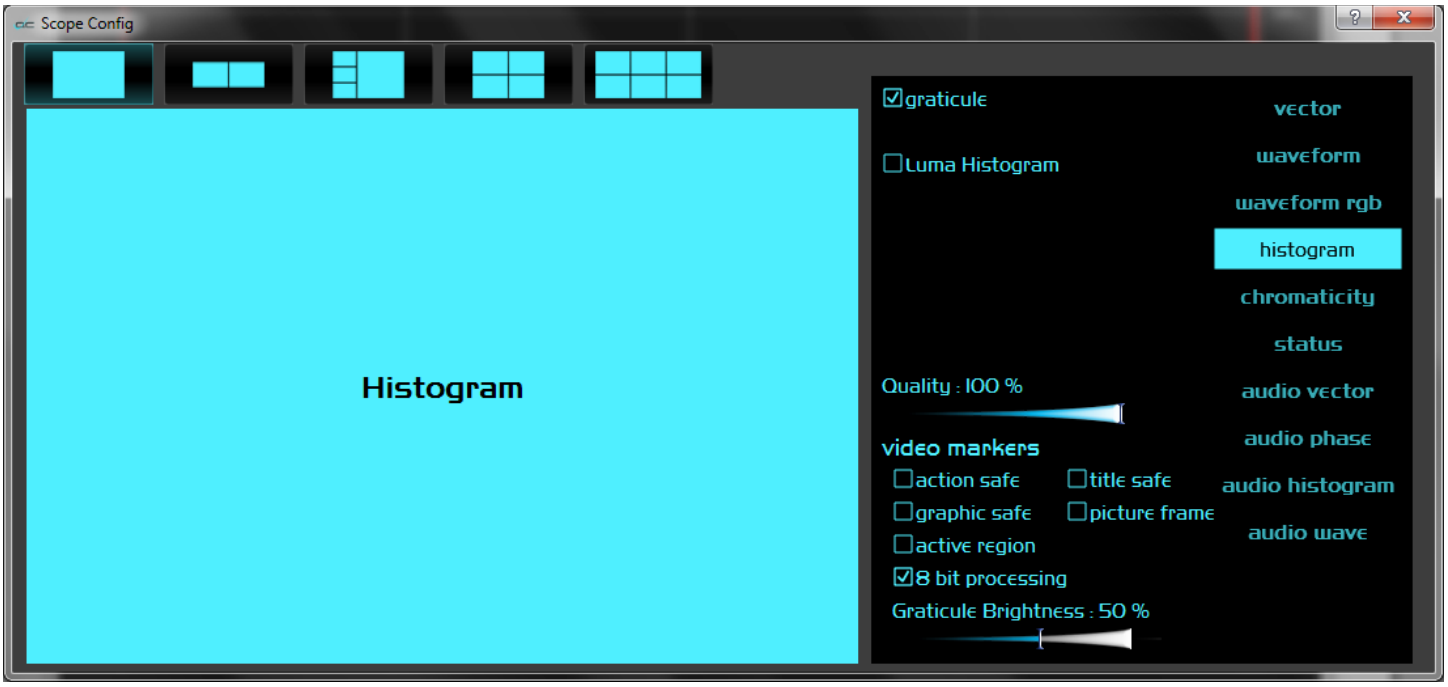
At all times a minimum and maximum value for each of the channels (R, G and B and A) is displayed in 10 bit mode (0-1023).

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

Histogram

To display the Histogram in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Histogram** button. To display the Histogram as one window of a multiple scope layout, press the **Scope Config** button on the **Scope** window, click on the desired layout, click on the window you want to use, and click on the **Histograms** button.

This opens the Histogram Setup section of the Scope Config window, which offers the following controls:



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.

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

Quality slider - Moving the Quality slider uses more or less of the data points to draw the video signal display. The current setting is shown above the slider, as a percentage, 0% being rather poor indeed and 100% drawing every pixel. Where system resources are less capable, it may be useful **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.

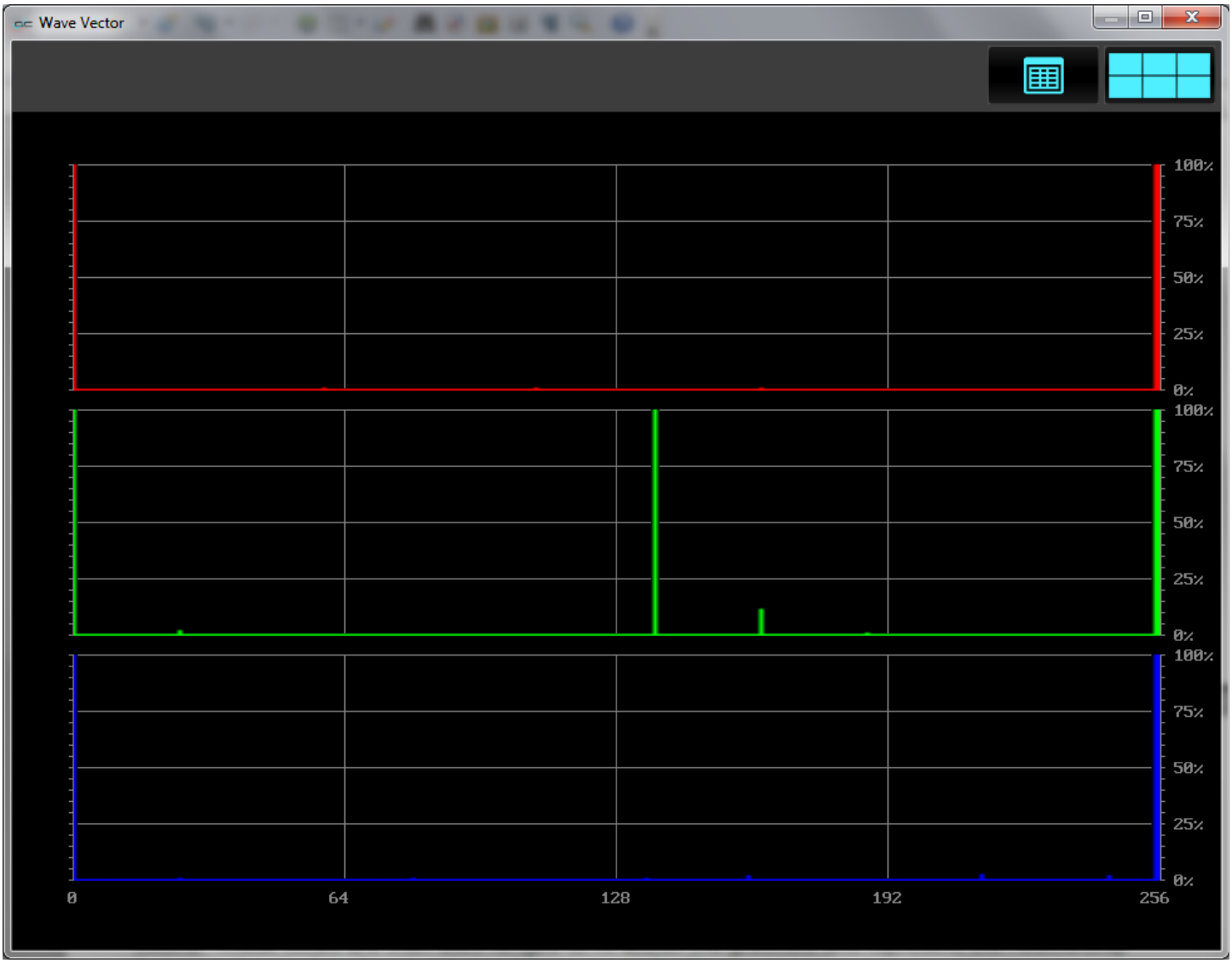
8 Bit Processing checkbox – when selected, 8 bit processing will be applied, otherwise it is 10 bit. 10 bit processing allows for finer analysis of the signal, and even

detection of 8 bit signals in a 10 bit path. Smooth scopes on true 10 bit signals display every possible level in the signal. An 8 bit processing mode is also available in 10 bit mode, to allow for mixed mode scopes.

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

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

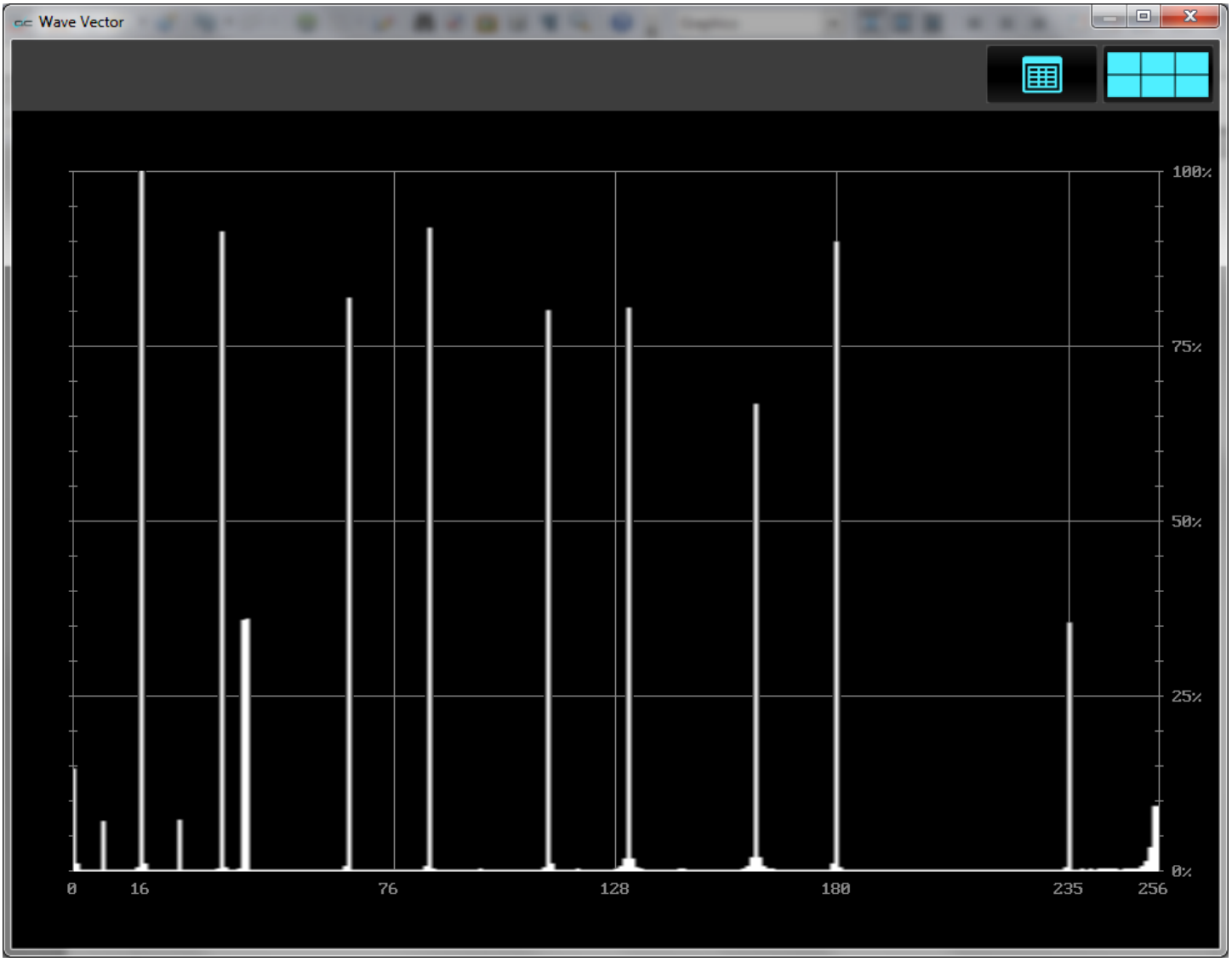
Here is the Histogram window in RGB mode.



The Histogram view shows the distribution of red, green and 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 1024 possible colors. These totals are then auto ranged to fit within the graticule and represent the relationship between the shades of each color and between each other.

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.

Here is the Histogram with Luma Histogram selected, displaying only luminance information.



Chromaticity

To display the Chromaticity in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Chromaticity** button. To display the Chromaticity as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Chromaticity** button.

This opens the Chromaticity Setup section of the Scope Config window, which offers the following controls:

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, inverts the black and white in the display. The color of the video within the CIE 1931 color display can be white over black, or black over white. The amount of a color will cause that dot to be scaled from the second color to the first.
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.

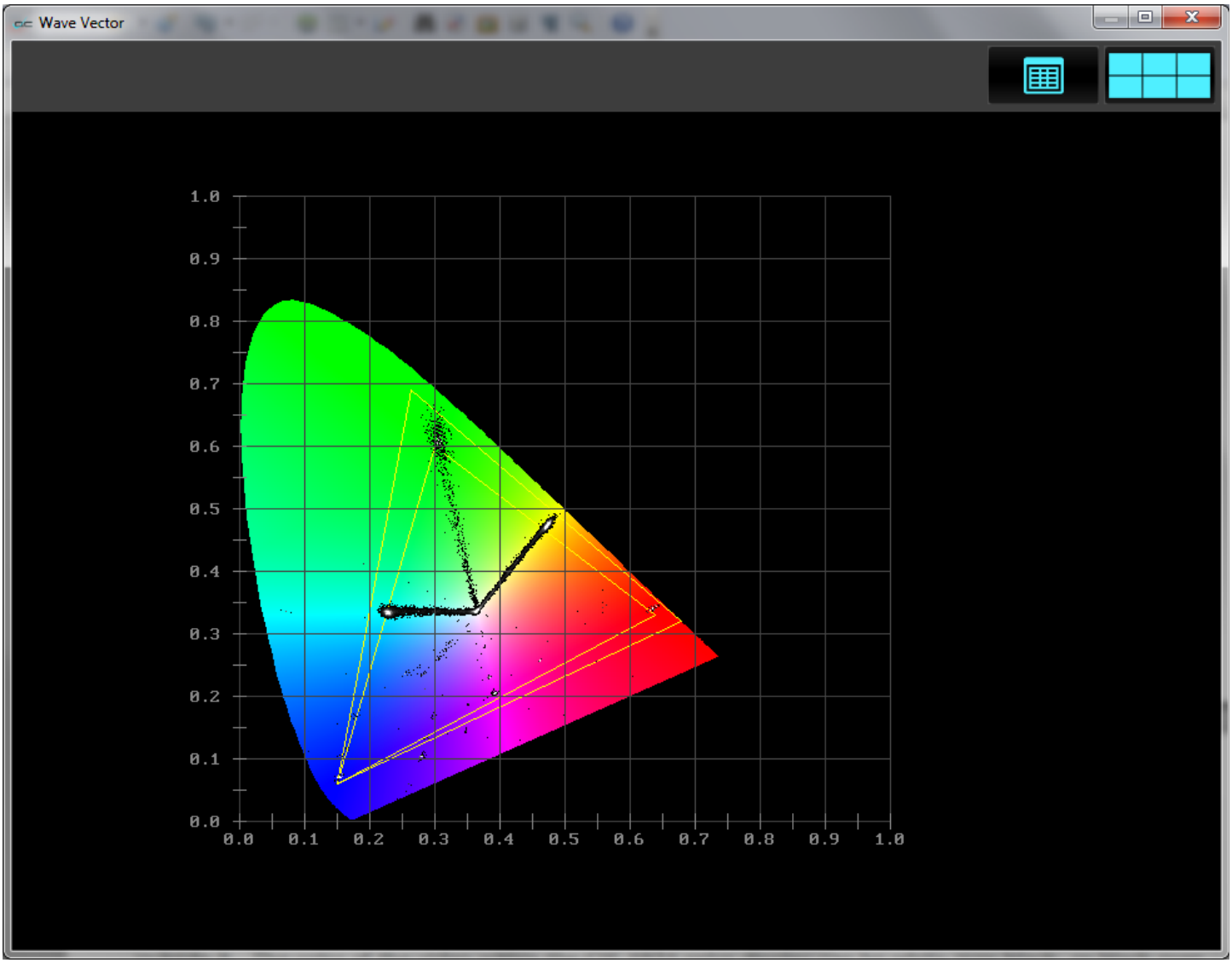
Active Region checkbox - when selected, the Active region graticule is displayed over the video output.

8 Bit Processing checkbox – when selected, 8 bit processing will be applied, otherwise it is 10 bit. 10 bit processing allows for finer analysis of the signal, and even detection of 8 bit signals in a 10 bit path. Smooth scopes on true 10 bit signals display every possible level in the signal. An 8 bit processing mode is also available in 10 bit mode, to allow for mixed mode scopes.

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

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

Here is the Chromaticity window.

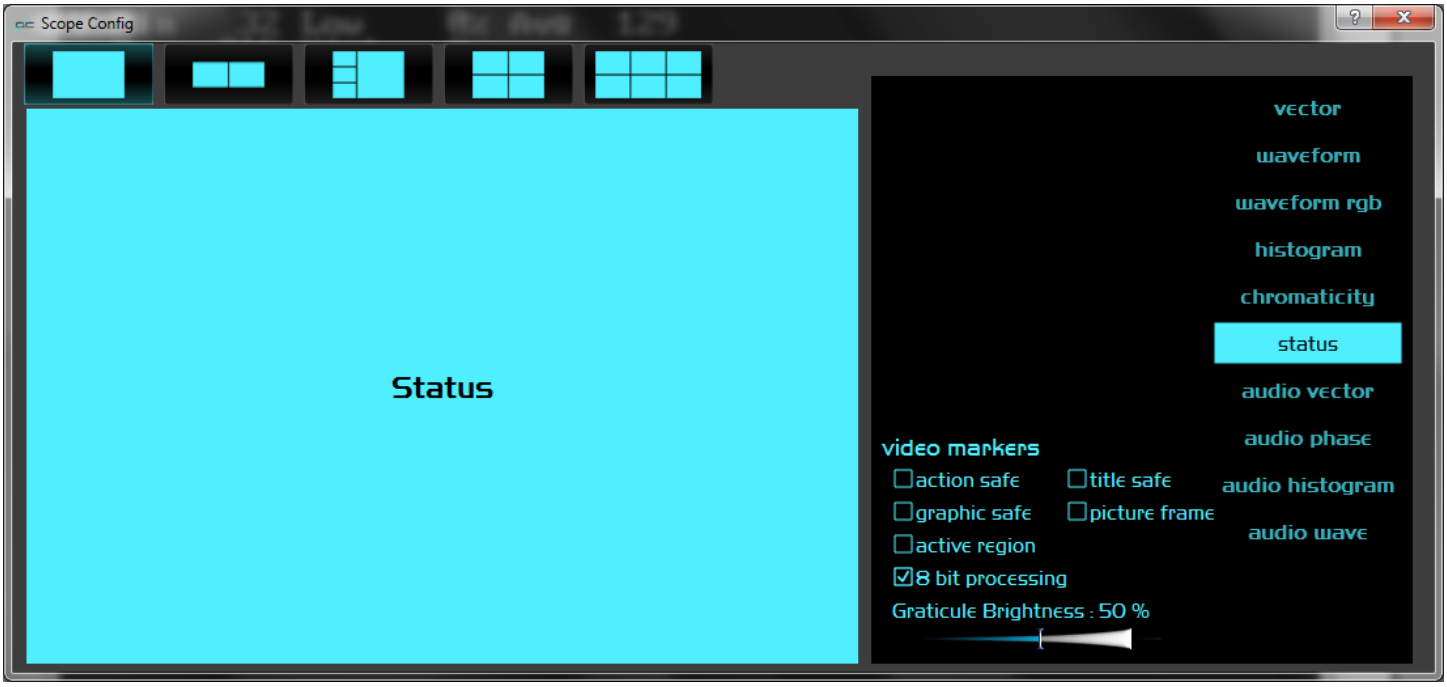


The Chromaticity scope provides a visual representation of the color in a video across all the colors of visible light. For a particular YCbCr range (BT.2020, P3, Rec.709, CCIR-601) a triangle can be superimposed. This will delineate the colors that fall within the acceptable range and those that are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

Status

To display the Status in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Status** button. To display the Status as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Status** button.

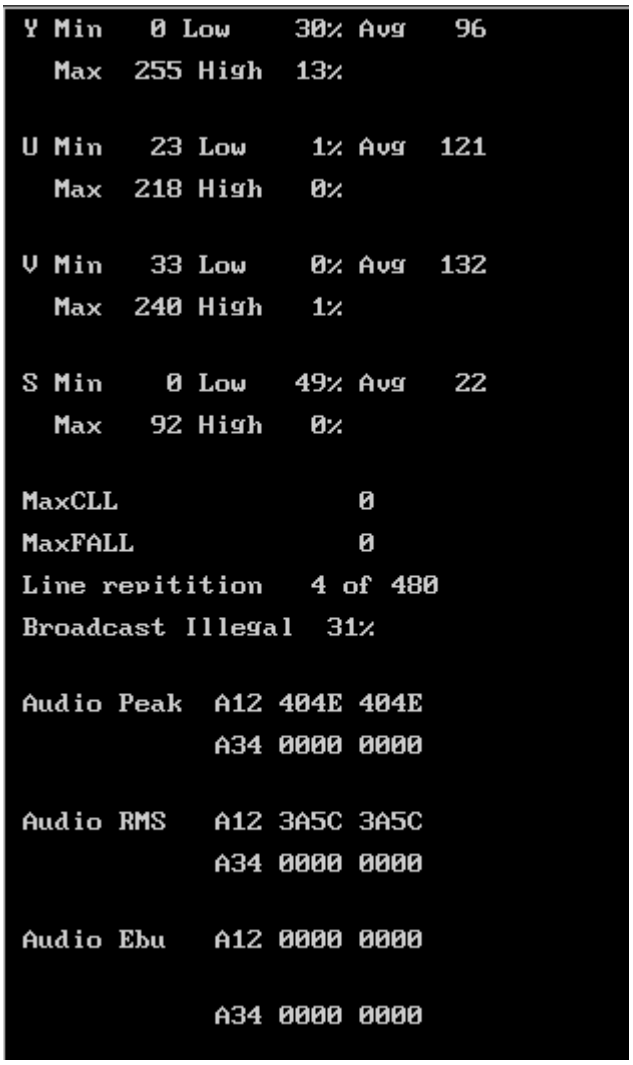
This opens the Status Setup section of the Scope Config window, which offers the following controls:



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.

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

Here is the Status window.



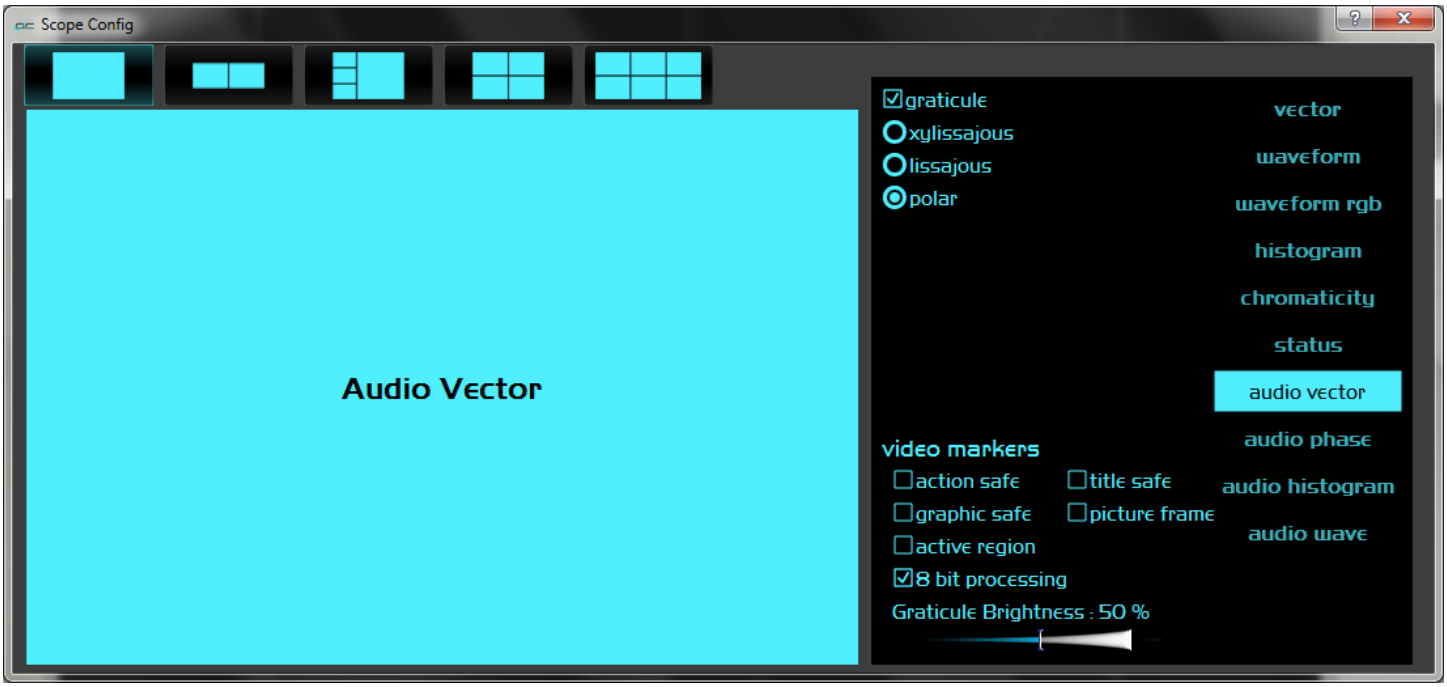
The Status window displays:

- Y: Minimum and Maximum, Low and High, and Average values
- U: Minimum and Maximum, Low and High, and Average values
- V: Minimum and Maximum, Low and High, and Average values
- S: Minimum and Maximum, Low and High, and Average values
- MaxCLL - Max Content Light Level which defines the luma of the brightest pixel
- MaxFALL - Max Frame-Average Light Level, or the highest frame average brightness within a given sequence
- Line repetition as the number of lines repeated against total lines
- Broadcast illegal in percentage
- Audio Peak per channel pair
- Audio RMS per channel pair
- Audio Ebu per channel pair

Audio Vector

To display the Audio Vectorscope in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Audio Vector** button. To display the Audio Vectorscope as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Audio Vectorscope** button.

This opens the Audio Vectorscope Setup section of the Scope Config window, which offers the following controls:



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.

Lissajous checkbox – when selected, displays the relative phase of the selected audio pair in Lissajous mode.

Polar checkbox – when selected, displays the relative phase of the selected audio pair in Polar mode.

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.

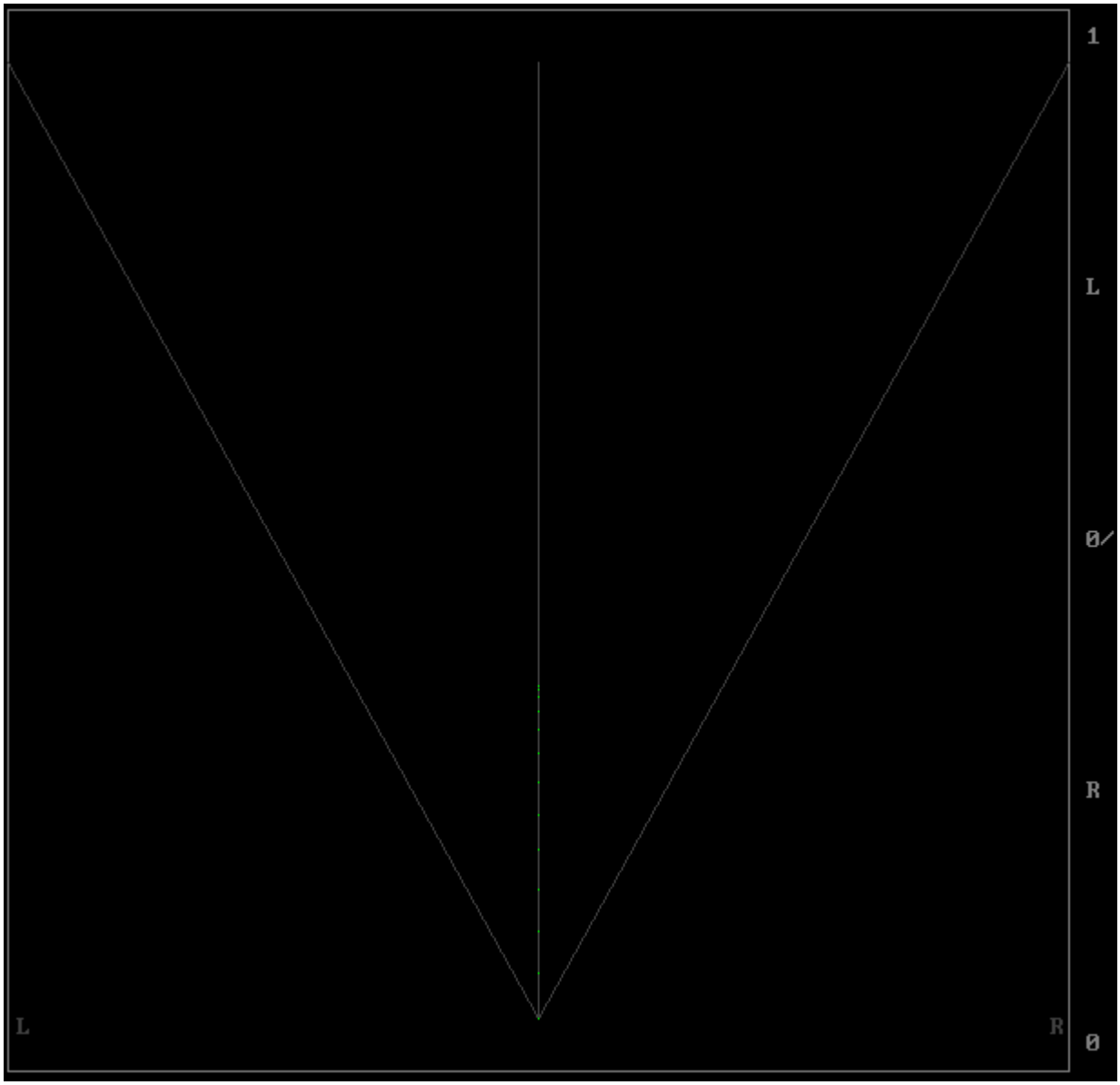
Picture Frame checkbox - when selected, the Picture Frame graticule is displayed over the video output.

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.

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

Here is the Audio Vector window.

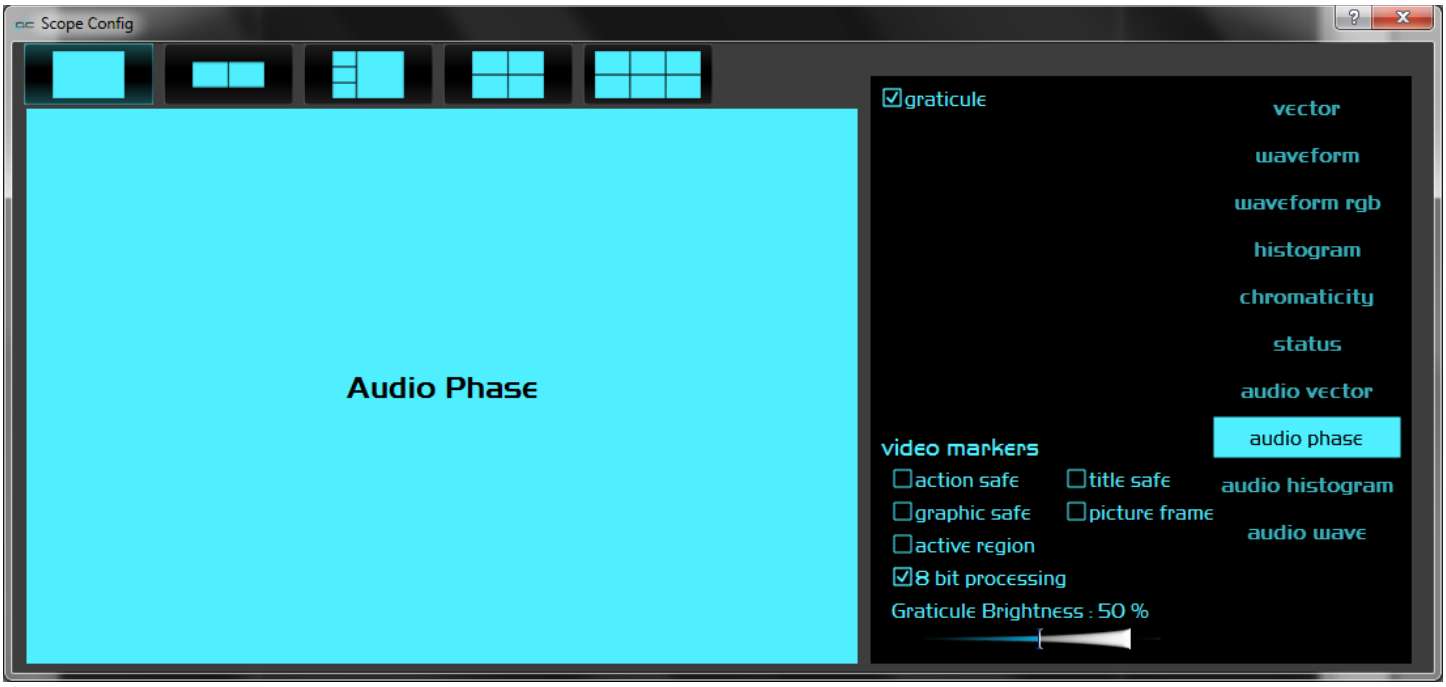


The audio vectorscope measures the difference between channels of a stereo pair. One channel drives the horizontal and the other the vertical deflection. This will show the relative phase of the two channels. This can be shown in Lissajous XY, Lissajous or Polar modes. Any pair may be selected in the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

Audio Phase

To display the Audio Phase in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Audio Phase** button. To display the Audio Phase as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Audio Phase** button.

This opens the Audio Phase Setup section of the Scope Config window, which offers the following controls:



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.

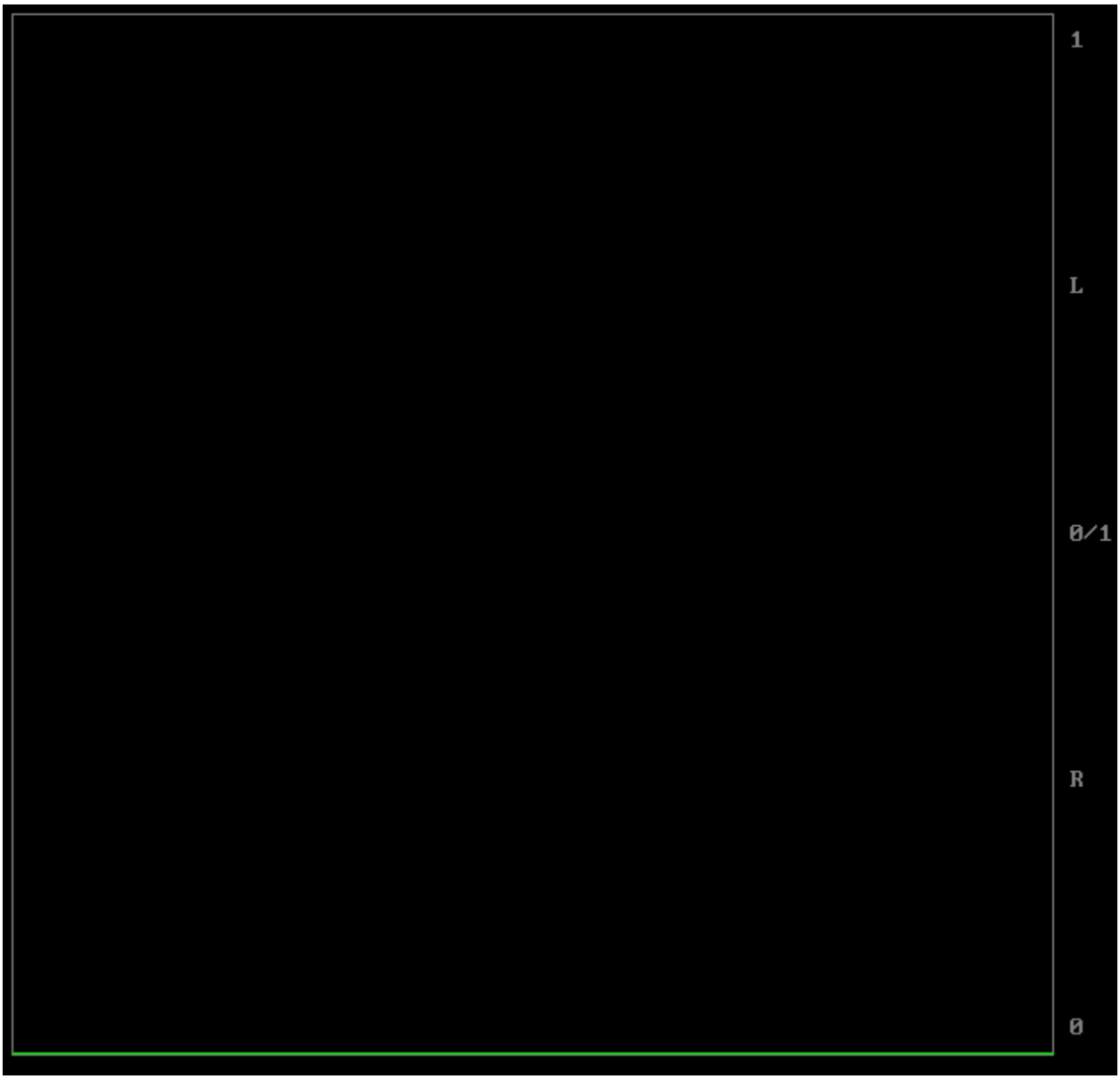
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.

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.

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 display the Audio Histogram in a single scope layout, press the **Scope Config** button on the **Scopes** window, and press the **Audio Histogram** button. To display the Audio Histogram as one window of a multiple scope layout, press the **Scope Config** button on the **Scopes** window, click on the desired layout, click on the window you want to use, and click on the **Audio Histogram** button.

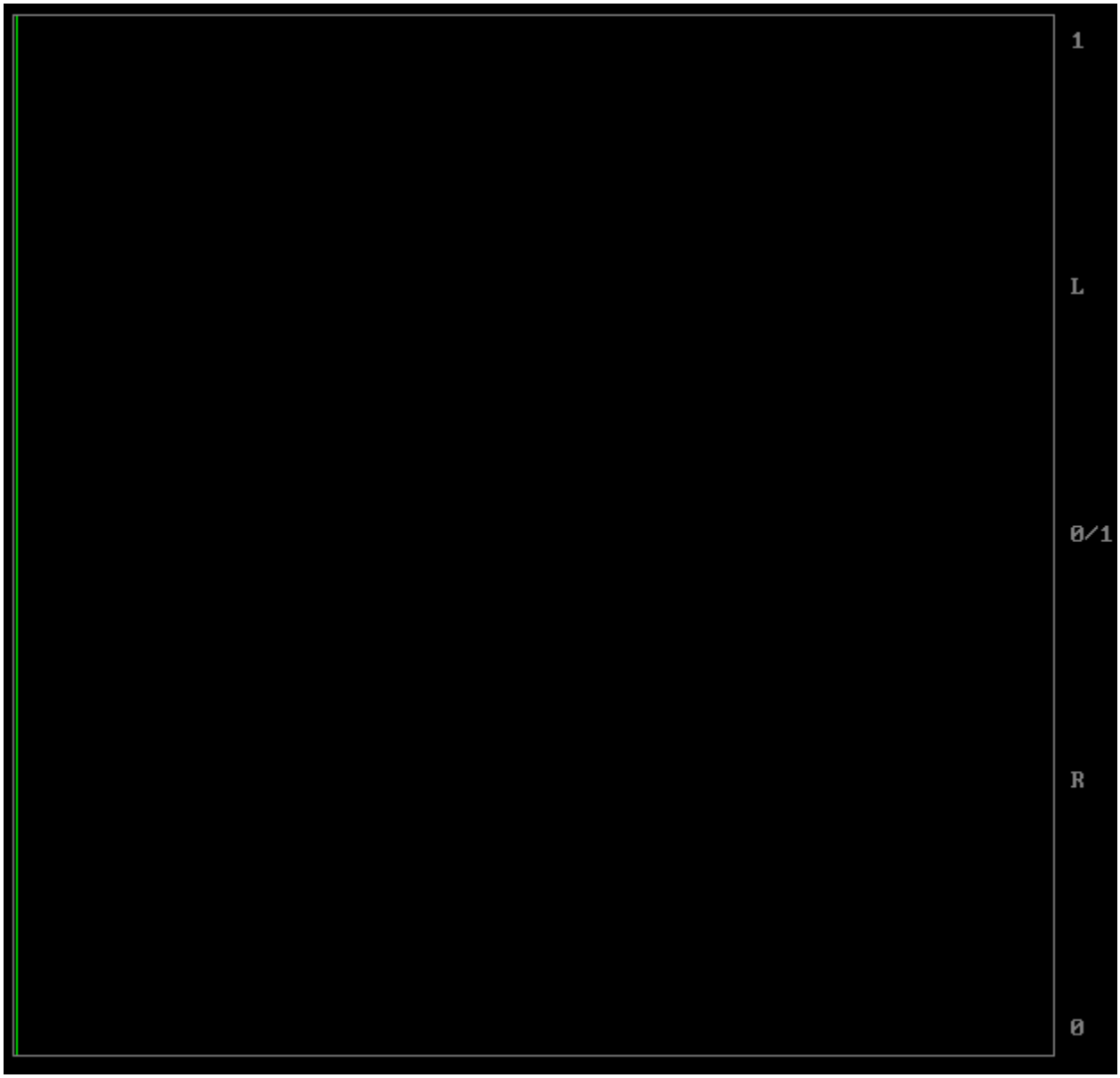
This opens the Audio Histogram Setup section of the Scope Config window, which offers the following controls:

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.

Here is the Audio Histogram window.

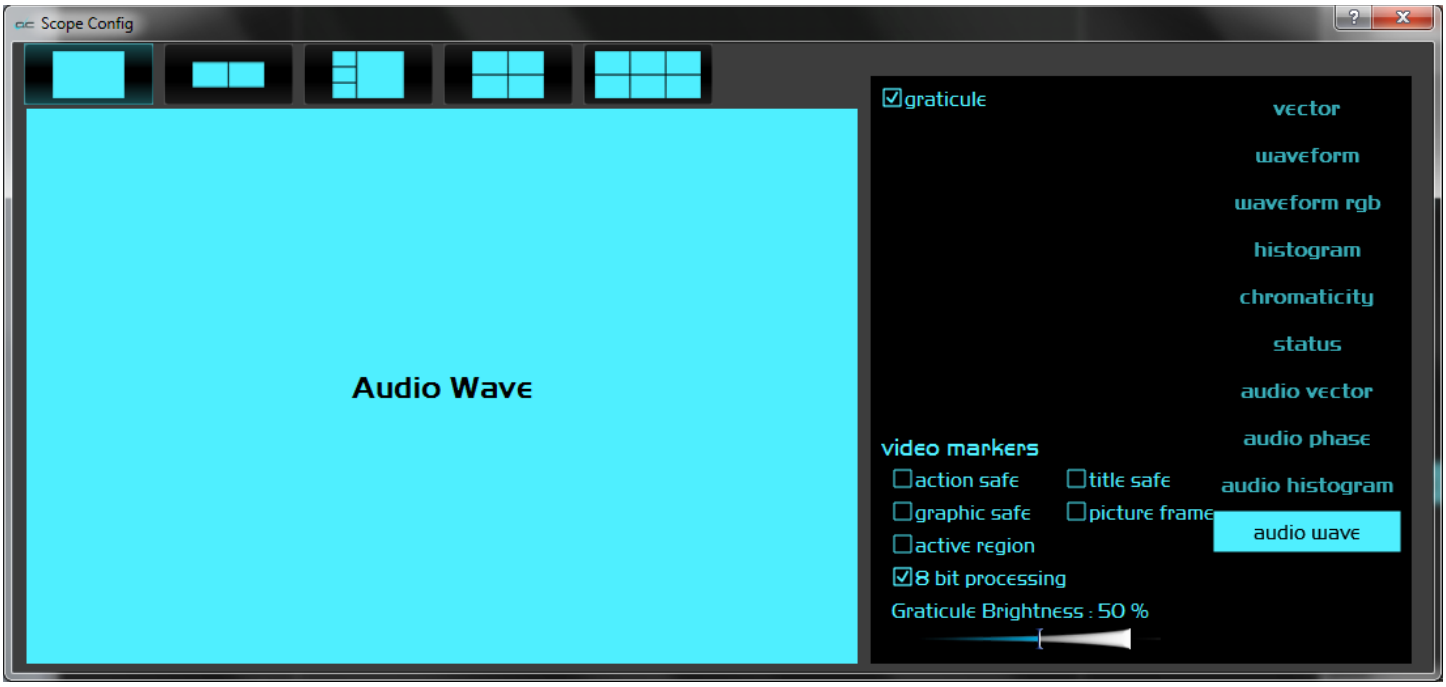


The audio histogram displays a bar chart of the levels of the components of an audio signal. This can be displayed as linear or logarithmic. The scale can be set as linear, square root, cubed root, log or reverse log.

Audio Wave

To display the Audio Wave in a single scope layout, press the **Scope Config** button on the **Scope** window, and press the **Audio Wave** button. To display the Audio Wave as one window of a multiple scope layout, press the **Scope Config** button on the **Scope** window, click on the desired layout, click on the window you want to use, and click on the **Audio Wave** button.

This opens the Audio Wave Setup section of the Scope Config window, which offers the following controls:



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.

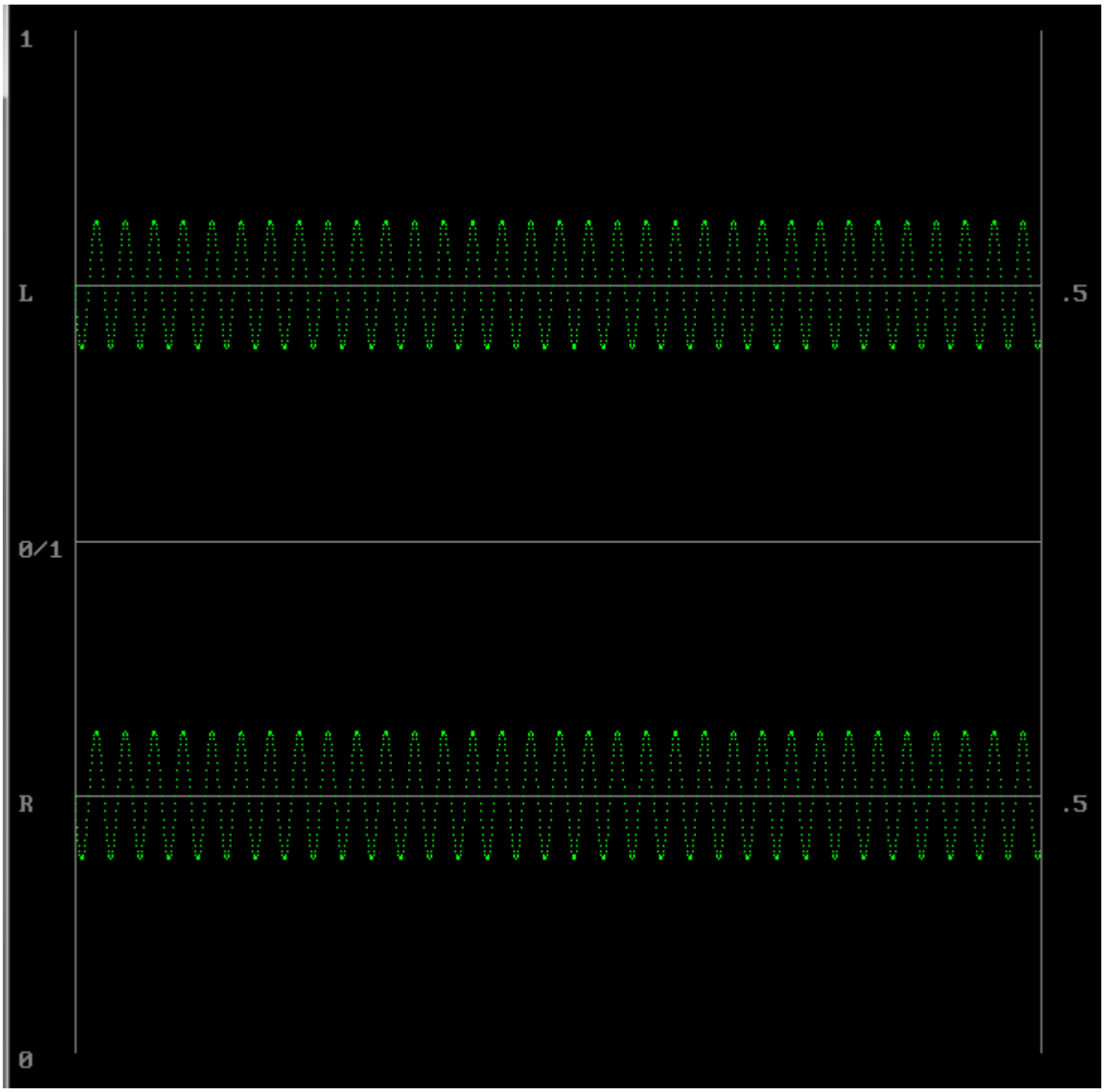
Graphic Safe checkbox - when selected, the Graphic Safe graticule is displayed over the video output.

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.

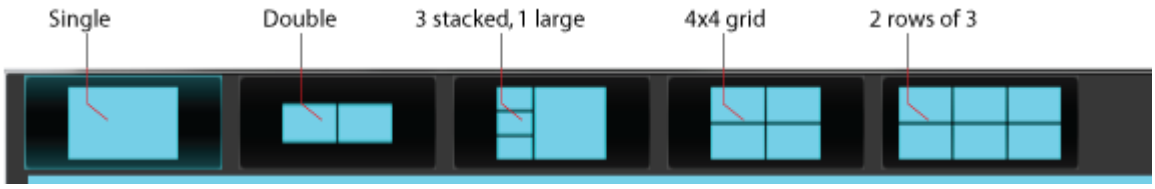
Here is the Audio Wave window.



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

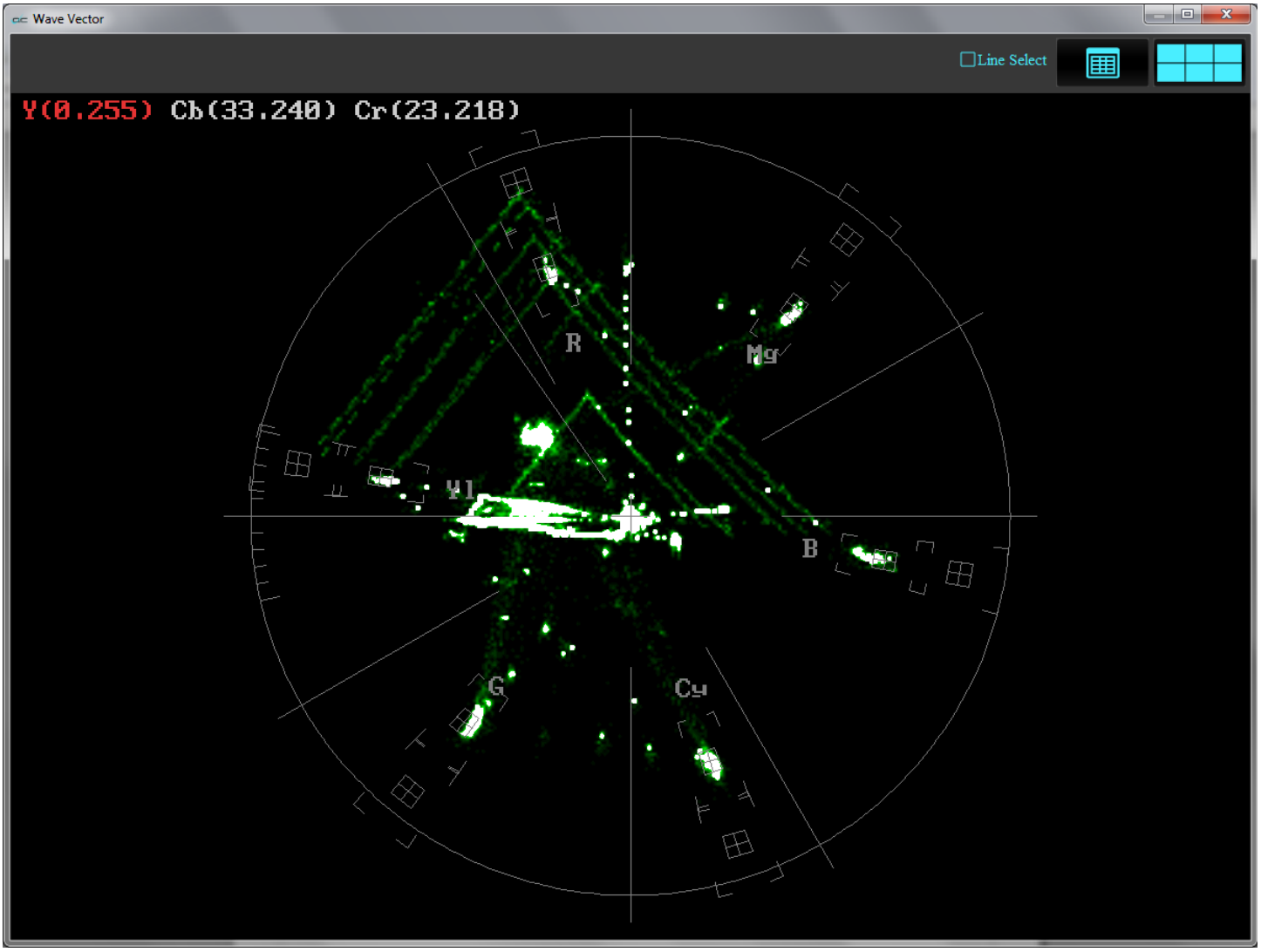
Scope Layout

Along the top of each scope config is the layout selector.



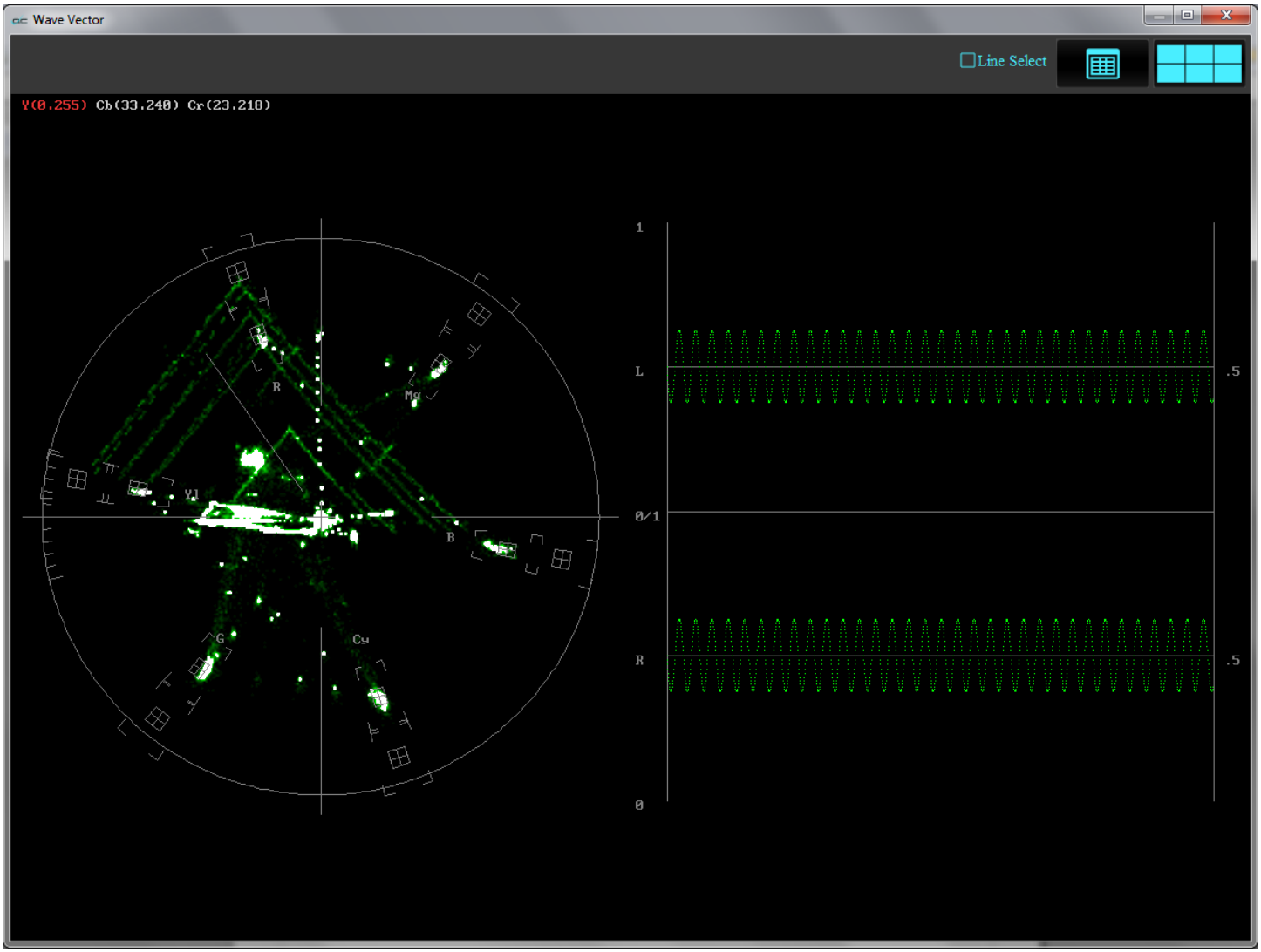
Single Scope Layout

A single scope may be selected for display. This example shows the Vectorscope.



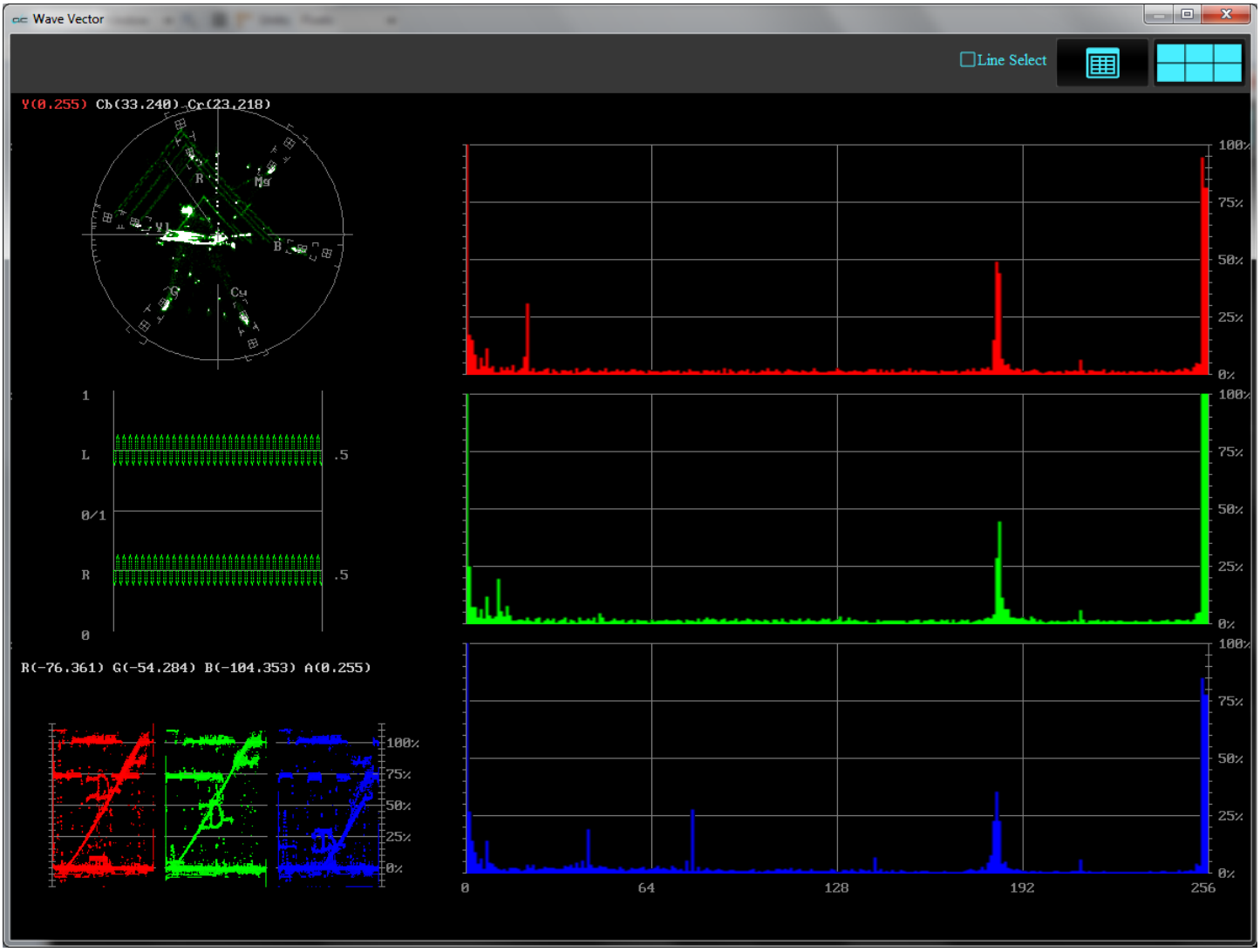
Double Scope Layout

Two scopes may be selected for display. This example shows the Vectorscope and the Audio Waveform monitor.



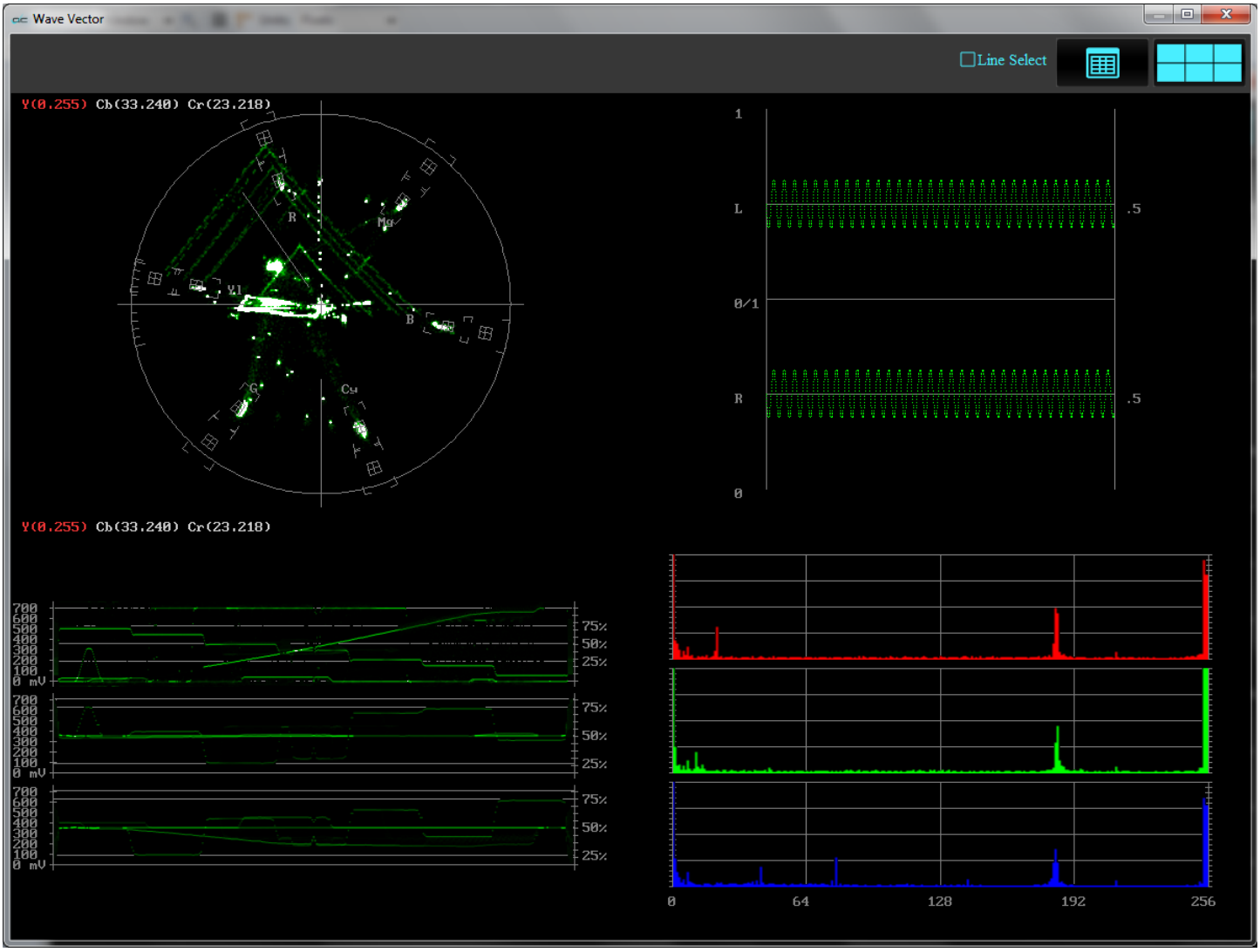
3 stacked, 1 large Scope Layout

Four scopes may be selected for display, 3 scopes stacked on the left and a larger scope on the right. This example shows the Vectorscope, the Audio Waveform monitor, the Waveform RGB and the Histogram.



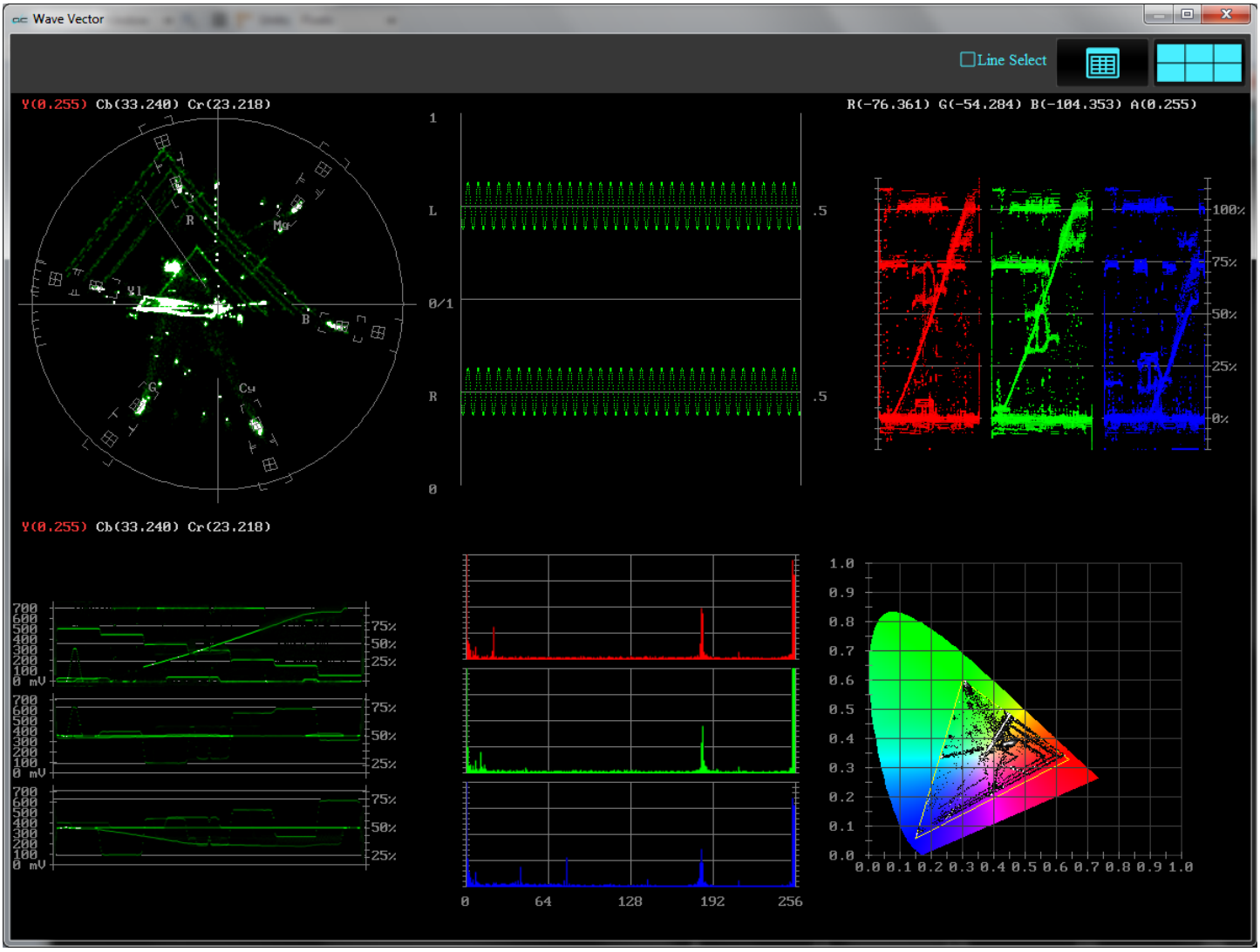
2 x 2 Grid Scope Layout

Four scopes may be selected for display, in a 2x2 grid. This example shows the Vectorscope, the Audio Waveform Monitor, the Waveform YCbCr, and the Histogram.



3 x 2 Grid Scope Layout

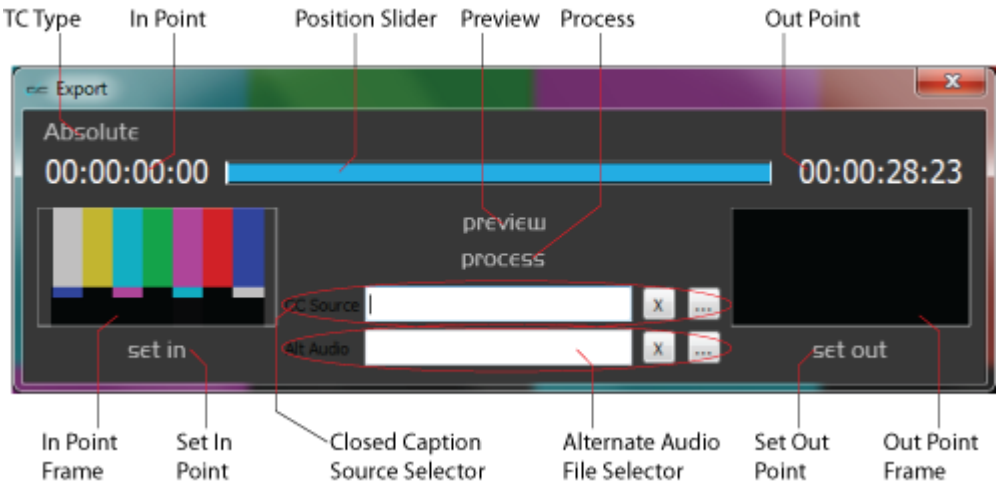
Six scopes may be selected for display, in two rows of 3 scopes. This example shows the Vectorscope, the Audio Waveform Monitor, the Waveform RGB, the Waveform YCbCr, the Histogram and the Chromaticity scopes.



Export

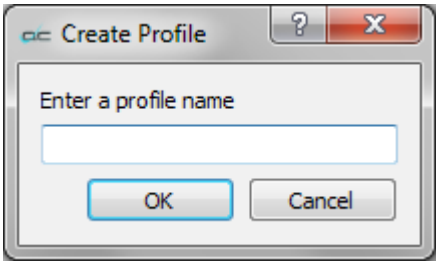
export

opens the export window, which allows the user to take the file or source 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.

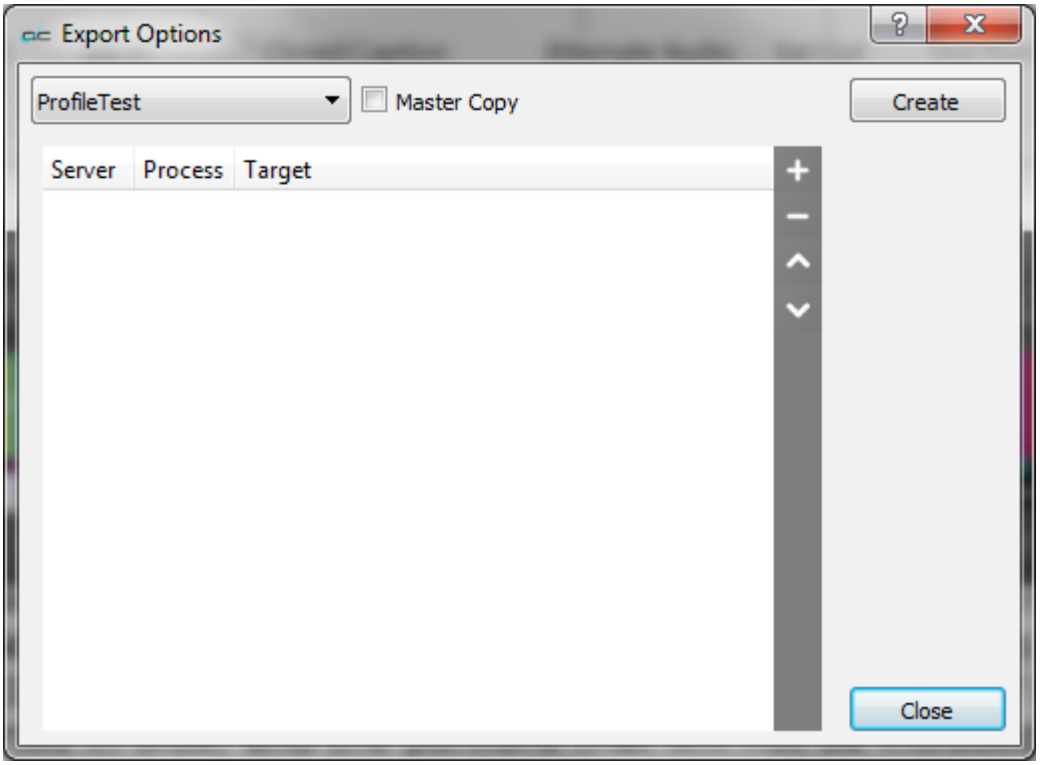


The **Export** Window offers the following controls and displays:

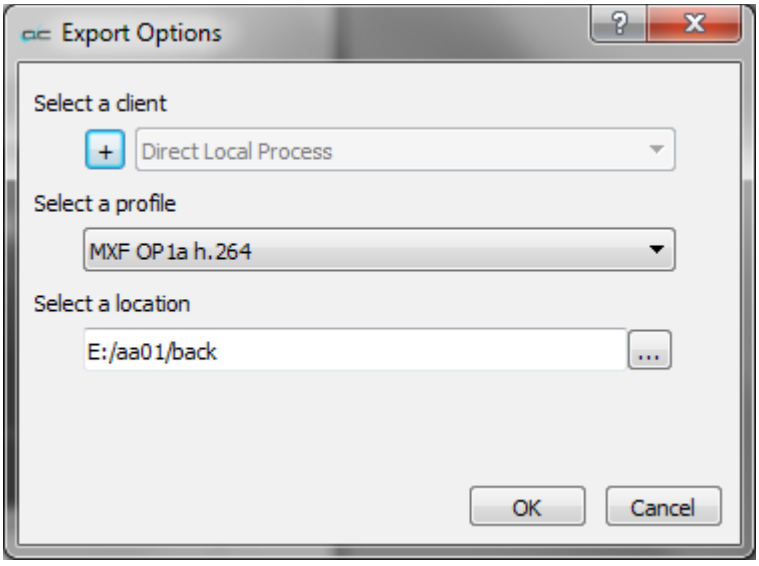
- **TC Type** – displays the type of time code being used, and clicking on this control will allow the user to select between other available types of time code
- **In Point** – displays the current In Point. A new In Point can be set, by pressing the **Set In** control. Once an In Point other than the first frame has been set, the Position slider lets the user dynamically move the In Point by grabbing with the mouse and moving the control. Sliding to a new location in the file and pressing the **Set In** control will update the In Point.
- **Position Slider** – displays the entire clip as blue when the clip is first loaded. 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.
- **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.



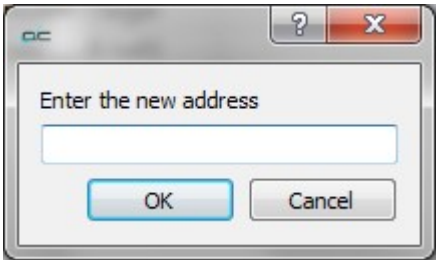
- Typing a name into the profile name field, and pressing the **OK** button, opens the **Export Options** window.



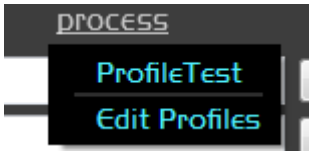
- The Export Options window offers a **Profile** pulldown menu which allows the user to select between profiles that have been created. Clicking the **Master Copy** checkbox opens a browser which allows the user to set where the master copy of the export should be saved. Clicking on the + control opens a further **Export Options** window, which allows the user to set up the export.



- Pressing the **+** by the **Select a Client** field opens the **Enter a New Address** window. This allows the user to set the 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.



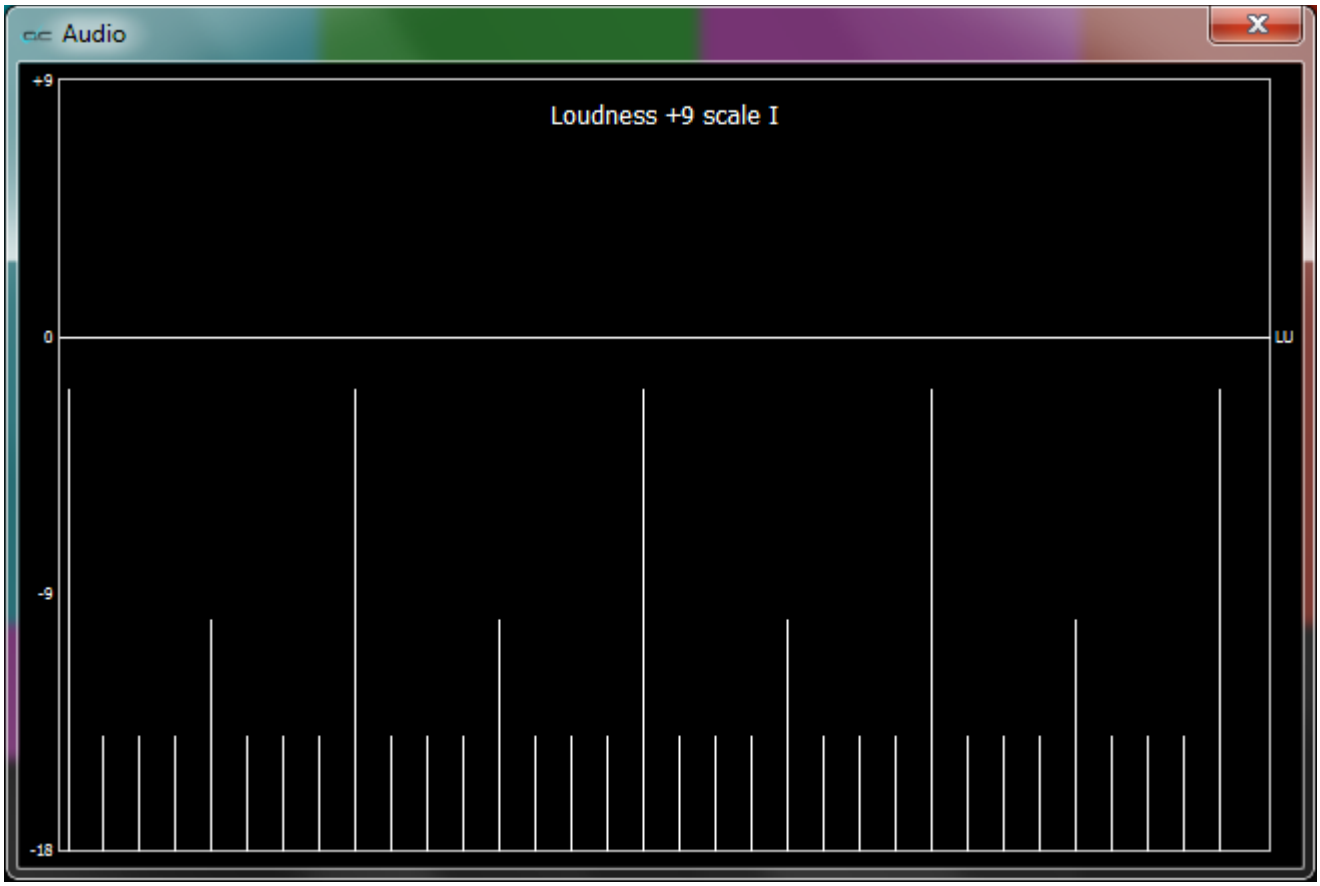
- Pressing the **Select a Profile** pulldown menu allows the user to select between available file format types for the export.
- Pressing the **Browse** button at the right of the **Select a Location** control opens a standard browser, which allows the user to set the location the exported file will 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 **Profile Test** (see if Net-X-Base is present), and the **Edit Profile** (go back to the Export Options window).



Audio

audio

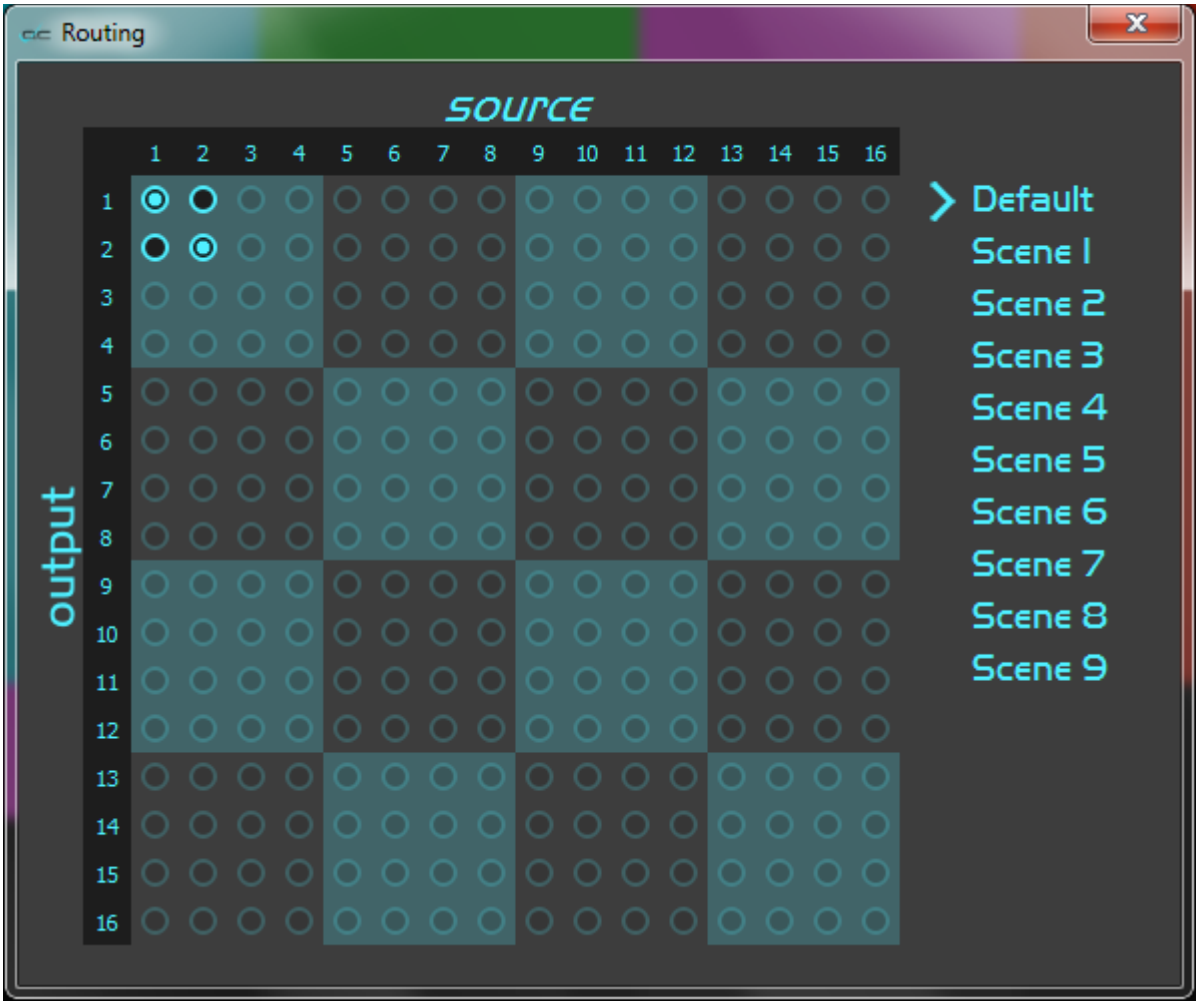
Open the audio meters display. This display shows relative audio levels during source passthrough or file output. The line 0 corresponds to -24 decibels.



Routing

routing

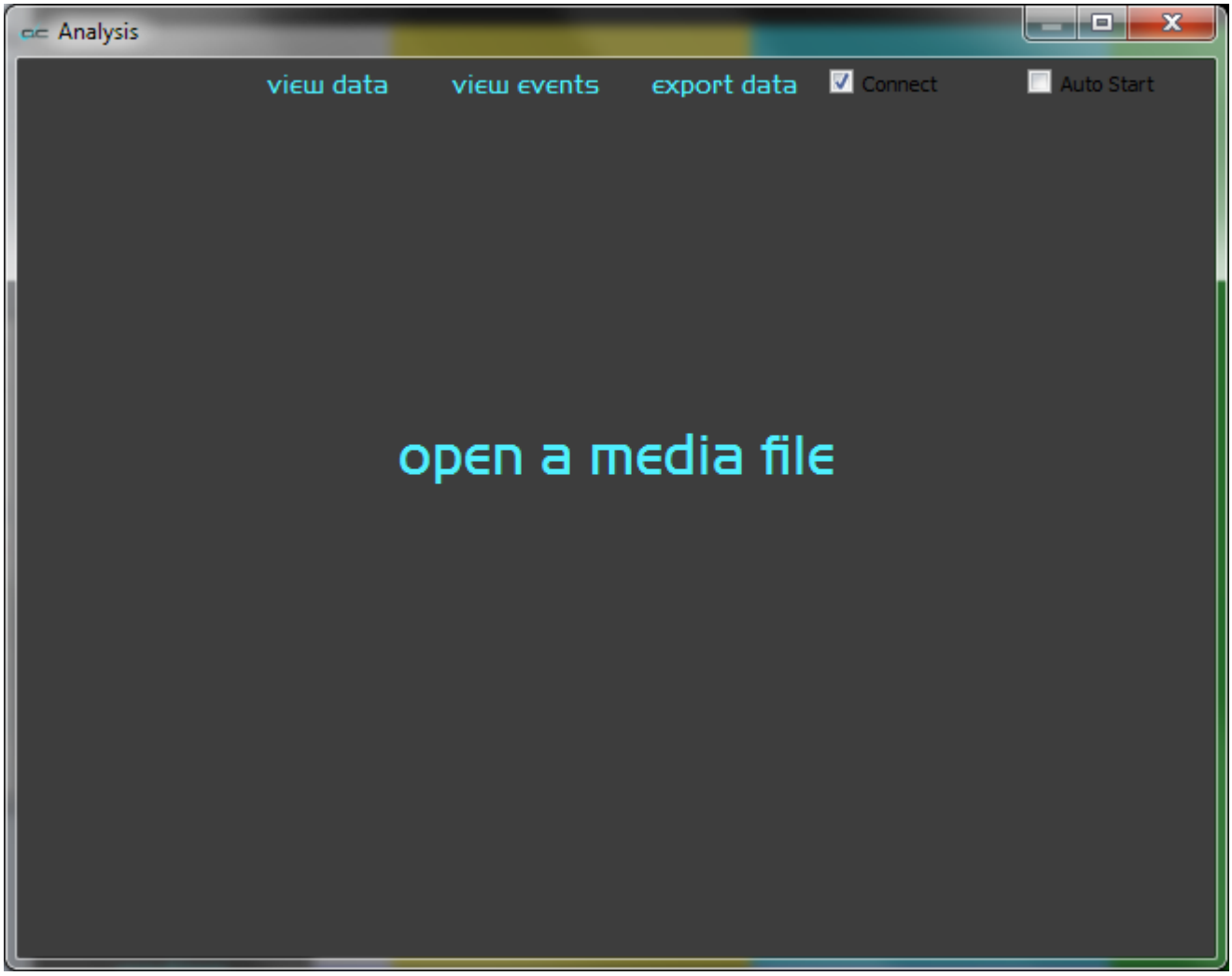
Opens the audio routing window. This window allows the user to reroute the output of up to 16 channels of audio.



Analysis

Open the **Analysis** window, which displays information about the file's levels. Hovering over a location provides track info. The red vertical line follows playback. The **Auto Start** checkbox sets the analysis to display upon opening the window. The **Connect** checkbox allows the frame analysis to be performed on a stream source.

Prior to loading the open file, Analysis offers an opportunity to load a file.

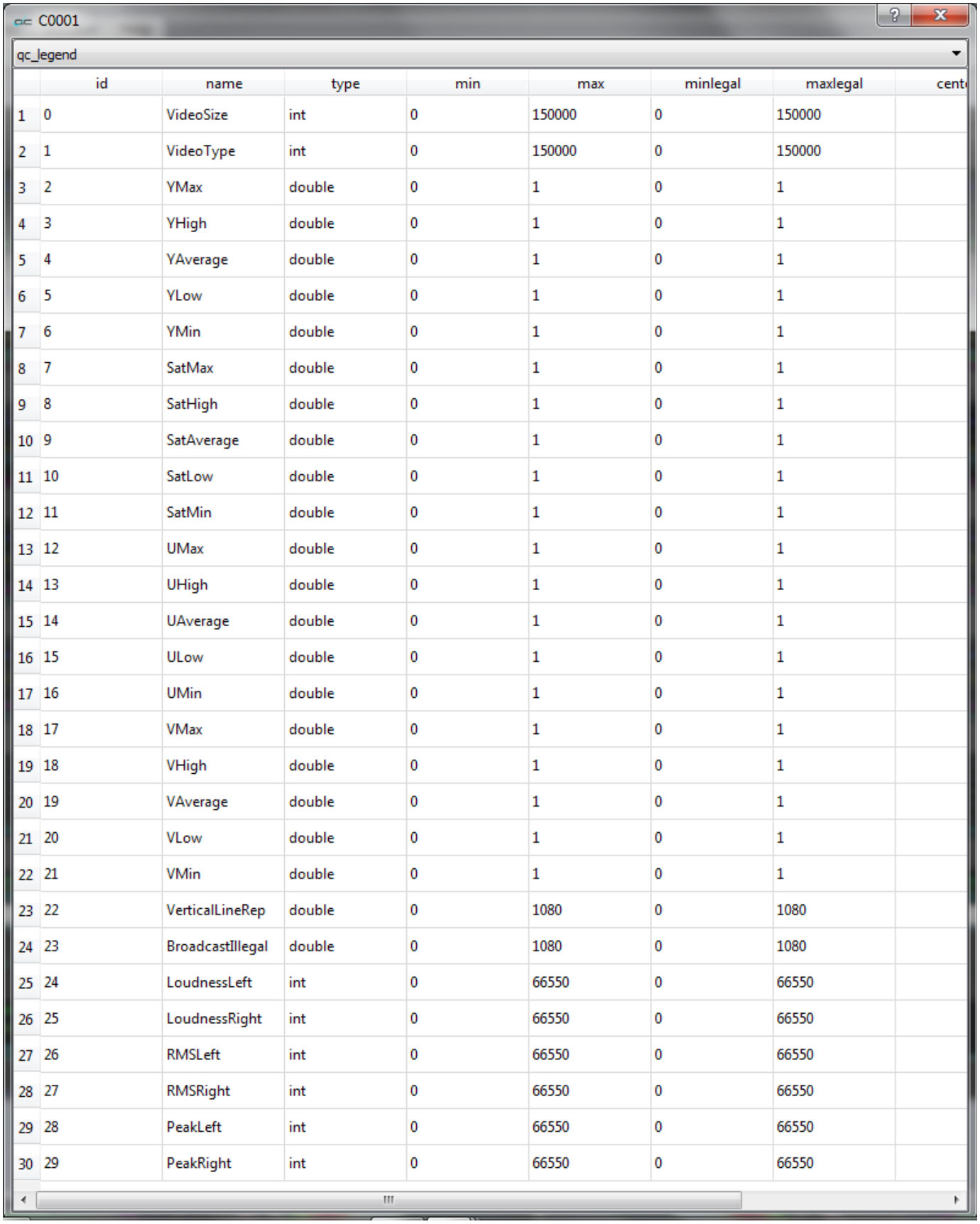


The Analysis process will then begin to analyze the current file.

Several components of the file are displayed in the analysis window:

The top row offers the following controls:

View Data – opens the View Data window.



	id	name	type	min	max	minlegal	maxlegal	cent
1	0	VideoSize	int	0	150000	0	150000	
2	1	VideoType	int	0	150000	0	150000	
3	2	YMax	double	0	1	0	1	
4	3	YHigh	double	0	1	0	1	
5	4	YAverage	double	0	1	0	1	
6	5	YLow	double	0	1	0	1	
7	6	YMin	double	0	1	0	1	
8	7	SatMax	double	0	1	0	1	
9	8	SatHigh	double	0	1	0	1	
10	9	SatAverage	double	0	1	0	1	
11	10	SatLow	double	0	1	0	1	
12	11	SatMin	double	0	1	0	1	
13	12	UMax	double	0	1	0	1	
14	13	UHigh	double	0	1	0	1	
15	14	UAverage	double	0	1	0	1	
16	15	ULow	double	0	1	0	1	
17	16	UMin	double	0	1	0	1	
18	17	VMax	double	0	1	0	1	
19	18	VHigh	double	0	1	0	1	
20	19	VAverage	double	0	1	0	1	
21	20	VLow	double	0	1	0	1	
22	21	VMin	double	0	1	0	1	
23	22	VerticalLineRep	double	0	1080	0	1080	
24	23	BroadcastIllegal	double	0	1080	0	1080	
25	24	LoudnessLeft	int	0	66550	0	66550	
26	25	LoudnessRight	int	0	66550	0	66550	
27	26	RMSLeft	int	0	66550	0	66550	
28	27	RMSRight	int	0	66550	0	66550	
29	28	PeakLeft	int	0	66550	0	66550	
30	29	PeakRight	int	0	66550	0	66550	

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

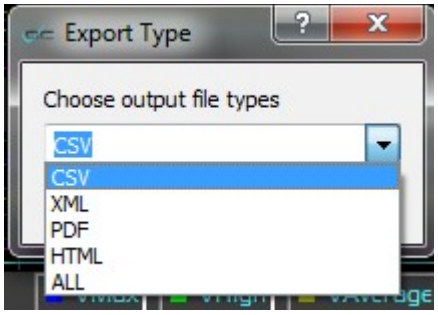
View Events – opens the View Events window.

events

Event	Start TC	TC String	Start Frame	End Frame	I Value	F Value
BlackAndWhite	107443	00:59:45;01	1	147	0	0
Loudness	107589	00:59:49;27	147	305	0	-14.8009
Silence	107737	00:59:54;25	295	443	0	0
BlackAndWhite	107737	00:59:54;25	295	443	0	0
Loudness	107885	00:59:59;23	443	620	0	-18.6703
OverSaturation	108062	01:00:05;20	620	688	0	1.29341
ContrastBlacks	108062	01:00:05;20	620	688	0	0.332031
Silence	108130	01:00:07;28	688	783	384	0
BlackAndWhite	108288	01:00:13;06	846	906	0	0
ContrastBlacks	108713	01:00:27;11	1271	1326	0	0.910156
Loudness	108348	01:00:15;06	906	1395	0	-15.7306

The **View Events** window looks for events such as line repetition, and describes the following for each event: Start time code, Time code string, Start frame, End frame, I Value, and F Value.

Pressing the Export Data control allows the user to select between report types. Once selected, a report will be generated for the analyzed file in the same directory as the file.

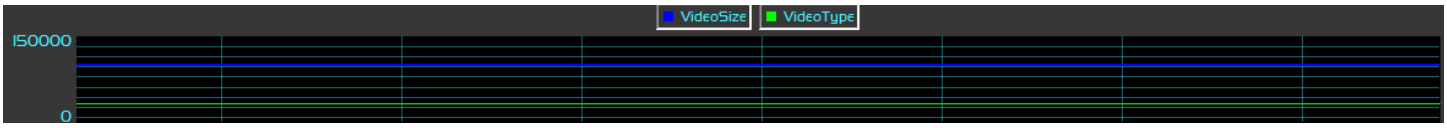


The data may be exported in the following formats: CSV, XML, PDF, HTML, and ALL [generate a report in each of the (CSV, XML, PDF, and HTML) formats].

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

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

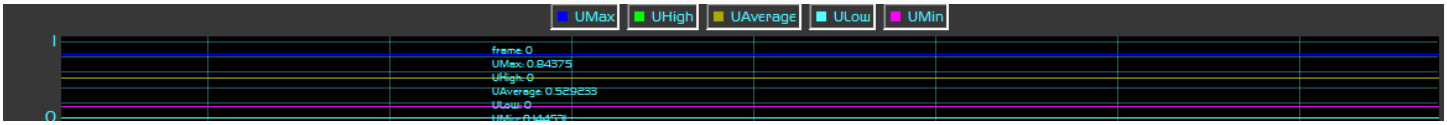
The second row details the video size and the video type



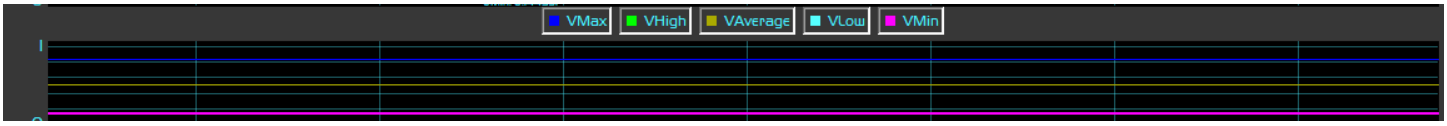
The third row details the **Maximum**, the **Minimum**, the **Average**, the **Low** and the **Minimum** for the **Y** component of the video.

The fourth row details the **Maximum**, the **High**, the **Average**, the **Low** and the **Minimum** for the **Saturation** level of the video.

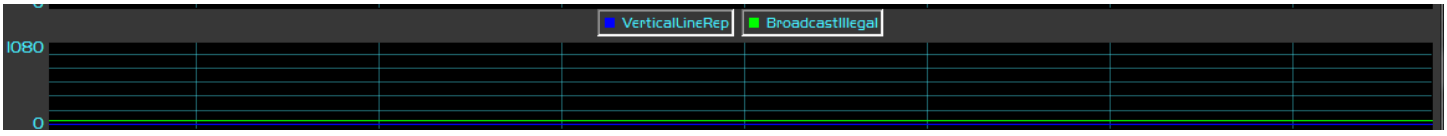
The fifth row details the **Maximum**, the **Minimum**, the **Average**, the **Low** and the **Minimum** for the **U** component of the video.



The sixth row details the **Maximum**, the **Minimum**, the **Average**, the **Low** and the **Minimum** for the **V** component of the video.

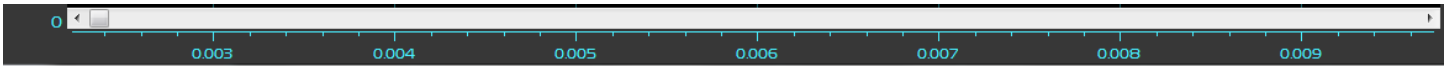


The seventh row looks for **Vertical Line Repetition**, and **Broadcast Illegal** (levels).



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.

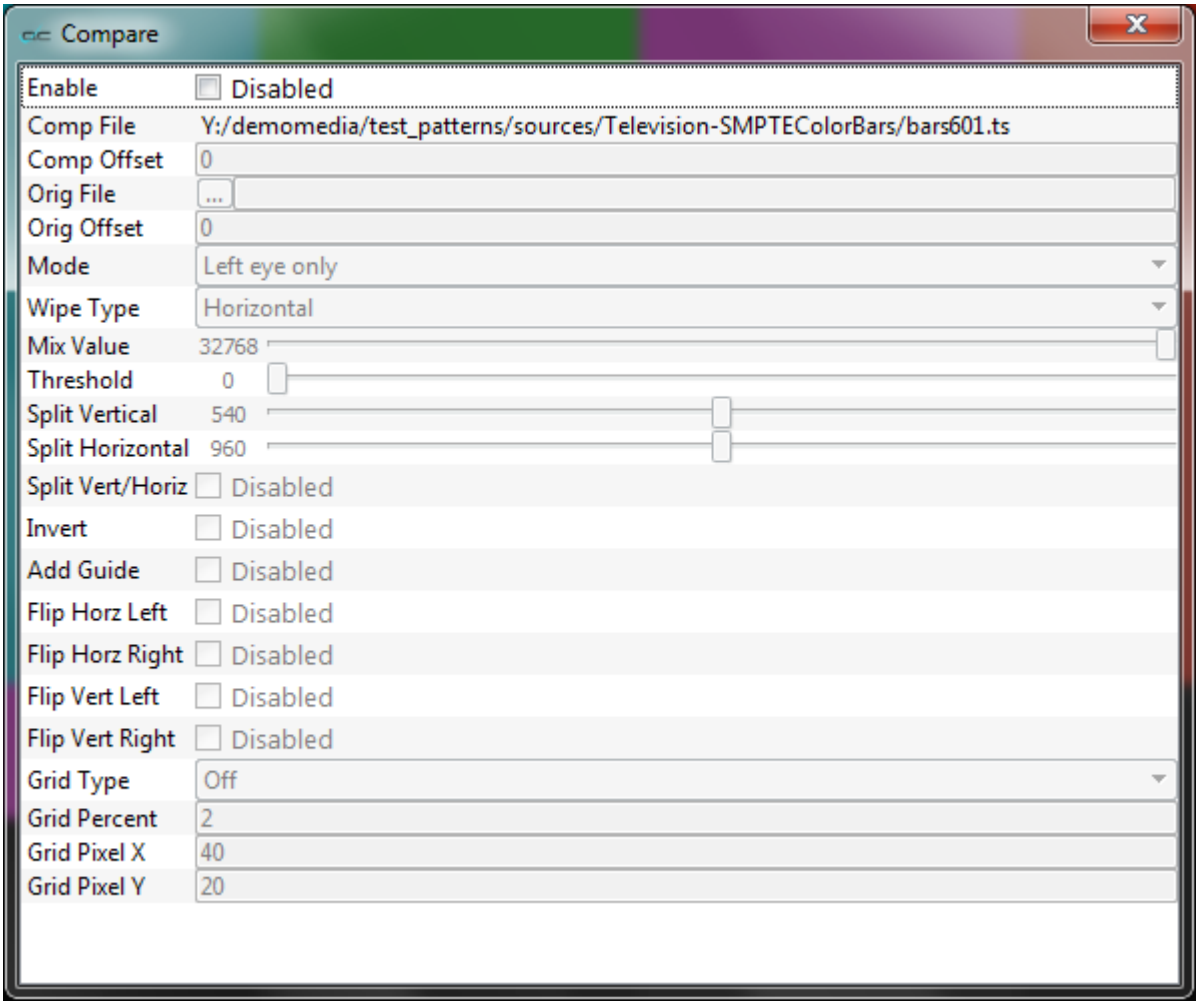
Along the bottom there is a position slider and markers for frame locations.


0
0.003
0.004
0.005
0.006
0.007
0.008
0.009

Compare (Full Reference)

compare

Opens the file compare window, which allows the user to compare a file with another file. This is useful for example in comparing an original source file to its exported/transcoded/compressed version, to check that the exported version is not overly degraded, or too different from the source.



- **Enable** – enable the visual compare mode
- **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
- **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

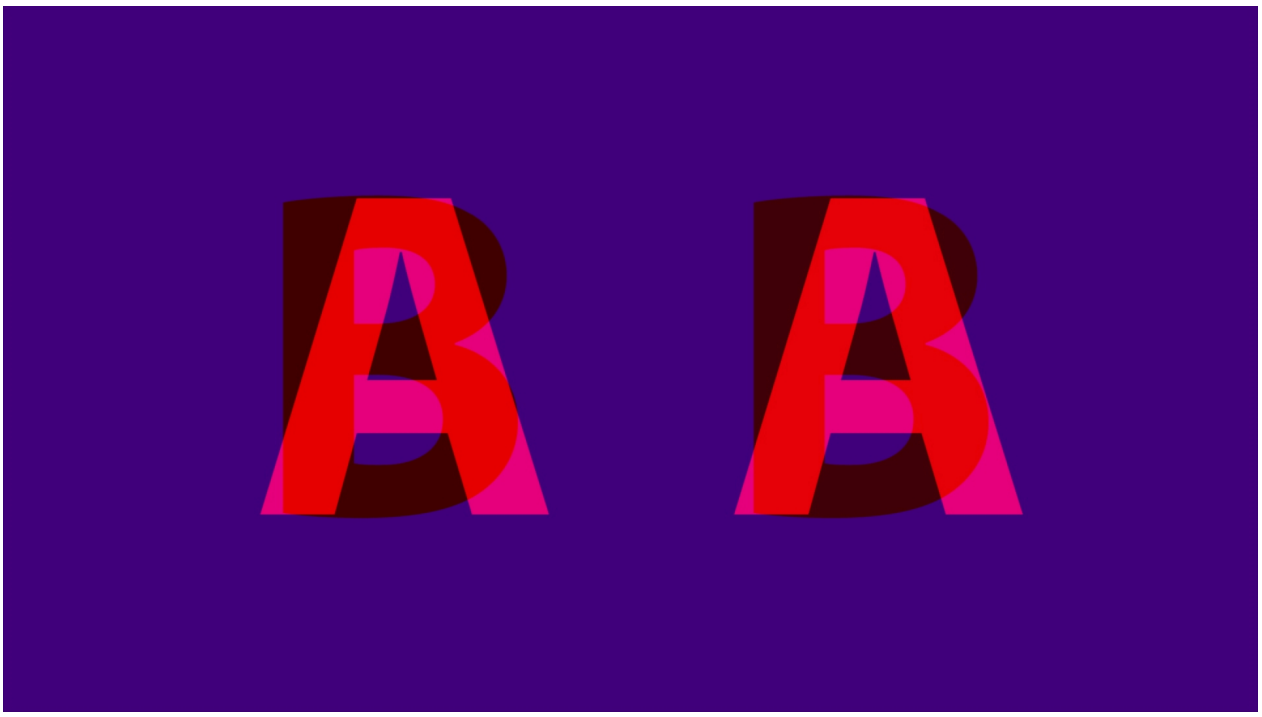
Basic Compare Settings:
Left Eye Only:

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

Right Eye Only:

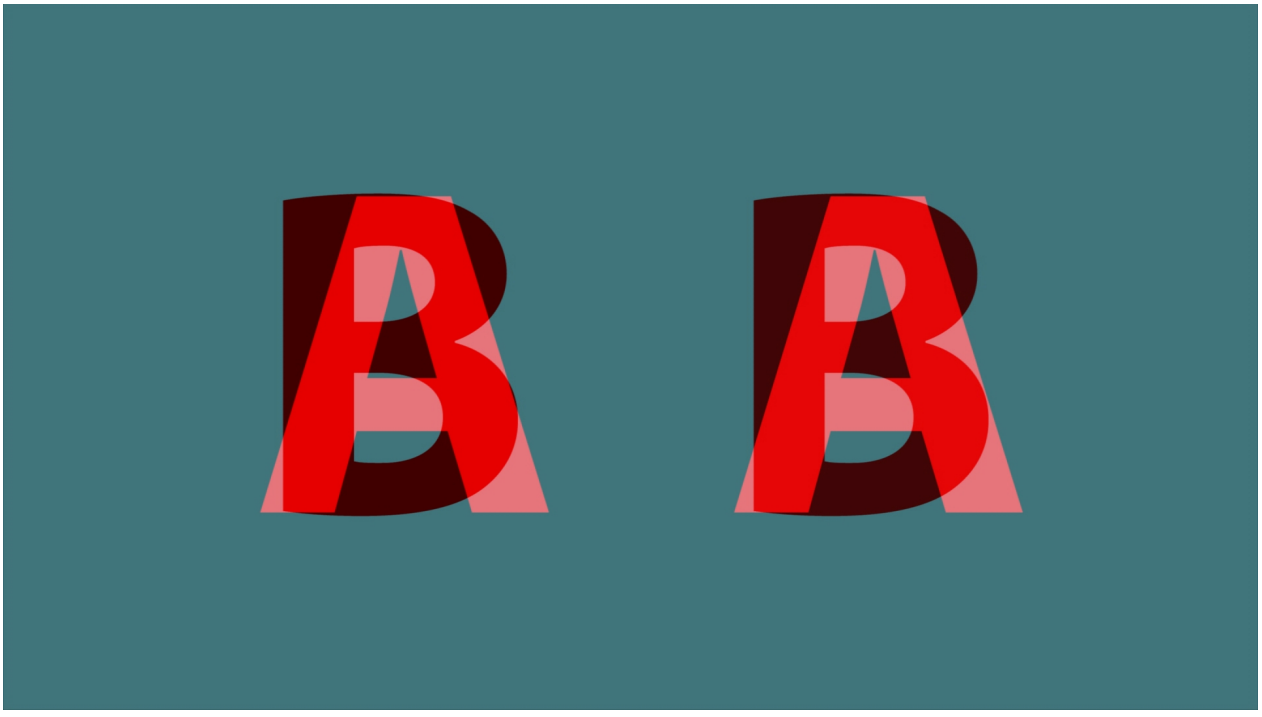
This shows only the right, or original, video signal.

Anaglyph Red-Blue:



For 3D glasses.

Anaglyph Red-Cyan:

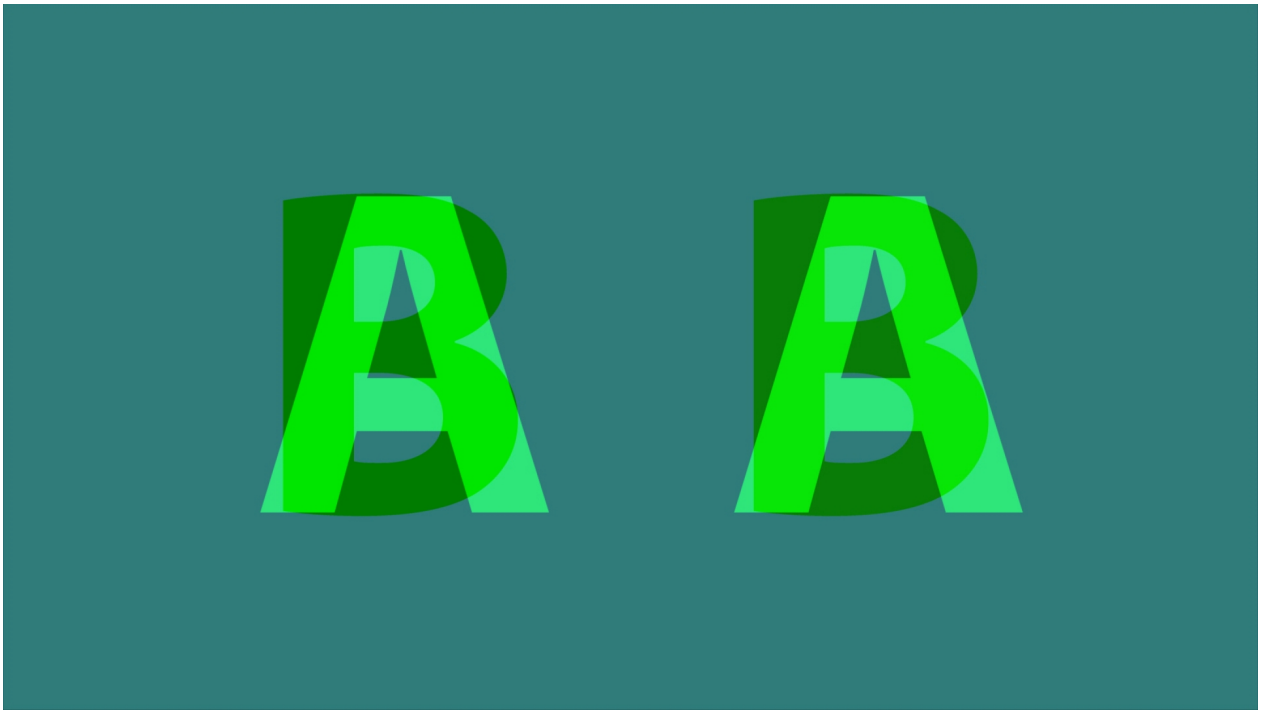


For 3D glasses.

Anaglyph Amber-Blue:

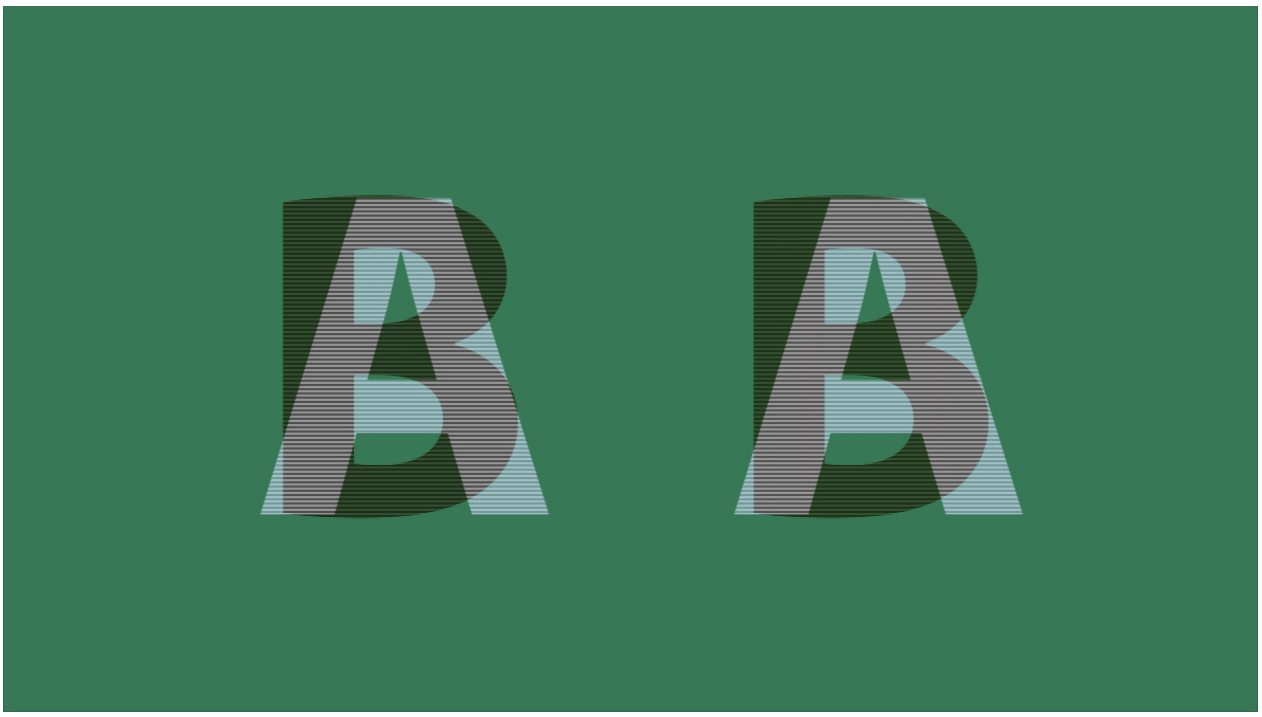
For 3D glasses.

Anaglyph Green-Magenta:



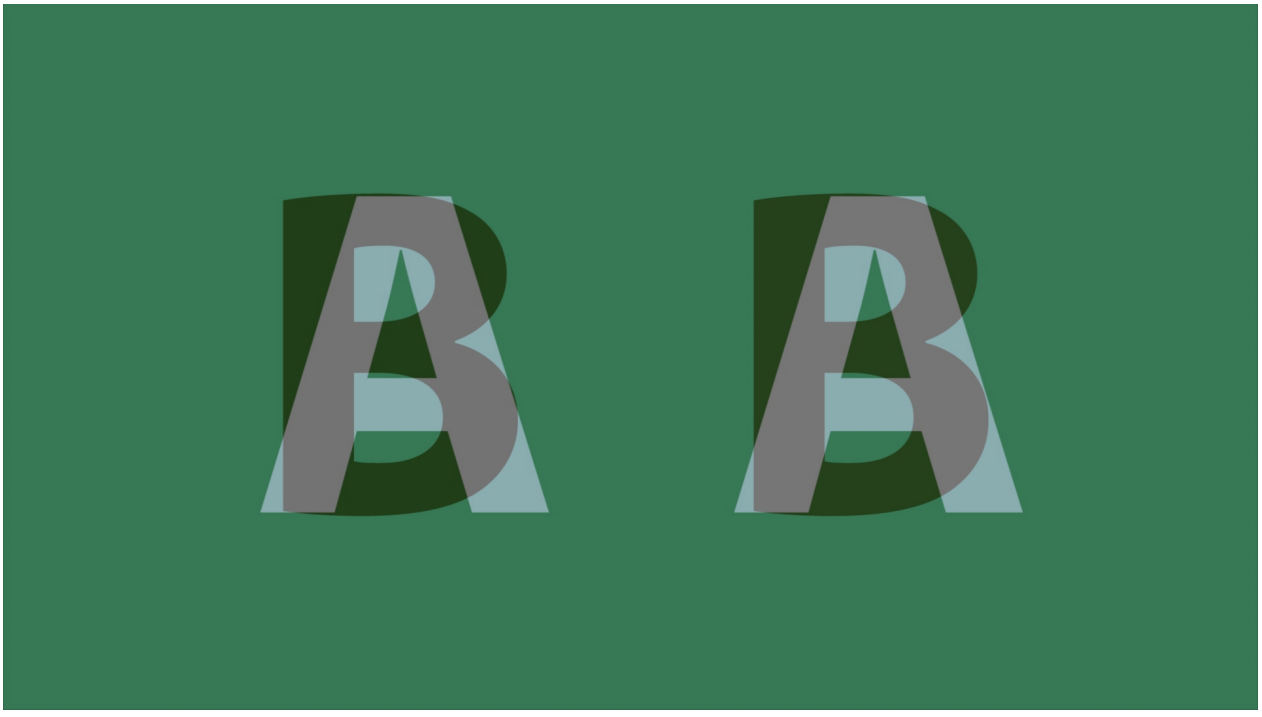
For 3D glasses.

Interlaced Eyes:



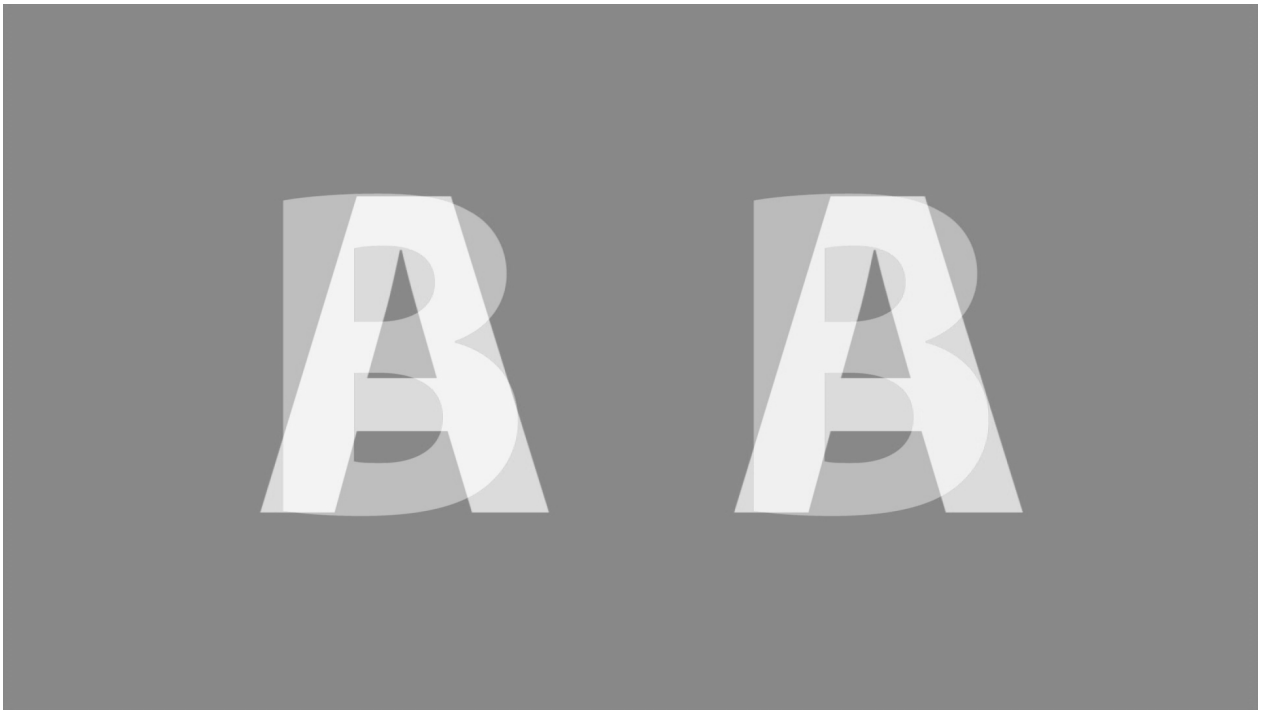
Show both signals on alternate lines, good for some 3D monitors.

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.

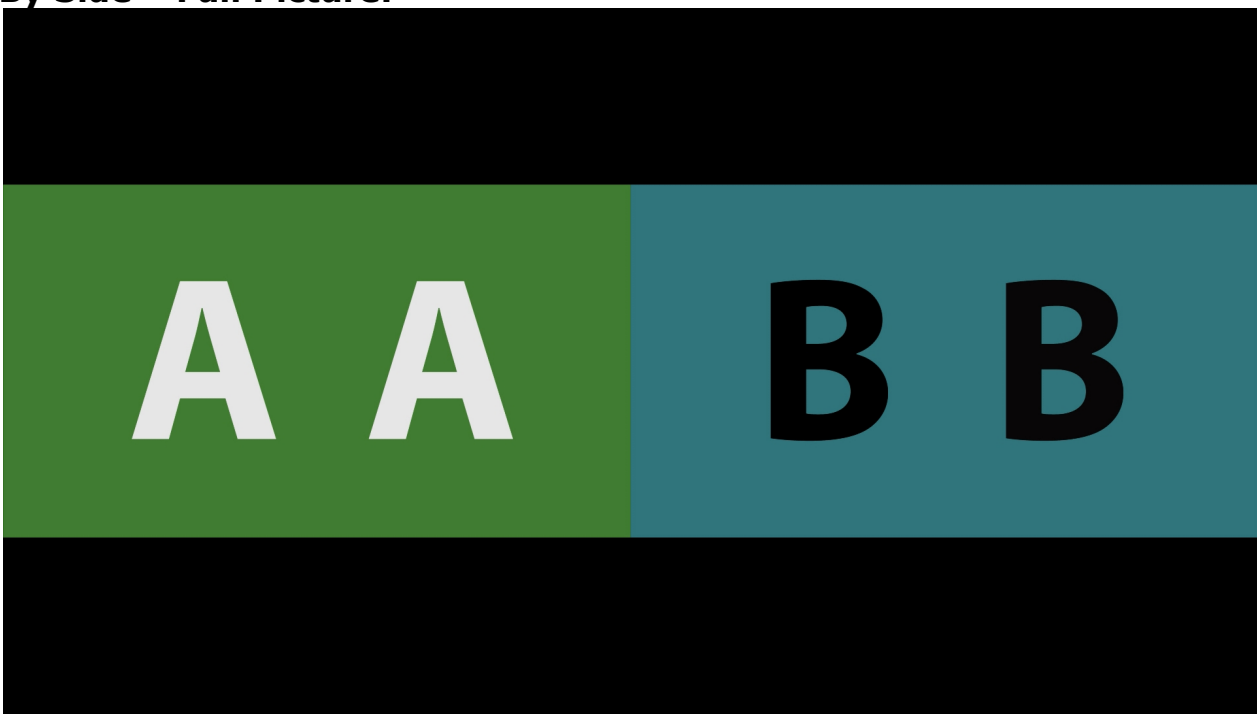
Seamless Split – Vertical:

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.

Side By Side – Full Picture:



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

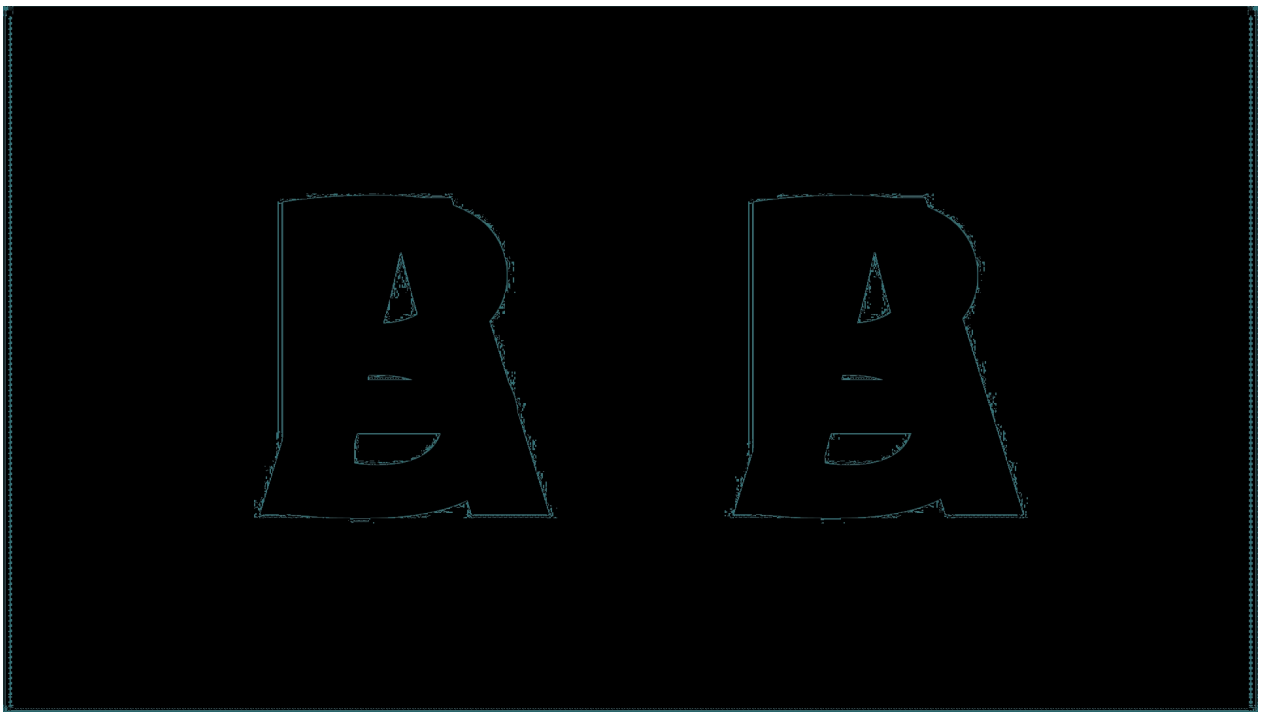
Side By Side – Same Side:

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

Mirror:

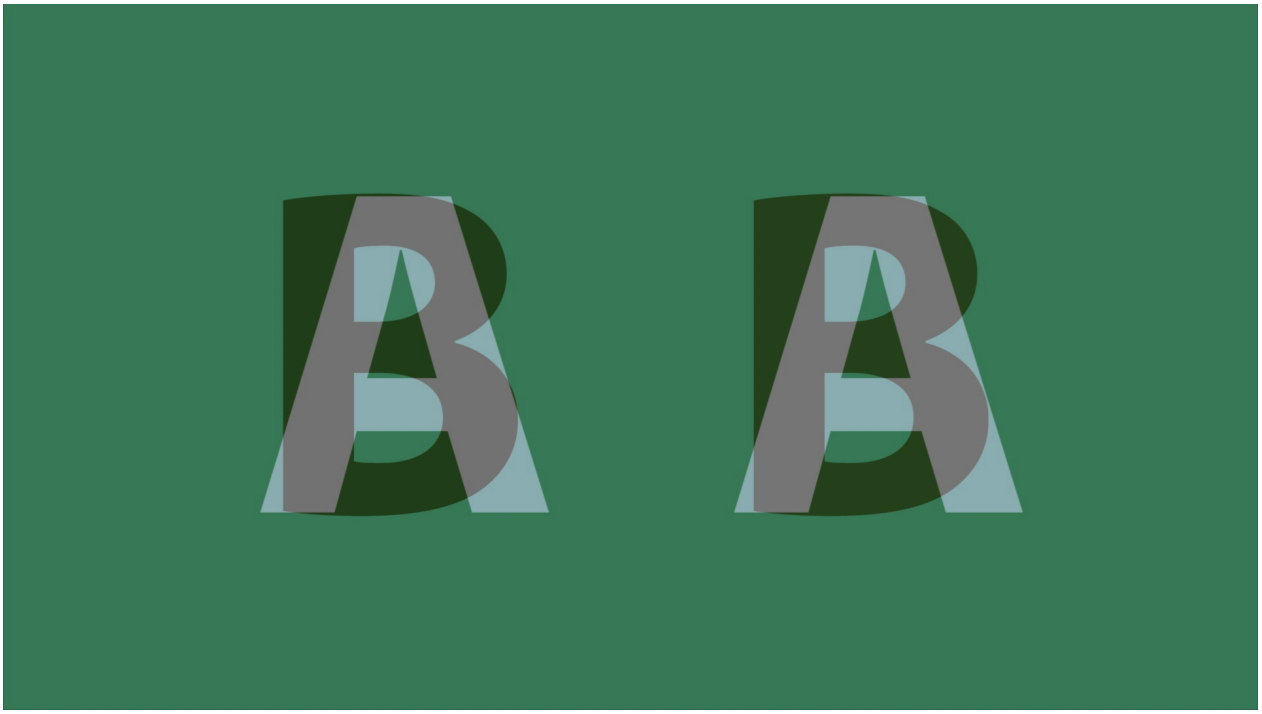
Mirror the compressed and original so they meet in the middle (vert or horiz)

A-B with Threshold:



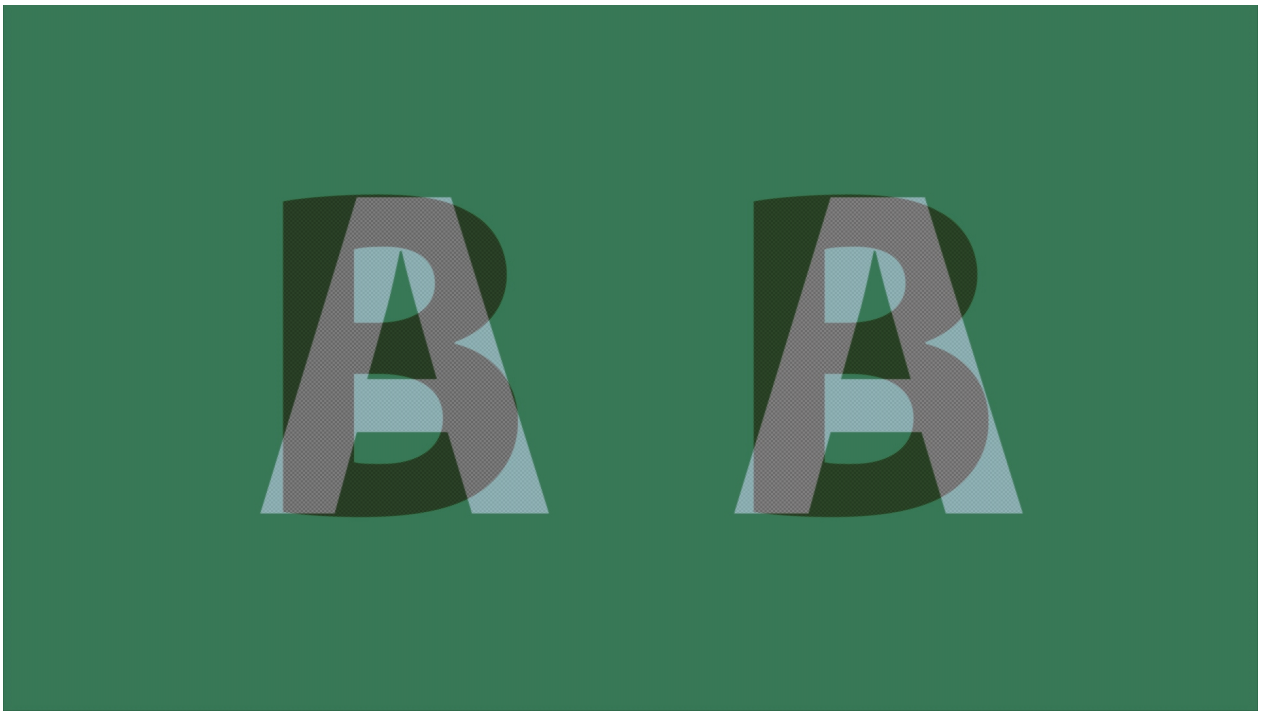
Subtract the two videos and show only the differences within a threshold.

Dissolve with Mix:



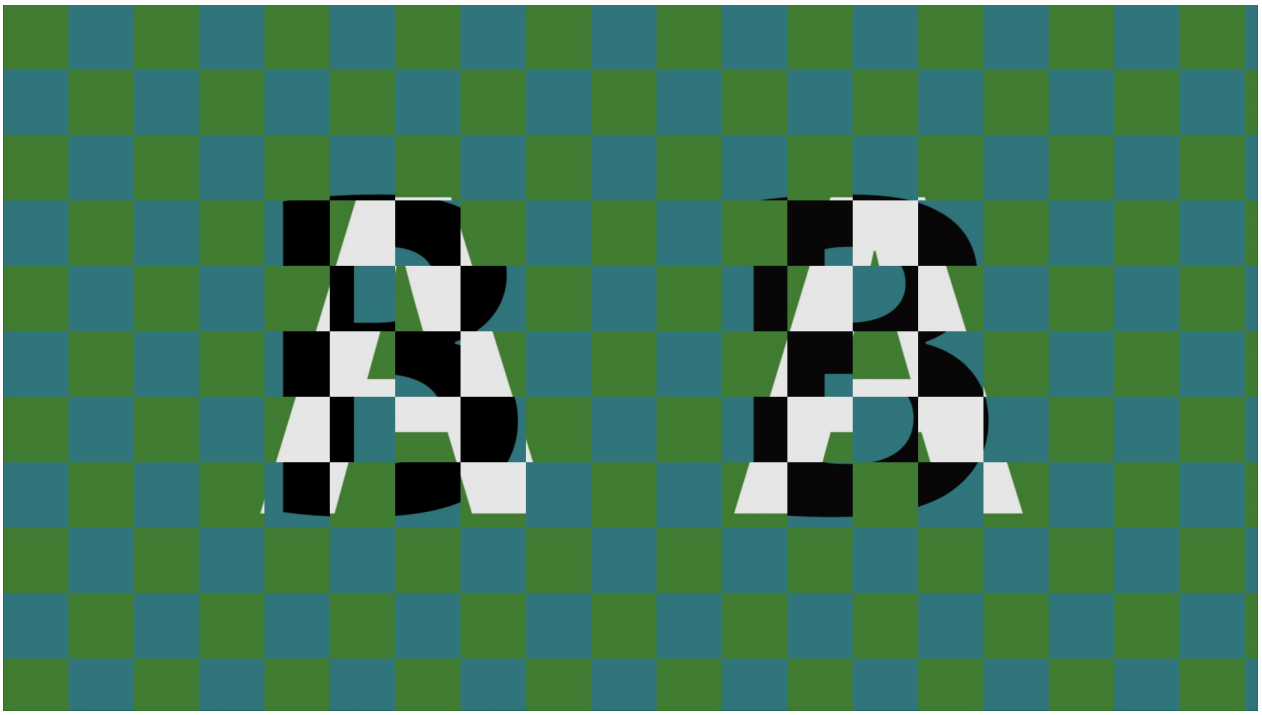
Dissolve back and forth between the compressed and original video.

Checkerboard 3D:



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

Boxes Sized by Mix:

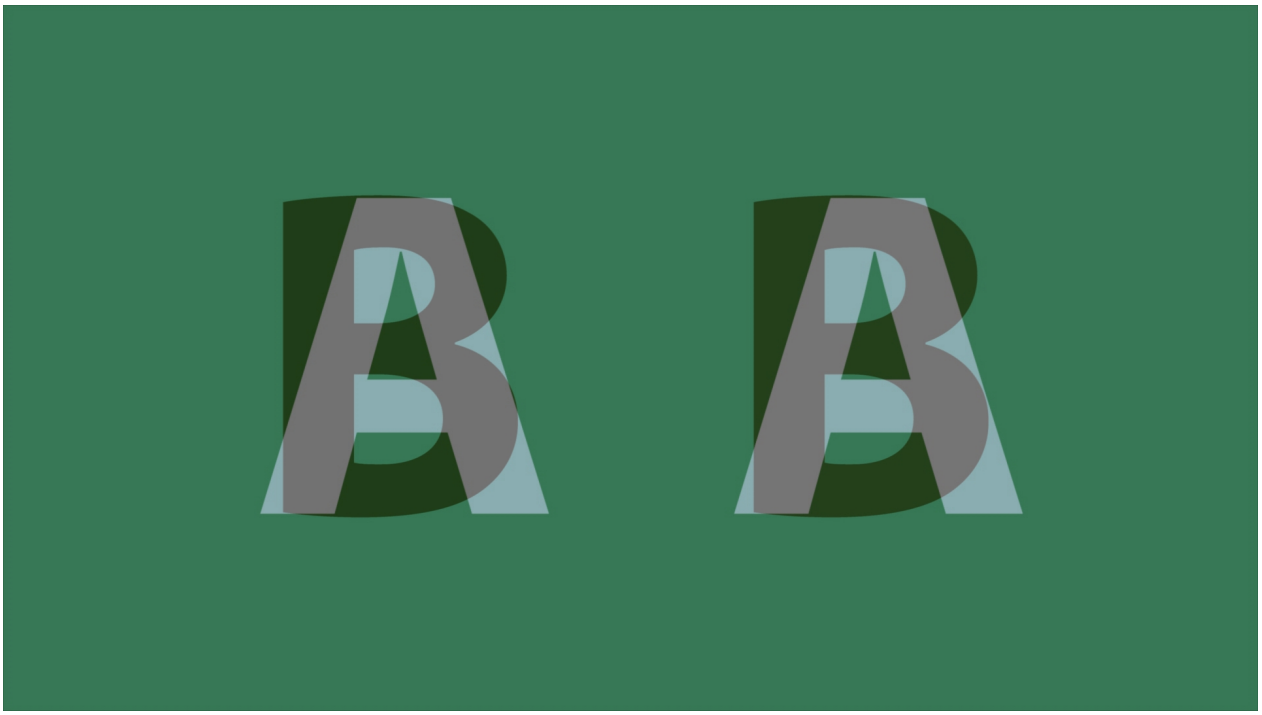


Create sizable, interleaving boxes with both videos.

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.

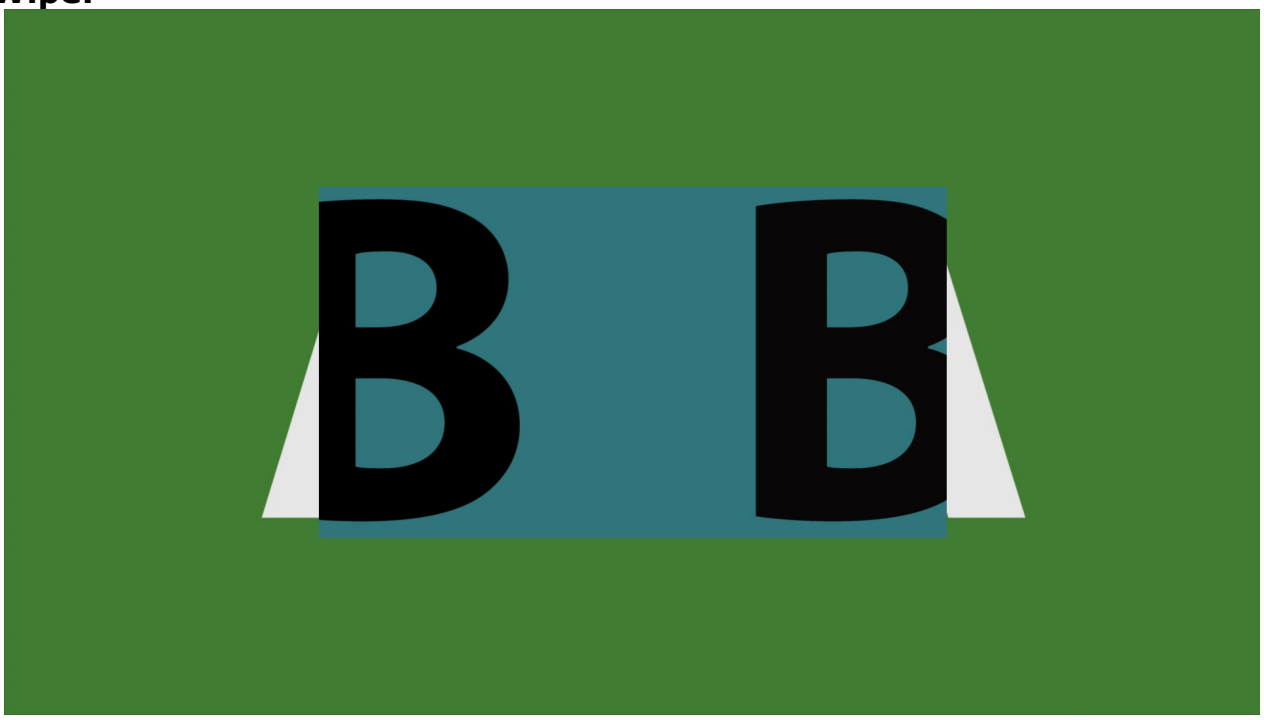
Bottom Center Wipe:

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:

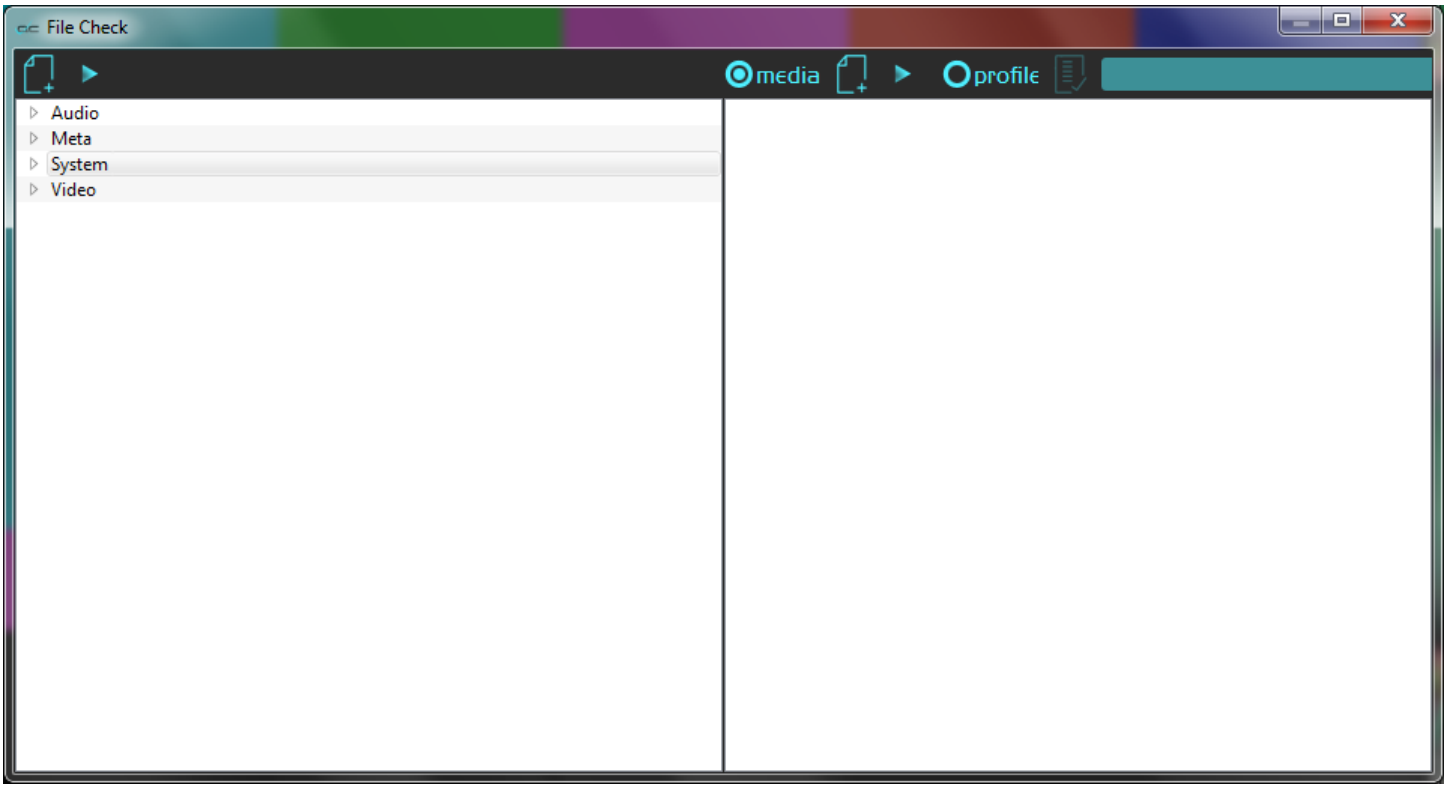
Slide down wipe between the two video sources based on the mix slider position.

Slide Right Wipe:

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

File Check (Full Reference)

Opens the file check window, which allows the user to load a file and compare it to their original source media, with track info being highlighted when a difference is detected.



Show Tips Context Menu

A series of tips may be displayed on the VGA screen before the user has loaded a clip. Right clicking on the Transport Controls reveals a **Show Tips** option. Click this option to toggle between showing the tips or not showing the tips. Here is a list of the tips:

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.
There are configuration files for the Contour Shuttle Pro available at www.drastic.tv.
Files can be added to videoQC by dragging them from a file explorer and dropping them on videoQC.
Clicking on the main time code allows you to type a time code and press **Enter** to cue that time code location.
Pressing <CTRL>-C will copy the current time code to the system clipboard.
Pressing F will set videoQC to full screen

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.
To enable/disable the time code overlay in full screen press the 'T' key.
videoQC supports the J-K-L keys for basic transport control.
The MODE button toggles the playback mode through: normal, loop or palindrome.
Clicking on TC/VITC/LTC will cause the main time code to display that time code source
Clicking the CC button allows the user to select different closed caption sources, or disable closed caption overlay.
The <SPACE BAR> will switch between pause and play.
Tips can be deactivated by right clicking on the control area and selecting the menu item **Show Tips**.

How to Use videoQC

Setup

Connect Hardware

videoQC software will run on most available 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 (uninterruptable power supply) device to provide power to the system so that signal analysis 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 you can, 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.

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.

OS-X
The OS-X 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

videoQC must be licensed in order to run without demo limitations. Open the **Settings** window, and click the **License** button at the upper left. This opens the licensing window:

To license the software:

1. open the licensing application and enter a user name into the field to the right of the **User Name** label.
2. enter an email address into the field to the right of the **Email Address** label.
3. 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.
4. copy the Site Code to the clipboard using the **Copy** button. (or you can select it and use Ctrl+C)
5. 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).
6. 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).
7. press the **Register** button.
8. 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
-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 (OS-X) must be changed. The basic settings are:

Windows (registry)
HKEY_CURRENT_USER\Software\Drastic\videoQC
OS-X (~\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
show_tips - enable tip display while idle
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, tr01)
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:

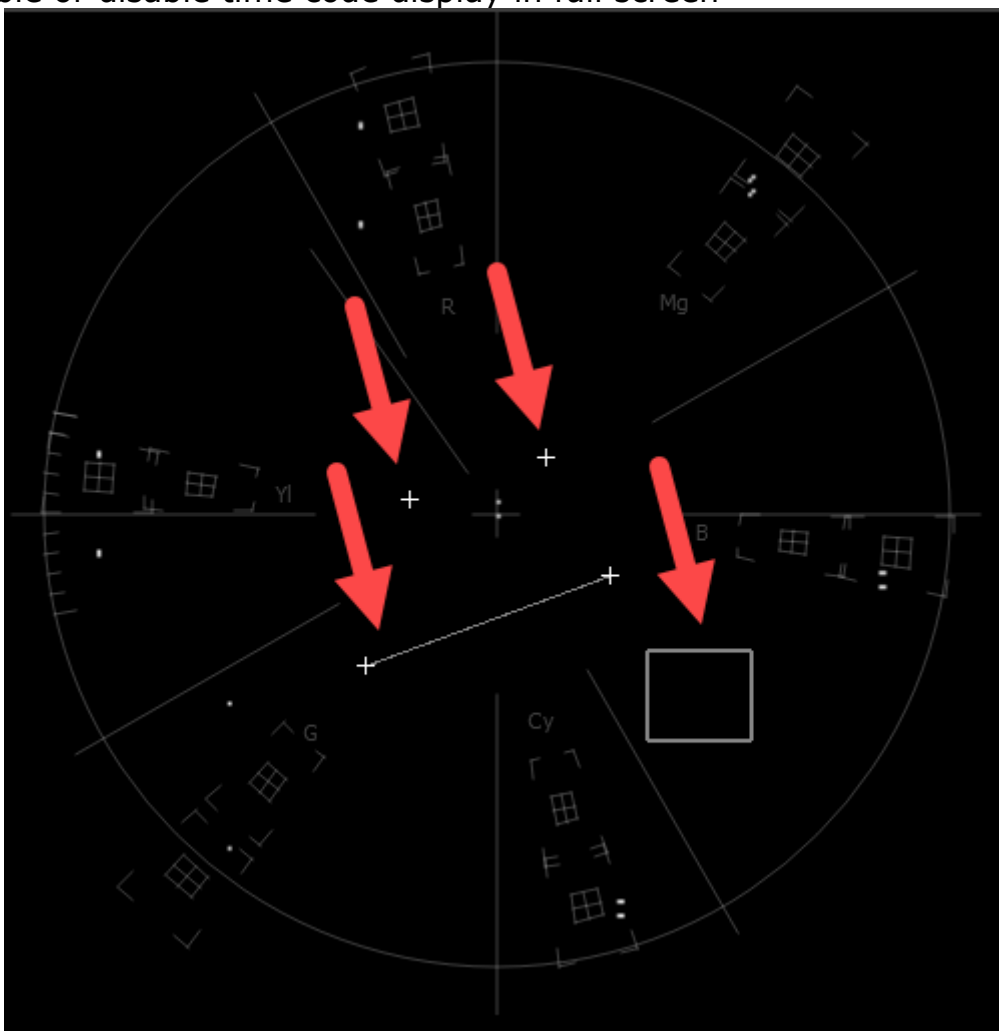
http://www.drastic.tv/images/software/drastickeyboard.pdf

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)

<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
<SHIFT><RightClick> - Clear all markers/guides

RESTful HTML AJAX API

videoQC 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

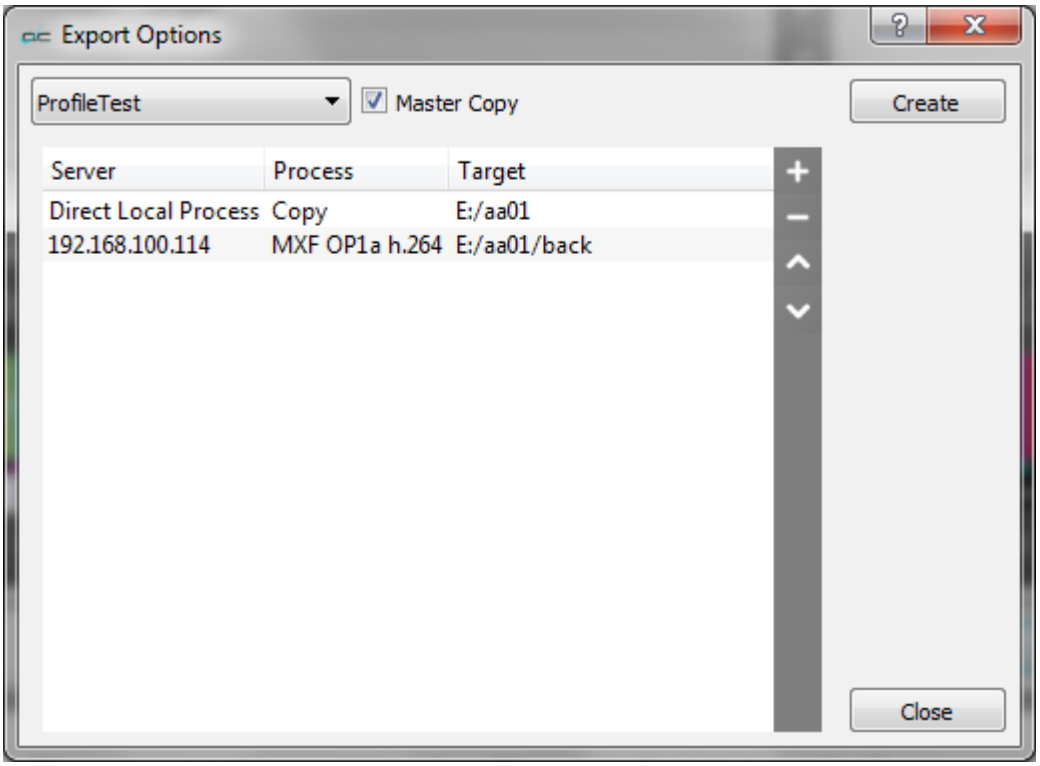
The video can be loaded by using the File | Open menu or by dragging and dropping the file on the interface. Once loaded, it can be controlled by the transport controls, the keyboard commands or by the optional http, serial or network interface.

How to Export a File

Press the Export control. This opens the **Export** window.

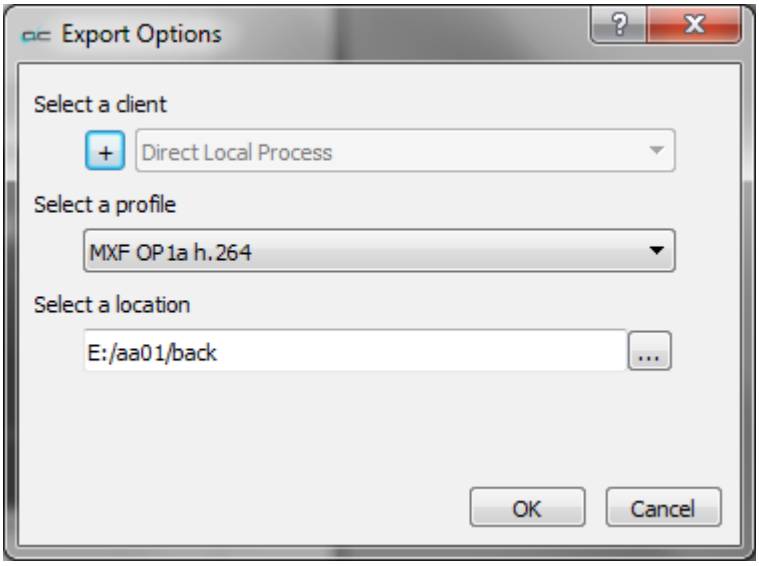
The In and Out points can be edited by cueing, and pressing the Set In and Set Out controls.

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 select an HTTP client, press the **+** button under Select a Client, and enter a known good IP address into the field. 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, Net-X-Code 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://, rtsp://, ndi://, s2022:// and s2110:// are supported. This document describes the URLs' format in more detail.

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.
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 muticast 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

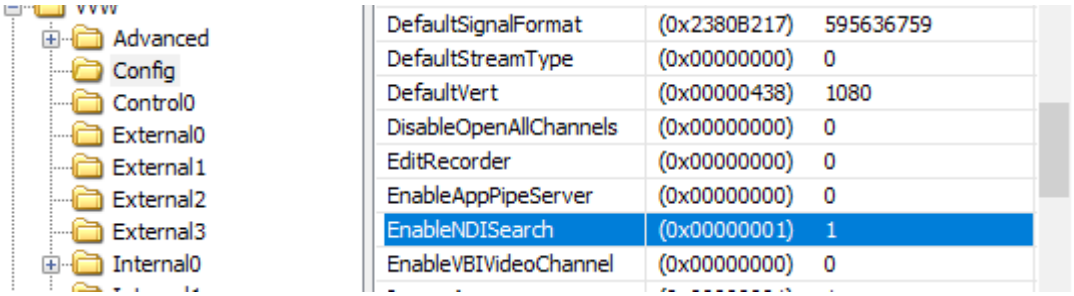
RTSP

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)

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.

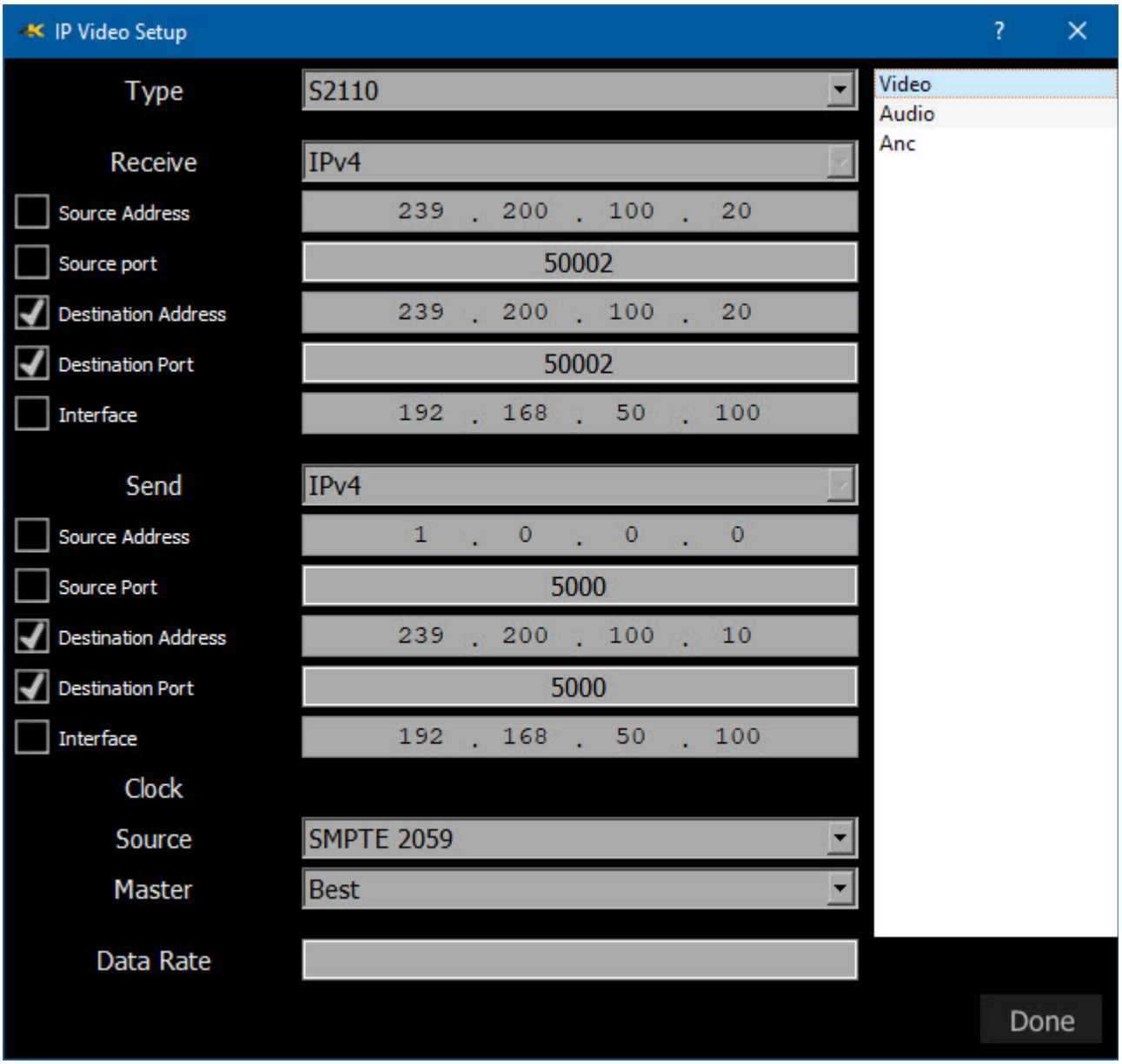
ndi://USER-PC (Desktop [2])
ndi://TestCameraSource (ISO_1)
ndi://PC2 (Google Chrome [1])

S2022 and S2110

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 from 4KScope:



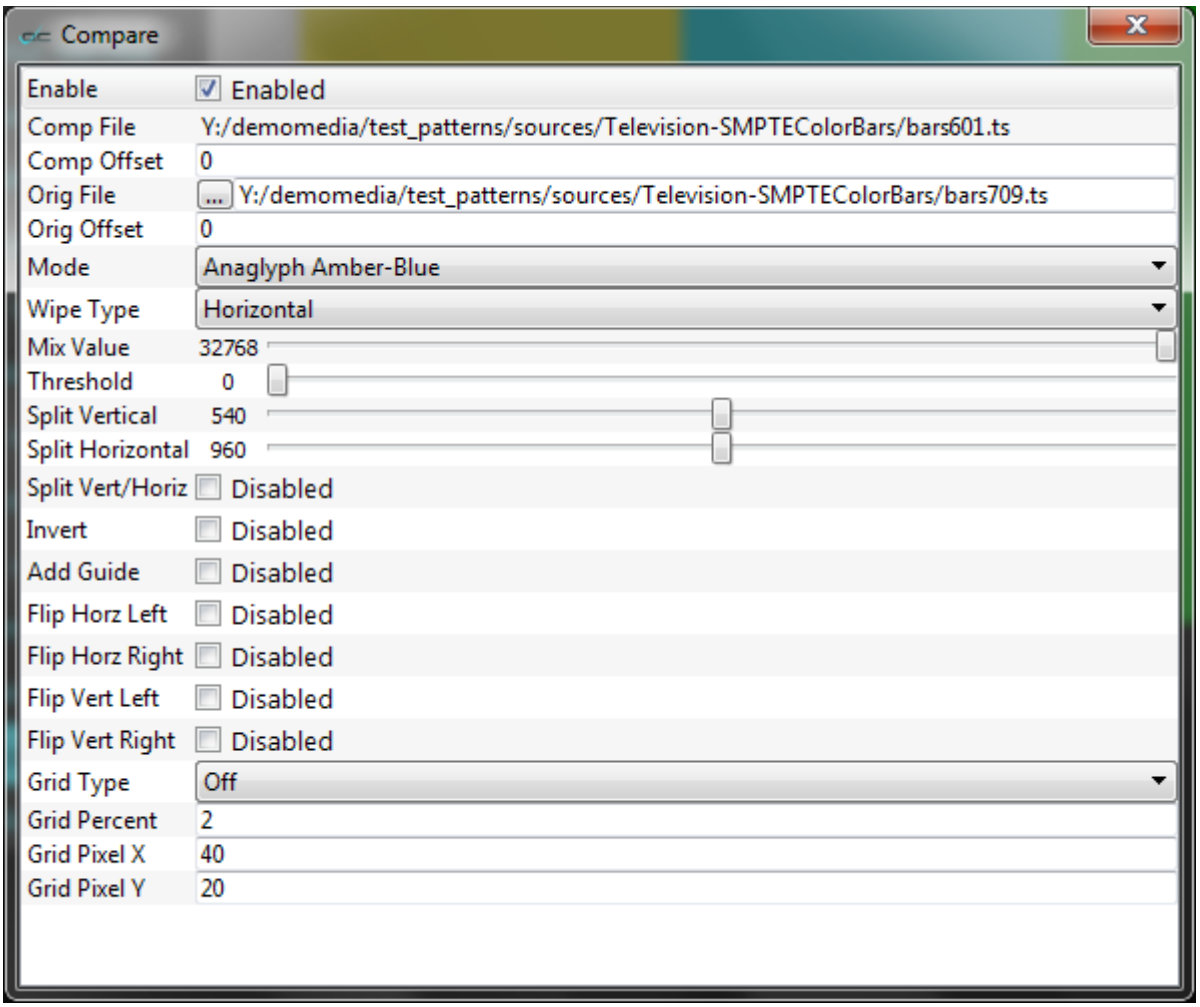
Full Reference Analysis

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.

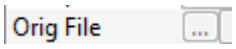
Enable Compare Mode
Once it is loaded, bring up the view **Compare** dialog from the menu.

This opens the **Compare** dialog.



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

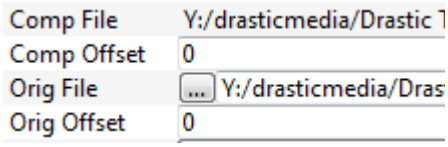
Load the Original Reference File
To load the original, or reference video, click on the **...** button next to the **Orig File** label.



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
Finally, 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 proxying 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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