

sdiScope v7

User Guide



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2 Introduction

This manual is for sdiScope 7.x software from Drastic Technologies, Ltd.

2.1 Conventions

This manual assumes the following:

That the user knows how to operate a mouse and keyboard and perform the basic functions of Microsoft Windows or macOS operating system.

That the user is familiar with the creative software in use.

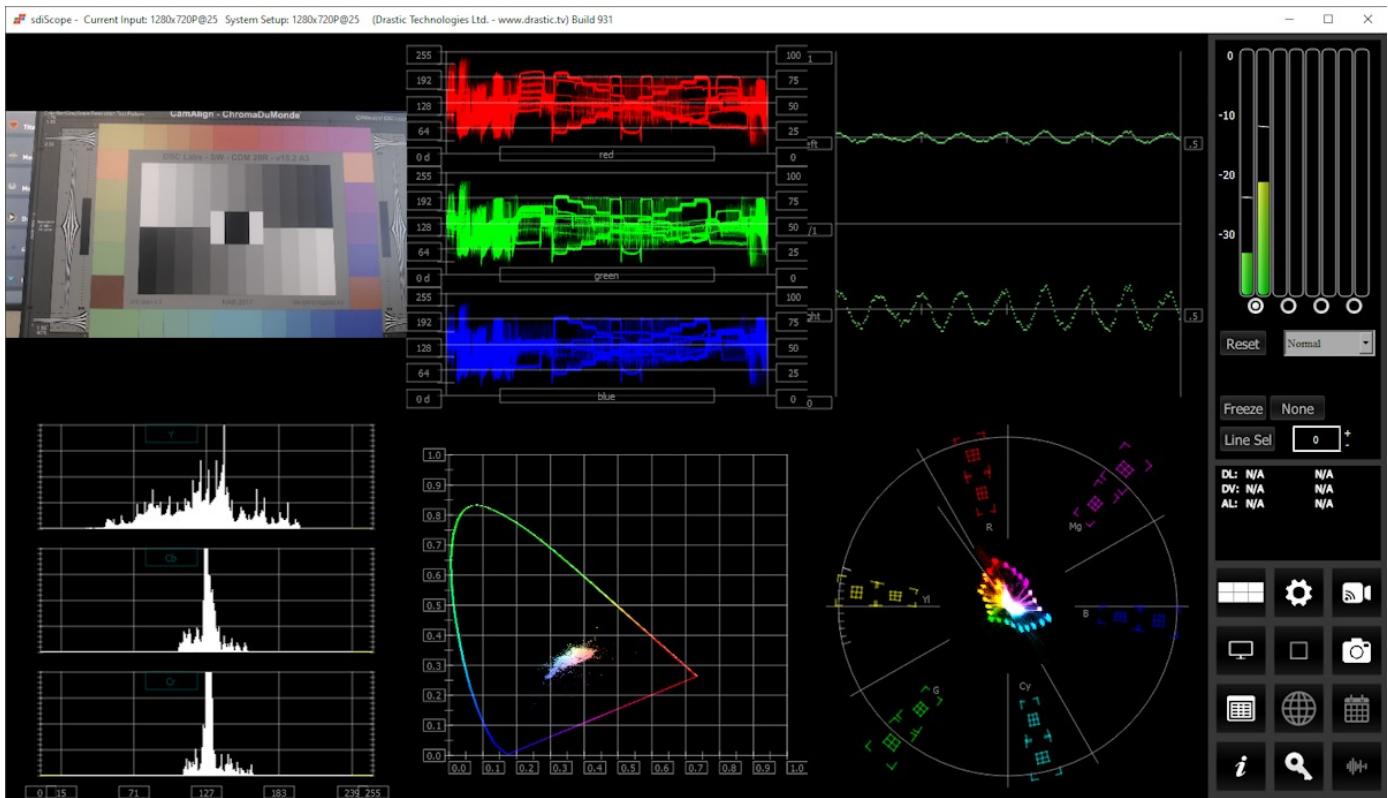
That the user has access to technicians capable of placing the device on the network and setting up any SAN systems if necessary.

The name of a control or display present on the interface will be displayed in **bold** text.

Where a portion of the manual is referred to the name of section mentioned will be displayed in *italics*.

Certain images in this document may have been grayed out where it is useful or necessary to place indicator marks to show specific controls or displays above a darker background.

2.2 About sdiScope



sdiScope is the world's most powerful SD/HD software signal monitoring tool.

sdiScope is available for Windows 10 or greater, and macOS 13 Ventura - macOS 14 Sonoma. It provides the following signal analysis tools:

- Picture, with zoom and pan
- Multiple time code display
- Data View with Ancillary Data Streams view
- Vectorscope
- YCbCr Waveform Monitor (stacked, parade, or luma only)
- RGB Waveform Monitor (stacked or parade)
- YCbCr Histogram
- RGB Histogram
- HSV (hue/saturation/value) Histogram
- Luma Histogram
- Chromaticity
- Status

- Audio Vectorscope (Lissajousxy, Lissajous, Polar)
- Audio Phase
- Audio Histogram (logarithmic or linear)
- Audio Waveform Monitor
- Audio Metering (RMS and Peak)
- Freeze and compare
- Save signal and scopes to image
- Standard desktop software

2.3 System Requirements

2.3.1 Recommended Environment

sdiScope software must be installed on a system at least as powerful as the configurations listed below.

HD 1080p60

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

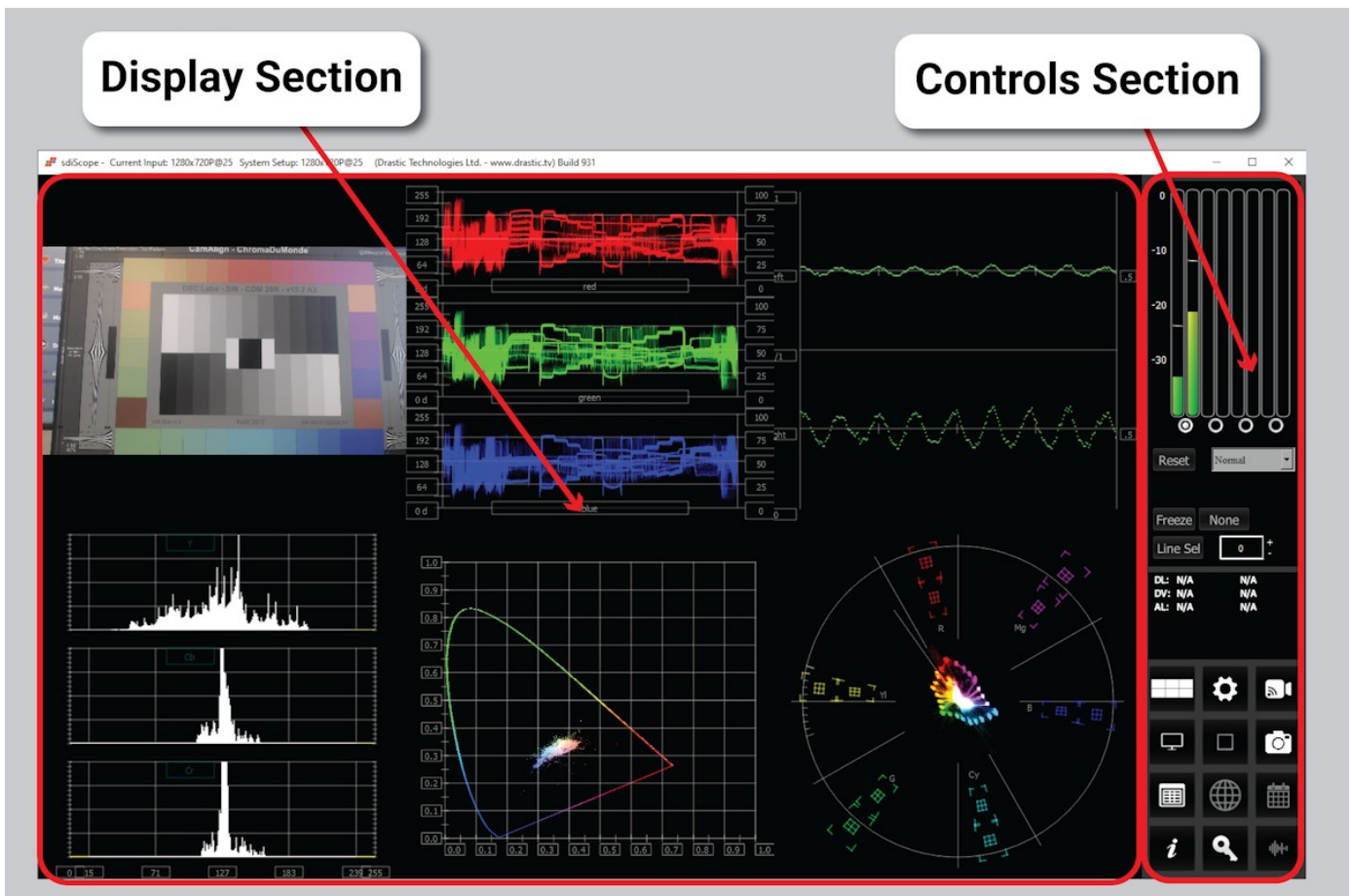
sdiScope supports a wide range of input boards and devices, including many low cost capture devices. Here is a list:

- [AJA](#): KONA LHe/plus, KONA LHi, KONA 3G, KONA 4, KONA IP, KONA 5, KONA HDMI, Io-XT, Io-4K, OEM2K, Corvid Series, U-TAP
- [Blackmagic](#) (version 11/12 drivers required): UltraStudio, DeckLink, Intensity Pro, Intensity, Mini Recorder, UltraScope, HyperDeck, Ursa, BMPCC (32 bit software support is end of life at version 7)
- [DekTec](#) - SDI boards: DTA-2172, DTA-2174B, DTA-2175, DTA-2178-ASI, DTA-2178, DTA-2179, DTA-2195 (use latest drivers)
- [Bluefish444](#): Epoch Supernova, Epoch Neutron, KRONOS
- [Digitnow](#): HDMI USB Capture
- [Elgato](#): Game device capture devices
- [Epiphan](#): AV.io HDMI/SDI/4K
- [Inogeni](#): 4K, 3G, DVI, VGA/CVBS
- [Logitech](#): HDMI Screen Share
- [Magewell](#): HDMI and SDI USB-3 devices
- [Microsoft](#): USB Cameras
- [Mokose](#): HDMI/SDI USB-3
- [NDI](#): NDI[®]
- [Rybozen](#): HDMI USB Capture
- [UVC](#): Most (USB Video Class) compliant video devices

3 Reference

The reference section provides a detailed look at each of the elements in the **sdiScope** graphical user interface.

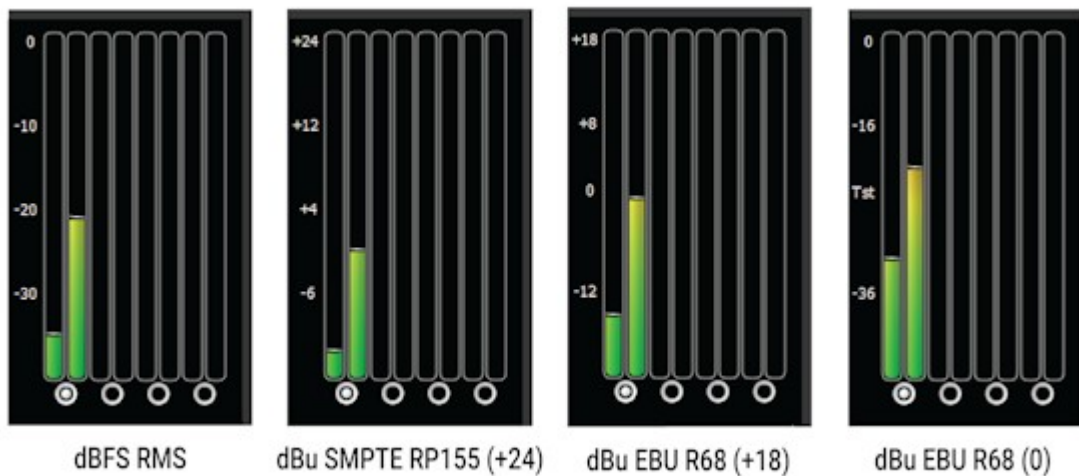
3.1 Main Interface Overview



Display section – to the left of the controls (the main portion of the GUI) is the screen where the various scopes, meters, or data will be displayed. sdiScope features four different layouts: a single display that takes up the full area, two scopes side by side, four scopes in a two by two grid, and six scopes (three across, two down). These can be selected in the Scope Config window. The Data View can be selected by clicking the Data View button in the Controls section.

Controls section – The panel on the right with the audio meters, status display, and access buttons is the Controls section. Following are details for the Controls section.

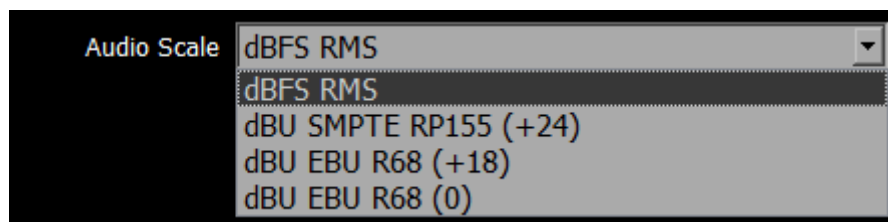
3.1.1 Audio Controls



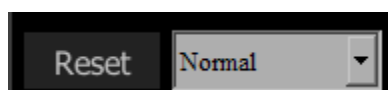
Audio display and pair selectors – At the top of the Controls section the audio meters are displayed. There are four supported audio scale types available in sdiScope. In the above spread, the types are all shown (L-R):

- dBFS RMS - decibels relative to Full Scale, root mean squared
- dBu SMPTE RP155 (+24) – decibel units, SMPTE RP155
- dBu EBU R68 (+18) - decibel units, EBU R86
- dBu EBU R68 (0) - decibel units, EBU R86

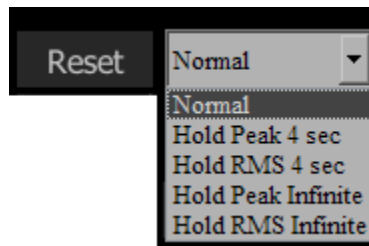
The user can switch between these settings in the Configuration menu.



sdiScope was designed as a simple scopes tool, and is limited to two channel audio support. For up to 16 channels of audio support, please see 4KScope, HDRScope, or 2110Scope.

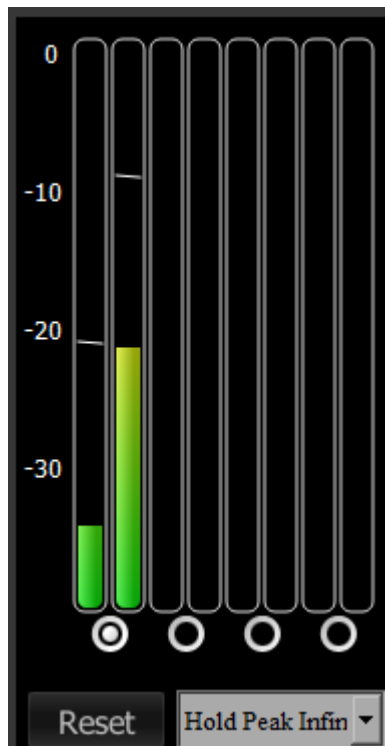


Hold Peak/RMS – Just under the audio pair selector buttons there is a reset button and a pulldown menu for options to hold the peak audio level. The following options are available:



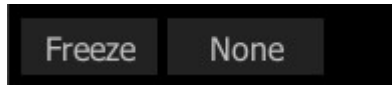
The following options are available:

- **Normal** – allow Peak and RMS to range freely with no hold
- **Hold Peak 4 sec** – hold the peak (the little white line in the audio level, typically near the top) for 4 seconds. Pressing the Reset button returns the Peak to the current level.
- **Hold RMS 4 sec** – hold the RMS (the main audio slider, green near the bottom and red at the top if the signal is too high) for 4 seconds. Pressing the Reset button returns the RMS to the current level.
- **Hold Peak Infinite** – hold the Peak at its highest level and leave it there, unless the Reset button is pressed. Pressing the Reset button returns the Peak to the current level.
- **Hold RMS Infinite** - hold the RMS at its highest level and leave it there, unless the Reset button is pressed. Pressing the Reset button returns the RMS to the current level.

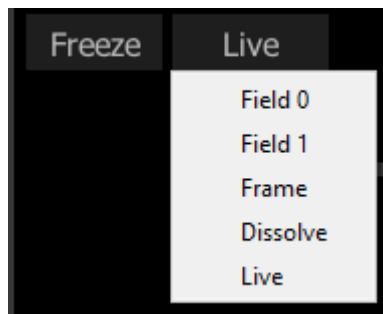


Shown are audio meters with **Hold Peak Infinite** selected. The current audio level is the green bar, and the peak level being held is the white line above the bar. Pressing the **Reset** button sets the peak to the current level.

3.1.2 Freeze Field/Frame



Freeze section – the Freeze button saves an image of the current frame of video for closer inspection or comparison. The button to the right offers a popup menu for the type of image that is created.



Field/Frame/Live drop down – selects how a frozen frame will be displayed against the live video

Field 0 – show field 0 frozen, field 1 live

Field 1 – show field 1 frozen, field 0 live

Frame – show the frozen frame

Dissolve – show 50% of the frozen frame and 50% of the live frame

Live – show the live video (frozen frame is still saved)

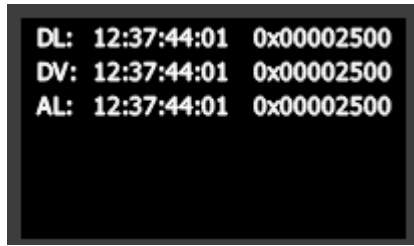
3.1.3 Line Select



Line Select – when clicked, all the video scopes will analyze only the video line in the line selection box next to the button. This line will be highlighted on the in-app video display.

Clicking the plus and minus buttons will increment the line up or down. Pressing the **Line Sel** button sets that line as the line to monitor. Note that horizontal blanking lines are not selectable since they are outside the image area. So, in HD for example, lines below line 41, and lines above line 1121 are not selectable.

3.1.4 Status Display



Status Display – the Status display shows time code and user bits (where present) for:

- RP-188 L SDI inputs
- RP-188 V SDI inputs
- Analog SMPTE time code input

3.2 Scopes Layout and Setup



Scope Setup button – The Scope Setup button in the Controls section opens the Scope Config window, which allows the user to configure how many scopes are displayed, to switch between scopes, and to set up each particular scope.

Note that the button reflects how many windows are set up in the layout. The above example shows sdiScope set to display one scope. Here is an example where six scopes have been set up:



3.2.1 Layout Options

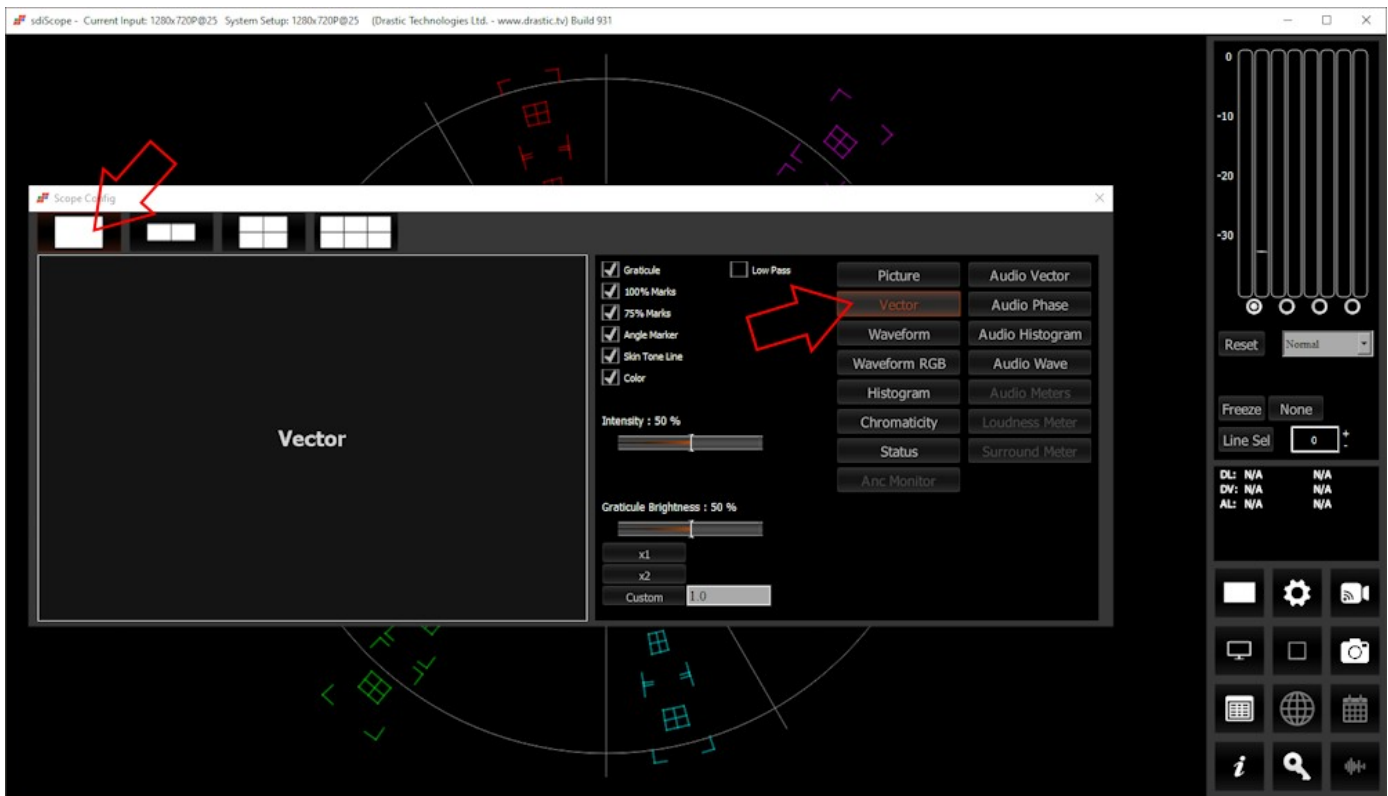
Press the Setup button, and select the layout that suits your workflow:



From left to right, the choices are: 1 scope (single), 2 scopes (side by side), 4 scopes (2 x 2 grid), or 6 scopes (two rows of three scopes).

3.2.1.1 Single Scope Layout

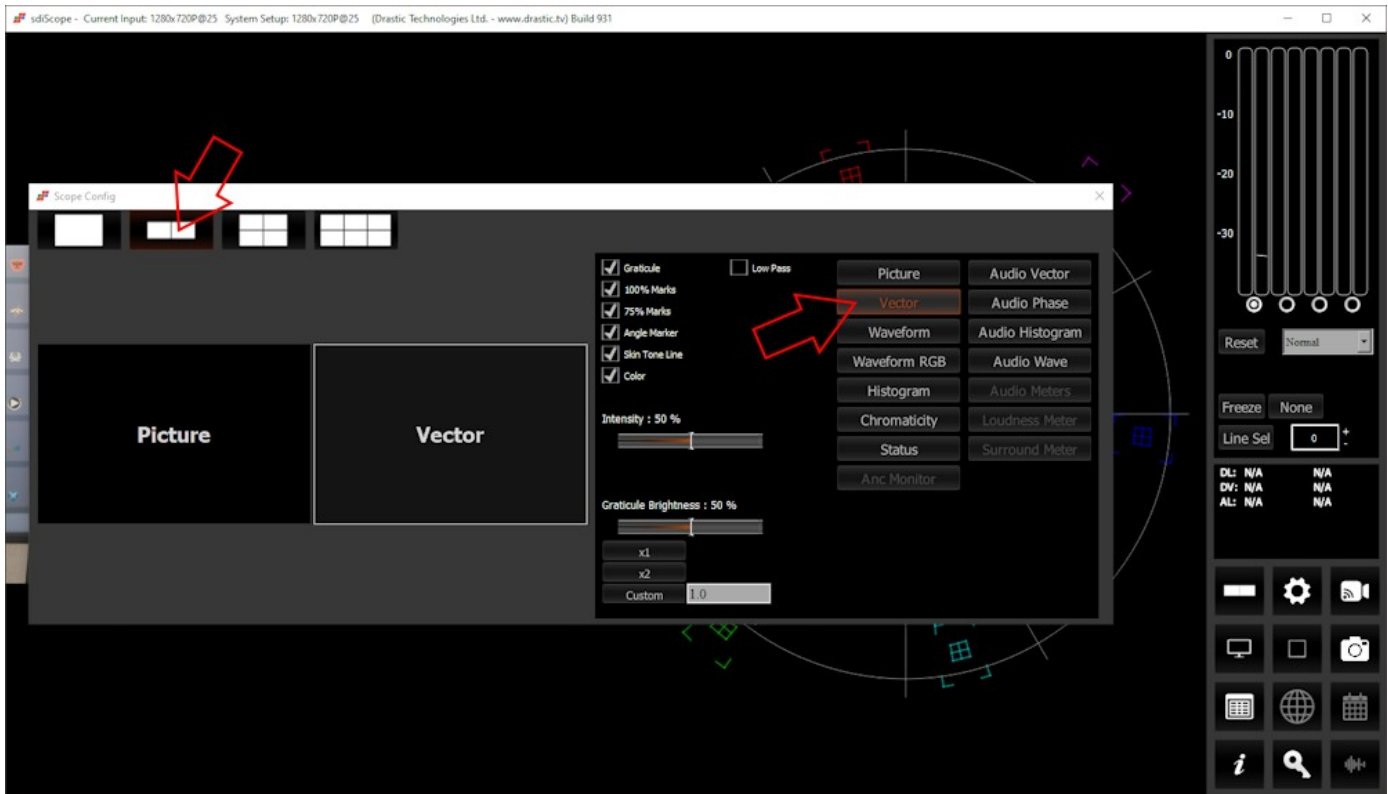
A single scope layout has been selected.



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

3.2.1.2 Two Scopes Layout

The two scopes layout has been selected.

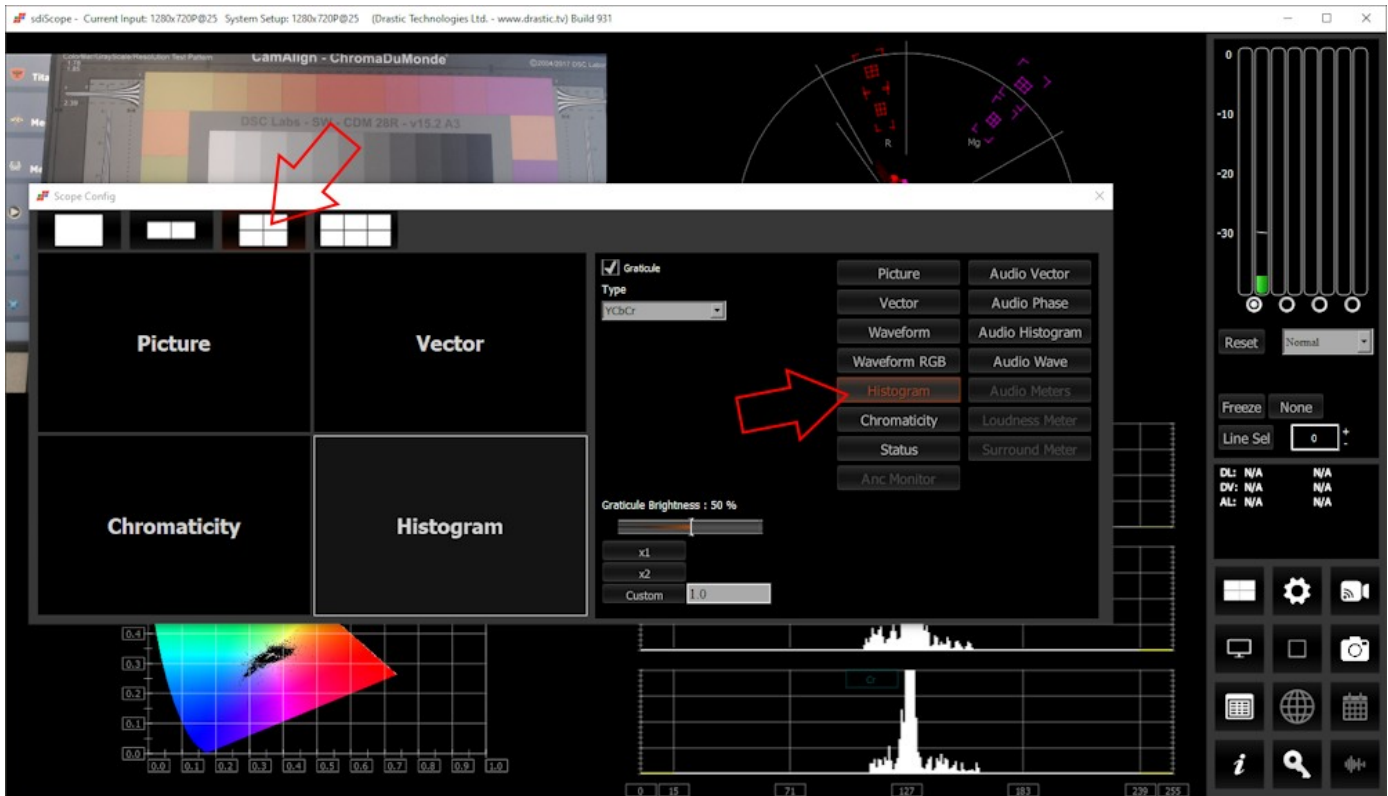


The arrow on the left shows the button used to select the two scopes layout. The example shown features the picture view and the vectorscope. The arrow on the right shows the button used to select the vectorscope.

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

3.2.1.3 Four Scopes Layout

The four scopes layout has been selected.

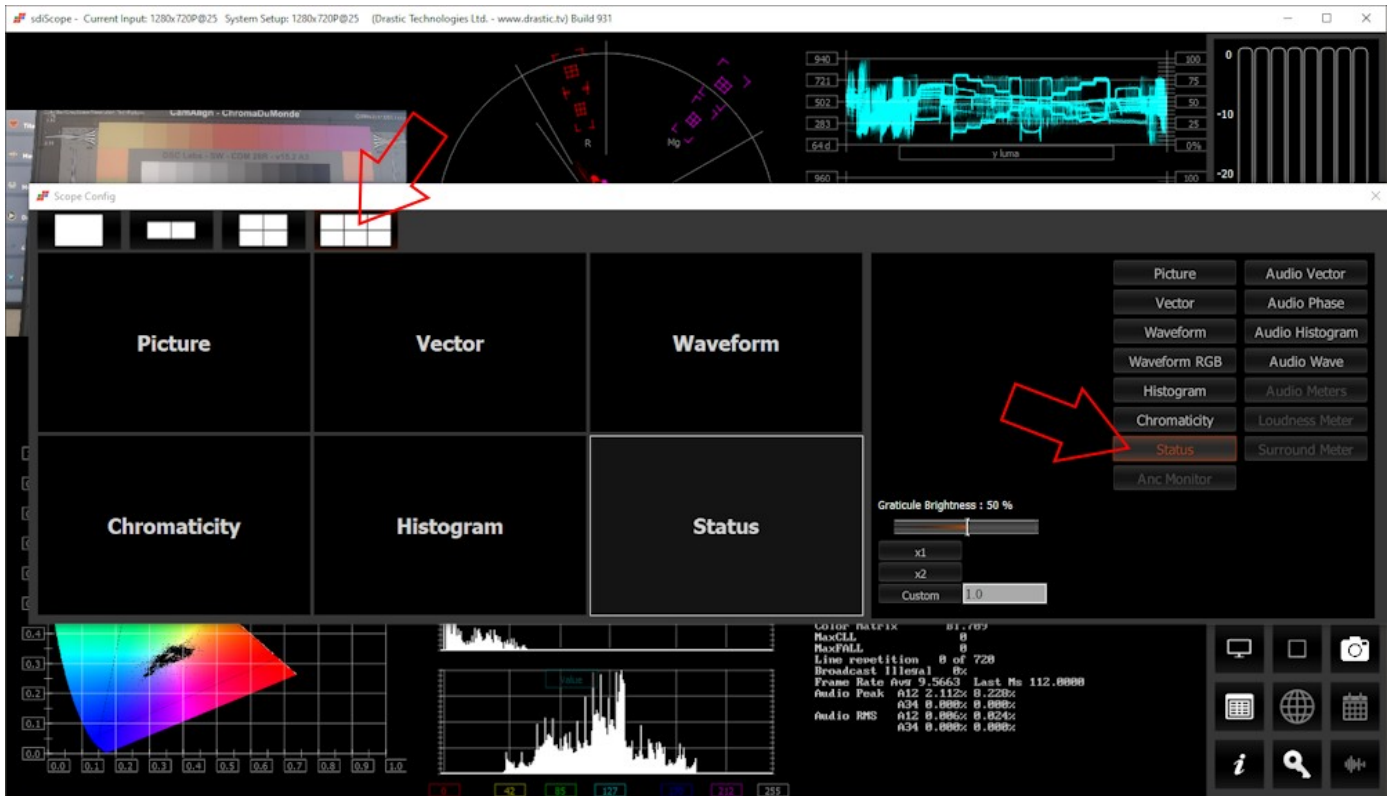


The arrow on the left shows the button used to select the four scopes layout. The example shown features the picture view, the vectorscope, the chromaticity, and the YCbCr histogram. The arrow on the right shows the button being used to select the histogram.

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

3.2.1.4 Six Scopes Layout

The six scopes layout has been selected.

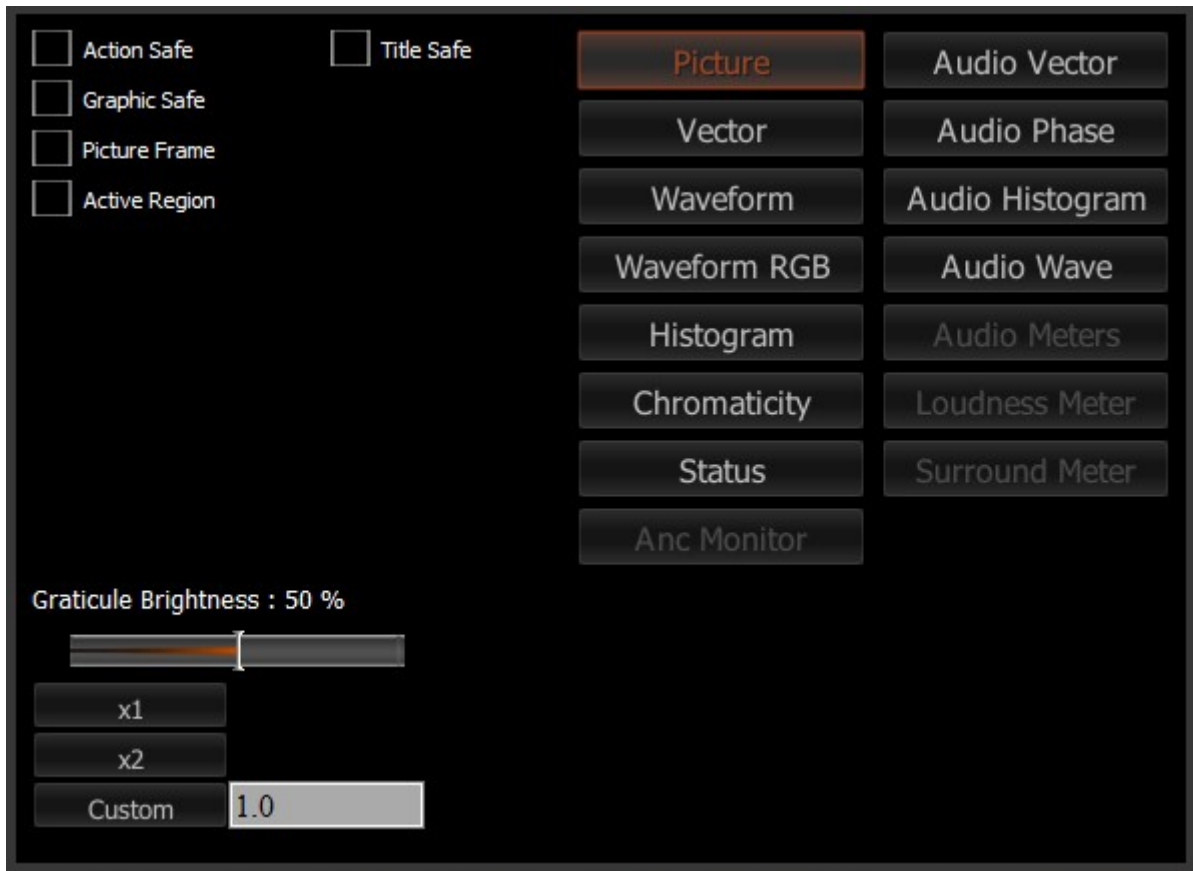


The arrow on the left shows the button used to select the six scopes layout. The example shown features the picture view, the vectorscope, the YCbCr waveform, the chromaticity, the YCbCr histogram, and the Status display. The arrow on the right shows the button being used to select the status view.

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

3.2.2 Picture View

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



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.

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

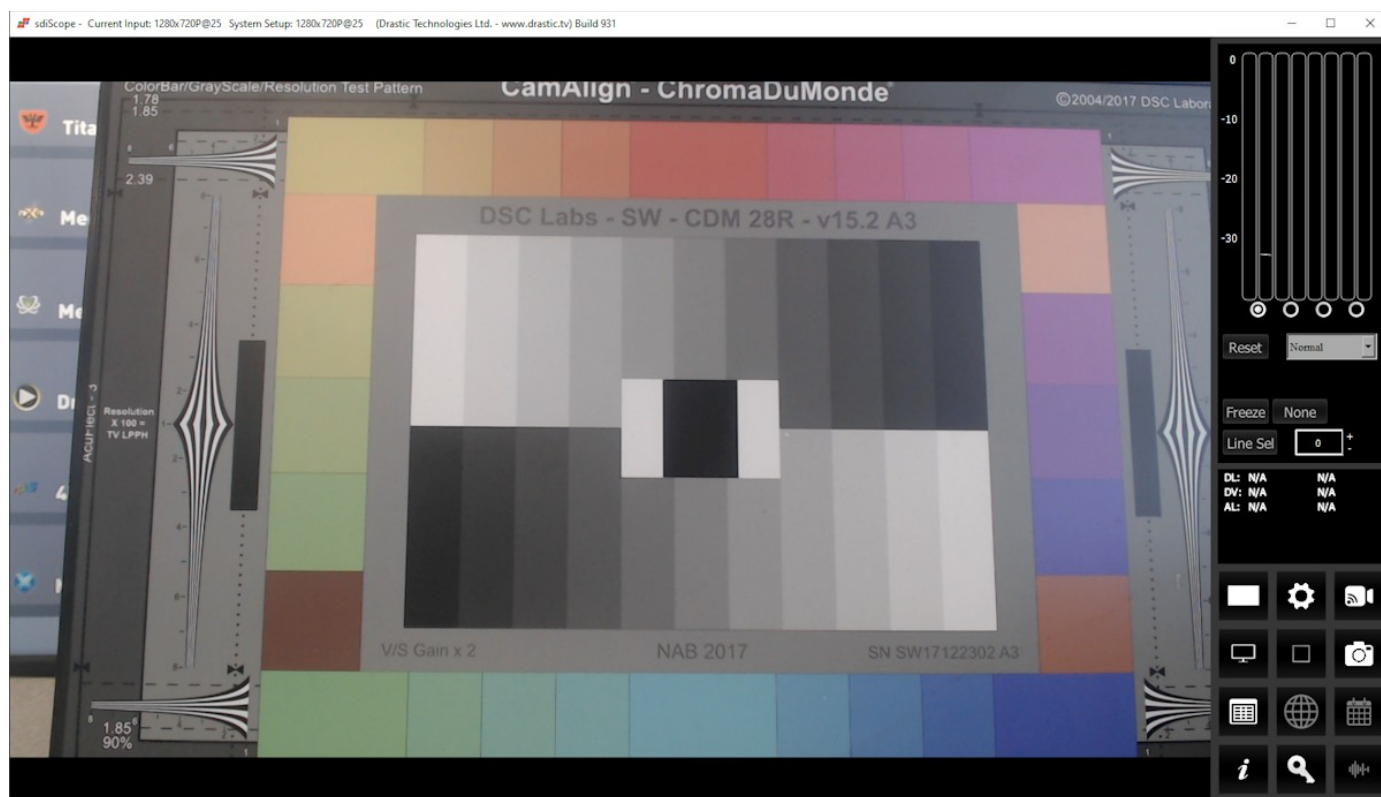
x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display.

Pressing the x1 button sets the display back to normal.

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

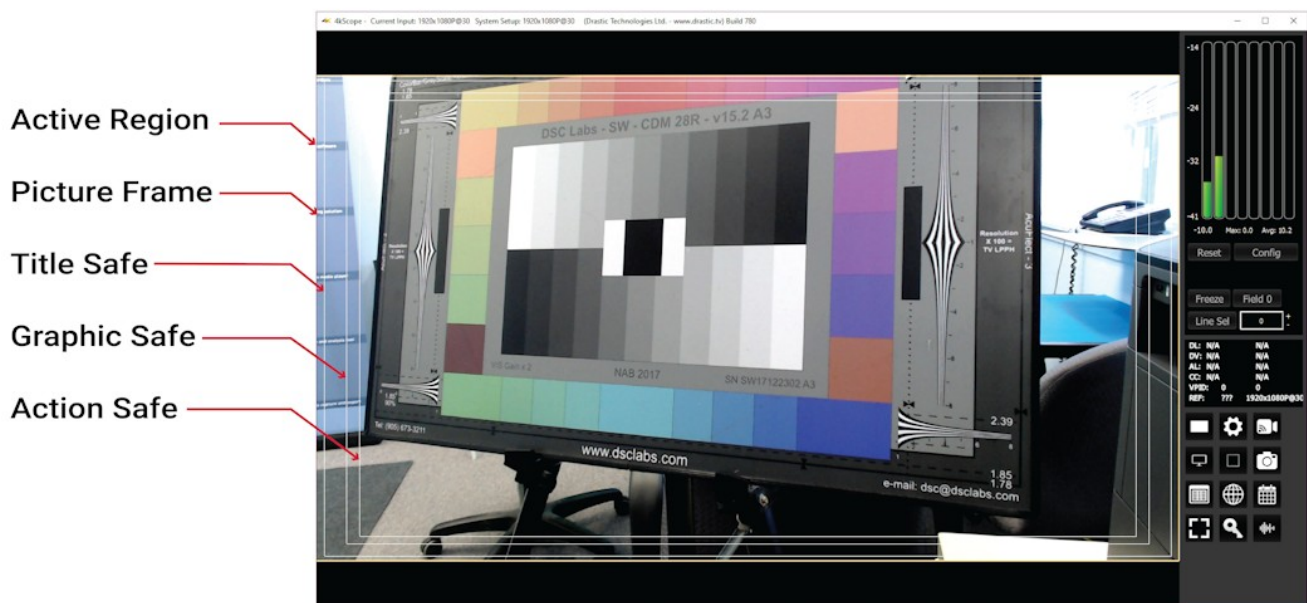
Pressing the x in the upper right corner will close the Scope Config window.

Here is the **Picture** view.



The **Picture** view shows the video signal, to confirm the source is correct.

3.2.2.1 Graticules



Action Safe, Title Safe, Graphic Safe, Picture Safe, and Active Region graticules may be optionally overlaid.

3.2.3 Vectorscope

3.2.3.1 Vectorscope Setup

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



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

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

100% Marks checkbox – when selected, the 100% Marks are displayed over the Vectorscope

75% Marks checkbox - when selected, the 75% Marks are displayed over the Vectorscope

Angle Marker checkbox - when selected, the Angle Marker is displayed over the Vectorscope

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

Color checkbox – when selected, the lines, regions, and points of the signal in the vectorscope are drawn in their respective colors.

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

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

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

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

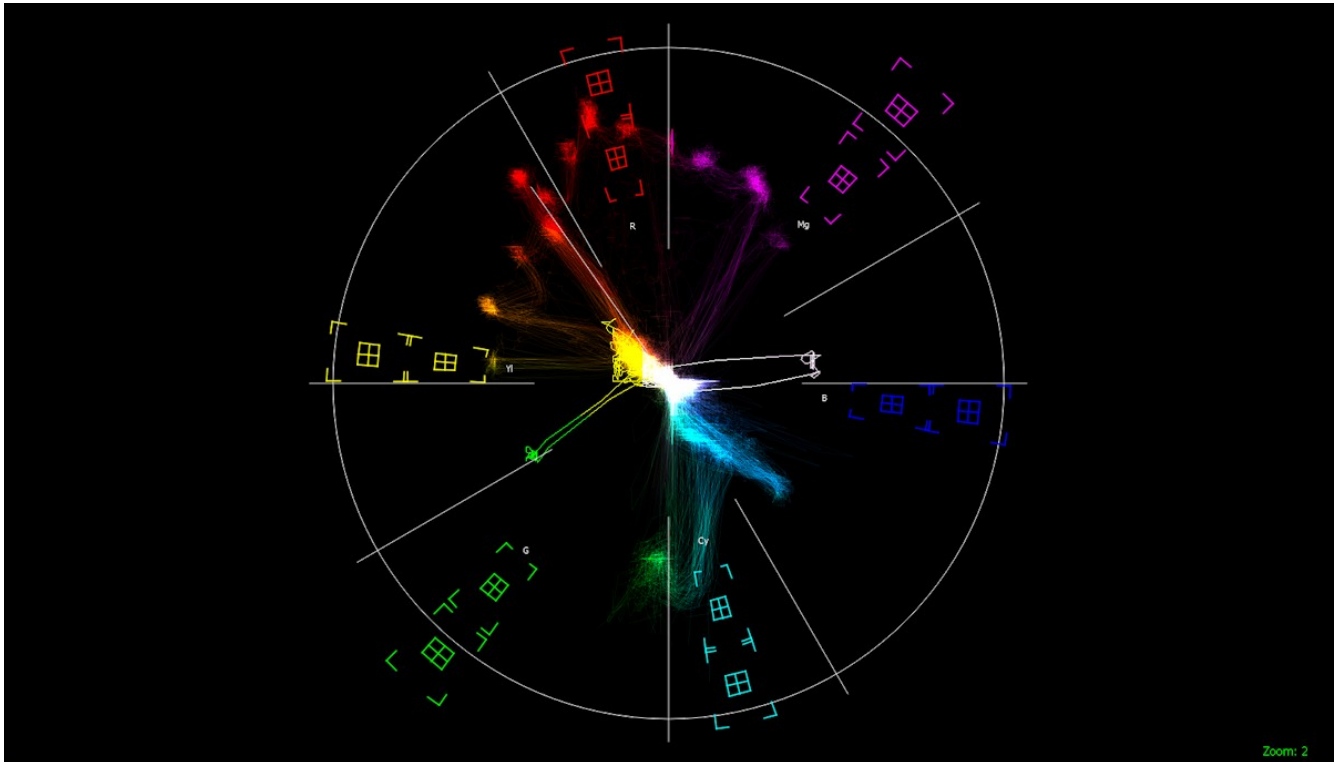
Pressing the x1 button sets the display back to normal.

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

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

3.2.3.2 Vectorscope 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.

3.2.4 Waveform YCbCr

3.2.4.1 Waveform YCbCr Setup

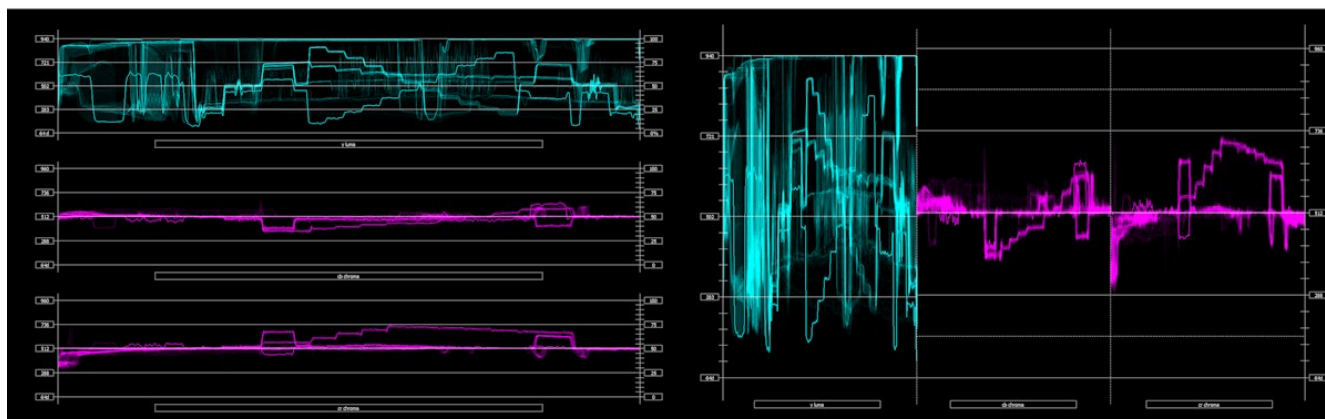
To set up the Waveform YCbCr, press the **Scope Config** button. This opens the Scope Config window. Click on the **Waveform** button on the right. There are a number of options to set up the waveform:



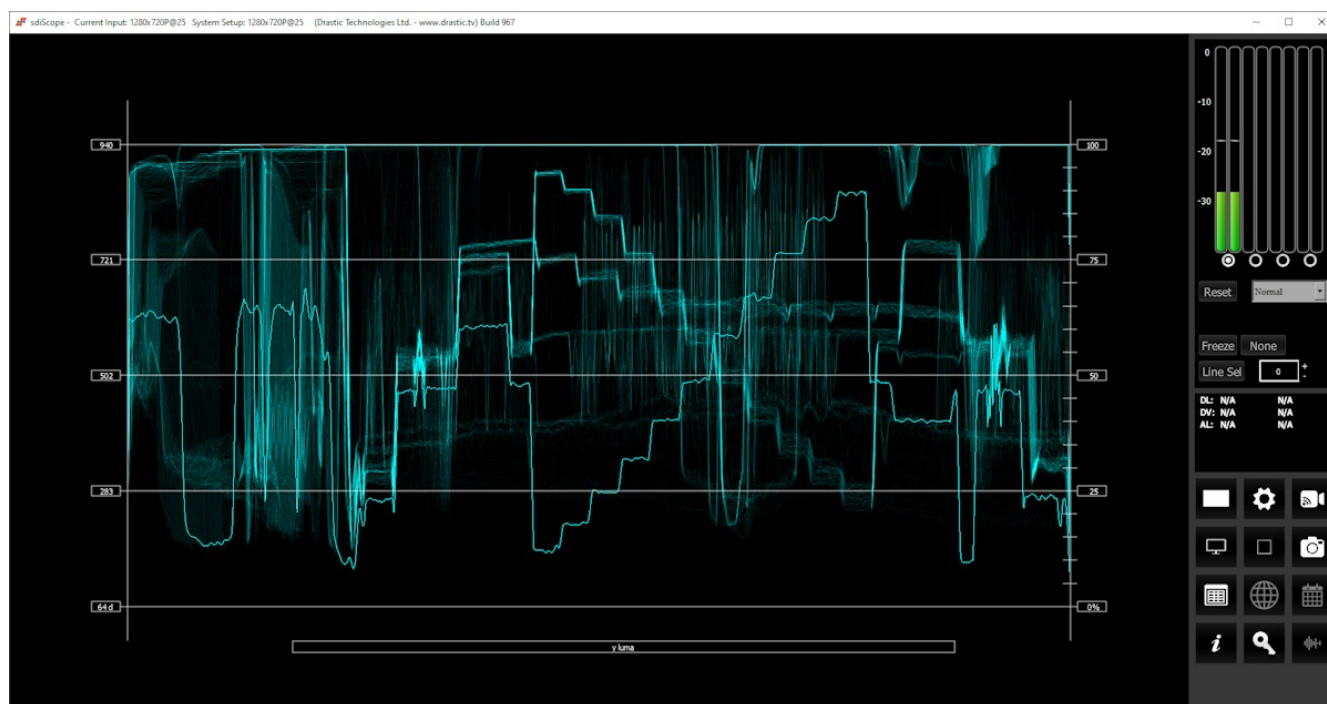
Graticule checkbox – when selected, the graticule is laid over the Waveform YCbCr display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.

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

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



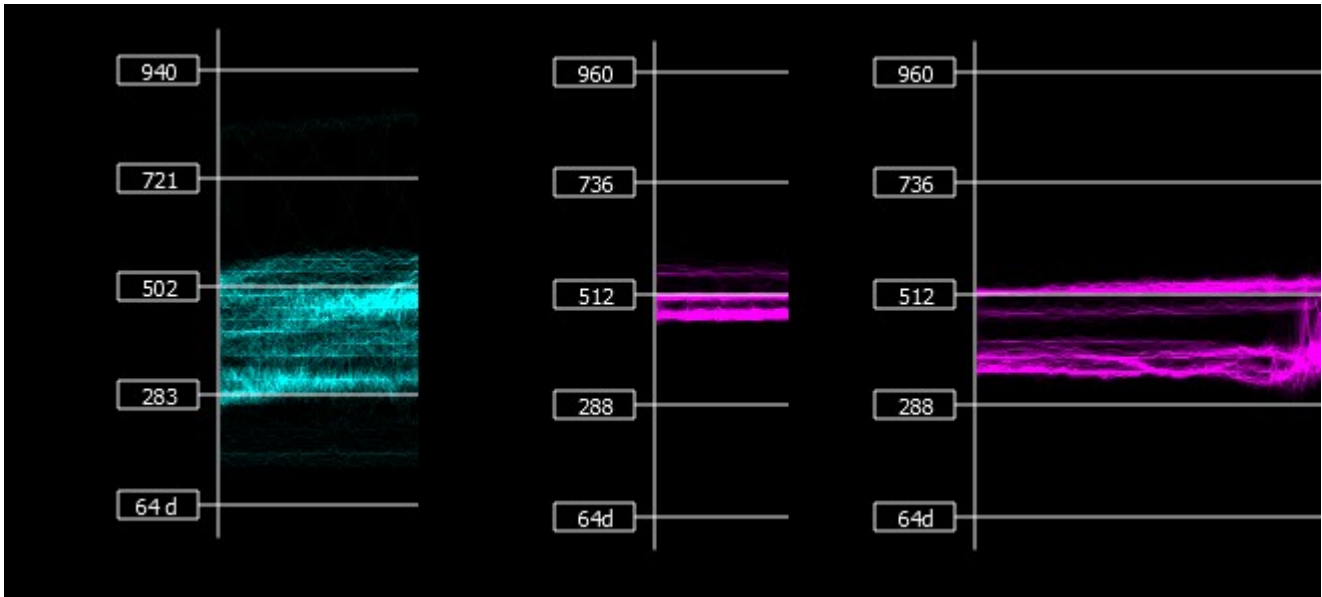
Only Luma checkbox – when selected, displays only the luminance of the signal.



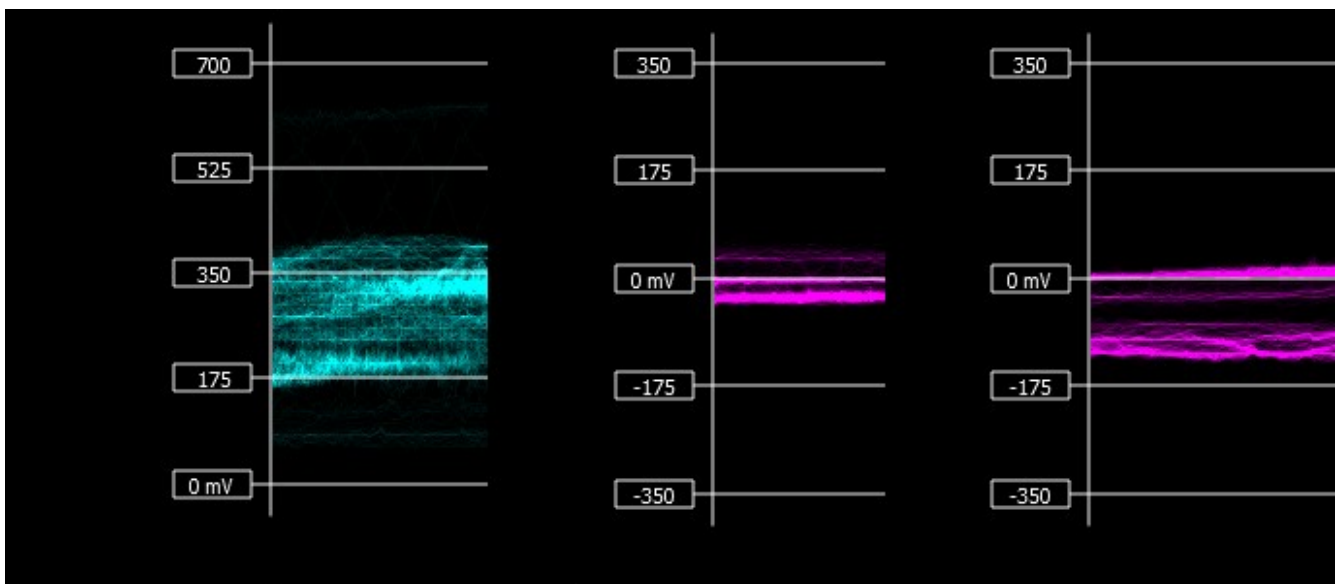
Scope White checkbox – turns the trace white.

Scale Type pulldown – set the type of scale used to draw the waveform. Choices include:

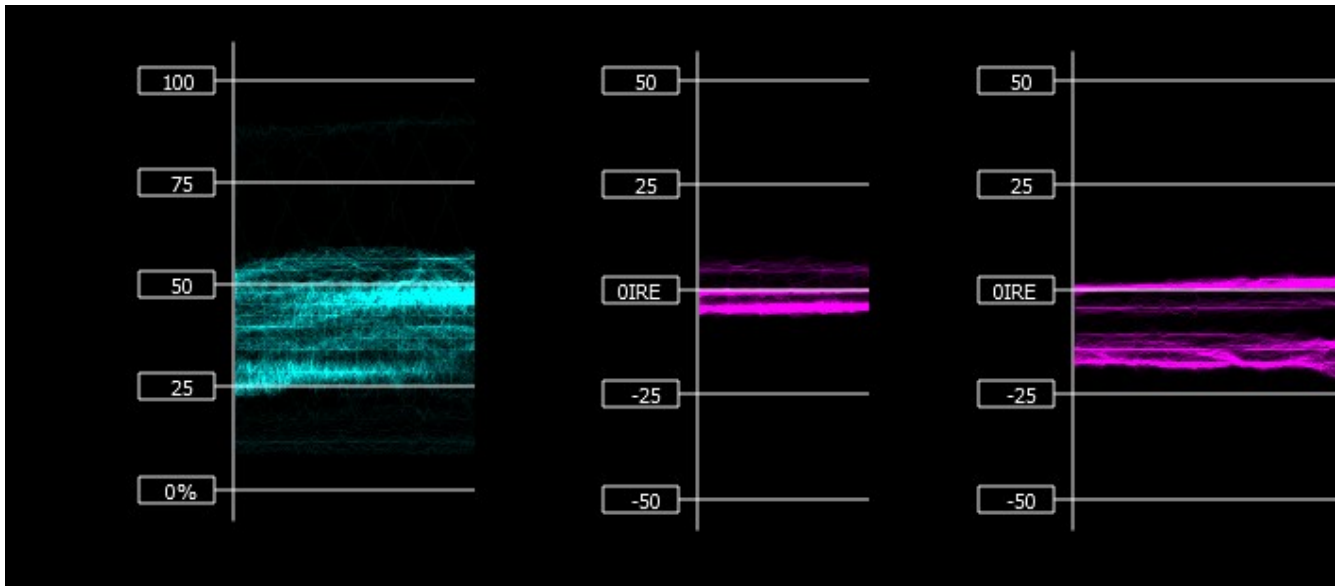
- **Digital** - the actual 0..255, 0..1023, or 0..4095 numeric values of the signal. In parade mode, the Cb and Cr graticule are not displayed.



- **MV** - the equivalent millivolts value of the signal if it was converted to analog. In parade mode, the Cb and Cr graticule are not displayed.



- **IRE** – Institute of Radio Engineers units, spanning 0..100. In parade mode, the Cb and Cr graticule are not displayed.



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

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

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

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

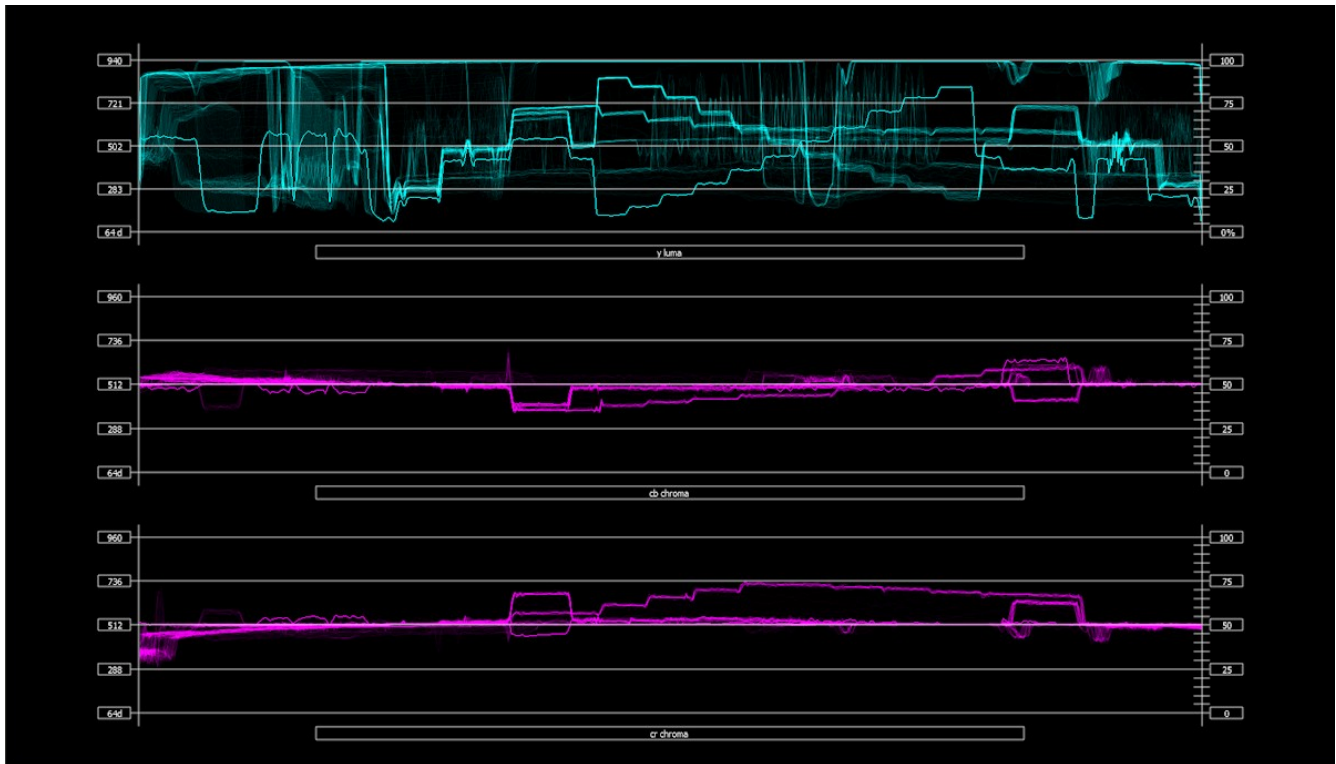
Pressing the x1 button sets the display back to normal.

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

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

3.2.4.2 Waveform YCbCr 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.

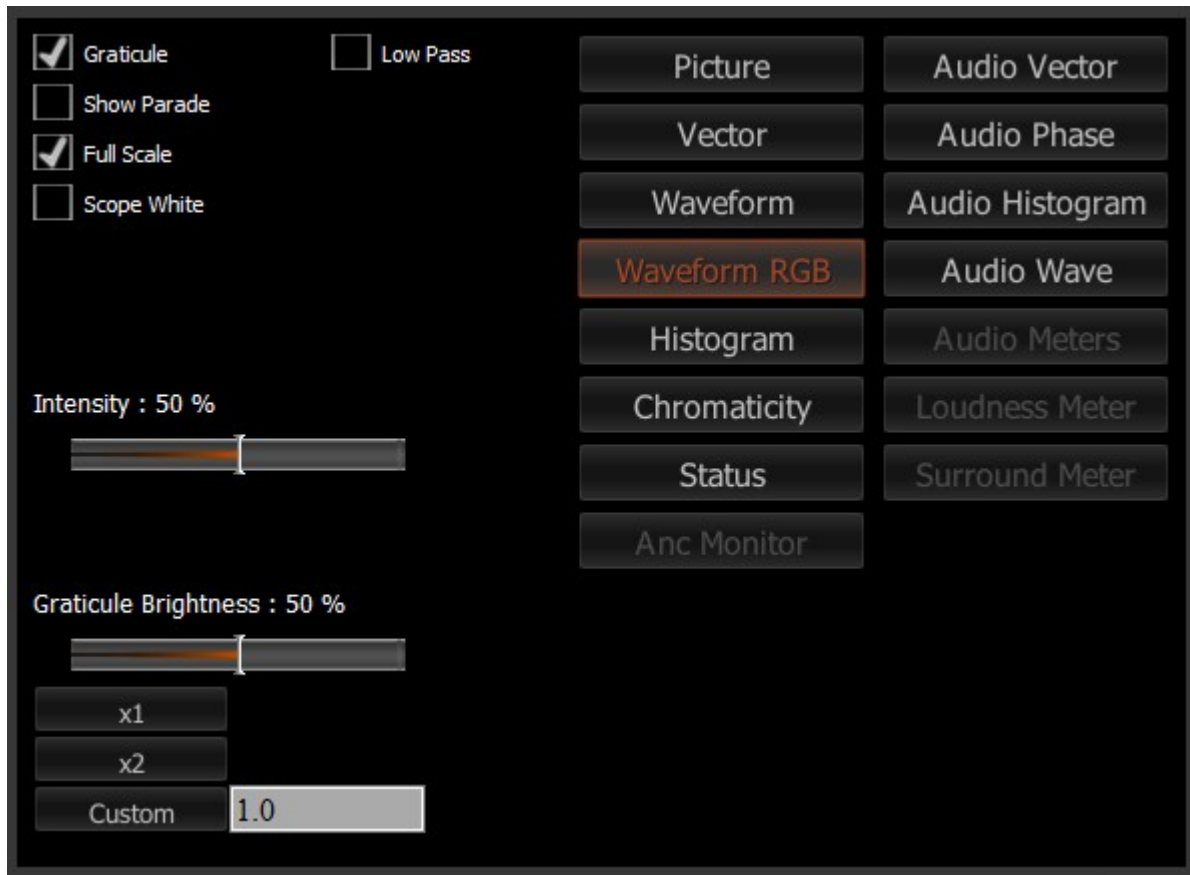
IRE (percentage) to Digital Equivalence		
0	64d	0x40
25	283d	0x11b
50	502d	0x1F6
75	721d	0x2D1
100	940d	0x3AC

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).

3.2.5 Waveform RGB

3.2.5.1 Waveform RGB Setup

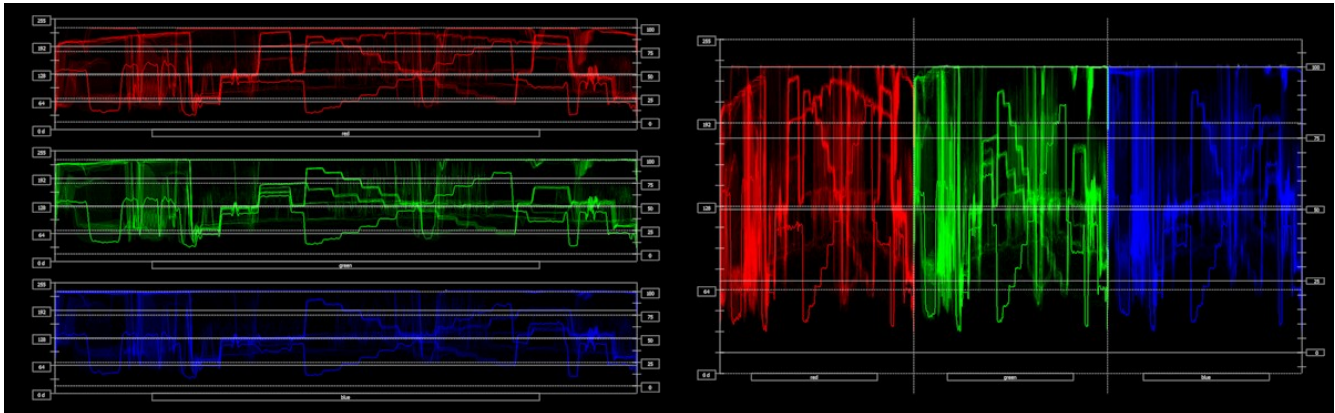
To set up the Waveform RGB press the **Scope Config** button. This opens the Scope Config window. Click on the **Waveform RGB** button on the right. There are a number of options to set up the Waveform RGB:



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

Low Pass checkbox - Smooth the scope with a 1/3 filter to remove single pixel anomalies.

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



Full Scale checkbox – RGB, by default, will be sRGB. The range of each color will be from 16 to 240 (in 8 bit), so the scale will place white at 240 and black at 16 in normal scale. If in full scale, white will be placed at 255 and black at 0. This setting changes the graticule so if you have a Full Scale signal, the graticule will line up properly with the signal.

Scope White checkbox – turns the display white.

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

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

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

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

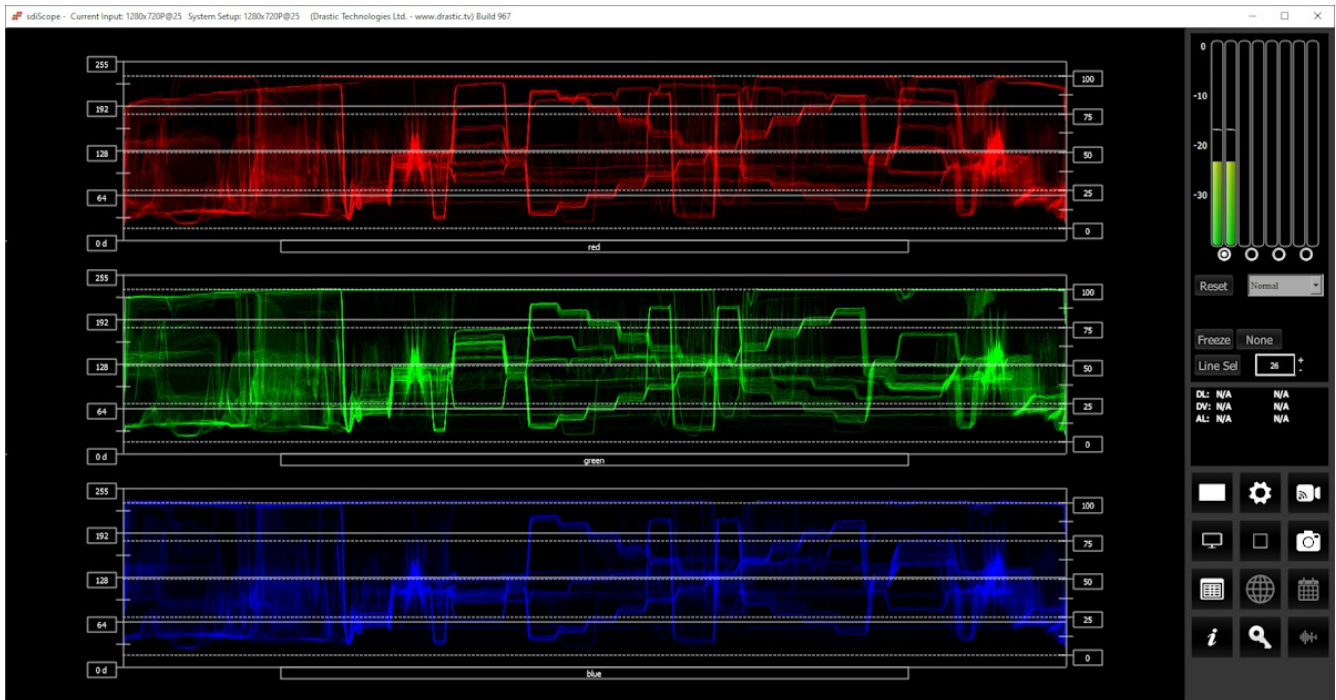
Pressing the x1 button sets the display back to normal.

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

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

3.2.5.2 Waveform RGB 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, B, and A) is displayed in 10 bit mode (0-1023).

IRE (percentage) to Digital Equivalence		
0	0	0x0
25	256	0x100
50	512	0x200
75	768	0x300
100	1023	0x3FF

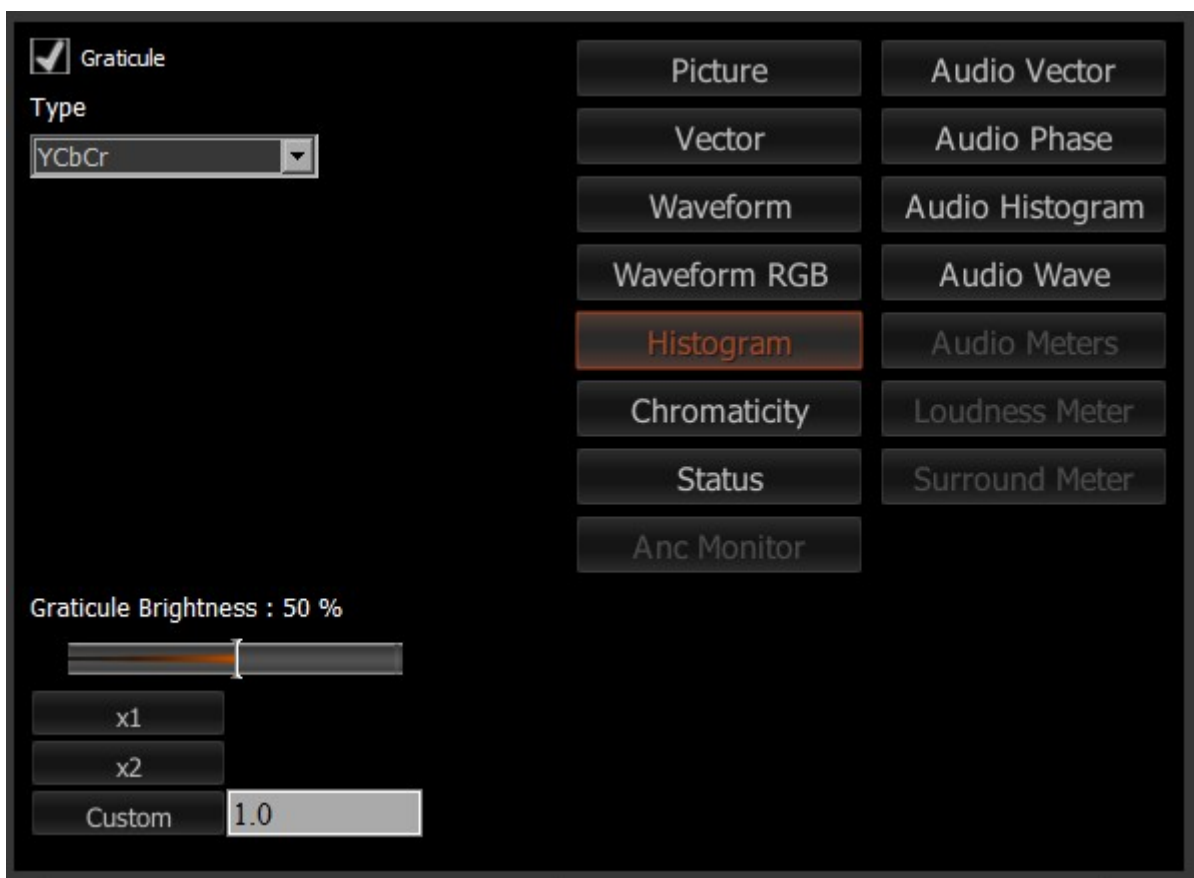
For single link YCbCr signals, they are first converted to RGB before being analyzed and displayed.

3.2.6 YCbCr Histogram

3.2.6.1 YCbCr Histogram Setup

There are four Histograms available in the histogram panel: the YCbCr Histogram, RGB Histogram, HSV Histogram, and Luma Histogram.

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



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

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

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

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

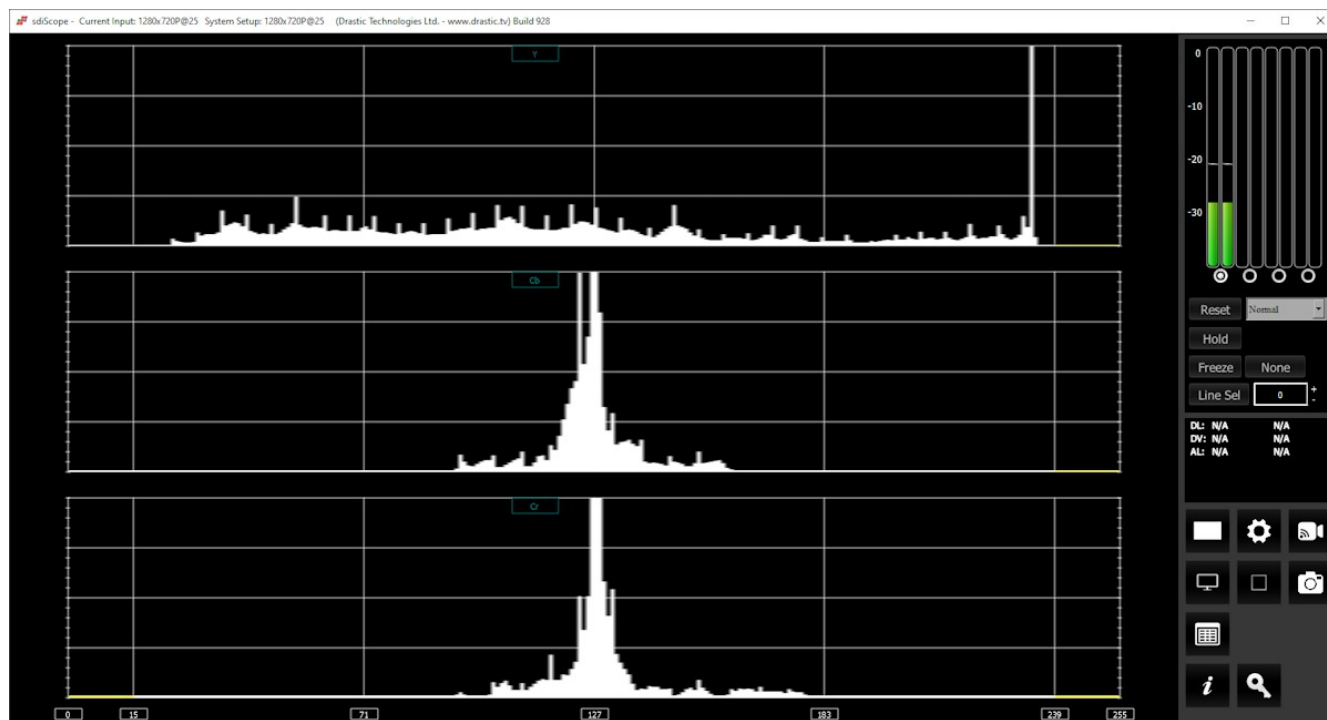
Pressing the x1 button sets the display back to normal.

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

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

3.2.6.2 YCbCr Histogram Window

Here is the YCbCr Histogram.



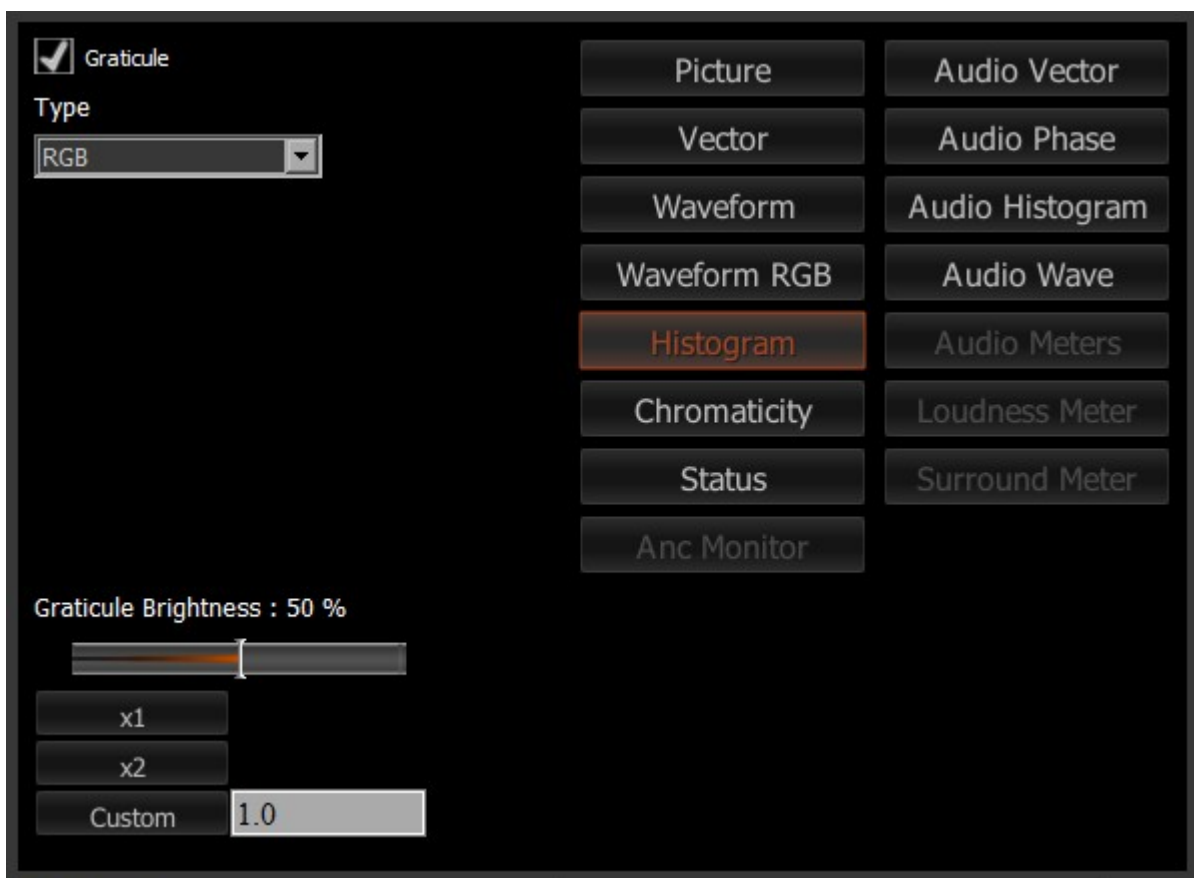
YCbCr - displays a YCbCr range. This histogram breaks up the signal in into luma and chroma components. The top histogram represents the luma power of the various levels in the signal. The Cb and Cr histograms that follow show the power distribution for those two components.

3.2.7 RGB Histogram

3.2.7.1 RGB Histogram Setup

There are four Histograms available in the histogram panel: the YCbCr Histogram, RGB Histogram, HSV Histogram, and Luma Histogram.

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



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

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

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

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

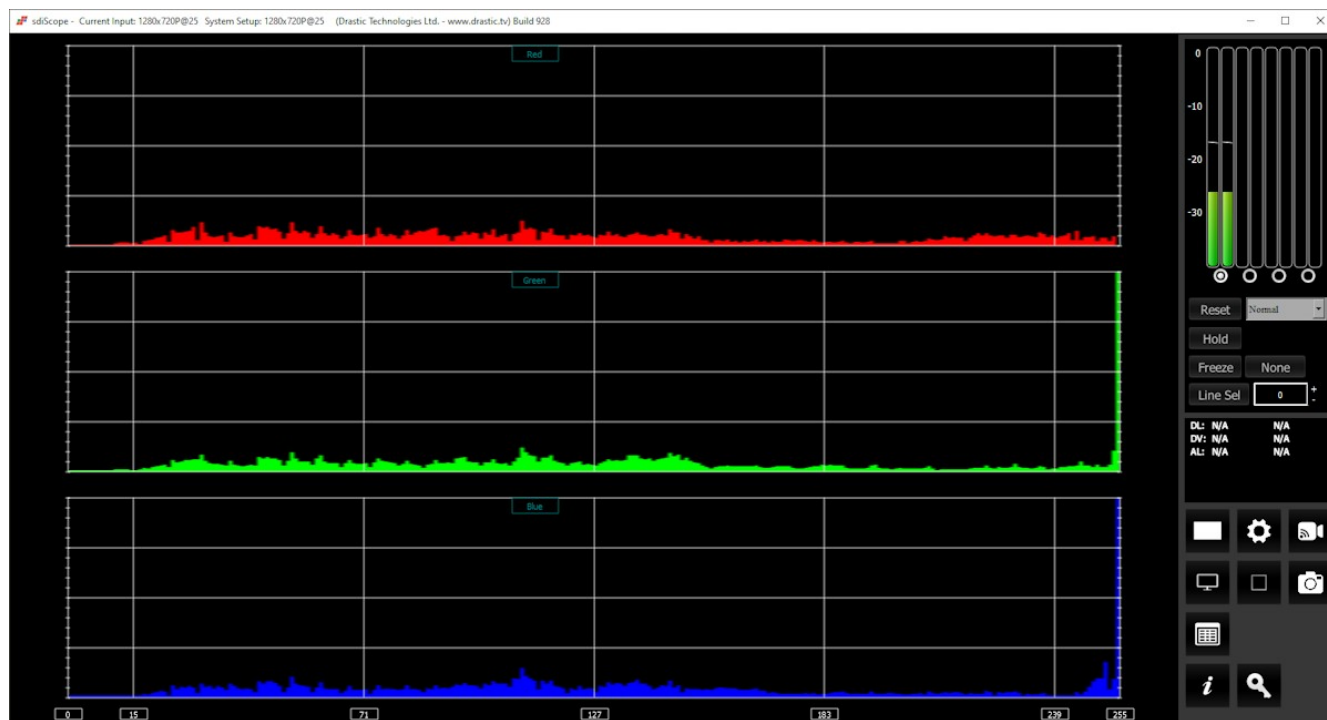
Pressing the x1 button sets the display back to normal.

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

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

3.2.7.2 RGB Histogram Window

Here is the RGB Histogram:



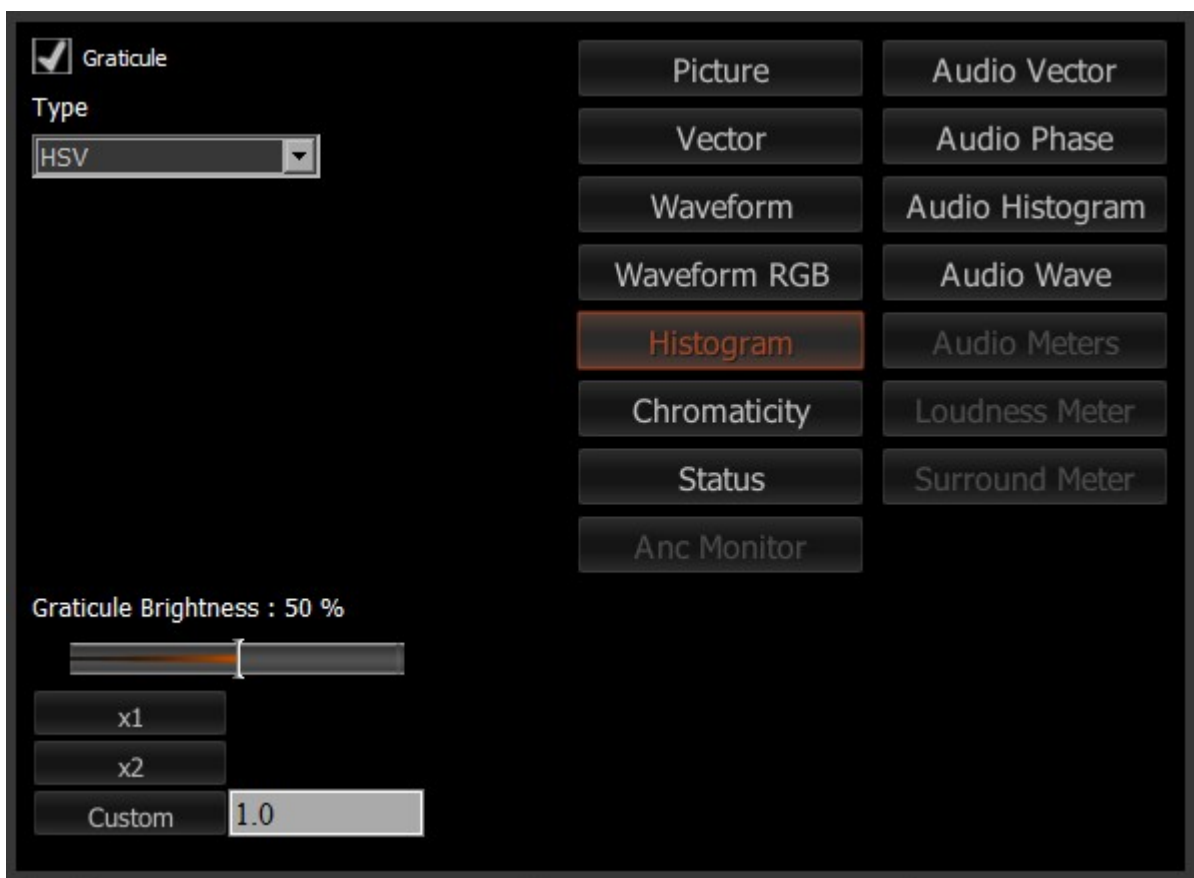
RGB – display an RGB range. Shows the distribution of red/green/blue within the signal as a series of discrete bars that make a continuous graph for each color. This display provides an overview of the tonal range of each color in the picture. Each bar is the count of the number of pixels for one of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

3.2.8 HSV Histogram

3.2.8.1 HSV Histogram Setup

There are four Histograms available in the histogram panel: the YCbCr Histogram, RGB Histogram, HSV Histogram, and Luma Histogram.

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



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

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

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

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

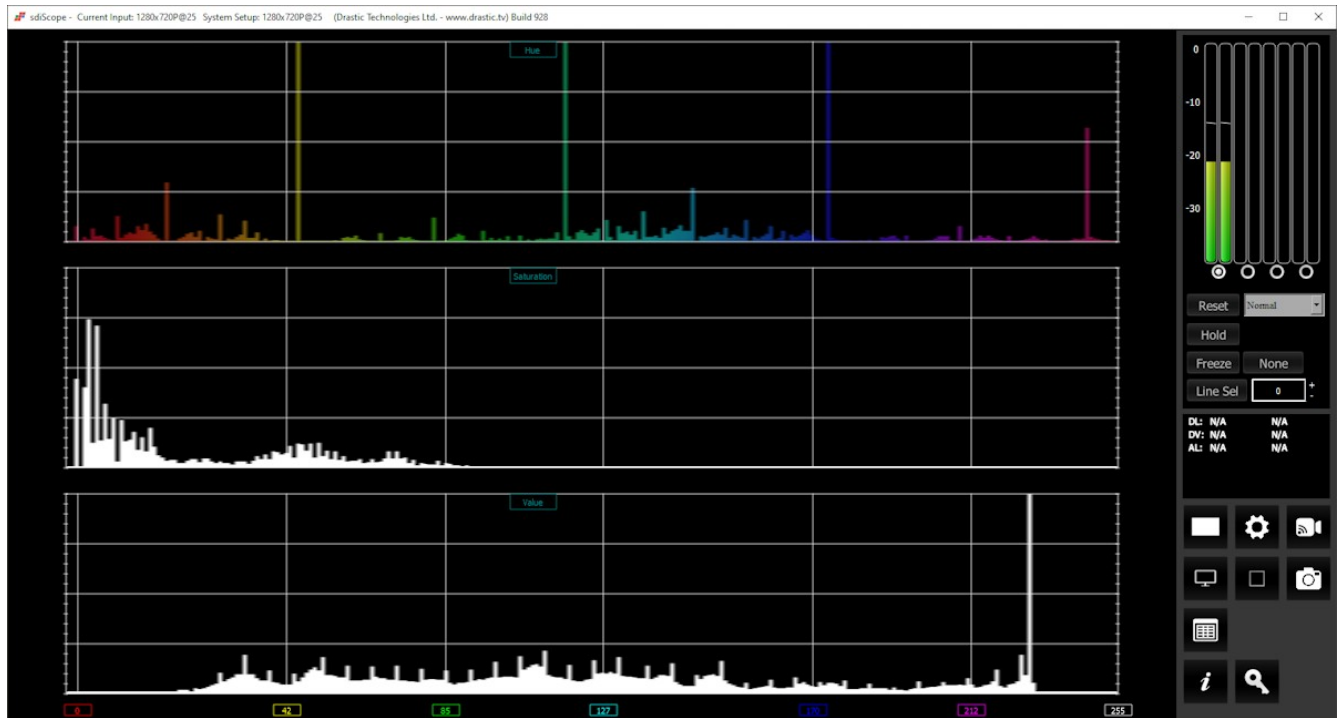
Pressing the x1 button sets the display back to normal.

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

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

3.2.8.2 HSV Histogram Window

Here is the HSV Histogram:



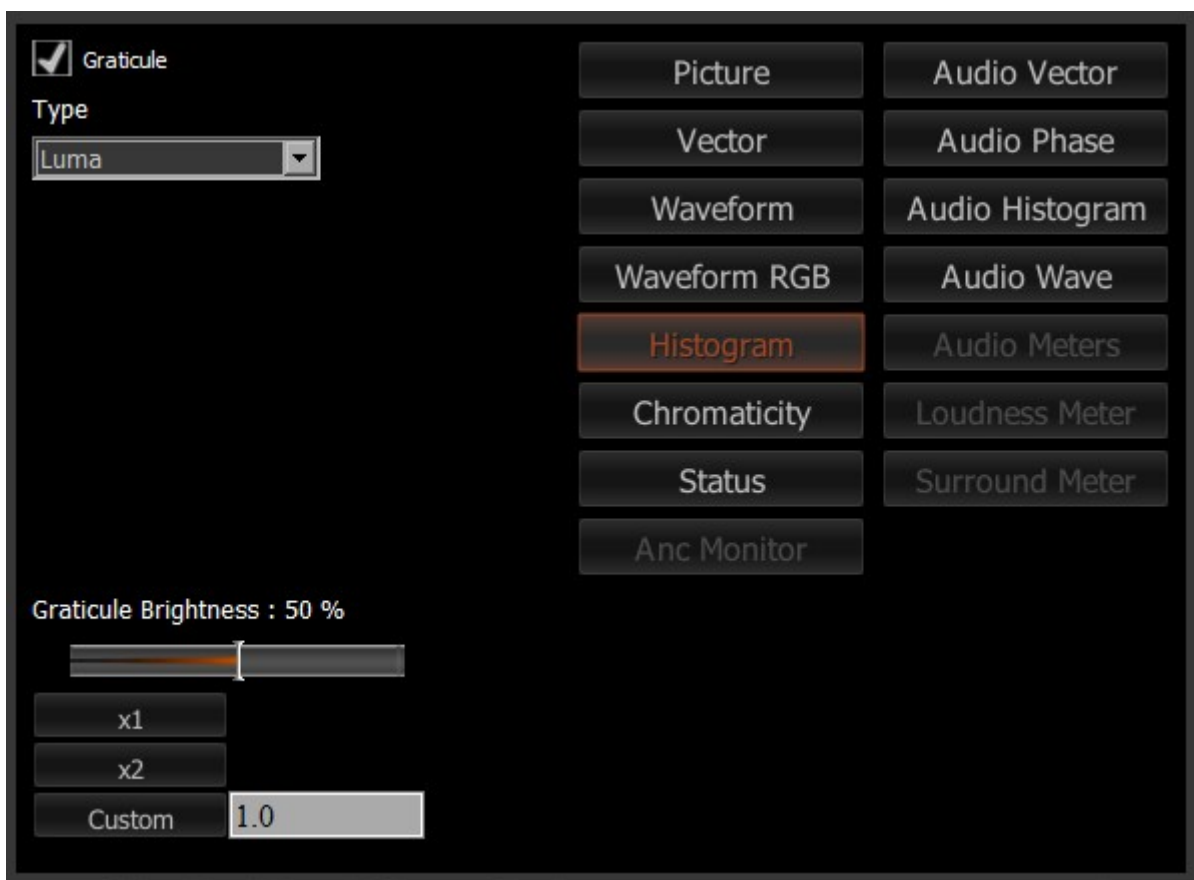
HSV – display Hue, Saturation, and Value levels. The top range shows the strength of each hue, the middle section displays the saturation levels of the hues, and the lower section displays the value, or darkness/lightness levels.

3.2.9 Luma Histogram

3.2.9.1 Luma Histogram Setup

There are four Histograms available in the histogram panel: the YCbCr Histogram, RGB Histogram, HSV Histogram, and Luma Histogram.

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



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

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

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

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

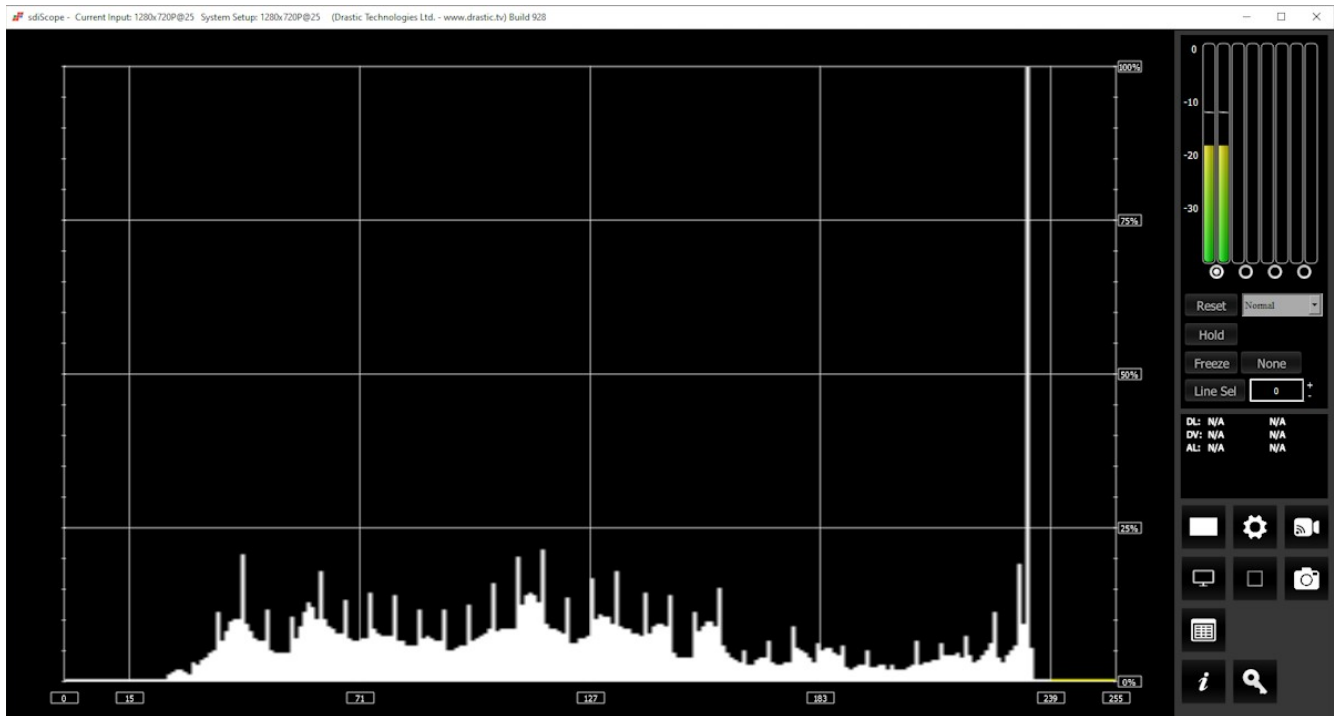
Pressing the x1 button sets the display back to normal.

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

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

3.2.9.2 Luma Histogram Window

Here is the Luma Histogram:



Luma – display only the luma in the signal

3.2.10 Chromaticity

3.2.10.1 Chromaticity Setup

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



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

Triangle 601 checkbox – when selected, displays the CCIR-601 (Rec. 601 or BT.601) triangle.

Triangle 709 checkbox – when selected, displays the Rec.709 (BT.709 or ITU 709) triangle.

Triangle 2020 checkbox – when selected, displays the BT.2020 (or Rec. 2020) triangle.

Triangle P3 checkbox – when selected, displays the P3 (DCI-P3 or DCI/P3) triangle.

Invert checkbox – when selected, displays the video signal over a black background instead of the Chromaticity hues background.

Black checkbox – when selected, displays the trace as black. If unselected, the trace will be

displayed as white.

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

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

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

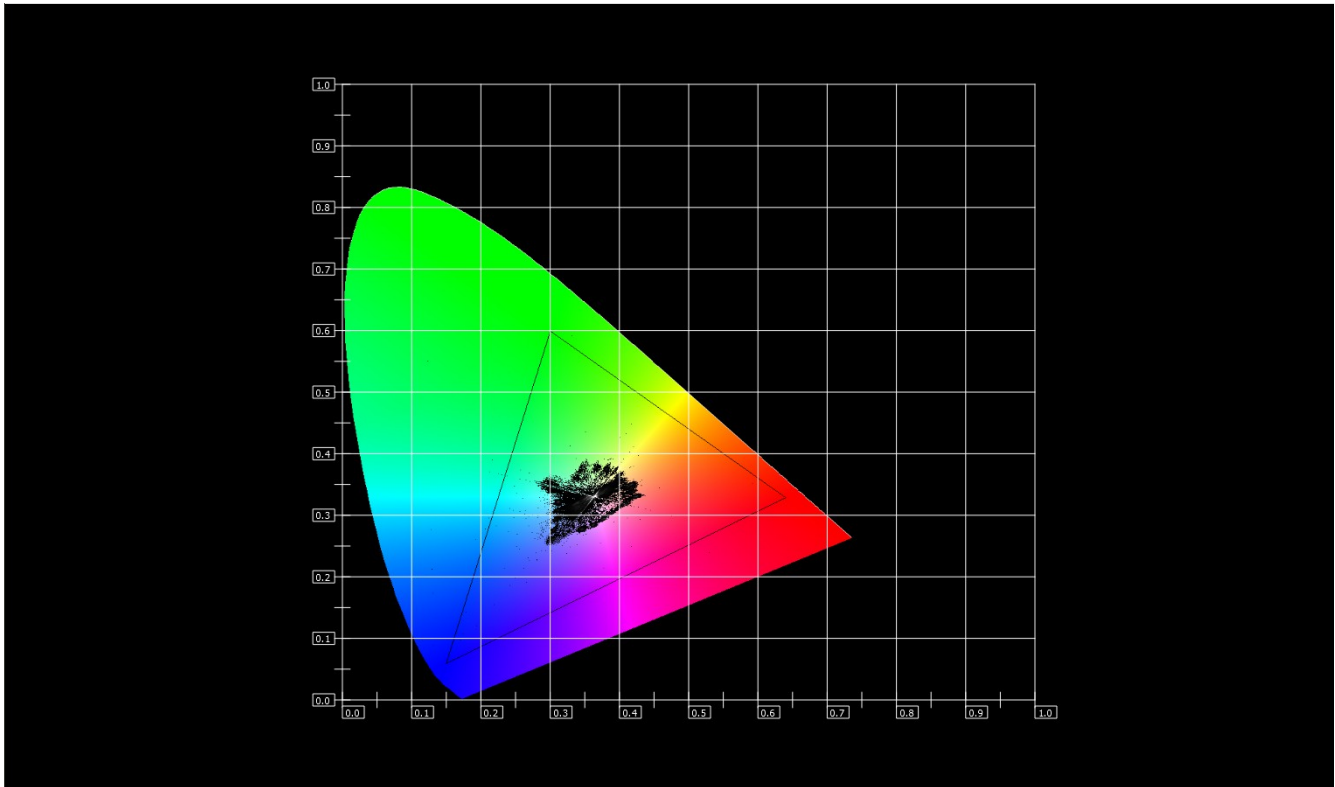
Pressing the x1 button sets the display back to normal.

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

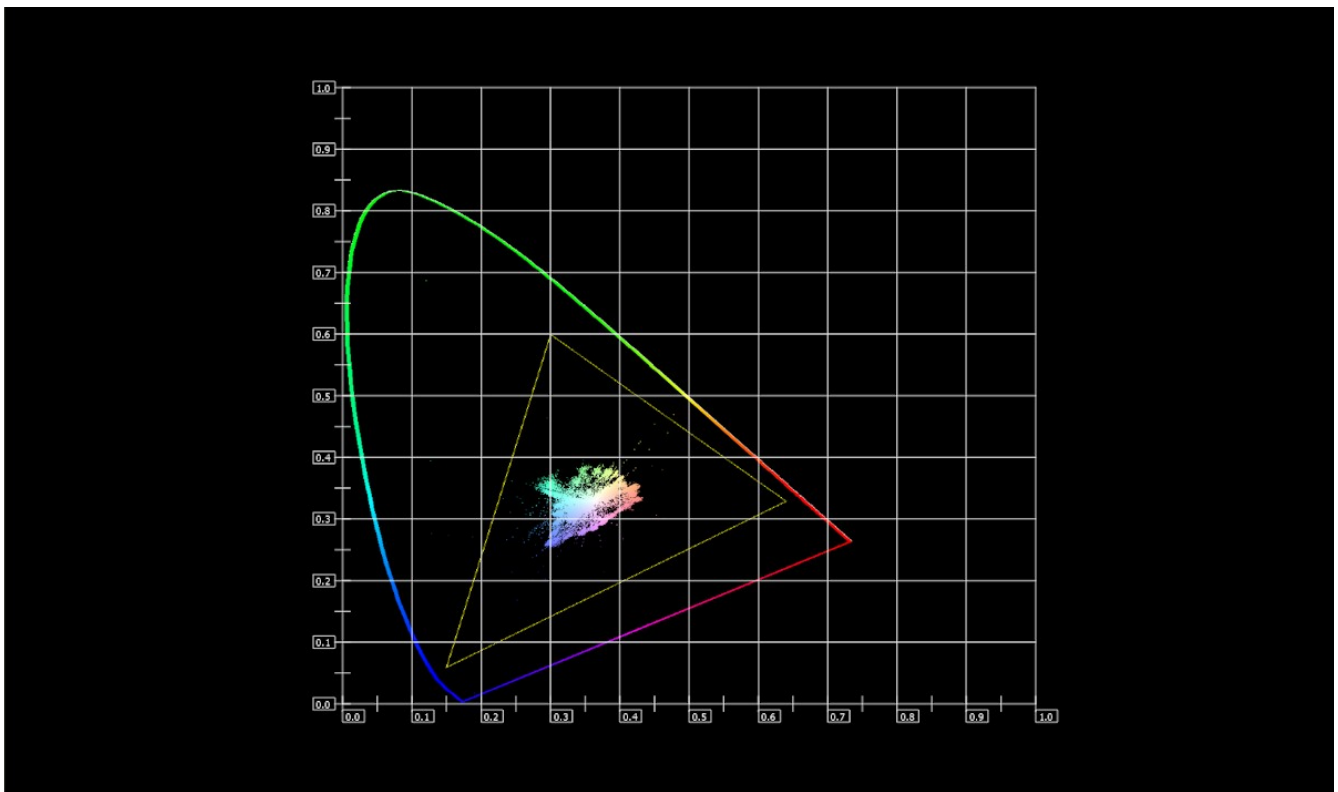
Pressing the x in the upper right corner will close the Scope Config window.

3.2.10.2 Chromaticity Window

Here is the Chromaticity window.

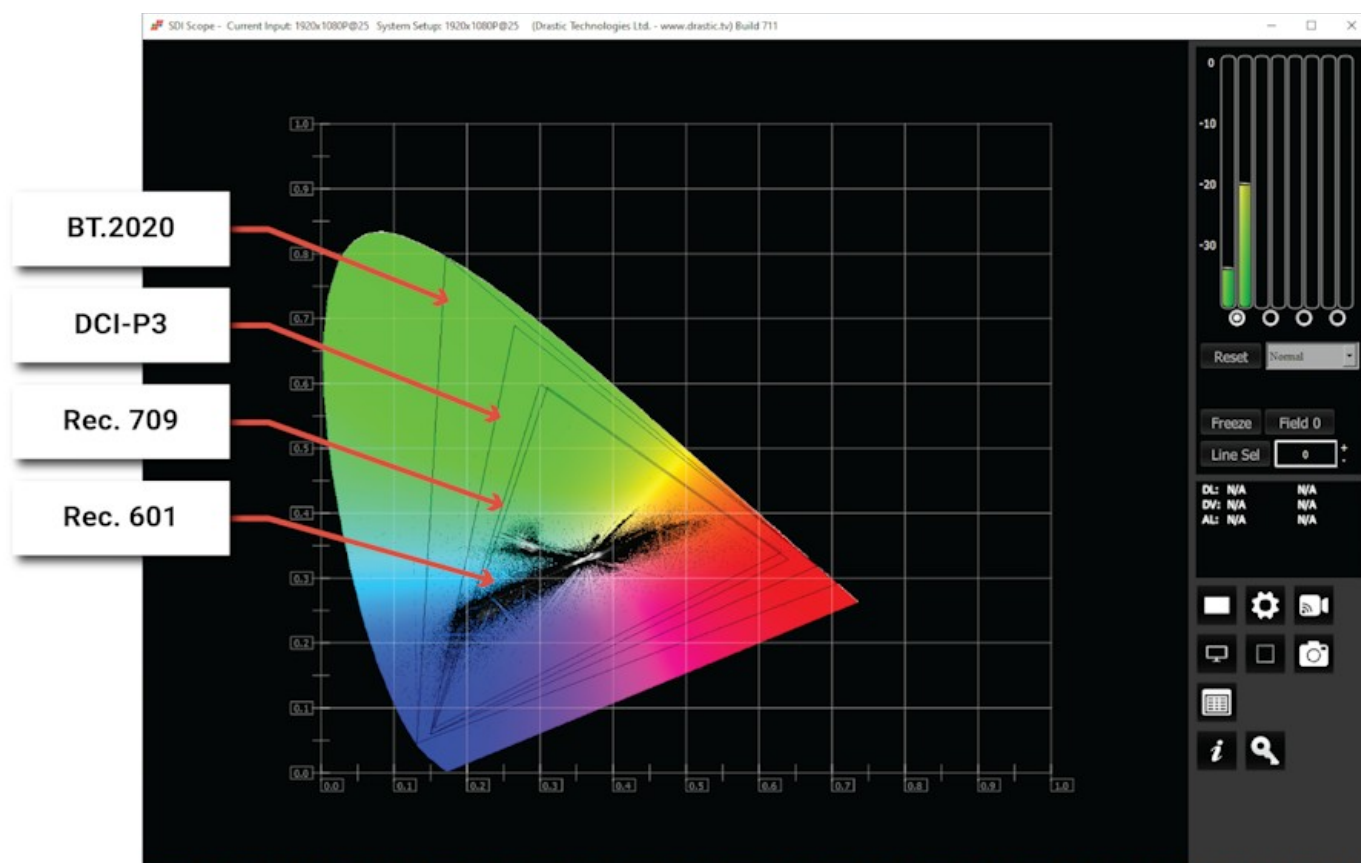


The **Chromaticity** scope provides a visual representation of the color in a video across all the colors of visible light. For a particular YCbCr range (BT.2020, P3, Rec.709, CCIR-601) a triangle can be superimposed. This will delineate the colors that fall within the acceptable range and those that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



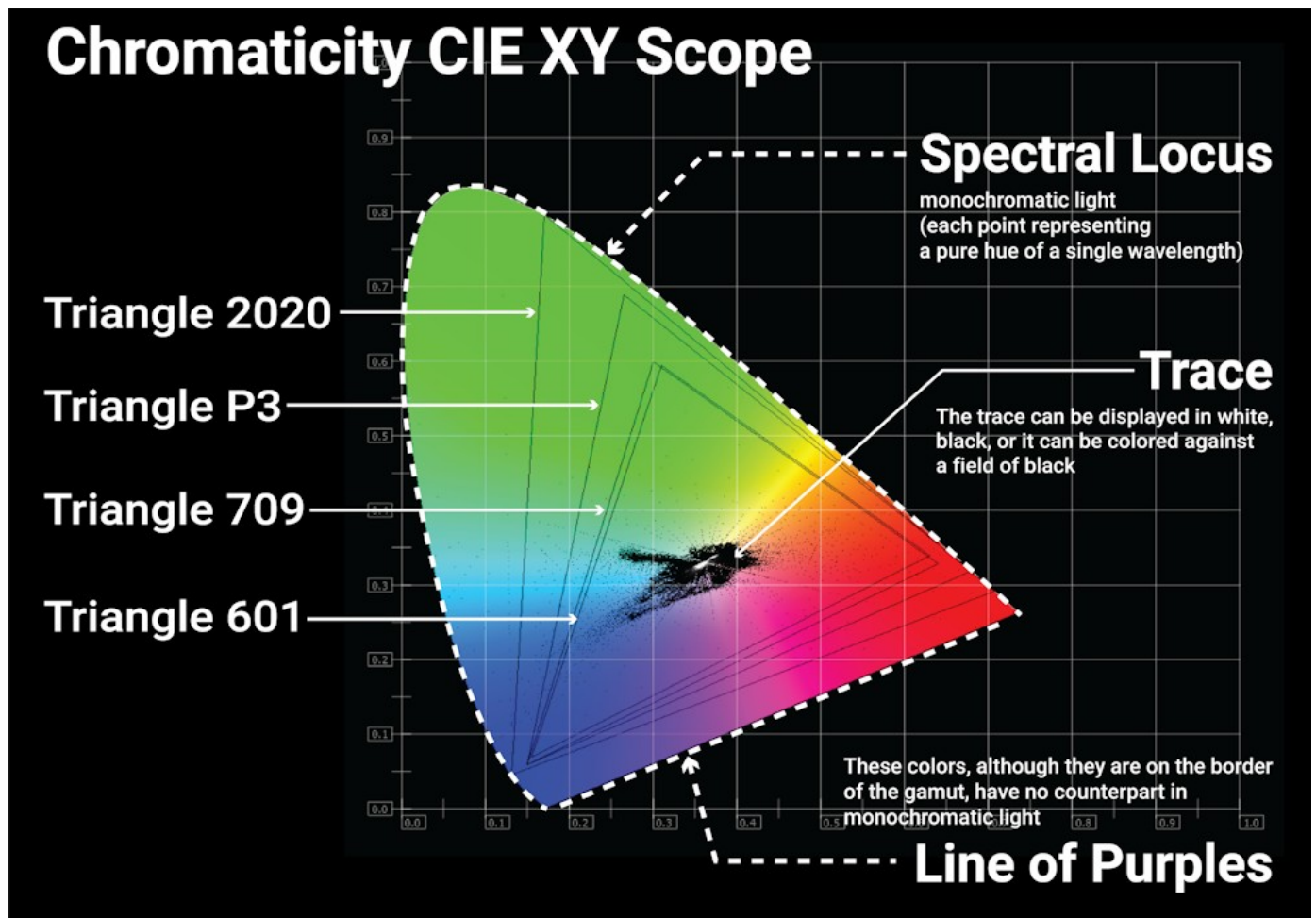
The display can also be inverted to use black as the background, and the colors to show the trace.

For a particular YCbCr range (BT.2020, P3, Rec.709, CCIR-601) a triangle can be superimposed.



This will delineate the colors that fall within the acceptable range and those that are outside it. The color of the video within the CIE 1931 color display can be white, black, or the chromaticity hues background.

Here are some details regarding the Chromaticity Scope, including the available gamut triangles that can be overlaid:



3.2.11 Status Window

3.2.11.1 Status Setup

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



Graticule Brightness slider – this slider is present in all of the scopes. In the Status window there is no graticule, so this slider has no effect.

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

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

Unfortunately this may cause the Status display to drop off the screen. Pressing the x1 button sets the display back to normal.

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

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

3.2.11.2 Status Window

Here is the Status window.

```
Signal: 1280x720 v 25.00
Y Min 17 Low 1% Avg 269
   Max 236 High 28%
Y-Gamut Under 0%
Y-Gamut Over 0%
U Min 92 Low 0% Avg 129
   Max 186 High 0%
U-Gamut Under 0%
U-Gamut Over 0%
V Min 68 Low 0% Avg 129
   Max 187 High 0%
V-Gamut Under 0%
V-Gamut Over 0%
S Min 0 Low 0% Avg 3
   Max 60 High 0%
Color Range SMPTE
Color Primaries BT.709
Transfer Function BT.709
Color Matrix BT.709
MaxCLL 0
MaxFALL 0
Line repetition 0 of 720
Broadcast Illegal 0%
Frame Rate Avg 31.4834 Last No 32.0000
Audio Peak A12 19.855% 19.855%
        A34 0.000% 0.000%
Audio RMS A12 0.189% 0.189%
        A34 0.000% 0.000%
```

The Status window displays:

Signal: displays the current signal type

Y: The Y component. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values

U: The U component. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values

V: The V component. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values

S: Saturation. Displays Minimum and Maximum, Low and High, Average, Gamut Under, and Gamut Over values

Color Range: Full or SMPTE (Limited)

Color Primaries: BT 709 (HD), BT 470BG (PAL), SMPTE 170M (NTSC), BT 2020 (WCG)

Transfer Function: BT 709 (HD), SMPTE 170M (PAL/NTSC), SMPTE 2084 (HDR10/PQ), ARIB B67 (HLG)

Color Matrix: BT 709 (HD), BT 479BG (PAL), BT 601 (NTSC), BT 2020 (WCG)

MaxCLL: In HDR10 mode, Maximum Content Light Level

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

Line repetition in number of lines over total possible lines

Broadcast illegal in percentage

Frame Rate: Displays Average, and Last Ms.

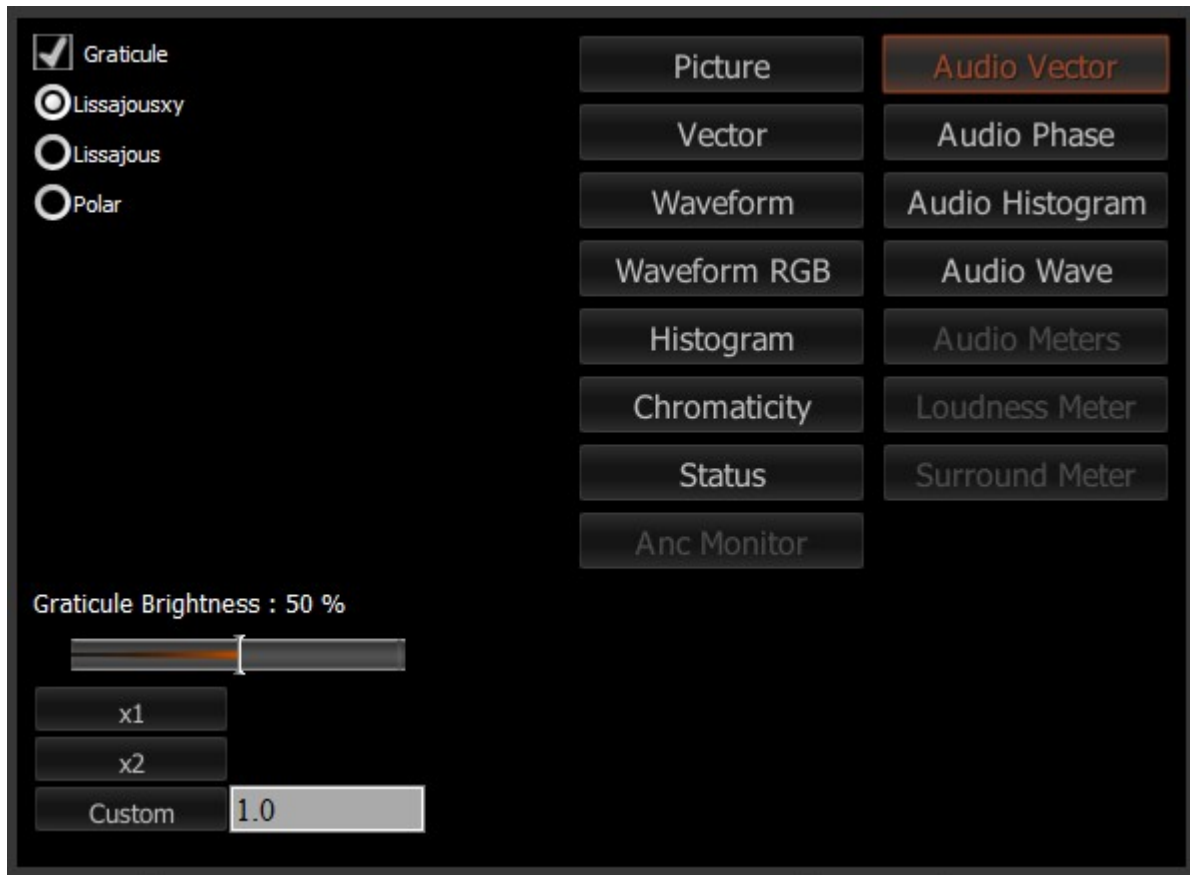
Audio Peak per channel pair

Audio RMS per channel pair

3.2.12 Audio Vector

3.2.12.1 Audio Vector Setup

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



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

Lissajousxy checkbox – when selected, displays the relative phase of the selected audio pair in Lissajous XY mode, where the audio signal's axis is the center vertical line, middle point.

Lissajous checkbox – when selected, displays the relative phase of the selected audio pair in Lissajous mode, where the audio signal's axis is the line from the lower left to the upper right, middle point.

Polar checkbox – when selected, displays the relative phase of the selected audio pair in Polar mode, where the signal's axis is the center vertical line, bottom point.

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

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

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

Pressing the x1 button sets the display back to normal.

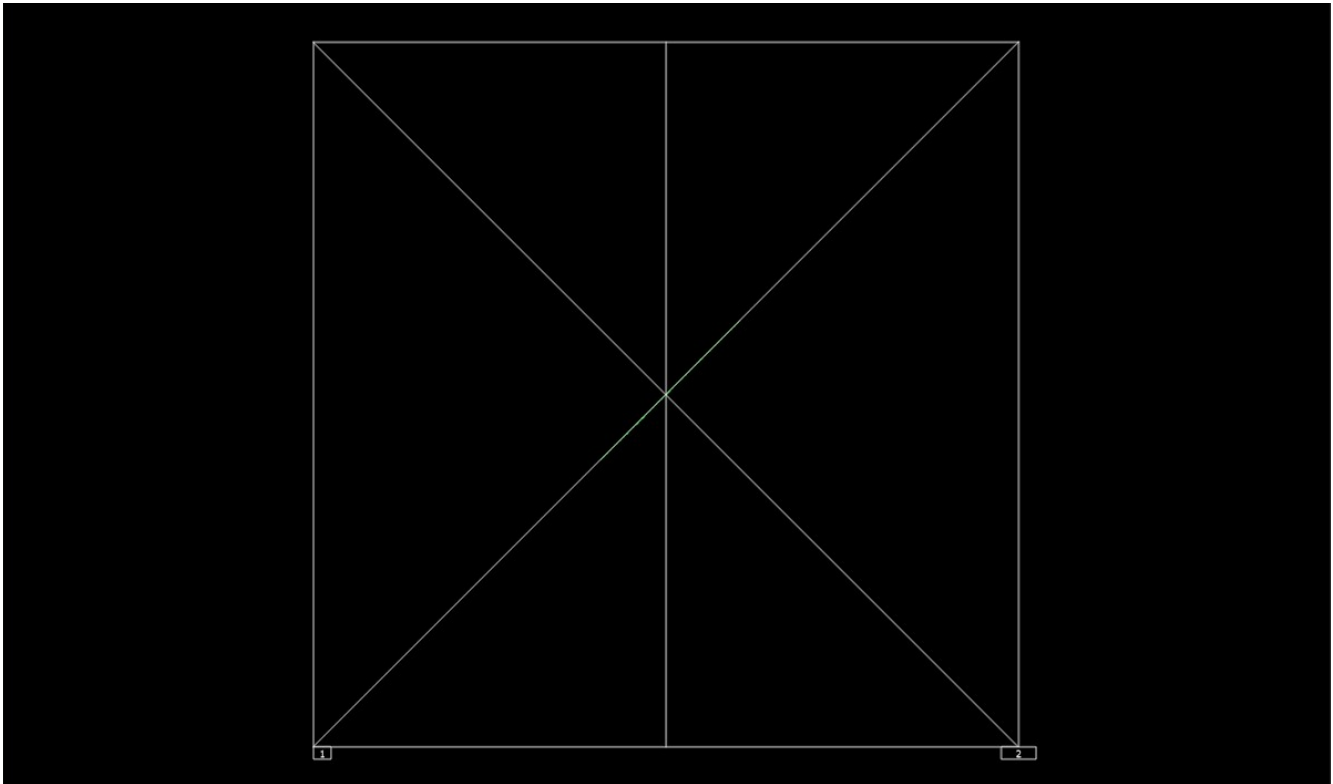
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

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

3.2.12.2 *Audio Vector Window*

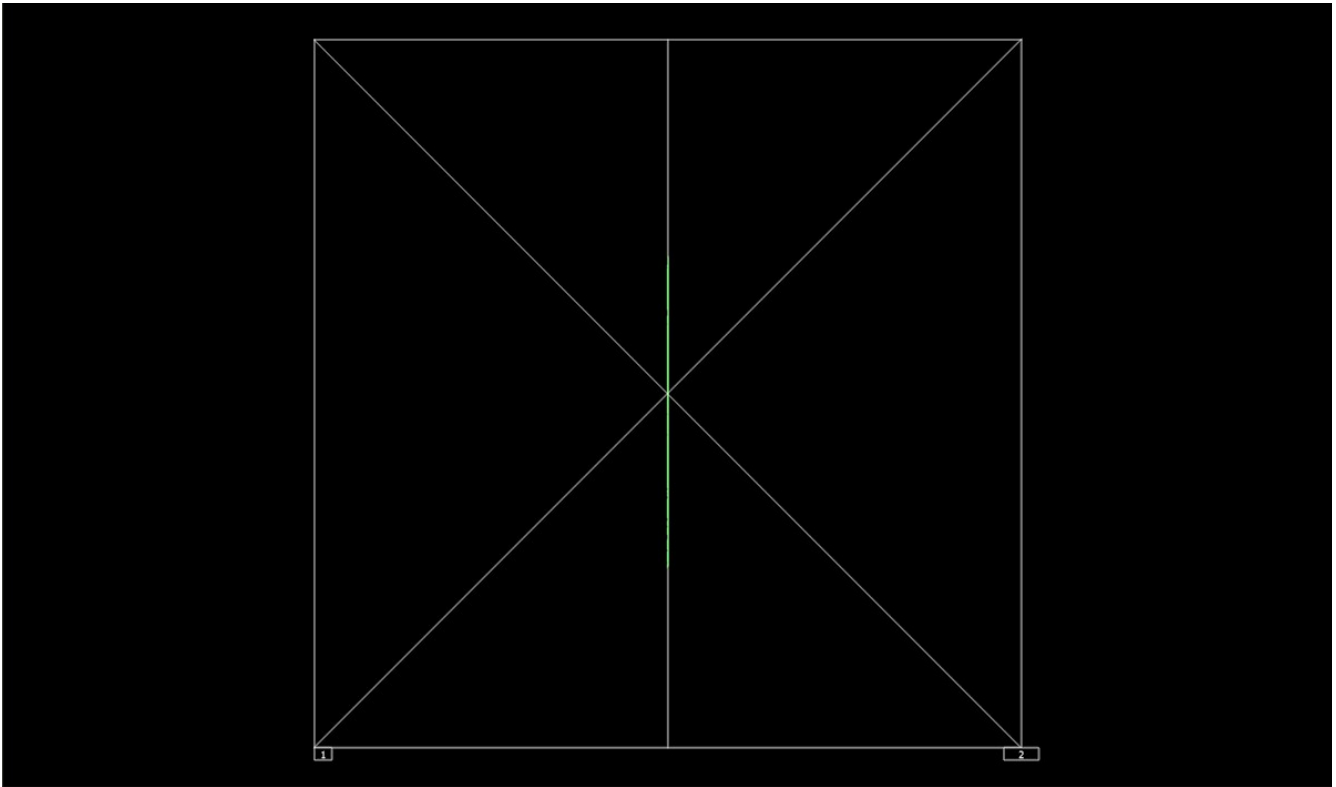
There are 3 types of audio vectorscope displays available.

Lissajous XY mode



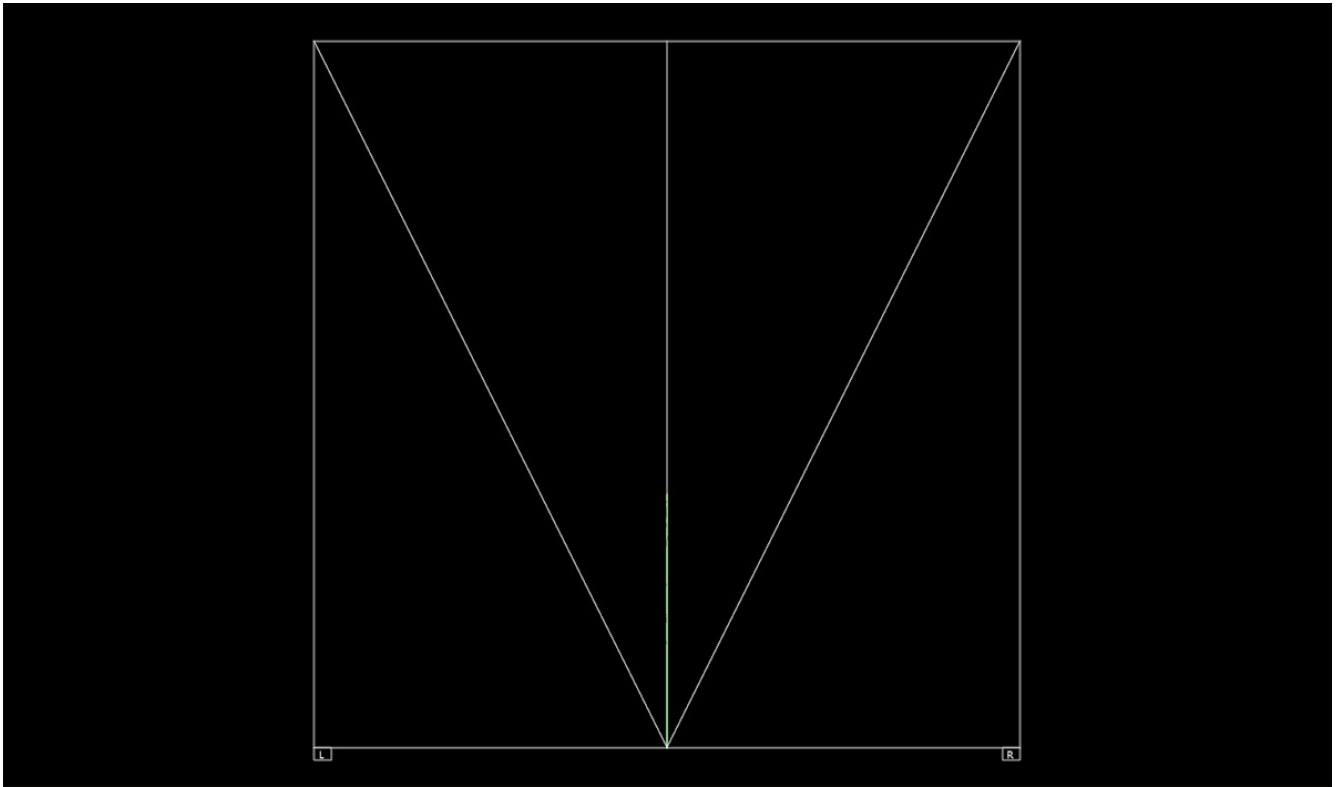
Lissajous XY mode centers the two audio channels along the X-Y axis (from the lower left corner to the upper right corner), and shows any difference between the channels as moving closer to vertical (left channel has more signal) or closer to horizontal (right channel has more signal).

Lissajous mode



Lissajous mode centers the two audio channels along the vertical axis, and shows any difference between the channels as either angled to the left (left channel has more signal) or angled to the right (right channel has more signal).

Polar mode



Polar mode centers the two audio channels along the vertical axis starting at the bottom center, and shows any difference between the channels as either angled to the left (left channel has more signal) or angled to the right (right channel has more signal).

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. The pair being monitored can be changed using the radio buttons under the audio meters at the top right.

3.2.13 Audio Phase

3.2.13.1 Audio Phase Setup

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



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

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

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

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

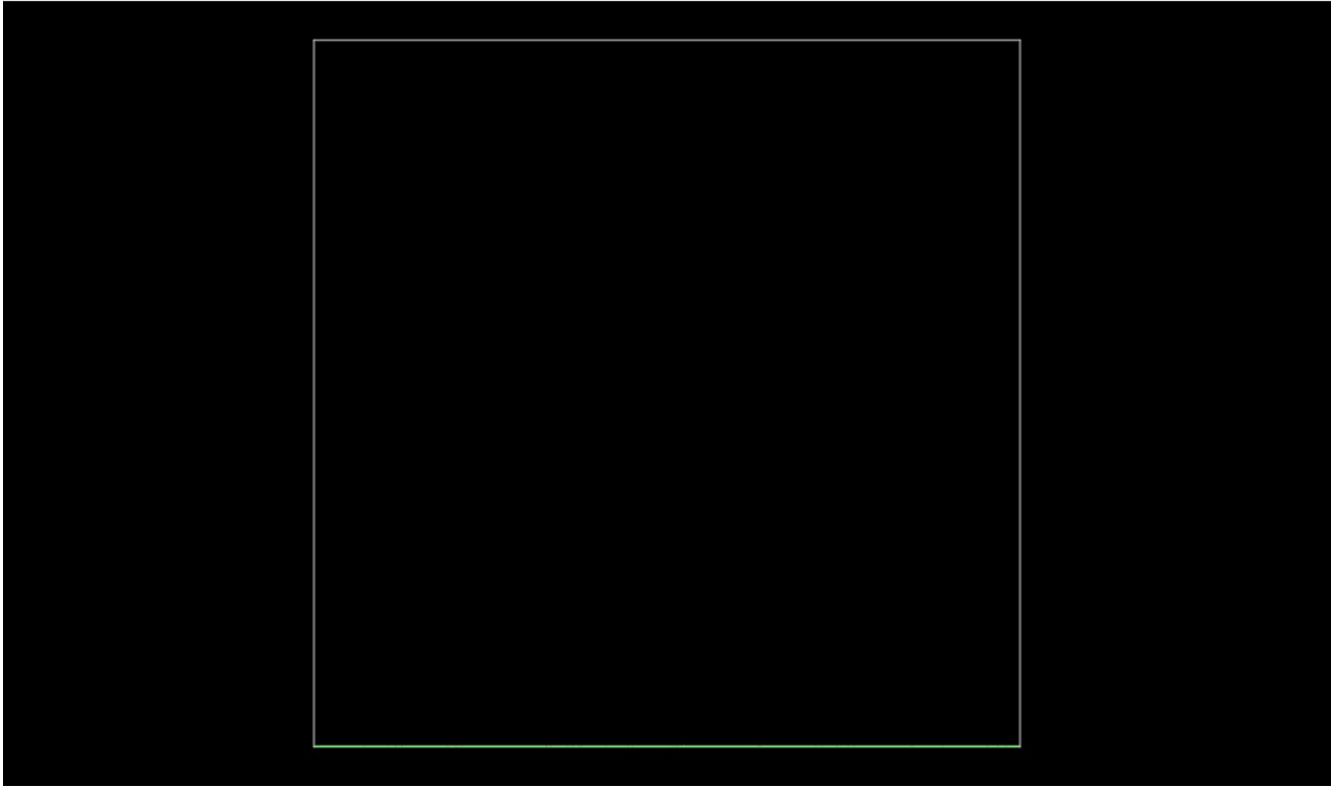
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets

the display back to normal.

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

3.2.13.2 *Audio Phase Window*

Here is the Audio Phase window.

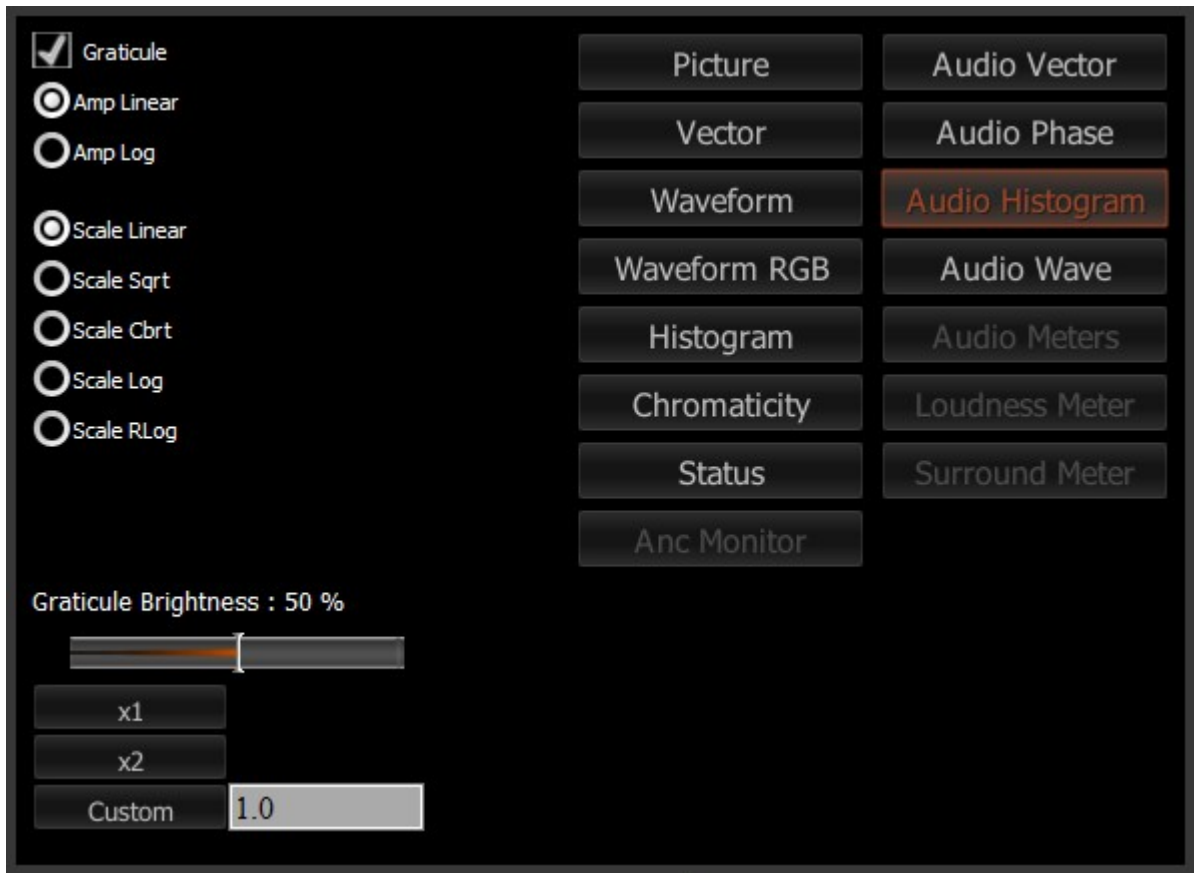


The audio phase meter shows the relative density of the first two audio channels and the relative loudness as a line moving towards the louder channel.

3.2.14 Audio Histogram

3.2.14.1 Audio Histogram Setup

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



Graticule checkbox – when selected, the graticule is laid over the Audio Histogram display. In this case, it is simply the outline around the area in which the traces is displayed. 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 (square root).

Scale Cbrt – clicking in the Scale Cbrt checkbox sets the scale to cbrt (cubed root).

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 (reverse logarithmic).

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

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

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

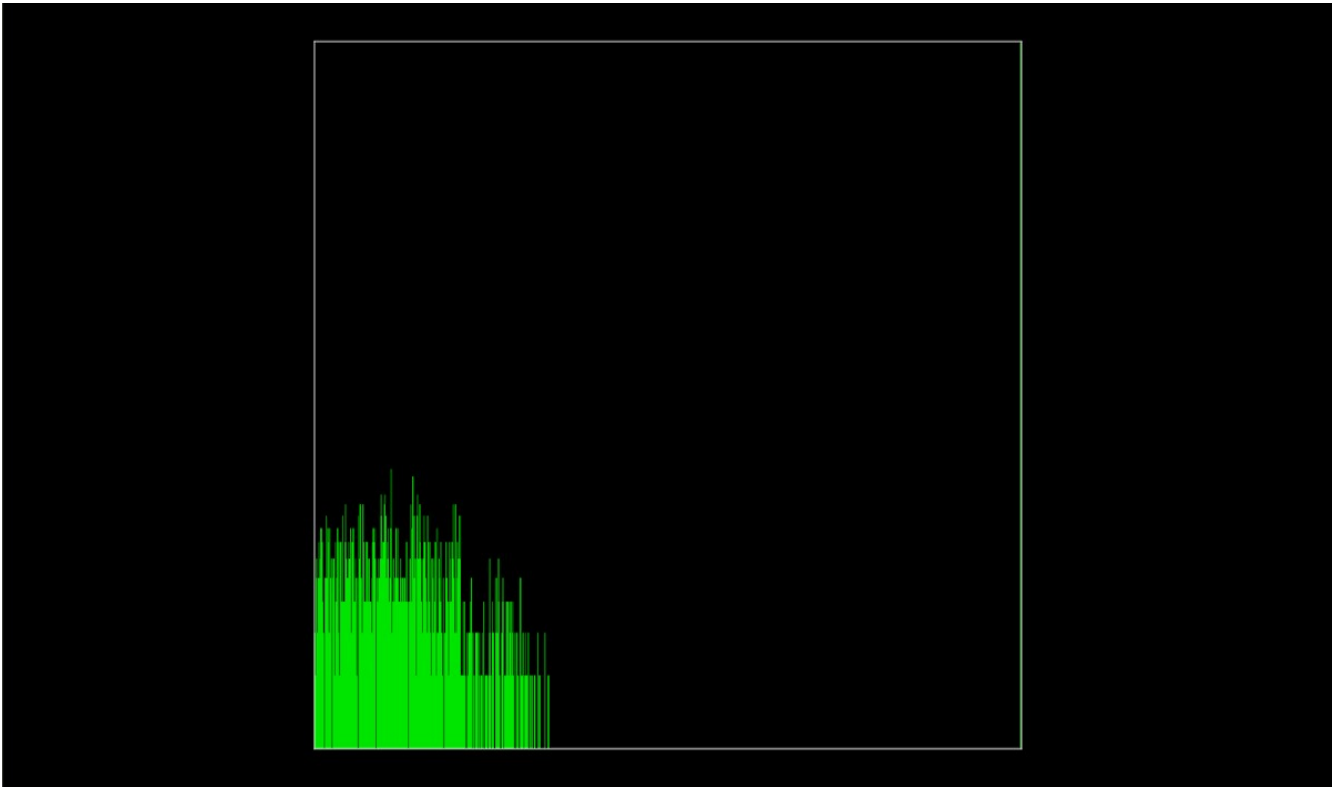
Pressing the x1 button sets the display back to normal.

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

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

3.2.14.2 *Audio Histogram Window*

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.

3.2.15 Audio Wave

3.2.15.1 Audio Wave Setup

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



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

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

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

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

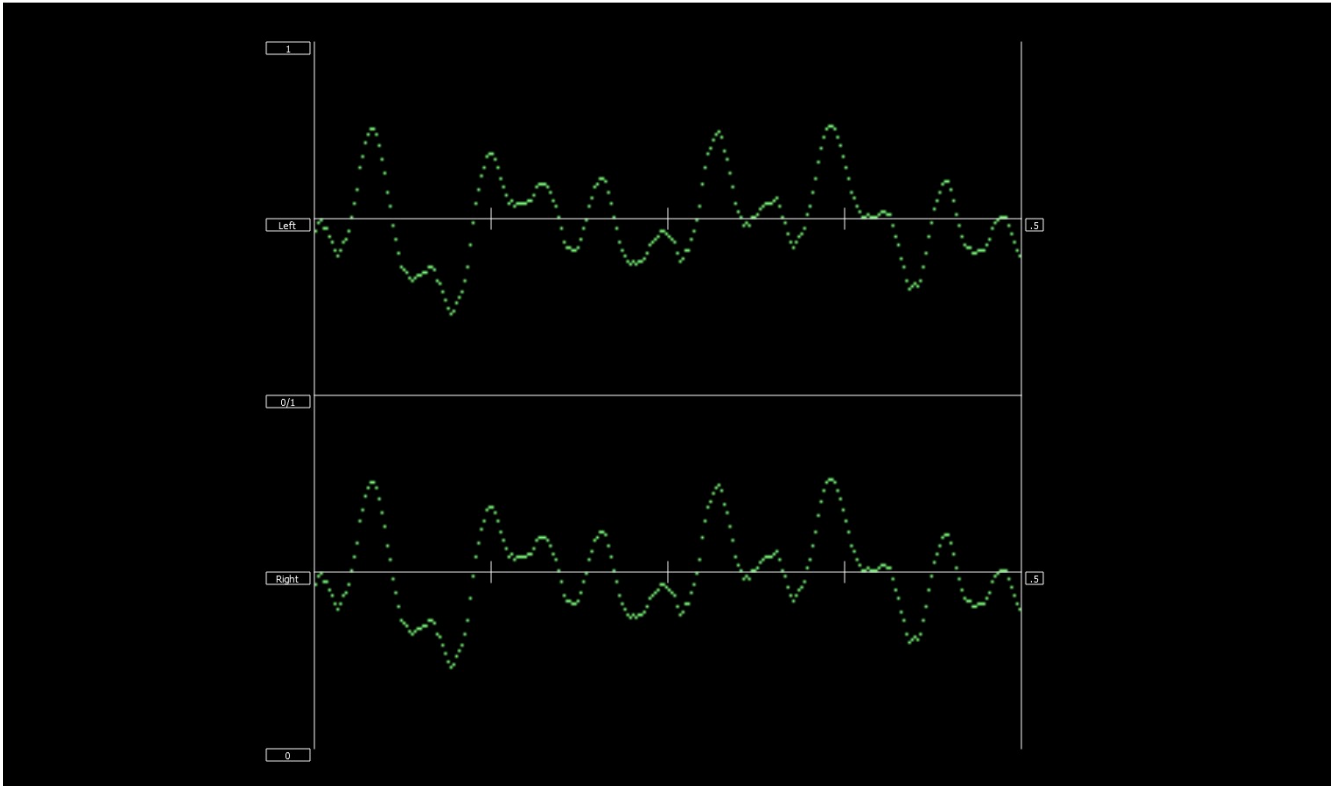
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets

the display back to normal.

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

3.2.15.2 *Audio Wave Window*

Here is the Audio Wave window.



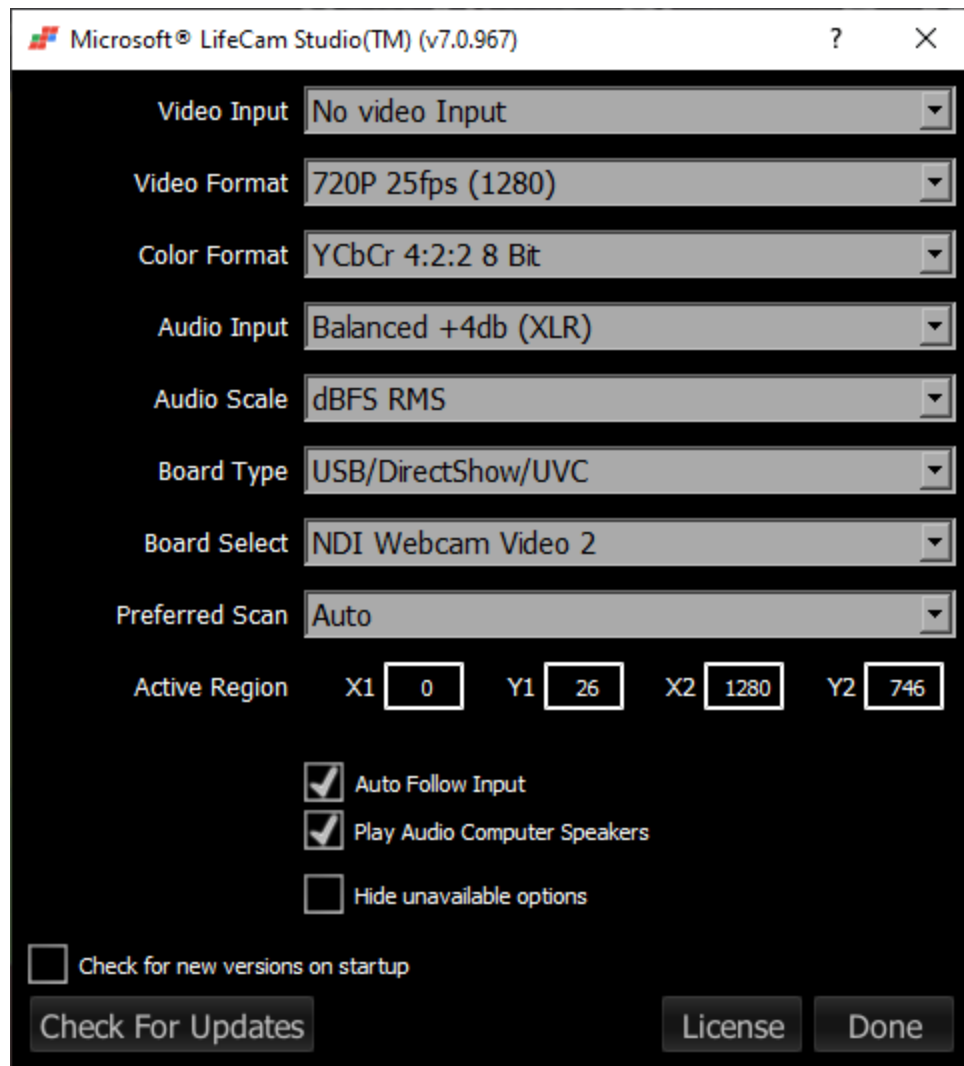
The audio waveform of the first pair of audio channels can be displayed.

3.3 System Configuration



System Configuration button – Opens the System Configuration window, which allows the user to adjust settings for the video and audio I/O type, and to license the software.

Here is a look at the options in the System Configuration window.

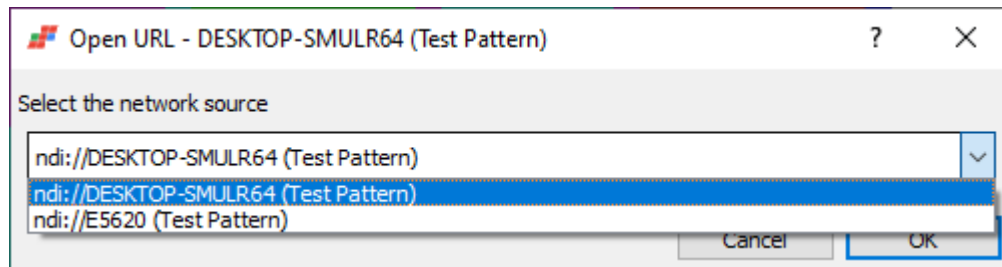


3.3.1 IP Setup

When set to an NDI input, there will be an IP Video Setup button at the top of the System Configuration window.

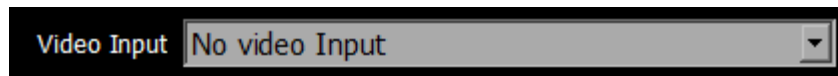
IP Video Setup

IP Setup button – opens the Open URL window, which allows the user to select between available NDI stream inputs. The list will be populated with the most recent sources that have been selected.



3.3.2 Video Input

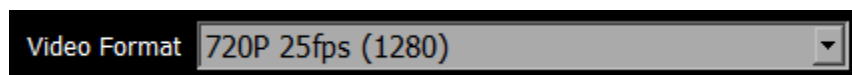
When set to a video input other than NDI, the video input pulldown menu becomes available.



Video Input pulldown menu – allows the user to select between SDI and HDMI input types. The user will be presented with a list similar to this:

- Serial Digital Single Link (4:2:2)
- Serial Digital + Alpha (4:2:2:4)
- Serial Digital Dual Link (4:4:4:4)
- HDMI – Auto YCbCr/RGB

3.3.3 Video Format

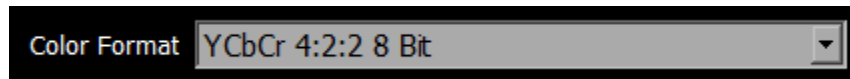


Video Format pulldown menu - allows the user to select between available SD and HD formats.

The user will be presented with a list similar to this:

- NTSC CCIR-601
- 1080i 30/60fps (1920)
- 1080i 29.97/59.94fps (1920)
- 1080i 25/50fps (1920)
- 1080i 24fps (1920)
- 1080i 23.98fps (1920)
- 1080sf 30/60fps (1920)
- 1080sf 29.97/59.94fps (1920)
- 1080sf 25/50fps (1920)
- 1080sf 24 (1920)
- 1080sf 23.98 (1920)
- 1080P 60fps (1920)
- 1080P 59.94fps (1920)
- 1080P 50fps (1920)
- 1080P 48fps (1920)
- 1080P@60 3G-A (1920)
- 1080P@59.94 3G-A (1920)
- 1080P@50 3G-A (1920)
- 1080P@30 3G-B Dual Link 1920x1080
- 1080P@29.97 3G-B Dual Link 1920x1080
- 1080P@25 3G-B Dual Link 1920x1080
- 1080P@48 3G-B Dual 1920x1080
- 1080P@47.95 3G-B Dual 1920x1080
- 1080P 30fps (1920)
- 1080P 29.97fps (1920)
- 1080P 25fps (1920)
- 1080P 24fps (1920)
- 1080P 23.98fps (1920)
- 720P 50fps (1280)
- 720P 60fps (1280)
- 720P 59.94fps (1280)
- 720P 25fps (1280)
- 720P 30fps (1280)
- 720P 29.97fps (1280)

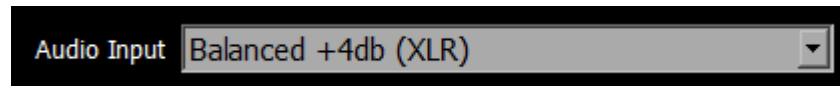
3.3.4 Color Format



Color Format pulldown menu - allows the user to select the processing mode. In the case of single link, this can be 8 bit YCbCr or YCbCr Alternate. There user will be presented with a list similar to this:

- YCbCr 4:2:2 8 bit
- YCbCr Alternate

3.3.5 Audio Input



Audio Input pulldown menu – (hardware dependent) allows the user to select between the embedded audio tracks (HD-SDI or HDMI depending on input), or the AES/EBU audio inputs. On some hardware, analog audio inputs are also available.

3.3.6 Audio Scale



Audio Scale – select between available audio meter modes. The user will be presented with a list similar to this:

- dBFS RMS
- dBu SMPTE RP155 (+24)
- dBu EBU R86 (+18)
- dBu EBU R86 (0)

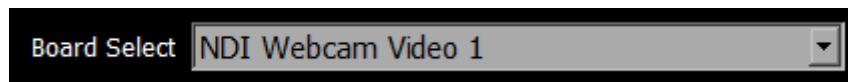
3.3.7 Board Type



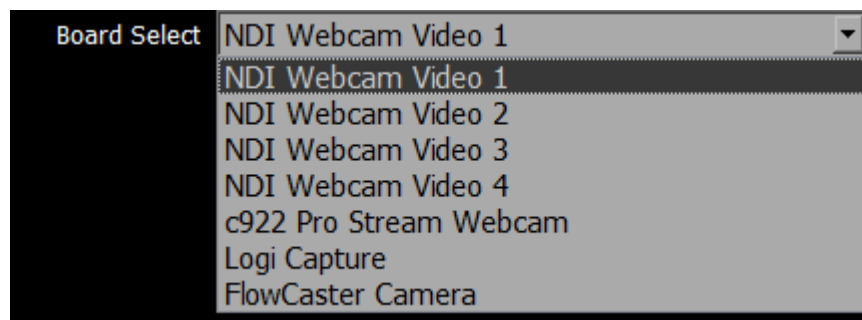
Board Type – select the type of board to use. The user may be presented with a list similar to this:

- Auto Select
- AJA
- Bluefish
- Blackmagic
- UltraScope
- Matrox
- DirectShow/UVC
- NDI In
- Desktop

3.3.8 Board Select



Board Select – allows the user to select which board or screen to use. Sometimes if there is more than one board in the system, the application may be looking at the wrong one. In fact, certain types of devices may appear to be out of order, depending on whether different boards have been used in the system. Clicking between boards can reset the selected board. sdiScope will take a look at how the device identifies itself and populate the list with any devices seen in the system. Here is an example:



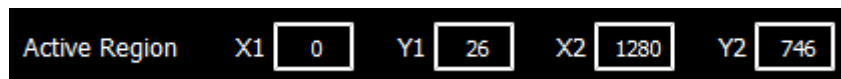
3.3.9 Preferred Scan



Preferred Scan – Select between available scan settings. Note that this is usually picked up when the input type is set, but it may be useful to unambiguously set the format for your workflow. The user may be presented with a list similar to this:

- Auto
- Interlaced (i)
- Segmented (psf)

3.3.10 Active Region



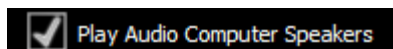
Active Region fields – allows the user to set the active region of the video signal to be viewed by the scopes. X1 sets the upper left pixel location, Y1 sets the lower left pixel location, X2 sets the upper right pixel location, Y2 sets the lower right pixel location.

3.3.11 Auto Follow Input



Auto Follow Input checkbox is selected, whenever the input type is changed, the settings for sdiScope are changed as well. If not checked, switching the input signal will not switch the settings.

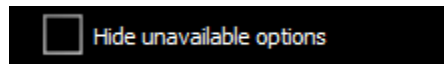
3.3.12 Play Audio Computer Speakers



Play Audio Computer Speakers – when checked, pass audio through the computer speakers. Where the system has capable hardware, the audio may be monitored via the hardware's

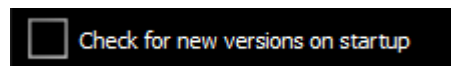
output, so in this case the user might uncheck the box to only use their external speakers for audio monitoring.

3.3.13 Hide unavailable options



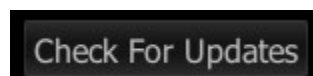
Hide unavailable options – when checked, remove the controls for features that are not available in sdiScope, such as the Loudness Meter, or the Web GUI.

3.3.14 Check for new versions on startup

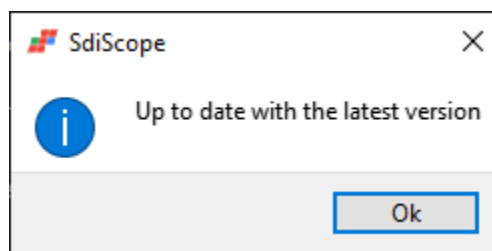


Check for new versions on startup – when checked, sdiScope will check to see if there is a new version available for download when the program is started.

3.3.15 Check For Updates

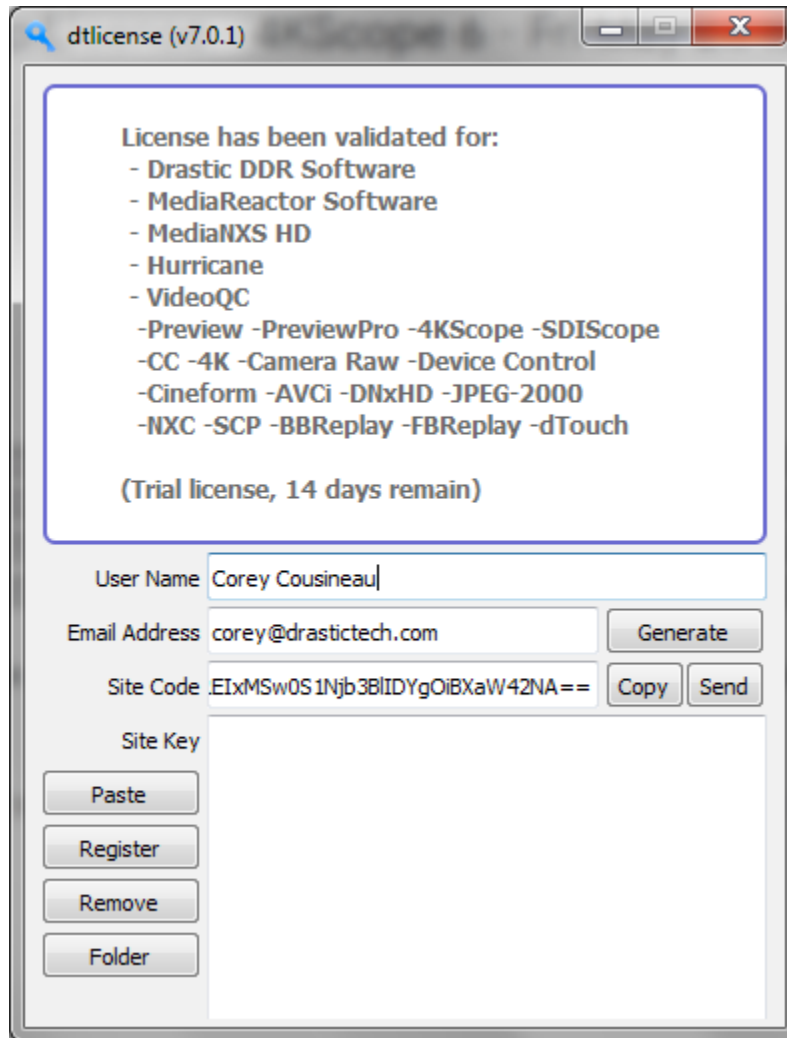


Check For Updates – press the Check For Updates button to immediately confirm whether there is a new version available for download. A fully updated system should produce the below message:



3.3.16 License

License button – Press the **License** button to open the licensing dialog. Note that the license dialog may also be opened using the “key” icon on the main GUI.



The top row shows the app name, and its version number.

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. The user may select the site code and use Ctrl+C to copy it to the clipboard, or use the **Copy** button. The

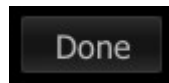
user will need to send the site code to Drastic Authorization to get a Site Key to enable the license.

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, 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. Pressing the x in the upper right corner will close the **License** window.

3.3.17 Done

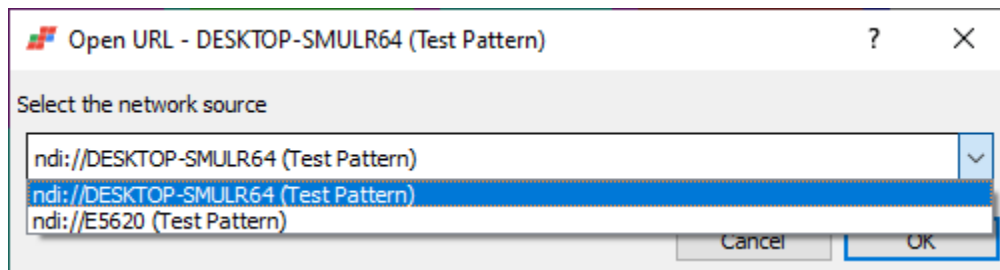


Done button. Pressing the Done button in the System Configuration window closes the window and enables any changes that have been made.

3.4 IP Setup



IP Setup button – opens the Open URL window, which allows the user to select between available IP sources. sdiScope supports NDI stream inputs. The list will be populated with the most recent sources that have been selected.



3.5 Display Modes



Display Mode button – opens the Monitor Settings window, which allows the user to select between available display modes.



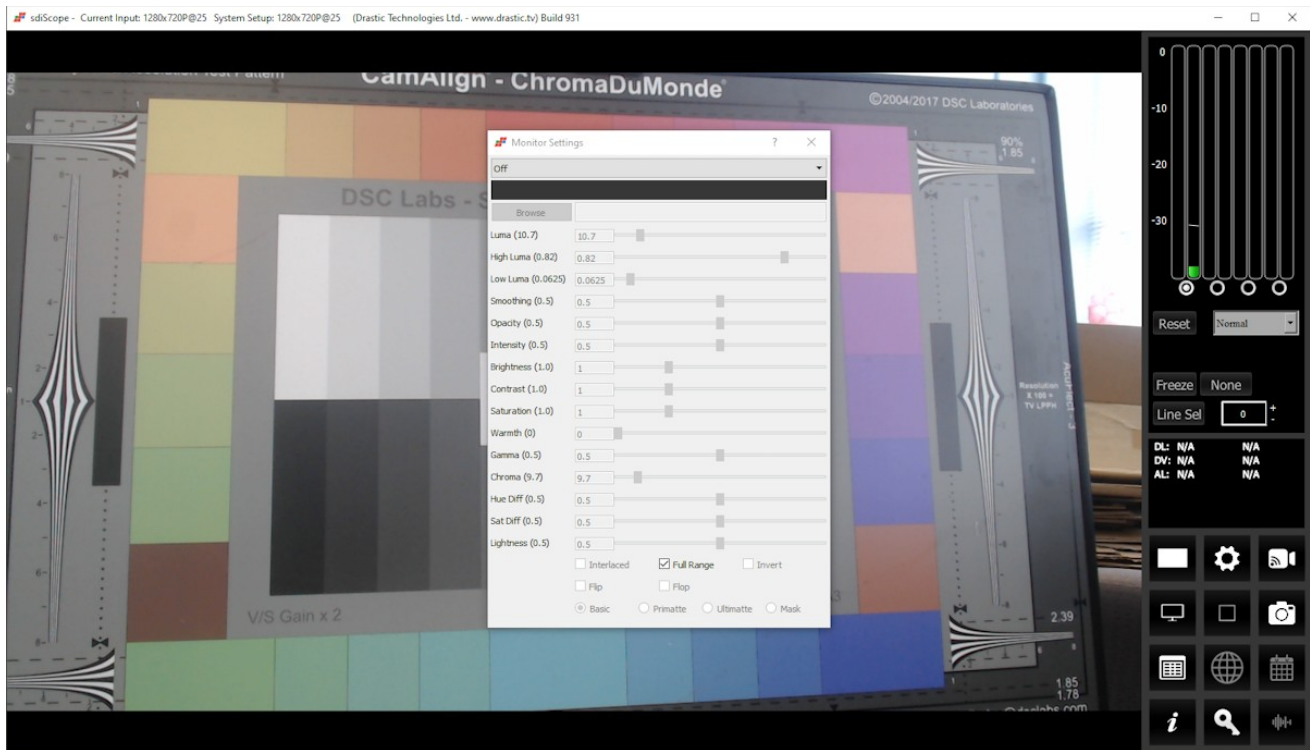
Monitor Settings window

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

Display modes include:

3.5.1 Off

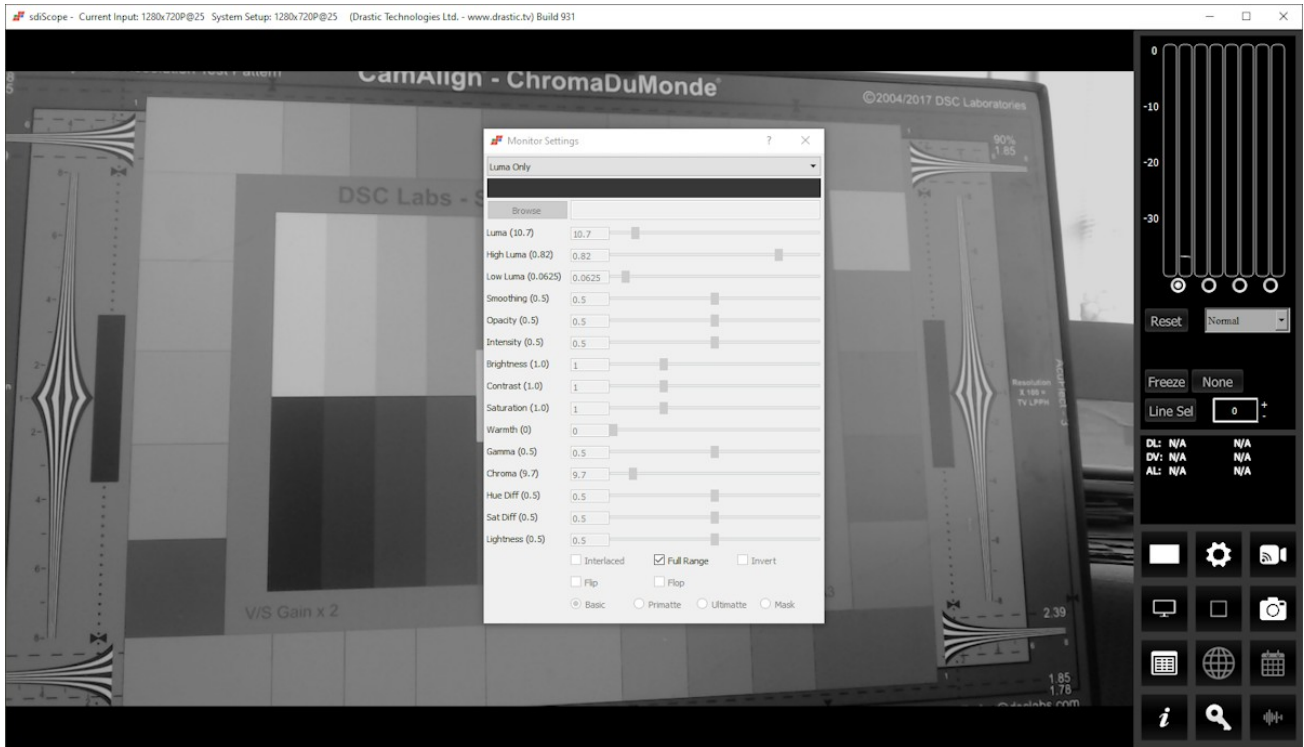
Display the signal normally. This is the default picture view.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.2 Luma Only

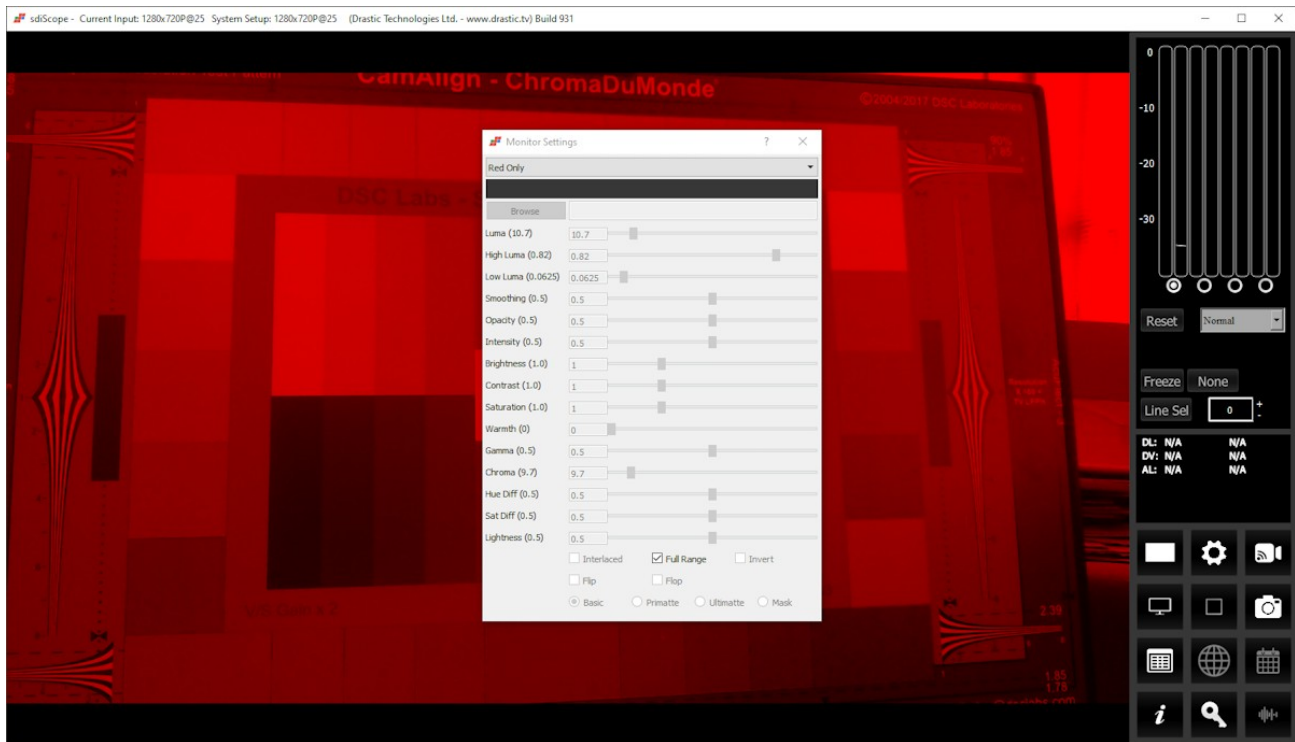
Show only the Y or brightness of the picture. This display setting produces a black and white image, with no chroma.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.3 Red Only

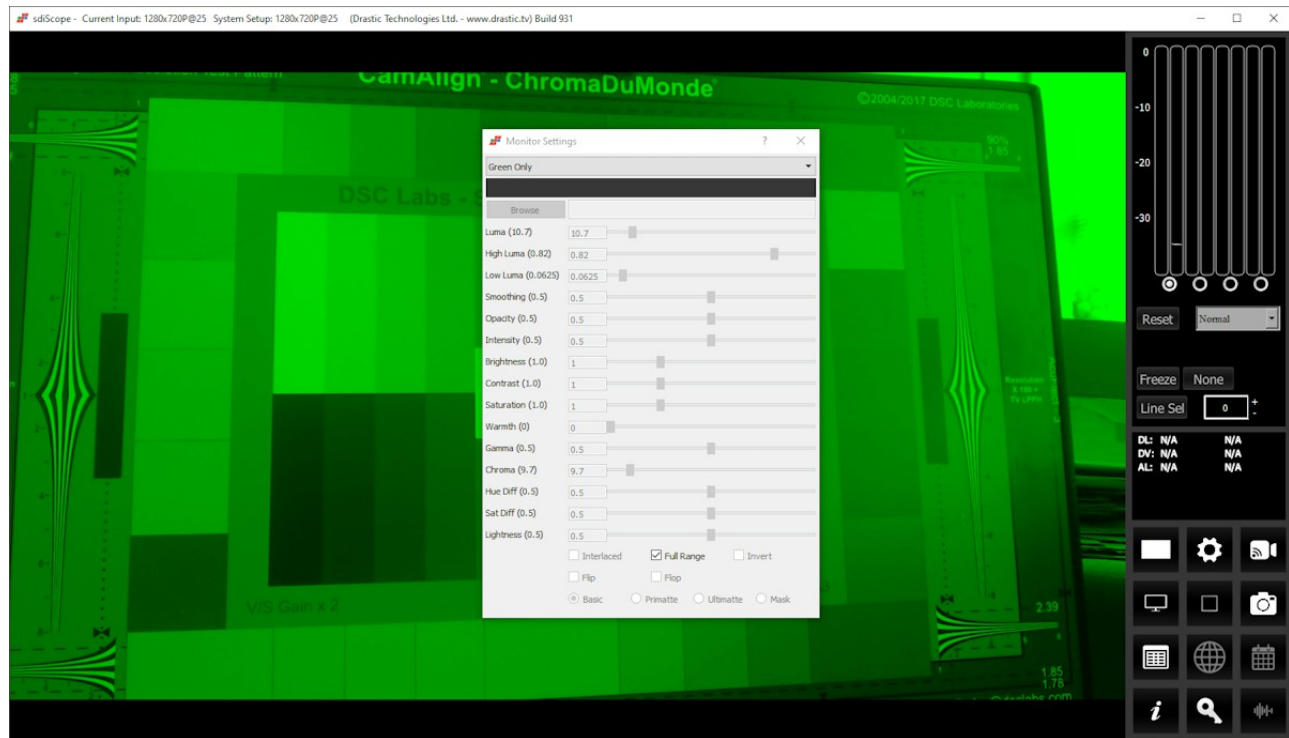
Show only the red channel.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.4 Green Only

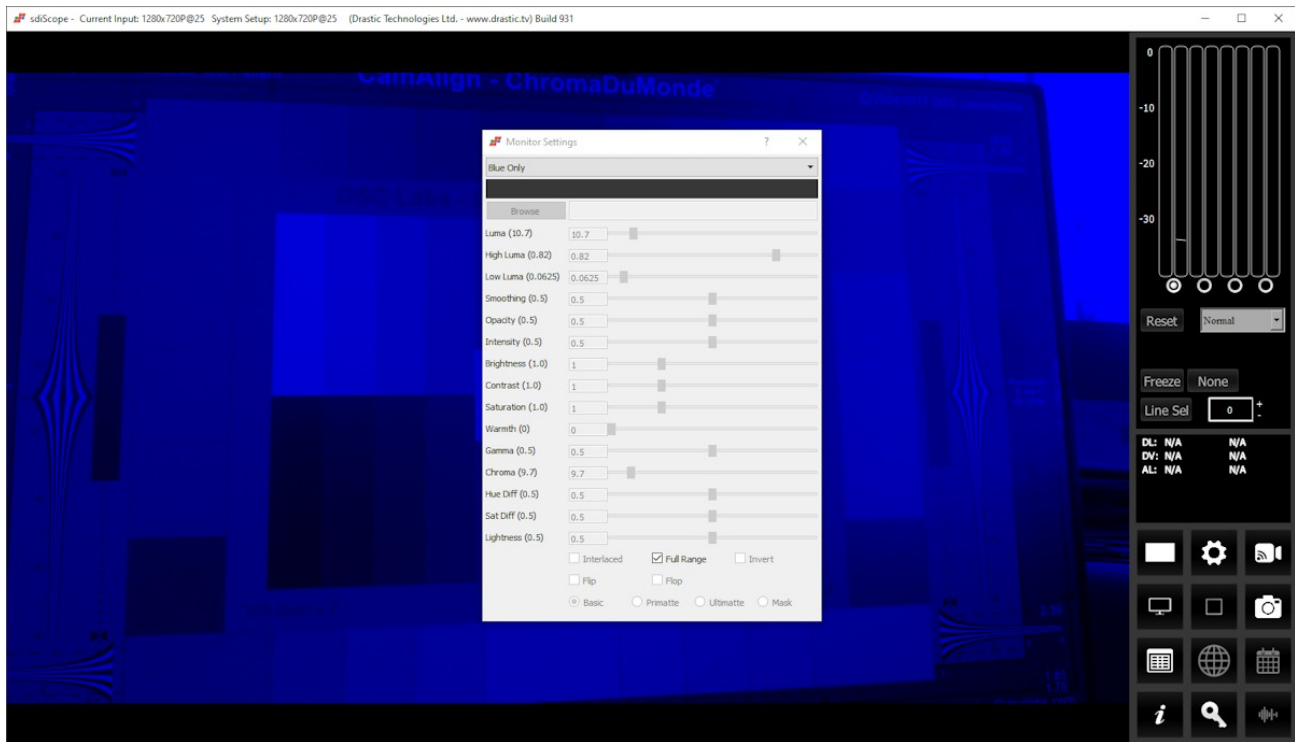
Show only the green channel.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.5 Blue Only

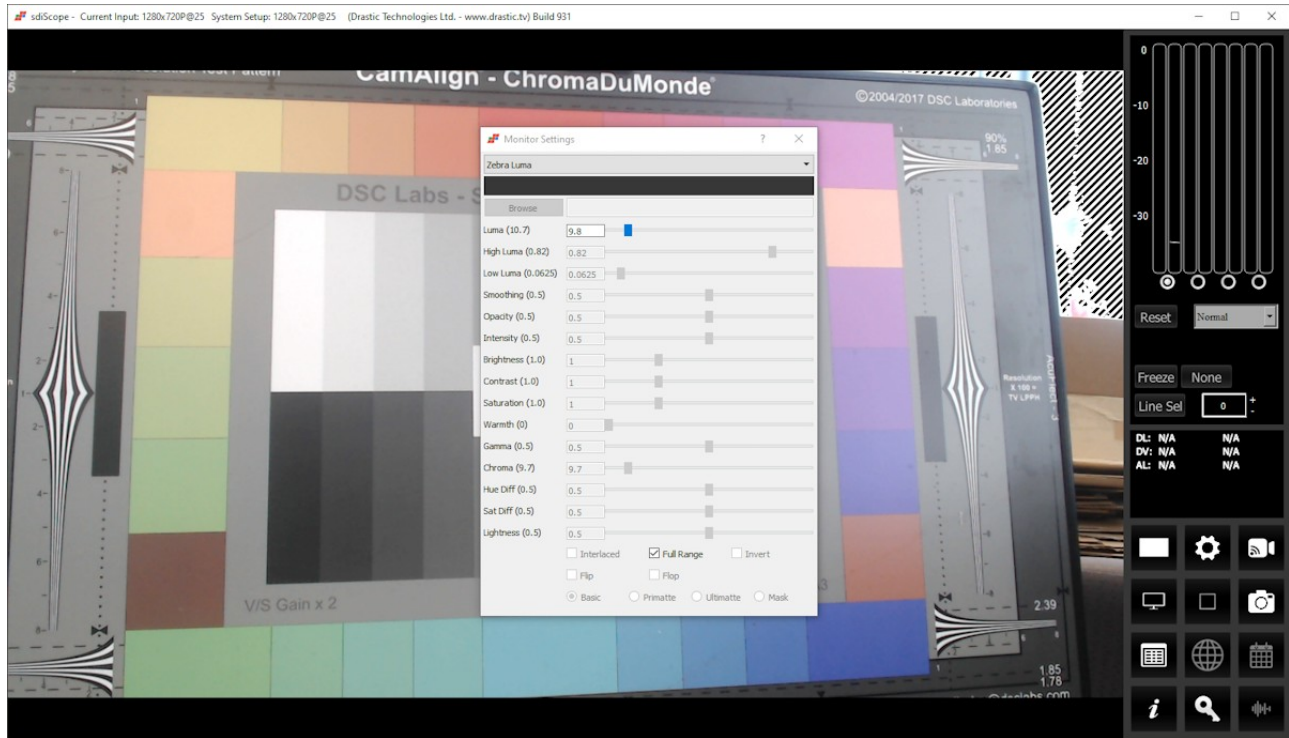
Show only the blue channel.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.6 Zebra Luma

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

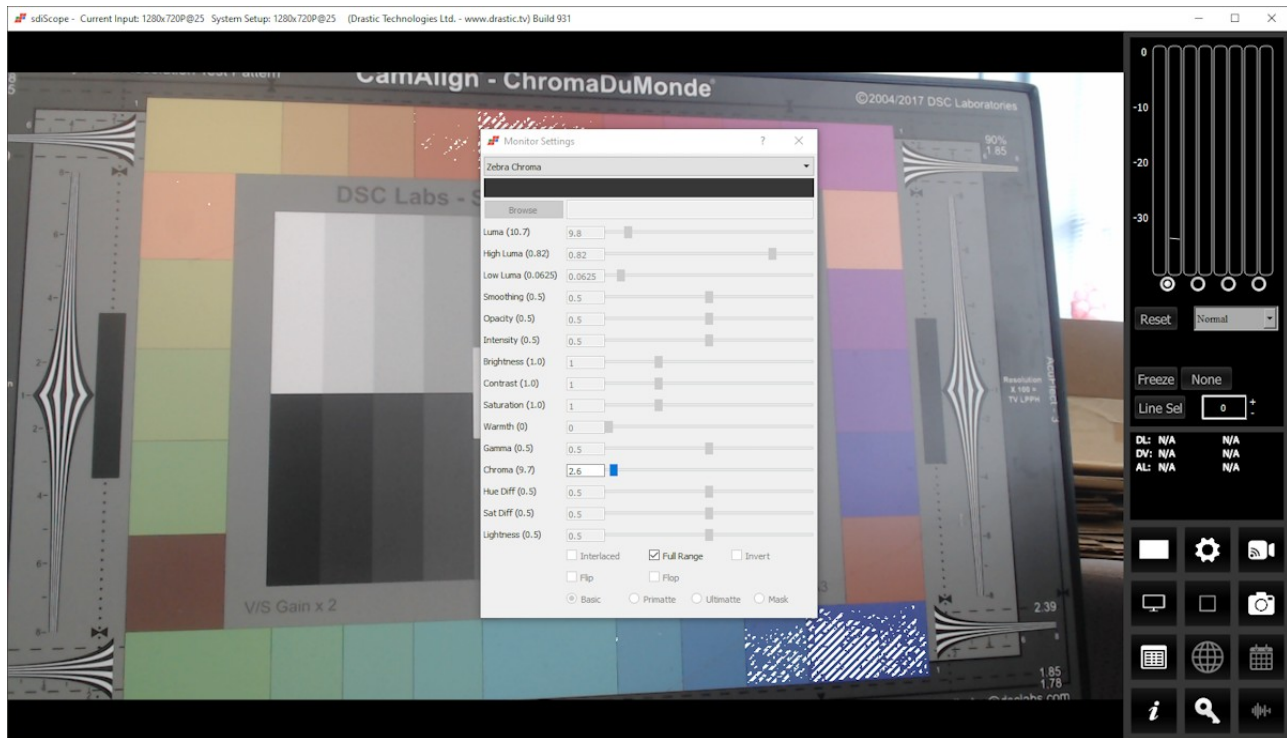


Activates the **Luma** slider, which allows the user to adjust the luma setting. When active, Luma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in tenths. Click on the slider and use the < and > keys.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.7 Zebra Chroma

Draw zebra bars where the chroma is out of range.

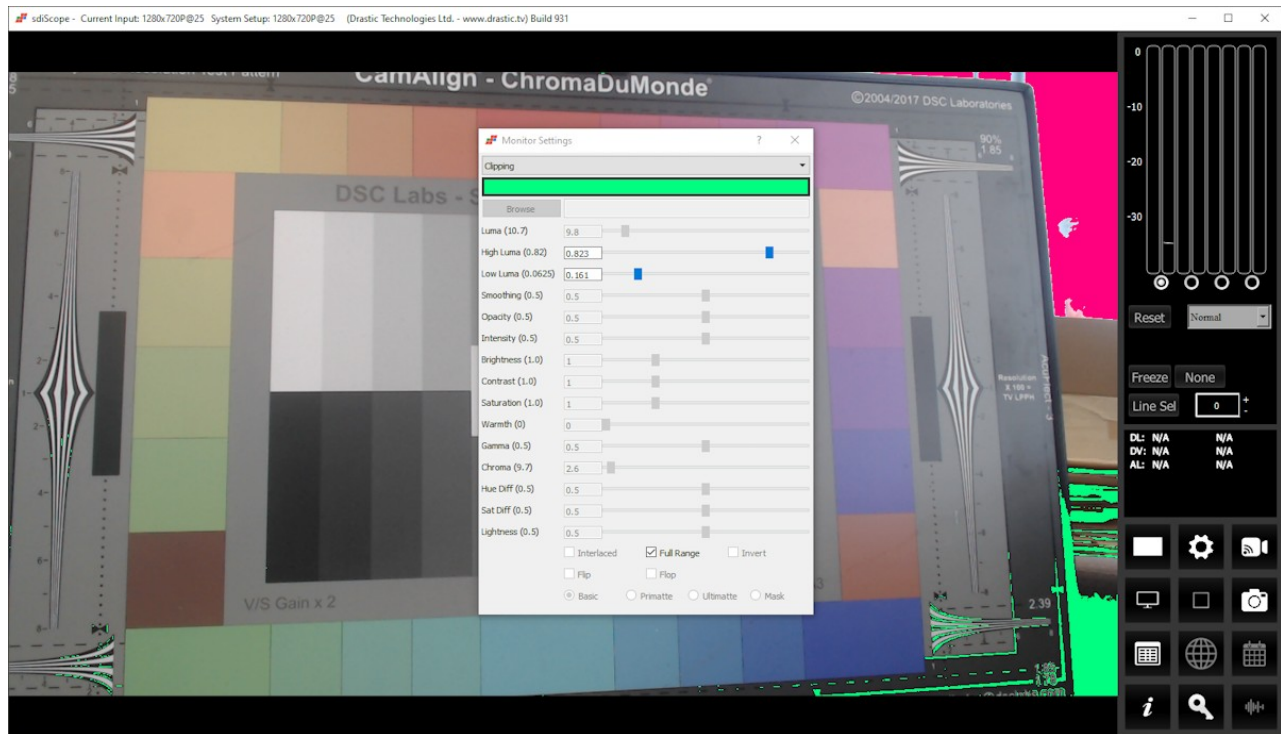


Activates the **Chroma** slider, which allows the user to adjust the chroma setting. When active, Chroma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in tenths. Click on the slider and use the < and > keys.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.8 Clipping

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



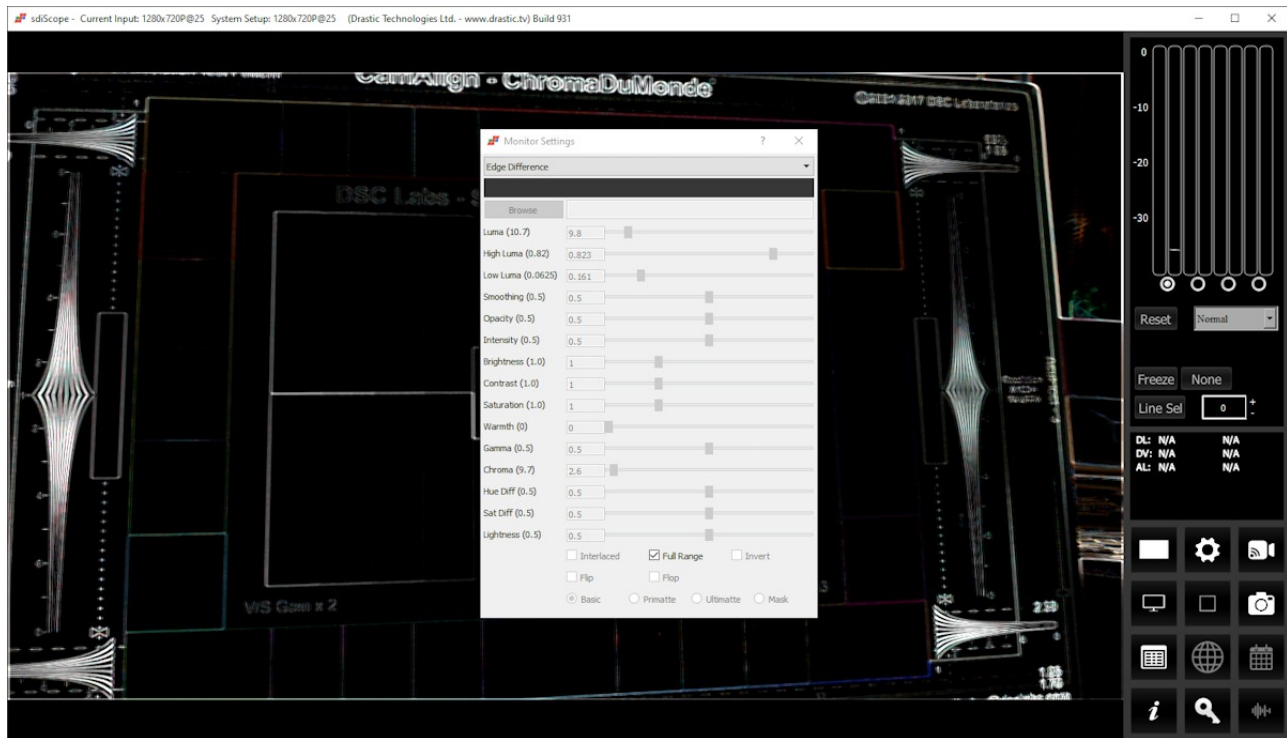
Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose a primary (too low) color other than green. The secondary (too high) color is automatically generated to be a contrasting color to the primary color. To open the color picker, click on the bar,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

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

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.9 Edge Difference

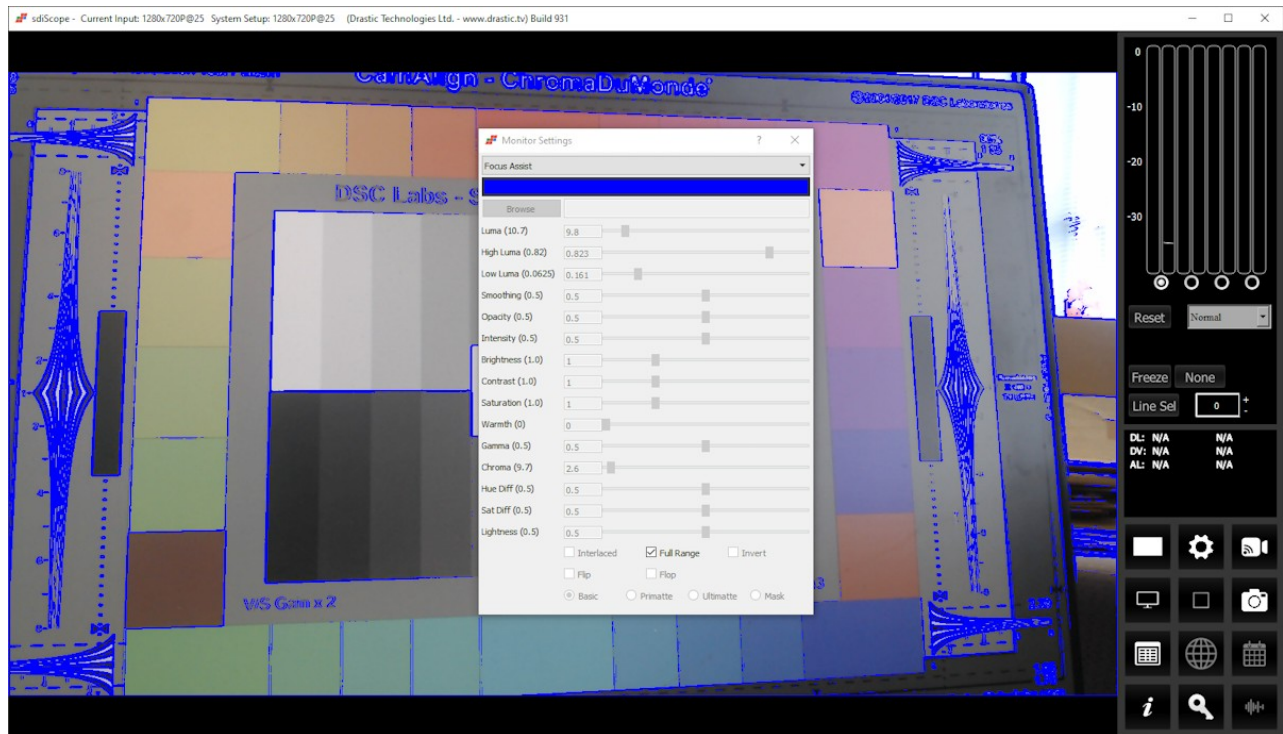
Highlight every edge in the picture, and turn the rest of the picture black.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.10 Focus Assist

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

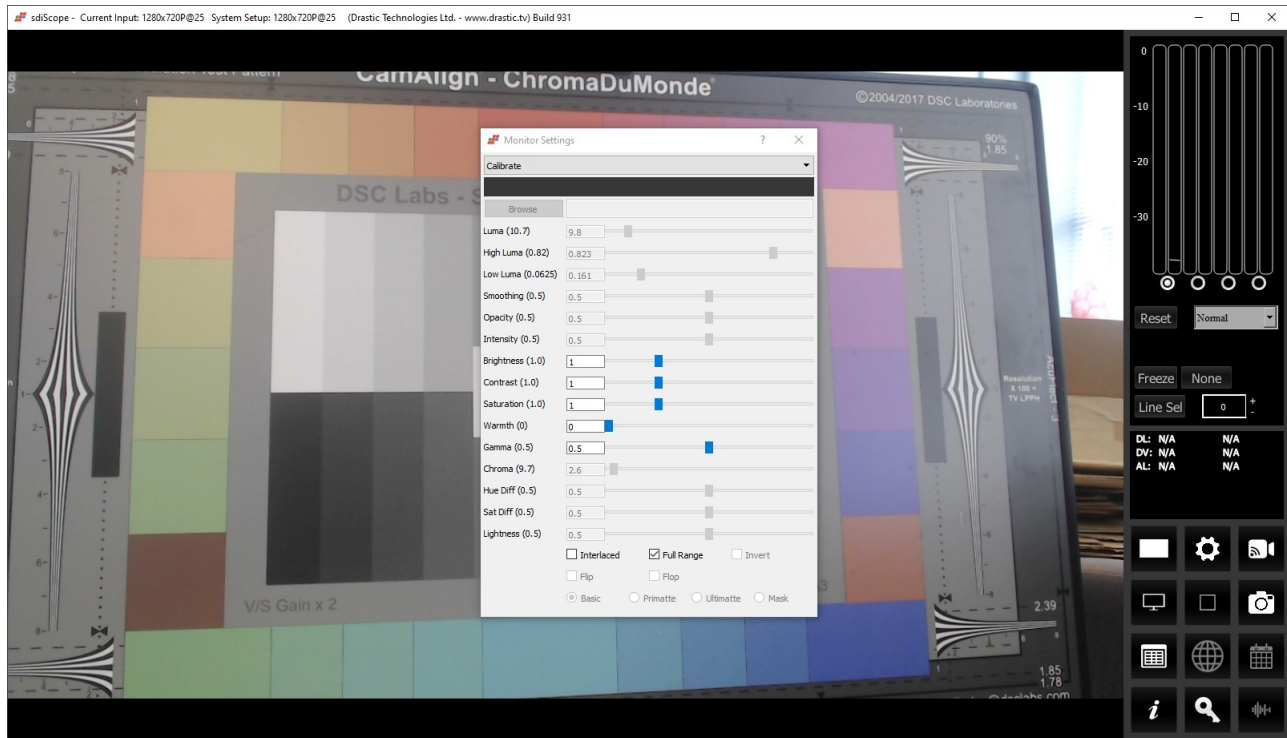


Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose an appropriate color to contrast from the general hue of the picture. To open the color picker, click on the bar, or press <ENTER>.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.11 Calibrate

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



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

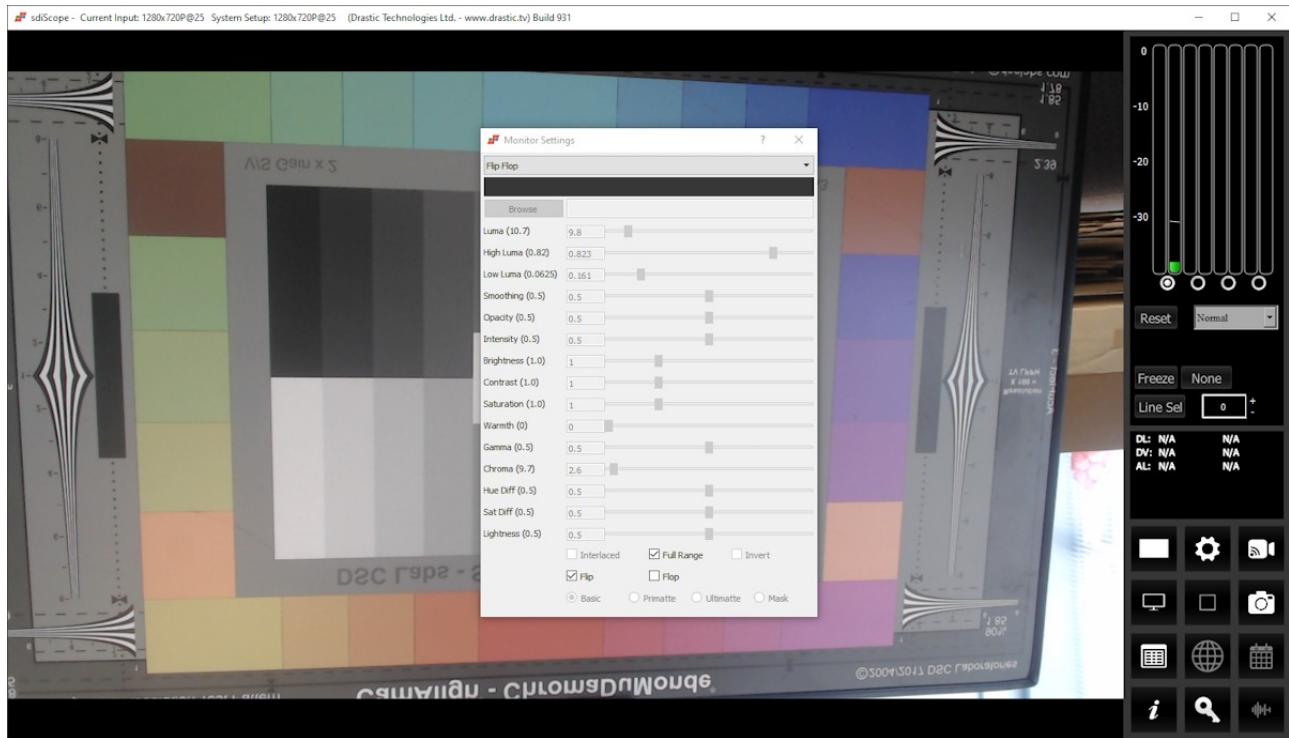
Activates the **Interlaced** checkbox, which allows the user to specify interlaced (checked) or progressive (unchecked) standards to display.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

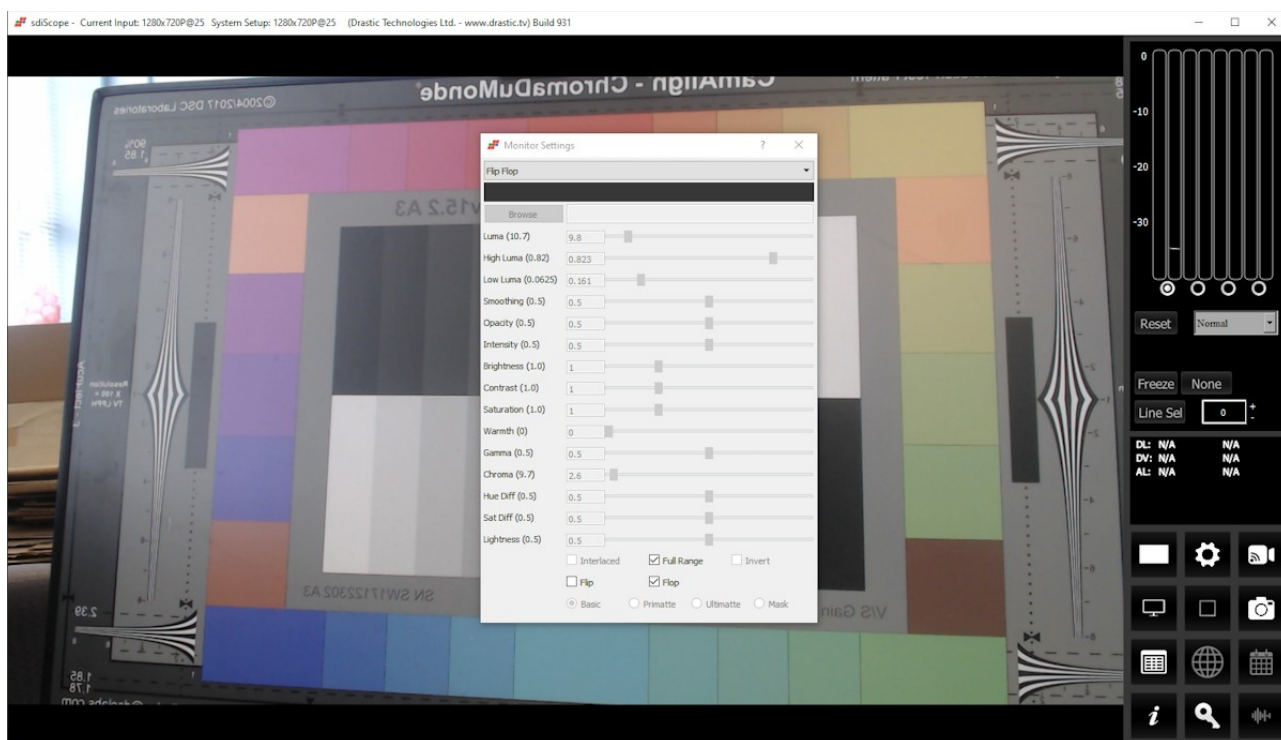
3.5.12 Flip Flop

Reverse the picture horizontally or vertically.

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



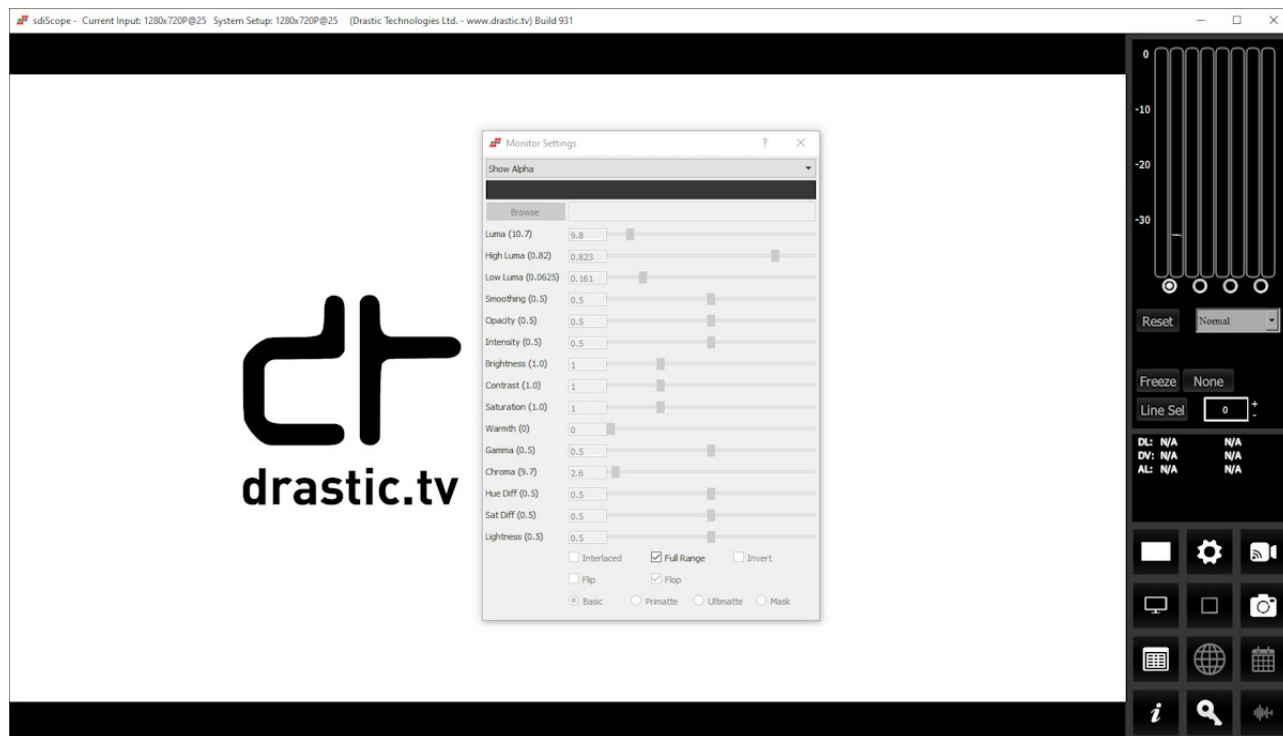
Activates the **Flop** checkbox, which allows the user to reverse the image left to right.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.13 Show Alpha

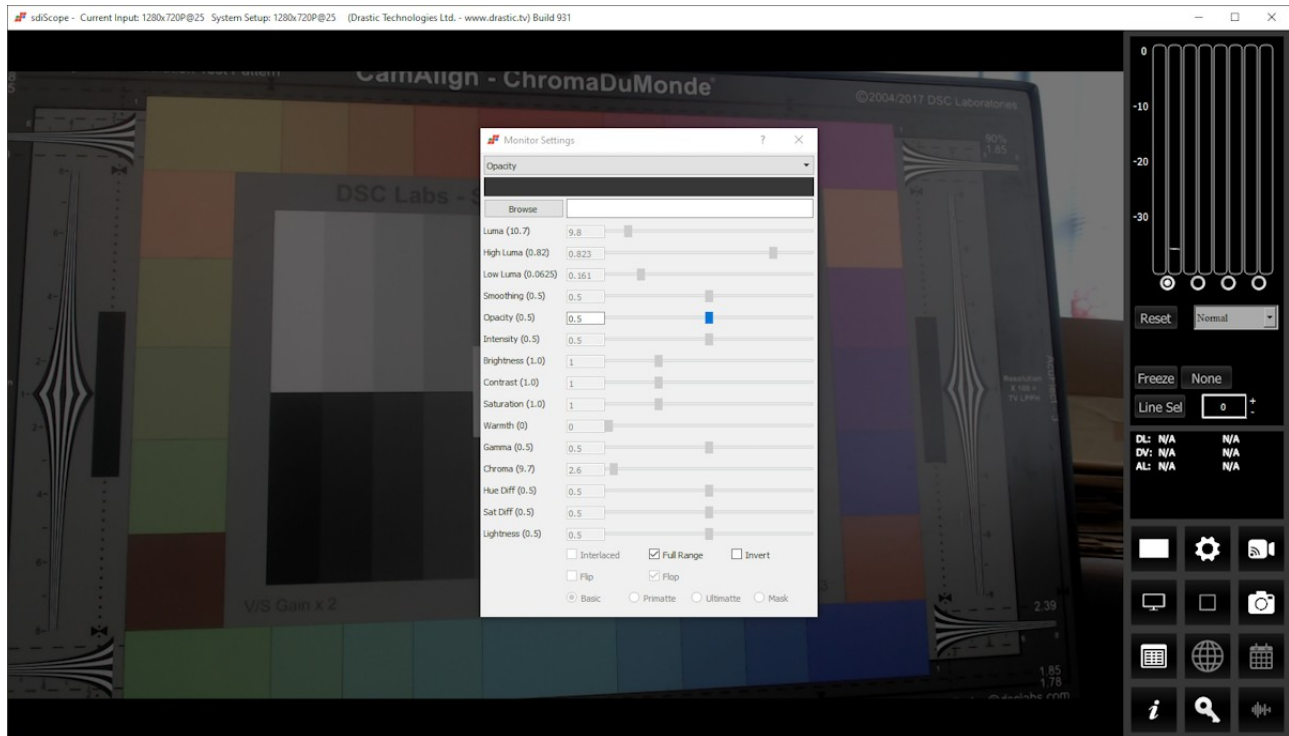
Show the alpha component of an RGBA or YCbCr+A signal. If your signal does not have an alpha channel, the screen will simply display white.



The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.14 Opacity

Mix the signal with a loaded still image for reference, using a checkerboard mix, or 50% gray. This setting can be used to compare two images to match a camera position from an existing shot with a new camera, where additional shots are needed for a scene and a new camera needs to match its position.



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

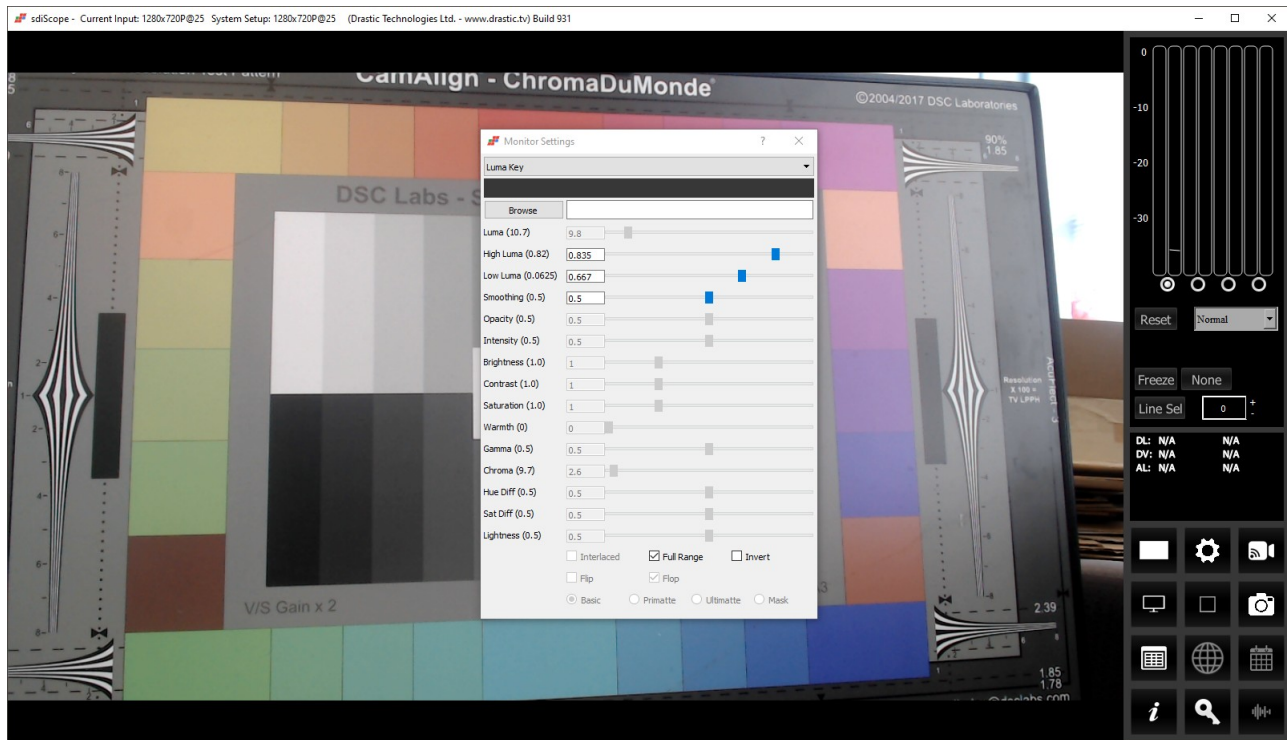
Activates the **Opacity** slider which allows the user to set the opacity level

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

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.15 Luma Key

Show the video luma keyed over a checkerboard or image.



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

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

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

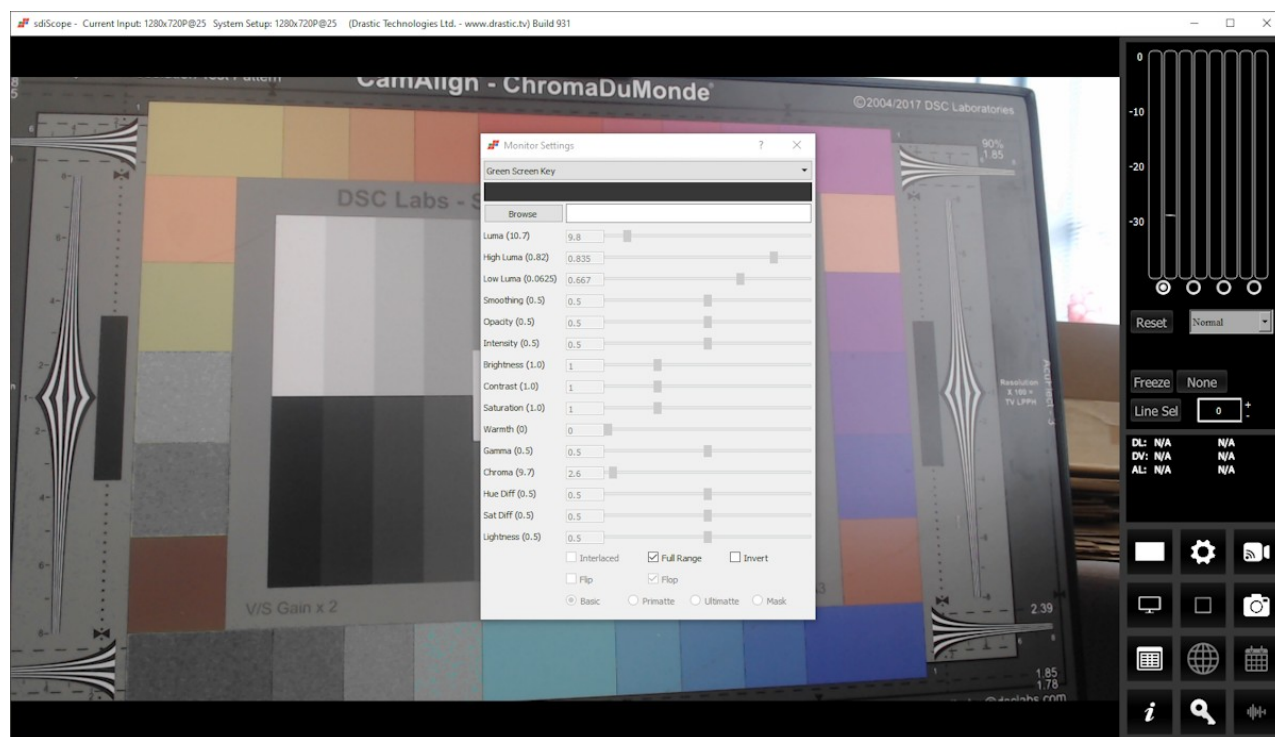
Activates the **Smoothing** slider, so the user can adjust the smoothing settings. When active, can be adjusted by pulling the slider, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

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

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.16 Green Screen Key

Show the image green screen keyed over a checkerboard.



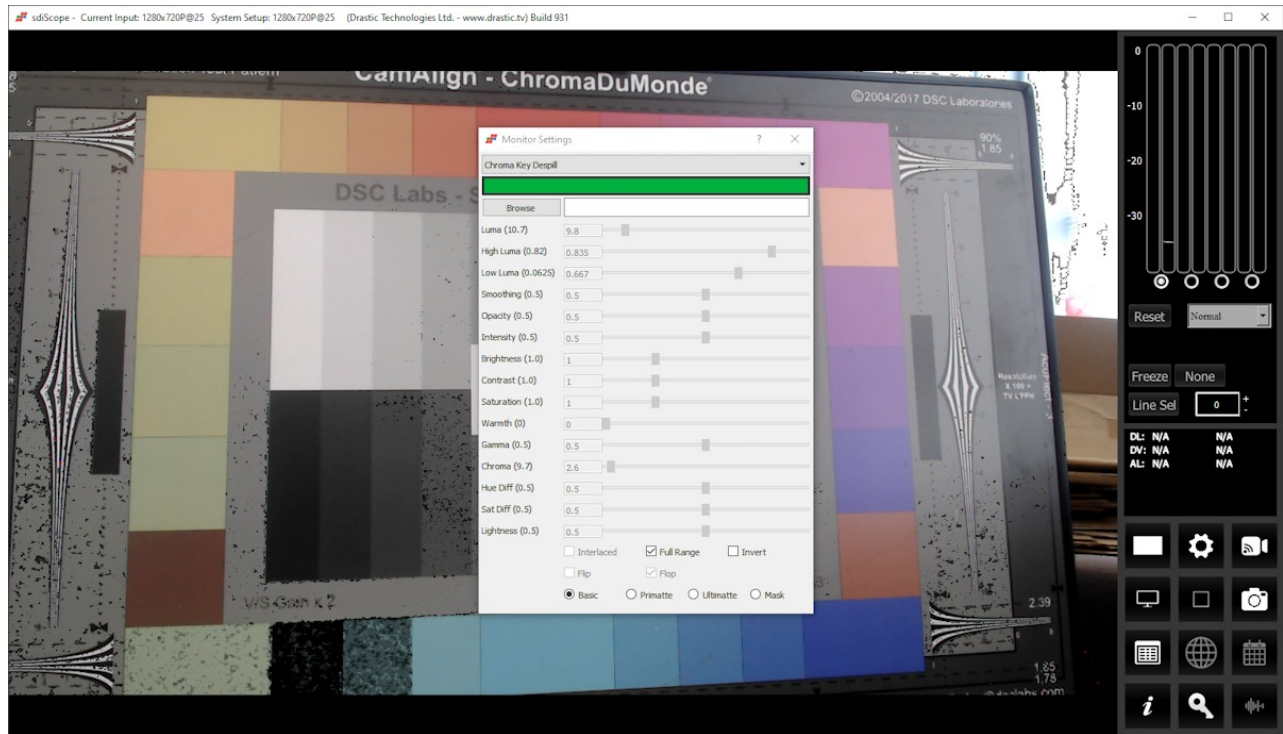
Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background for the green screen key, instead of the checkerboard.

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

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

3.5.17 Chroma Key Despill

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



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

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

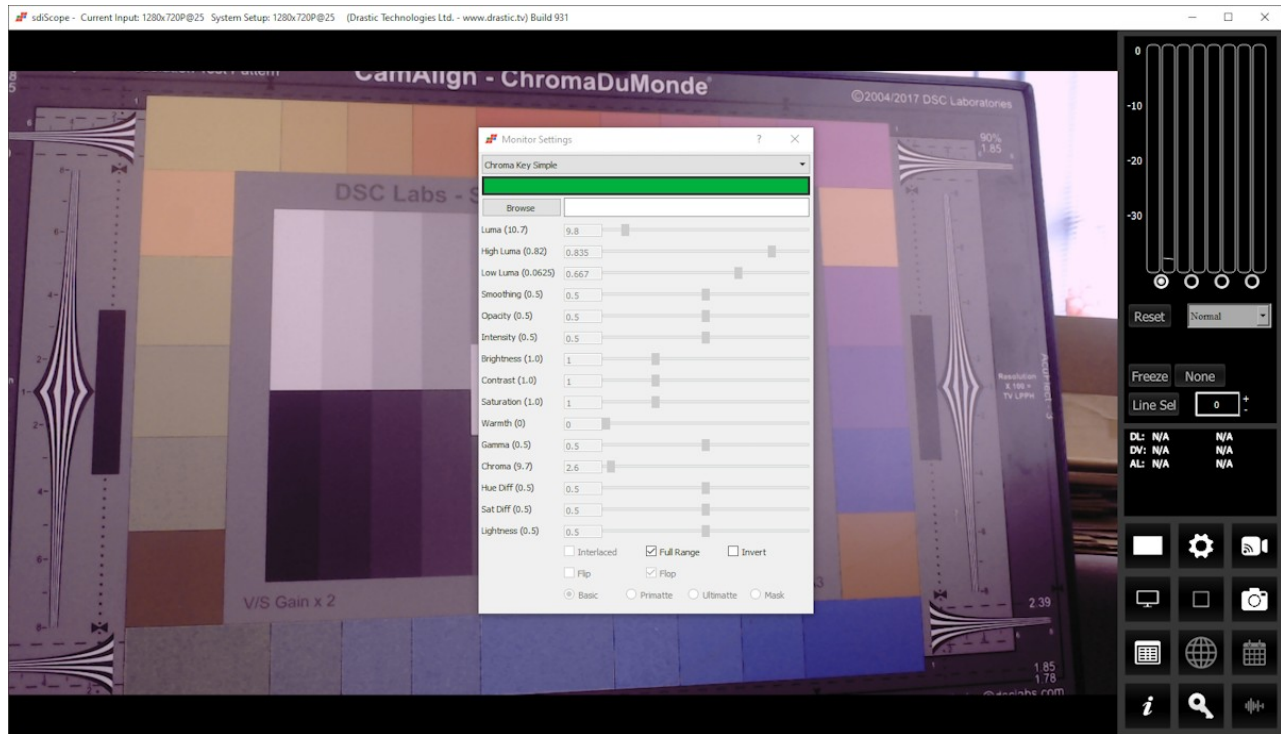
The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

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

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

3.5.18 Chroma Key Simple

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



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

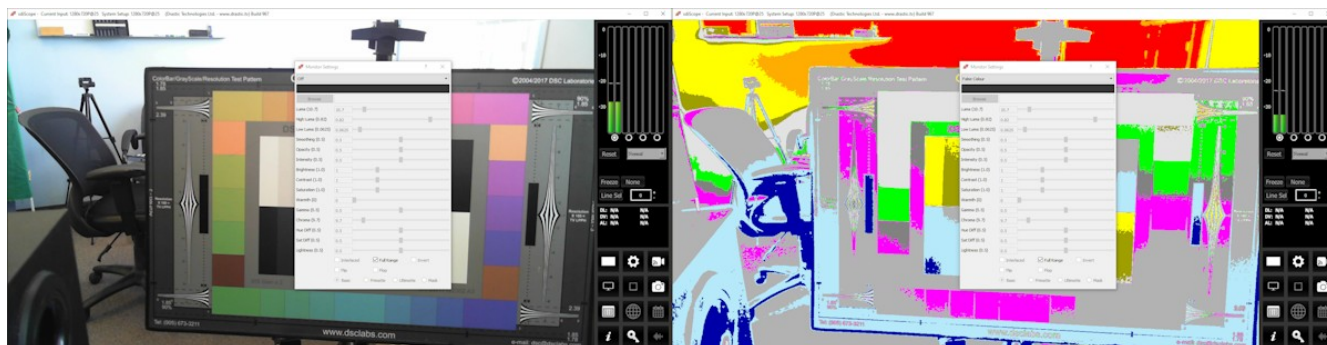
Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background for the chroma key, instead of the checkerboard.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

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

3.5.19 False Colour

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



The above example shows the normal signal on the left, and false colour mode on the right.

The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the gratitudes.

Here are the IRE Breakpoints in False Colour display mode:

0 to 2	Red		Too low
2 to 10	Blue		Underexposed
10 to 20	Light Blue		
20 to 42	60% Gray		
42 to 48	Magenta		
48 to 52	70% Gray		
52 to 58	Bright Green		
58 to 78	80% Gray		Skin Tones
78 to 84	Dark Yellow		
84 to 94	Bright Yellow		
94 to 99	Orange		Overexposed
>99	Red		Too high

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

Intensity slider – reserved for future development.

Hue Diff slider – reserved for future development.

Sat Diff slider – reserved for future development.

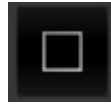
Lightness slider – reserved for future development.

3.5.20 Display Modes Keyboard Controls

The display modes can be set using keyboard commands rather than the Monitor Settings window.

- <ALT>-A - Display mode alpha only
- <ALT>-B - Display mode blue only
- <ALT>-C - Display mode clipping
- <ALT>-D - Display Mode flip flop
- <ALT>-E - Display mode edges
- <ALT>-F - Display mode focus assist
- <ALT>-G - Display mode green only
- <ALT>-H - Display mode HDR false color [shows greater than SDR and less than 64]
- <ALT>-I - Display mode calibrate
- <ALT>-J - Display mode luma key
- <ALT>-K - Display mode chroma key
- <ALT>-L - Display mode luma only
- <ALT>-M - Display mode false color
- <ALT>-N - Display mode none
- <ALT>-O - Display mode opacity
- <ALT>-P - Display mode chroma key despill
- <ALT>-R - Display mode red only
- <ALT>-S - Display mode green screen
- <ALT>-V - Display mode buffer weighted *[not implemented]*
- <ALT>-W - Display mode weighted RGB *[not implemented]*
- <ALT>-X - Display mode edge difference
- <ALT>-Y - Display mode zebra chroma
- <ALT>-Z - Display mode zebra luma

3.6 Manual



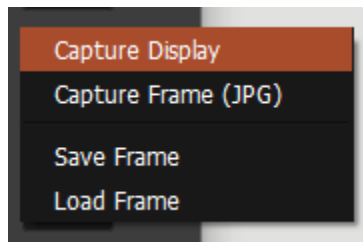
Manual button – opens up this manual for quick reference.

3.7 Capture Image

sdiScope lets you capture an image for later reference or examination.



Capture Image button – provides options for capturing a frame of video for reference. Opens the following dialog:



Capture Display – opens a standard save as window set to C:\Users\corey\OneDrive\Pictures, with the option to save either a bmp or a jpg. Since it is a save as window, the file can be saved anywhere you like.

Capture Frame JPG - a JPG image can be captured , using the filename structure:
[Input_DD_M_YYYY_HH_MM_SS.jpg] in 8 bit YCbCr mode for easy reading and documentation.

Save Frame - The incoming image can be captured as a raw image in full, bit perfect images based on the current system settings. examples include:

YCbCr 8 bit - .yuv
YCbCr 10 bit - .v210
BGRA 8 bit - .bgra

RGB10 – rgb30

These files are saved using the [Input_DD_M_YYYY_HH_MM_SS.filetype] filename structure. They can be read with videoQC or converted with MediaReactor, or loaded into sdiScope.

Save Images Keyboard Commands

Save JPG Images

- <CTRL>-1 Capture a full size JPG image (in 8 bit YCbCr only)
- <CTRL>-2 Capture a 50% size JPG image (in 8 bit YCbCr only)
- <CTRL>-3 Capture a 25% size JPG image (in 8 bit YCbCr only)
- <CTRL>-4 Capture a 10% size JPG image (in 8 bit YCbCr only)
- <CTRL>-5 Capture a full size JPG image (in 8 bit YCbCr only)
- <CTRL>-6 Capture a full size JPG image (in 8 bit YCbCr only)
- <CTRL>-7 Capture a full size JPG image (in 8 bit YCbCr only)
- <CTRL>-8 Capture a full size JPG image (in 8 bit YCbCr only)

Save Raw Images

- <CTRL>-9
 - <CTRL>-0 Capture uncompressed frames as YUV (8 bit), v210 (10 bit), RGB10 (10 bit)
- These are headerless frames, with only the raw data in them. They can be viewed or read in Drastic software like videoQC, DTMediaRead, Net-X-Code Server, etc. Please contact Drastic for the bit format of these files.

Saved Frames Location - Frames are saved at C:\Users\username\OneDrive\Pictures\sdiScope directory.

Load Frame – opens a browser pointed at your C:\Users\username\OneDrive\Pictures\sdiScope directory so you can load a frame you have saved. The file type pulldown lets you filter to only look for .yuv, or only .v210, or to view all uncompressed files.

3.8 Data View



Data View button – populates the Display section with the Data view.

The screenshot displays the sdiScope software interface. The top section contains control buttons: 'Start Pixel' (set to 0), 'Start Line' (set to 25), 'Hex' (selected), 'Dec', 'Freeze', 'Find', and 'Show ANC'. Below these is a large data table with columns for pixel coordinates (0 px to 57) and corresponding hex/dec values. A vertical waveform graph is visible on the right side. At the bottom, there is a small inset image of a camera sensor or display showing a grid pattern.

Start Pixel field – displays the current start pixel. The user can enter a new start pixel, or use the + / - buttons to increment the value up or down.

Start Line field – displays the current start line. The user can enter a new start line, or use the + / - buttons to increment the value up or down.

Hex and **Dec** radio buttons – select one or the other button to set the values display to either decimal or hexadecimal.

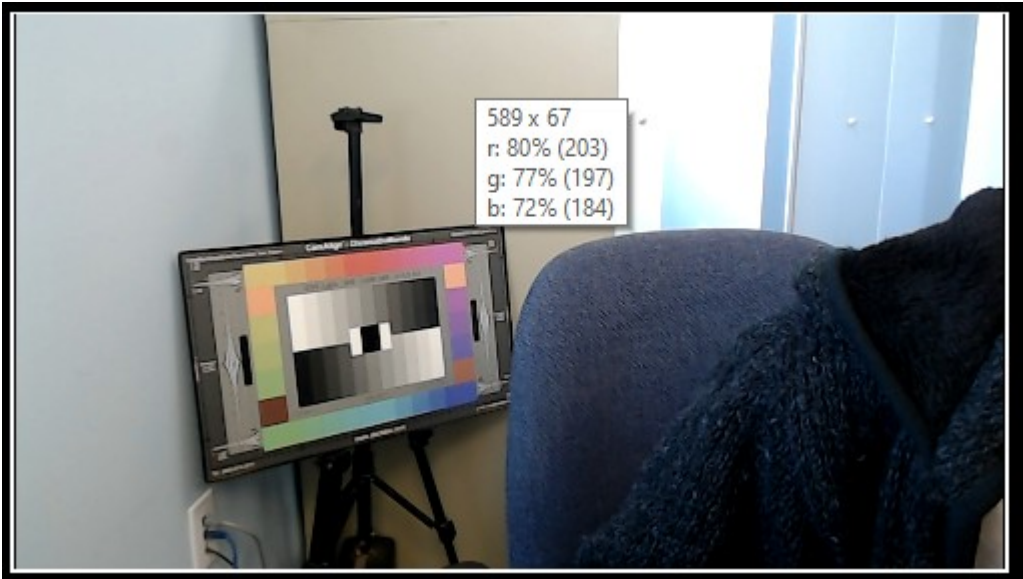
Freeze button – freezes the current frame of video for closer inspection

Find button – to find a specific hexadecimal value, enter it into the field, then press the find button.

Show ANC checkbox – a Show Anc checkbox exists, but the Anc display feature is unavailable in sdiScope. The Show Anc feature is added at the 4KScope level.

The Data view allows access to the raw pixel values being monitored on the HDMI or SDI input. Raw values are captured and displayed with no manipulation by the software. 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.

The Data View picture inset also provides real time per pixel data when you hover over any area of the image with the mouse. It displays the specific pixel you are looking at, and shows the RGB values.



The pixels data view analyzes can be set by the user by clicking the **Start Pixel**, or the **Start Line** checkbox, and changing the value. Note, if set to an area outside the signal (such as start pixel 0, start line 0), you will not see any useful information about the video.

Start Pixel	624	+	Start Line	222	+	
624 px	Cb-U	Y0	Cr-V	Y1	Cb-U	Y0
222	0x0083	0x00A3	0x007D	0x00A3	0x0083	0x00A3
223	0x0083	0x00A3	0x007D	0x00A3	0x0083	0x00A3
224	0x0083	0x00A3	0x007D	0x00A3	0x0083	0x00A3
225	0x0083	0x00A3	0x007D	0x00A3	0x0083	0x00A3
226	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2
227	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2
228	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2
229	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2
230	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2
231	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2
232	0x0083	0x00A2	0x007D	0x00A2	0x0083	0x00A2

The **Data View** can be set to display either hexadecimal, or decimal values for each pixel:

Start Pixel333+Start Line222+HexDec

332 px

Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	
222	0x0072	0x0077	0x0068	0x0078	0x0071	0x0078	0x0068	0x0078	0x0073
223	0x0072	0x0077	0x0068	0x0077	0x0071	0x0077	0x0068	0x0077	0x0072
224	0x0072	0x0075	0x0068	0x0075	0x0071	0x0075	0x0068	0x0075	0x0072
225	0x0072	0x0074	0x0068	0x0073	0x0071	0x0073	0x0068	0x0073	0x0072
226	0x0072	0x0073	0x0066	0x0073	0x0071	0x0073	0x0066	0x0073	0x0072
227	0x0072	0x0073	0x0066	0x0073	0x0071	0x0072	0x0066	0x0072	0x0072
228	0x0072	0x0073	0x0066	0x0072	0x0071	0x0072	0x0066	0x0072	0x0072
229	0x0072	0x0072	0x0066	0x0072	0x0071	0x0072	0x0066	0x0072	0x0072

Start Pixel333+Start Line222+HexDec

332 px

Cb-U	Y0	Cr-V	Y1	Cb-U	Y0	Cr-V	Y1	Cb-U	
222	0115	0119	0103	0119	0115	0120	0103	0120	0115
223	0115	0118	0104	0118	0115	0119	0104	0119	0115
224	0115	0117	0104	0117	0115	0117	0104	0117	0115
225	0115	0116	0104	0116	0115	0116	0104	0116	0115
226	0114	0117	0103	0116	0114	0116	0103	0116	0115
227	0114	0116	0103	0116	0114	0116	0103	0115	0115
228	0114	0115	0103	0115	0114	0114	0103	0114	0115
229	0114	0115	0102	0114	0114	0113	0102	0113	0115

Hexadecimal values are shown above on the left, and the decimal values on the right.

3.9 Info button



Opens the splash screen, so the user can quickly confirm which version of sdiScope they are running.



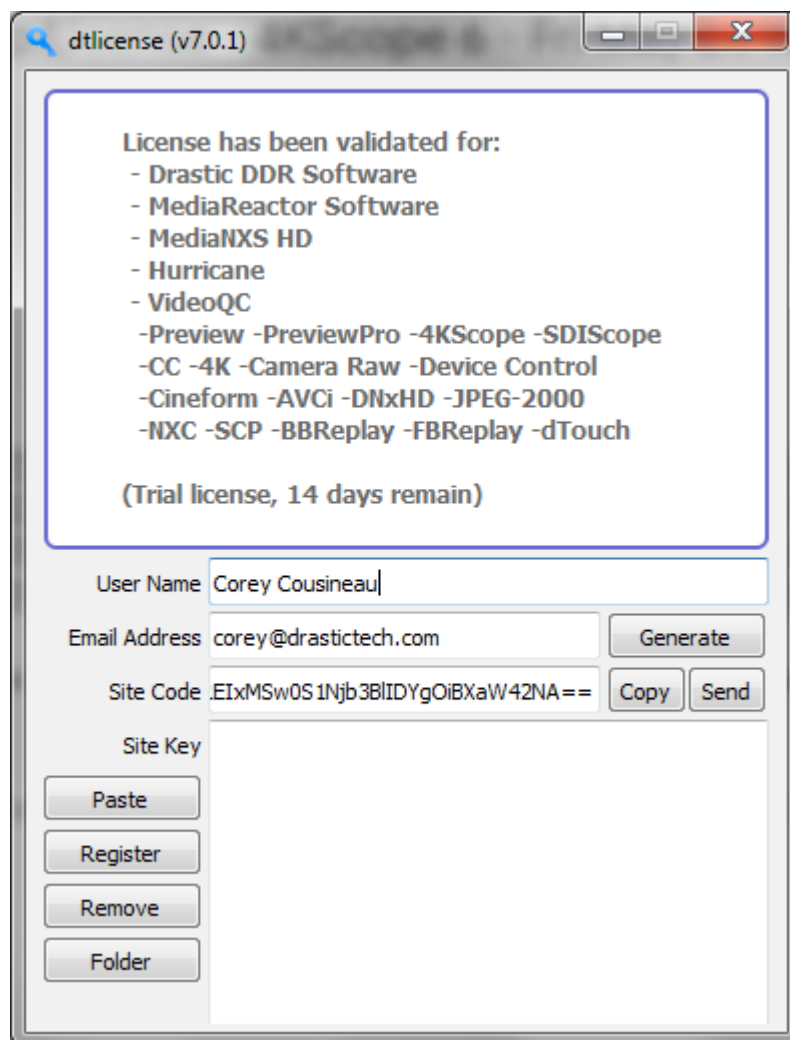
3.10 License

The license button.



This button opens the licensing dialog so the user can confirm their license status, and update the license with a new site key. The user can also access this control via the Configuration menu.

The licensing dialog looks like this:

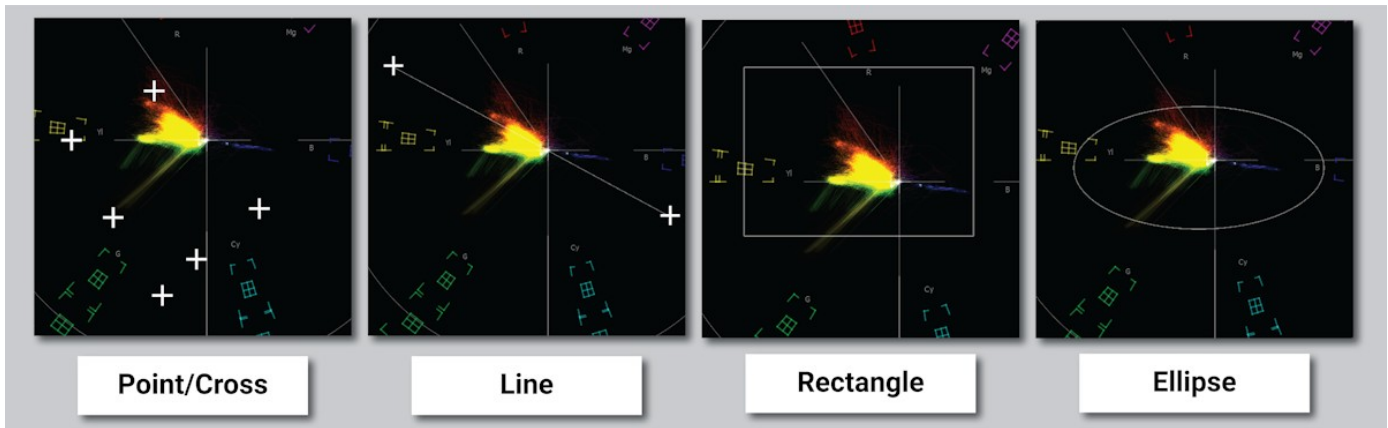


- The top field displays the current status of the license.
- The **User Name** field allows the user to type in a first and last name during the licensing

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. The 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, 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. Pressing the x in the upper right corner will close the License window.
- Press the **Done** button to enable any changes, and close the **Settings** window.

3.11 Making Marks/Guides (cross, line, rectangle, ellipse)



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

4 Setup

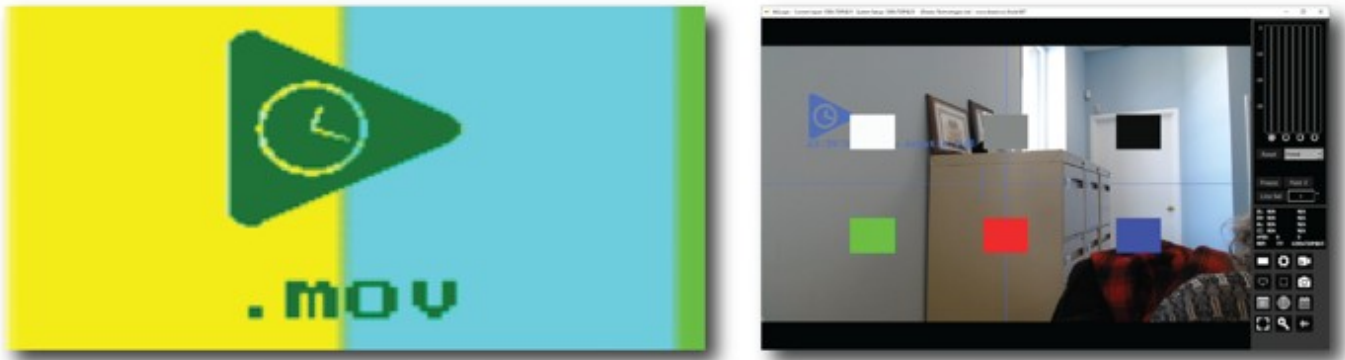
4.1 Install the Software

Install **sdiScope** software on a capable system. Regardless of the delivery method, the software will be available at some level as an (executable) installable file. Double-click on the file, or right click and select **Open** from the context menu. Follow the prompts to set where the software should be installed and make other installation-specific decisions.

4.2 License the Software

4.2.1 How Do I Remove the Watermarks?

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



Sample watermarks

In order to license sdiScope, open sdiScope and navigate to the Settings ("Gear" icon at the bottom right of the application). Next click on the "License" button at the bottom of the Settings menu box and then follow the steps at the following location: <http://license.drastictech.com/>

4.3 Run the Software

Run the software. If the default installation path is used, you can open it at: **Start|Programs|Drastic sdiScope|sdiScope**. The software will then need to be set up.

4.3.1 Setup Window

Confirm that the signal you wish to monitor is connected to the correct input(s) of the video board. Click on the **Setup** button to confirm or adjust any settings for the type of signal format being used. Once the system is correctly set up, pressing the **Done** button closes the **Setup** window.

5 Operations

sdiScope can be used to view an input signal through supported AJA, Bluefish444, Matrox or Blackmagic video hardware. Once a capable system has been equipped with an install of sdiScope, the user may connect a signal to the appropriate inputs and begin to use the software.

Multiple inputs may be connected to a switcher to compare and adjust any mismatched parameters of setup. Also, multiple instances of sdiScope may be run on one system using the same license, and set up to analyze different sources.

Use the **Setup** Window to confirm or adjust any settings for your video signal.

Use the **Scope Config** window to set the layout (number and arrangement of windows), and which window uses which scope.

At this point if all has been properly set up, the user should be able to view their signal through the appropriate scopes and other signal analysis tools.

5.1 Controlling sdiScope

5.1.1 Zoom and Pan

sdiScope supports zooming the waveform monitors and vectorscope for a closer look at low saturation signals, or the luma elements of the waveform. The live picture can also be zoomed in or out, and panned with the mouse.

To zoom, place the mouse over the picture or scope, and roll the mouse wheel.

To pan the picture, click on it and drag it until the area of interest is visible.

To reset to normal zoom, right click the mouse.

5.1.2 Mouse Control

sdiScope features extended mouse controls. These include:

- <MouseWheel> - zoom in and out symmetrical
- <MouseWheel><Alt> - zoom X axis
- <MouseWheel><Ctrl> - zoom Y axis
- <RightClick> - reset zoom to view all
- <LeftClick>Drag - pan and scan the video image in the app
- <MiddleClick> - zoom 1:1
- <DoubleClick> - enter and exit full screen mode
- <T> - enable or disable time code display in full screen

5.1.3 Frame Compare

sdiScope includes a signal compare feature that can be used to freeze a complete frame of video (two fields in interlaced), every second line (field) or at a 50/50 dissolve to compare two signals or cameras. Once frozen, all the standard scopes are still available for setup and comparison. While a frame is frozen, the comparison mode and type of scope can be changed.

To access the frame compare features, press the **Frame Grab** button.

5.1.4 Command Line Parameters

```
4KScope -f -m -s D H P R W V  
-f Open in full screen mode
```


- m Open in maximized mode
- s Open in standard mode
- D Show Data view on open
- H Show Histogram view on open
- P Show Picture view on open
- R Show Waveform RGB on open
- W Show Waveform on open
- V Show Vectorscope on open

5.1.5 Set Layout

- <ALT>-1 - set to single scope
- <ALT>-2 - set to two scopes
- <ALT>-4 - set to four scopes
- <ALT>-6 - set to six scopes

5.1.6 Capture Image

<CTRL>-0 Capture uncompressed frames as YUV (8 bit), v210 (10 bit), RGB10 (10 bit)
These are headerless frames, with only the raw data in them. They can be viewed or read in Drastic software like videoQC, DTMediaRead, Net-X-Code Server, etc. Please contact Drastic for the bit format of these files.

- <CTRL>-1 Capture a full size JPG image (in 8 bit YCbCr only)
- <CTRL>-2 Capture a 50% size JPG image (in 8 bit YCbCr only)
- <CTRL>-3 Capture a 25% size JPG image (in 8 bit YCbCr only)
- <CTRL>-4 Capture a 10% size JPG image (in 8 bit YCbCr only)
- <CTRL>-9 Capture a 1% size JPG image (in 8 bit YCbCr only)

5.1.7 Other Features

- D - Show the frozen frame
- F - Toggle full screen
- M - Show mix of live and frozen signal
- S - Show the live signal
- <CTRL><ALT><SHIFT> 0..9 Save a preset to Documents\4kScope\0..9.ini
- <CTRL><ALT> 0..9 Load a preset from Documents\4kScope\0..9.ini
- <CTRL><SHIFT>-D - set the interface dimming for HDR display screens
- <CTRL>-F - Freeze and thaw

<ESC> Leave full screen mode
<SPACE> Freeze/Thaw data view

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This manual has been compiled to assist the user in their experience using **DrasticScope** software. It is believed to be correct at the time of writing, and 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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