

DrasticScope v8

User Guide



July 29, 2025

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1 Introduction

This manual is for DrasticScope 8.x software from Drastic Technologies, Ltd.

1.1 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, macOS or Linux operating system.

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

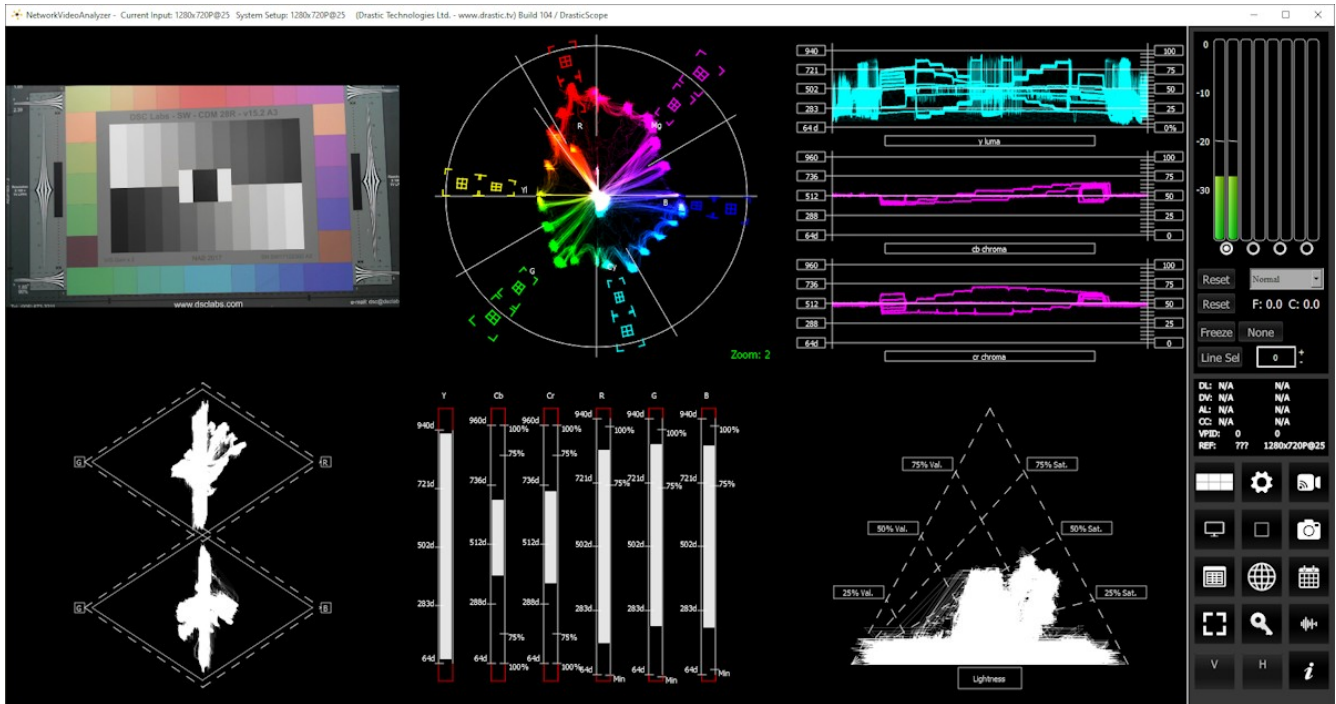
That the user has access to technicians capable of placing the device on the network and setting up any SAN systems if necessary.

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.

1.2 About DrasticScope



DrasticScope is a suite of software tools for video and audio signal analysis and monitoring. DrasticScope software provides measurement instruments like industry standard RGB/YCbCr waveforms and vectorscope, as well as workflow specific tools like the Channel Plot, 6 Bar Gamut, Y/C Peak, and a full set of audio analysis tools.

DrasticScope can be licensed at the following levels to accommodate various workflows.

- Free** – you can download a free version for training and signal validation, basic setup. Features up to 2 scopes at a time, with time code, Picture View, YCbCr waveform, RGB waveform, and vectorscope. Sign up required (name/email) to remove the demo limitations (overlay, watermark, nag screen etc.).
- sdiScope** – economical SD/HD analysis in a 4up layout, with a limited but slightly larger range of scopes, suitable for small productions such as house of worship or wedding videographers to confirm levels and calibrate their setup.
- 4KScope** – professional level, designed for post houses and production companies working with more extensive setups. Provides most of the important tools you would see on more expensive hardware scopes, including 6 Bar Gamut, Y/C Peak, Luma Peak, Channel Plot, as well as hex/decimal per pixel display, web GUI, REST API, area select, audio routing, and more.

HDRScope – features are provided for high dynamic range and wide color gamut based workflows. MaxFALL/MaxCLL monitoring and measurement for loudness, another 11 chromaticity triangles are provided for camera raw support, and support for 8K standards is added.

NetXScope – at the NetXScope level, everything is included, plus support for ST-2110, and analysis for the compressed IP stream types RTP, UDP, SRT, and RIST.

There is a detailed version comparison at the end of this document. The Drastic website also offers a comparison document, at:

<https://www.drastic.tv/productsmenu/test-and-measurement/drastic-scopes-comparison>

1.3 System Requirements

1.3.1 Recommended Environment

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

Our scopes can run on a variety of hardware, but for real time performance on multiple scopes, here are some general guidelines:

HD 1080p60

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

4K/QHD

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

DrasticScope supports a wide variety of input 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 (Note: 17.x drivers are not currently compatible with our software)
- [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)
- [Bluefish444](#): Epoch Supernova, Epoch Neutron, KRONOS
- [DekTec](#) - SDI boards: DTA-2172, DTA-2174B, DTA-2175, DTA-2178-ASI, DTA-2178, DTA-2179, DTA-2195 (use latest drivers)
- [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

To support ST-2110 sources (supported in a NetXScope level install), specific hardware and software are required:

Either:

Mellanox NVIDIA [Bluefield-2/3](#) (requires a separate Rivermax software license under support)

Or:

Mellanox NVIDIA [Connect-X 6/7](#) (requires a separate Rivermax software license under support)

Both options require a valid Rivermax license under support.

Temporary (duration limited) Rivermax licenses for testing can be made available on request.

Details on setting up Rivermax can be found [here](#).

2 Setup

2.1 Install the Software

Install **DrasticScope** software on the 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.

Upon completion of the install, please restart the system.

2.1.1 Windows:

DrasticScope requires a 64 bit Windows platform. Windows 10 & 11 are supported as well as Windows Server 2016 or greater. To install, double-click the installer you downloaded. By default, the software will be installed in

C:\Program Files\DrasticScope\

2.1.2 macOS

DrasticScope supports both x64_64 and Apple Silicon processors, and is shipped as a standalone executable. Download and unpack the zip files, then move the DrasticScope app into your Applications directory.

2.2 ST-2110 Using NVIDIA and Rivermax

The NVIDIA Rivermax® + ConnectX-5/6/7/BlueField2/3 adapter card combination fully enables compliance with M&E specifications, such as the SMPTE 2110-22; reduces CPU utilization for video data streaming; and removes bottlenecks for the highest throughput. It can reach 82 Gbps of streamed video with a single CPU core.

Rivermax accelerated applications stream not only video, audio, and ancillary data but other data stream formats as well, enabling the Rivermax accelerations and CPU savings required for high bandwidth applications such as broadcast and production quality video streaming.

ST-2110 support is added at the NetXScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
				ST-2110

NetXScope can use NVIDIA hardware plus Rivermax software to enable ST-2110 as a source, or input board type.

IMPORTANT: Make sure you have installed NetXScope before setting up NVIDIA and Rivermax. The latest versions should be located at:

<https://www.drastic.tv/component/content/article/267-thank-you-for-downloading-drasticscope>

2.2.1 Install Rivermax

2.2.1.1 Download Mellanox NVIDIA Drivers

Download the Mellanox/NVIDIA driver

- <https://network.NVIDIA.com/products/adaptersoftware/ethernet/windows/winof-2/>
- Select "WinOF-2 Download", "Current Version" and "3.10.52010 LTS" for your OS.

WinOF-2 Download

WinOF Download

Benefits

WinOF-2 Download Center

Current VersionsArchive Versions

Version (Current)	OS Distribution	OS Distribution Version	Download/ Documentation	
3.10.52010-LTS	Windows Server	8.1	WinOF Driver: MLNX_WinOF2-3_10_52010_All_x64.exe MD5SUM: 901330912702b51cadcee7d88ec5a9eb SHA256: 9655d676f7c2f68b1ef0d4307f9c5a1eaf750faf3bdc3b726f6ccf4cddb7ca28 Size: 64.9MB Documentation: Release Notes User Manual	
24.7	Windows Client	11 22H2		
23.10-LTS		11		
		10 22H2		
		10 21H2		
		10 1809		
		10 1607		

2.2.1.2 Install via Command Line

To install for Rivermax, you must specify it on the command line:

```
./MLNX_WinOF2-3_10_52010_All_x64.exe /v"MT_RIVERMAX=1 /log log.txt"
```

2.2.1.3 Updating Firmware

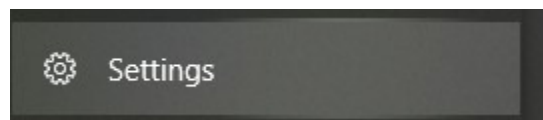
Get the correct firmware and burning tools

- <https://www.mellanox.com/support/firmware/nic>
- <https://www.mellanox.com/support/firmware/connectx6dx>
- <https://www.mellanox.com/products/adapter-software/firmware-tools>

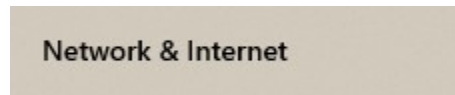
2.2.1.4 Hardware Settings

There are two important settings for the ConnectX/BlueField hardware:

Go to the system's **Settings/Config** app

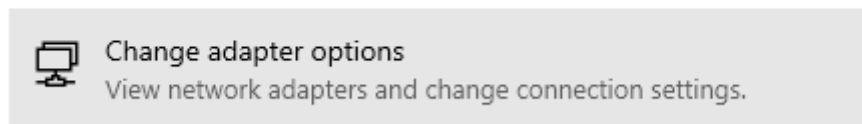


Network & Internet

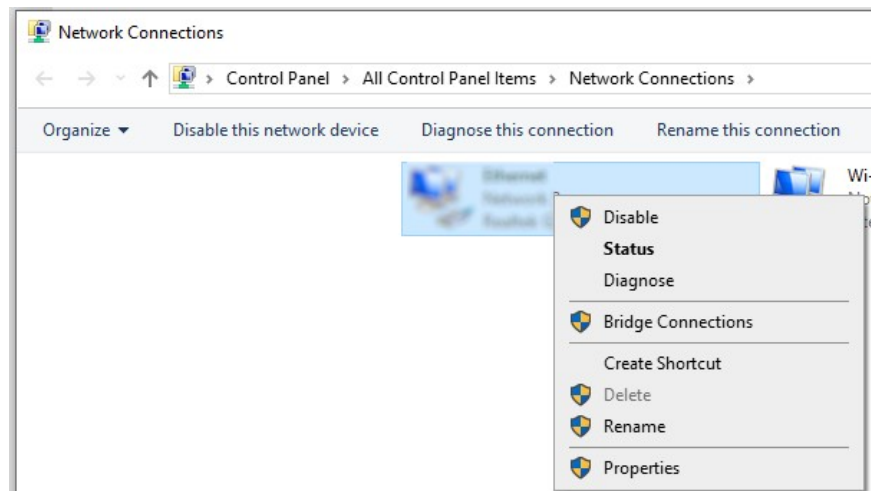


Advanced Network settings - **Change Adapter Options**

Advanced network settings



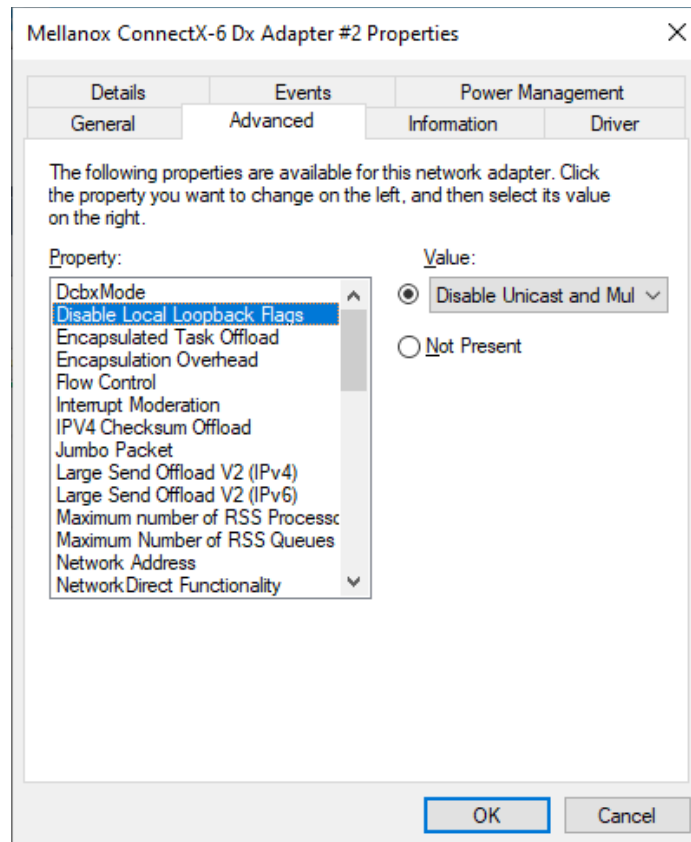
Right Click on the Mellanox adapter



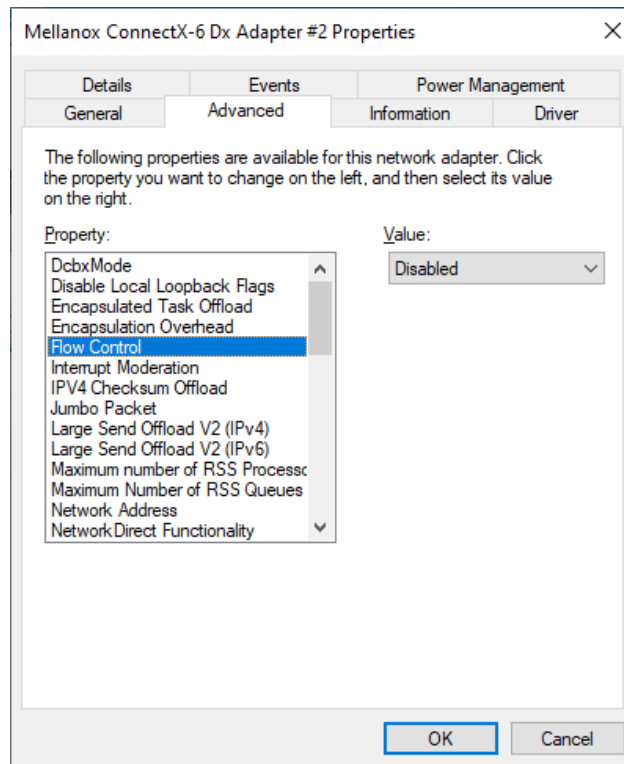
Select **Properties**, then Select **Configure**.

Under the **Advanced** tab,

Disable Local Loopback Flags – Disable Unicast and Multicast



and **Flow Control - Disabled**



2.2.1.5 BlueField Setup

We support BlueField-2/3 and Connect-X 6/7. This section describes setting up a BlueField card. Please skip this section if you do not have a BlueField card.

Follow the instructions in:

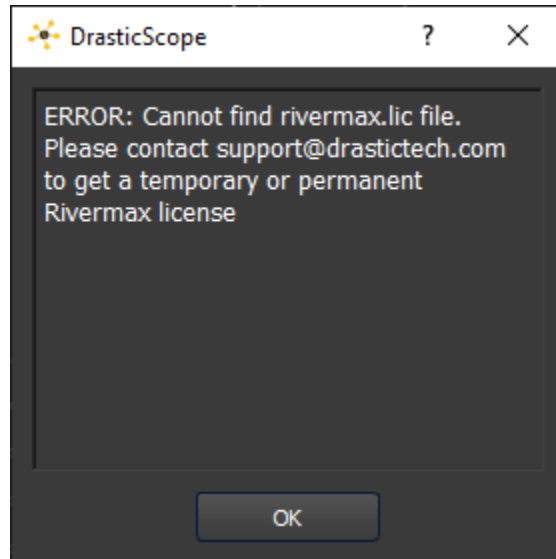
[DPU_Deployment_Guide_1_09.pdf](#)

to set up the DPU's PTP reader for hardware PTP handling. Please feel free to [contact us](#) if you need more information.

2.2.1.6 Put the Rivermax License in Place

Using DrasticScope with Rivermax requires both a Rivermax license, and a DrasticScope license.

If you try to set DrasticScope up to receive 2110 flows without a license, it will fail, and the following message will appear:

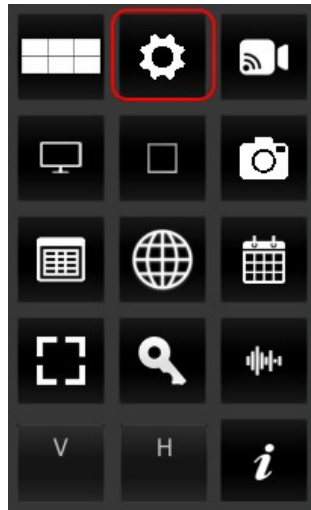


When you request a license for DrasticScope to test ST-2110, you should include a request for a Rivermax license so you can get set up and running properly.

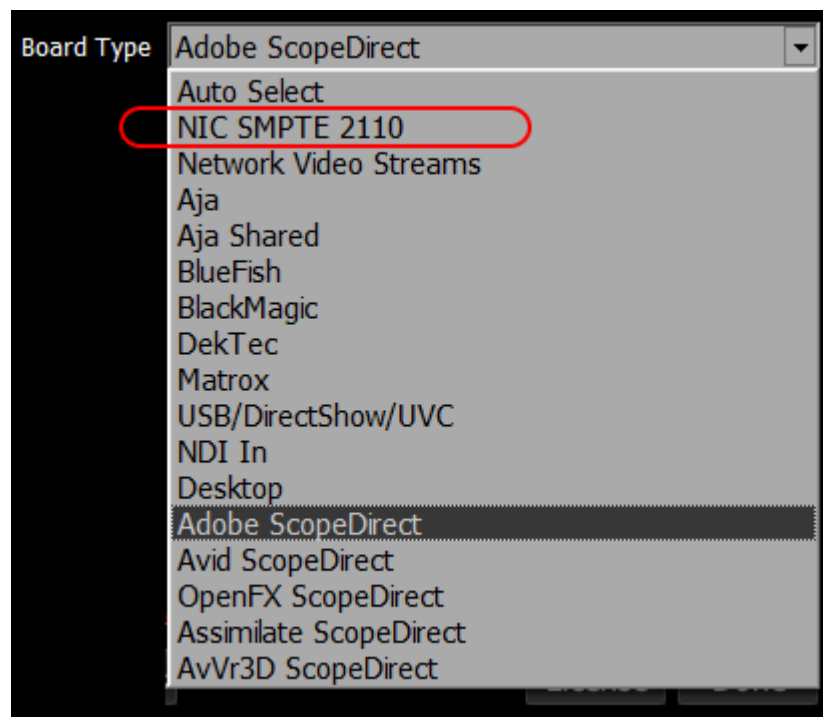
Install the Rivermax license here: C:\Program Files\DrasticScope\rivermax.lic

2.2.2 Select the ST-2110 Source

Run DrasticScope, and open the **Config** menu via the Gear icon on the GUI.

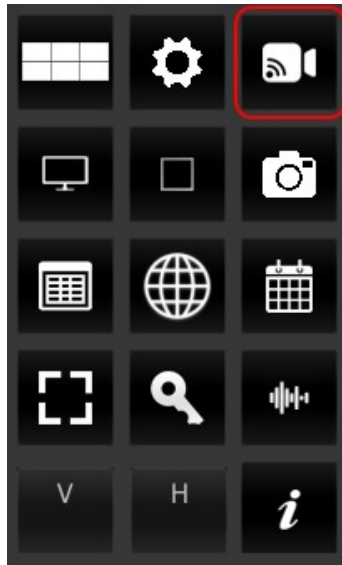


To set up Connect-X/BlueField ST-2110 streams as a source signal in NetXScope, use the board pulldown menu, and select NIC SMPTE 2110.



Confirm the system is set to the correct video standard, color format, primary, and transfer settings.

Click the **IP Setup** button (camera icon) to open the IP Video Setup window.



This opens the **IP Video Setup** dialog for ST-2110 flow setup.

Set the **Interface** to your Mellanox address, using the correct IP address for the 10/25/100G port going to the video network under interface. Select **Lock** to lock all the flows to that interface.

Channel: channel-0

☒ Check and display errors ☒ Override NMOS Settings ☐ NMOS Log to file **NMOS Config**

Type: SMPTE-2110

Video Format: 1080i 59.94fps (1920)

Audio Channels per Flow: 2 Audio Flows: 1 125

Receive: IPv4 ☐ lock all

☐ Source Address: 239 . 200 . 100 . 20 ☐ lock

☐ Source port: 50002 ☐ lock

☒ Destination Address: 239 . 200 . 100 . 20 ☐ lock

☒ Destination Port: 50002 ☐ lock

☐ Interface: 1 . 0 . 0 . 0 ☒ lock

Send / us: IPv4 125

☐ Source Address: 1 . 0 . 0 . 0 ☐ lock

☐ Source Port: 5000 ☐ lock

☒ Destination Address: 239 . 200 . 100 . 10 ☐ lock

☒ Destination Port: 5000 ☐ lock

☒ Interface: 192 . 168 . 100 . 166 ☒ lock

Clock Source: Internal

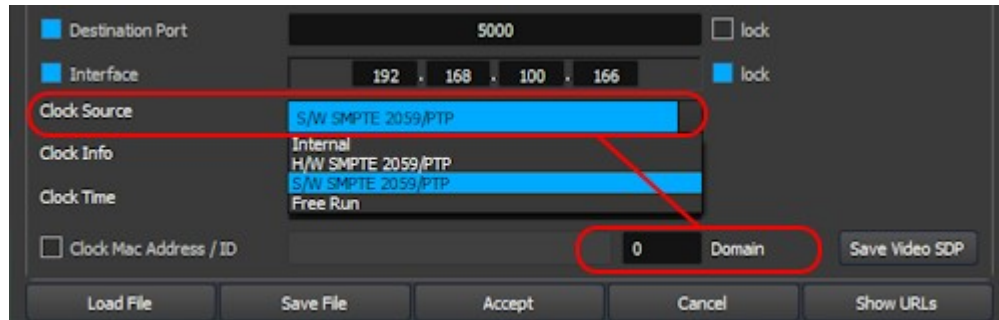
Clock Info: GMT Time

Clock Time: 2025-07-24 T12:59:40.697

☐ Clock Mac Address / ID: 0 Domain **Save Video SDP**

Load File **Save File** **Accept** **Cancel** **Show URLs**

Change the **Clock Source** to **S/W SMPTE 2059/PTP** for clock source and the correct **Domain** for the clock (0,1,127 are normal, but can be any number between 0..255).



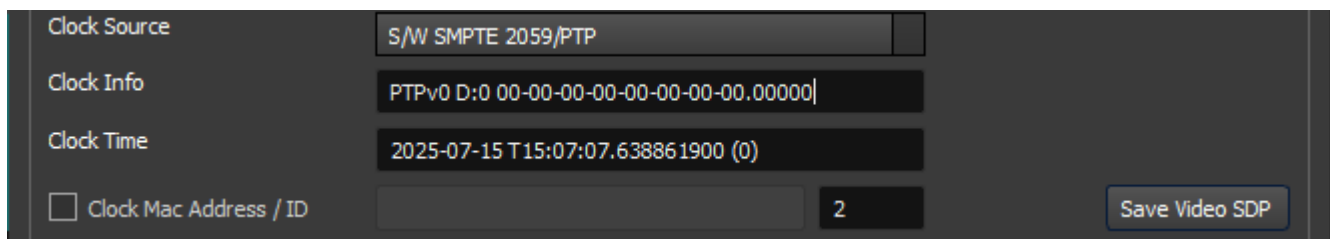
2.2.2.1 Click Accept to Set the Source

Click **Accept** to set the source. **IP Video Setup** will close.

2.2.2.2 Confirm Grandmaster

Open the **IP Video Setup** dialog again, to confirm that it has a valid Grandmaster.

Here is an example of an incorrect setup. The **Clock Info** details are zeroes, and the Clock Time is using simple computer time – note the zero at the end. Since most Grandmaster domains are 0, 1, or 127, it is easy to produce an incorrect setting with a different number here.



Here is an example of a correct setup. The Clock Info details contain PTP version details, and other details, plus the clock is using epoch time.

Clock Source	S/W SMPTE 2059/PTP
Clock Info	PTPv2 D: 127 00-20-FC-FF-FE-35-CC-0C.00001
Clock Time	2025-07-15 T15:07:49.114021837 (83955)
<input type="checkbox"/> Clock Mac Address / ID	127

Save Video SDP

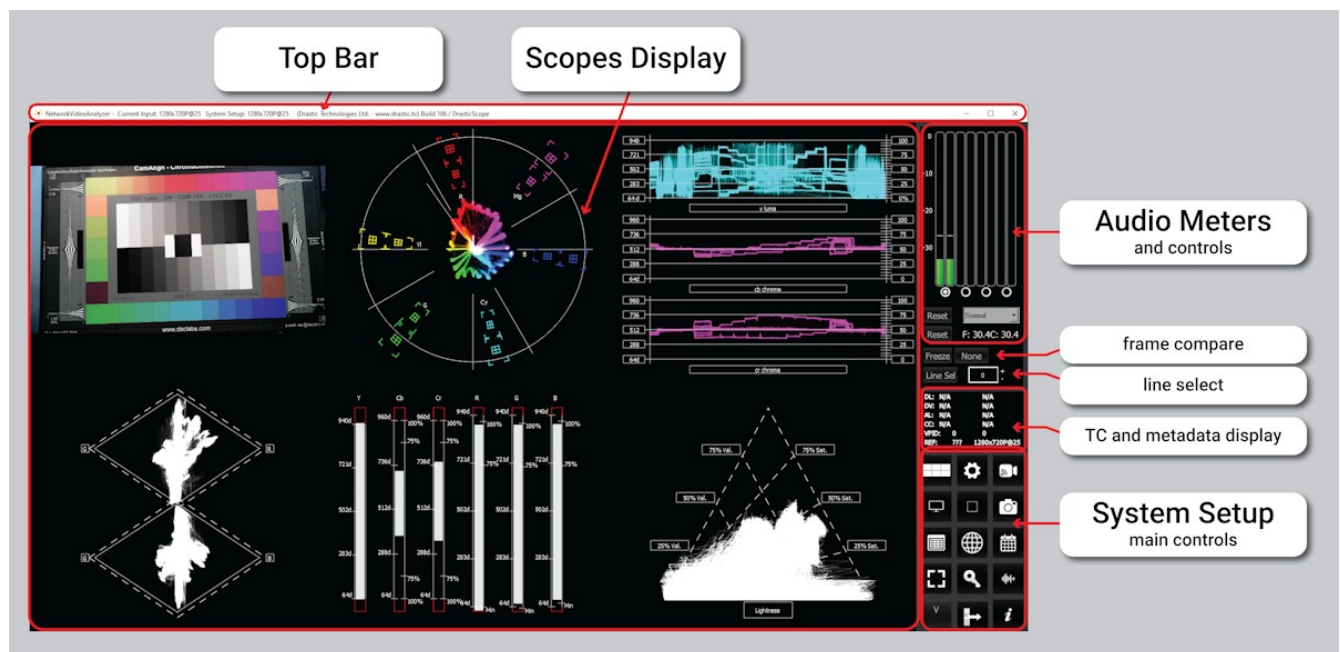
Once the Grandmaster is detected, you can then set up the 2110 flows manually, or you can run IP Video Setup to use NMOS. Either load the setting from an INI, or manually set the Video, Audio and ANC settings to the correct multicast and ports, or use NMOS to configure.

Once the 2110 flows have been set up, click **Accept** to set and check the signal.

3 Reference

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

3.1 Main Interface Overview



Top Bar – displays the following details:

- the icon and product name for the level of DrasticScope that has been licensed
- the Current Input details (frame size/scan type/frame rate)
- the System Setup details (frame size/scan type/frame rate)
- a gratuitous mention of Drastic Technologies Ltd. Along with a link to our excellent website
- the Build number
- the Instance of DrasticScope: when multiple instances of DrasticScope are running on the same system, they will be numbered. The first instance will be labeled DrasticScope, the second will be labeled DrasticScope1, and so on.

NetworkVideoAnalyzer - Current Input: 1280x720P@25 System Setup: 1280x720P@25 (Drastic Technologies Ltd. - www.drastic.tv) Build 104 / DrasticScope

Scopes Display – 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. Depending on the version licensed, DrasticScope features up to four different layouts: (1up) single, (2up) side by side, (4up) four quadrants, and (6up) six up (three across, two down). These layouts can be selected in the Scope Config window.

Audio Meters and Controls – audio meters are provided for up to 16 channels of audio, along with pair selector buttons.

Frame Compare – offers controls to freeze a field or frame of video and compare it to the current signal.

Line Select – view only a single line of the signal in the scopes. Especially useful for multi-pattern analysis.

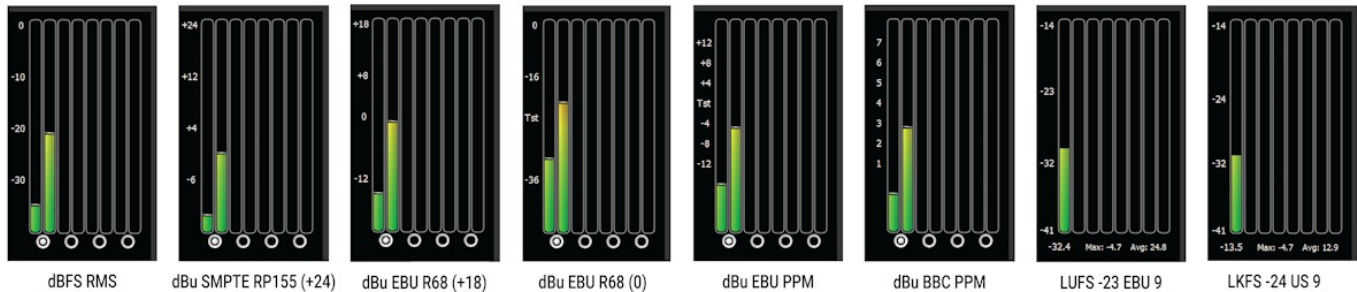
Time Code and Metadata Display – shows time code source and user bits, closed caption presence and type, VPID, video standard, and reference input details.

System Setup (main controls) – provides controls and displays for most of the available features.

Note: controls that have not been licensed will be grayed out, and clicking on them will provide a mini preview of the unlicensed feature. The grayed out controls may be removed by clicking the **Hide Unavailable Controls** option in the **Config** dialog.

The following chapters document a fully licensed version, equivalent to the NetXScope level. At this level, all of the features are supported so there are no grayed out controls or displays, and the **Hide Unavailable Controls** option is not provided.

3.1.1 Audio Controls and Displays



Audio display and pair selectors – At the top of the Controls section there are a set of audio meters. Licensing provides the following audio meters:

Free	sdiScope	4KScope	HDRScope	NetXScope
2 audio meters, dBFS				
	Up to 8 audio meters dBFS			
	Audio pairs selector			
	Up to 16 meters			
	dBu EBU R68 (+18), dBu EBU R68 (0), dBu EBU PPM, dBu BBC PPM, LUFS -23 EBU 9, LKFS -24 US 9			

The buttons just below the dBFS and dBu meters allow the user to select between audio pairs for monitoring. These selectors are removed when set to one of the loudness scales. Various types of audio meter scales may be selected using the **Audio Scale** pulldown menu in the **Configuration Settings** window.

In the above spread, all 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 R68
- dBu EBU R68 (0) - decibel units, EBU R68
- dBu EBU PPM - decibel units, EBU peak programme meter
- dBu BBC PPM - decibel units, BBC peak programme meter
- LUFS -23 EBU 9 - Loudness Units relative to full scale, -23 EBU 9
- LKFS -24 US 9 - Loudness, K-weighted, relative to full scale, -24 US 9

3.1.1.1 Hold Peak/RMS

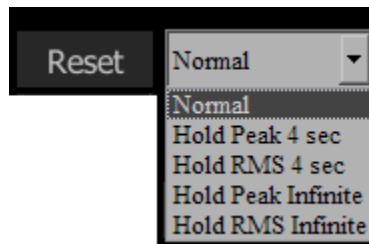
Hold Peak/RMS is added at the sdiScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
	Hold Peak/RMS			

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. Hold Peak/RMS is not supported in the Free version. This menu becomes available when the audio scale is set to one of the dBFS or dBu settings.

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
- **Hold RMS 4 sec** – hold the RMS (the main audio level, green near the bottom and red at the top if the signal is too high) for 4 seconds
- **Hold Peak Infinite** – hold the Peak at its highest level and leave it there
- **Hold RMS Infinite** – hold the RMS at its highest level and leave it there



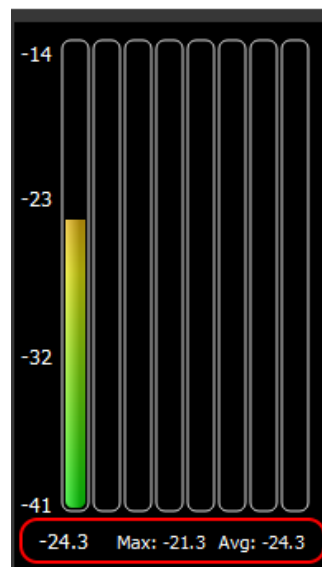
The Peak/RMS values can be held for either 4 seconds, or frozen (Infinite Hold), or not held. The **Reset** button lets you clear any Peak/RMS values to refresh the display for a new measurement.

3.1.1.2 Loudness Settings

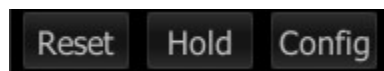
Loudness support is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Loudness		

With either of the loudness scales set, the channel selector buttons are replaced with loudness values:



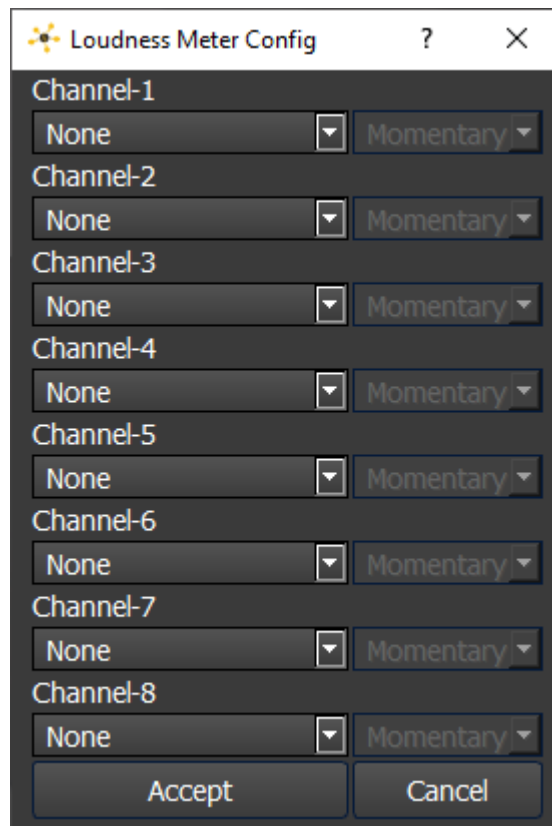
Below that, the **Hold Peak/RMS** pulldown menu is replaced with a **Hold/Cont.** Button, and a **Config** button for loudness configuration.



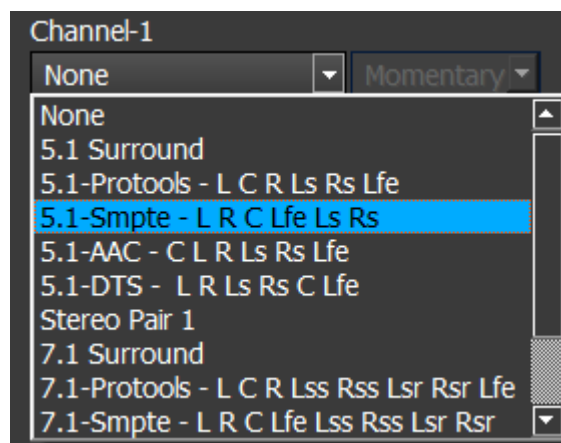
The **Reset** button now resets loudness levels, so you don't have to start the whole program again after adjusting the levels.

The **Hold/Cont.** Button toggles between **Hold** (hold the current peak levels) and **Cont.** (continue to process signal levels).

The **Config** button opens the **Loudness Meter Config** dialog.



In this dialog there are a number of presets for monitoring differing audio input types.



Presently these include:

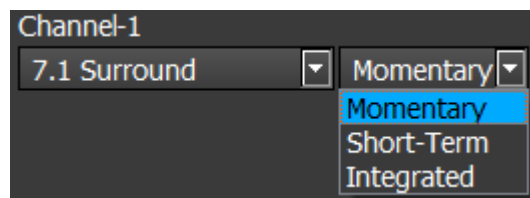
- None
- 5.1 Surround
- 5.1-Protocols - L C R Ls Rs Lfe

- 5.1 Smpte - L R C Lfe Ls Rs
- 5.1-AAC - C L R Ls Rs Lfe
- 5.1-DTS - L R Ls Rs C Lfe
- Stereo Pair 1
- 7.1 Surround
- 7.1-Protocols - L C R Lss Rss Lsr Rsr Lfe
- 7.1-Smpte - L R C Lfe Lss Rss Lsr Rsr
- 7.1-EXT - L R C Lfe Lss Rss Lsr Rsr
- 7.1-Dolby - L C R Ls Rs Lfes Bsl Bsr
- Stereo Pair 2

The descriptions for the channels (abbreviated above) are as follows:

- L = Left
- R = Right
- C = Center
- Ls = Left Surround
- Rs = Right Surround
- Lfe = Low Frequency Effects
- Lss = Left Side Surround
- Rss = Right Side Surround
- Lsr = Left Rear Surround
- Rsr = Right Rear Surround
- Lfes = Low Frequency Effects
- Bsl = Back Surround Left
- Bsr = Back Surround Right

Each channel can be set up separately. Once an input type has been selected, the user can select between measurement options.



These include:

- **Momentary Loudness** – measures the loudness of the past 400 Milliseconds
- **Short-Term Loudness** – measures the loudness of the past 3 Seconds
- **Integrated Loudness** – (Also called Programme Loudness) indicates how loud the

programme is on average, and is measured over entire duration of material

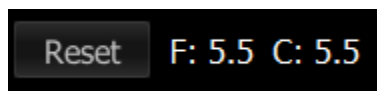
At the bottom of the Loudness Meter Config dialog, there is an **Accept** button to enable any changes you have made, and there is a **Cancel** button to exit the dialog without making any changes to the settings.

3.1.2 MaxFALL/MaxCLL

MaxFALL/MaxCLL support is added at the HDRScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
			MaxFALL/MaxCLL	

MaxFALL/MaxCLL section – below the Peak/RMS is the MaxFALL/MaxCLL section.



When working in HDR, MaxFALL and MaxCLL values become available. MaxFALL/MaxCLL is metadata required for HDR10 content. These features are available in HDRScope and NetXScope.

MaxFALL (Maximum Frame Average Light Level) indicates the maximum value of the frame average light level (in cd/m2 or nits) of the entire playback sequence. MaxFALL is calculated by averaging the decoded luminance values of all the pixels within a frame. MaxFALL is usually much lower than MaxCLL.

MaxCLL (Maximum Content Light Level) indicates the maximum light level of any single pixel (in cd/m2 or nits) of the entire playback sequence. MaxCLL is usually measured off the final delivered content after mastering.

The **F** field displays the MaxFALL.

The **C** field displays the MaxCLL.

A **Reset** button clears the measurement to view a new signal, or refresh the display for another look at the same signal.

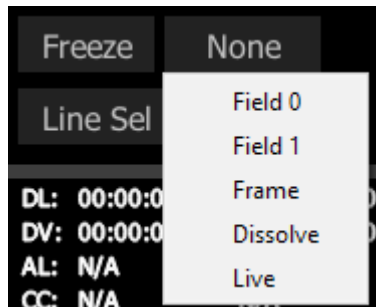
3.1.3 Freeze Field/Frame



Freeze Field/Frame functions are added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Freeze Field/Frame		

Freeze section – the Freeze button saves an image of the current frame of video for closer inspection or comparison. Freeze Field/Frame is added at the 4KScope level. 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)

3.1.4 Line Select



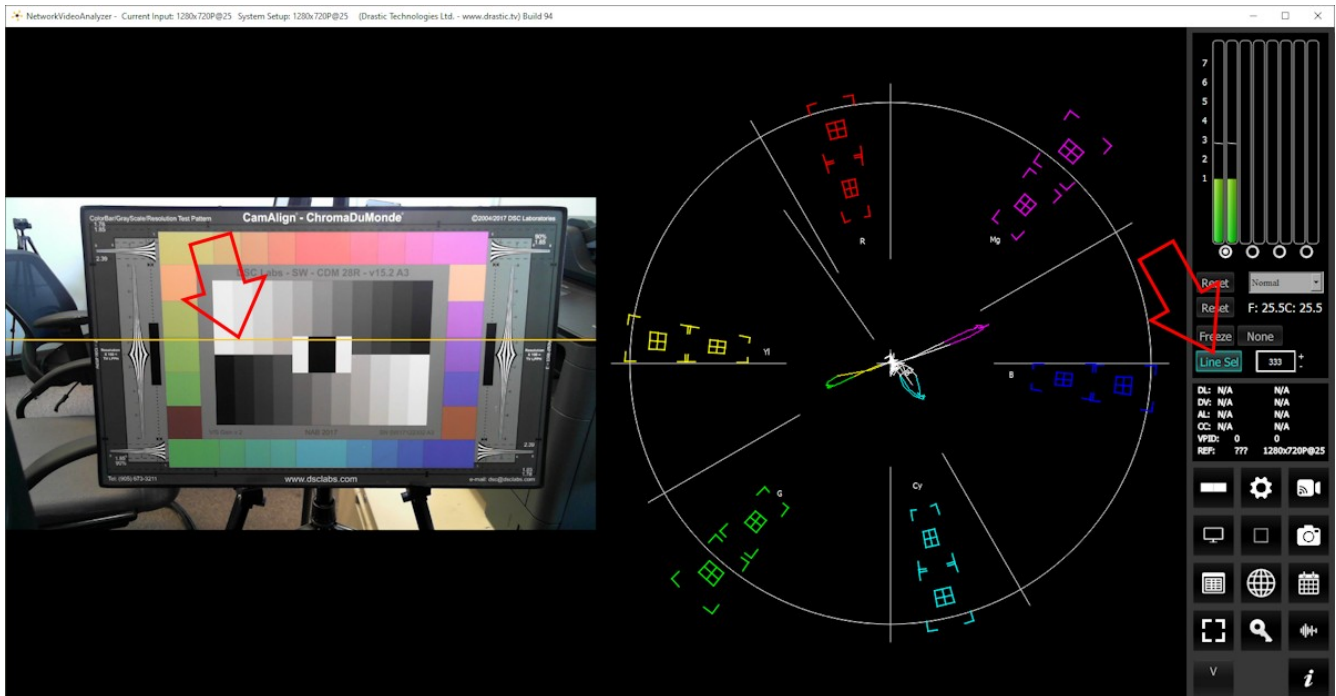
Line select is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		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. Line Select is added at the 4KScope level. This line will be highlighted on the in app video display.

Note: In interlaced 1080, every second line is the next field, so the lines go 0-539 (top to bottom) and 540-1079 (top to bottom again) in picture only mode. If we are displaying vertical blank, then you will see more lines. In either case, the first line for the active picture, first

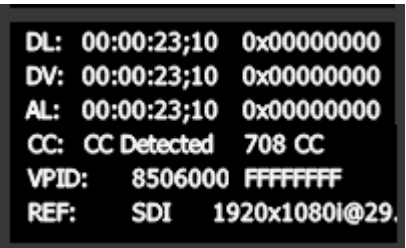
field, is 21. The first line for active picture, second field is 584. The total possible lines for a frame are 1124.



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. You can enter a line number in the Line field via keyboard and press the **Line Sel** button to select that line.

In the above example line 333 has been selected. It is highlighted in yellow in the Picture view, and its control is lit, indicating it is in use. The vectorscope only 'sees' the selected line, so it gets some violet and some green, along with a gray 10 step and a smattering of blue from the chair. It ignores all the other colors present in the signal.

3.1.5 Status Display



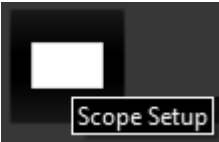
Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
DL (LTC) and user bits, DV (VITC) and user bits, AL (Analog) and user bits				
		Closed Captions detection and type, VPID value and user bits, Ref input, Vid standard		

Status Display – the Status display shows details (where present) for:

- RP-188 L SDI inputs (LTC) and user bits
- RP-188 V SDI inputs (VITC) and user bits
- Analog SMPTE time code input and user bits
- Closed Captions presence and type
- VPID (Video Payload Identifier), includes the ancillary data flag, data identifier, secondary data identifier, data count, user bits, and checksum.
- Reference input presence/type
- Video Standard

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.

The **Scope Setup** button is also a display, in that it will tell you at a glance how many scopes have been set up. The above example shows a two scopes layout.

3.2.1 Layout Options

When you press the Setup button the Scopes config window opens up. At the top of the window there are four layout options. Select the layout that suits your workflow:



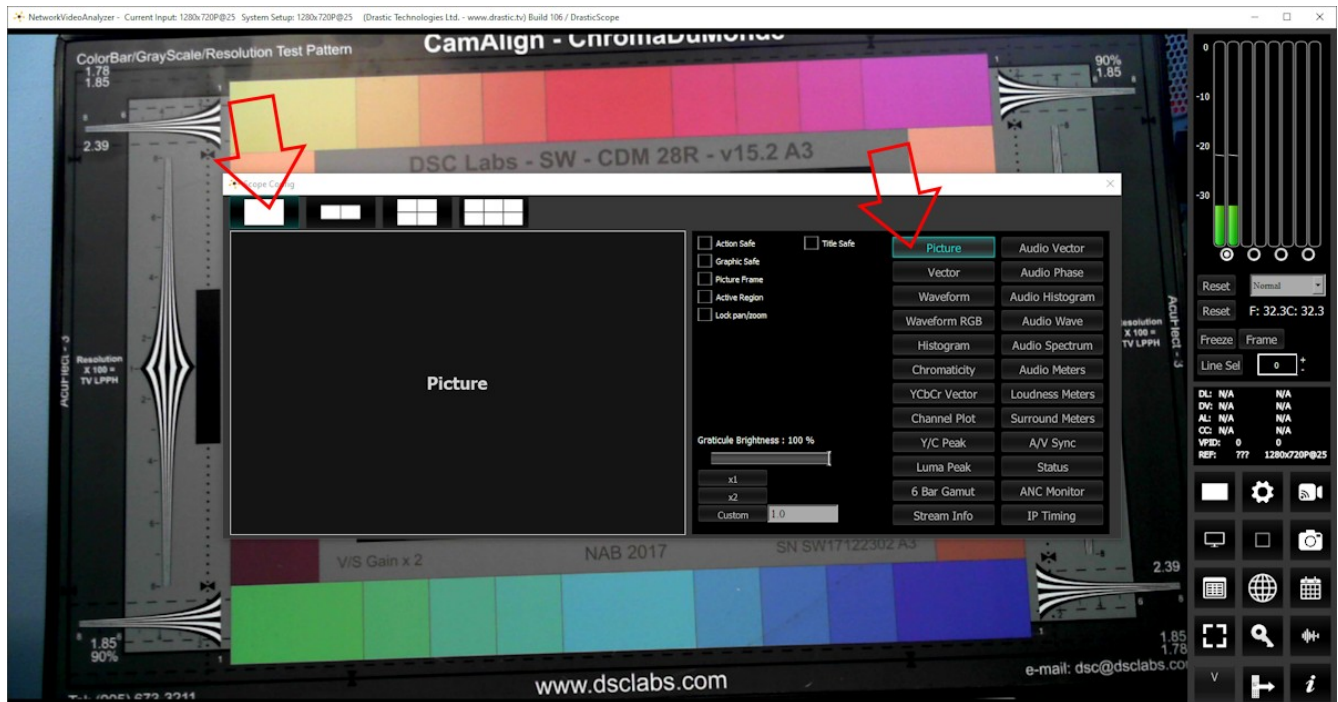
From left to right, the choices are: 1 scope (single), 2 scopes (side by side), 4 scopes (2 x 2 grid), or 6 scopes (two rows of three scopes).

Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
1up and 2up layout				
	4up layout			
		6up layout		

3.2.1.1 Single Scope Layout

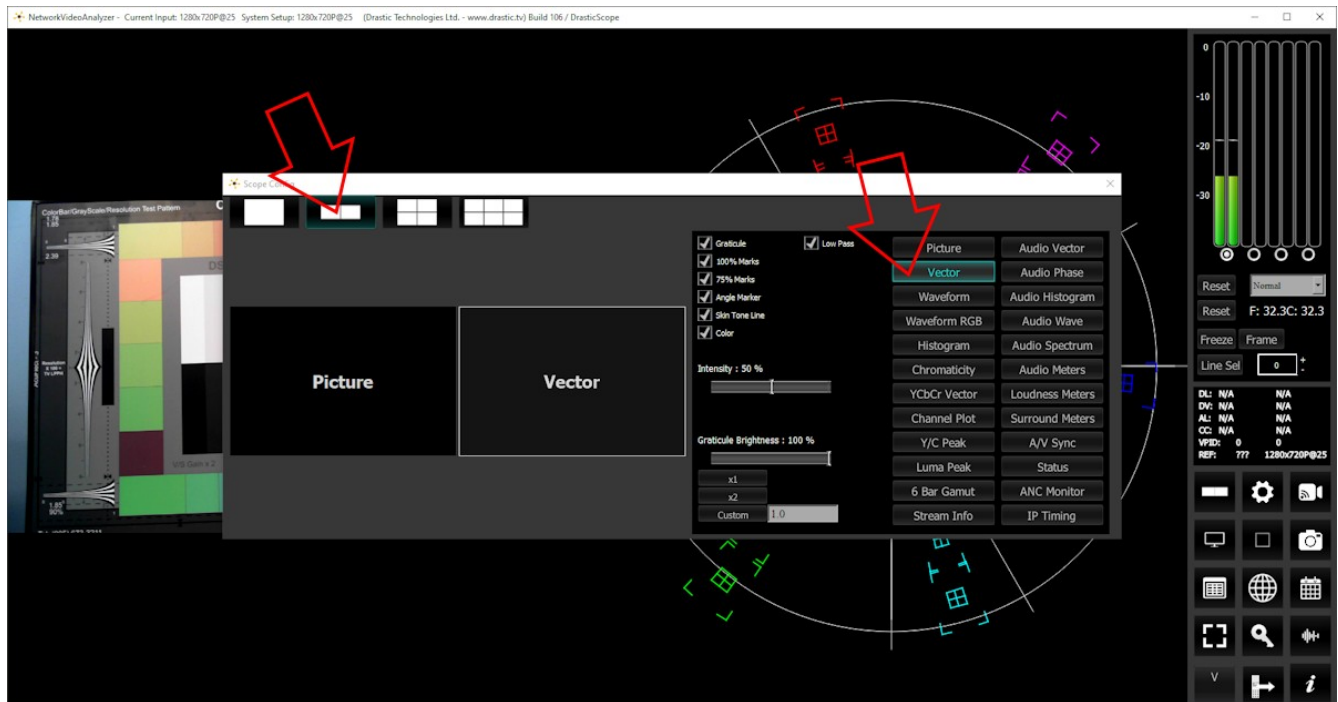
A single scope layout has been selected. The single (1up) layout is supported in all versions.



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

3.2.1.2 Two Scopes Layout

The two scopes layout has been selected. The 2up layout is supported in all versions.

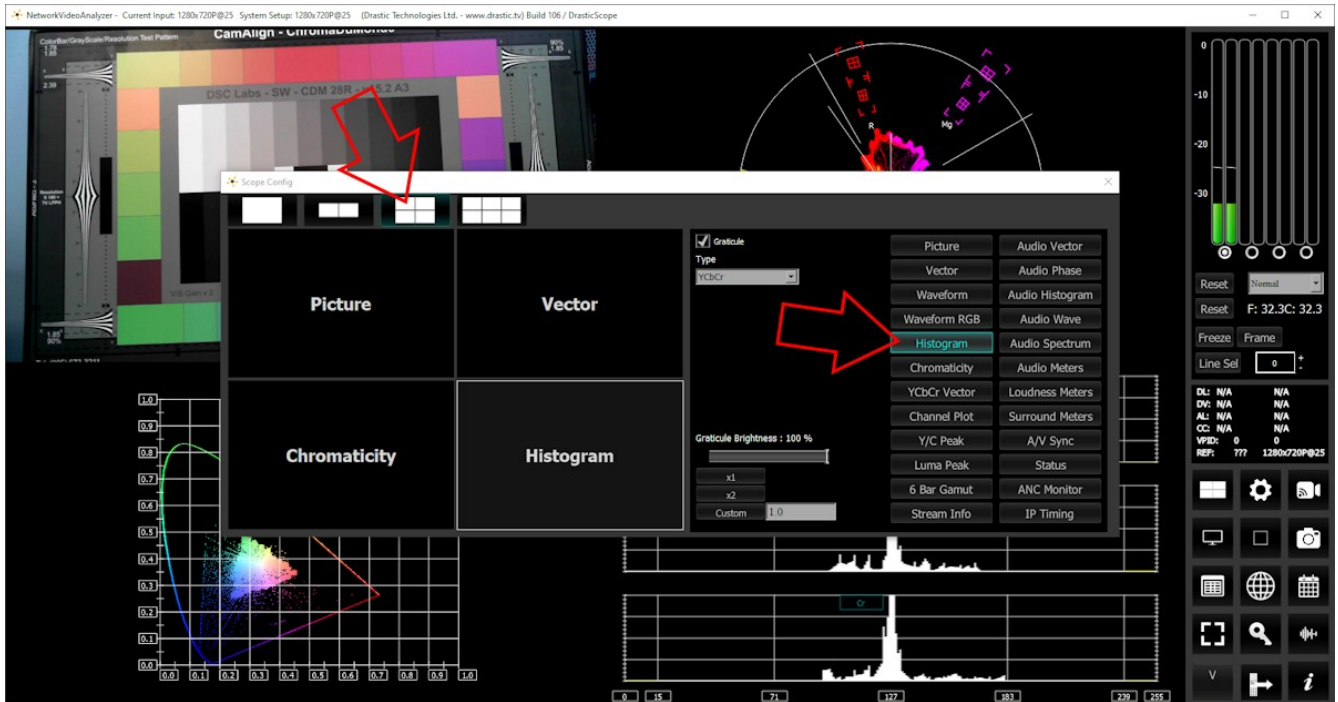


The arrow on the left shows the button used to select the two scopes layout. The example shown features the picture view and the vectorscope. The arrow on the right shows the button used to select the vectorscope.

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. This layout is provided at the sdiScope level and above.

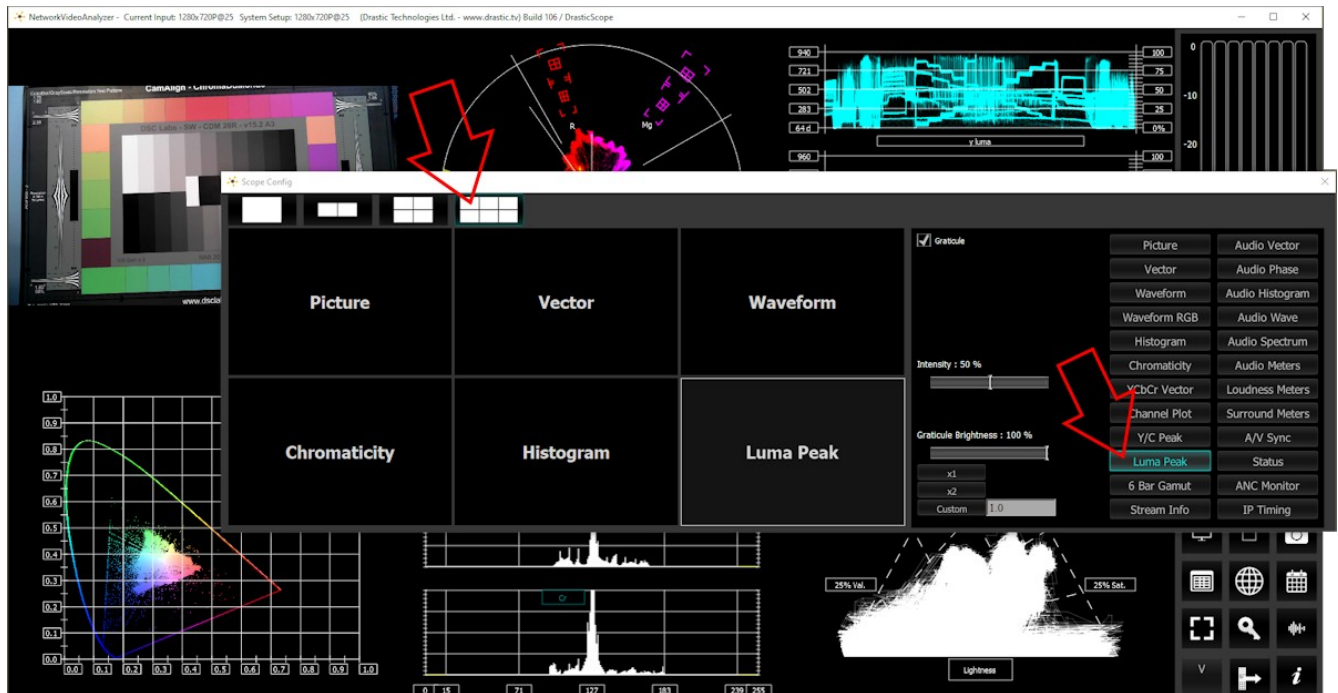


The arrow on the left shows the button used to select the four scopes layout. The example shown features the picture view, the vectorscope, the chromaticity, and the histogram. The arrow on the right shows the button being used to select the histogram.

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. This layout is added at the 4KScope level.



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 Luma Peak. The arrow on the right shows the button being used to select the Luma Peak.

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:



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
Picture				
	Action Safe, Title Safe, Graphic Safe, Picture Frame, Active Region graticules, and Lock pan/zoom			

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.

Lock pan/zoom checkbox – check this box to prevent the display from being panned or zoomed. This feature keeps an unintended mouse movement from altering the sizing or position of any of the traces, or the picture view.

Graticule Brightness slider – The Picture View has no graticule, so this control has no effect here.

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

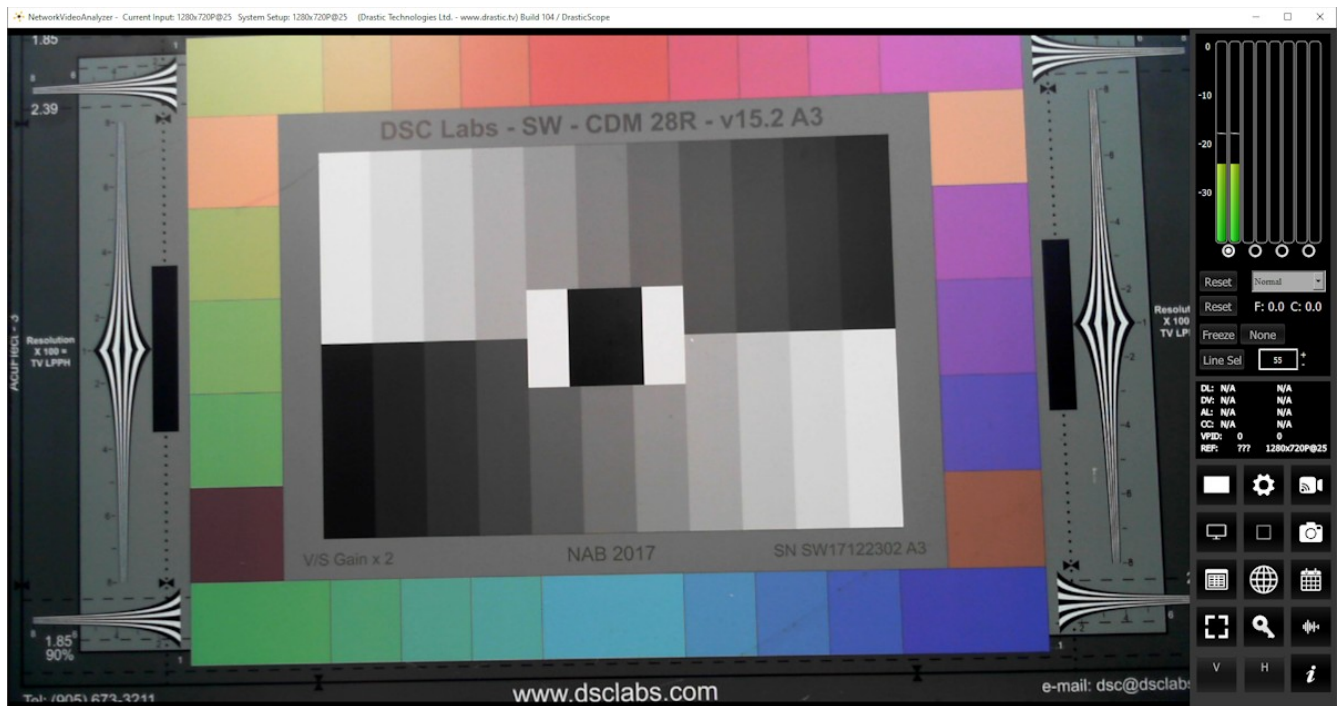
x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display.

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.

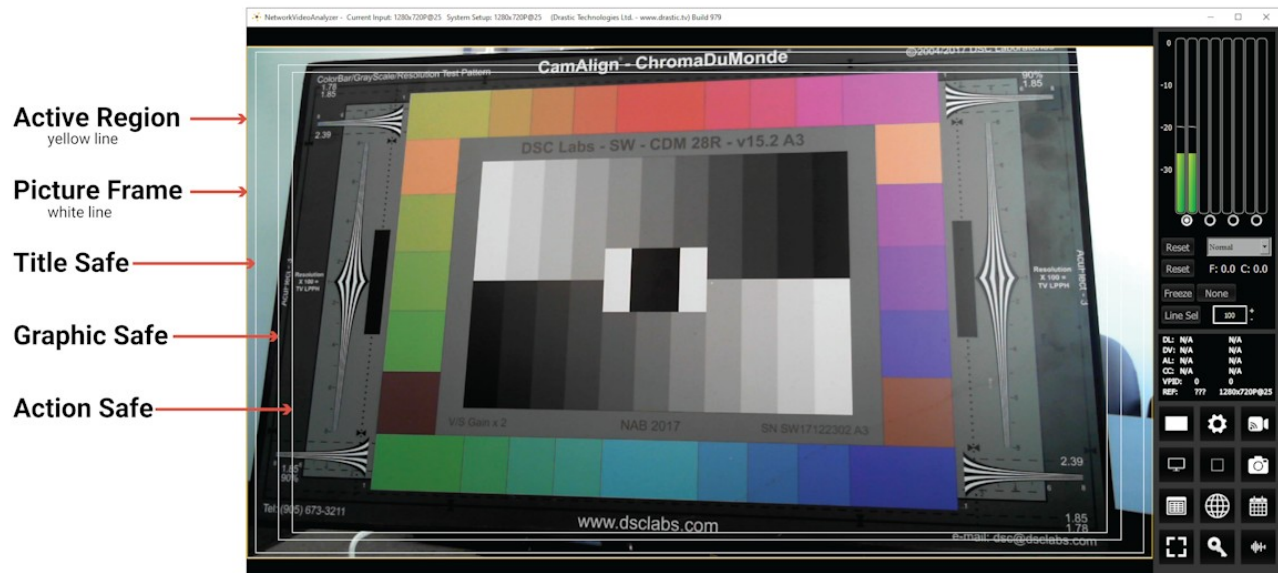
Pressing the x in the upper right corner will close the Scope Config window.

Here is the **Picture** view.



The **Picture** view shows the video signal, to confirm the source is correct and to display time code location.

3.2.2.1 Graticules



The Graticules include:

Active Region – the region of active video signal

Picture Frame – the picture frame of the video signal

Title Safe – in theaters, titles placed within the title safe region will avoid being cut off by the limitations of the viewing area

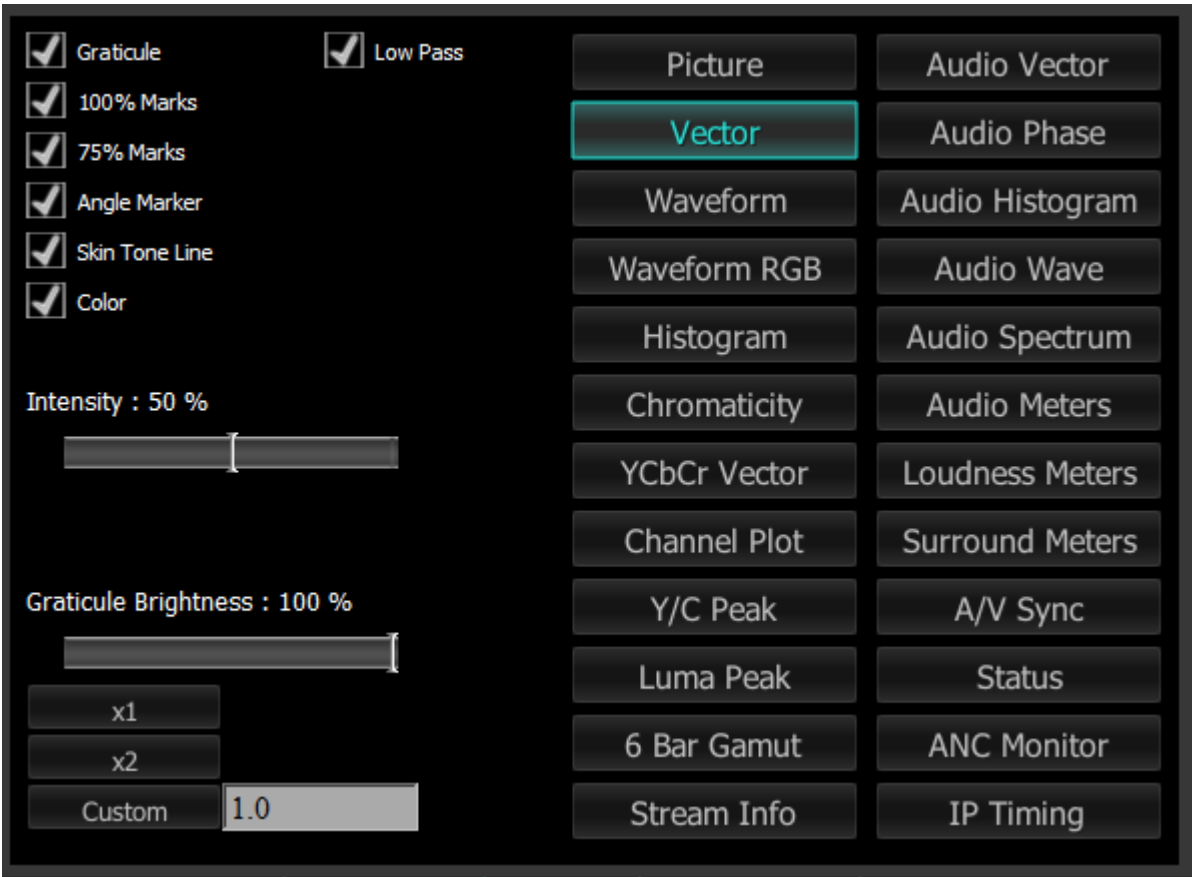
Graphic Safe – for broadcast, ensure any bugs/overlays/station ID graphics are within the viewing area and not clipped by any up- or down-conversion.

Action Safe – for all screens, scenes within the action safe area can always be viewed on any screen.

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:



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
Vectorscope, Graticule, 100%, 75%, Angle Marker, Intensity				
	Color, Low Pass			

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

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

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

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

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

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

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

Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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

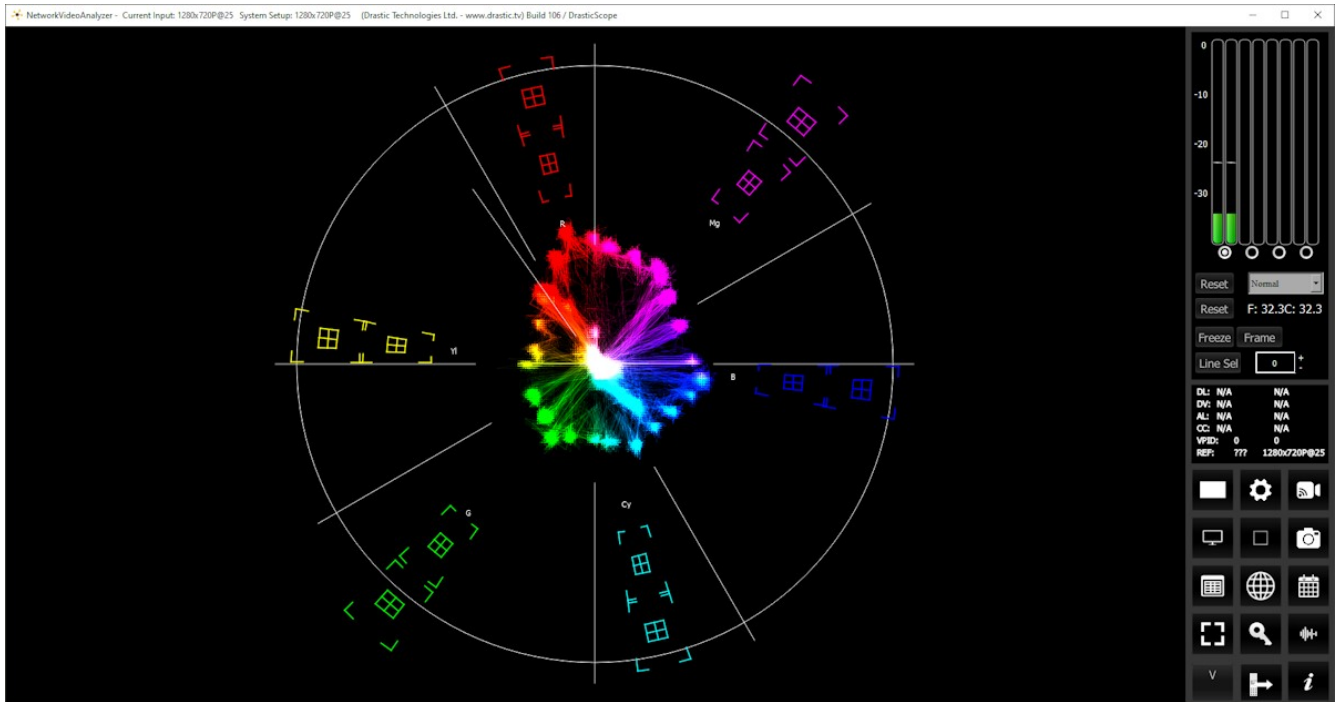
x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

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.

3.2.3.2 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 line provides a general guideline for skin tone area hue adjustment, as well as standard diagonals.

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:



Feature support by version:

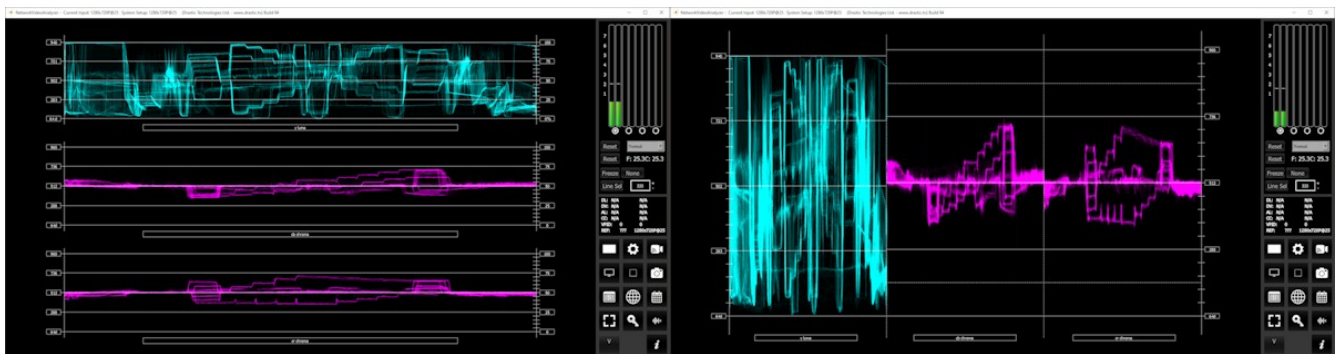
Free	sdiScope	4KScope	HDRScope	NetXScope
YCbCr waveform stacked/parade, Intensity, Scope White, Scale Type				
		Only Luma, Overlay, High/Low		
			Max HDR	

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.

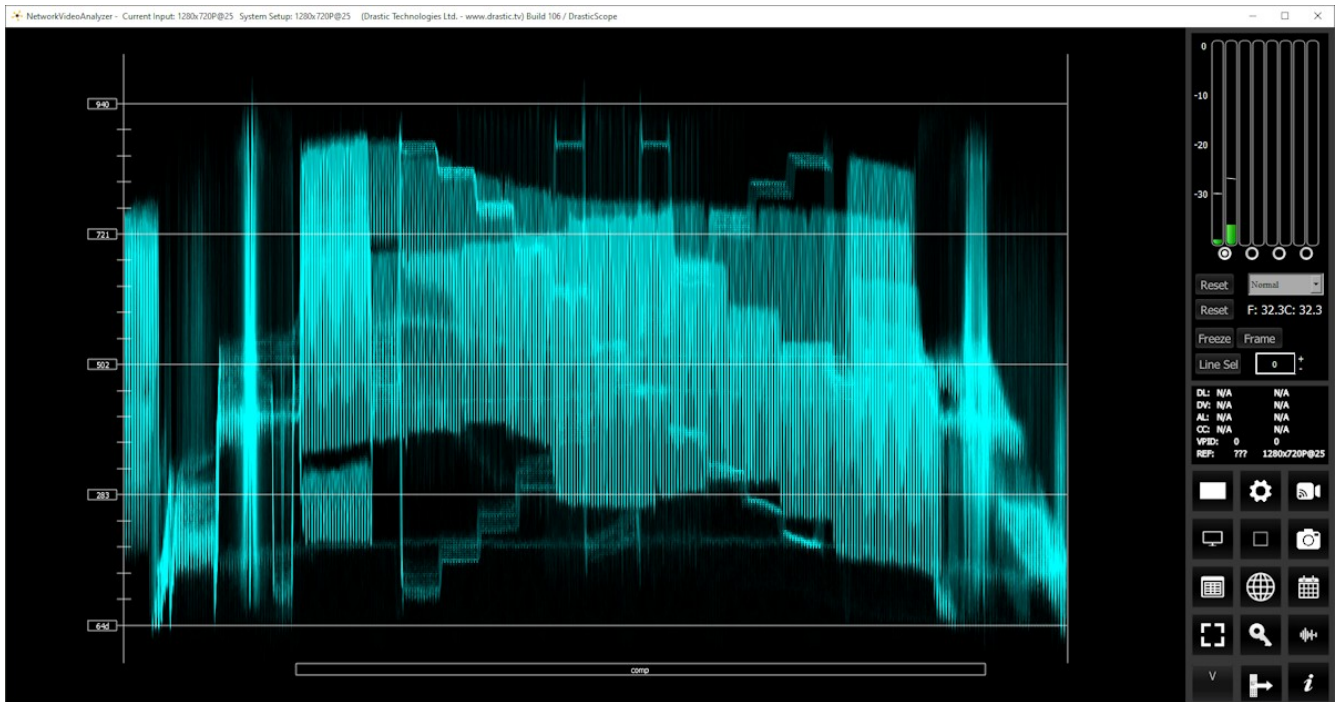
3.2.4.1.1 Show Parade

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



3.2.4.1.2 Overlay

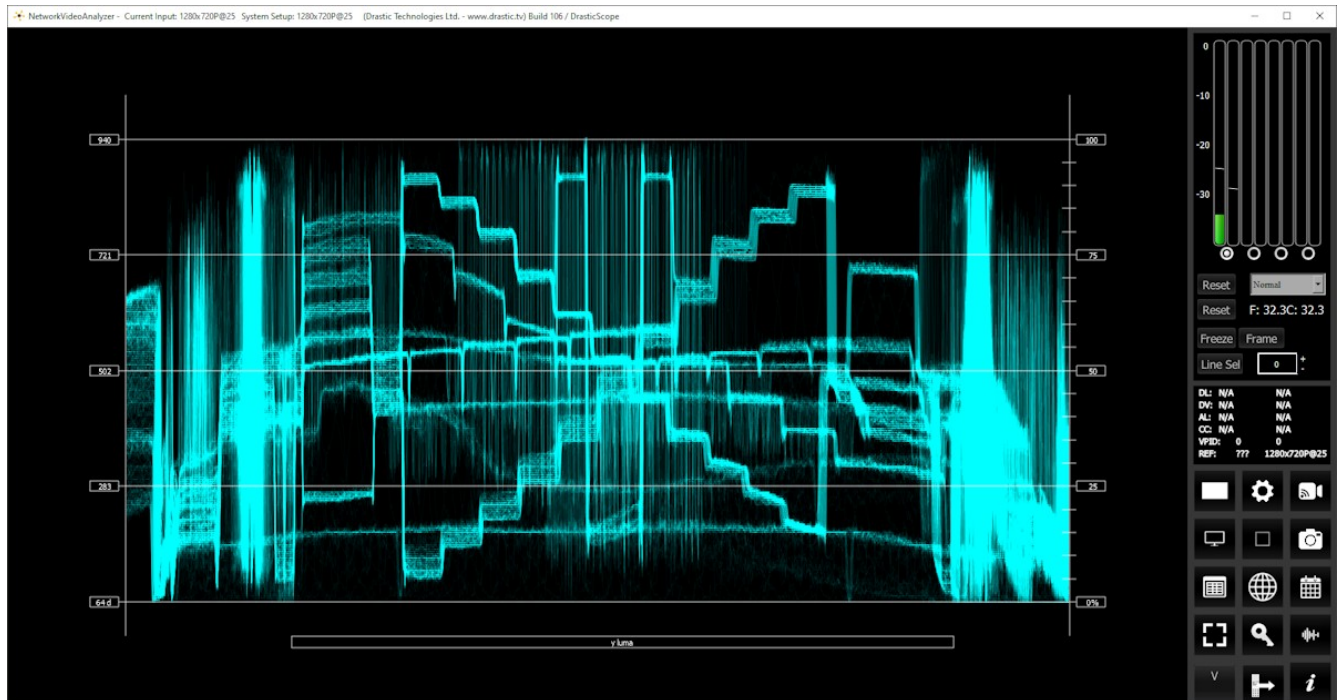
Overlay checkbox – when selected, overlays the Y, Cb, and Cr channels on one waveform.



Composite Waveform YCbCr

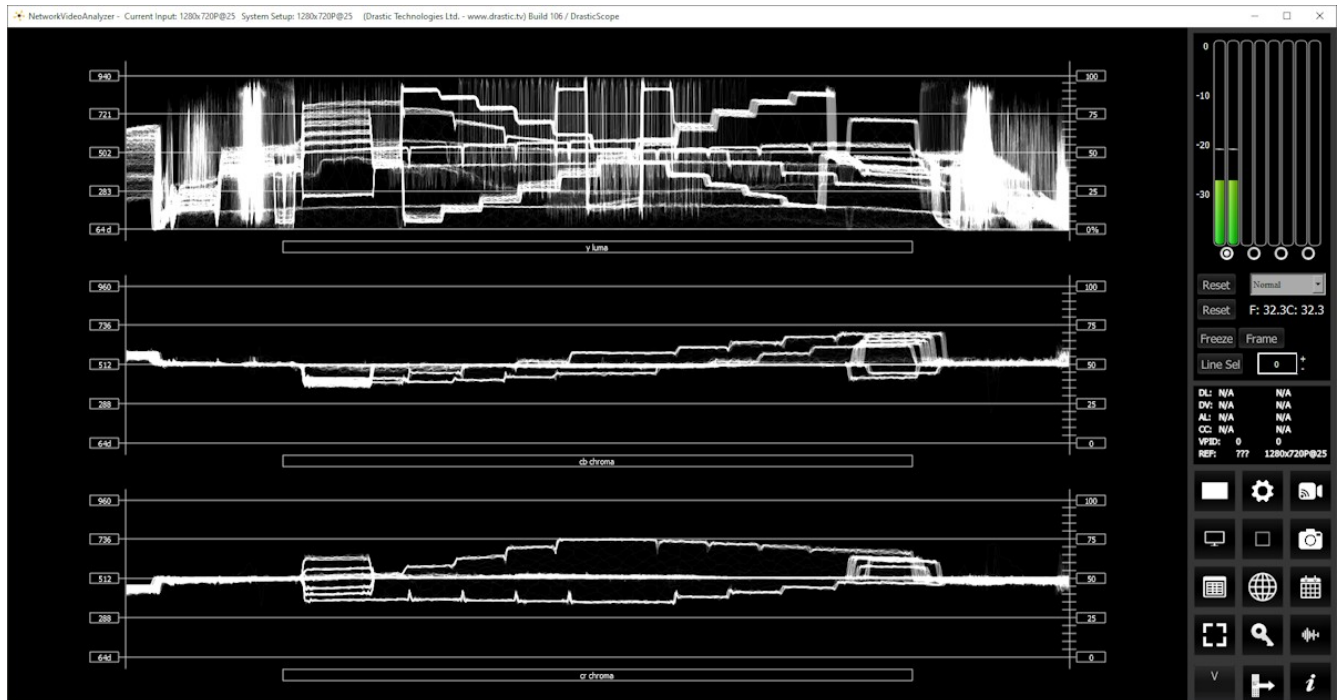
3.2.4.1.3 Only Luma

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



3.2.4.1.4 Scope White

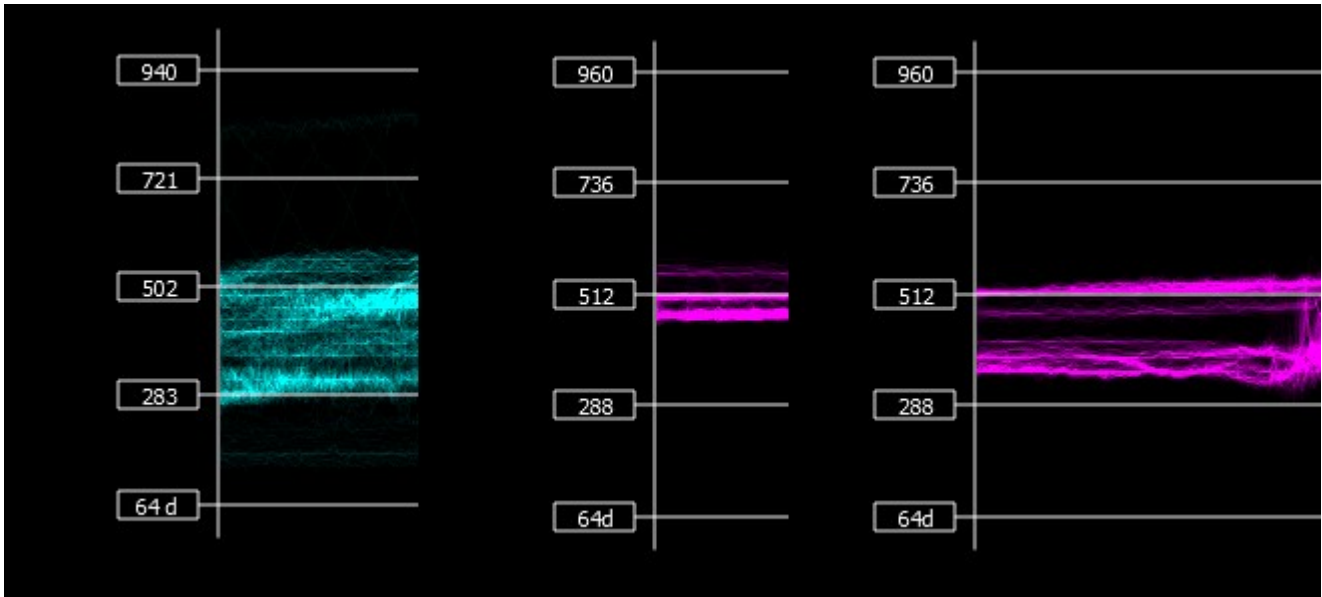
Scope White checkbox – turns the display white.



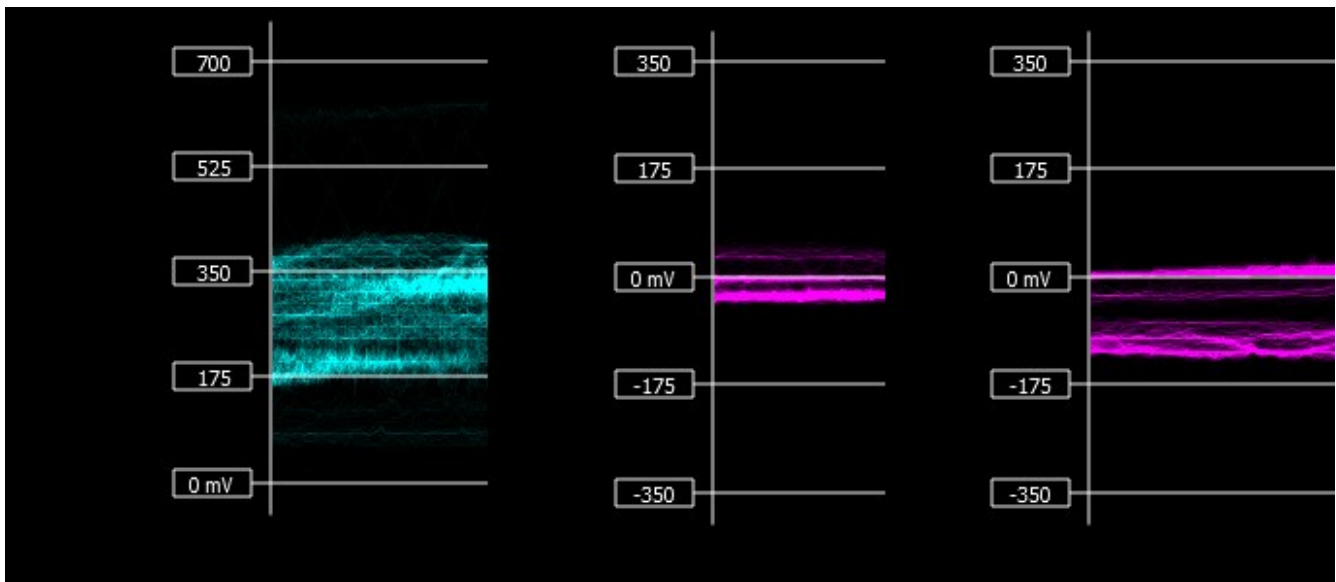
3.2.4.1.5 Scale Type

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

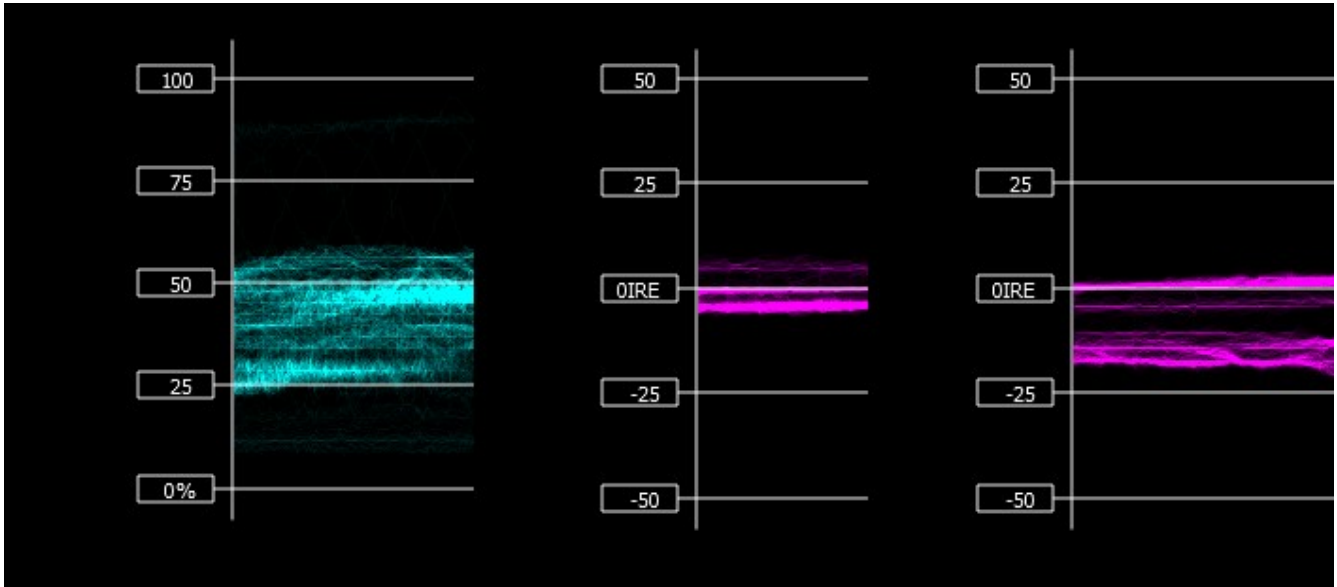
- **Digital** - the actual 0..255, 0..1023, or 0..4095 numeric values of the signal. In parade mode, the Cb and Cr graticule are not displayed.



- **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.



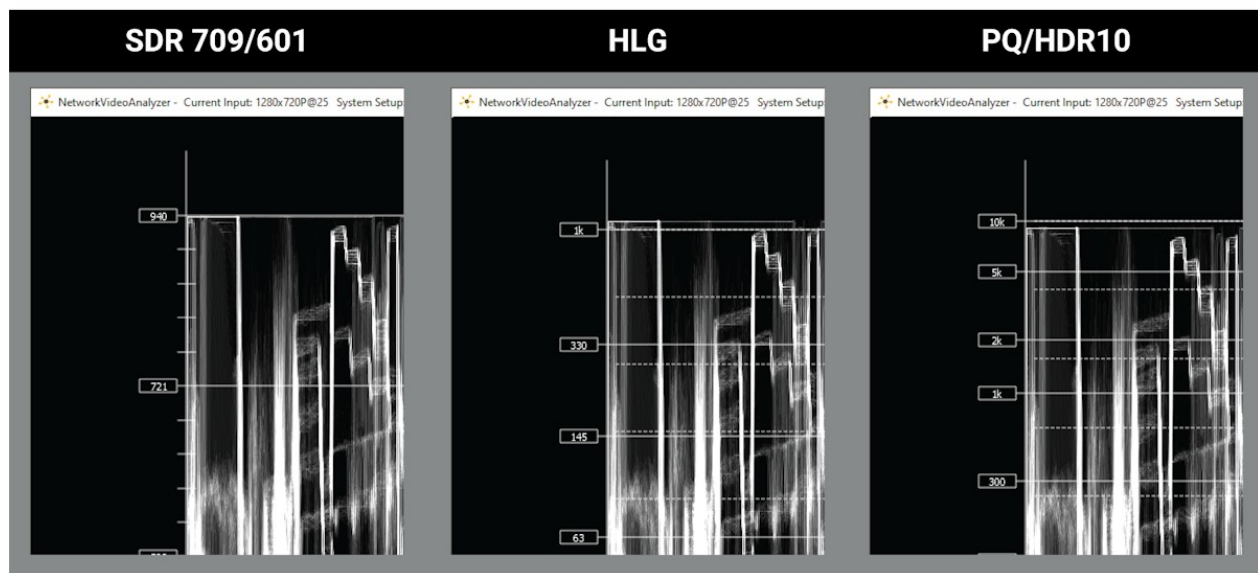
3.2.4.1.6 Max HDR

Max HDR checkbox – lets the user select between NITS settings for HDR work. When set to PQ/HDR10, up to 10k nits becomes available. When set to HLG, this range is set to 1k

PQ/HDR10 Options include:

- 10K NITS Max
- 5K NITS Max
- 4K NITS Max
- 3K NITS Max
- 2K NITS Max
- 1K NITS Max
- 200 NITS Max

NITS settings for HDR workflows

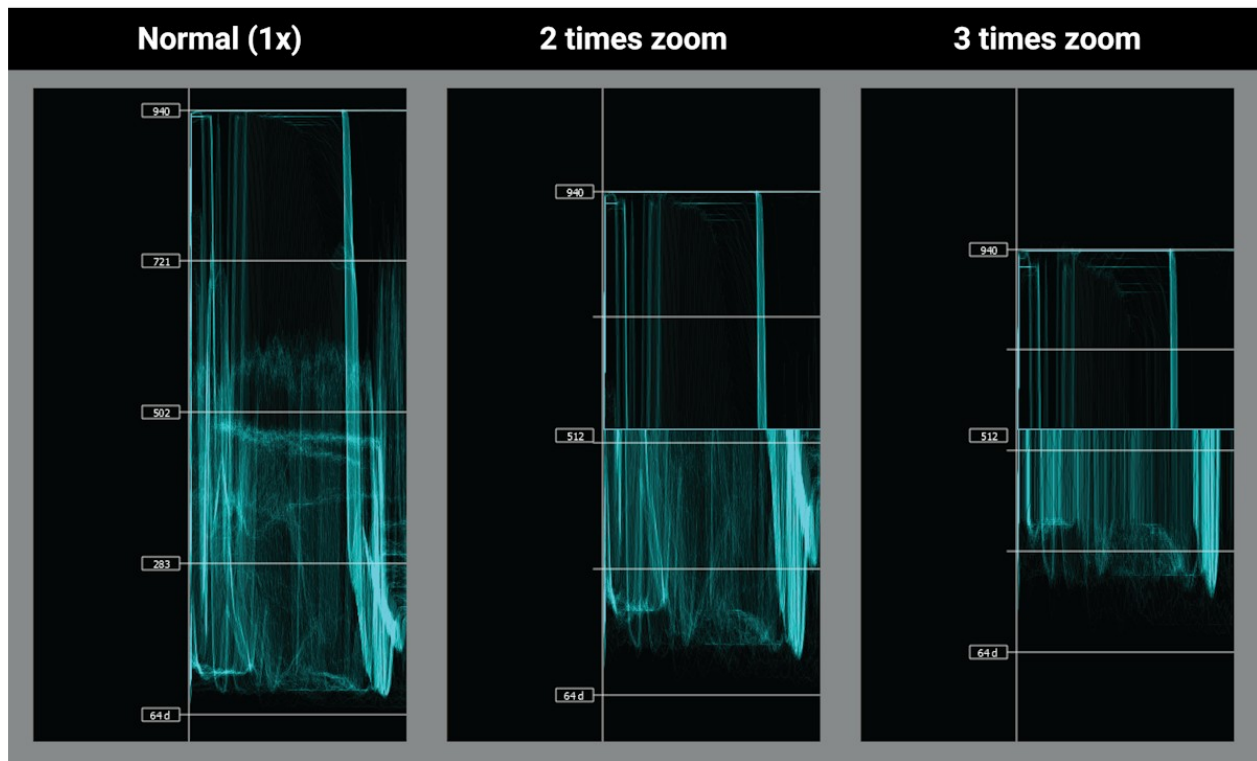


3.2.4.1.7 High/Low

High/Low pulldown – Show only the high and low portions of the signal, cutting out the middle.

Choices include: Normal, 2x zoom, 3x zoom. Below is a triptych of the same signal with (L-R) a 1x (no zoom), a 2x zoom, and a 3x zoom:

High/Low View for Colorists



Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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

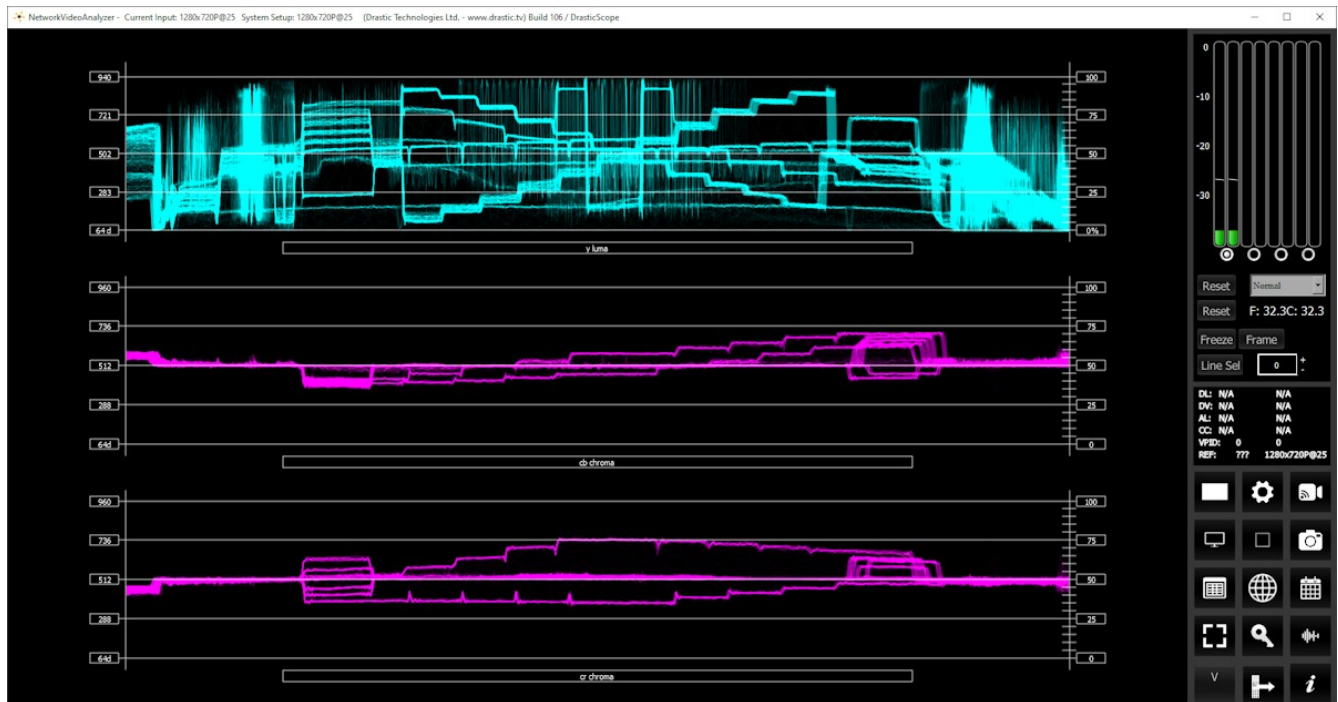
x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

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.

3.2.4.2 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.

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

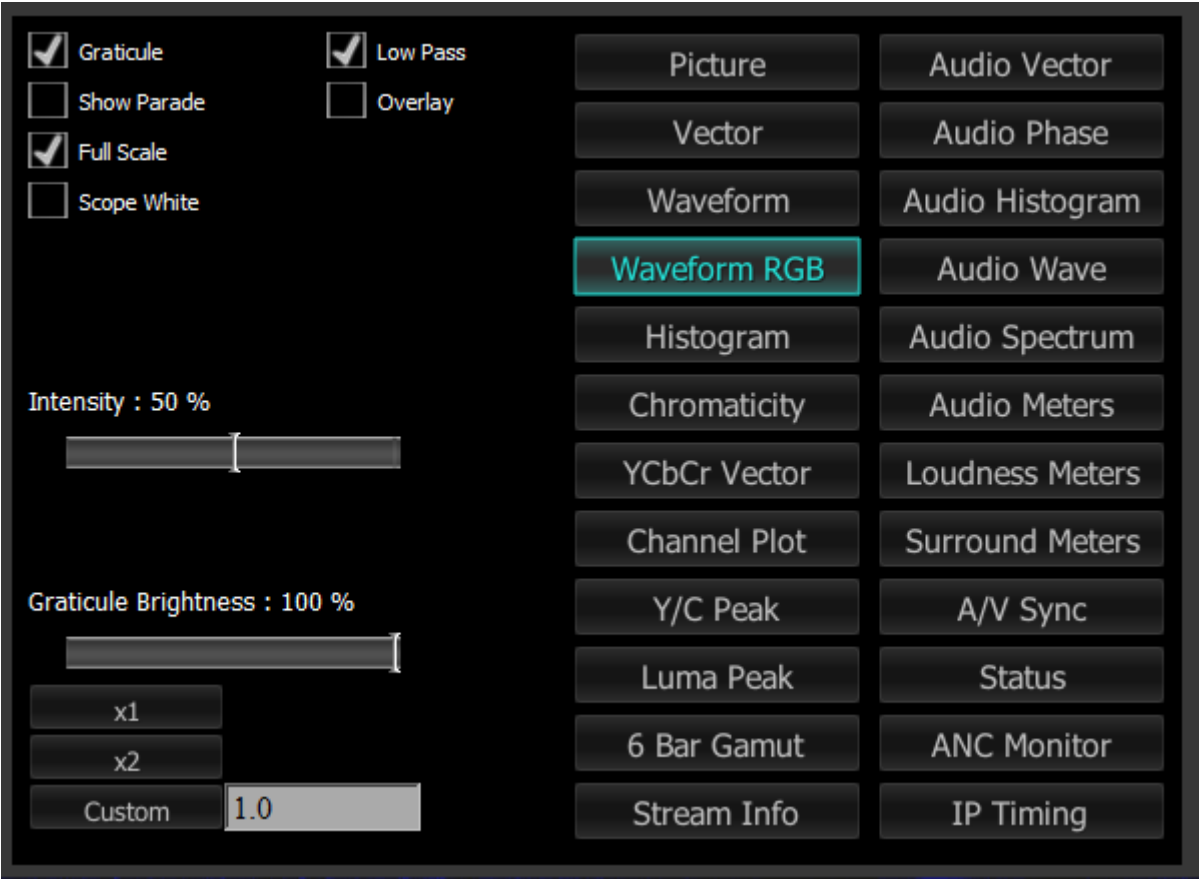
Critical for downstream color correction is the need to ensure proper luminance levels at the stage of initial capture, so any corrections will not muddy or wash out the signal information.

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

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:



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
Waveform RGB Stacked/Parade, Graticule, Intensity, Scope White				
	Full Scale			
	Low Pass, Overlay			

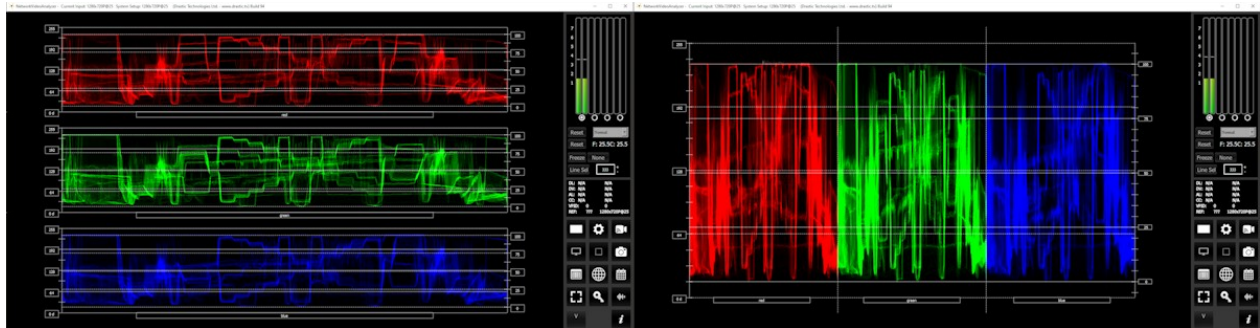
Graticule checkbox – when selected, the graticule is laid over the Waveform RGB display. The brightness of the Graticule may be adjusted using the **Graticule Brightness** slider described below.

3.2.5.1.1 Low Pass

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

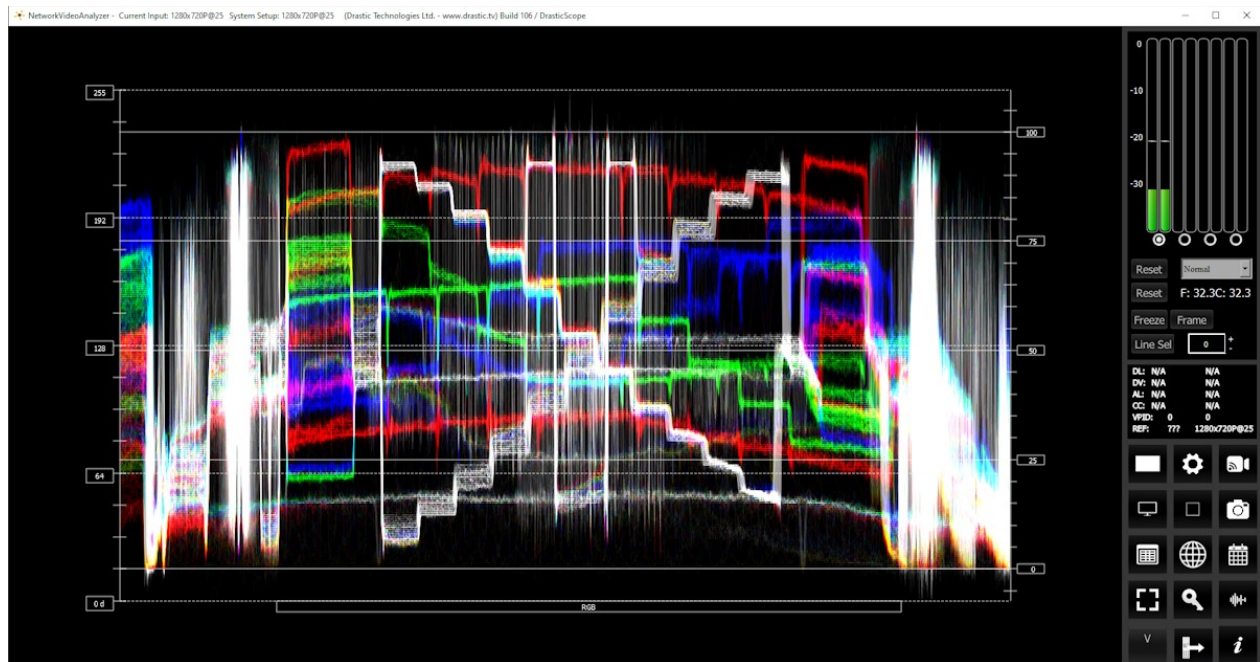
3.2.5.1.2 Show Parade

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



3.2.5.1.3 Overlay

Overlay checkbox – show Red, Green, and Blue overlaid on top of each other, to directly compare the relative strength of the channels.

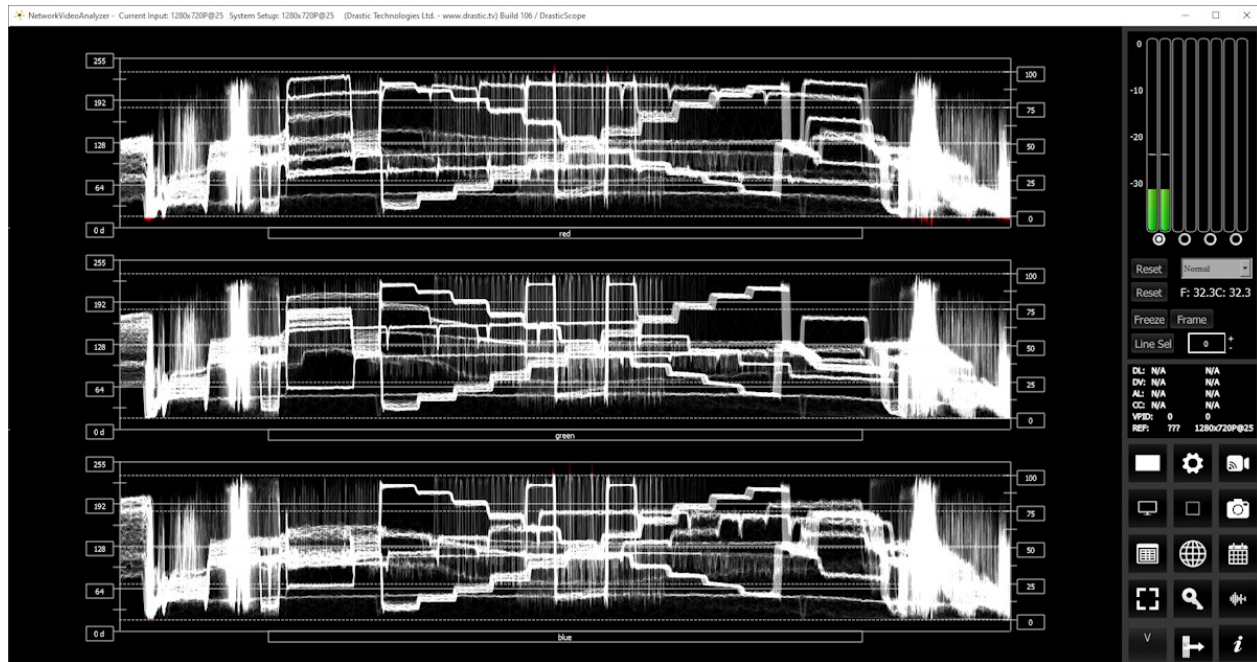


3.2.5.1.4 Full Scale

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.

3.2.5.1.5 Scope White

Scope White checkbox – turns the trace white.



Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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.

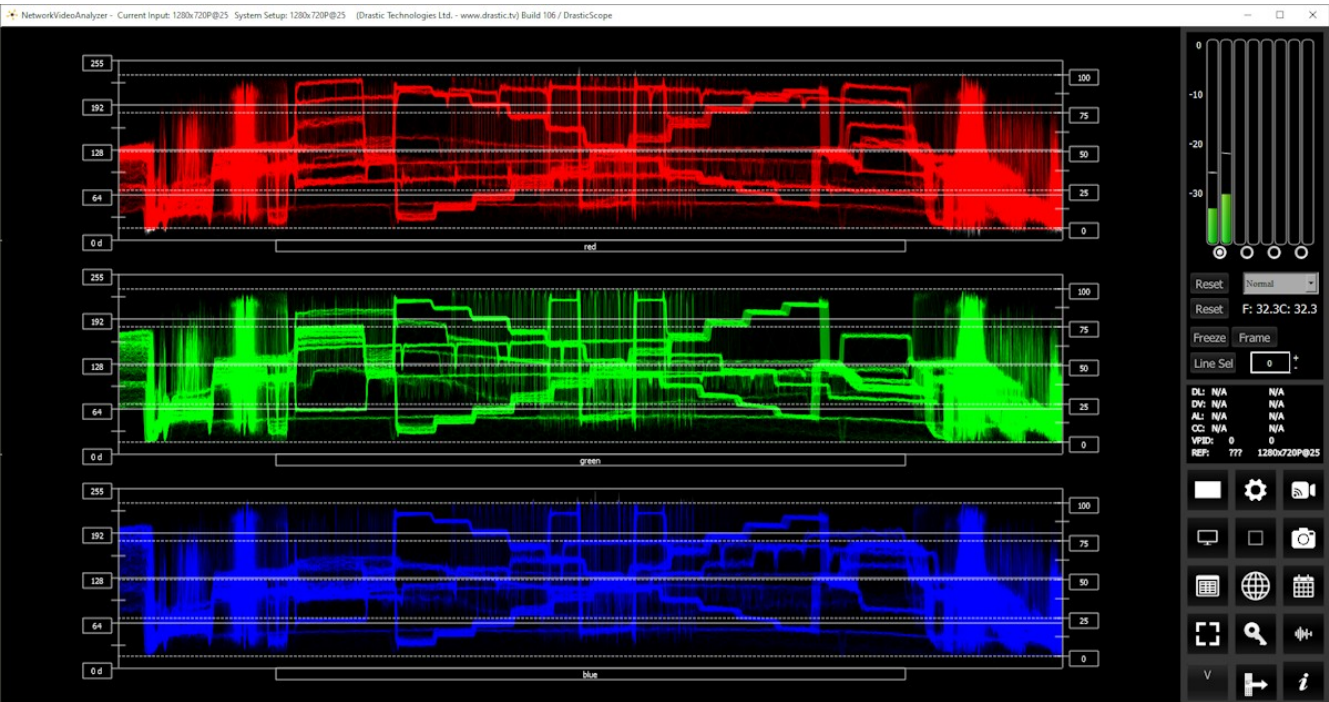
Pressing the x1 button sets the display back to normal.

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.

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

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

3.2.6 Histogram

3.2.6.1 Histogram Setup

There are five Histograms available in the histogram panel: YCbCr, RGB, HSV, Luma, and the H/S Scope.

To set up one of the Histograms 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 between the available histograms. Here are the options to set up each Histogram:



Histogram support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
	YCbCr, RGB, HSV, Luma			

For each of the histograms, the following controls may be used to adjust the 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.

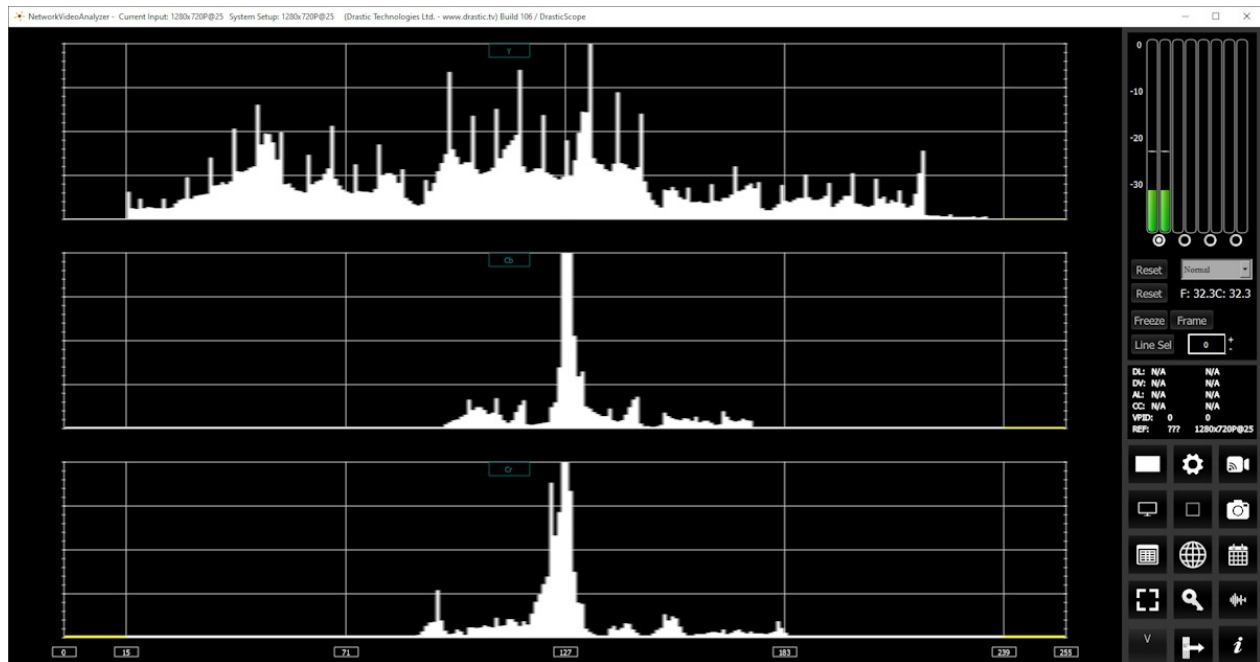
Pressing the x1 button sets the display back to normal.

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.

3.2.6.2 Histogram YCbCr Window

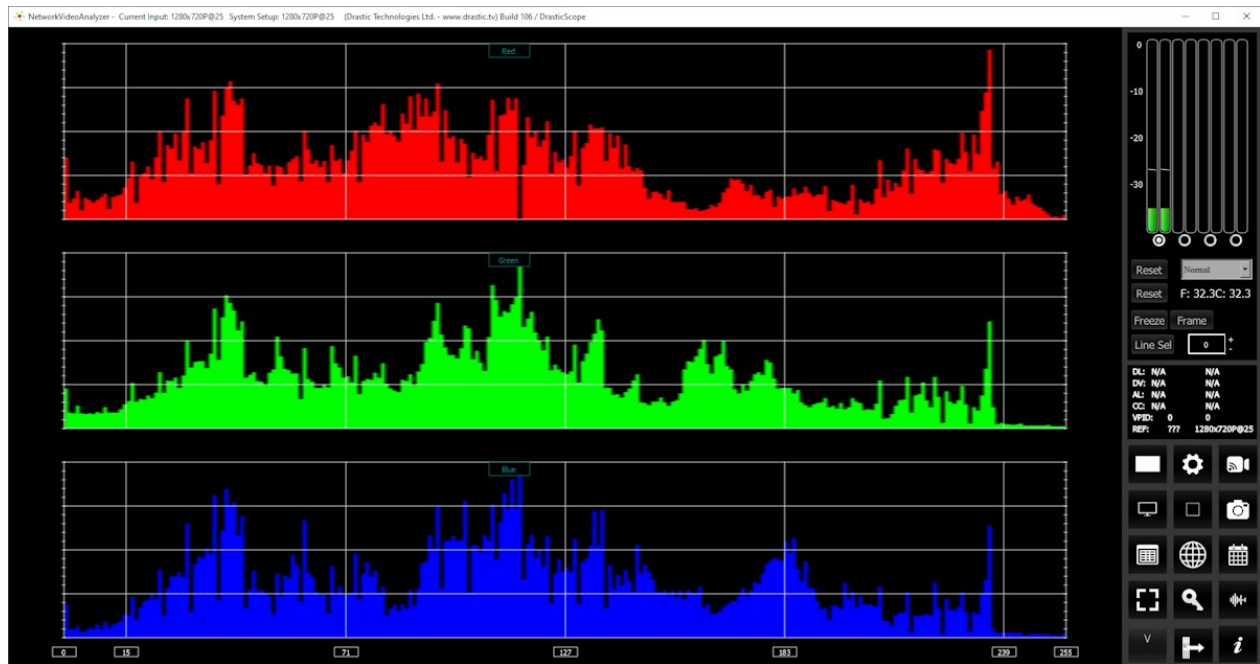
Here is the Histogram YCbCr.



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

3.2.6.3 Histogram RGB Window

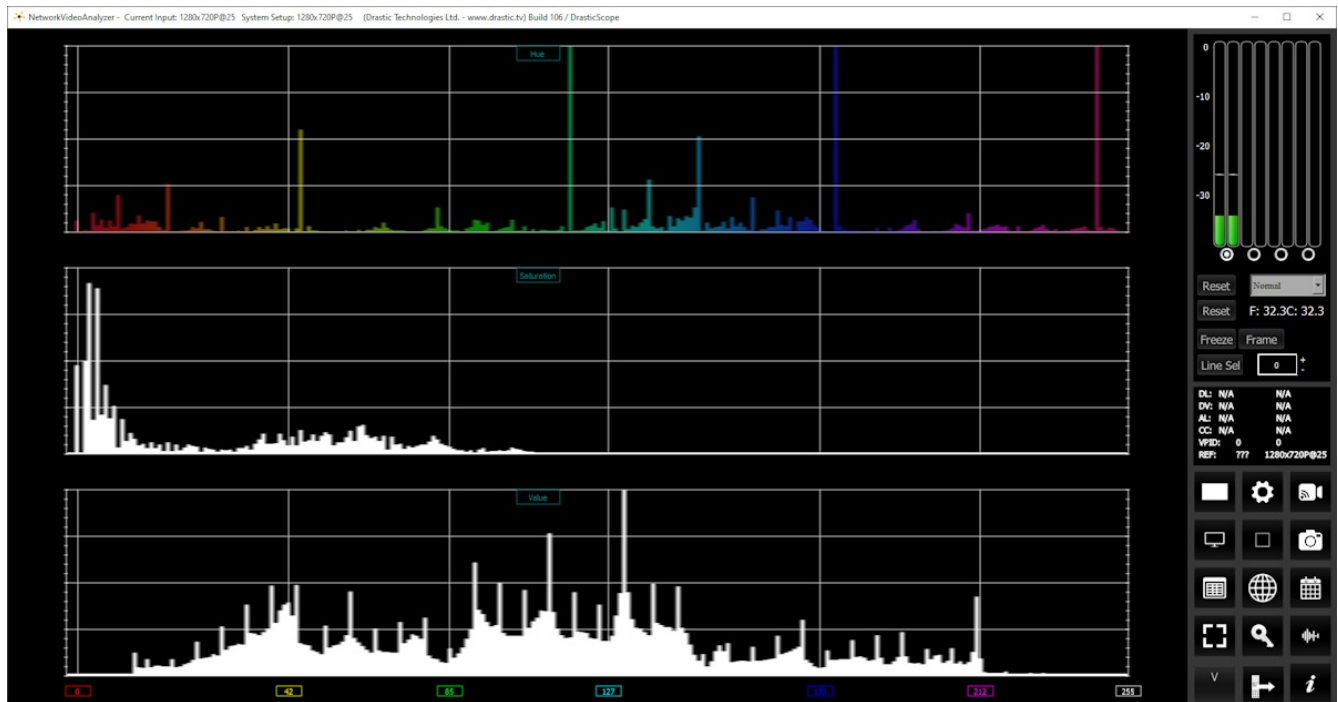
Here is the Histogram RGB:



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

3.2.6.4 Histogram HSV Window

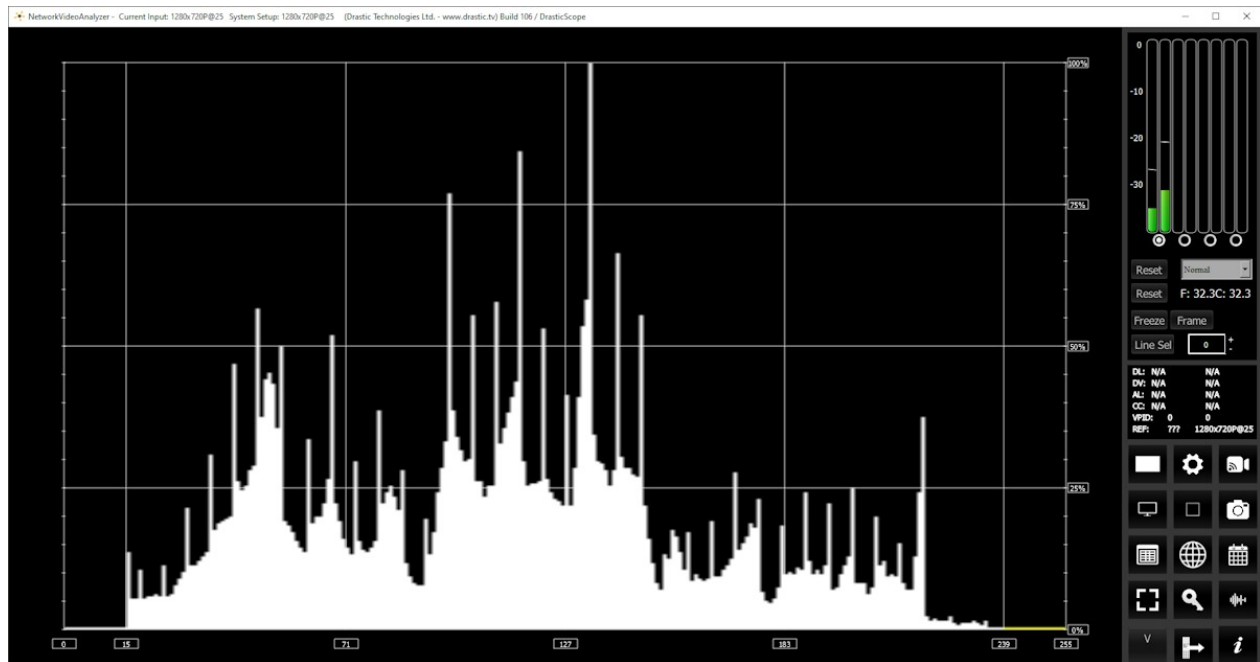
Here is the Histogram HSV:



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.

3.2.6.5 Histogram Luma Window

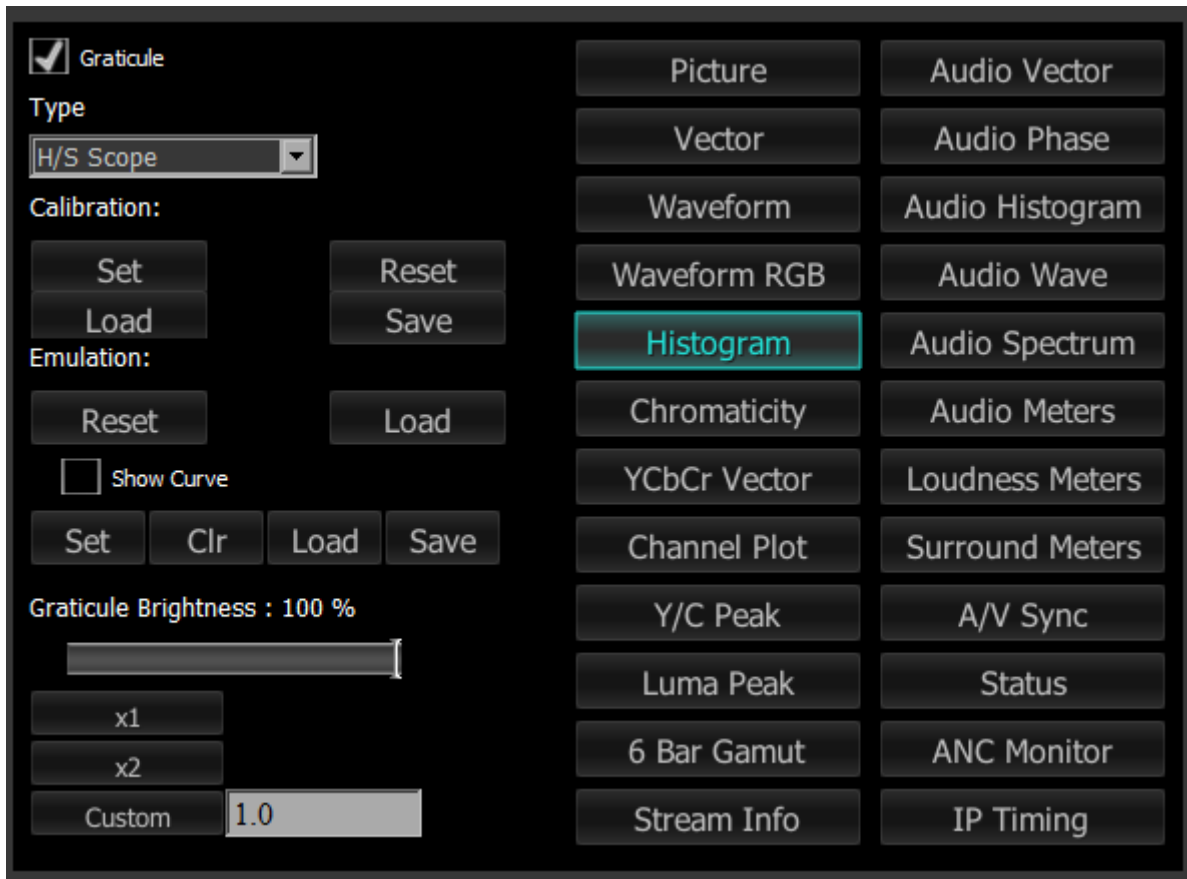
Here is the Histogram Luma:



Luma – display only the luma in the signal. Each of the possible luminance values are ranged across the bottom of the scale, and the strength at each value is indicated the trace's vertical level, as a percentage of 100.

3.2.6.6 The Drastic H/S Scope

Drastic's exclusive H/S Scope provides several important configuration options once it has been selected in the Histogram pulldown menu.



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.

Calibration section – choices include:

- **Set** – given a camera and a DSC ChromaDuMonde color chart, click to calibrate the input so the hue and saturation levels are even across the spectrum. Creates a calibration settings file that may be saved into memory.
- **Load** – opens a browser which allows the user to browse to and load a saved calibration file.
- **Reset** – remove any calibration and display the signal unaltered, to show what the camera or device is seeing.
- **Save** – opens a save as window which allows the user to select a location and save the

current calibration settings as a file.

Emulation section – choices include:

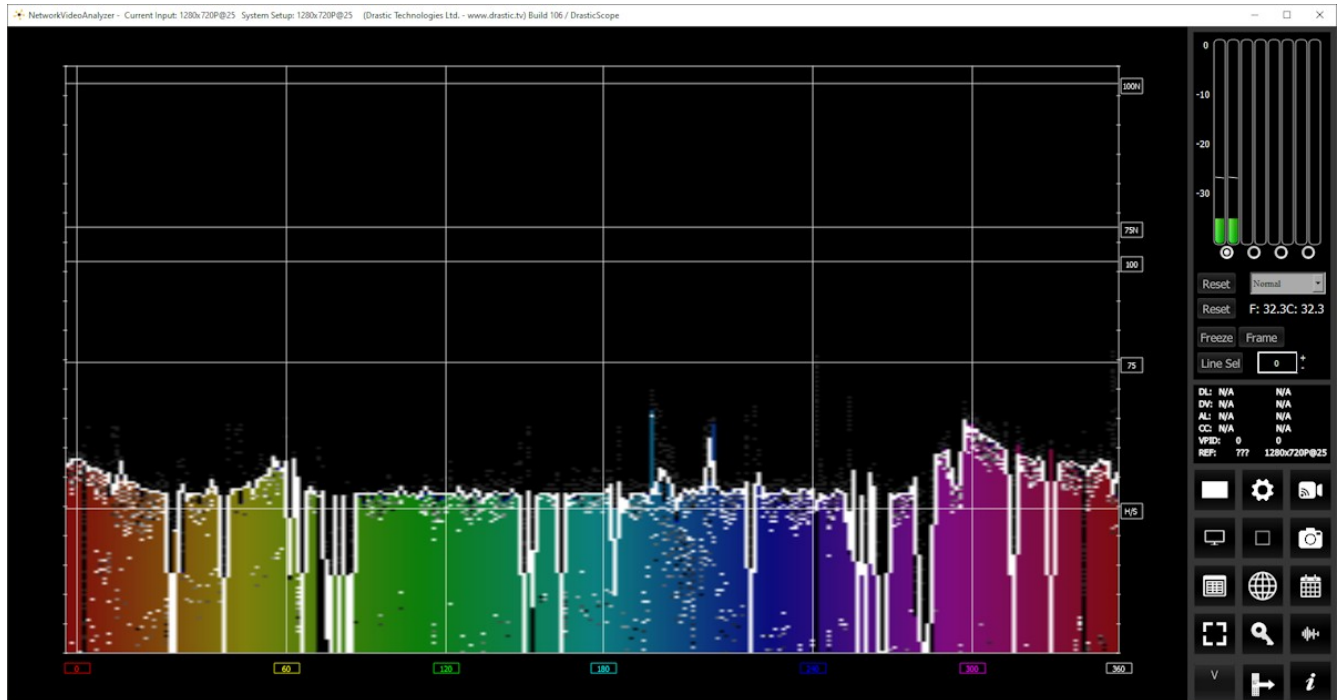
- **Reset** – reset the emulation values back to default.
- **Load** – load a calibration file, so a new setup can emulate the setup used to create the calibration file.

Show Curve section – choices include:

- **Set** – click to set the current curve into memory. With Show Curve selected, displays the curve as a white line at the top of the signal, for levels comparison. With the curve set, the user can then test other lights to see how the peaks and valleys of the curve line up with the signal.
- **Clear** – clear the current curve and return to default settings.
- **Load** – opens a browser which allows the user to browse for and select a saved curve file to display in the H/S Scope.
- **Save** – opens a save as window which allows the user to select a location and save the current curve settings as a file.

H/S Scope Window

Here is the H/S Scope:



H/S Scope Histogram

H/S Scope – Designed for calibration of lighting or camera to a standard DSC ChromaDumonde chart. The target color level or saturation is calibrated to a single horizontal line in the chart. The color hue component is mapped horizontally, with standard 601, 709 or 2020 targets as vertical lines.

The **H/S Scope** shows the distribution of red, green and blue within the signal as a series of discrete bars that make a continuous graph for each color. This display provides an overview of the tonal range of each color in the picture. Each bar is the count of the number of pixels for one of the 1024 possible colors. These totals are then auto ranged to fit within the graticule and represent the relationship between the shades of each color and between each other.

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

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

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

and a similar one here:

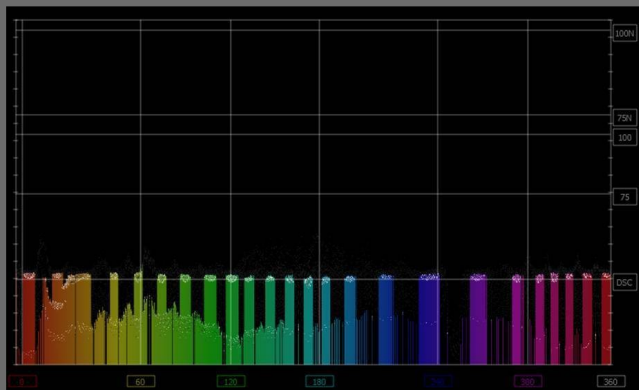
https://www.youtube.com/watch?v=nHg-_yCxo0U

H/S Scope Example

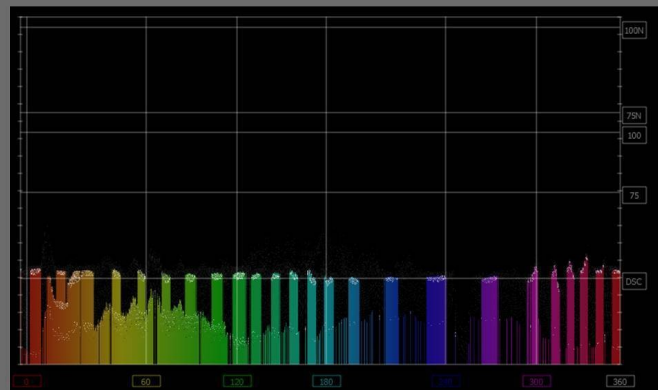
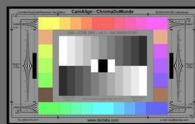
Here is an example where the H/S Scope reads the chroma signal response from a camera, to evaluate the Rosco DMG MIX LED fixture.

ARRI Alexa Mini preset to 3200K

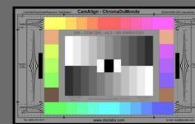
- Tungsten 3200K / DMG MIX 3200CCT / HS SCOPE readout



ARRI 3200K Preset / 3200K Light



ARRI 3200K Preset / 3200 CCT DMG MIX



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

Finally at the end of the H/S Scope setup, there are the following controls:

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.

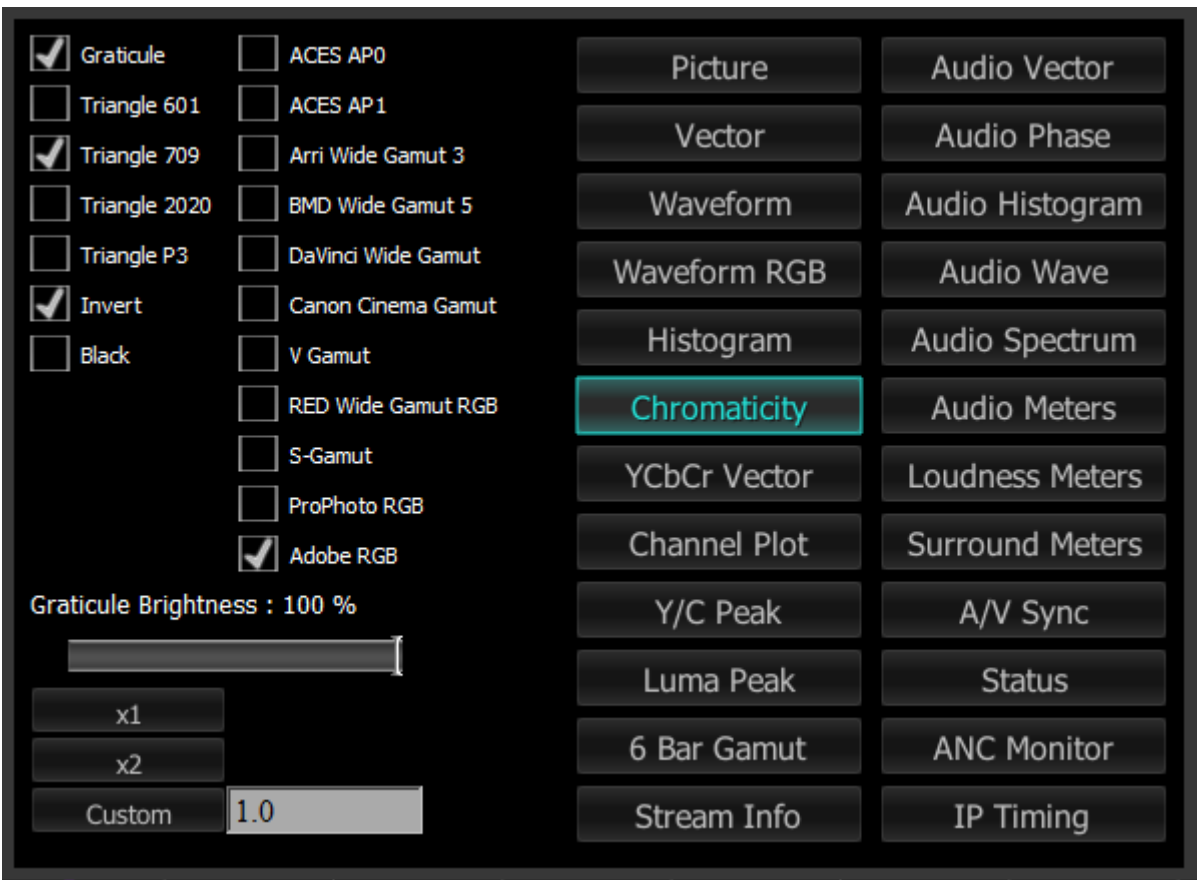
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

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

3.2.7 Chromaticity

3.2.7.1 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:



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
	Chromaticity scope, Graticule, Triangles 601, 709, 2020, P3, Invert, Black			
	Triangles ACES0, ACES1, Arri, BMD, DaVinci, Canon, V Gamut, RED, S-Gamut, ProPhoto, Adobe			

Graticule checkbox – when selected, the graticule is laid over the Chromaticity 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 trace as a colored region 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.

ACES AP0 checkbox - when selected, displays the ACES AP0 triangle. The ACES AP0 primaries form the smallest possible triangle which contains all the real colors. The result may be that a significant proportion of code values are “wasted” on unreal colors.

ACES AP1 checkbox - when selected, displays the ACES AP1 triangle. The ACES AP1 primaries are a compromise which code most colors likely to occur in images from real cameras using positive values. Because even the most saturated ACEScc/ACEScct/ACEScg colors are still real, this means that the mathematics of grading operations works in a way which “feels” better to colorists.

Arri Wide Gamut 3 checkbox - when selected, displays the Arri Wide Gamut 3 triangle. Images encoded with Log C (C is for Cineon; the original Cineon log encoding is based on the density of color film negative) can be identified by their flat and desaturated nature. Whites and blacks are not extended to their maximum values. The reason for this: the Log C curve is a logarithmic encoding for images, the encoding has a grayscale characteristic similar to a scan from negative film. LogC3 images were based on the origins and requirements of the ALEV3 (the original ALEXA sensor).

BMD Wide Gamut 5 checkbox - when selected, displays the BMD Wide Gamut 5 triangle. Blackmagic Design specific triangle.

DaVinci Wide Gamut checkbox - when selected, displays the DaVinci Wide Gamut triangle. DaVinci specific triangle.

Canon Cinema Gamut checkbox - when selected, displays the Canon Cinema Gamut triangle. Canon created an expanded gamut color space they call DCI-P3+ using the same ~6300 K white point as DCI-P3. Otherwise, P3+ has no relation to DCI-P3 nor the Digital Cinema Initiative. Unlike the DCI-P3 color space, which defines an actual display technology, Canon's DCI-P3+ color space uses imaginary primaries which cannot be realized by any physical display technology.

V Gamut checkbox - when selected, displays the V Gamut triangle. This is the log curve and gamut used in Panasonic's “Varicam” for utilization in recording and workflow composition. V-Log has characteristics similar to a log curve of a scan from negative film and is highly compatible with conventional film workflow.

RED Wide Gamut RGB checkbox - when selected, displays the RED Wide Gamut RGB triangle. REDWideGamutRGB is the new standardized colorspace option for RED footage. It can reproduce a much larger range of colors than REDcolor4, which is very useful for shots that have high saturation levels. However, it will look desaturated on a Rec709 monitor.

S-Gamut checkbox - when selected, displays the S-Gamut triangle. sRGB is a standard numerical encoding of colors, based on the RGB (red, green, blue) color model, for use on monitors, printers, and the internet. It is the current defined standard colorspace for the web, and it is usually the assumed colorspace for images that are neither tagged for a colorspace nor have an embedded color profile. The sRGB standard uses the same color primaries and white point as the ITU-R BT.709 standard for HDTV, but a different transfer function (or gamma) compatible with older CRT displays, and assumes a viewing environment closer to typical home and office viewing conditions.

ProPhoto RGB checkbox - when selected, displays the ProPhoto RGB triangle. The ProPhoto RGB color space, also known as ROMM RGB (Reference Output Medium Metric), is an output referred RGB color space developed by Kodak. It offers an especially large gamut designed for use with photographic output in mind. The ProPhoto RGB color space encompasses over 90% of possible surface colors in the CIE L*a*b* color space, and 100% of likely occurring real-world surface colors, making ProPhoto even larger than the Wide-gamut RGB color space.

Adobe RGB checkbox - when selected, displays the Adobe RGB triangle. Adobe RGB (1998) color space or opRGB is a color space developed by Adobe Inc. in 1998. It was designed to encompass most of the colors achievable on CMYK color printers, but by using RGB primary colors on a device such as a computer display. The Adobe RGB (1998) color space encompasses roughly 30% of the visible colors specified by the CIELAB color space – improving upon the gamut of the sRGB color space, primarily in cyan-green hues. It was subsequently standardized by the IEC as IEC 61966-2-5:1999 with a name opRGB (optional RGB color space) and is used in HDMI

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.

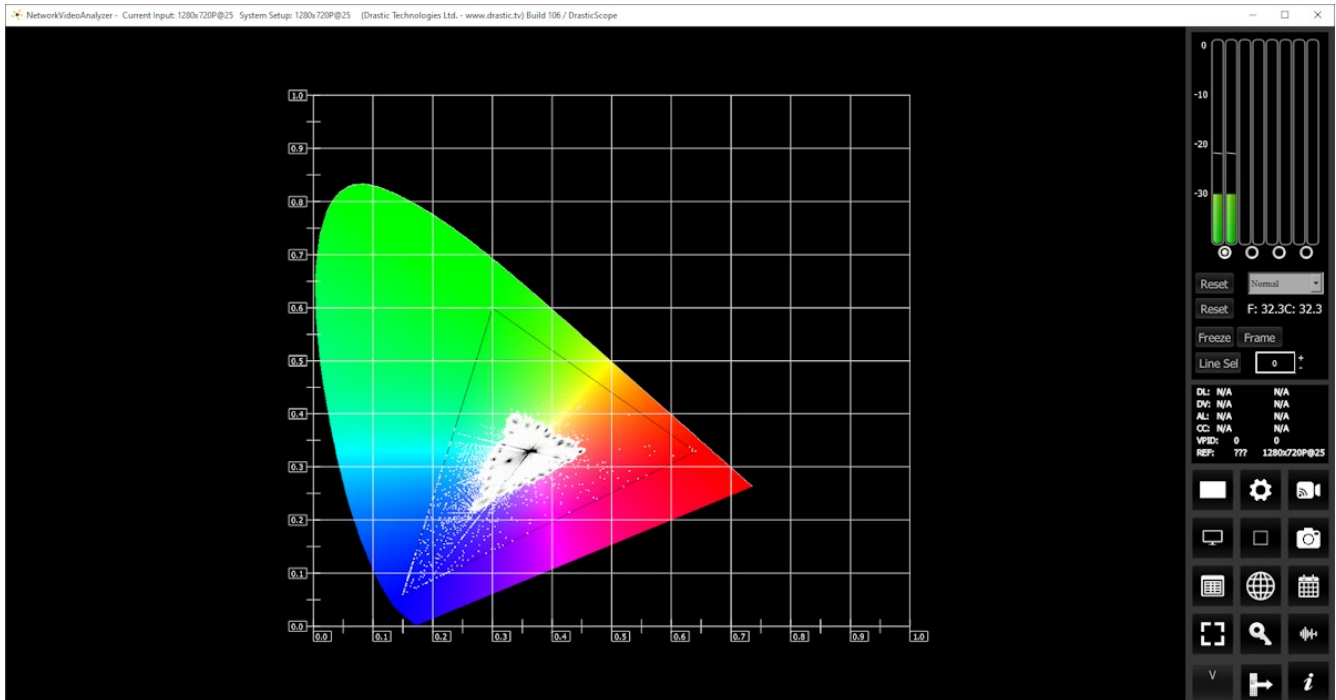
Pressing the x1 button sets the display back to normal.

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 Chromaticity Window

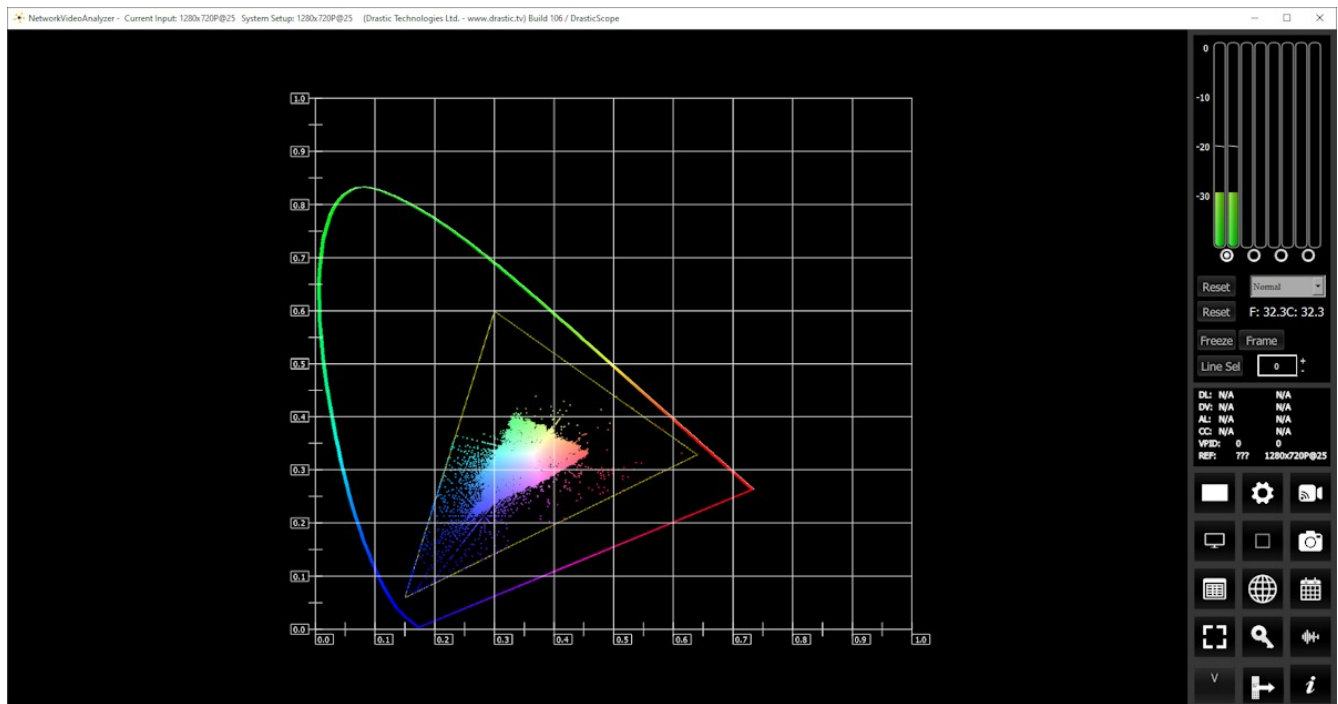
Here is the Chromaticity window.



The **Chromaticity** scope provides a visual representation of the color in a video across all the colors of visible light. Depending on the version, there are a number of gamut triangles that can be superimposed. This will delineate the colors that fall within the acceptable range and those that are outside it. The color of the trace (video signal) within the CIE 1931 color display can be white, black, or the chromaticity hues background.

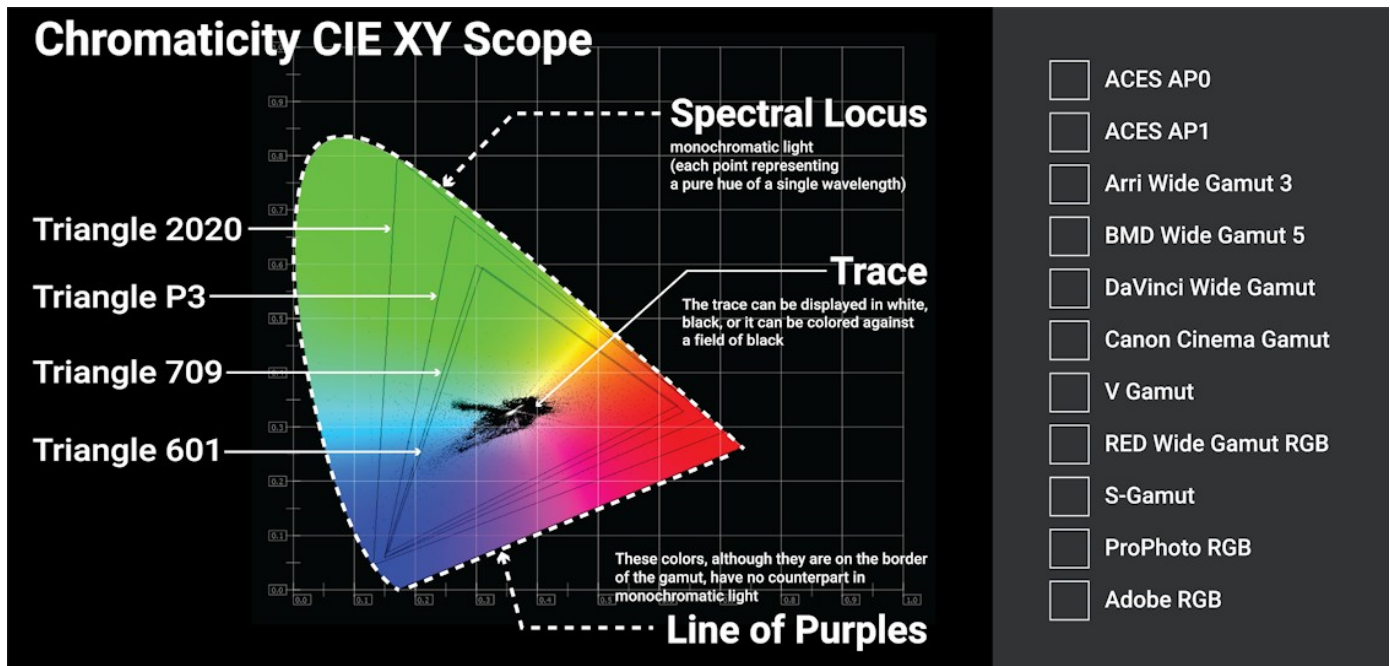
In the above image, a 709 gamut triangle has been overlaid to match the system settings. Any signal excursions outside this triangle may end up producing non compliant levels.

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



Note that the overlaid gamut triangle is now displayed in yellow, to clearly delineate the area being used.

The below image shows our chromaticity scope with the 4 most common gamut triangles: 2020, P3, 709, and 601.



There is also a list of available triangles from specific manufacturers along the right. The additional gamut triangles are used to validate WCG and camera raw workflows using the appropriate color space.

3.2.8 YCbCr Vector

3.2.8.1 YCbCr Vector Setup

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



The YCbCr Vector scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		YCbCr Vectorscope, Graticule, Marks, Color, Intensity		

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

described below.

Marks pulldown menu – allows the user to select between 75% marks and 100% marks, to provide targets for a signal that features color bars or a similar test pattern.

Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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

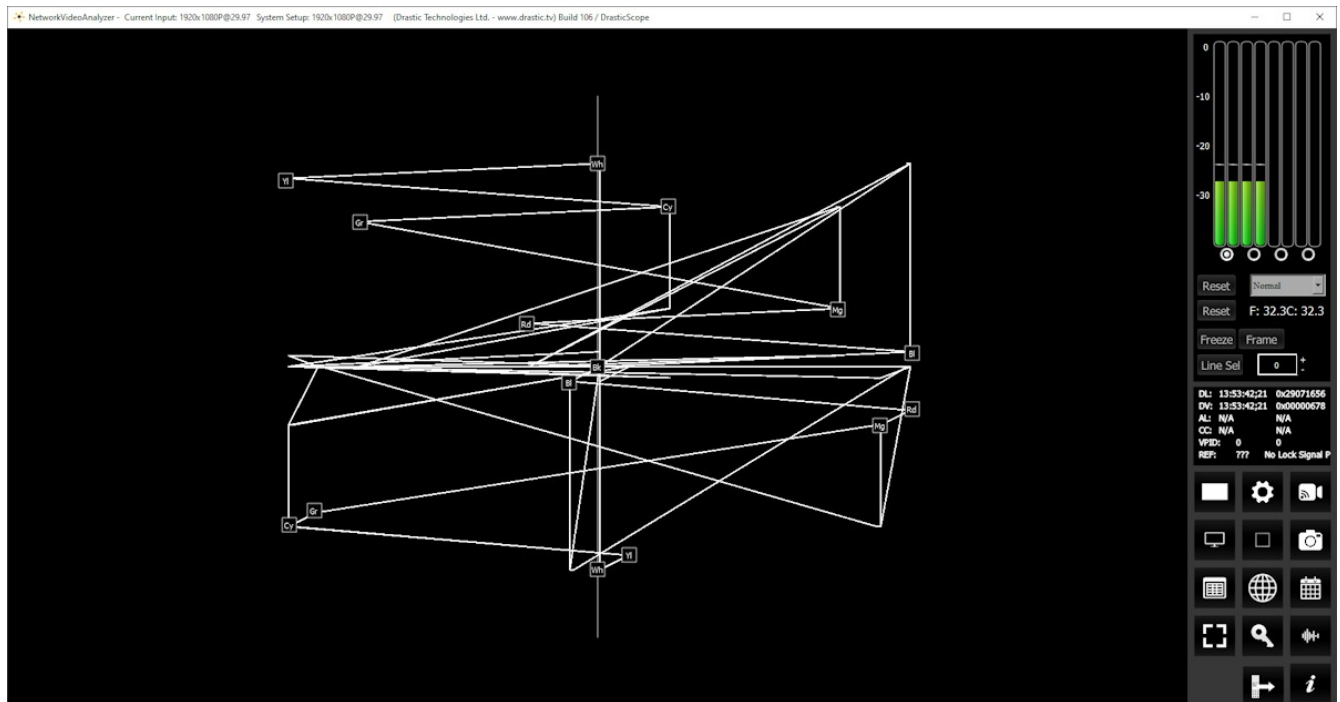
x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

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.

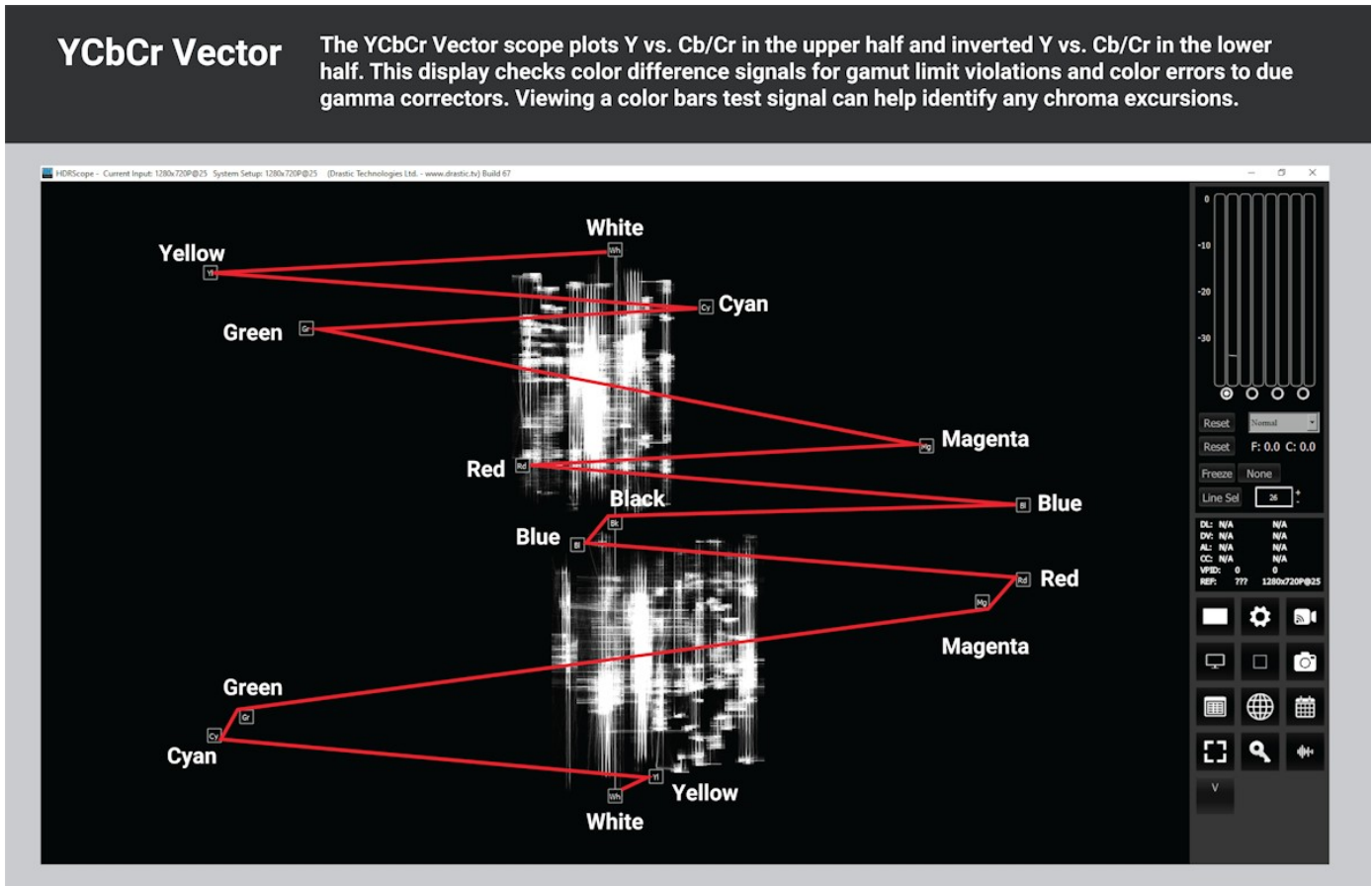
3.2.8.2 YCbCr Vector Window

Here is the YCbCr Vector window, viewing a test pattern signal.



YCbCr Vector (Lightning style display)

The **YCbCr Vector** scope plots the Y vs. Cb/Cr in the upper half and inverted Y vs. Cb/Cr in the lower half. The user can select between 75% marks and 100% marks, to provide a target for the primaries where a camera is looking at color bars or similar test pattern.

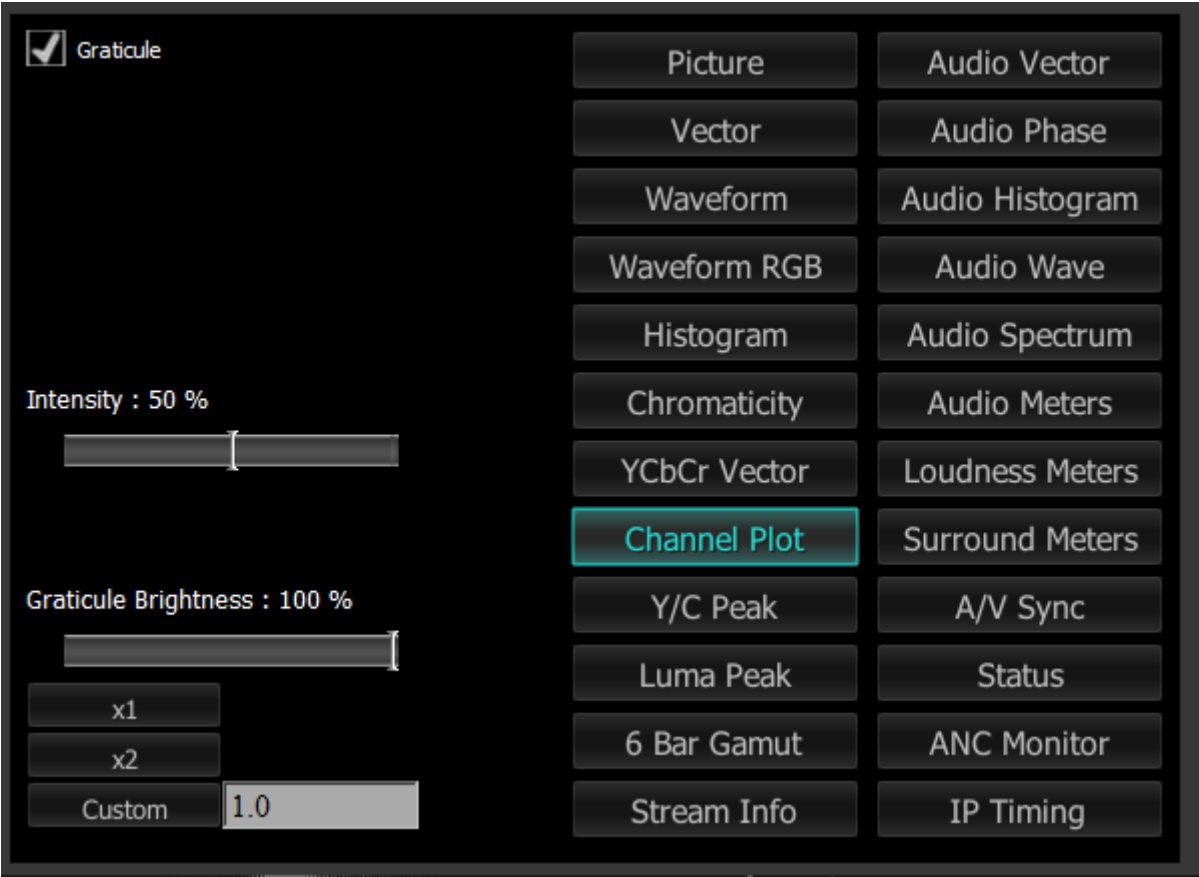


Here is a diagram with the primaries clearly identified, and their locations connected via the familiar “lightning style” trace path.

3.2.9 Channel Plot

3.2.9.1 Channel Plot Setup

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



The Channel Plot scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Channel Plot, Graticule, Intensity		

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

described below.

Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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.

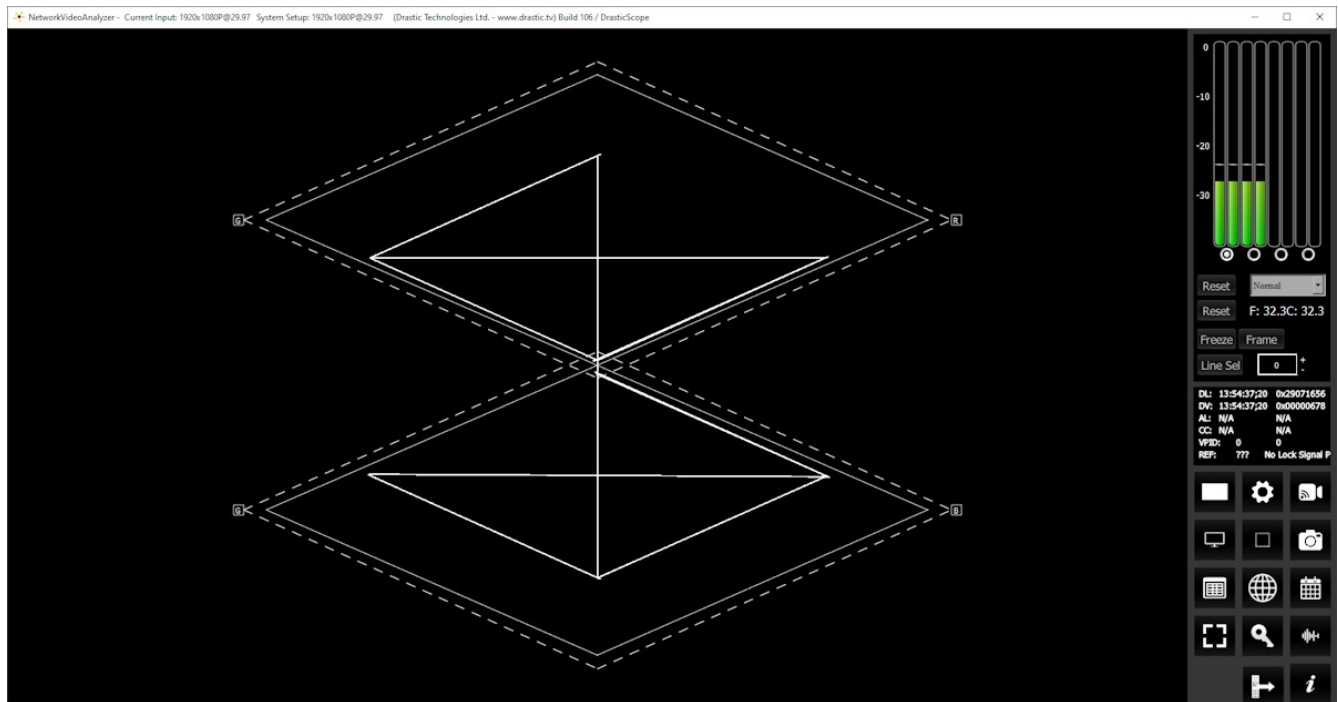
Pressing the x1 button sets the display back to normal.

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.

3.2.9.2 Channel Plot Window

Here is the Channel Plot window.



Channel Plot (Double Diamond)

The top diamond shows the levels of green component on the left and blue component on the right. The lower diamond shows the levels of green component on the left and red component on the right.

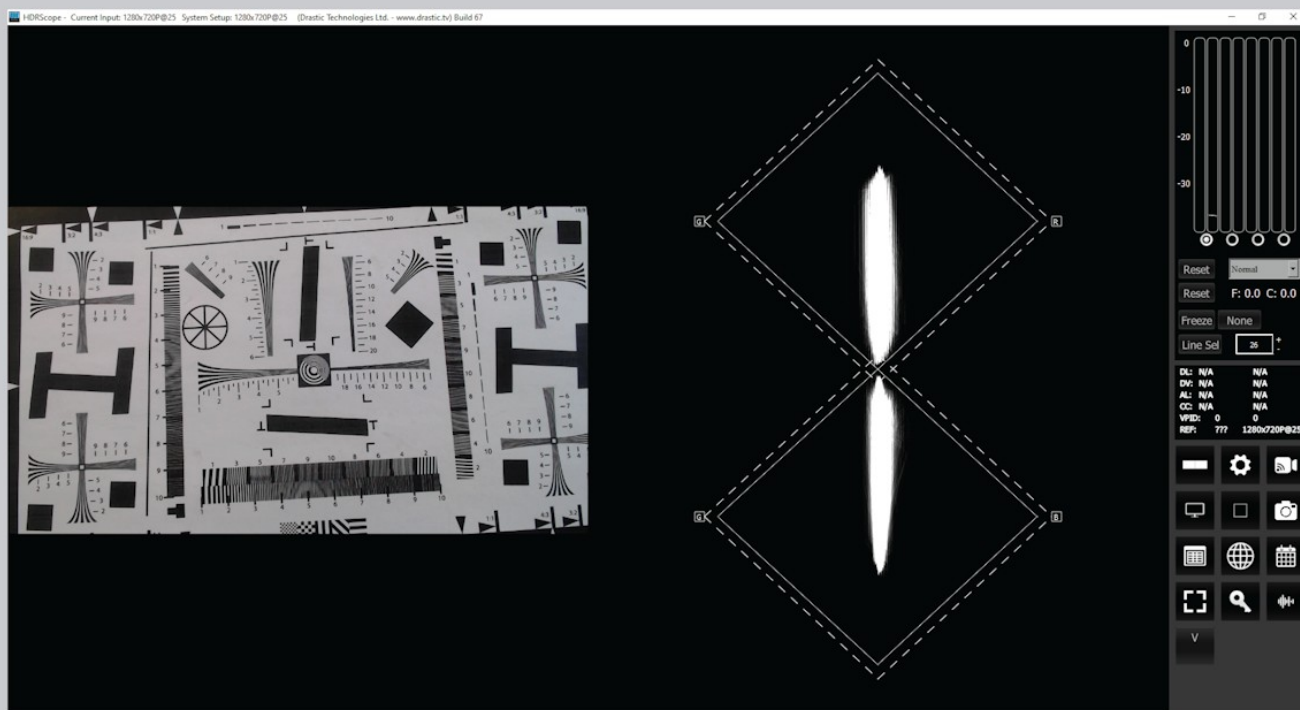
With the green signal indicated on the left side of both diamonds, errors in specific channels are easy to spot. The distance that the trace extends beyond the diamonds indicates the severity of the violation, so that minor violations may be dismissed.

Channel Plot indicates pure black where the two diamonds join in the center of the display. If the black is not dark enough then the trace starts above the bottom of the top Diamond and below the top of the bottom diamond. If there is a color cast to the black, the trace is skewed to the left or right of the diamonds. A perfectly monochromatic (i.e. black and white) signal of the full contrast range or voltage range of video will display as a perfect vertical line. If there is a color cast to the monochromatic signal, the trace will skew off to left or the right at the top of the top diamond and the bottom of the bottom diamond

Pure gray is indicated in the center of the broadest part of both diamonds. If there is a color cast in the mid-tones or gammas, the trace will skew off to the left or the right across the breadth of either or both of the diamonds

Channel Plot

The Channel Plot display helps adjust white balance, overall luma levels, and camera shading. This scope processes the RGB signal similarly to the input processing of your camera. Equal R, G, and B channels produce a gray value, offering a vertical line in both halves of the Channel Plot display.

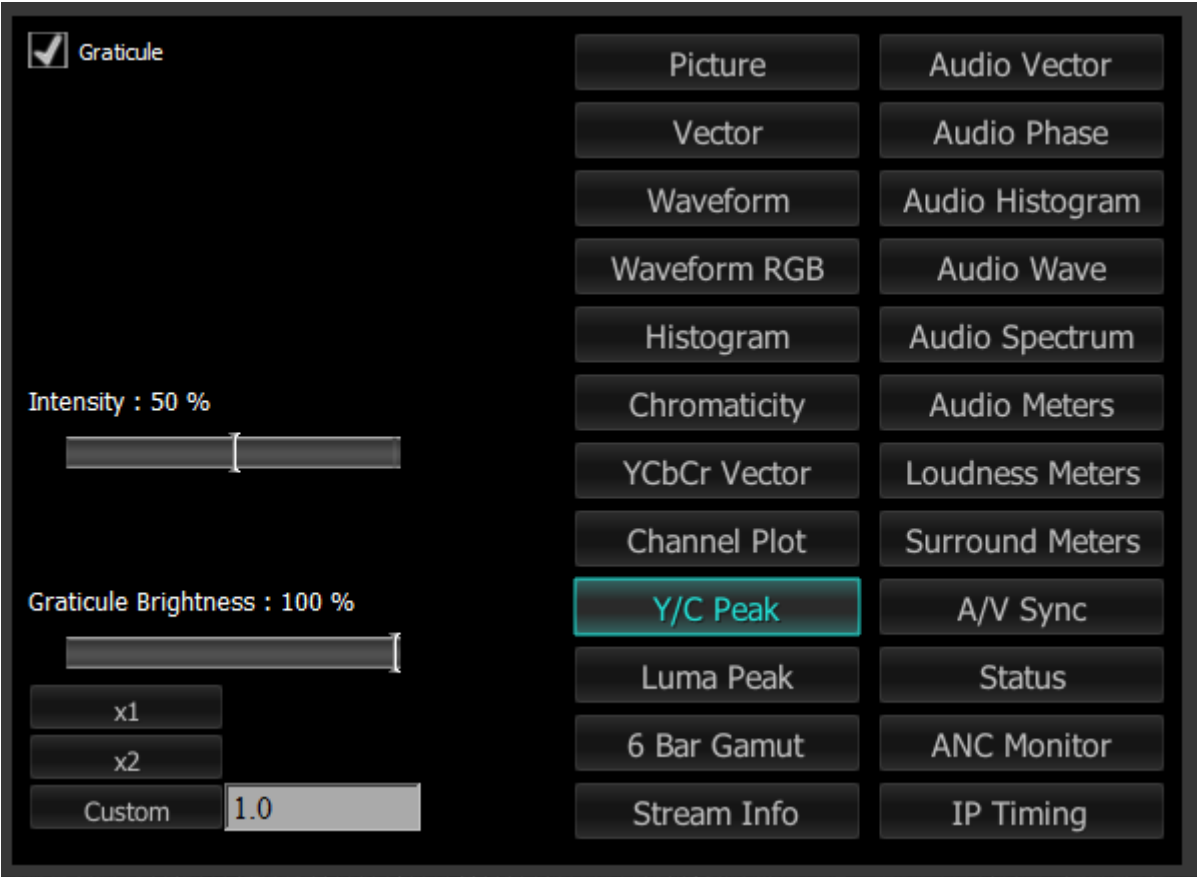


Above is an example where the camera is pointed at a black and white chart, and the trace is running quite convincingly through the center of the graticule. At the same time the white levels do not fully extend to the top and bottom of the graticule, so the lighting may need to be increased.

3.2.10 Y/C Peak

3.2.10.1 Y/C Peak Setup

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



The Y/C Peak scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Y/C Peak scope, Graticule, Intensity		

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

Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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.

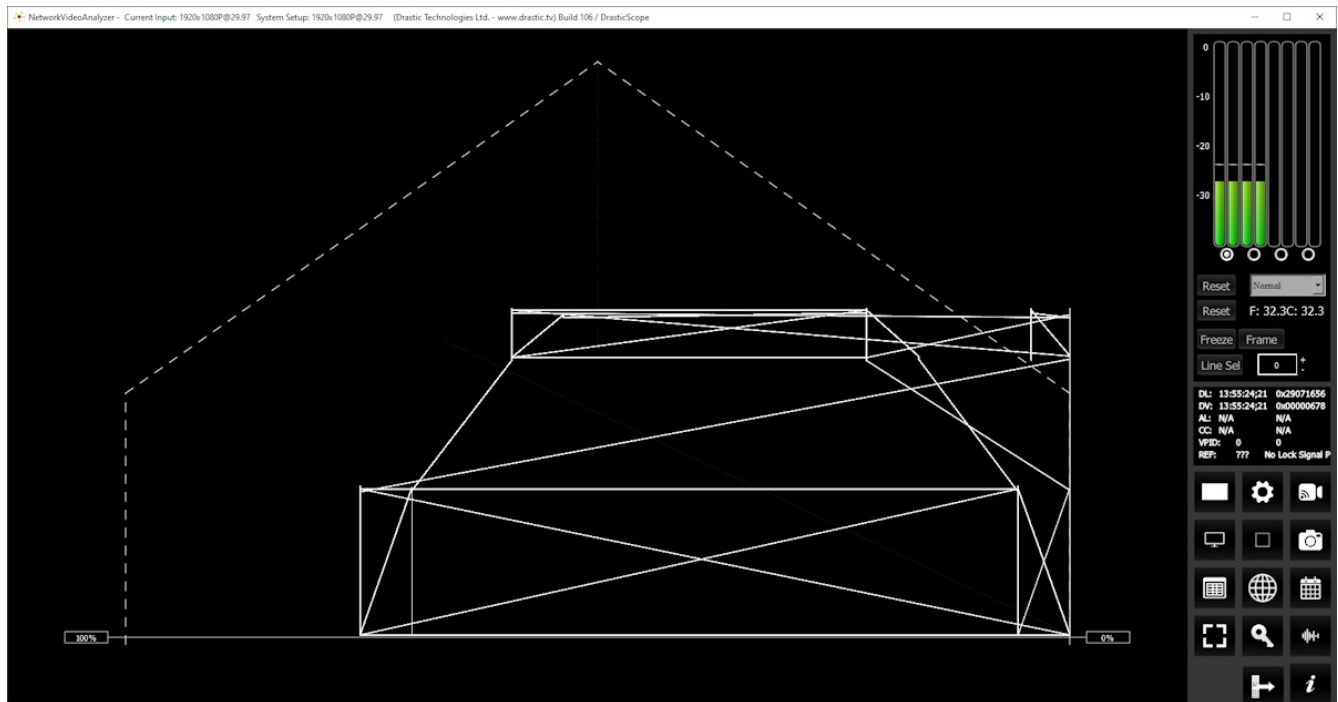
Pressing the x1 button sets the display back to normal.

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.

3.2.10.2 Y/C Peak Window

Here is the Y/C Peak window.

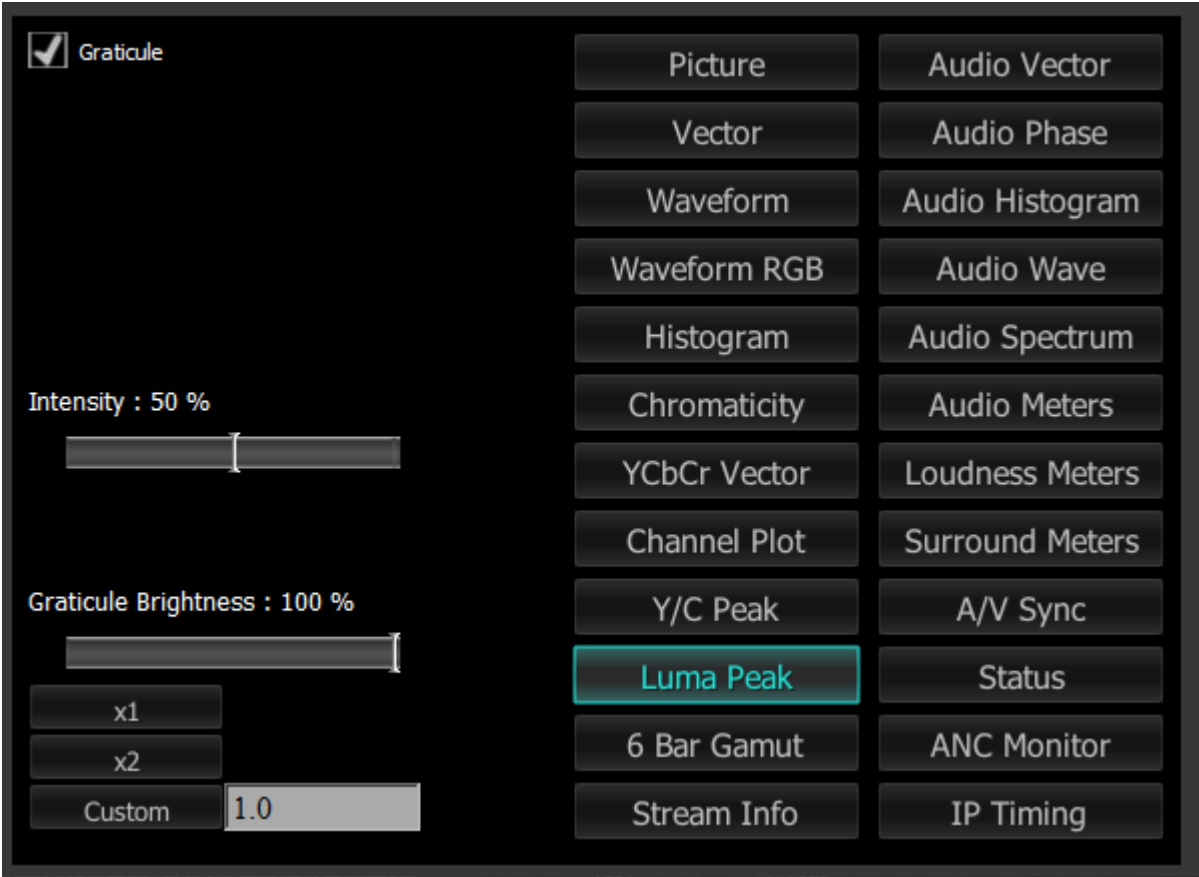


The **Y/C Peak** window shows all three channels in composite mode, and the relative strength of the levels from 100% to 0 at the right. This display shows luminance as a function of the sum of the R, G, and B channels, so the user can confirm the signal levels are valid and compliant.

3.2.11 Luma Peak

3.2.11.1 Luma Peak Setup

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



The Luma Peak scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Luma Peak scope, Graticule, Intensity		

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

Intensity slider – Moving the Intensity slider brightens or dims the display of the video signal (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.

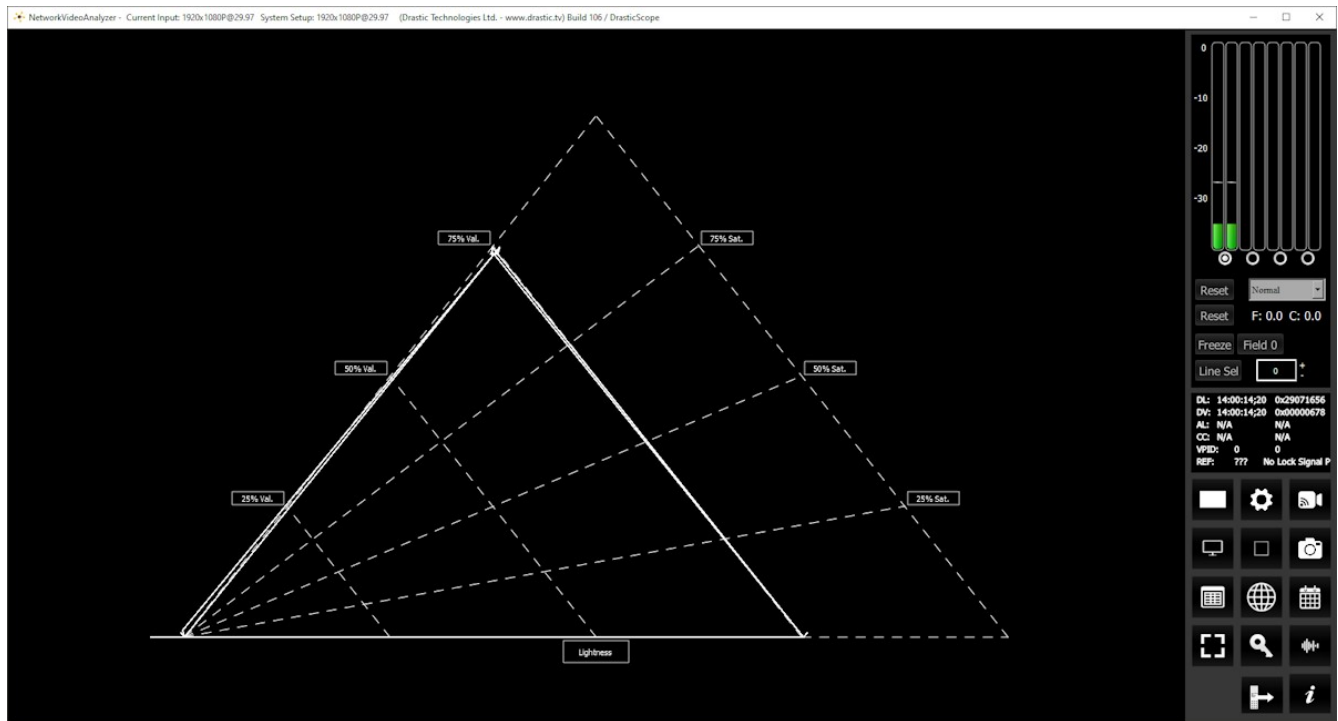
Pressing the x1 button sets the display back to normal.

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.

3.2.11.2 Luma Peak Window

Here is the Luma Peak window.

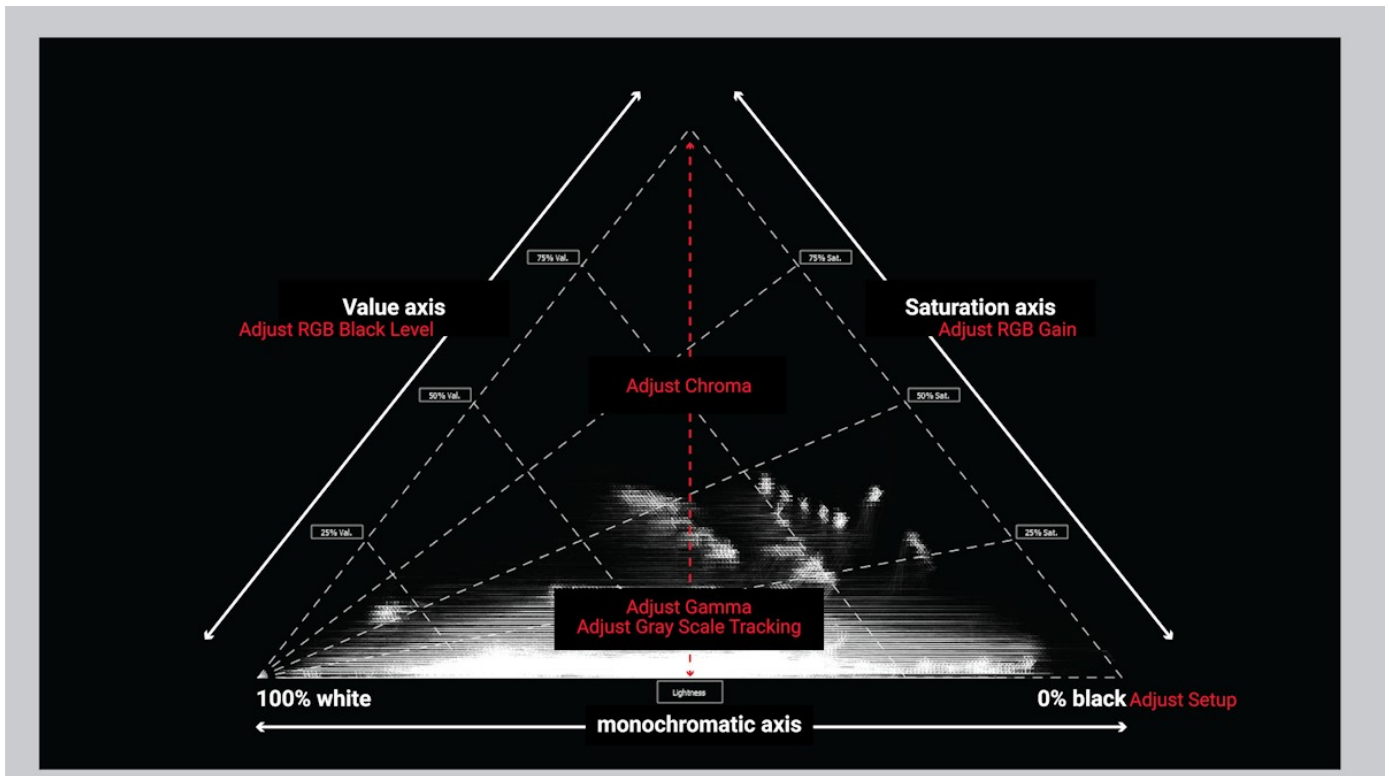


The **Luma Peak** display shows the signal's color saturation and value over a triangle representing the full RGB color gamut. Excursions would fall outside of the triangle.

Luma Peak (spearhead)

The Luma Peak shows the color saturation and color value or lightness combined with RGB gamut limits. This allows a colorist to adjust live video signals in the HSV (Hue, Saturation, Value) space within the valid signal gamut range. This display plots the maximum of the R', G', and B' color values for each sample versus the minimum of the three values. The resulting area is a triangle that represents the full RGB color gamut.

This triangle represents Lightness with black at the bottom right corner of the triangle and white at the bottom left corner. The vertical axis represents chroma levels. Value increases up along the left side, and Saturation increases along the right side. This display provides both luminance and saturation values in a single display.



The **Luma Peak** display allows colorists to see hue, saturation, and value while maintaining a valid RGB signal gamut range. Adjust the RGB Black levels to optimize the Value levels. Adjust the RGB Gain to optimize Saturation levels.

Chroma, Gamma, and Gray Scale adjustments can be tweaked to fine tune any excursions from valid and compliant signal levels.

3.2.12 6 Bar Gamut

3.2.12.1 6 Bar Gamut Setup

To set up the 6 Bar Gamut press the **Scope Config** button. This opens the Scope Config window. Click on the **6 Bar Gamut** button on the right. There are a number of options to set up the 6 Bar Gamut:



The 6 Bar Gamut display is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		6 Bar Gamut display		

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 6 Bar Gamut Display

Here is the 6 Bar Gamut display.



The **6 Bar Gamut** shows a set of channel strength markers for both YCbCr and RGB modes. Equivalent values are created depending on the current setup.

3.2.13 Stream Info

3.2.13.1 Stream Info Setup

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



The Stream Info display is added at the NetXScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
				Stream Info display, Graticule

Graticule checkbox – the Stream Info display has no Graticule, so this control has no effect here.

Graticule Brightness slider - the Stream Info display has no Graticule, so this control has no effect here.

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.

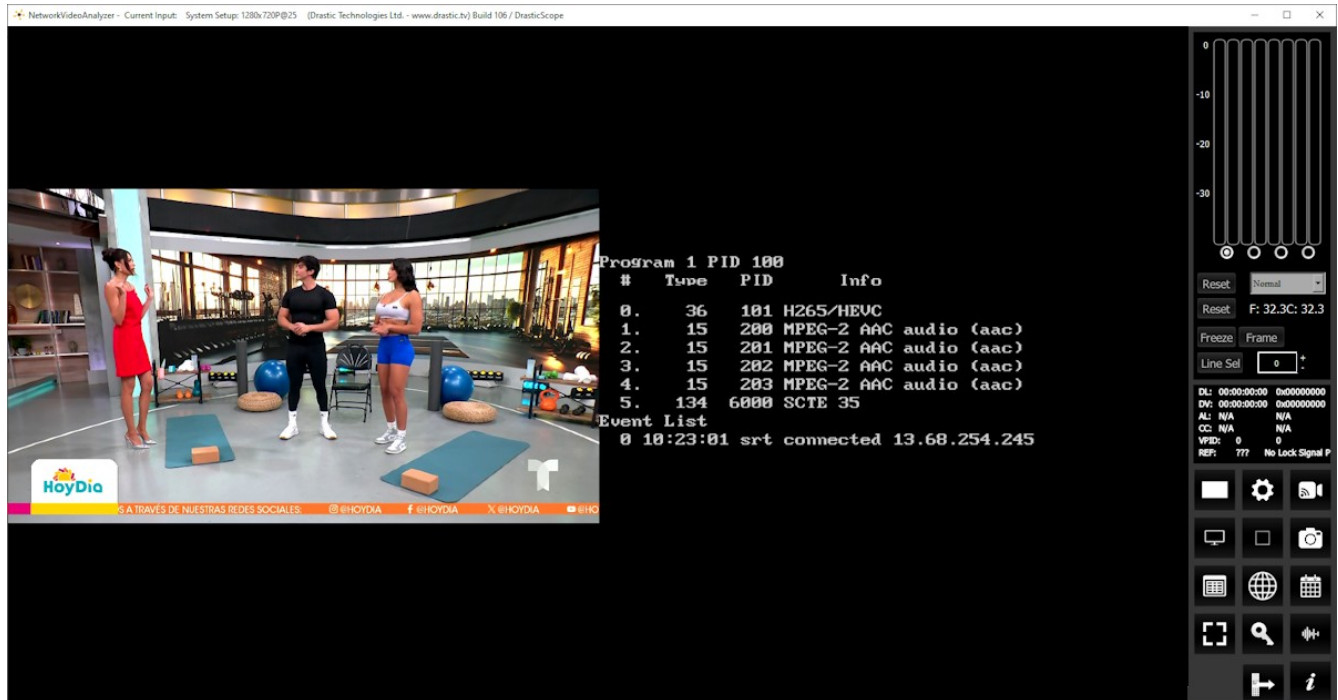
Pressing the x1 button sets the display back to normal.

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 Stream Info Window

Here is the Stream Info window. This example shows a picture view on the left, with the video from the stream, and the stream info on the right.



The **Stream Info** window shows details about an incoming RTP, UDP, SRT, or RIST IP video stream, where one has been set up as an input. The details are:

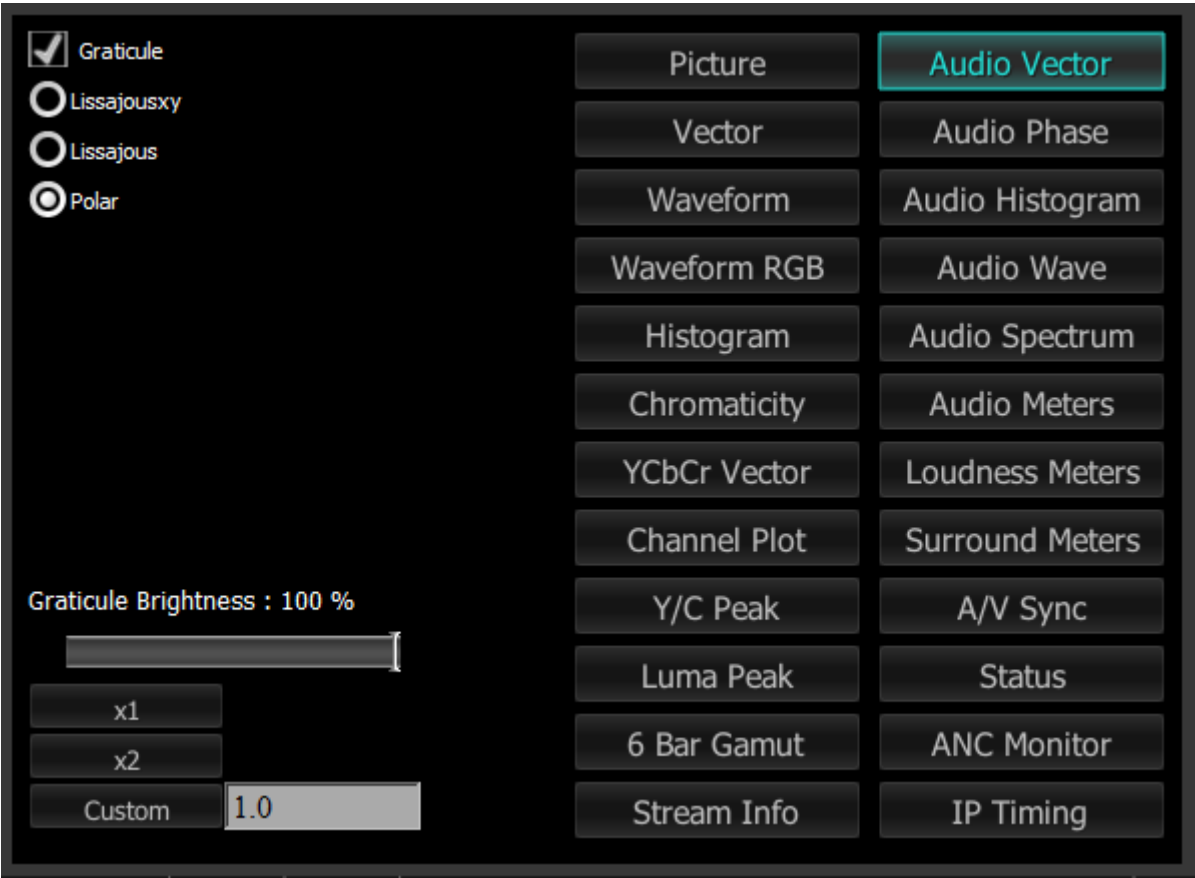
- Program Number/ID
- The media elements in the signal, featuring the details:
 - Element number
 - Element type
 - Element PID
 - Element Info
- The event list, in case any errors or messages are generated in connecting to the stream. The event list shows:
 - Event number
 - The time the event occurred
 - The type of stream and its state
 - The IP address of the stream

The Event list is the same one accessible through the Error log.

3.2.14 Audio Vector

3.2.14.1 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 Vector display:



The Audio Vector scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Vector scope, Graticule, Mode Selectors		

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

described below.

Lissajousxy, **Lissajous**, and **Polar** checkboxes – clicking/selecting one of these controls deselects the others. Use these buttons to set the mode to set the display to either Lissajousxy, Lissajous, or Polar configurations.

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.

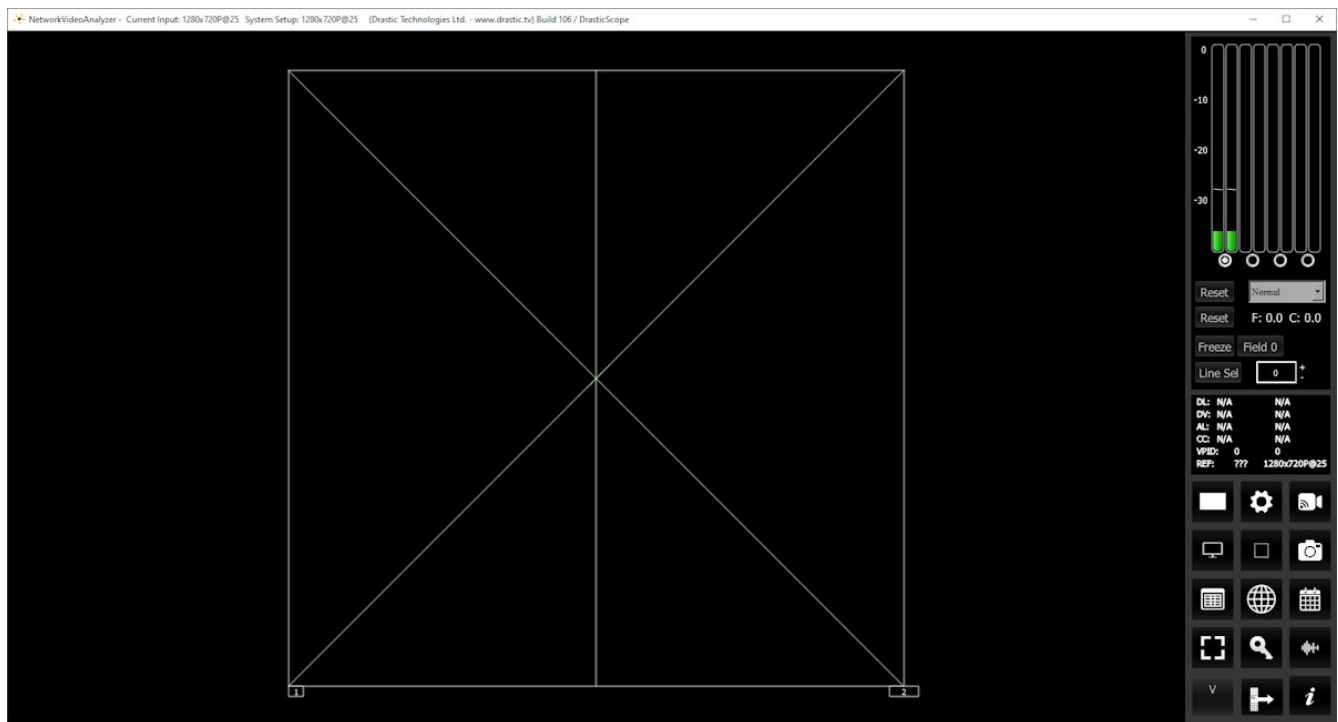
Custom button and field – The user may enter a custom enlargement value in the field, and press the Custom button to zoom in and see details up close. Pressing the x1 button sets the display back to normal.

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

3.2.14.2 Audio Vector Window

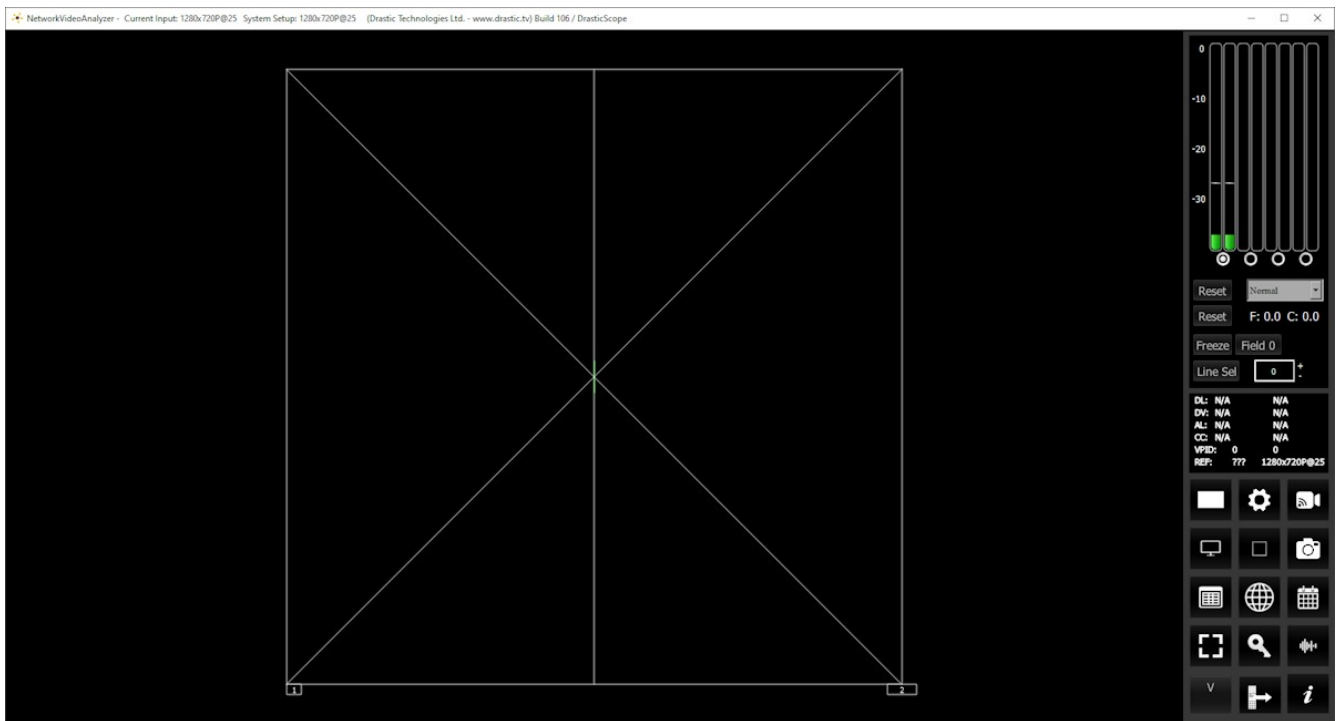
There are 3 types of audio vectorscope displays available.

Lissajous XY mode



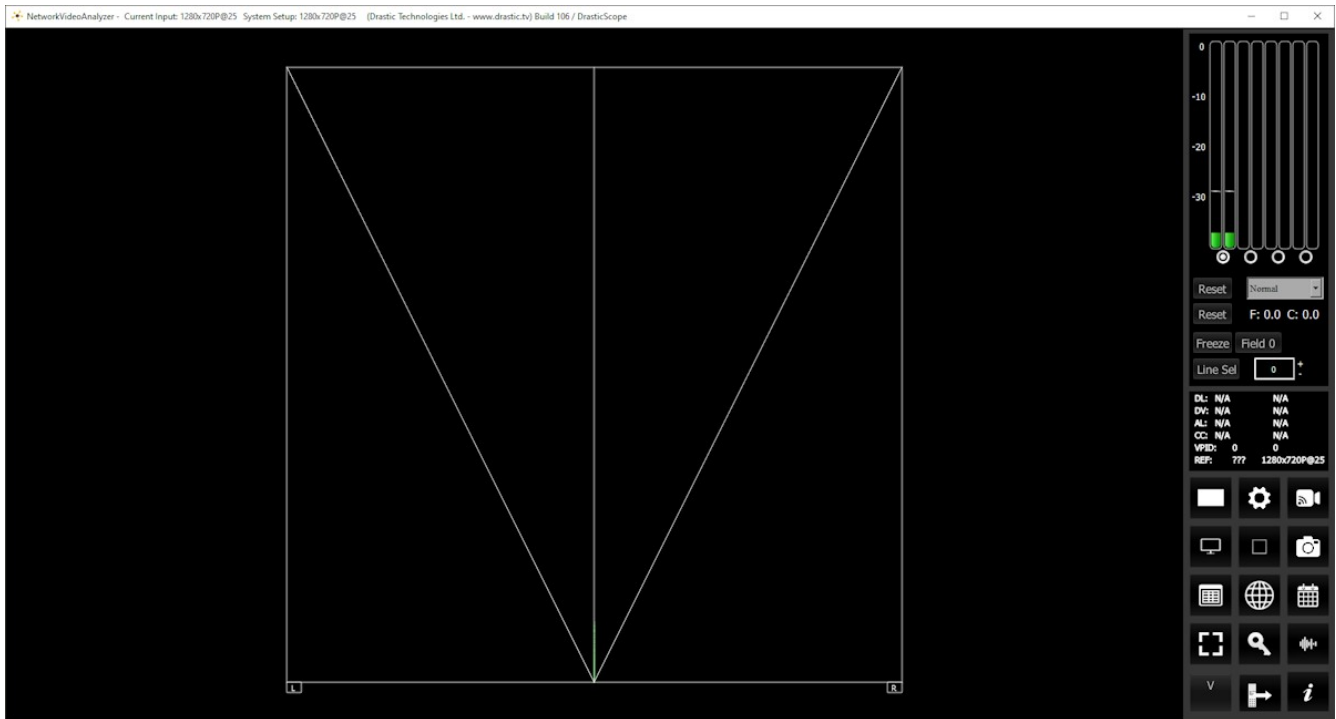
Lissajous XY mode centers the two audio channels along the X-Y axis (from the lower left corner to the upper right corner), and shows any difference between the channels as moving closer to vertical (left channel has more signal) or closer to horizontal (right channel has more signal).

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



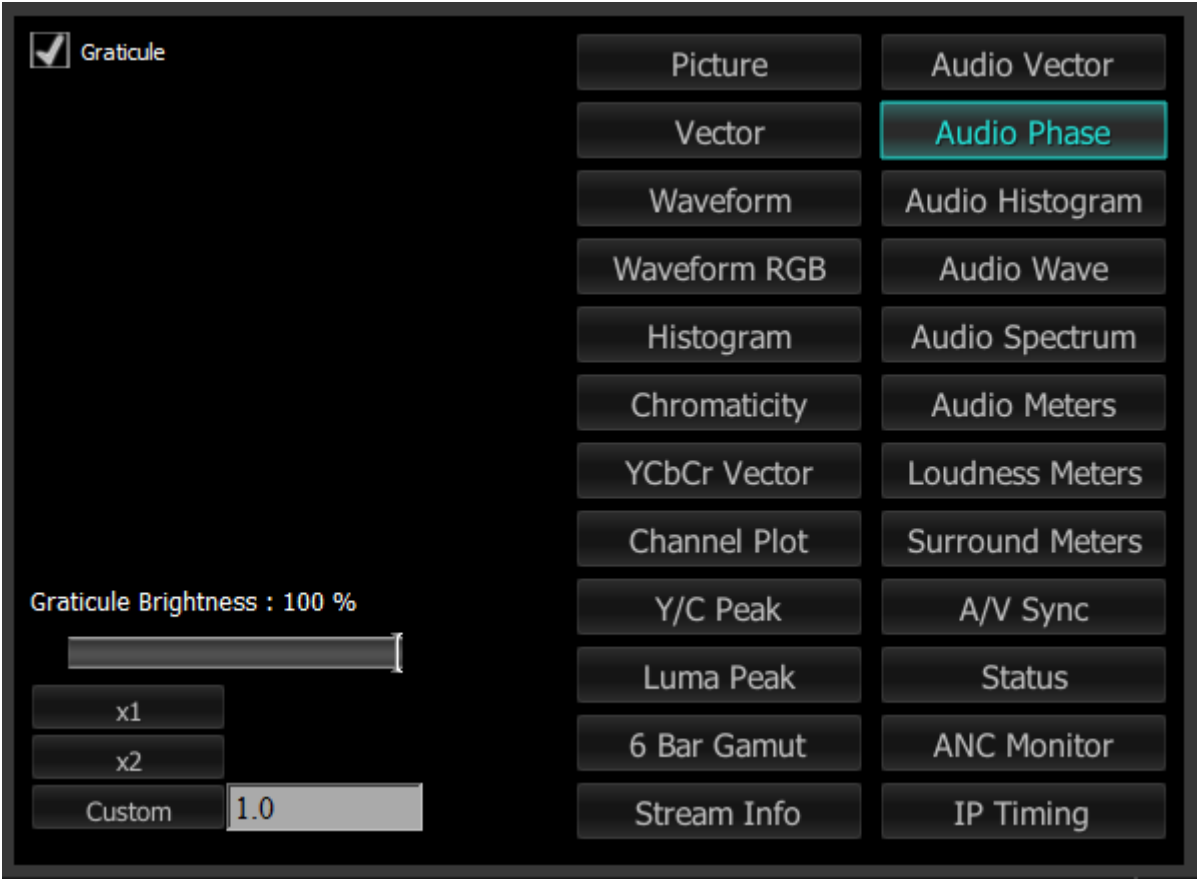
Polar mode centers the two audio channels along the vertical axis starting at the bottom center, and shows any difference between the channels as either angled to the left (left channel has more signal) or angled to the right (right channel has more signal).

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

3.2.15 **Audio Phase**

3.2.15.1 **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:



The Audio Phase scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Phase scope		

Graticule checkbox – when selected, the graticule is laid over the Audio Phase 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.

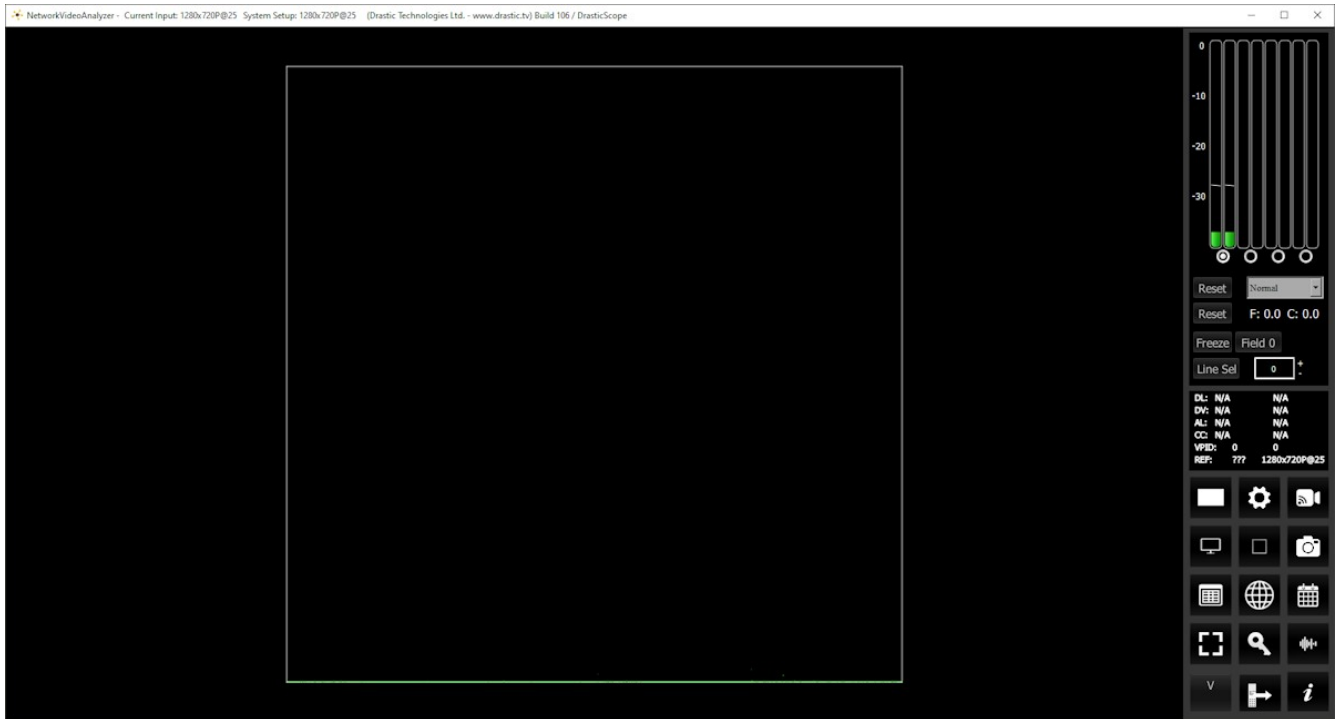
Pressing the x1 button sets the display back to normal.

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 Phase Window

Here is the Audio Phase window.

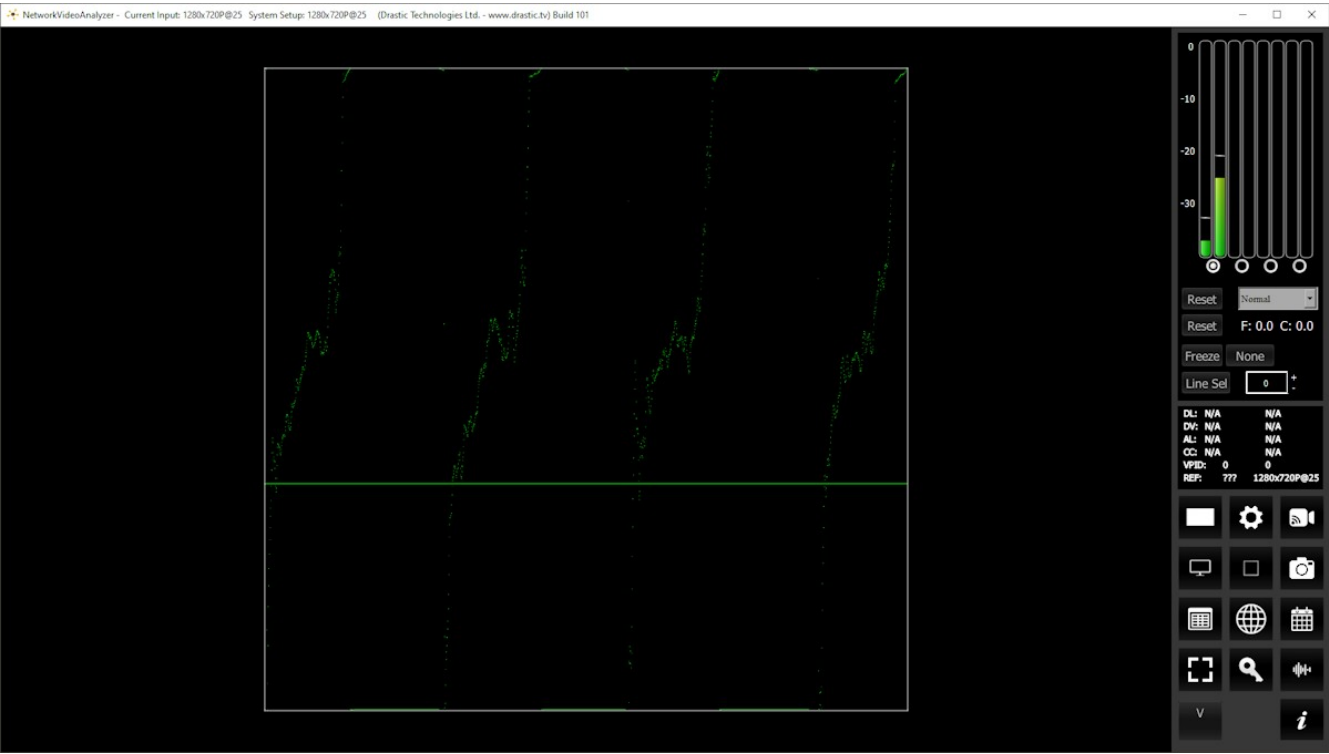


The **Audio Phase** meter shows the phase relationship of the selected pair of audio channels.

The more in-phase the two channels are, the closer to the bottom of the screen the green line will be.

An out of phase pair of channels will display a line closer to the top. The more out of phase they are, the closer to the top the line will be. Out of phase channel pairs will have issues, such as distortion or dropouts. A perfectly out of phase pair of channels will produce silence.

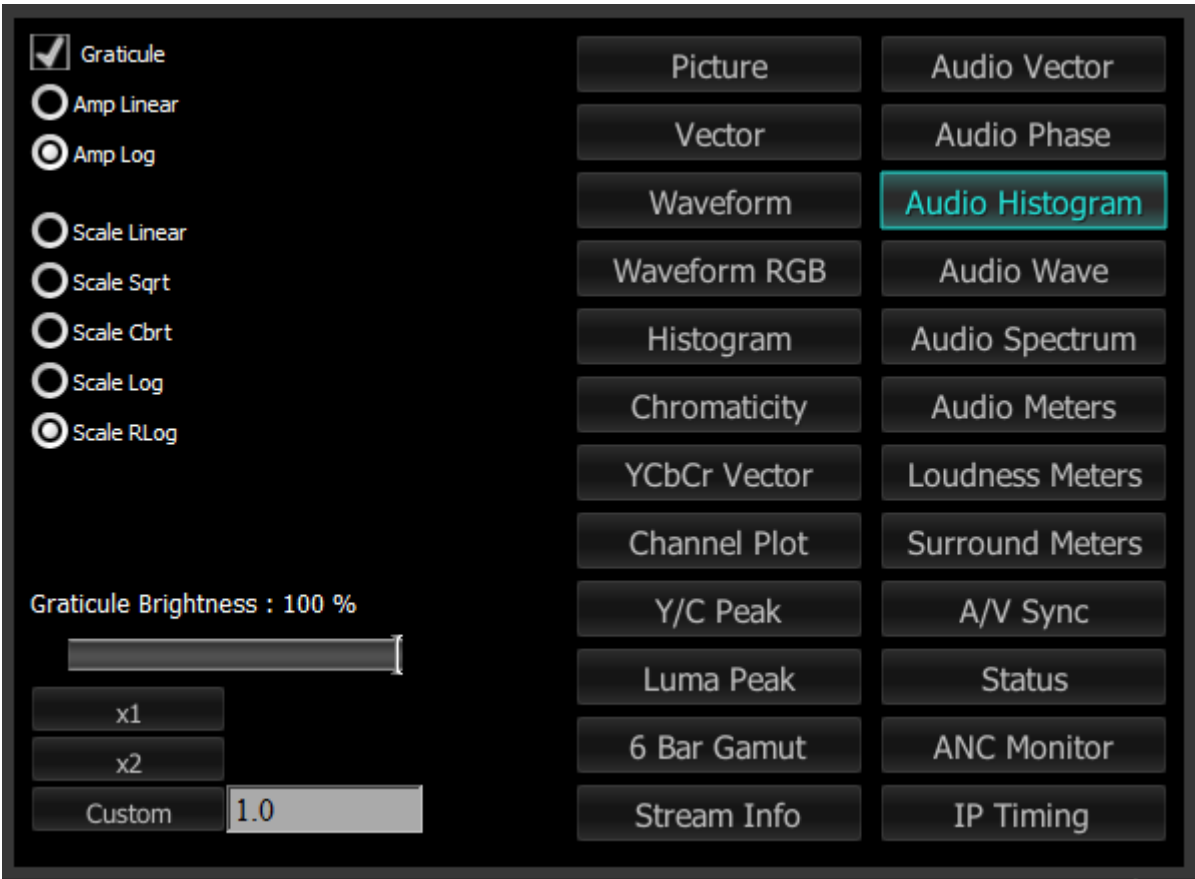
Shown below is a pair of audio channels with audio phase issues.



3.2.16 Audio Histogram

3.2.16.1 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:



The Audio Histogram scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Histogram scope, Graticule, Amp/Scale Selectors		

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

described below.

Amp Linear and **Amp Log** selectors – clicking/selecting one deselects the other. Use these controls to set the amp method to either a linear or logarithmic amp setting.

Scale Linear, **Scale Sqrt**, **Scale Cbrt**, **Scale Log**, **Scale RLog**, **Scale Rlog** checkboxes – selecting one of these deselects all the others. Use these controls to set the scale.

Choices include:

Scale Linear – linear scale.

Scale Sqrt – square root scale.

Scale Cbrt – cubed root scale.

Scale Log – logarithmic scale.

Scale RLog – reverse logarithmic scale.

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.

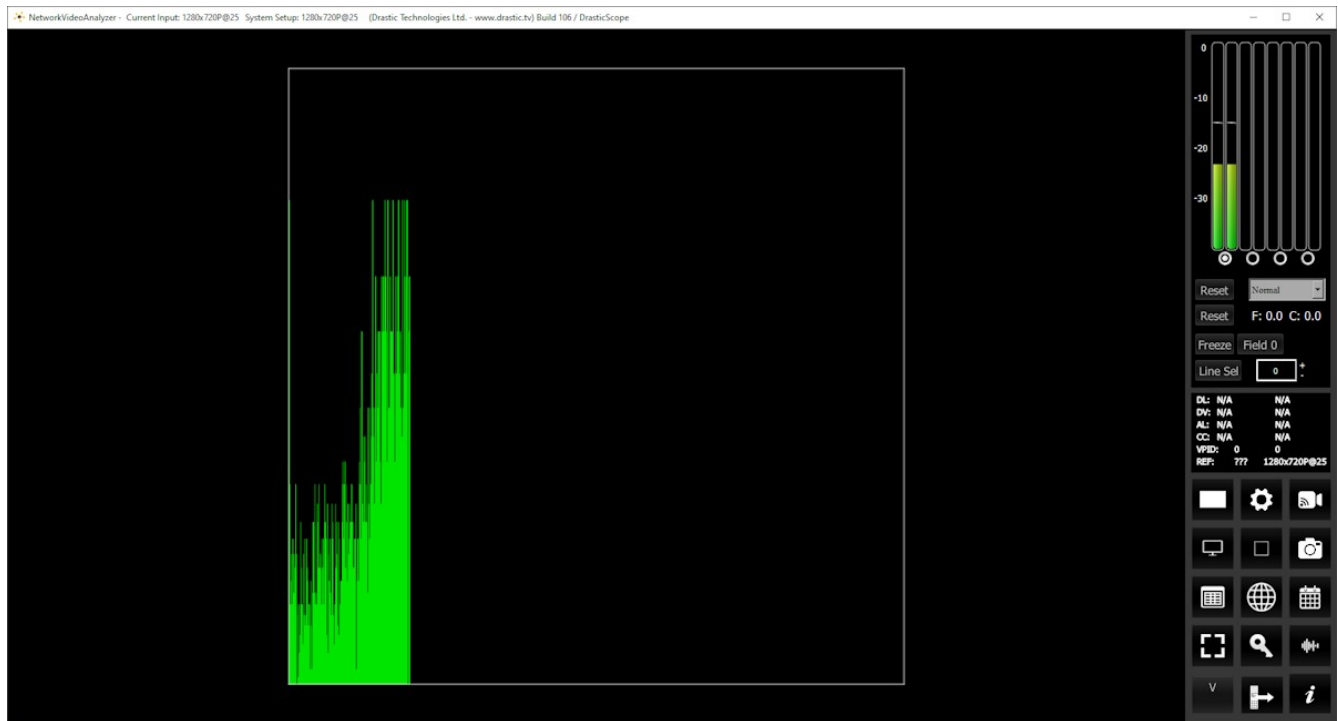
Pressing the x1 button sets the display back to normal.

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.

3.2.16.2 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, cube root, log or reverse log.

3.2.17 **Audio Wave**

3.2.17.1 **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:



The Audio Wave scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Wave scope, Graticule		

Graticule checkbox – when selected, the graticule is laid over the Audio Wave 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.

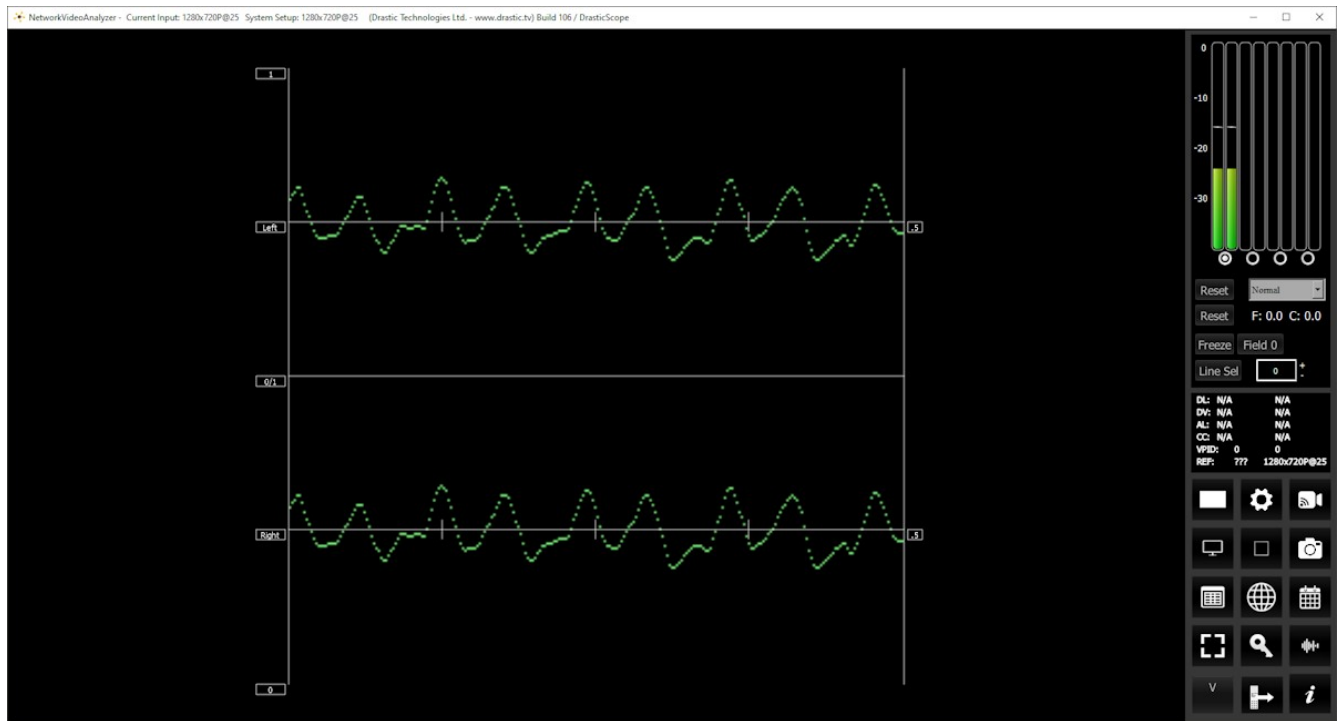
Pressing the x1 button sets the display back to normal.

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.

3.2.17.2 Audio Wave Window

Here is the Audio Wave window.

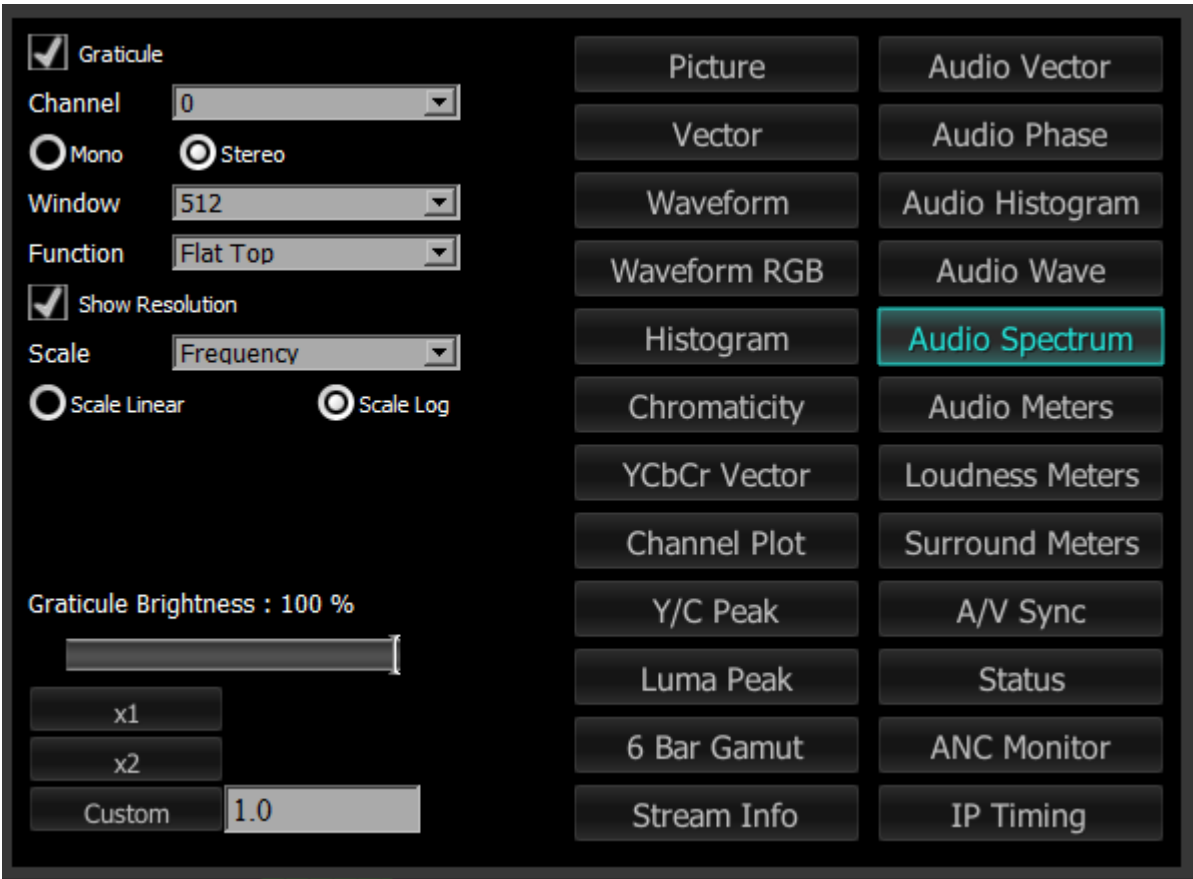


The **Audio Waveform** of any pair of channels can be displayed by selecting its radio button in the on-GUI audio meters.

3.2.18 Audio Spectrum

3.2.18.1 Audio Spectrum Setup

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



The Audio Spectrum scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Spectrum scope, Graticule, controls		

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

described below.

Channel pulldown menu – lets the user select the first channel of the channel pair being monitored.

Mono / Stereo radio buttons – use these buttons to select between a mono (channel pair) or stereo (channel pair). Selecting one button deselects the other.

Window pulldown – sets the number of lines, or resolution, of the spectrum bands. Select between 256, 512, 1024, or 2048.

Function pulldown – sets the type of audio spectrum windowing that will be used. Types include:

Hann - The function is named in honor of von Hann, who used the three-term weighted average smoothing technique on meteorological data. It is also known as **raised cosine**, because the zero-phase version, $w_0(n)$, is one lobe of an elevated cosine function. Smooth taper, moderate resolution.

Bartlett - Triangular, moderate taper. General use, low complexity.

Welch - Parabolic taper. Reducing spectral leakage, good for large windows

Blackman - Strong taper, high side-lobe suppression. High precision, lower spectral leakage, faster calculations with high side-lobe suppression.

Blackman-Harris - for low spectral leakage if you can afford a wider main lobe, the Blackman-Harris window is suitable.

Nuttall - for low spectral leakage if you can afford a wider main lobe, the Nuttall window is suitable.

Gaussian-2.5 - shaped according to a Gaussian function, providing smooth transitions. The Gaussian window is known for providing a good balance between main-lobe width (frequency resolution) and side-lobe height (spectral leakage).

Gaussian-3.5 - shaped according to a Gaussian function, providing smooth transitions. The Gaussian window is known for providing a good balance between main-lobe width (frequency resolution) and side-lobe height (spectral leakage).

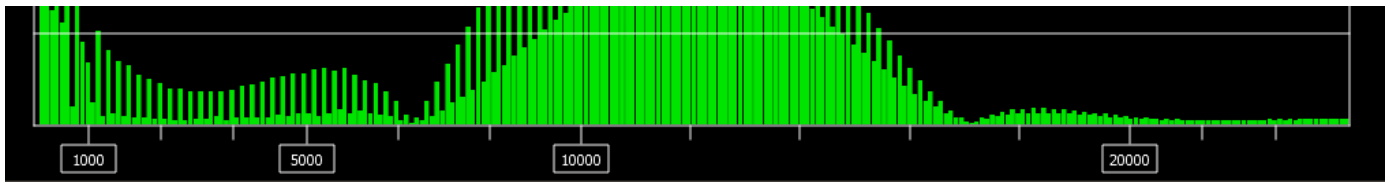
Gaussian-4.5 - shaped according to a Gaussian function, providing smooth transitions. The Gaussian window is known for providing a good balance between main-lobe width (frequency resolution) and side-lobe height (spectral leakage).

Flat Top - designed to provide the least spectral distortion. It has very flat main lobes and significantly reduced side lobes, making it useful for applications requiring high precision in amplitude measurements.

Show Resolution checkbox – when selected, displays the resolution value above the scope.

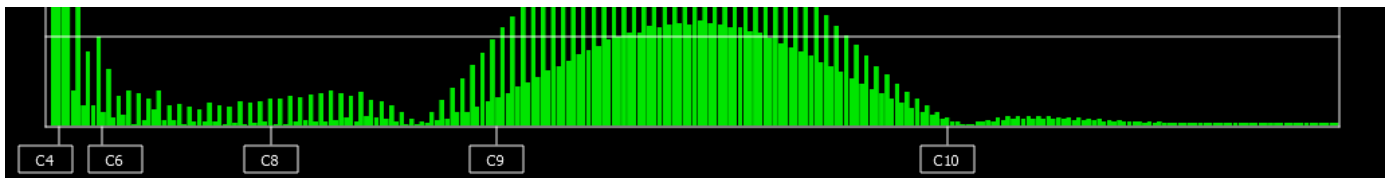
Scale pulldown menu – select between Frequency, and Octave.

With **Frequency** selected, the graticule offers audio frequency markers along the bottom:

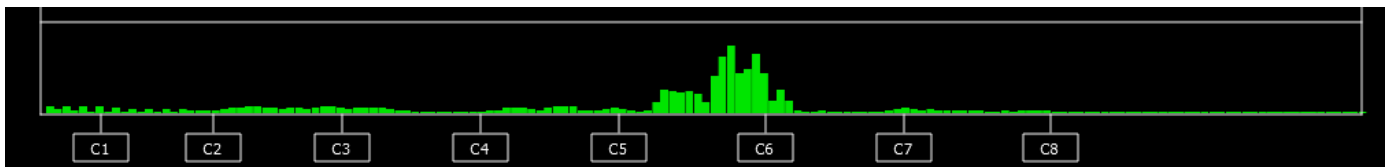


With **Octave** selected, the graticule offers a scale that shows where C is at each octave.
C notes on the piano in cycles per second (Hertz)

C1 = 37.868
C2 = 65.406
C3 = 130.81
C4 = 261.63
C5 = 523.25
C6 = 1046.5
C7 = 2093.0
C8 = 4186.0
C9 = 8372.0
C10 = 16,744



Scale **Linear** and **Log** buttons – with Linear selected (above), the scale shows each octave as doubling the last. Notice how there is a small space between C4 and C6, and a huge space between C9 and C10. With Log selected as in the image below, the octaves are evenly spaced.



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.

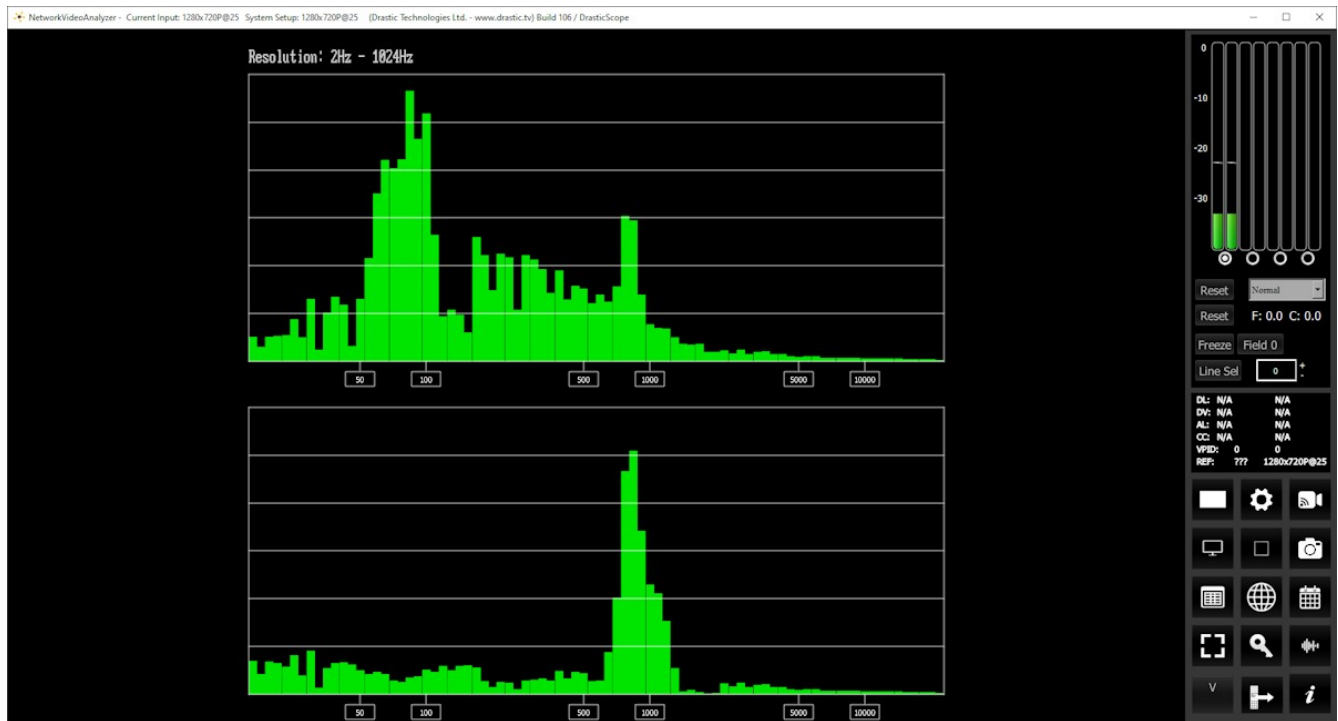
Custom button and field – The user may enter a custom enlargement value in the field, and

press the Custom button to zoom in and see details up close. Pressing the x1 button or right clicking on the scope sets the display back to normal. Also, a mouse scroll wheel can be used to zoom in and out.

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

3.2.18.2 Audio Spectrum Window

Here is the Audio Spectrum window.



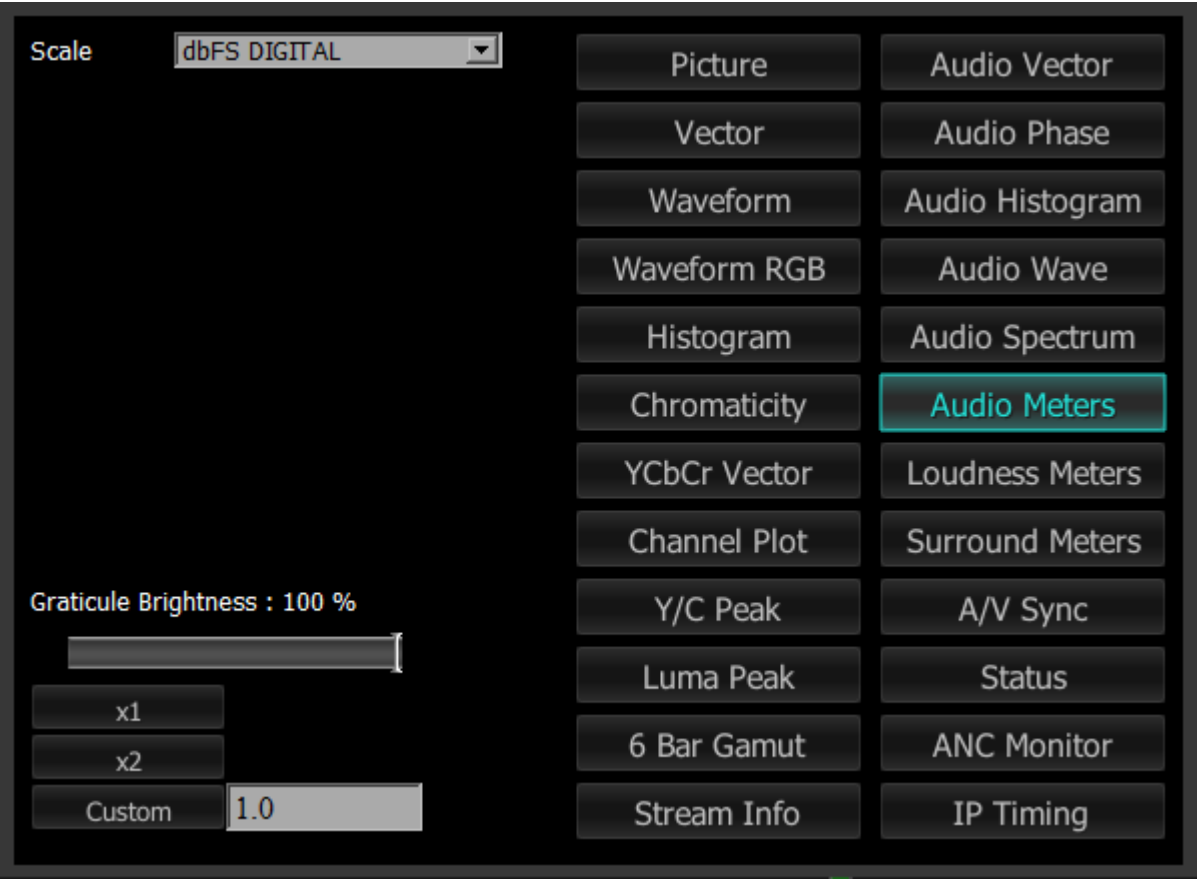
The **Audio Spectrum** of any pair of channels can be displayed. For stereo signals, left and right are shown stacked.

In the above image, the scope is set to: Stereo, a 256 window, with a Flat Top function, the Show Resolution checkbox checked, the scale set to Frequency, and logarithmic.

3.2.19 Audio Meters

3.2.19.1 Audio Meters Setup

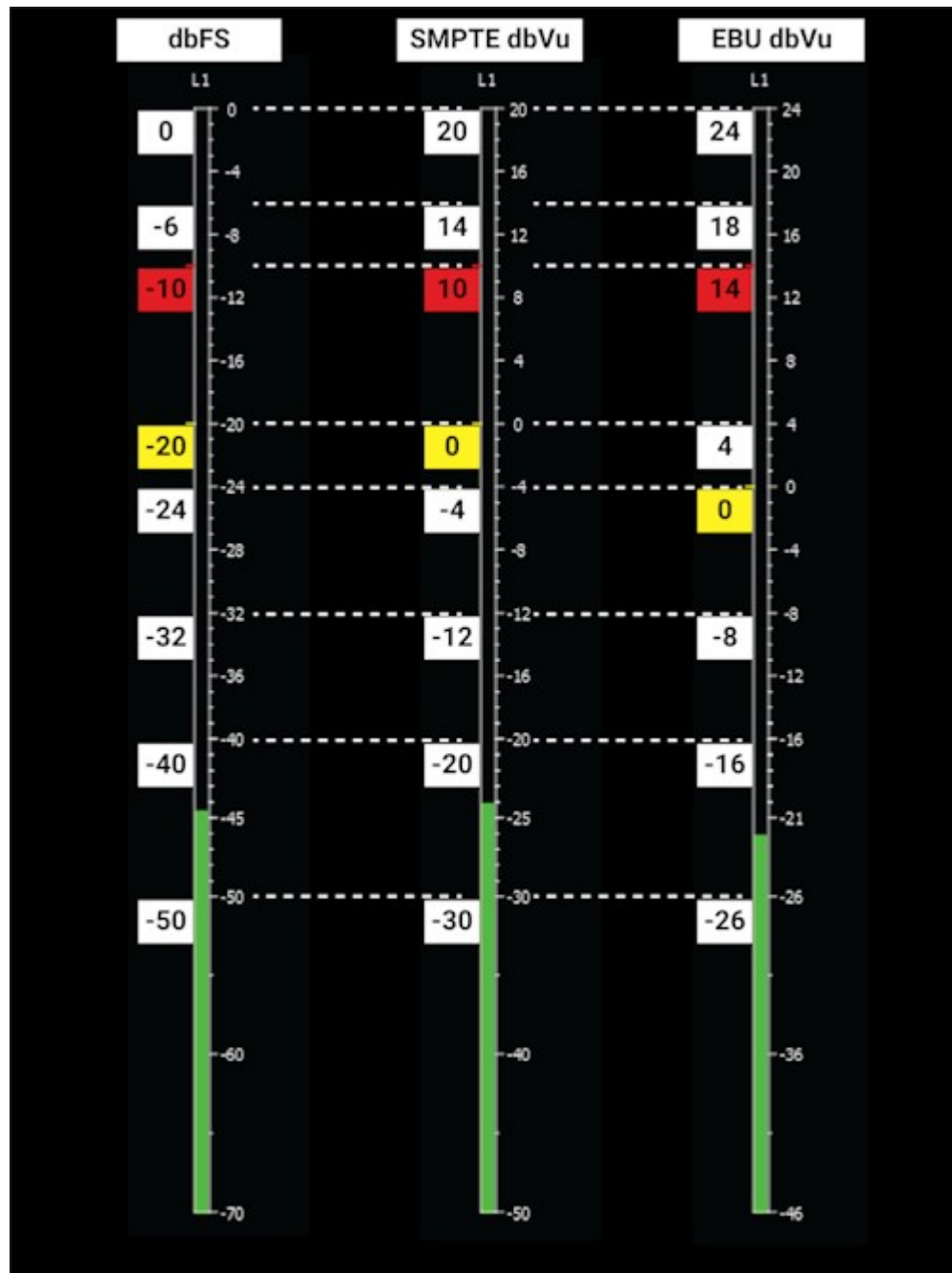
To set up the Audio Meters press the **Scope Config** button. This opens the Scope Config window. Click on the **Audio Meters** button on the right. There are a number of options to set up the Audio Meters display:



The Audio Meters scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Meters scope, Scale		

Scale pulldown menu – provides three types of audio scale: dbFS DIGITAL, SMPTE dbVU, and EBU dbVU. Here is a chart with the correspondences:



Graticule checkbox – when selected, the graticule is laid over the Audio Meters 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.

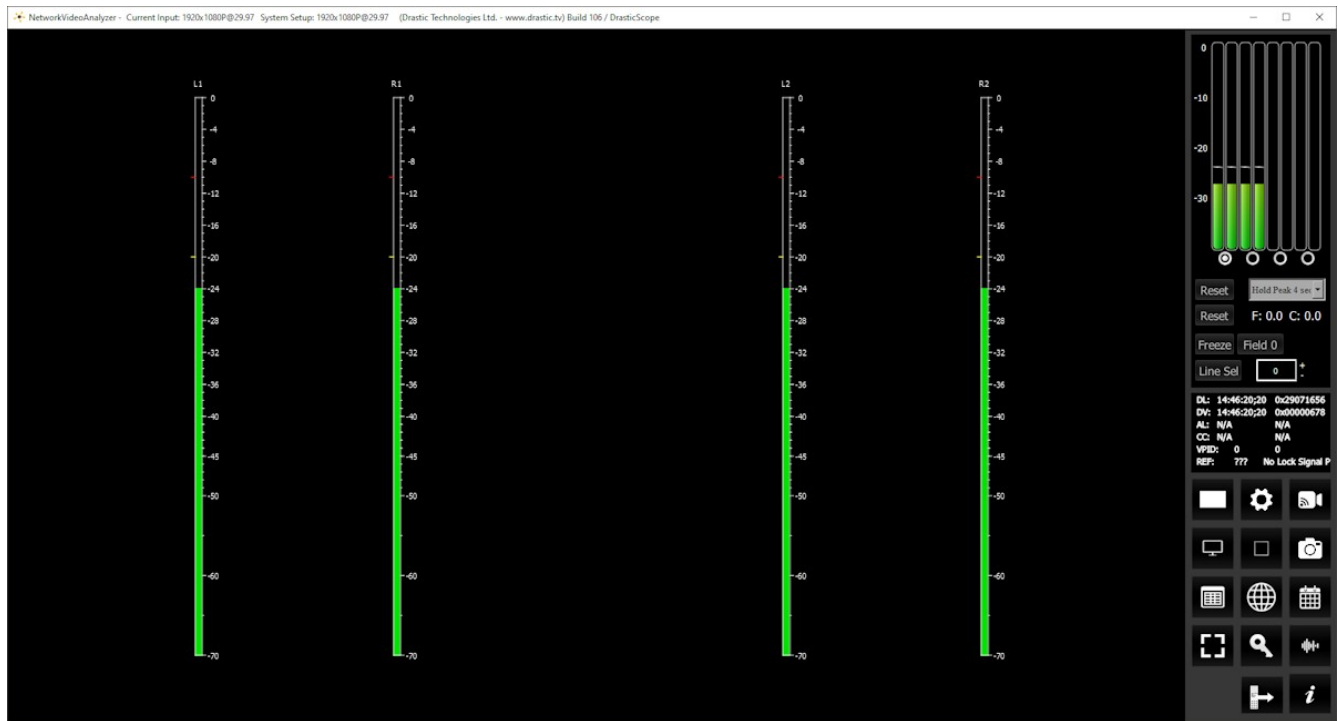
Pressing the x1 button sets the display back to normal.

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 or right clicking on the scope sets the display back to normal. Also, a mouse scroll wheel can be used to zoom in and out.

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

3.2.19.2 Audio Meters Window

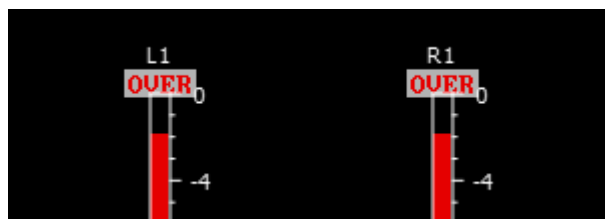
Here is the Audio Meters window.



A set of up to 16 audio meters are displayed, depending on the capabilities of the system. Channels that are set up for the system but do not have an input are shown with a "MUTE" label.



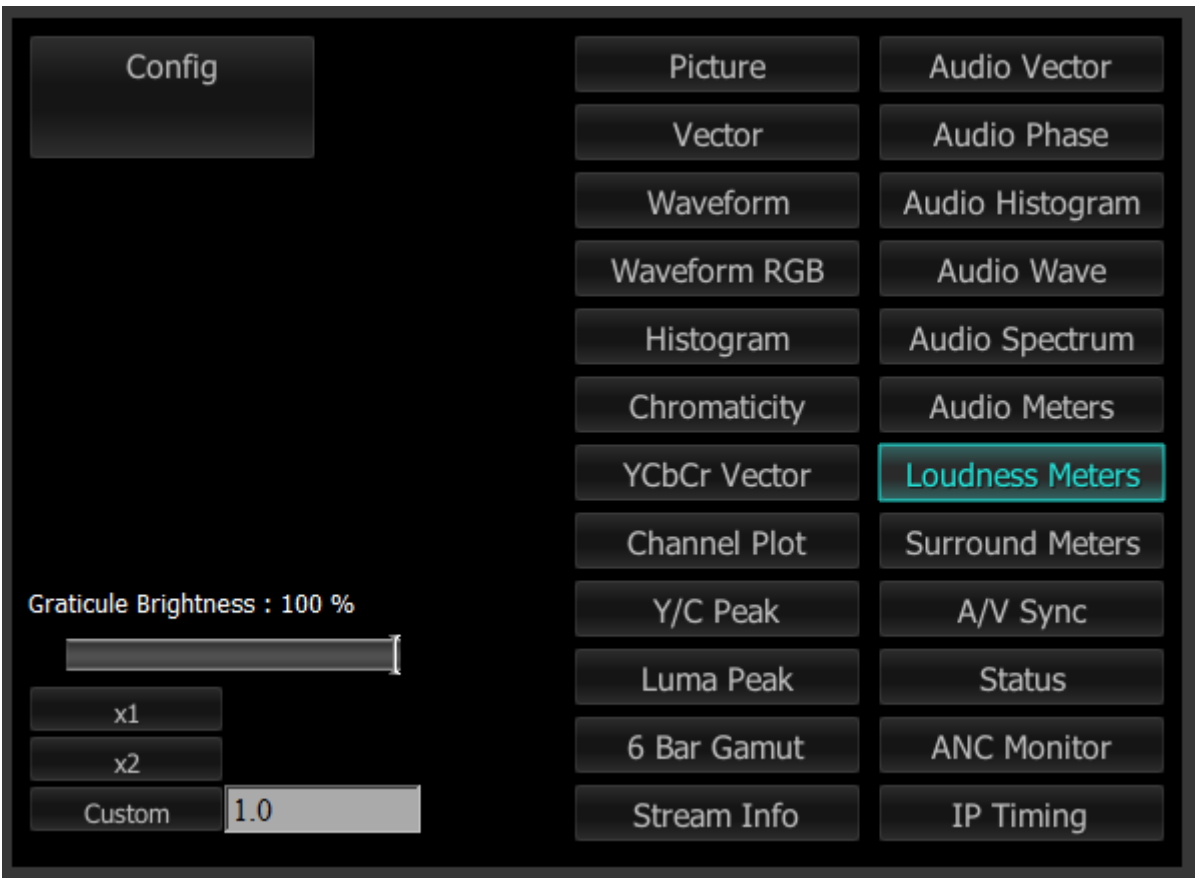
Where levels are too high, a red "OVER" warning is displayed for a couple seconds, to provide a visual cue for an operator or QC personnel.



3.2.20 Loudness Meters

3.2.20.1 Loudness Meters Setup

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



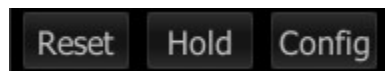
The Loudness Meters scope is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Loudness Meters scope, Config		

Note: selecting the Loudness scope assumes you will have gone into the **Config**, and set the **Audio Scale** to one of the Loudness settings. If you have not done so, a reminder will appear:

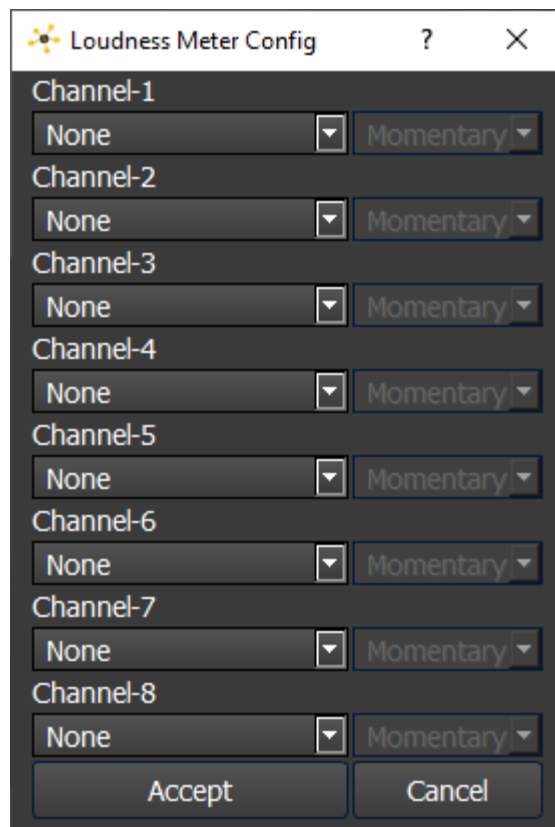


With either of the loudness scales set, the Hold Peak/RMS pulldown menu is replaced with a **Hold/Cont.** Button, and a **Config** button for loudness configuration.

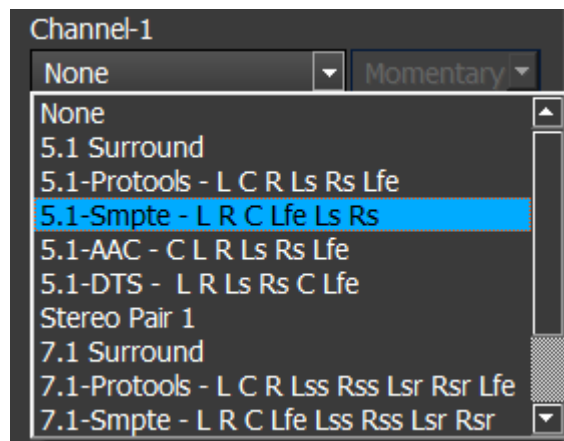


The **Hold/Cont.** Button toggles between “hold” (hold the current peak levels) and “cont.” (continue to process signal levels).

The **Config** button opens the **Loudness Meter Config** dialog.



In this dialog there are a number of presets for monitoring differing audio input types.



Presently these include:

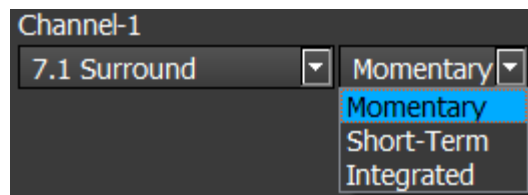
- None

- 5.1 Surround
- 5.1-Protocols - L C R Ls Rs Lfe
- 5.1 Smppte - L R C Lfe Ls Rs
- 5.1-AAC - C L R Ls Rs Lfe
- 5.1-DTS - L R Ls Rs C Lfe
- Stereo Pair 1
- 7.1 Surround
- 7.1-Protocols - L C R Lss Rss Lsr Rsr Lfe
- 7.1-Smppte - L R C Lfe Lss Rss Lsr Rsr
- 7.1-EXT - L R C Lfe Lss Rss Lsr Rsr
- 7.1-Dolby - L C R Ls Rs Lfes Bsl Bsr
- Stereo Pair 2

The descriptions for the channels (abbreviated above) are as follows:

- L = Left
- R = Right
- C = Center
- Ls = Left Surround
- Rs = Right Surround
- Lfe = Low Frequency Effects
- Lss = Left Side Surround
- Rss = Right Side Surround
- Lsr = Left Rear Surround
- Rsr = Right Rear Surround
- Lfes = Low Frequency Effects
- Bsl = Back Surround Left
- Bsr = Back Surround Right

Each channel can be set up separately. Once an input type has been selected, the user can select between measurement options.



These include:

- **Momentary Loudness** – measures the loudness of the past 400 Milliseconds

- **Short-Term Loudness** – measures the loudness of the past 3 Seconds
- **Integrated Loudness** – (Also called Programme Loudness) indicates how loud the programme is on average, and is measured over entire duration of material

At the bottom of the Loudness Meter Config dialog, there is an **Accept** button to enable any changes you have made, and there is a **Cancel** button to exit the dialog without making any changes to the settings.

Graticule Brightness slider – moving the Graticule Brightness slider has no effect on the Loudness Meters.

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.

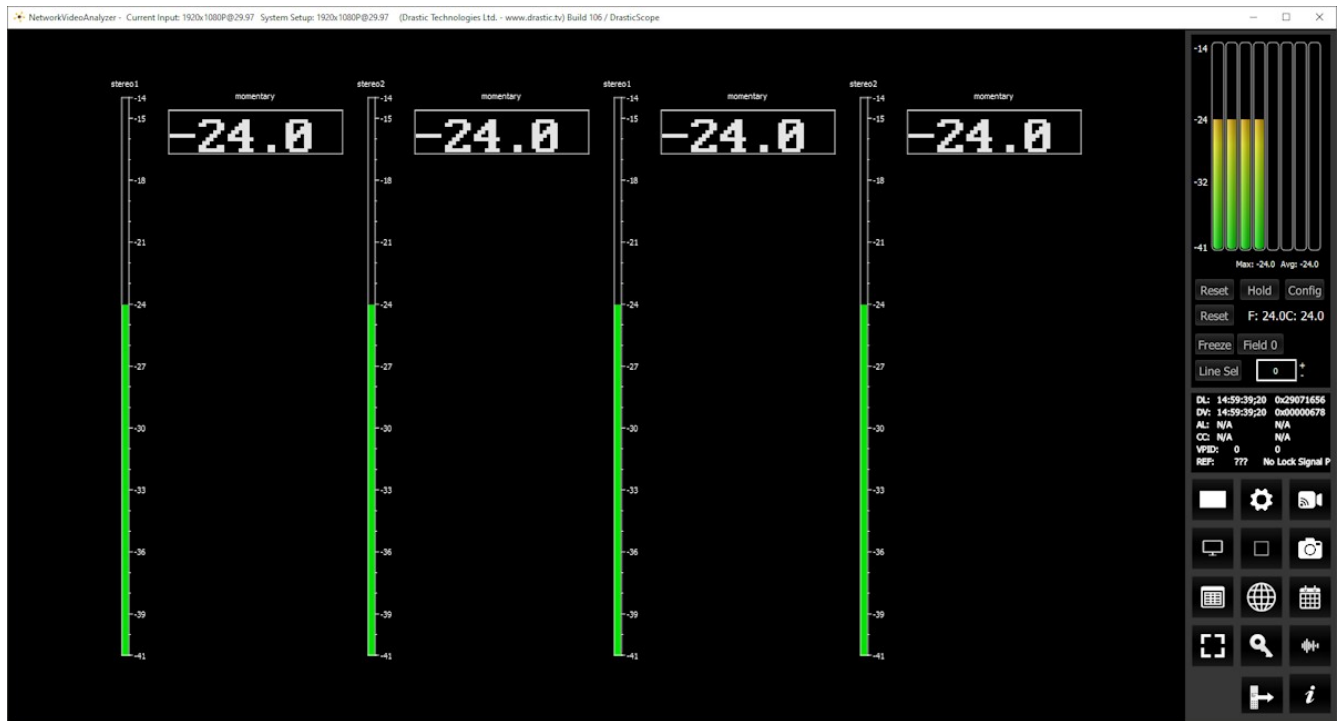
Pressing the x1 button sets the display back to normal.

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 or right clicking on the scope sets the display back to normal. Also, a mouse scroll wheel can be used to zoom in and out.

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

3.2.20.2 Loudness Meters Window

Here is the Loudness Meters window.

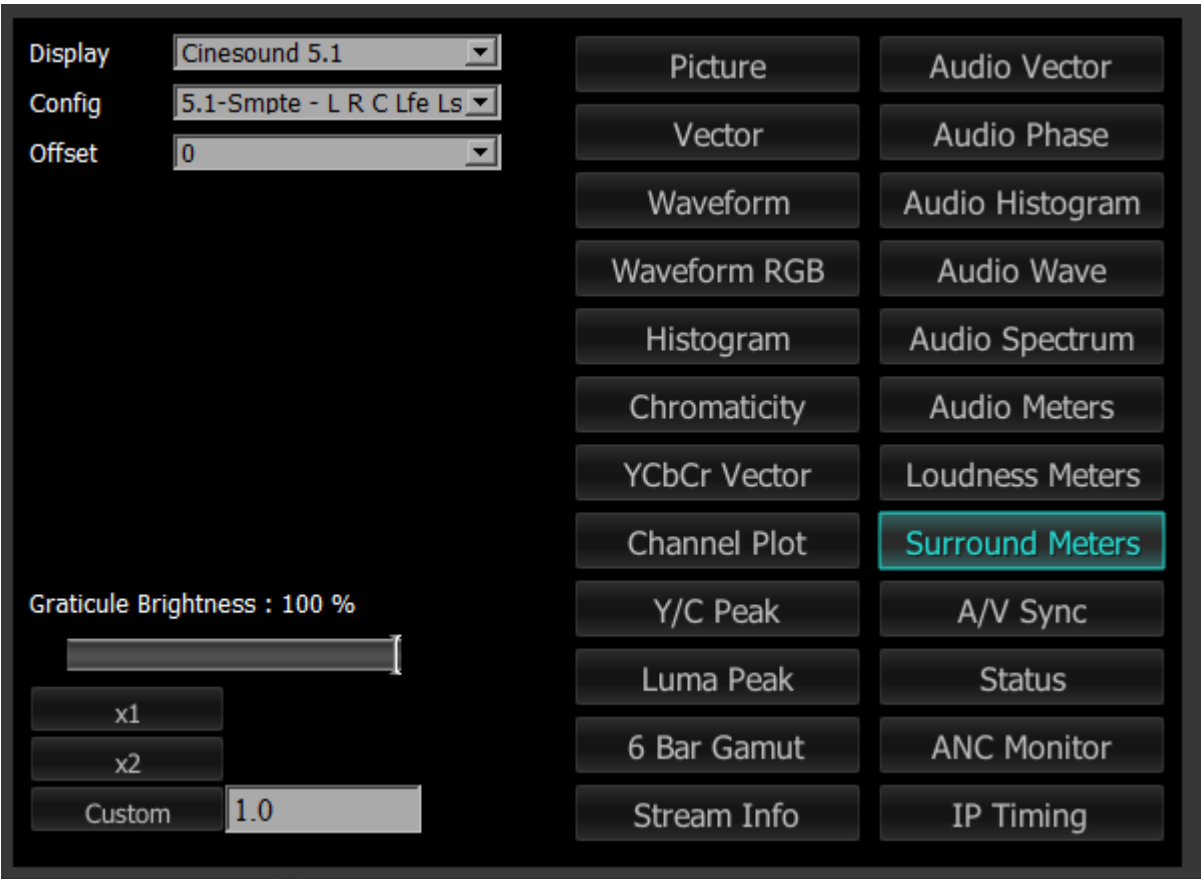


A set of up to 8 **Loudness Meters** (pairs) are displayed, depending on the capabilities of the system. Note that the Config must be set to one of the loudness settings for this set of meters to see any levels.

3.2.21 Surround Meters

3.2.21.1 Surround Meters Setup

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



The Surround Meters scope is added at the 4KScope level.

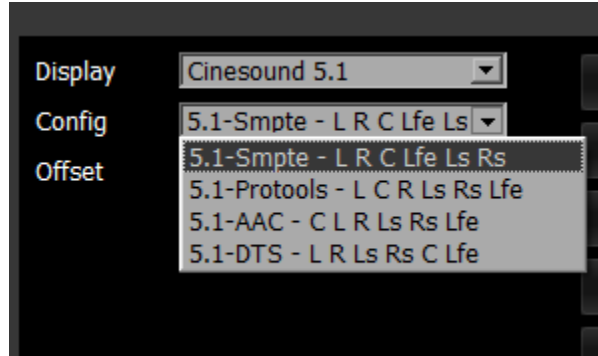
Free	sdiScope	4KScope	HDRScope	NetXScope
		Surround Meters scope, controls		

Display pulldown – select between Cinesound 5.1 or Cinesound 7.1.

Config pulldown – select the ordering of the channels per specific workflow, such as ProTools,

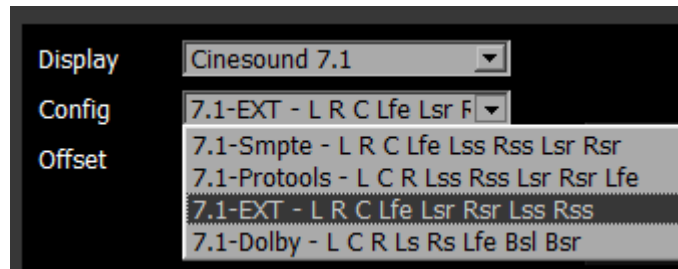
SMPTE etc. The following setups are available:

With Cinesound 5.1 selected:



- 5.1 Smpte - L R C Lfe Ls Rs
- 5.1-Protocols - L C R Ls Rs Lfe
- 5.1-AAC - C L R Ls Rs Lfe
- 5.1-DTS - L R Ls Rs C Lfe

With Cinesound 7.1 selected:



- 7.1-Smpte - L R C Lfe Lss Rss Lsr Rsr
- 7.1-Protocols - L C R Lss Rss Lsr Rsr Lfe
- 7.1-EXT - L R C Lfe Lss Rss Lsr Rsr
- 7.1-Dolby - L C R Ls Rs Lfe Bsl Bsr

The descriptions for the channels (abbreviated above) are as follows:

- L = Left
- R = Right
- C = Center
- Ls = Left Surround
- Rs = Right Surround

- Lfe = Low Frequency Effects
- Lss = Left Side Surround
- Rss = Right Side Surround
- Lsr = Left Surround Rear
- Rsr = Right Surround Rear
- Bsl = Back Surround Left
- Bsr = Back Surround Right

Offset pulldown – use the pulldown menu to rotate the channels, if necessary, to get the first channel of surround sound to line up with your source and/or monitoring setup.

Graticule Brightness slider – moving the Graticule Brightness slider has no effect on the Surround Meters.

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

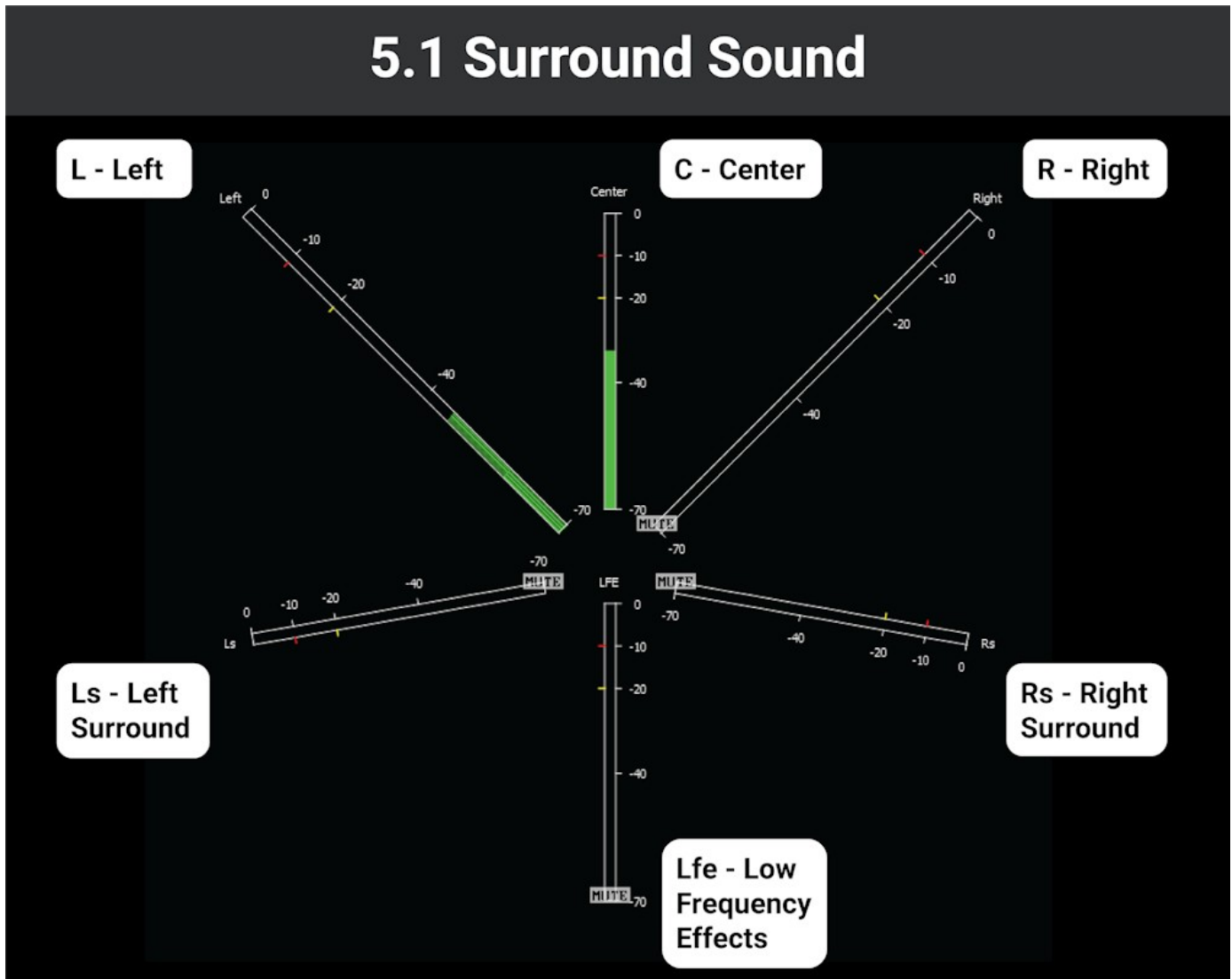
x2 button – clicking this display zooms in to set the display at 200%, or 2x normal display. Pressing the x1 button sets the display back to normal.

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 or right clicking on the scope sets the display back to normal. Also, a mouse scroll wheel can be used to zoom in and out.

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

3.2.21.2 5.1 Surround Meters Window

The Surround Meters window has 4 modes for setting up 5.1 inputs.



Smpte - L R C Lfe Ls Rs

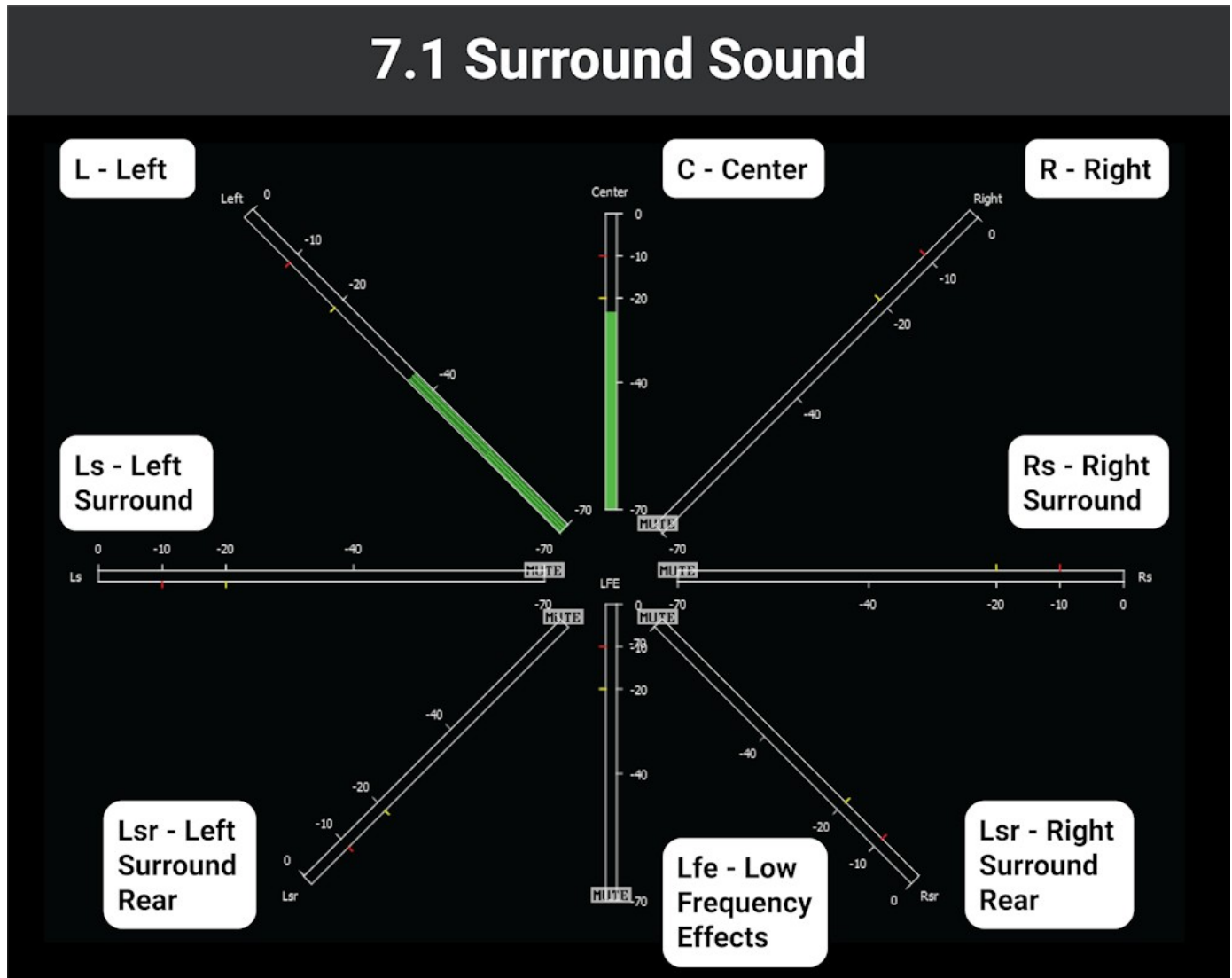
Protools - L C R Ls Rs Lfe

AAC - C L R Ls Rs Lfe

DTS - L R Ls Rs C Lfe

3.2.21.3 7.1 Surround Meters Window

The Surround Meters window has 4 modes for setting up 7.1 inputs.



Smpte - L R C Lfe Lss Rss Lsr Rsr

Protools - L C R Lss Rss Lsr Rsr Lfe

EXT - L R C Lfe Lsr Rsr Lss Rss

Dolby - L C R Ls Rs Lfe Bsl Bsr

3.2.22 A/V Sync Window

3.2.22.1 A/V Sync Setup

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



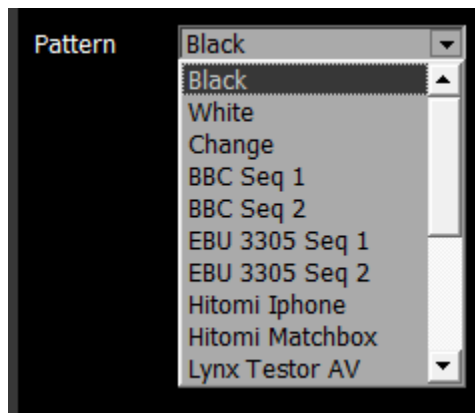
The A/V Sync display is added at the HDRScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
			A/V Sync scope, controls	

Pattern pulldown menu – select the motion pattern type being used to check A/V Sync. Drastic patterns, as well as a number of third party patterns, are supported. Choices include:

- Black

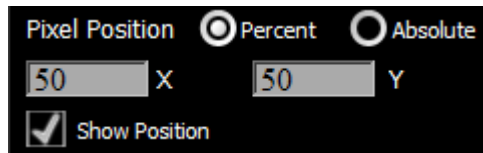
- White
- Change
- Drastic iPhone
- BBC Seq 1
- BBC Seq 2
- EBU 3305 Seq 1
- EBU 3305 Seq 2
- Hitomi iPhone
- Hitomi Matchbox
- Lynx Testor AV
- PhotoJoseph
- Sarnoff Visualizer
- Sync-It
- Tektronix
- Twitch
- Valid
- VAL Check
- VB440



Tone pulldown menu – select the tone type that has been set to test the A/V Sync. Choices include **Sine**, and **Silence**.

Clock Source pulldown – select between clock sources. Choices include PC NTP (network time protocol), or PTP (precision time protocol).

Pixel Position radio buttons – select between available pixel position modes. Provides an X and a Y field to set the position location. The **Show Position** checkbox shows the X and Y values for the position when checked.



Read QR Code checkbox – when checked, display the QR code's details in the A/V Sync window.

Graticule Brightness slider – As the A/V Sync display has no graticule, this control has no effect here.

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.

3.2.22.2 A/V Sync Window

Here is the A/V Sync window.



The **A/V Sync** window is designed to view specific A/V Sync test patterns via IP stream and analyze whether the audio is arriving in sync with the video. If there is a timing mismatch, the details will be displayed in real time so adjustments can be made.

The top row shows the current frame of video. It provides a preview of the signal, the time code location, and the audio pair being monitored for sync.

The second row shows one flash prior, and the third row shows two flashes prior. For each flash the frame immediately before and the frame immediately after are shown. In the example the AV Sync scope 'tone' is set to silence, and the Test Pattern Generator is set to output Silence along with the pattern.

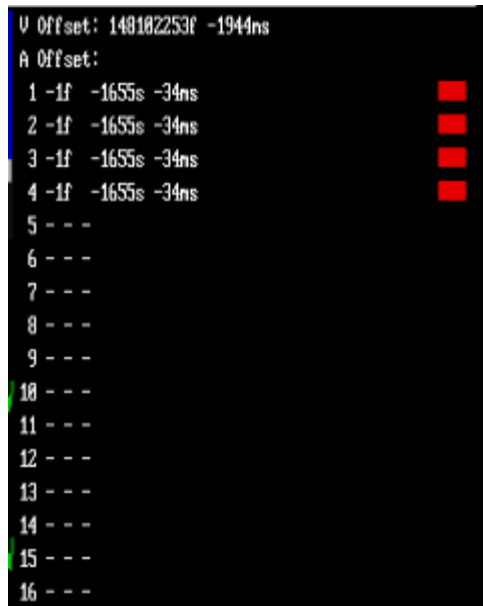
The data to the right of each flash section detail audio and video offsets where detected.

V Offset: 148182253f -1947ns		
A Offset:		
1 0f	24s	0ns
2 0f	24s	0ns
3 0f	24s	0ns
4 0f	24s	0ns
5 - - -		
6 - - -		
7 - - -		
8 - - -		
9 - - -		
10 - - -		
11 - - -		
12 - - -		
13 - - -		
14 - - -		
15 - - -		
16 - - -		

Above is an example where everything is marching along in lockstep, the audio and video have very little offset.

There is a 0 frame offset, the audio has a 24 sample delay, not even a millisecond, and the indicator is green, indicating the audio video sync is good.

The below example shows a stream where audio and video have fallen out of sync.



If there is a video offset, its duration is displayed. In the above example the video has taken 1944 milliseconds in transit. For the 4 audio streams seen, they are off. The offset is described:

- -1f (minus one frame)
- -1655s (minus 1655 samples)
- -34ms (minus 34 milliseconds)
- red indicator, indicates a large offset in the signal chain which will need to be addressed

3.2.23 **Status Window**

3.2.23.1 **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:



The Status display is added at the sdiScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
	Status display			

Graticule Brightness slider – As the Status display has no graticule, this control 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.

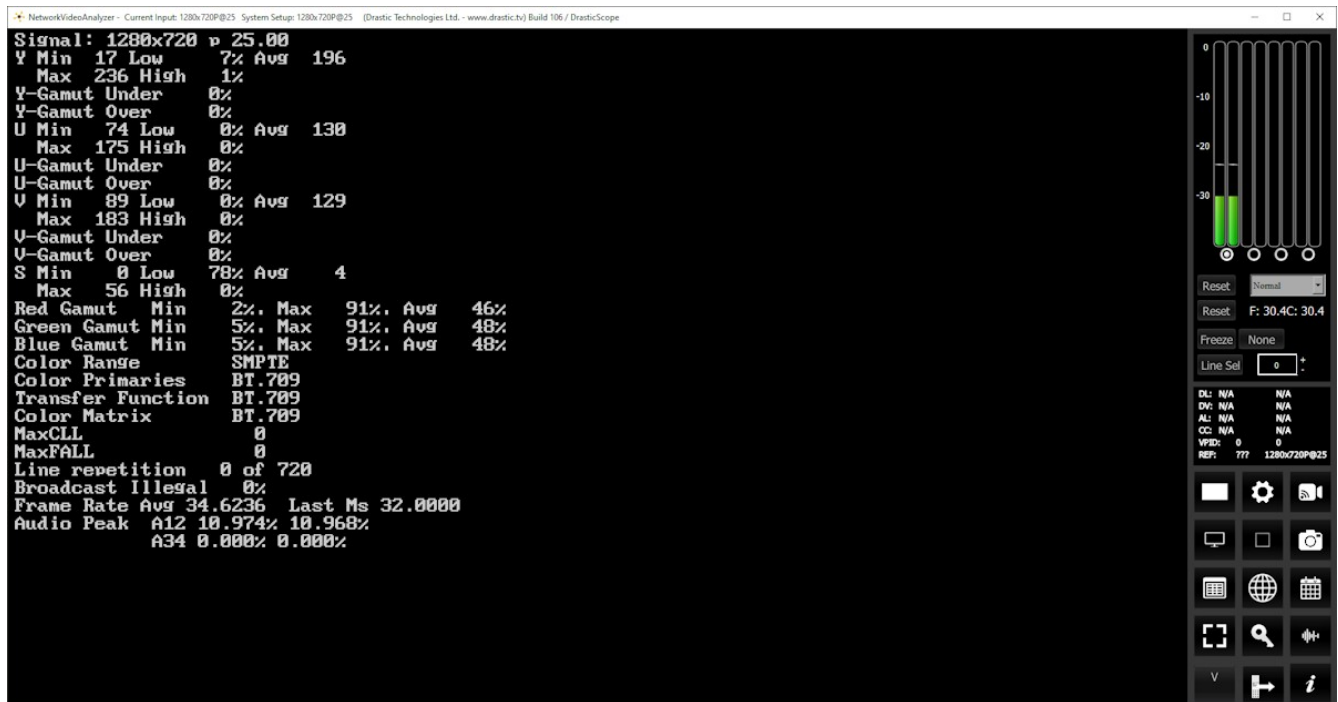
Pressing the x1 button sets the display back to normal.

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.

3.2.23.2 Status Window

Here is the Status window.



The Status window displays:

Signal: displays the current signal type

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

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

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

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

Red Gamut – shows minimum, maximum, and average values for the red gamut.

Green Gamut – shows minimum, maximum, and average values for the green gamut.

Blue Gamut – shows minimum, maximum, and average values for the blue gamut.

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

3.2.24 **ANC Monitor Display**

3.2.24.1 **ANC Monitor Setup**

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



The ANC Monitor display is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		ANC Monitor display		

Graticule Brightness slider – this slider is present in all of the scopes. In the ANC Monitor 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.

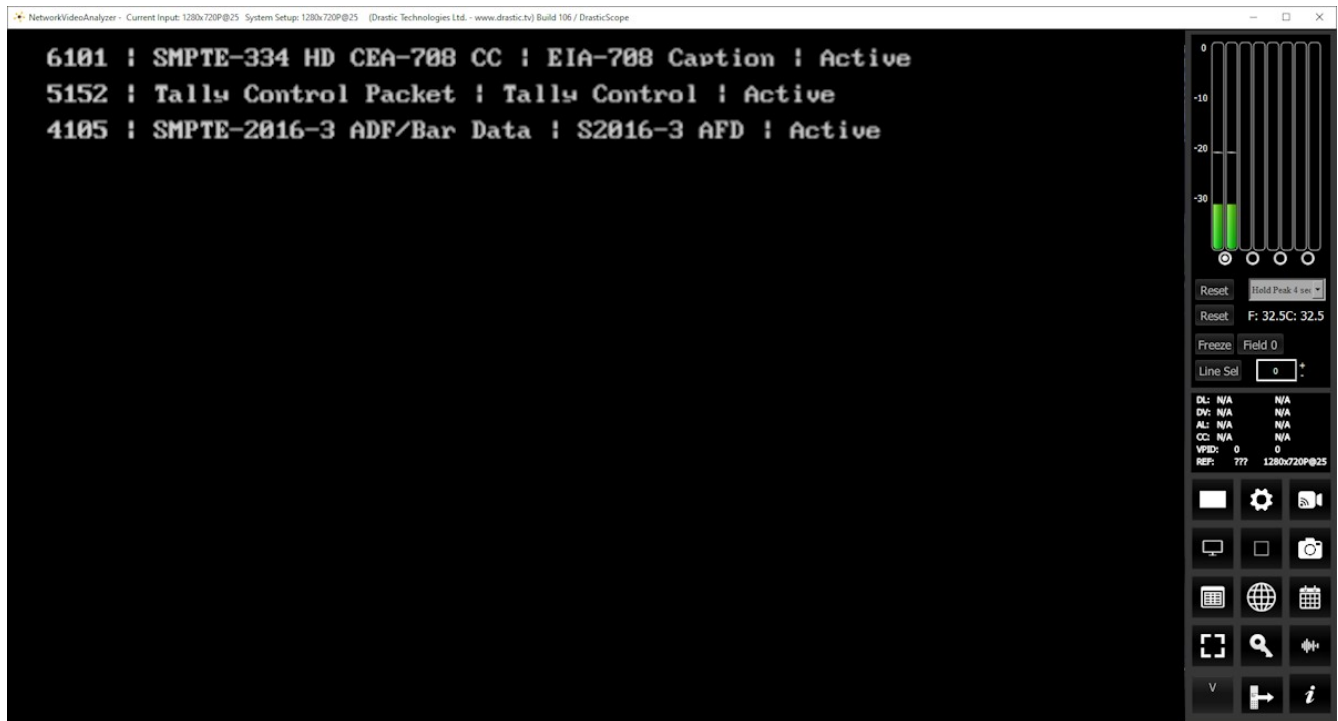
Pressing the x1 button sets the display back to normal.

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 or right clicking on the scope sets the display back to normal. Also, a mouse scroll wheel can be used to zoom in and out.

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

3.2.24.2 ANC Monitor Display

Here is the ANC Monitor display.



The **Anc Monitor** window displays each ancillary data stream present in the signal as a line of data. The data includes:

- Numerical ID – the number associated with the data type
- Name of the data type – the more detailed name of the data type
- A short descriptor for the data type
- Status – whether active, stopped, missing, etc.

3.2.25 IP Timing Display

3.2.25.1 IP Timing Setup

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



The IP Timing window is added at the NetXScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
				IP Timing display

Graticule checkbox – when selected, the graticule is laid over the IP Timing 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.

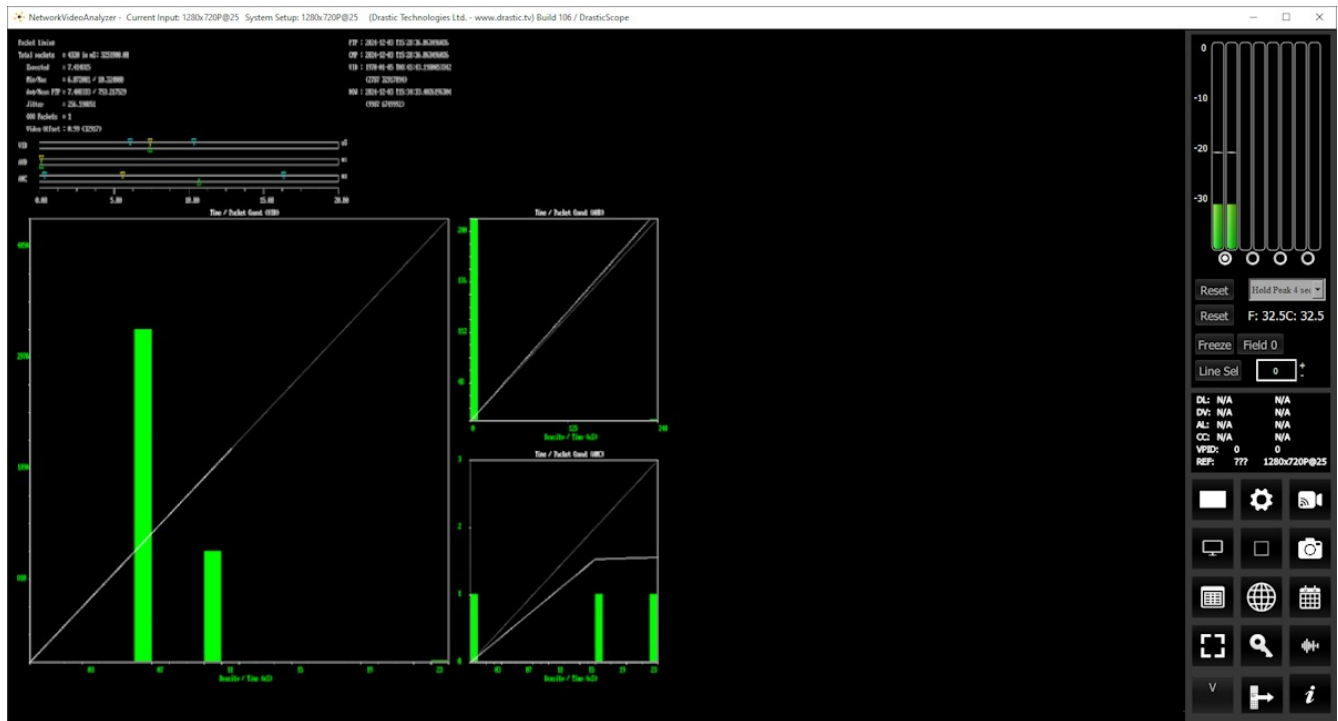
Pressing the x1 button sets the display back to normal.

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 IP Timing window.

3.2.25.2 IP Timing Window

Here is the IP Timing window.



IP Timing tracks the timing of the incoming SMPTE 2110 or 2022 packets on the network. The Min/Max/Avg/Mean of the distance between packets is calculated, as well as the expected value. Jitter and out of order packets are also tracked. A packet timing histogram is generated as well as a packet time vs ideal time line graph.

3.3 System Configuration Window



System Configuration button – Opens the System Configuration window, which provides most of the settings for the video and audio I/O type. Licensing is also available in the configuration window.

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

Microsoft® LifeCam Studio(TM) (v8.0.101)

Video Input: No video Input

12G Type: Square division (SQD)

Video Format: 1080P 30fps (1920)

Color Format: YCbCr 4:2:2 8 Bit

Primaries: Rec 709 - SMPTE Range

Transfer: SDR 709/601

Picture Mode: No Up/Down Converter

Down Convert: No Monitor Setup

Output: Composite

Closed Caption: Disable

Audio Input: Balanced +4db (XLR)

Audio Scale: dBFS RMS

Board Type: USB/DirectShow/UVC

Board Select: Microsoft® LifeCam Studio(TM)

Preferred Scan: Auto

Active Region: X1: 0 Y1: 42 X2: 1920 Y2: 1122

☒ Auto Follow Input ☒ Scope VBlank

☐ Play Audio Computer Speakers

Audio Channels: ☒ 8 ☐ 16

Audio Pairs: ☒ 1/2 ☐ 3/4 ☐ 5/6 ☐ 7/8

☒ Check for new versions on startup ☐ 9/10 ☐ 11/12 ☐ 13/14 ☐ 15/16

Check For Updates License Done

The Settings window is designed to sense and reflect the capabilities of the board or stream the system is set up to view.

The top bar of the Config window displays the input setting, shows the version number, and offers an X to close the window.



When set to an NDI input, the IP Video setup button appears just below the top bar, and the 12G Type pulldown is removed. When set to another source, the IP Video Setup button disappears and the 12G Type pulldown reappears.

3.3.1 IP Video Setup



IP Video setup supports NDI inputs starting at the 4KScope level. NetXScope uses this dialog to monitor SRT, RTP, UDP, and RIST streams as well.

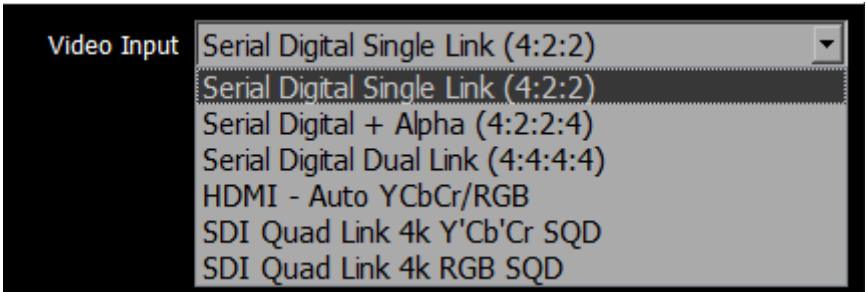
Free	sdiScope	4KScope	HDRScope	NetXScope
		NDI		
				SRT, RTP, UDP, RIST

IP Video Setup – where an IP video source is being used, an IP Video Setup button will appear on the top section of the Configuration window. (the 12G Type pulldown will disappear though) It opens the **Open URL** window, which allows the user to select between available IP sources. The pulldown list will be populated with the most recent sources that have been selected.

In NetXScope level installs, a **2110 IP Config** button is added to set up ST-2110 sources.



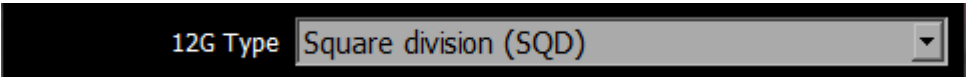
3.3.2 Video Input



Video Input pulldown menu - allows the user to select between the HD-SDI, HDMI or analog inputs. In the case of dual link, 2 inputs are used. In the case of quad HD (3840x2160) and 4K (4096x2160), all four I/O ports of the 3D are in use, so the downconvert is HDMI and analog only. The user may be presented with a list similar to this:

- Serial Digital Single Link (4:2:2)
- Serial Quad Link 4K Y'Cb'Cr SQD
- Serial Quad Link 4K RGB SQD
- Serial Dual Link 4K Y'Cb'Cr SQD

3.3.3 12G Type

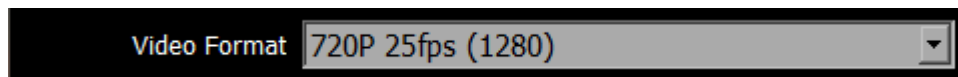


This features is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		12G type		

12G Format pulldown menu - displays the current setting, and allows the user to select between Square Division (SQD), or 2SI (two sample interleave) on some hardware. This pulldown may be removed when DrasticScope is set to view NDI or IP streams.

3.3.4 Video Format

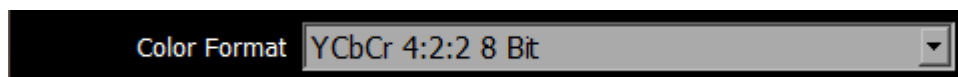


Video format support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
SD, HD				
		2K, 4K		
			8K	

Video Format pulldown menu - displays the current setting, and allows the user to select between the signal formats supported by the I/O hardware. DrasticScope supports a wide range of signal formats from NTSC CCIR-601 to 8K Cinema (8192x4320) 60fps, depending on the version licensed.

3.3.5 Color Format



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
8 bit				
	10 bit			

Color Format pulldown menu - allows the user to select the processing mode. In the case of single link, this can be 8 or 10 bit YCbCr or RGBA 8. For dual link it is normally YCbCr 10 or RGB 10. There user will be presented with a list similar to this:

- YCbCr 4:2:2 10 bit
- YCbCr 4:2:2 8 bit
- YCbCr Alternate
- RGBA 4:4:4:X 8 bit

- RGB 4:4:4 10 bit
- RGB 4:4:4 8 bit

3.3.6 Primaries



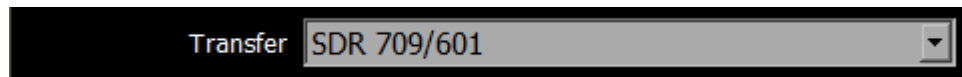
Primaries functionality is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Primaries		

Primaries – the user will be presented with a list similar to this:

- Auto 2020 709 601
- CCIR 601 - SMPTE Range
- Rec 709 - SMPTE Range
- BT 2020 - SMPTE Range
- CCIR 601 - Full RGB
- Rec 709 - Full RGB
- BT 2020 - Full RGB
- DCI P3 (in 2020)
- Display P3 (in 2020)

3.3.7 Transfer



Transfer functionality is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Transfer		

Transfer – adjust the Transfer Gamma setting. The user will be presented with a list similar to this:

- SDR 709/601

- PQ/HDR10
- HLG

3.3.8 Picture Mode

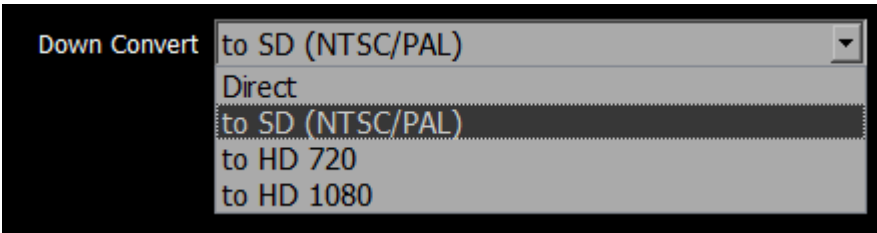


Picture Mode functionality is added at the 4KScope level, and requires up/down conversion hardware.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Picture Mode		

Picture Mode pulldown menu – allows the user to select how up/down conversion is done. All standard modes for up and down conversion are supported. Requires an up/down converter.

3.3.9 Down Convert



Down Convert functionality is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Down Convert		

Down Convert pulldown menu - allows the user to select the output signal type. The output can match the input or be converted to another up or down signal format. Requires a Monitor setup.

3.3.10 Output



Composite/Component output functionality is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Output		

Output pulldown menu – allows the user to select between available analog output formats. In SD this can be Composite, S-video or Component. For HD, only component is supported. The user with capable hardware will be presented with a list similar to this:

- Composite – single wire output
- Component RGB – three wire RGB output
- Component YUV – Sony VTR three wire output
- Component YUV MII – Panasonic VTR three wire output
- Component YUV SMPTE – Standard SMPTE three wire output

3.3.11 Closed Caption



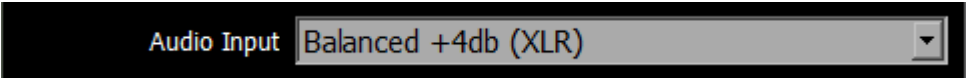
Closed Caption functionality is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Closed Captions		

Closed Caption pulldown menu - allows the user to select which closed caption format is to be displayed, or to not display closed captions. The user will be presented with a list similar to this:

- Disable
- CC1/Subtitle (608)
- CC2 (608)
- CC3 (608)
- CC4 (608)
- Service1 (708)
- Service2 (708)
- Service3 (708)
- Service4 (708)
- OP-47

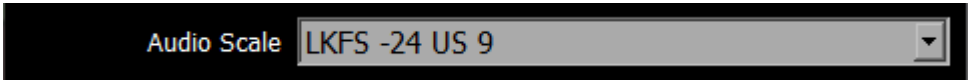
3.3.12 Audio Input



The audio input pulldown is available in all versions.

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.

3.3.13 Audio Scale



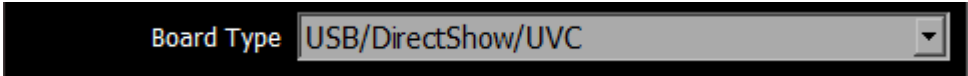
Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
DBFS RMS				
		dBu SMPTE RP155 (+24), dBu EBU R68 (+18), dBu EBU R68 (0), dBu EBU PPM, dBu BBC PPM, LUFS -23 EBU 9, LKFS -24 US 9		

Audio Scale – change the audio meter scale. The user will be presented with a list similar to this, depending on the version licensed:

- dBFS RMS
- dBu SMPTE RP155 (+24)
- dBu EBU R86 (+18)
- dBu EBU R86 (0)
- dBu EBU PPM
- dBu BBC PPM
- LUFS -23 EBU 9
- LKFS -24 US 9

3.3.14 Board Type



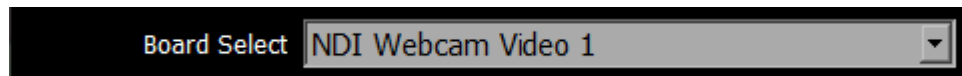
Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
AJA, Bluefish444, Blackmagic, USB/DirectShow, DekTec				
	Auto Select			
	Matrox, NDI, Desktop, ScopeDirect			
	NIC SMPTE 2110, Network Video Streams			

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

- Auto Select
- NIC SMPTE 2110
- Network Video Streams
- AJA
- AJA Shared
- Bluefish
- Blackmagic
- DekTec
- Matrox
- USB/DirectShow/UVC
- NDI
- Desktop
- Adobe ScopeDirect
- Avid ScopeDirect
- OpenFX ScopeDirect
- Assimilate ScopeDirect
- AvVr3D ScopeDirect

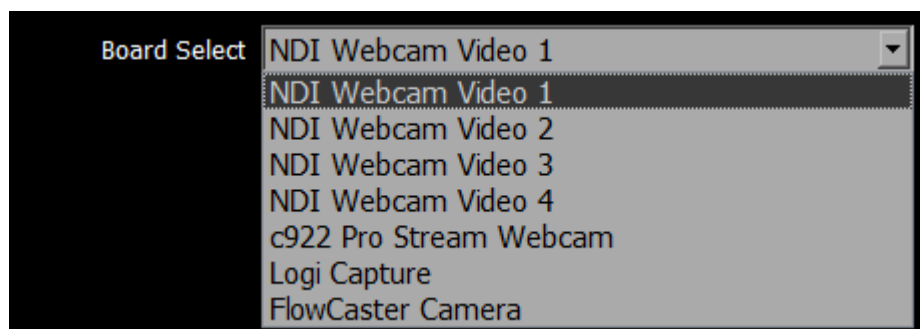
3.3.15 Board Select



The Board Select pulldown is available in all versions.

Board Select – allows the user to select which board or screen to use. Sometimes if there is (or if there has been) more than one board in the system, or if there is more than one channel in a board, the application may be looking at the wrong one. In fact, certain types of devices may appear to be out of order, depending on what hardware was set up, and in what order. Clicking between boards can help the application “find” the right board.

DrasticScope 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:



3.3.16 Preferred Scan

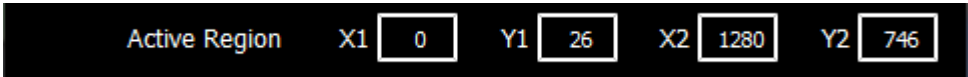


The Preferred Scan pulldown is available in all versions.

Preferred Scan – Select between available scan settings. The user may be presented with a list similar to this:

- Auto
- Interlaced (I)
- Segmented (psf)

3.3.17 Active Region



Active Region display is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Active Region		

Active Region fields – allows the user to set the active region of the video signal. 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.

3.3.18 Auto Follow Input



The Auto Follow Input checkbox is available in all versions.

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

3.3.19 Scope VBlank



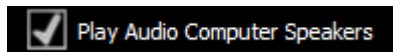
The Scope VBlank checkbox is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Scope VBlank		

Scope VBlank – by default, the waveform/vectorscopes do not use the vertical blanking area. If

this is set, the vertical blank lines will be treated as active picture.

3.3.20 Play Audio Computer Speakers



The Play Audio Computer Speakers checkbox is available in all versions.

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 can deselect the box to only use their external speakers for audio monitoring.

3.3.21 Audio Channels

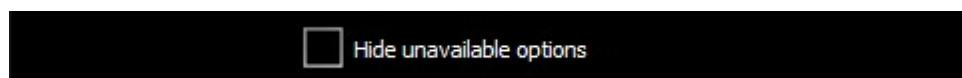


The Audio Channels selector buttons are added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Channels selector buttons		

Audio Channels – (hardware dependent) provides a set of radio buttons to allow a user to set the number of audio channels, in hardware that supports more than 2 channels of audio. Selecting one button deselects the other.

3.3.22 Hide Unavailable Options



The **Hide Unavailable Options** checkbox is available in all versions except NetXScope (which offers all of the optional features).

Free	sdiScope	4KScope	HDRScope	NetXScope
------	----------	---------	----------	-----------

Hide Unavailable Options	
--------------------------	--

Hide Unavailable Options – when checked, remove the grayed out controls that are not available for the product level that has been licensed. If this is left unchecked, any options that is not licensed will be shown, but grayed out. Clicking the grayed out options will display a preview, with a link in case the user would like more details on the option.

3.3.23 **Audio Pairs**

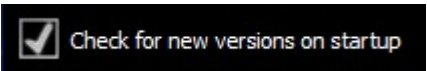


The Audio Pairs selector buttons are added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Pairs selector		

Audio Pairs – (hardware dependent) buttons allow the user to select the audio pair that will be monitored. The Free version only supports 2 audio channels so they are always selected. sdiScope supports 8 audio channels, and the pair being monitored can be switched using the radio buttons below the on-GUI audio meters.

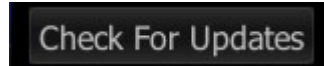
3.3.24 **Check for New Versions on Startup**



The Check for new versions on startup checkbox is available in all versions.

Check for new versions on startup checkbox – each time the system is started, check the current version of the build available on the Drastic website, in case the version you have installed is no longer current.

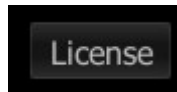
3.3.25 Check for Updates



The Check For Updates button is available in all versions.

Check For Updates button – click to check the current version of the build available on the Drastic website, in case the version you have installed is no longer current.

3.3.26 License



The License button is available in all versions.

License button - Press the **License** button to open the licensing dialog.

The screenshot shows a window titled "DrasticScope License Application - v8.0.0.0". Inside, a box lists the license status: "310 Trial days remain. Licensed for:" followed by a list of software components: Drastic DDR Software, MediaReactor Software, MediaNXS HD, FlowCaster, VideoQC, VideoQCWorkStation, Preview, PreviewPro, 4KScope, SDIScope, CC, 4K, Camera Raw, Device Control, Cineform, AVCi, DNxHD, JPEG-2000, NXC, SCP, BBReplay, and FBReplay. Below this, there are input fields for "User Name" (containing "corey"), "Email" (containing "corey.cousineau@gmail.com"), and "Site Code" (containing a long alphanumeric string). A "Generate" button is next to the email field. Below the "Site Code" field are "Copy" and "Send" buttons. A "Site Key" field is empty, with "Paste", "Register", "Remove", and "Folder" buttons to its left.

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.

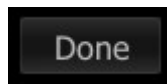
The **Site Code** field is where the site code displayed during the licensing process. The user may select the site code and use Ctrl+C to copy it to the clipboard, or use the **Copy** button. The user will need to send the site code to Drastic Authorization to get a Site Key to enable the license.

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.

3.3.27 Done



The Done button is available in all versions.

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

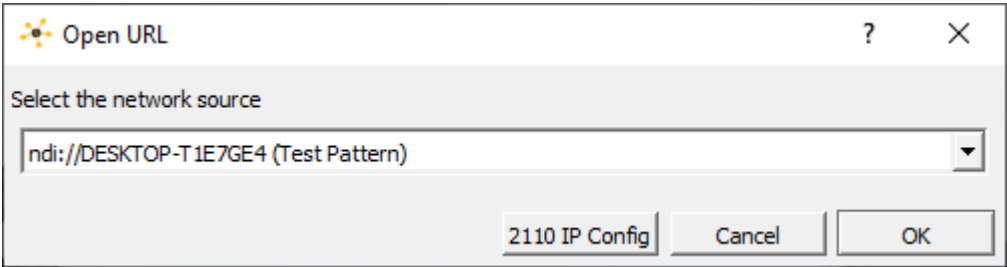
3.4 IP Setup



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
		NDI		
				ST-2110 Setup, RTP, UDP, SRT, RIST Setup

Clicking the **IP Setup** button opens the **Open URL** window.



Clicking the **2110 IP Config** button opens the ST-2110 setup and configuration dialog.

3.4.1 ST-2110 Video Setup

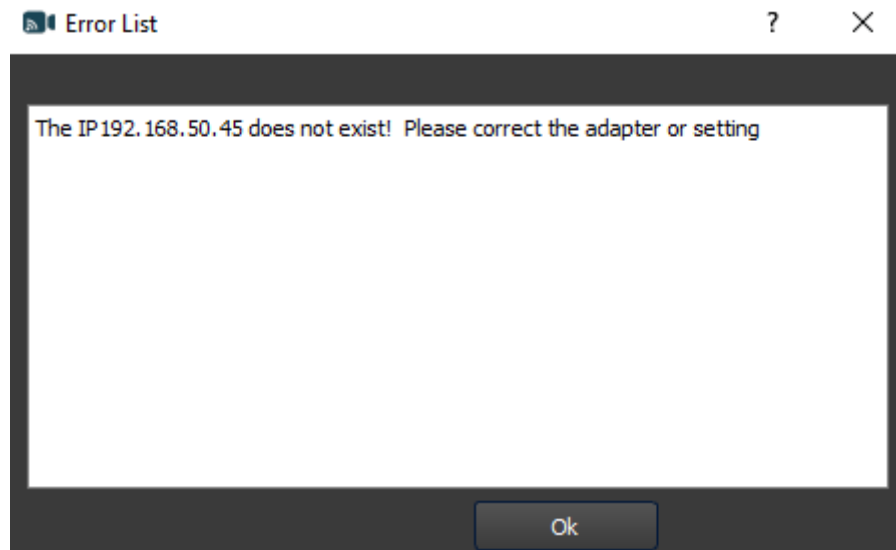
When set to ST-2110 or ST-2022 sources, the IP Setup button opens the **IP Video Setup** window, which allows the user to set up how IP video is handled, and to specify the source, destination, and interface addresses for the Receiver, and the Sender. Clock source, master, and domain settings are present. Settings are maintained separately for video, audio, and ancillary data.

The IP Video Setup window is titled "IP Video Setup" and shows configuration for "channel-0". It includes the following sections and controls:

- Channel:** channel-0
- Check and display errors:** ☐
- Override NMOS Settings:** ☒
- NMOS Log to file:** ☐
- NMOS Config:** Button
- Type:** SMPTE-2110
- Video Format:** 1080i 59.94fps (1920)
- Audio Channels per Flow:** 0
- Audio Flows:** 1
- 125:** (field)
- Receive:**
 - IPv4:** (dropdown)
 - lock all:** ☐
 - Source Address:** 239 . 200 . 100 . 20
 - lock:** ☐
 - Source port:** 50002
 - lock:** ☐
 - Destination Address:** 239 . 200 . 100 . 20
 - lock:** ☐
 - Destination Port:** 50002
 - lock:** ☐
 - Interface:** 192 . 168 . 100 . 166
 - lock:** ☒
- Send / μ s:**
 - IPv4:** (dropdown)
 - 125:** (field)
 - Source Address:** 1 . 0 . 0 . 0
 - lock:** ☐
 - Source Port:** 5000
 - lock:** ☐
 - Destination Address:** 239 . 200 . 100 . 10
 - lock:** ☐
 - Destination Port:** 5000
 - lock:** ☐
 - Interface:** 192 . 168 . 100 . 166
 - lock:** ☒
- Clock Source:** Internal
- Clock Info:** GMT Time
- Clock Time:** 2025-07-22 T14:34:12.274
- Clock Mac Address / ID:** 0
- Save Video SDP:** Button
- Buttons:** Load File, Save File, Accept, Cancel, Show URLs

Channel pulldown – select between channels.

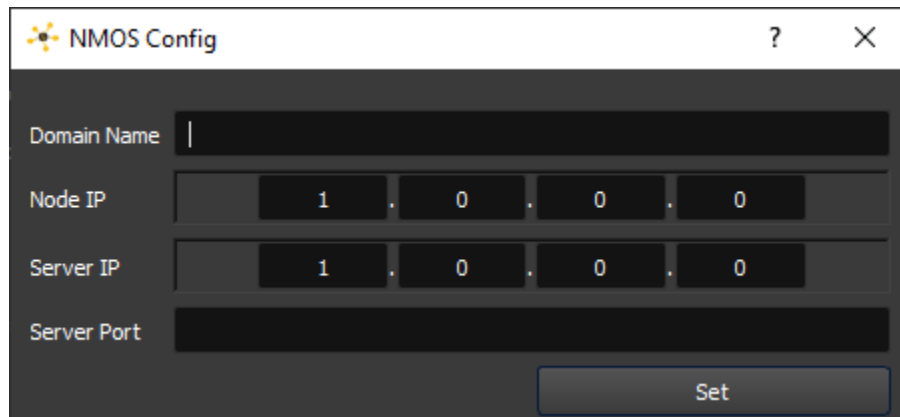
Check and display errors checkbox - enabled by default. It checks if the Rivermax license exists, if the IPs of the interface exist and similar details, and provides a warning dialog. Example below:



Override NMOS Settings checkbox – select to automatically set up the configuration according to the source signal parameters.

NMOS log to file checkbox - For advanced debugging. NMOS controllers are not standardized. This logs all the interactions with the NMOS server so we can debug issues.

NMOS Config button – opens the NMOS Config dialog.



Domain Name field – Name of the domain for the NMOS

Node IP fields – Our node IP

Server IP fields – the Server IP

Server port field – the Server Port to use

Set button – Set the new server setting

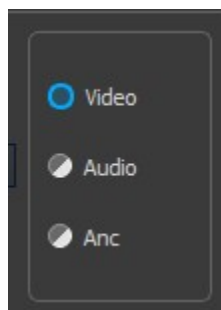
Type pulldown menu - select between SMPTE-2110, SMPTE-2022, or TR-01.

Video Format pulldown menu - select between available video standards.

Audio Channels per flow field – allows the user to select the number of audio channels each flow will have. Only used when set to Audio Setup.

Audio flows pulldown and **microseconds** field – Audio in 2110/2022 is commonly split into packets of 125 microseconds or 1 millisecond, and this pulldown allows the user to set which one is used.

Setup selector – select between Video, Audio, and Ancillary Setup modes.



Receive pulldown menu / section – lets the user select the type of IP version used to receive IP video. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Send / μ s pulldown menu / section – lets the user select the type of IP version used to send IP video, and adjust the setting for packet size in microseconds. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

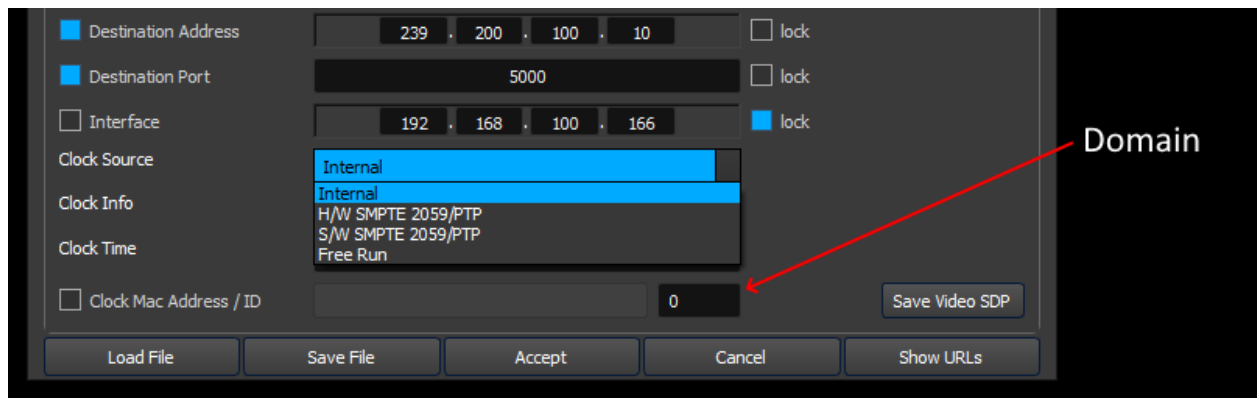
Clock Source pulldown menu – select the clock source. Choices include Internal, H/W SMPTE 2059/PTP, S/W SMPTE 2059/PTP, or Free Run.

Clock Info field – displays information about the clock setting.

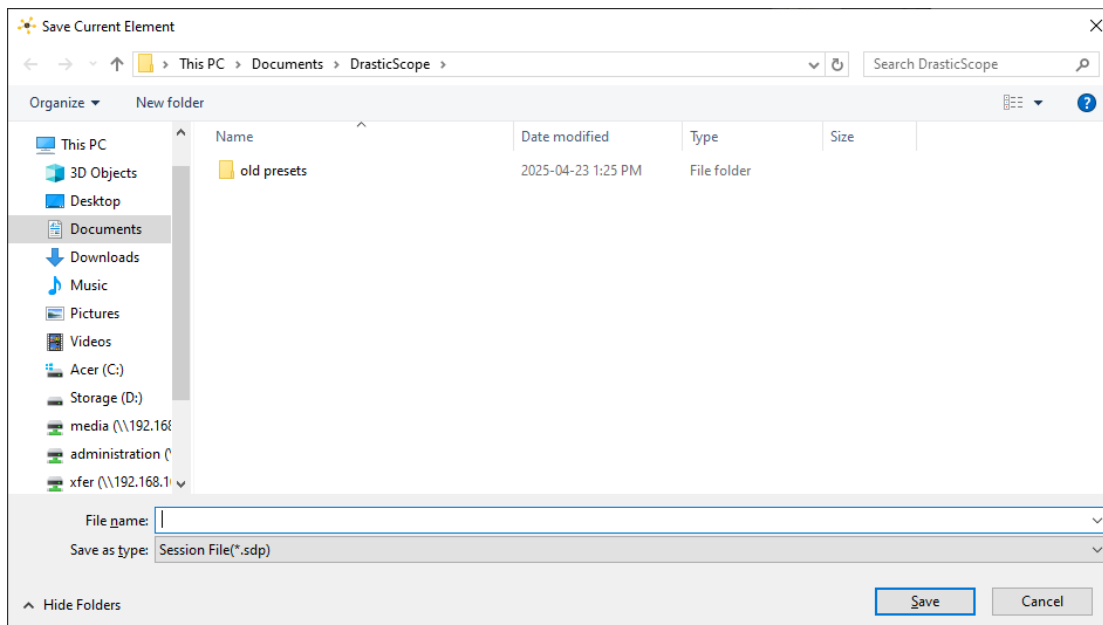
Clock Time field – displays the current time in YYYY-MM-DD-THH-MM-SS- μ s

Clock Mac Address / ID checkbox – check to activate the Mac Address field to the right, so you can enter the clock's Mac Address.

Domain field – use this field to enter the Domain setting.



Save Video SDP button – opens the Save Current Element window, which allows the user to save all of the settings as a Session File (*.sdp) for later retrieval.



Load File button – opens the Ini File window, which allows the user to save all of the settings as an Ini File (*.ini) for later retrieval.

Save File button – opens the Ini File window, which allows the user to open an existing Ini File (*.ini) to use the settings again.

Accept button – press to accept all changes and close the IP Video Setup window.

Cancel button – press to close the IP Video Setup window without making any changes.

Show URLs button – opens the IP Setup window to reveal the URLs.

3.4.2 ST-2110 Audio Setup

The image shows the 'IP Video Setup' dialog box with the 'channel-0' tab selected. The 'Type' is set to 'SMPTE-2110'. The 'Video Format' is '1080i 59.94fps (1920)'. The 'Audio Channels per Flow' is '0', and 'Audio Flows' is '1' with a value of '125'. The 'Receive' section is set to 'IPv4' with a 'lock all' checkbox. The 'Source Address' is '239 . 200 . 100 . 21', 'Source port' is '50004', 'Destination Address' is '239 . 200 . 100 . 21', 'Destination Port' is '50004', and 'Interface' is '1 . 0 . 0 . 0' with a 'lock' checkbox. The 'Send / μs' section is set to 'IPv4' with a value of '125'. The 'Source Address' is '1 . 0 . 0 . 0', 'Source Port' is '5001', 'Destination Address' is '239 . 200 . 100 . 10', 'Destination Port' is '5001', and 'Interface' is '1 . 0 . 0 . 0' with a 'lock' checkbox. The 'Clock Source' is 'Internal', 'Clock Info' is 'GMT Time', and 'Clock Time' is '2025-07-22 T14:45:56.924'. The 'Clock Mac Address / ID' is '0'. The 'Audio Flows' section shows 8 flows, with flow 1 selected. The 'Save Audio SDP' button is visible. The 'Channel' pulldown at the top right shows 'channel-0'.

Channel: channel-0

☐ Check and display errors ☒ Override NMOS Settings ☐ NMOS Log to file NMOS Config

Type: SMPTE-2110

Video Format: 1080i 59.94fps (1920)

Audio Channels per Flow: 0 Audio Flows: 1 125

Receive: IPv4 ☐ lock all

☐ Source Address: 239 . 200 . 100 . 21 ☐ lock

☐ Source port: 50004 ☐ lock

☐ Destination Address: 239 . 200 . 100 . 21 ☐ lock

☐ Destination Port: 50004 ☐ lock

☐ Interface: 1 . 0 . 0 . 0 ☒ lock

Send / μs: IPv4 125

☐ Source Address: 1 . 0 . 0 . 0 ☐ lock

☐ Source Port: 5001 ☐ lock

☐ Destination Address: 239 . 200 . 100 . 10 ☐ lock

☐ Destination Port: 5001 ☐ lock

☐ Interface: 1 . 0 . 0 . 0 ☒ lock

Clock Source: Internal

Clock Info: GMT Time

Clock Time: 2025-07-22 T14:45:56.924

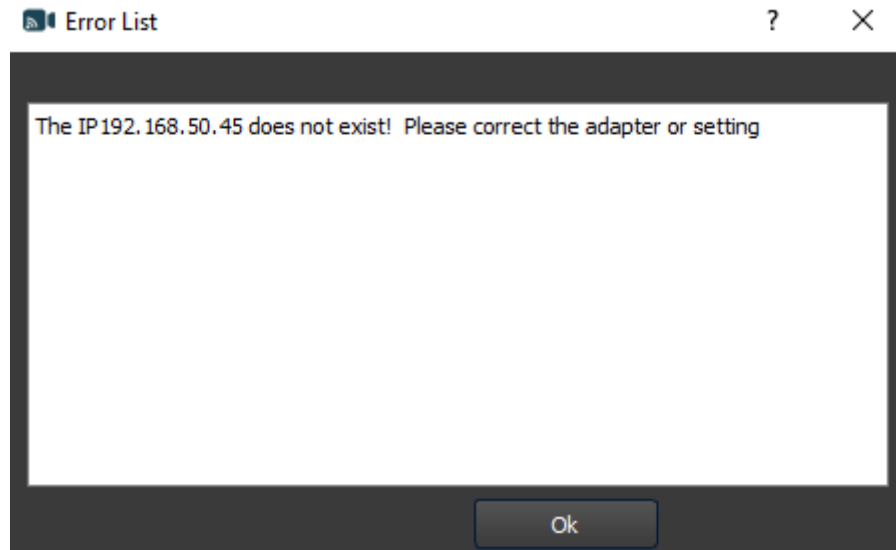
☐ Clock Mac Address / ID: 0 Save Audio SDP

Load File Save File Accept Cancel Show URLs

Audio Flows: 1 2 3 4 5 6 7 8

Channel pulldown – select between channels.

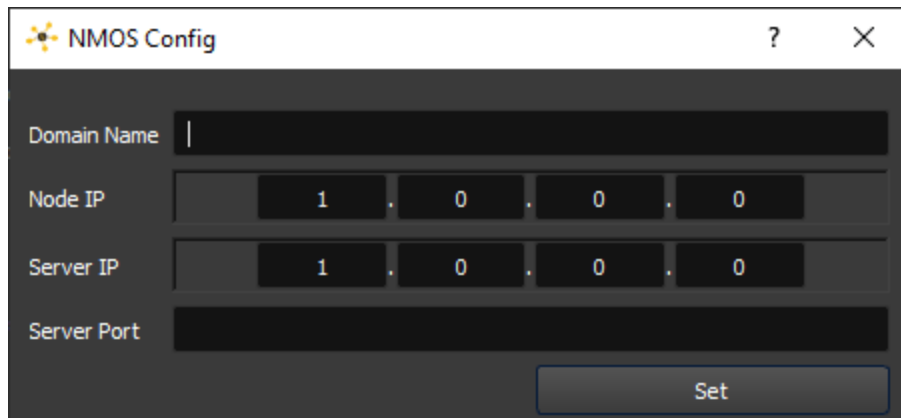
Check and display errors checkbox - enabled by default. It checks if the Rivermax license exists, if the IPs of the interface exist and similar details, and provides a warning dialog. Example below:



Override NMOS Settings checkbox – select to automatically set up the configuration according to the source signal parameters.

NMOS log to file checkbox - For advanced debugging. NMOS controllers are not standardized. This logs all the interactions with the NMOS server so we can debug issues.

NMOS Config button – opens the NMOS Config dialog.

The image shows a software dialog box titled "NMOS Config". It has a dark grey background. At the top, there is a title bar with a yellow gear icon, the text "NMOS Config", and standard window controls (a question mark and a close 'X' button). Below the title bar, there are four input fields: "Domain Name" (a text box), "Node IP" (a field with four segments showing "1", "0", "0", "0"), "Server IP" (a field with four segments showing "1", "0", "0", "0"), and "Server Port" (a text box). At the bottom right of the dialog is a button labeled "Set".

Domain Name field – Name of the domain for the NMOS

Node IP fields – Our node IP

Server IP fields – the Server IP

Server port field – the Server Port to use

Set button – Set the new server setting

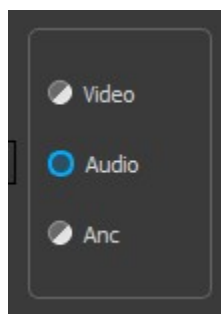
Type pulldown menu - select between SMPTE-2110, SMPTE-2022, or TR-01.

Video Format pulldown menu - select between available video standards.

Audio Channels per flow field – allows the user to select the number of audio channels each flow will have.

Audio flows pulldown and **microseconds** field – Audio in 2110/2022 is commonly split into packets of 125 microseconds or 1 millisecond, and this pulldown allows the user to set which one is used.

Setup selector – select between Video, Audio, and Ancillary Setup modes.

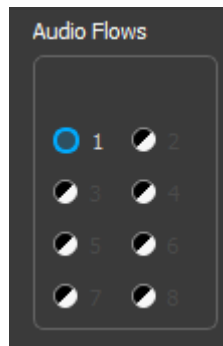


Receive pulldown menu / section – lets the user select the type of IP version used to receive IP video. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each

setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Send / μ s pulldown menu / section – lets the user select the type of IP version used to send IP video, and adjust the setting for packet size in microseconds. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Audio Flows section – used in conjunction with the Audio Channels per Flow pulldown and the Audio Flows pulldown menus. Setting the Audio flows number activates that many channels, so they can be set up.



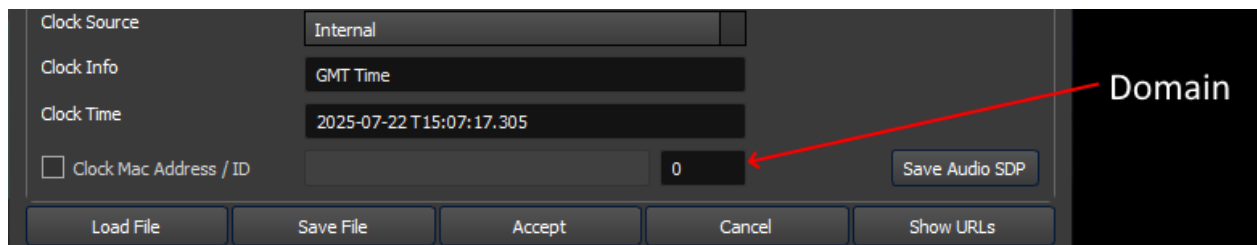
Clock Source pulldown menu – select the clock source. Choices include Internal, H/W SMPTE 2059/PTP, S/W SMPTE 2059/PTP, or Free Run.

Clock Info field – displays information about the clock setting.

Clock Time field – displays the current time in YYYY-MM-DD-THH-MM-SS- μ s

Clock Mac Address / ID checkbox – click to activate the Mac Address boxes to the right, so you can enter the clock's Mac Address.

Domain field – use this field to enter the Domain setting.



Save Audio SDP button – opens the Save Current Element window, which allows the user to save all of audio the settings as a Session File (*.sdp) for later retrieval.

Load File button – opens the Ini File window, which allows the user to save all of the settings as an Ini File (*.ini) for later retrieval.

Save File button – opens the Ini File window, which allows the user to open an existing Ini File (*.ini) to use the settings again.

Accept button – press to accept all changes and close the IP Video Setup window.

Cancel button – press to close the IP Video Setup window without making any changes.

3.4.3 ST-2110 Anc Setup

The IP Video Setup dialog box is shown with the 'Channel' dropdown set to 'channel-0'. The 'Type' is 'SMPTE-2110'. The 'Video Format' is '1080i 59.94fps (1920)'. The 'Audio Channels per Flow' is '2' and 'Audio Flows' is '1'. The 'Receive' section is set to 'IPv4' with 'lock all' checked. The 'Send / μs' section is also set to 'IPv4' with 'lock all' checked. The 'Clock Source' is 'Internal' and 'Clock Info' is 'GMT Time'. The 'Clock Time' is '2025-07-22 T15:04:11.215'. The 'Clock Mac Address / ID' is '0'. The 'Save Anc SDP' button is visible at the bottom right.

Channel: channel-0

☐ Check and display errors ☒ Override NMOS Settings ☐ NMOS Log to file NMOS Config

Type: SMPTE-2110

Video Format: 1080i 59.94fps (1920)

Audio Channels per Flow: 2 Audio Flows: 1 125

Receive: IPv4 ☐ lock all

☐ Source Address: 239 . 200 . 100 . 22 ☐ lock

☐ Source port: 50006 ☐ lock

☒ Destination Address: 239 . 200 . 100 . 22 ☐ lock

☒ Destination Port: 50006 ☐ lock

☐ Interface: 1 . 0 . 0 . 0 ☒ lock

Send / μs: IPv4 125

☐ Source Address: 1 . 0 . 0 . 0 ☐ lock

☒ Source Port: 5002 ☐ lock

☒ Destination Address: 239 . 200 . 100 . 10 ☐ lock

☐ Destination Port: 5002 ☐ lock

☐ Interface: 192 . 168 . 100 . 166 ☒ lock

Clock Source: Internal

Clock Info: GMT Time

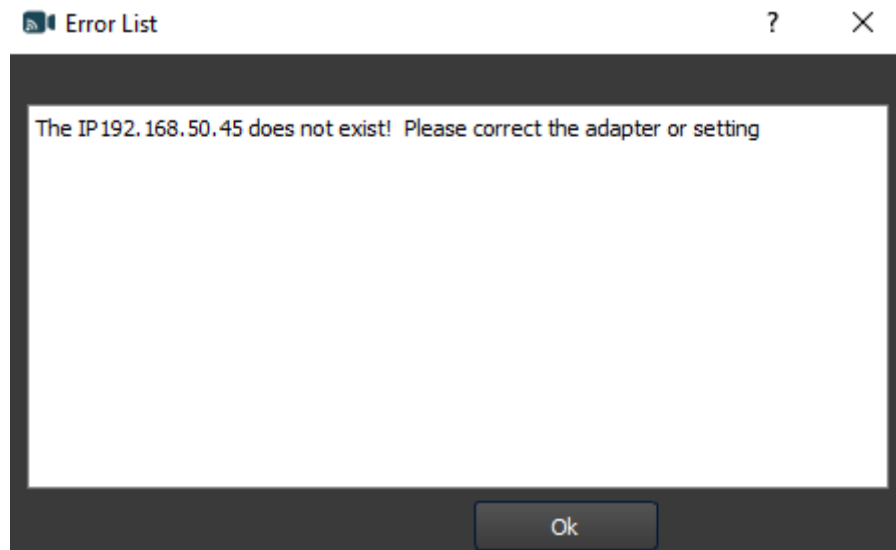
Clock Time: 2025-07-22 T15:04:11.215

☐ Clock Mac Address / ID: 0 Save Anc SDP

Load File Save File Accept Cancel Show URLs

Channel pulldown – select between channels.

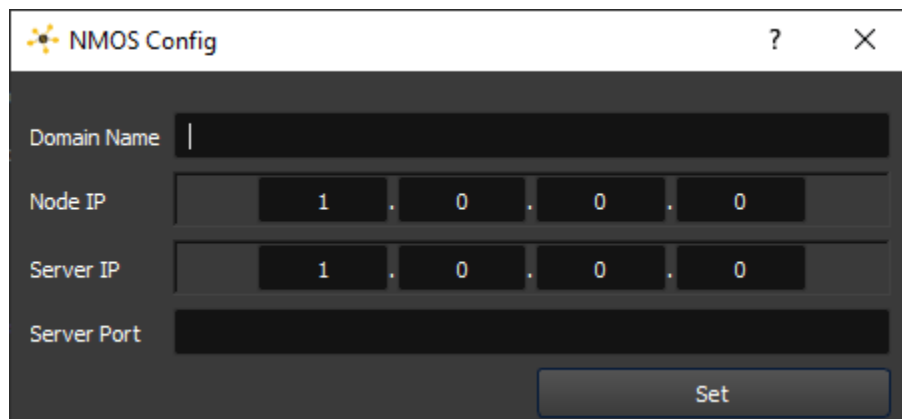
Check and display errors checkbox - enabled by default. It checks if the Rivermax license exists, if the IPs of the interface exist and similar details, and provides a warning dialog. Example below:



Override NMOS Settings checkbox – select to automatically set up the configuration according to the source signal parameters.

NMOS log to file checkbox - For advanced debugging. NMOS controllers are not standardized. This logs all the interactions with the NMOS server so we can debug issues.

NMOS Config button – opens the NMOS Config dialog.



Domain Name field – Name of the domain for the NMOS

Node IP fields – Our node IP

Server IP fields – the Server IP

Server port field – the Server Port to use

Set button – Set the new server setting

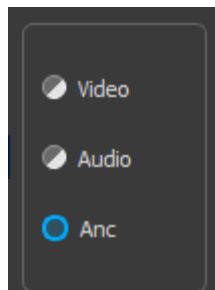
Type pulldown menu - select between SMPTE-2110, SMPTE-2022, or TR-01.

Video Format pulldown menu - select between available video standards.

Audio Channels per flow field – allows the user to select the number of audio channels each flow will have.

Audio flows pulldown and **microseconds** field – Audio in 2110/2022 is commonly split into packets of 125 microseconds or 1 millisecond, and this pulldown allows the user to set which one is used.

Setup selector – select between Video, Audio, and Ancillary Setup modes.



Receive pulldown menu / section – lets the user select the type of IP version used to receive IP video. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Send / μ s pulldown menu / section – lets the user select the type of IP version used to send IP video, and adjust the setting for packet size in microseconds. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

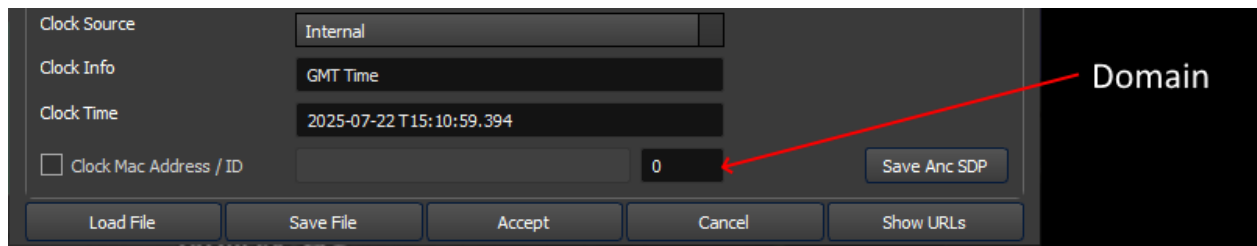
Clock Source pulldown menu – select the clock source. Choices include Internal, H/W SMPTE 2059/PTP, S/W SMPTE 2059/PTP, or Free Run.

Clock Info field – displays information about the clock setting.

Clock Time field – displays the current time in YYYY-MM-DD-THH-MM-SS- μ s

Clock Mac Address / ID checkbox – click to activate the Mac Address boxes to the right, so you can enter the clock's Mac Address.

Domain field – use this field to enter the Domain setting.



Save Anc SDP button – opens the Save Current Element window, which allows the user to save all of the Anc settings as a Session File (*.sdp) for later retrieval.

Load File button – opens the Ini File window, which allows the user to save all of the settings as an Ini File (*.ini) for later retrieval.

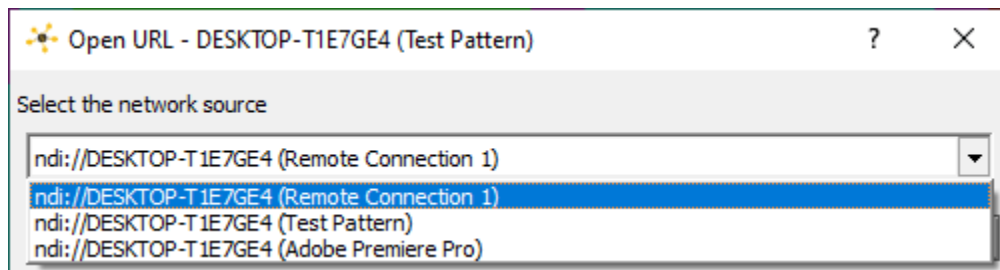
Save File button – opens the Ini File window, which allows the user to open an existing Ini File (*.ini) to use the settings again.

Accept button – press to accept all changes and close the IP Video Setup window.

Cancel button – press to close the IP Video Setup window without making any changes.

3.4.4 IP Setup - NDI

The IP Setup button opens the **Open URL** window, which allows the user to select between available NDI video sources. The pulldown menu is populated with any NDI streams seen on the network, and the user may select between available streams.



NDI offers a full suite of free tools in case you'd like to check this out and do some NDI testing. Go to:

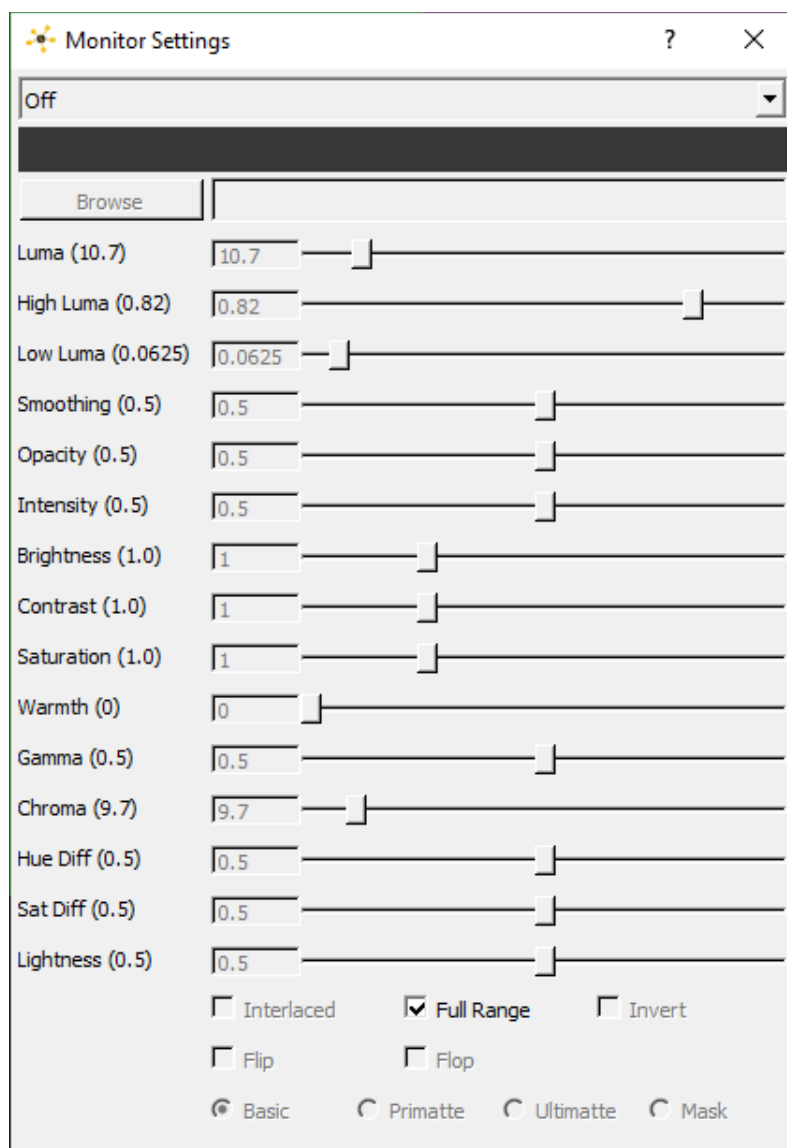
<https://ndi.video/>

And view their offerings.

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

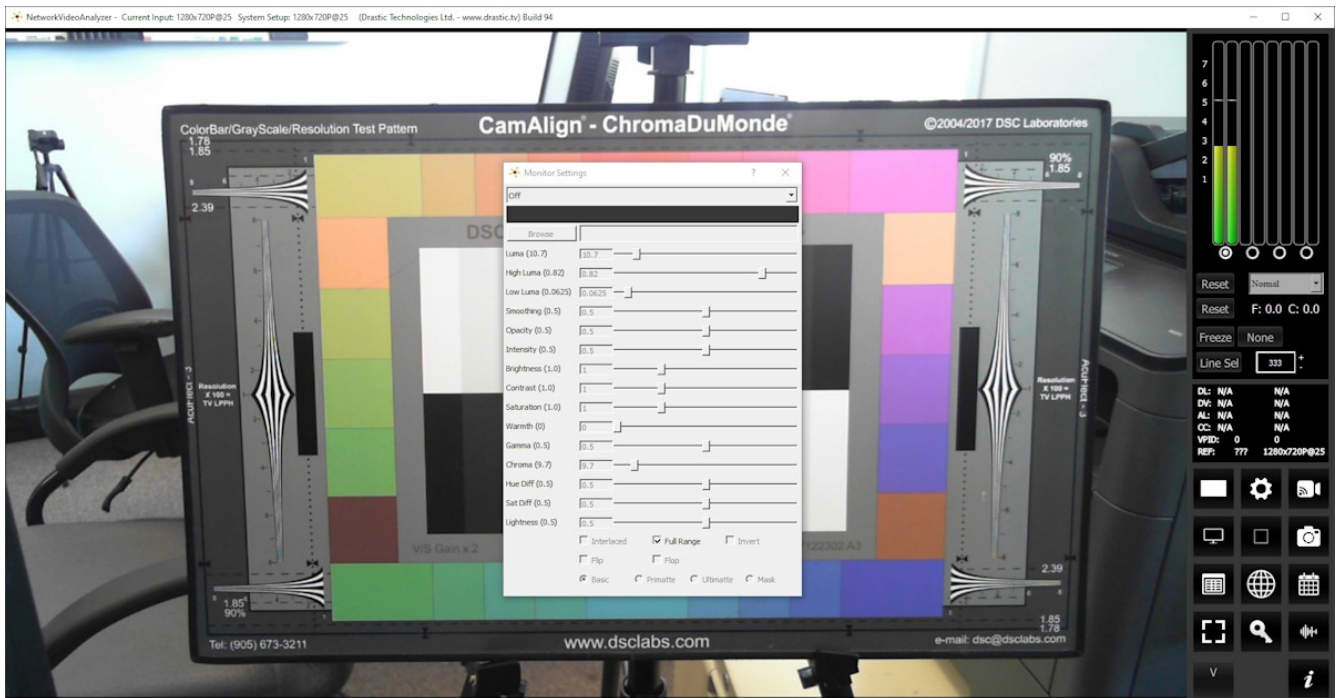
The pulldown menu at the top allows the user to select between various display modes.

Display mode support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
	Luma only, Red/Blue/Green only, Focus Assist			
		Zebra Luma, Zebra Chroma, Clipping, Edge Difference, Calibrate, Flip Flop, Show Alpha, Opacity, Luma Key, Green Screen Key, Chroma Key Despill, Chroma Key Simple, False Colour, Neutral		

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

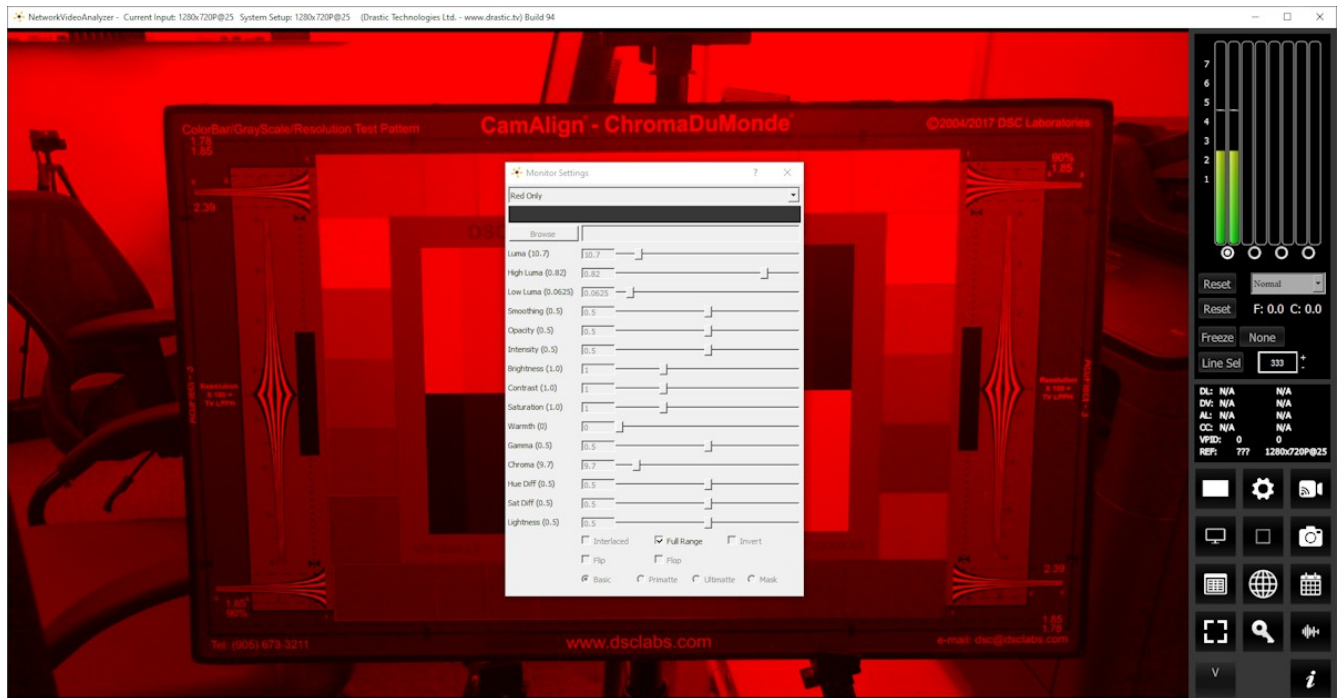
Show only the Y or brightness of the picture. This display setting produces a black and white image, with no chroma.



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

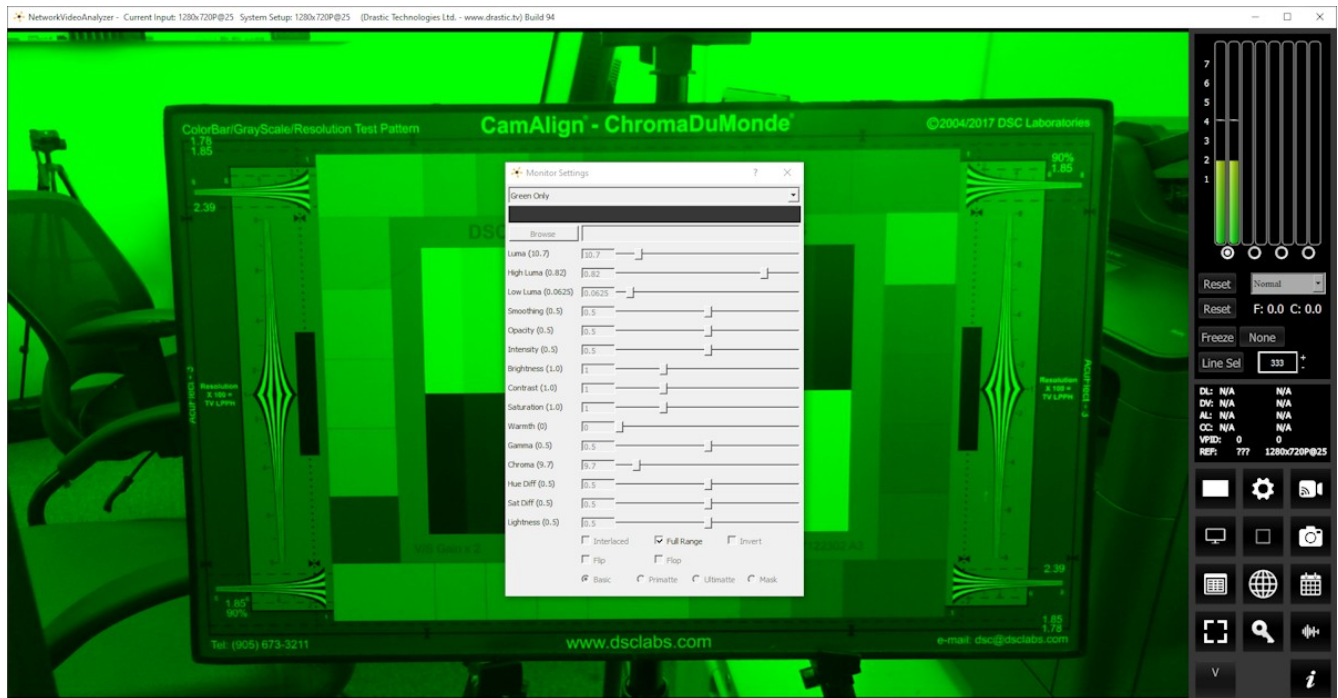
Show only the red channel.



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

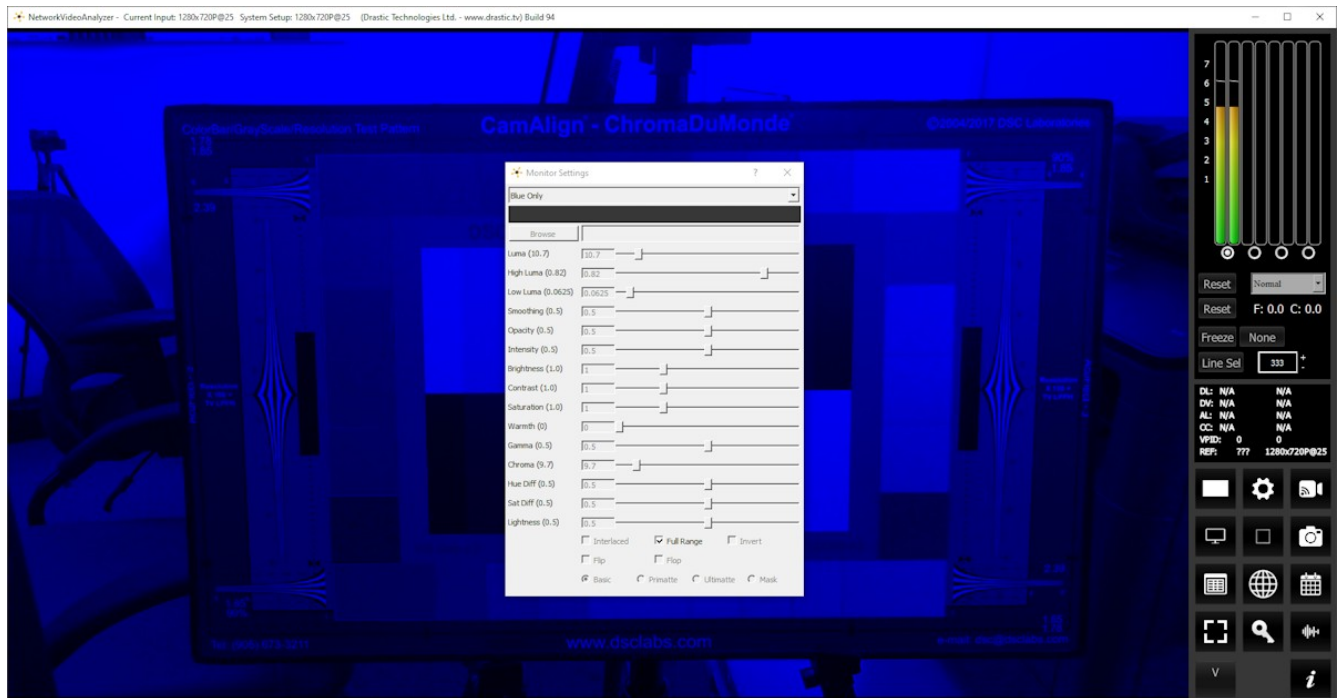
Show only the green channel.



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

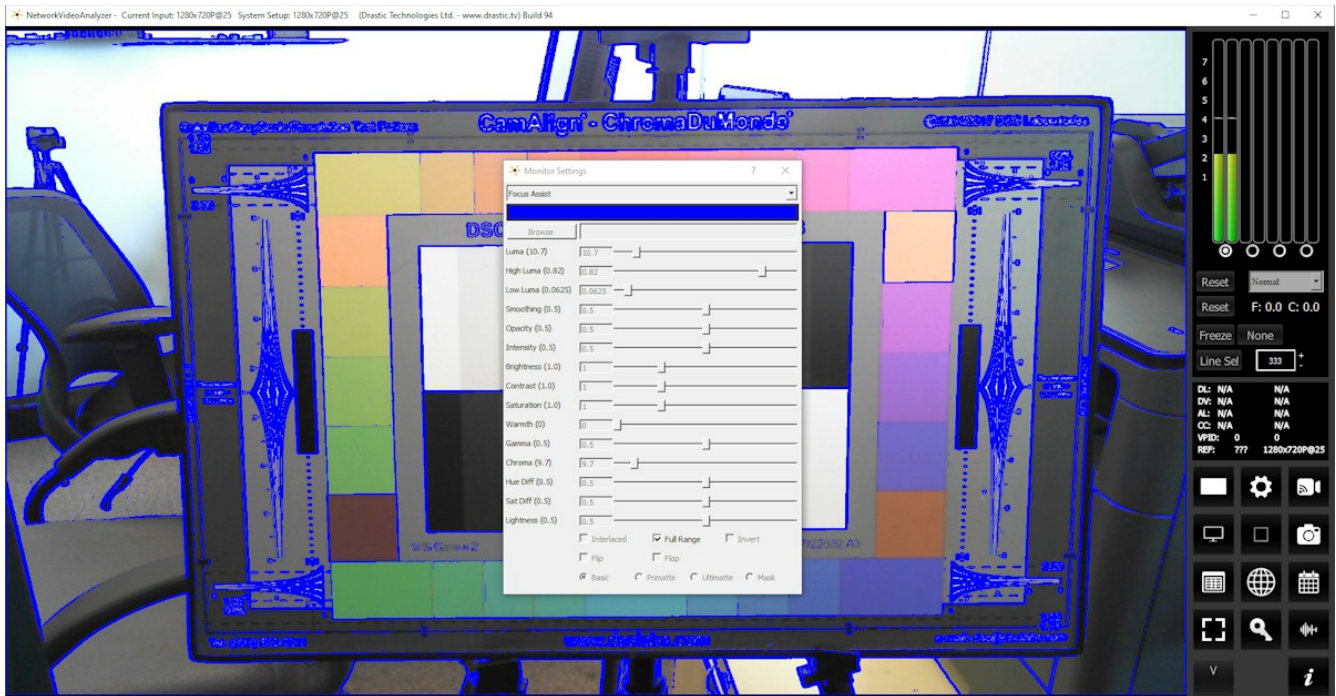
Show only the blue channel.



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 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.

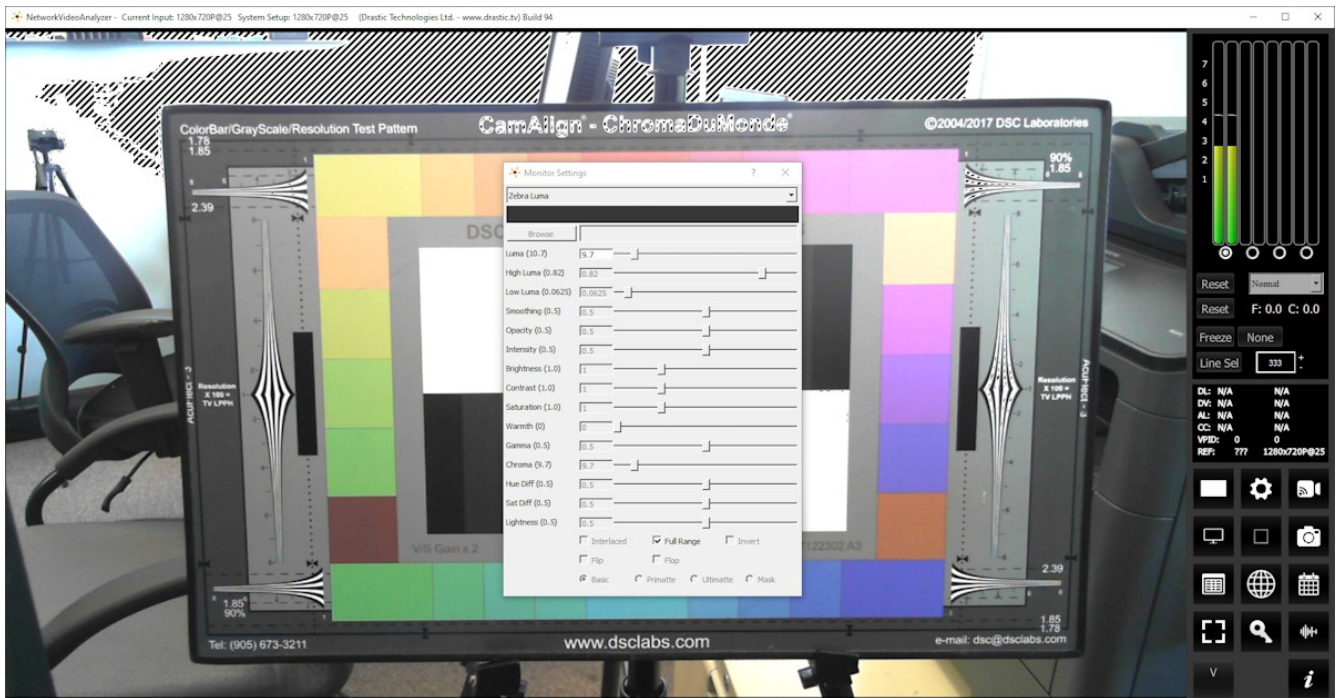


Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose an appropriate color to contrast from the general hue of the picture.

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 Luma

Draw zebra bars where the luma is too high.

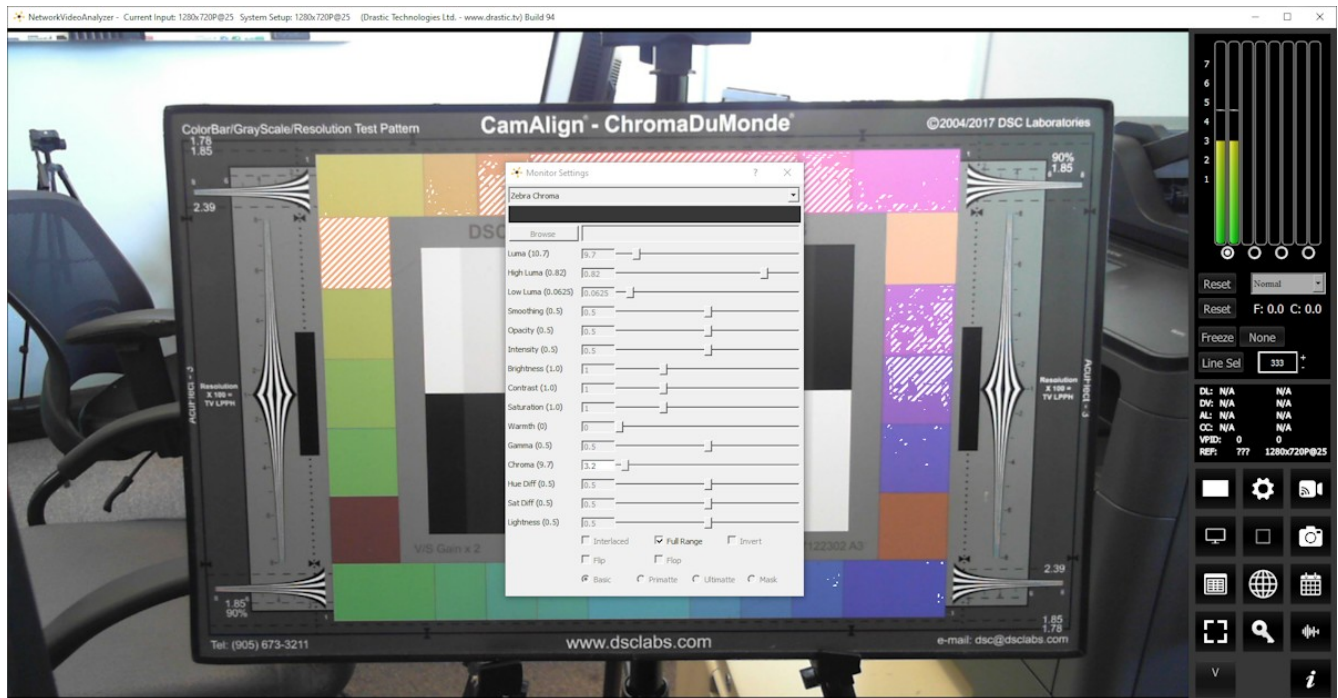


Activates the **Luma** slider, which allows the user to adjust the luma setting. When active, Luma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in tenths. Click on the slider and use the < and > keys.

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.

3.5.8 Zebra Chroma

Draw zebra bars where the chroma is out of range.



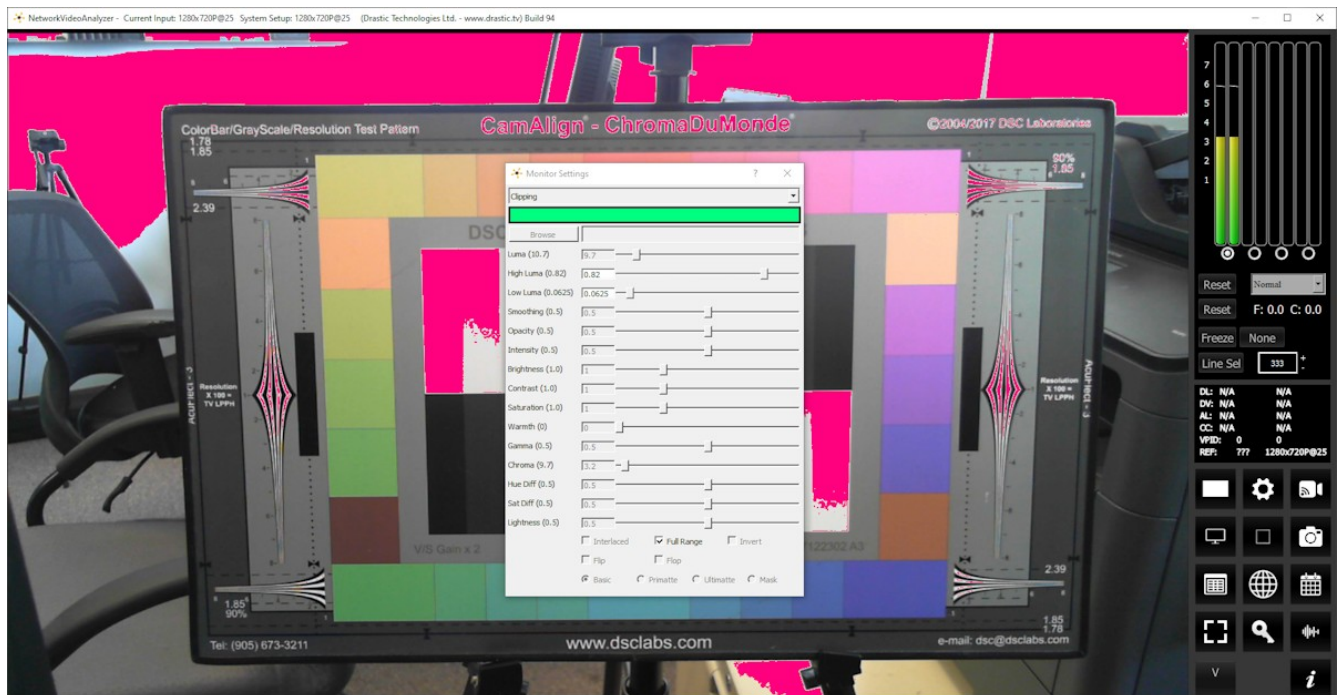
Activates the **Chroma** slider, which allows the user to adjust the chroma setting. When active, Chroma can be adjusted by pulling the slider with the mouse, or using the left and right arrow buttons, in tenths. Click on the slider and use the < and > keys.

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.

3.5.9 Clipping

Draw a color anywhere the signal is too low, or a contrasting color anywhere it is too high. If a signal is too low, the blacks will become muddy and lose detail. With green selected as the main color, a red is generated as the contrasting color.

If the signal is too high, the whites will bleach out and lose detail.



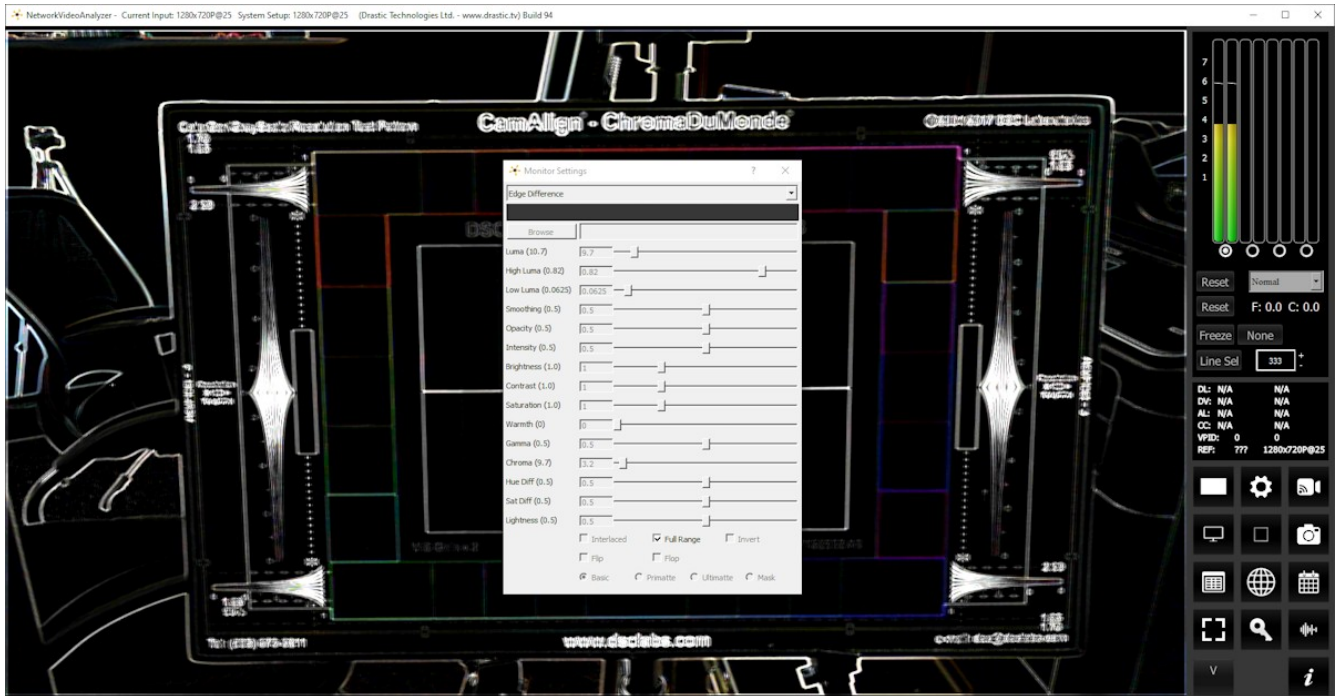
Activates the **Color Picker** (the bar just below the display mode pulldown menu), so the user can choose a primary (too low) color other than green. The secondary (too high) color is automatically generated to be a contrasting color to the primary color.

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 tenths, but displays whole integers only. 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.

3.5.10 Edge Difference

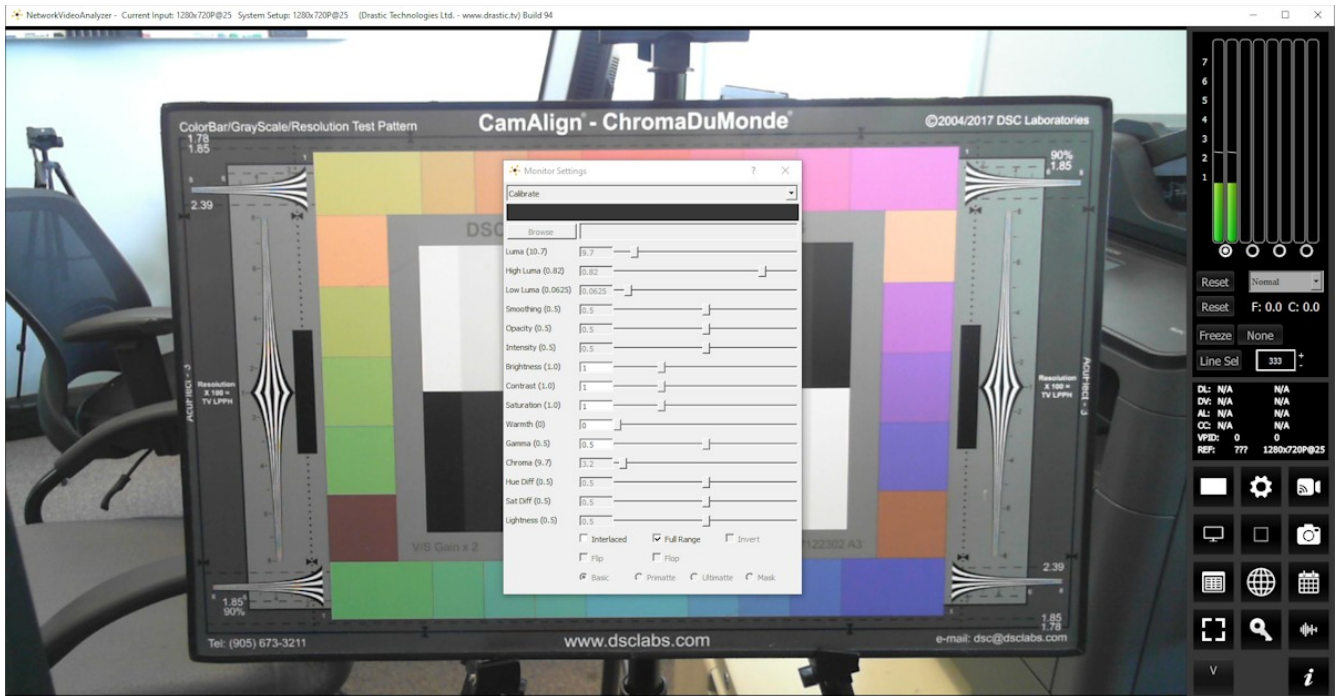
Highlight every edge in the picture, and turn the rest of the picture black.



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.

3.5.11 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 change the way the image is displayed.



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.

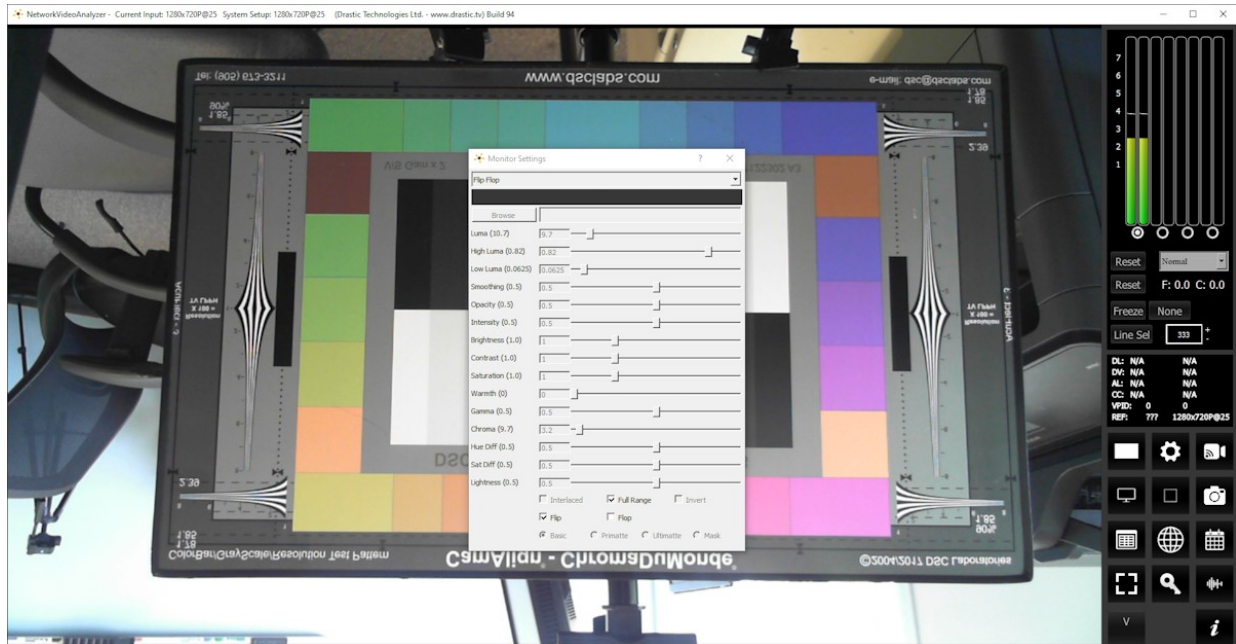
Activates the **Interlaced** checkbox, which allows the user to specify interlaced (checked) or progressive (unchecked) standards to display.

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.

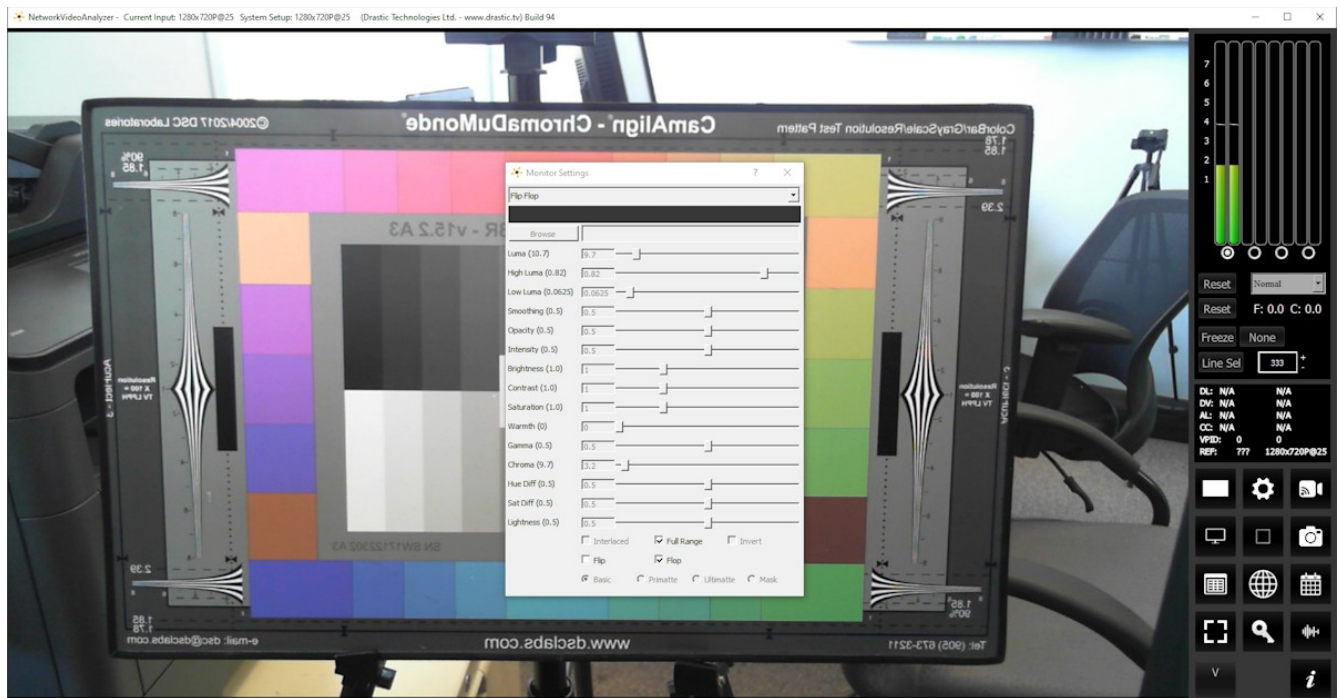
3.5.12 Flip Flop

Reverse the picture horizontally or vertically. Here is an example of the image in 'flipped' mode, or reversed from top to bottom.

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

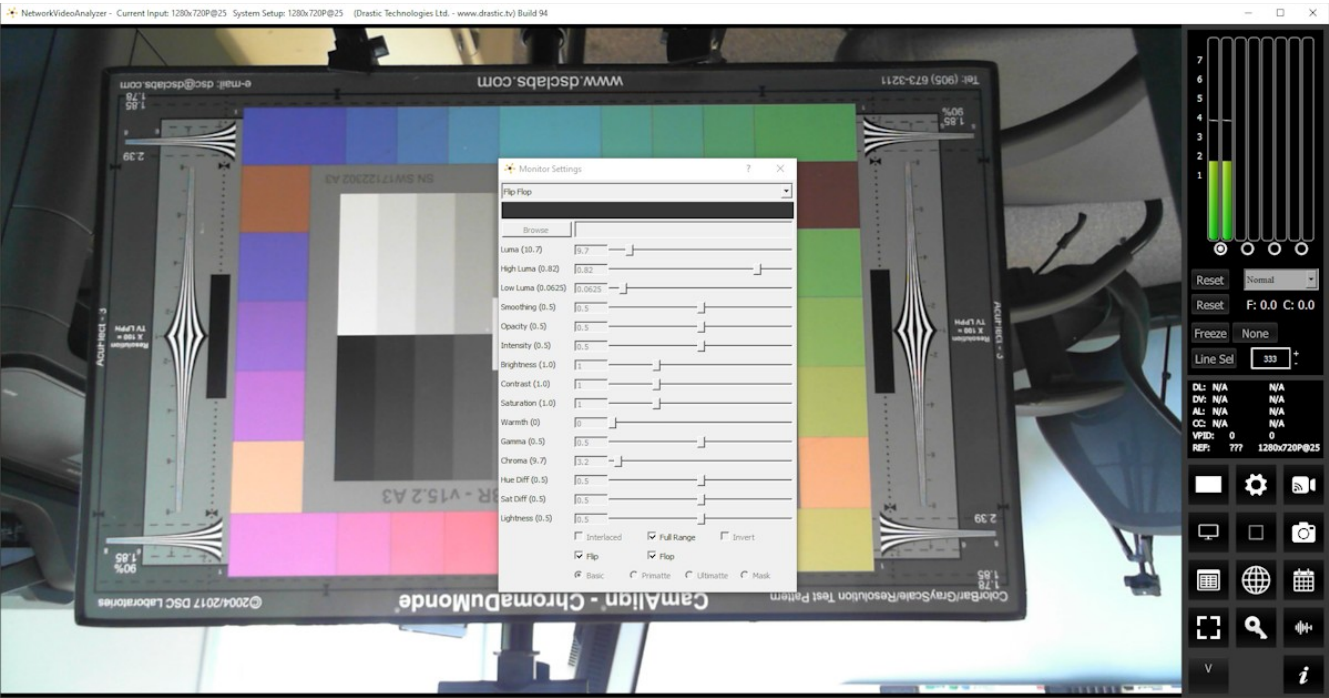


Activates the **Flip** checkbox, which allows the user to reverse the image left to right.



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.

Note that the image can be both 'flipped' and 'flopped' at the same time.



3.5.13 Show Alpha

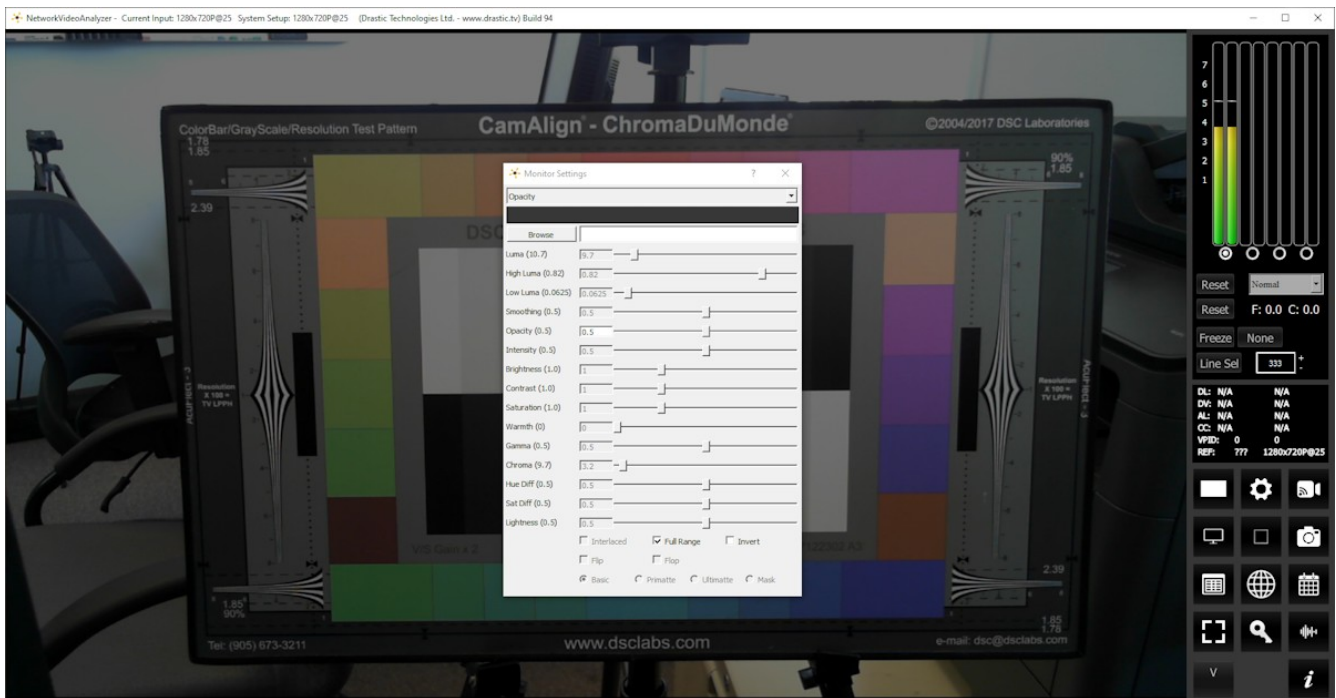
Show the alpha component of an RGBA or YCbCr+A signal.



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. This setting can be used to compare two images to match a camera position from an existing shot with a new camera, where additional shots are needed for a scene and a new camera needs to match its position.



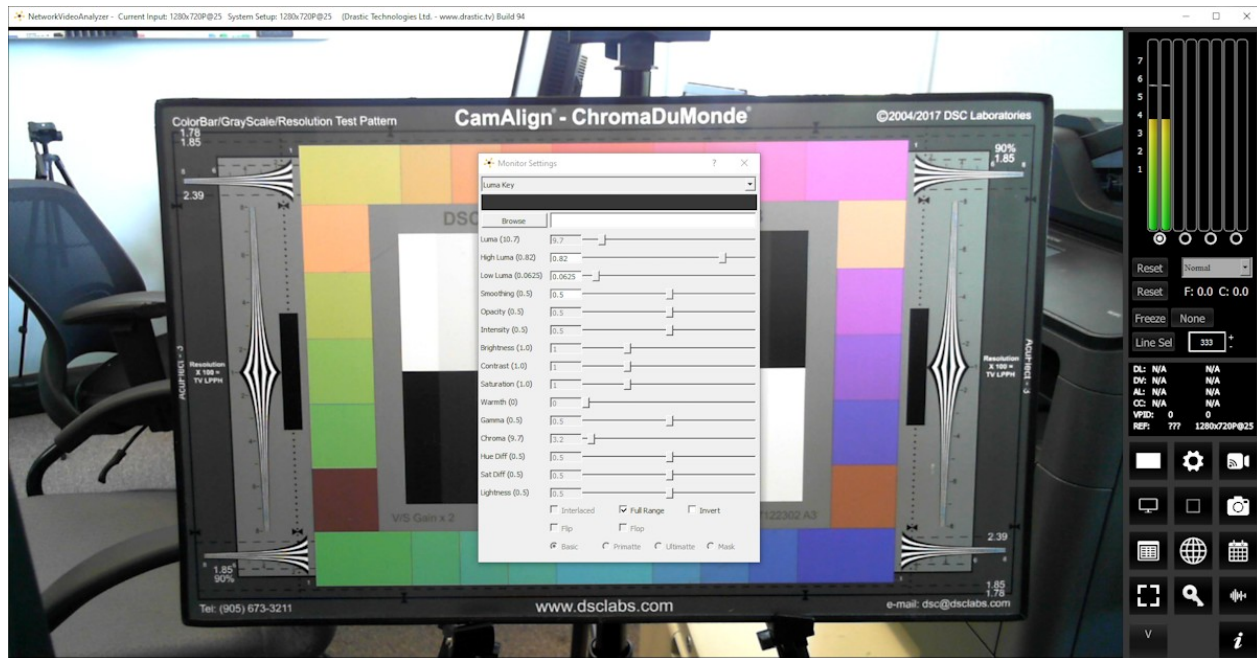
Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background to compare live video to the existing image.

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

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

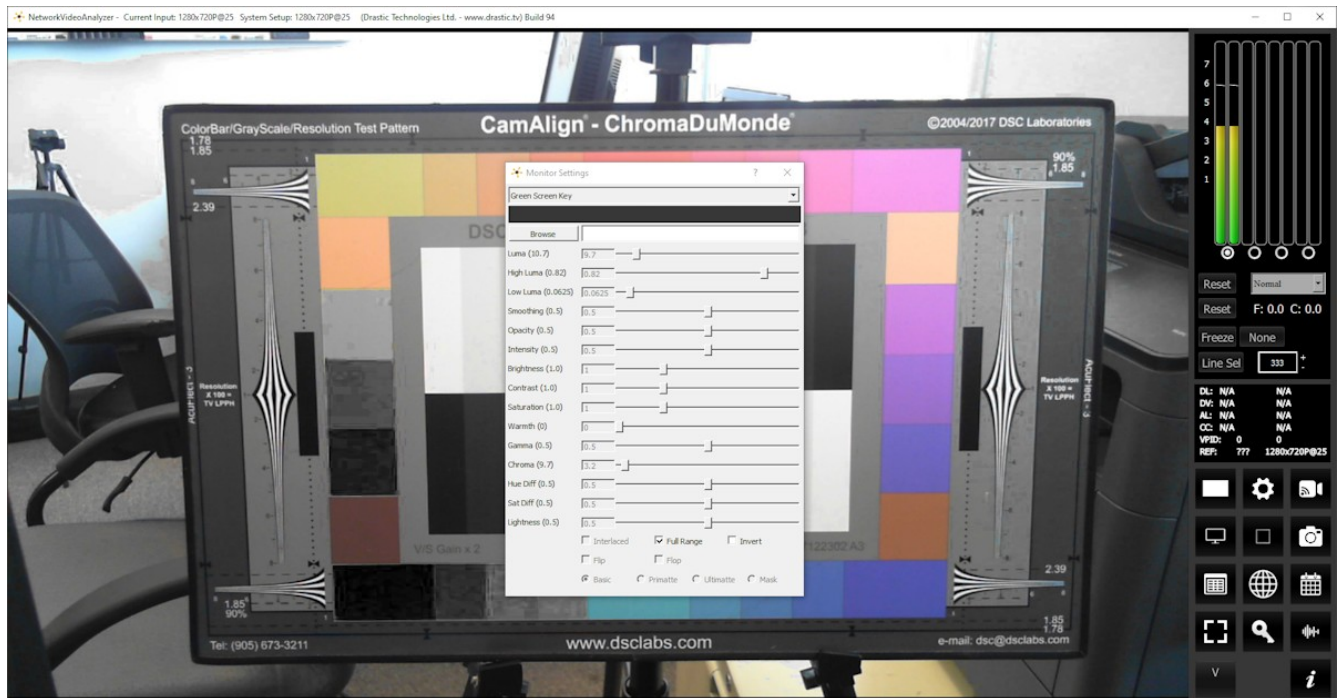
Activates the **Smoothing** slider, so the user can adjust the smoothing settings. When active, can be adjusted by pulling the slider, or using the left and right arrow buttons, in thousandths. Click on the slider and use the < and > keys.

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 gratitudes.

3.5.16 Green Screen Key

Show the image green screen keyed over a checkerboard.



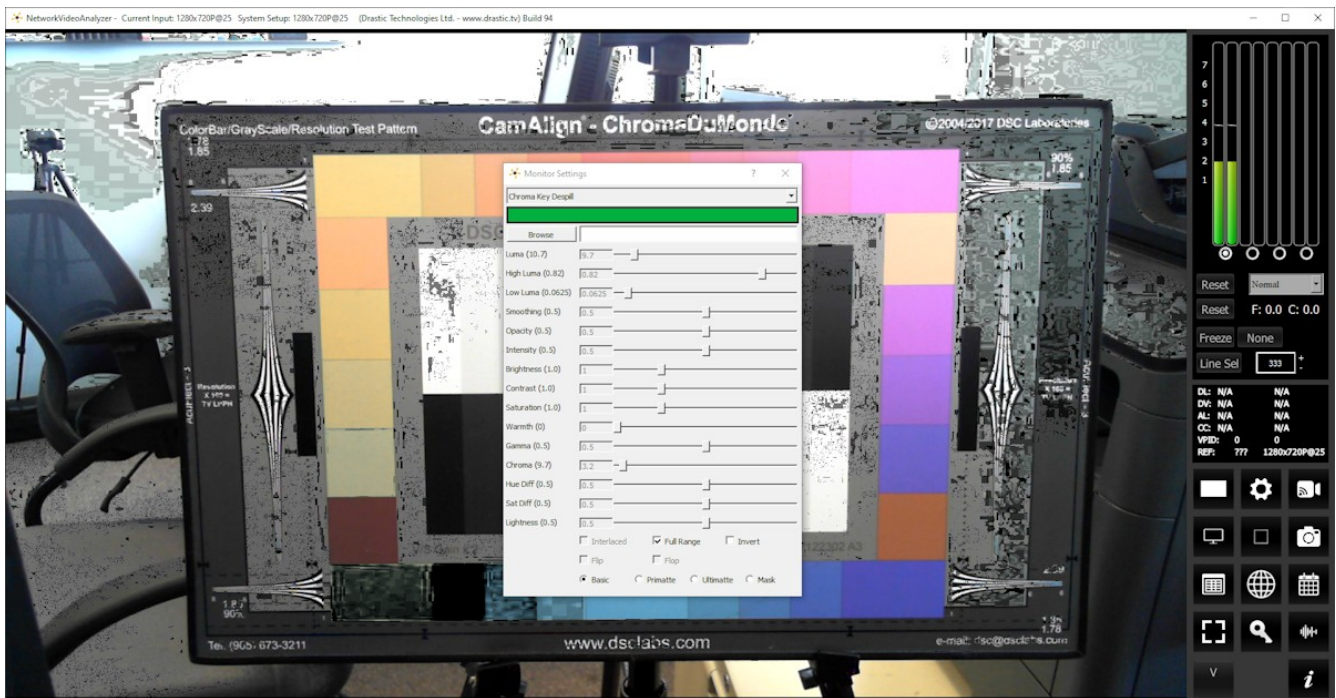
Activates the **Browse** button. This opens a standard browser, which allows the user to load a TGA/PNG/BMP/JPG/v210/YUV to use as the background for the green screen key, instead of the checkerboard.

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.

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.

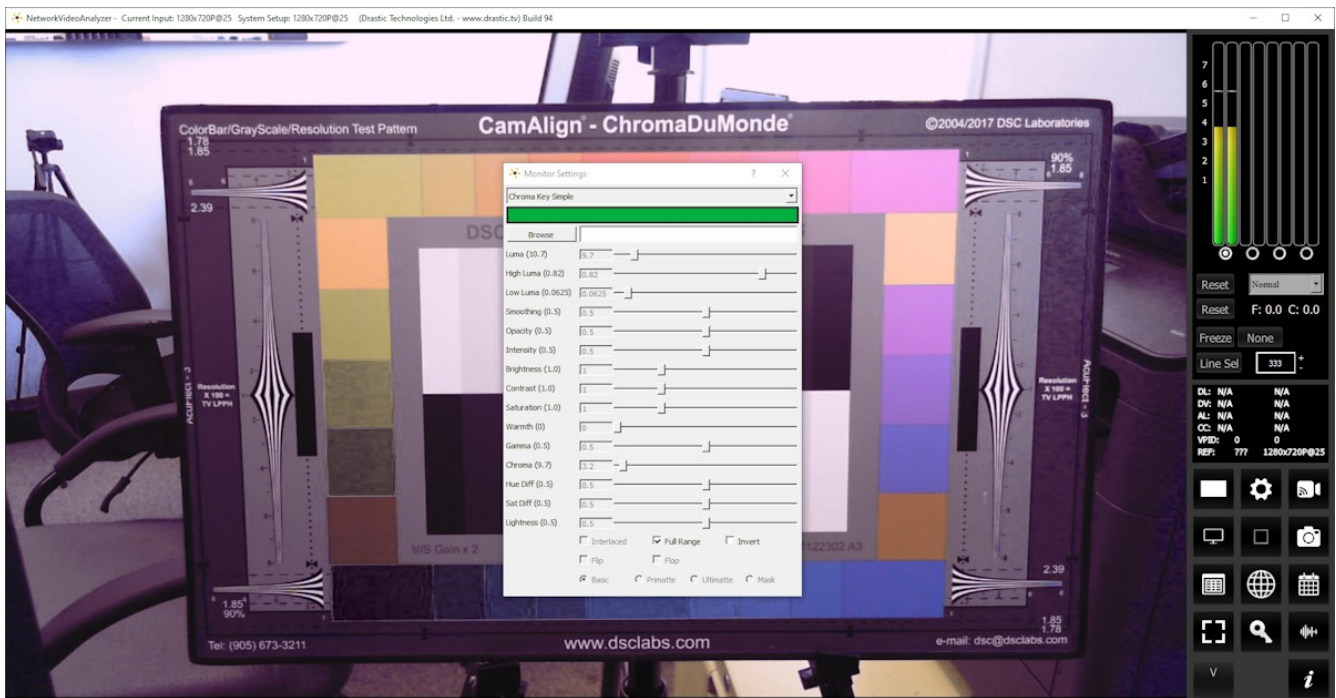
The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

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 **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.

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

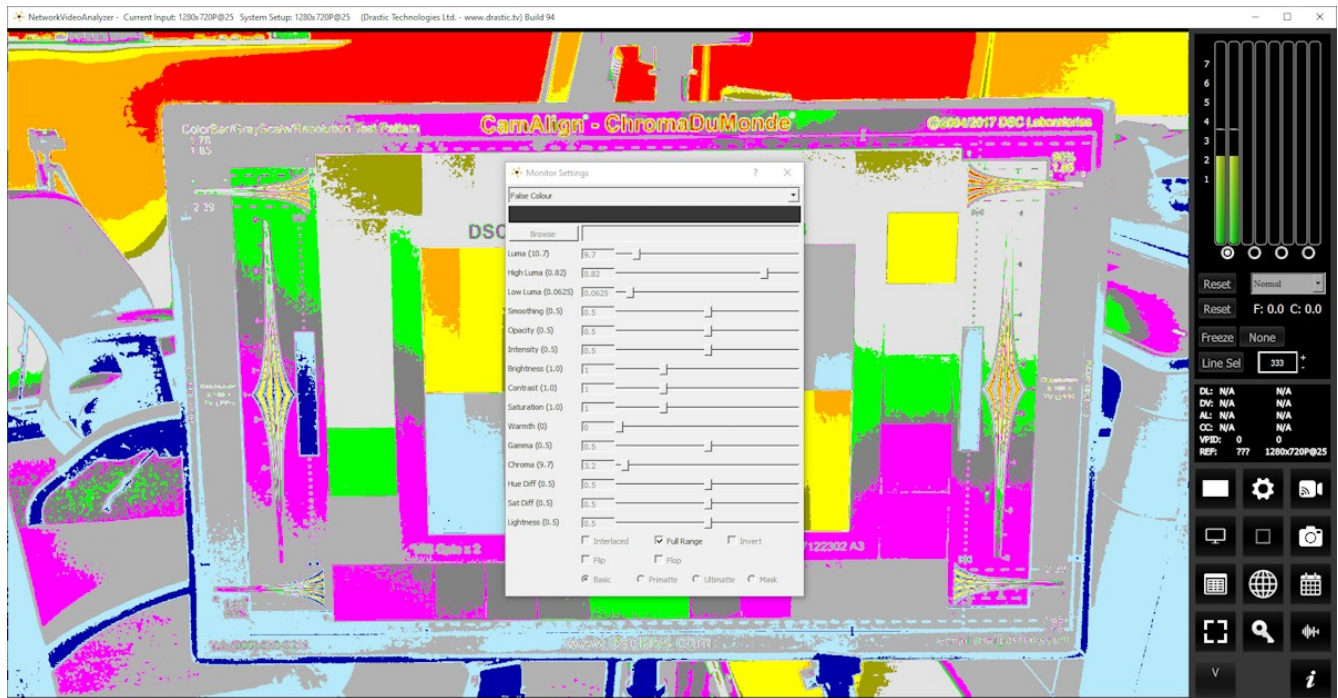
Activates the **Browse** button. This opens a standard browser, which allows the user to navigate to an image to load.

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:



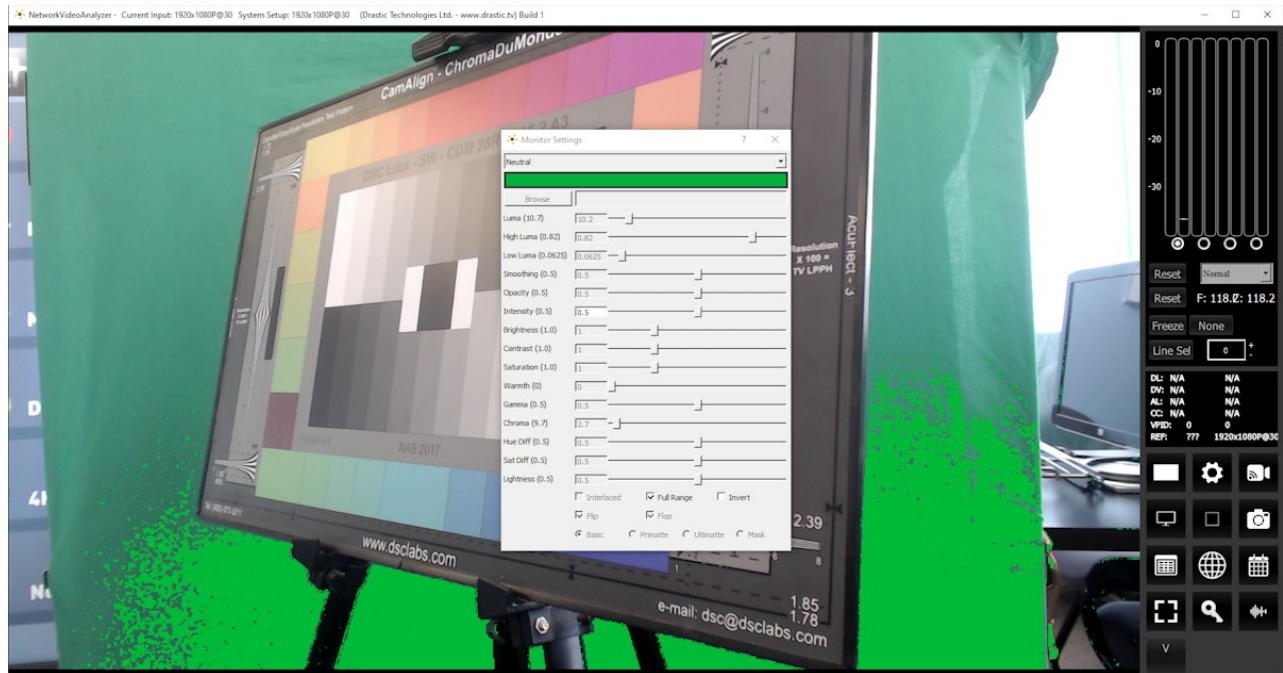
The **Full Range** checkbox may be checked (use Full video range) or unchecked (use the standard SMPTE range). Full Range lets you adjust how the signal is processed to the display and does not affect any of the graticules.

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

3.5.20 Neutral

Draw a color where there are stronger color values, and pass through any neutral areas, where the R, G, and B are relatively equal.



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

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.

3.5.21 Display Modes Keyboard Controls

The display modes can be set using keyboard commands rather than the Monitor Settings window. DrasticScope would have to be the selected application for the commands to have an effect.

- <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 simple
- <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>-T** – Display mode neutral
- <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



The manual is available through this button in all versions.

Manual button – opens up the manual included with your install for quick reference. Depending on the version of software you have installed, this may not be the most up to date manual that exists.

The latest versions of Drastic documentation can be found here:

<https://www.drastic.tv/support-59/supportdocumentation>

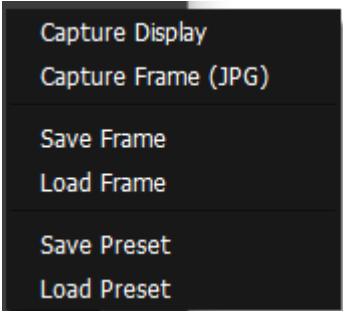
3.7 Capture Image



Feature support by version:

Free	sdiScope	4KScope	HDRScope	NetXScope
	Capture Display, Capture Frame JPG, Save Frame, Load Frame			
	Save Preset, Load Preset			

Frame Grab button – provides options for capturing a frame of video for reference. Images are saved in C:\Users\<username>\Pictures\<softwarename>. Opens the following dialog:



Capture Display – Capture the interface with the current video and scopes to an image

Capture Frame JPG - by selecting this option or using <CTRL>-1, a JPG image can be captured to your C:\Users\<username>\Pictures\NetworkVideoAnalyzer directory in 8 bit YCbCr mode for easy reading and documentation. 10% and 50% JPG scaled versions can also be captured with <CTR>-5 and <CTRL>-9.

Save Frame - The incoming image can be captured as a raw (YUV, V210, RGB10) image in full, bit perfect images to your C:\Users\<username>\Pictures\NetworkVideoAnalyzer directory by selecting this option or by pressing <CTRL>-0. These can be read with videoQC or converted with MediaReactor.

3.7.1 Save Images Keyboard Commands

3.7.1.1 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)

3.7.1.2 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>\Pictures\NetworkVideoAnalyzer.

Load Frame – opens a browser pointed at your C:\Users\<username>\Pictures\NetworkVideoAnalyzer directory so you can load a frame you have saved.

Save Preset – opens a browser set to C:\Users\username\OneDrive\Documents\DrasticScope,

which allows the user to save the current layout in a location of their choice, as a preset for similar workflows.

Load Preset – opens a browser set to C:\Users\username\OneDrive\Documents\DrasticScope, which allows the user to locate and load existing presets.

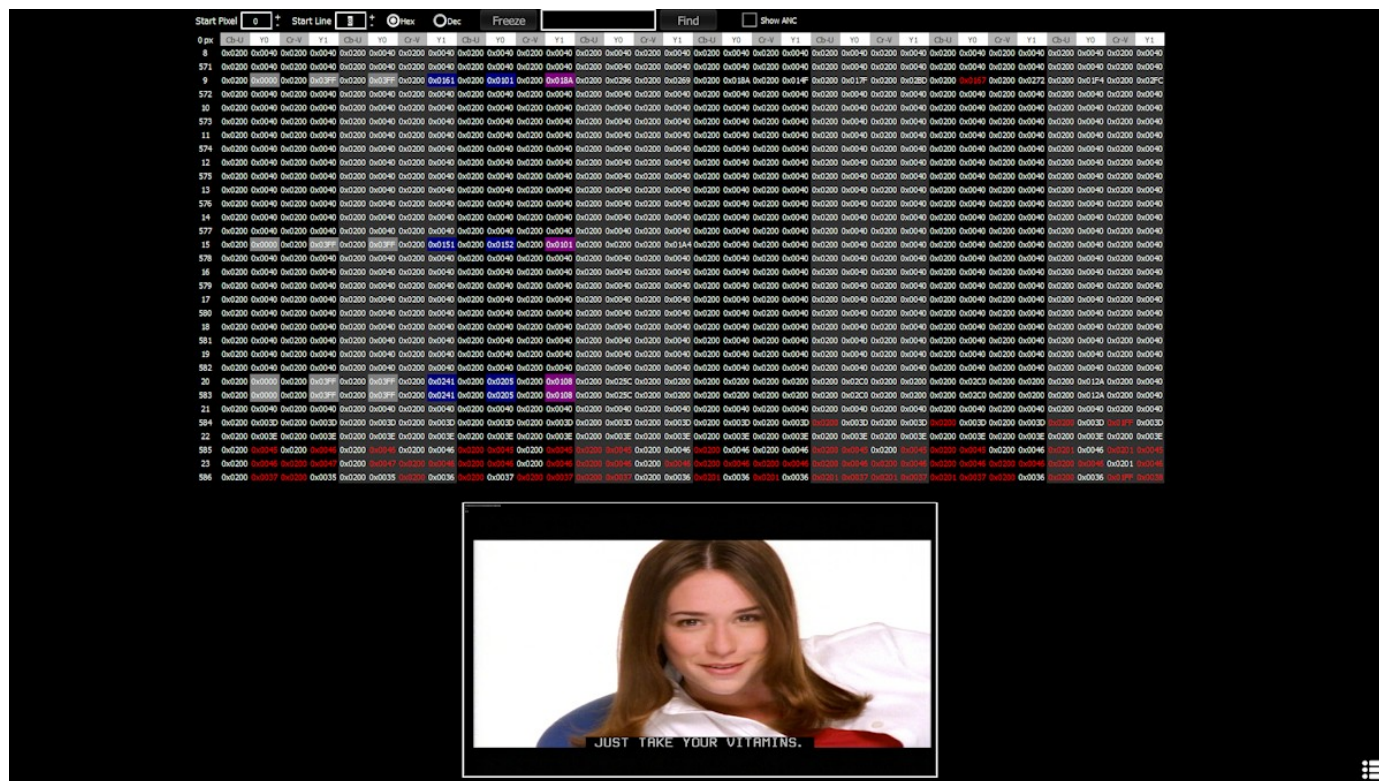
3.8 Data View



The Data View is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Data View		

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



At the top of the data view the following controls are offered:



Start Pixel field and +/- buttons – displays the current start pixel. The user may click in this box

to enter a new start pixel, or use the +/- buttons to increment the start pixel up or down by single pixels.

Start Line field and +/- buttons – displays the current start line. The user may click in this box to enter a new start line, or use the +/- buttons to increment the start line up or down by single lines.

Hex/Dec buttons – select between hexadecimal or decimal values to display.

Freeze button – freeze the current frame of video for closer inspection.

Find field and button – enter a hexadecimal value into the field and press the Find button, and the data view will highlight any instances of this value it finds.

3.8.1 Color Coded Values display

Valid ANC data in the signal starts with the values 0x0000, 0x03FF, 0x03FF (in the luma or a chroma channel, so every second value), followed by the DID and sDID value denoting the ANC type, followed by the size of the data.

These are color coded, with the following values and their color schemes:

Start Values – white on gray

DID/sDID Values – white on blue

Size Values – white on magenta.

	Name	DID/sDID	Activity	Status	Location
1	EIA-708 Caption	61/1	Active	Ok	Field 1 / Line 11
2	Tally Control	51/52	Active		Field 1 / Line 22
3	S2016-3 AFD	41/5	Active	14x9 Center	Field 1 / Line 32


```
6101 : SMPTE-334 HD CEA-708 CC : EIA-708 Caption : Active
5152 : Tally Control Packet : Tally Control : Active
4105 : SMPTE-2016-3 ADF/Bar Data : S2016-3 AFD : Active
```


577	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
15	0x0200	0x0000	0x0200	0x03FF	0x0200	0x03FF	0x0200	0x0151	0x0200	0x0152	0x0200	0x0101	0x0200		
578	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
16	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
579	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
17	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
580	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
18	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
581	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
19	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
582	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200
20	0x0200	0x0000	0x0200	0x03FF	0x0200	0x03FF	0x0200	0x0241	0x0200	0x0205	0x0200	0x0108	0x0200		
583	0x0200	0x0000	0x0200	0x03FF	0x0200	0x03FF	0x0200	0x0241	0x0200	0x0205	0x0200	0x0108	0x0200		
21	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200	0x0040	0x0200		

Start Values
White on Gray

DID/sDID
White on Blue

Size
White on Magenta

Show ANC checkbox – selecting this checkbox will display any valid ancillary data found

Show ANC checkbox – when selected, displays any valid, decoded ANC it can find. Each ancillary data stream is allocated a row.

[illegible]

Reset button – click to reset any lingering values to force a refresh of the Anc monitor.

Show Anc checkbox – click to display the Anc Monitor.

Name column – shows the type of ancillary data being displayed

DID/SDID column – shows Data Identifier/Secondary Data Identifier

Activity column – whether active or paused etc.

Status column – status of the data

Location column – location within the video frame

Details of a selected data stream:

Format – format of the data

DID – Data Identifier

SDID – Secondary Data Identifier

Exp/Act Checksum – shows the expected checksum against the actual checksum

Status – status of the data

Activity – whether active or paused etc.

Type – type of data

Field – which field the data is on if applicable

DC – dc of the data

Line – which line of video the data is on

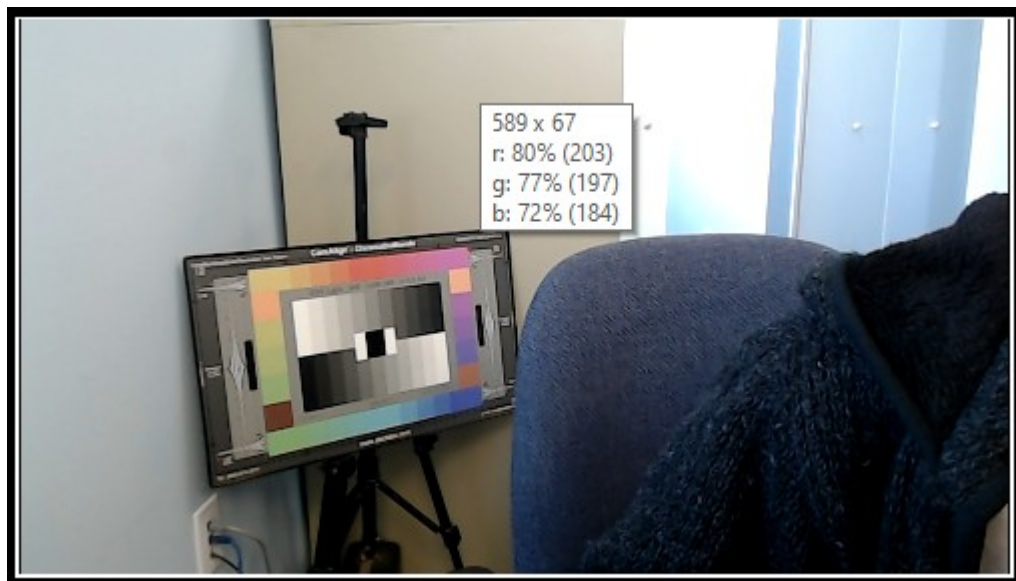
Sample – which sample is being shown

Last Timecode – most recent time code location

Real time values display – displays per pixel details for the selected data

The lower section shows real time details when a row is selected. Current values are displayed. The values will be displayed in white when they are static, and in red when they have changed.

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 location of the specific pixel you are looking at, and shows the RGB values.



The region of pixels that data view analyzes can be set by the user by clicking the **Start Pixel**, or the **Start Line** checkbox, and changing the value. Note, areas outside the active picture region cannot be selected since they will not provide a useful measurement.

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 Pixel <input type="text" value="333"/> <input type="button" value="+"/> <input type="button" value="-"/> Start Line <input type="text" value="222"/> <input type="button" value="+"/> <input type="button" value="-"/> <input checked="" type="radio"/> Hex <input type="radio"/> Dec									
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 Pixel <input type="text" value="333"/> <input type="button" value="+"/> <input type="button" value="-"/> Start Line <input type="text" value="222"/> <input type="button" value="+"/> <input type="button" value="-"/> <input type="radio"/> Hex <input checked="" type="radio"/> Dec									
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.

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.

3.9 Web Page



Globe button – opens up the web page for DrasticScope. This feature requires UwAmp Wamp Server be installed. There is more information about UwAmp, including download links, here: <https://www.uwamp.com/en/?page=download>

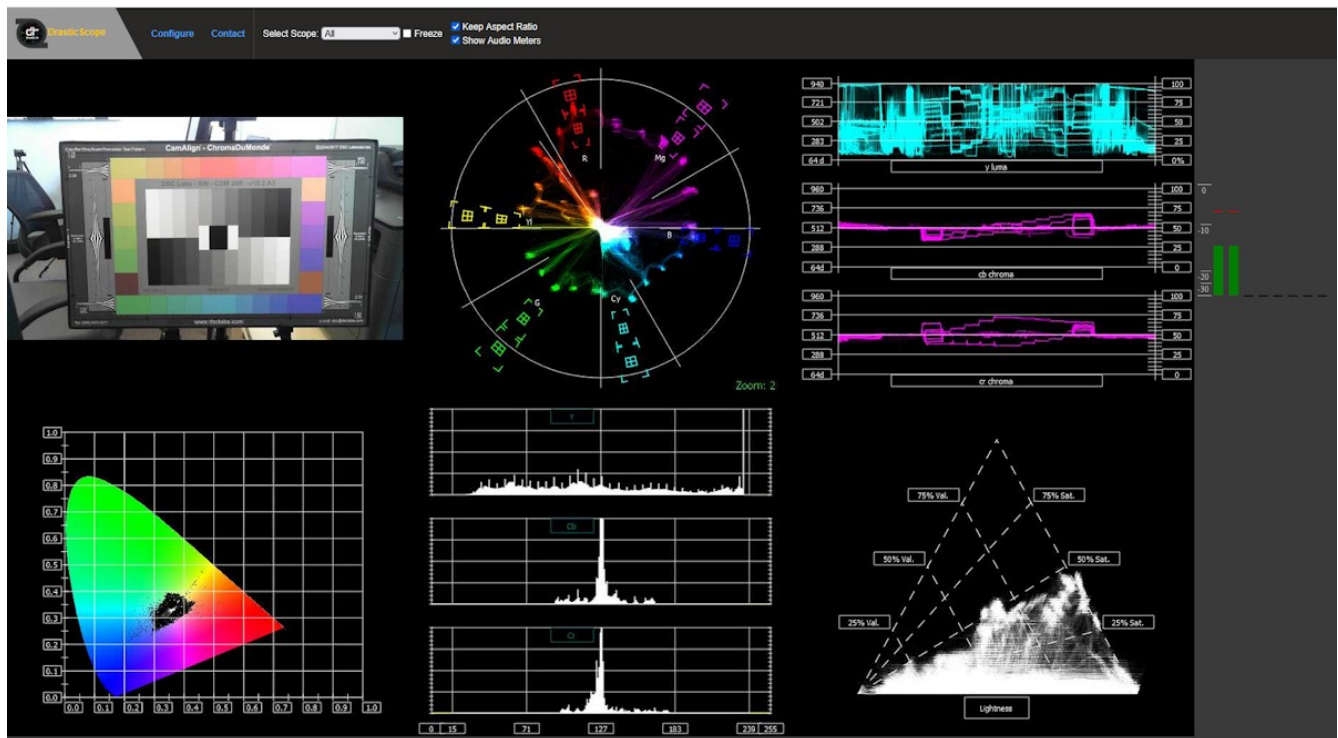
The web GUI is added at the 4KScope level

Free	sdiScope	4KScope	HDRScope	NetXScope
		Web GUI		

The web page lets the user set up and view scopes remotely.

3.10 Web Interface

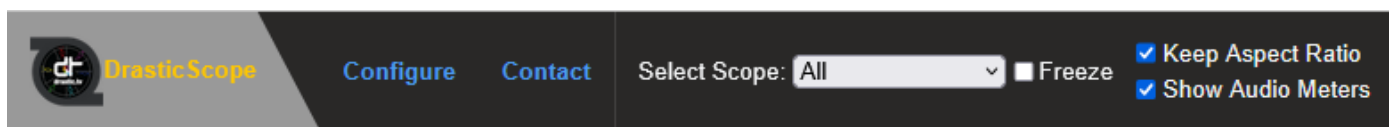
DrasticScope software features a web interface, so the user can remotely set up the scopes and view their signal through the scopes on a web page.



The user can set:

- How many scopes are displayed (1, 2, 4, or 6)
- Where each scope is placed in a multiple scope layout
- How the scope is displayed
- Which overlays are displayed

The main menu offers the following options:

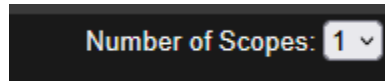


DrasticScope Logo – open the main menu

3.10.1 Configure

Pressing the **Configure** button opens the configuration page, where the user can set up how many scopes are displayed, and how they are displayed.

At the middle right there is a pulldown menu to select which layout to use. The options are:



- 1 – (1up) Use a single scope
- 2 – (2up) Two scopes, side by side
- 4 – (4up) Four scopes in a 2 x 2 grid
- 6 – (6up) Two rows of three scopes

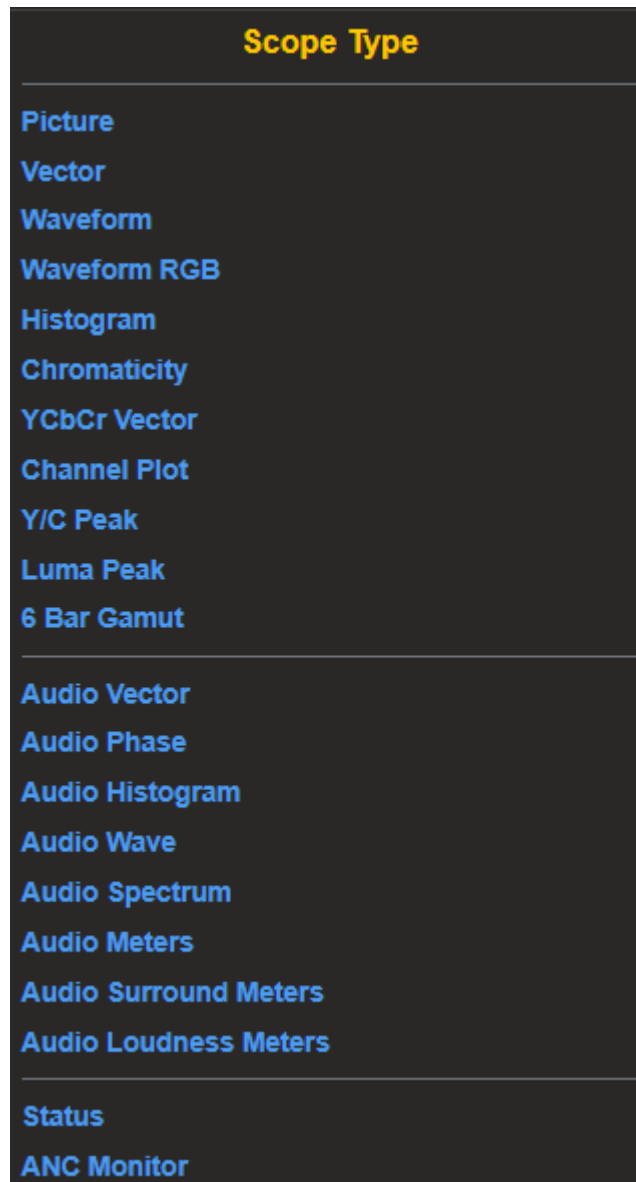
Below the layout selector there are buttons to select between the available scopes for display. Support for specific scopes depends on the version licensed.

Keep Aspect Ratio checkbox – select to constrain any image scaling to maintain the aspect ratio of the input signal

Show Audio Meters checkbox – select to display audio levels in the audio meters to the right of the scopes

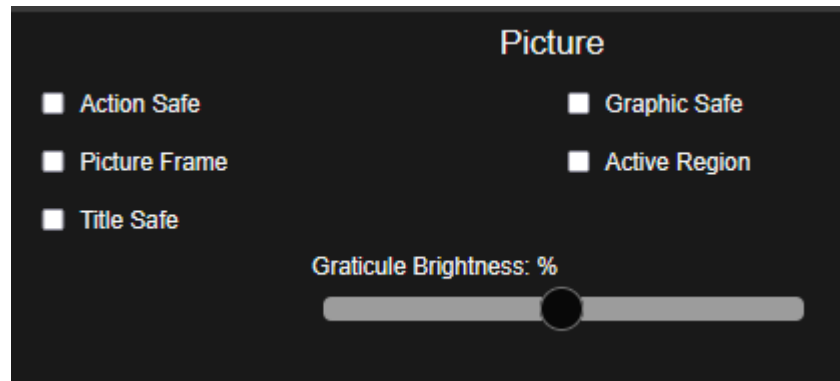
Home – open the main menu

To the right there are controls to select between the various available scopes.



3.10.1.1 *Picture*

Setting a scope to display the Picture view provides the following options:



Action Safe checkbox – select to display the Action Safe rectangle over the picture

Graphic Safe checkbox – select to display the Graphic Safe rectangle over the picture

Picture Frame checkbox – select to display the Picture Frame rectangle over the picture

Active Region checkbox – select to display the Active Region rectangle over the picture

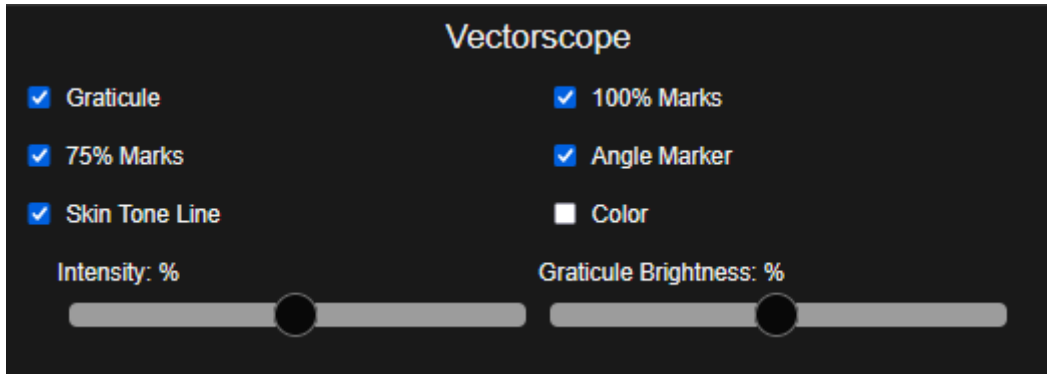
Title Safe checkbox – select to display the Title Safe rectangle over the picture

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.2 Vectorscope

Setting a scope to display the Vector view provides the following options:



Graticule checkbox – select to display the graticule over the vectorscope

100% Marks checkbox – select to display the 100% Marks

75% Marks checkbox – select to display the 75% Marks

Angle Marker checkbox – select to display the Angle Marker

Skin Tone Line checkbox – select to display the Skin Tone Line

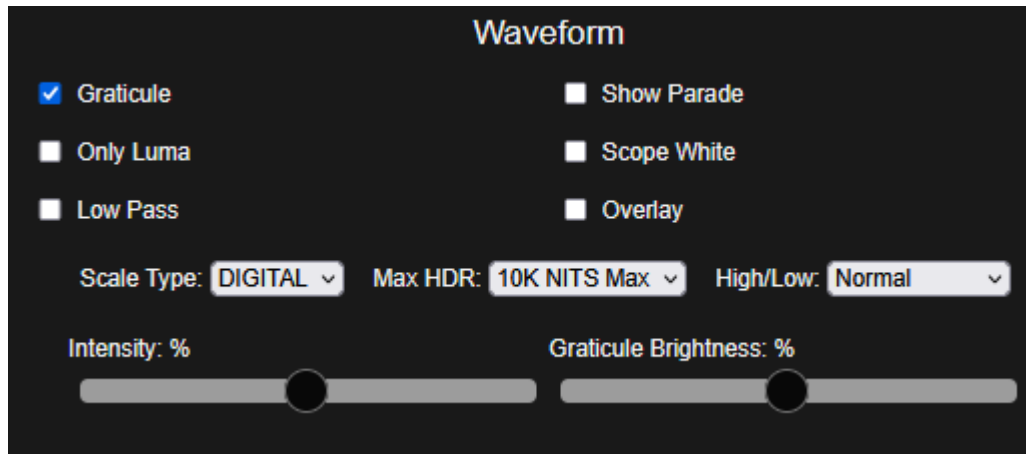
Color checkbox – select to display the trace in color

Intensity slider – use the slider to adjust how intense the vector display will be. Pull to the left reduces the intensity, and pull to the right makes it more intense.

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.3 Waveform

Setting a scope to display the (YCbCr) Waveform view provides the following options:



Graticule checkbox – select to display the graticule over the vectorscope

Show Parade checkbox – select to display the Y, Cb, and Cr from left to right. When not selected, the display is stacked top to bottom.

Only Luma checkbox – select to display only the luminance in the signal

Scope White checkbox – select to display the signal in white

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

Overlay checkbox – select to display the overlay, or composite scope (only available in HDRScope and Network Video Analyzer)

Scale Type pulldown – select between Digital, MV, and IRE scales

Max HDR pulldown – when in HDR mode, select the maximum HDR level. Choices include:

- 10K NITS Max
- 5K NITS Max
- 4K NITS Max
- 3K NITS Max
- 2K NITS Max
- 1K NITS Max
- 200 NITS

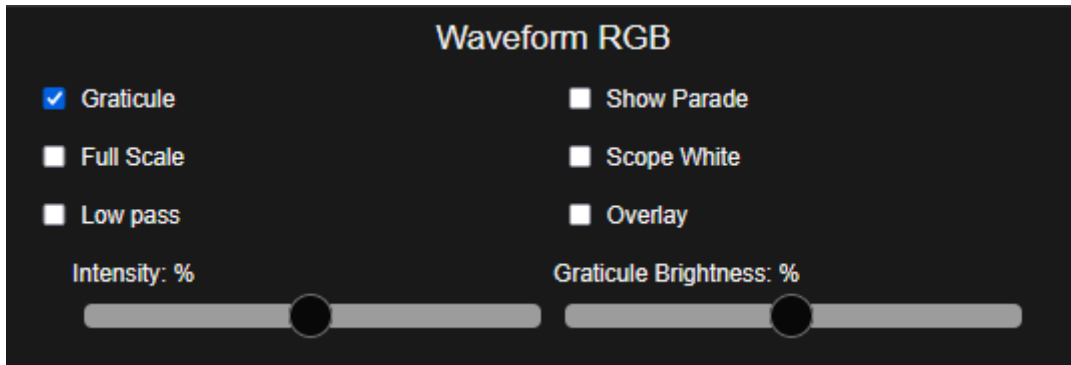
High/Low pulldown – remove the middle section of the trace so the user can just look at the highs and lows, to confirm gamut range. Select between None, 2x zoom, and 3x zoom views.

Intensity slider – use the slider to adjust how intense the vector display will be. Pull to the left reduces the intensity, and pull to the right makes it more intense.

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.4 *Waveform RGB*

Setting a scope to display the Waveform RGB view provides the following options:



Graticule checkbox – select to display the graticule over the vectorscope

Show Parade checkbox – select to display the R, G, and B from left to right. When not selected, the display is stacked top to bottom.

Full Scale checkbox – when selected, use the full luminance range. RGB, by default, will be sRGB. The range of each color will be from 16 to 240 (in 8 bit), so the scale will place white at 240 and black at 16 in normal scale. If in full scale, white will be placed at 255 and black at 0.

Scope White checkbox – select to display the signal in white

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

Overlay checkbox – select to display the overlay, or composite scope (only available in HDRScope and Network Video Analyzer)

Intensity slider – use the slider to adjust how intense the vector display will be. Pull to the left reduces the intensity, and pull to the right makes it more intense.

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.5 Histograms

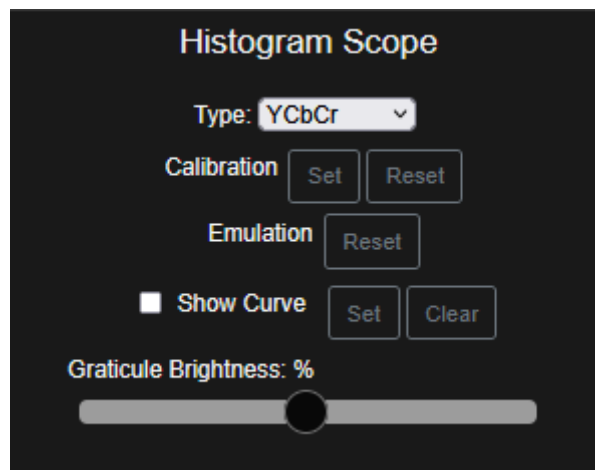
Setting a scope to display the Histogram view provides the following options:

Type pulldown – select between available histogram types.

There are five Histograms available in the histogram panel

- YCbCr Histogram
- RGB Histogram
- HSV Histogram
- Luma Histogram
- H/S Scope.

Once the Histogram has been selected, the following controls are available:



Use the pulldown menu to select between the available histograms.

The following controls apply specifically to the H/S Scope.

Calibration section – choices include:

- **Set** – given a camera and a DSC ChromaDuMonde color chart, click to calibrate the input so the hue and saturation levels are even across the spectrum. Creates a calibration settings file that may be saved into memory.
- **Reset** – remove any calibration and display the signal unaltered, to show what the camera or device is seeing.

Emulation section – choices include:

- **Reset** – reset the emulation values back to default.

Show Curve section – choices include:

- **Show Curve** checkbox – select, or check, this box to show the curve.
- **Set** – click to set the current curve into memory. With Show Curve selected, displays the curve as a white line at the top of the signal, for levels comparison. With the curve set, the user can then test other lights to see how the peaks and valleys of the curve line up with the signal.
- **Clear** – clear the current curve and return to default settings.

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.
Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.6 Chromaticity

Setting a scope to display the Chromaticity view provides the following options:



Graticule checkbox – select to display the graticule over the chromaticity scope

Triangle ACES AP1 – select to display the ACES AP1 triangle

Triangle 2020 checkbox – select to display the 2020 triangle

Triangle Canon Cinema Gamut – select to display the Canon Cinema Gamut triangle

Triangle V Gamut checkbox – select to display the V Gamut triangle

ProPhoto RGB – select to display the ProPhoto RGB triangle

Triangle 601 checkbox – select to display the 601 triangle

Triangle Arri Wide Gamut – select to display the Arri Wide Gamut triangle

Triangle BMD Wide Gamut 5 – select to display the BMD Wide Gamut 5 triangle

Triangle P3 checkbox – select to display the P3 triangle

Triangle RED Wide Gamut RGB checkbox – select to display the RED Wide Gamut RGB triangle

Adobe RGB – select to display the Adobe RGB triangle

Triangle ACES AP0 – select to display the ACES AP0 triangle

Triangle 709 checkbox – select to display the 709 triangle

Triangle DaVinci Wide Gamut – select to display the DaVinci Wide Gamut triangle

Invert checkbox – select to display the signal in color, and the chromaticity triangle in black

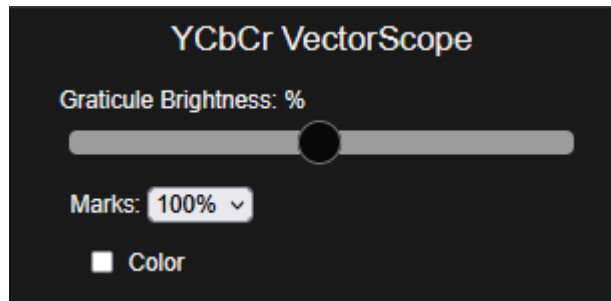
Triangle S-Gamut – select to display the S-Gamut triangle

Black checkbox – select to display the signal in black

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.7 YCbCr VectorScope

Setting a scope to display the YCbCr VectorScope view provides the following options:



Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

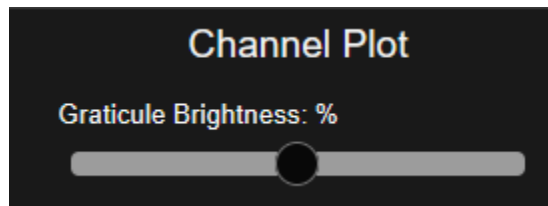
Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

Marks pulldown menu – use to select between 100% markers and 75% markers.

Color checkbox – when selected, display the trace in color.

3.10.1.8 Channel Plot

Setting a scope to display the Channel Plot view provides the following options:

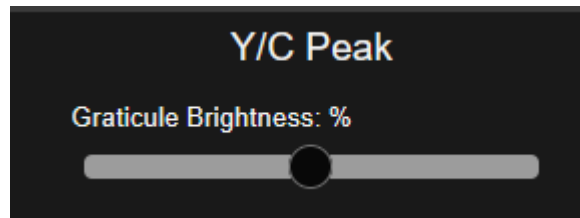


Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.9 Y/C Peak

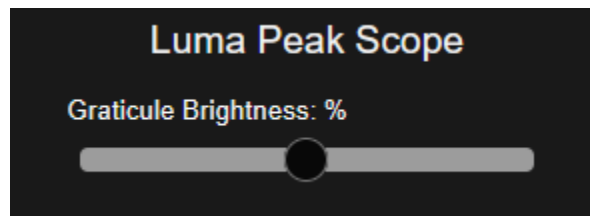
Setting a scope to display the Y/C Peak view provides the following options:



Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.10 Luma Peak

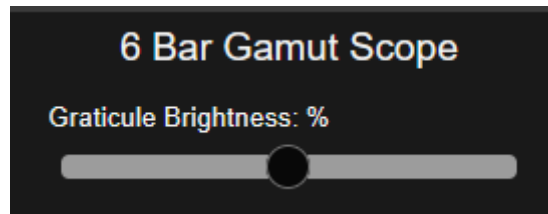
Setting a scope to display the Luma Peak view provides the following options:



Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.11 6 Bar Gamut Scope

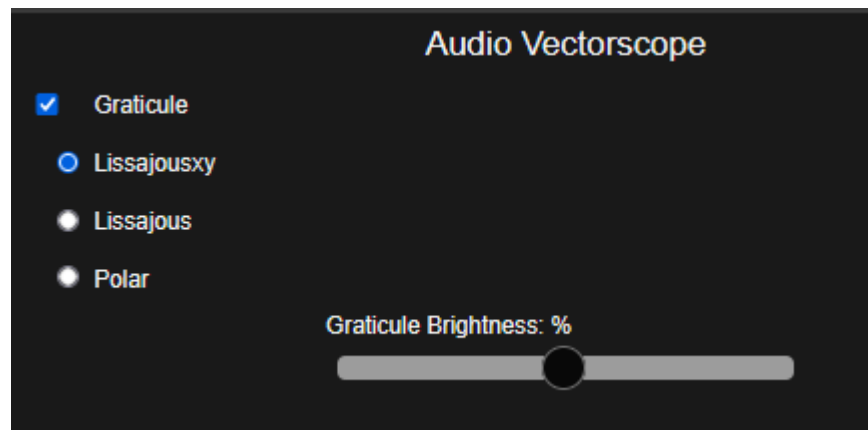
Setting a scope to display the 6 Bar Gamut Scope view provides the following options:



Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider. Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.12 Audio Vectorscope

Setting a scope to display the Audio Vectorscope view provides the following options:



Graticule checkbox – select to display the graticule over the audio vectorscope

Lissajousxy checkbox – select to set the audio vectorscope to Lissajousxy mode

Lissajous checkbox – select to set the audio vectorscope to Lissajous mode

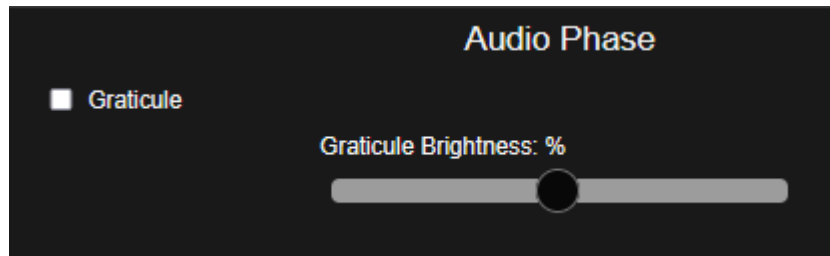
Polar checkbox – select to set the audio vectorscope to Polar mode

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.13 Audio Phase Scope

Setting a scope to display the Audio Phase Scope view provides the following options:



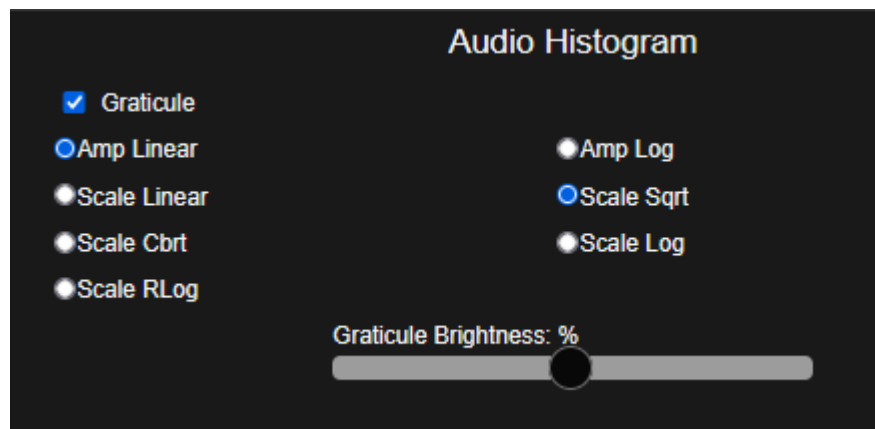
Graticule checkbox – select to display the graticule over the audio phase scope

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.14 Audio Histogram Scope

Setting a scope to display the Audio Histogram Scope view provides the following options:



Graticule checkbox – select to display the graticule over the audio histogram scope

Amp Settings: choose between

Amp linear checkbox – select to set the display to Amp Linear

Amp Log checkbox – select to set the display to Amp Logarithmic

Scale Settings: choose between

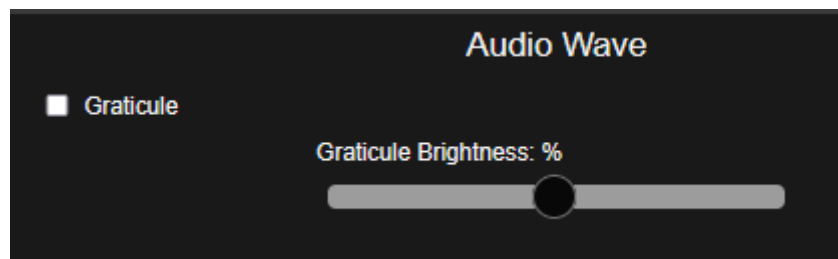
Scale Linear checkbox – select to set the display to Scale Linear

Scale Sqrt checkbox – select to set the display to Scale Square Root

- Scale Cbrt** checkbox – select to set the display to Square Cube Root
- Scale Log** checkbox – select to set the display to Scale Logarithmic
- Scale RLog** checkbox – select to set the display to Scale R Logarithmic
- Graticule Brightness** slider – adjust the brightness of the graticule overlay by using the slider.
Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.15 Audio Wave

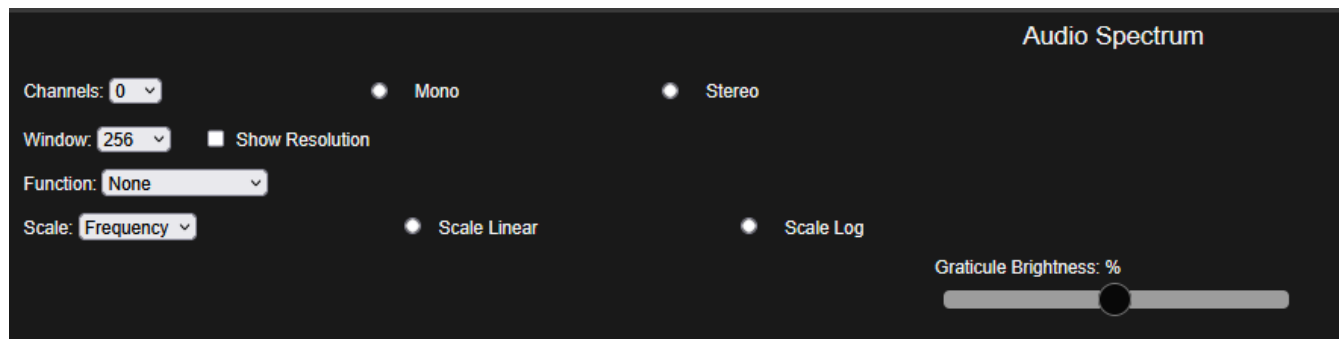
Setting a scope to display the Audio Wave view provides the following options:



- Graticule** checkbox – select to display the graticule over the audio phase scope
- Graticule Brightness** slider – adjust the brightness of the graticule overlay by using the slider.
Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.1.16 Audio Spectrum Scope

Setting a scope to display the Audio Spectrum view provides the following options:



- Graticule Brightness** slider – adjust the brightness of the graticule overlay by using the slider.
Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.
- Function** pulldown menu – use the pulldown menu to select between available functions.
- Channels** pulldown menu – use the pulldown menu to select the channel or first channel of a

channel pair to monitor

Show Resolution checkbox – when selected, the resolution setting is displayed above the audio spectrum meters.

Mono/Stereo radio buttons – use to select between a mono/single audio channel, and a stereo pair. When one button is selected, the other is deselected.

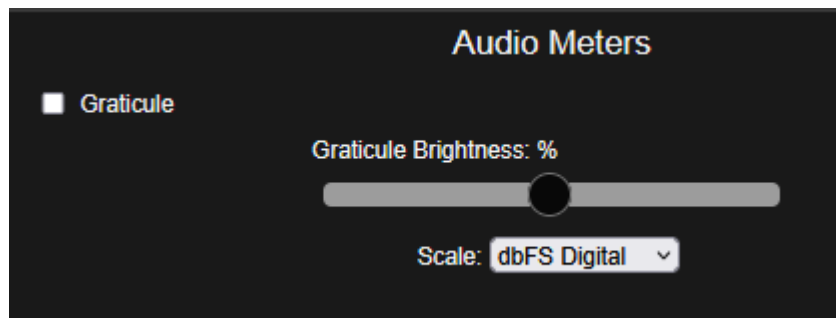
Scale pulldown menu – select between Frequency, or Octave scale settings. Frequency shows the audio frequency (oscillation rate), and Scale shows each instance of the C note, where C4 is middle C on the piano.

Window pulldown menu – use this pulldown menu to select how many bands the audio spectrum is divided into.

Scale Linear/Scale Log radio buttons – use to select between displaying a linear curve or a logarithmic curve. When one button is selected, the other is deselected.

3.10.1.17 Audio Meters Scope

Setting a scope to display the Audio Meters Scope view provides the following options:

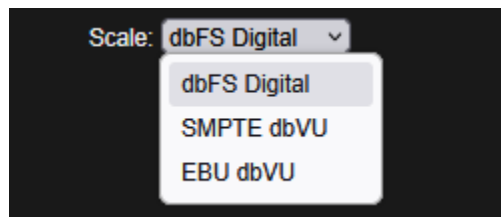


Graticule checkbox – select to display the graticule over the audio phase scope

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

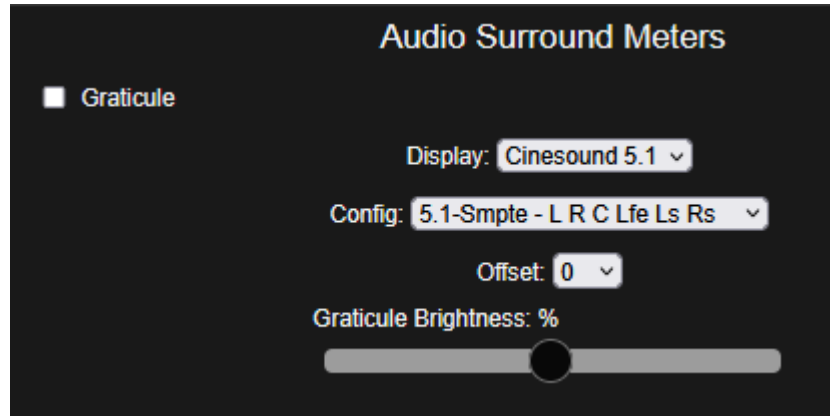
Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

Scale pulldown menu – choose the audio scale being used. Options include: dBFS Digital, SMPTE dBVU, or EBU dBVU.



3.10.1.18 Audio Surround Sound

Setting a scope to display the Audio Surround Meters view provides the following options:



Graticule checkbox – select to display the graticule over the audio phase scope

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

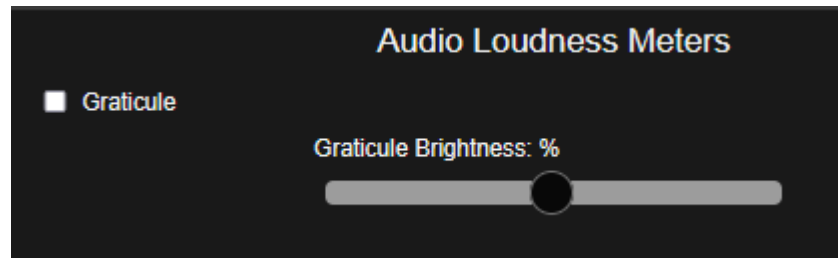
Display pulldown menu – select between Cinesound 5.1 and Cinesound 7.1.

Config pulldown menu – depending on which display mode is set, this menu is used to select which layout is enabled (where each of the channels are output).

Offset pulldown menu – use to rotate the channels so that the first surround sound channel lines up with the correct output channel.

3.10.1.19 Audio Loudness Meters

Setting a scope to display the Audio Loudness Meters view provides the following options:



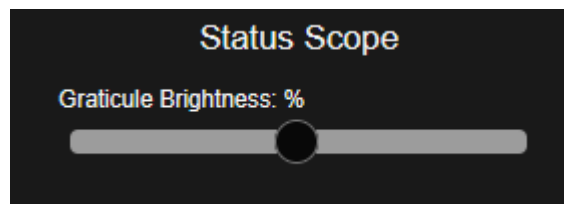
Graticule checkbox – select to display the graticule over the audio loudness meters

Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.2 Status

Setting a scope to display the Status view provides the following options:

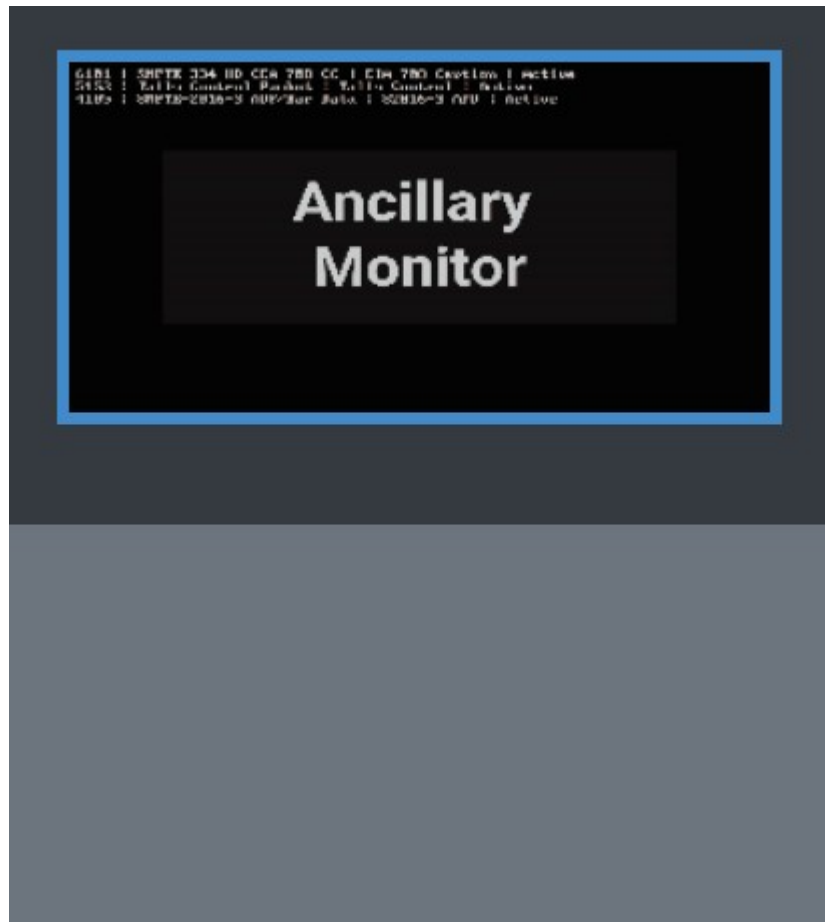


Graticule Brightness slider – adjust the brightness of the graticule overlay by using the slider.

Pull to the left makes the graticule dimmer, and pull to the right makes it brighter.

3.10.2.1 *ANC Monitor*

Setting a scope to display the ANC Monitor view does not provide any setup options. It does allow the user to select the ANC monitor.



Contact - displays contact information for Drastic Technologies.

Drastic Technologies Ltd.

523 The Queensway Suite 201

Toronto, Ontario

Canada M8Y 1J7

Monday To Friday

9:00 am - 5:00 pm EST

Phone: (416) 255-5636

Fax: (416) 255-8780

Email: sales@drastictech.com

3.11Error Log



The error log is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Error Log		

Log button – opens up the Error Log, which allows the user to review specific types of events and errors, useful for troubleshooting the system and/or the signal.

NetworkVideoAnalyzer							
<input type="checkbox"/> Show info events		<input checked="" type="checkbox"/> Auto scroll		<input type="checkbox"/> Auto load		event_0000000725_2022_11_23-08_53_57.csv	
						Event Sensitivity	Show Logs
	Date-Time	Timecode	Code	SubCode	Event	Description	Details
4	2022_11_23-09_30_55	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
5	2022_11_23-09_30_56	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
6	2022_11_23-09_30_56	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
7	2022_11_23-09_30_56	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
8	2022_11_23-09_31_28	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
9	2022_11_23-09_31_28	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
10	2022_11_23-09_31_28	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
11	2022_11_23-09_31_28	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
12	2022_11_23-09_31_46	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
13	2022_11_23-09_31_46	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
14	2022_11_23-09_31_46	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
15	2022_11_23-09_31_46	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
16	2022_11_23-09_31_49	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
17	2022_11_23-09_31_49	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
18	2022_11_23-09_31_49	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
19	2022_11_23-09_31_49	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
20	2022_11_23-09_31_55	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
21	2022_11_23-09_31_55	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
22	2022_11_23-09_31_55	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
23	2022_11_23-09_31_55	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
24	2022_11_23-09_31_57	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
25	2022_11_23-09_31_57	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
26	2022_11_23-09_31_57	n/a	Hardware	0x00000002	0x0000000B	Closing video board	
27	2022_11_23-09_31_58	n/a	Hardware	0x00000002	0x0000000A	Found and opened VGA ...	
28	2022_11_23-10_16_10	n/a	Hardware	0x00000002	0x0000000B	Closing video board	

The following controls are available:

Show Info Events checkbox – click to show or hide the events listed in the log.

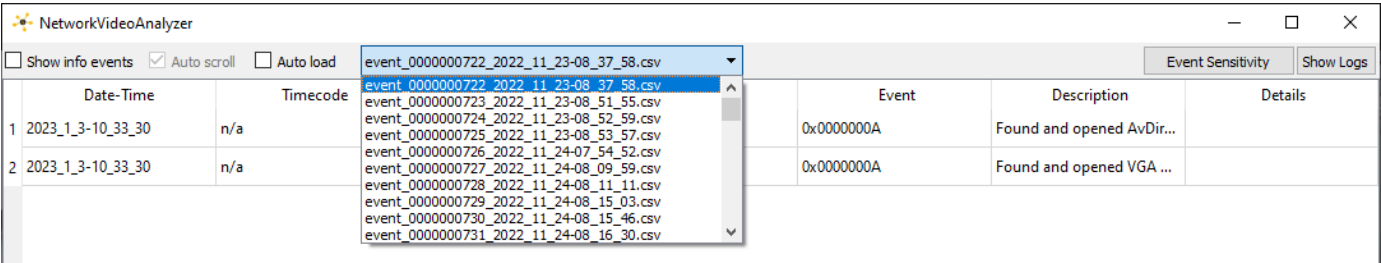
Auto Scroll checkbox – when selected, will automatically scroll the list down as new events are added, so they are not missed by the operator.

Auto Load checkbox – when selected, each time the Log button is pressed, the Event Log will open with the most recent event log displayed. When this checkbox is deselected, the log pulldown menu to the right becomes active, so the user can load other saved event logs.

Error logs are saved into the following location:

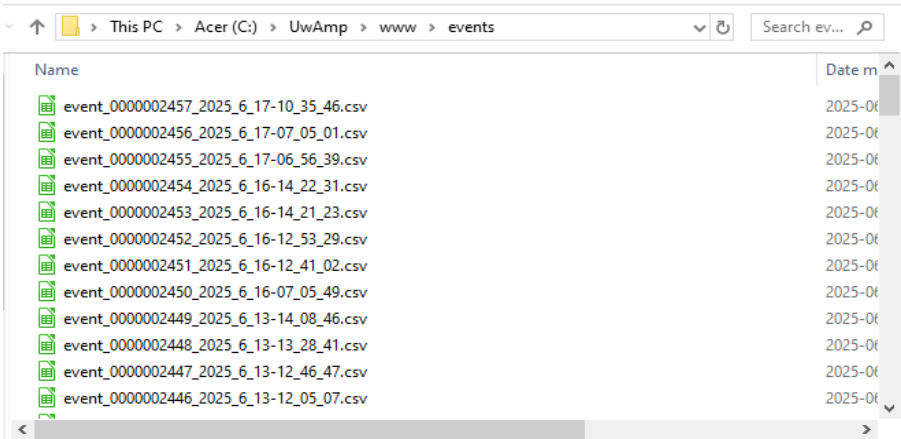
C:\UwAmp\www\events

With the **Auto load** checkbox unchecked, the user can open existing event logs. They are given names which also contain the date and time of the log creation.



Selecting an event log from this list lets the user view older event logs.

Pressing the **Show Logs** button opens the folder where the event files are saved.

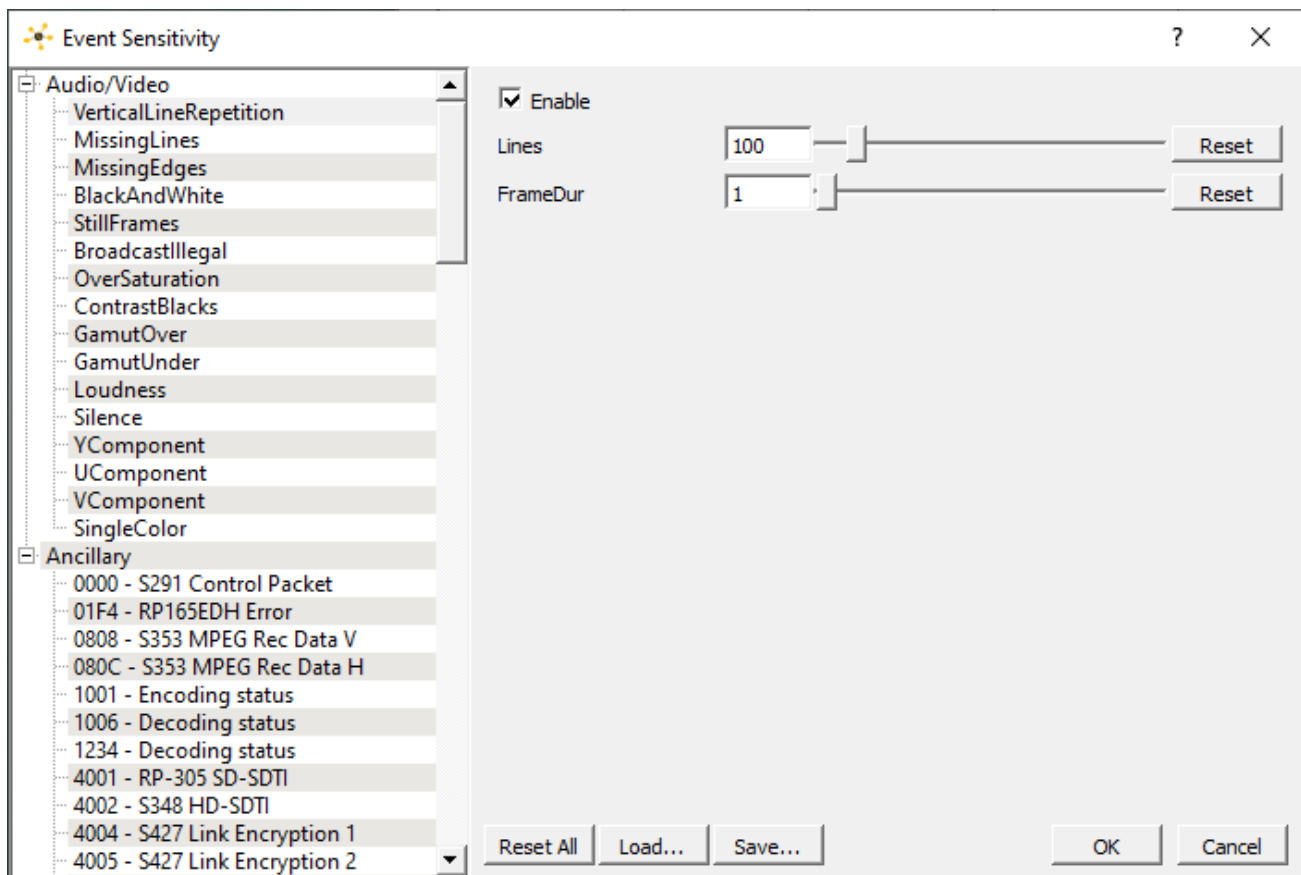


3.11.1 Audio/Video Event Sensitivity

Event Sensitivity button – opens the Event Sensitivity window

Each category of event can be adjusted to suit the requirements of the user's workflow. The default value is displayed, and the user can adjust a parameter by using the sliders provided. A reset button is available for each individual setting.

3.11.1.1 Vertical Line Repetition



Enable checkbox – click to enable checking for Vertical Line Repetition, and adjust any relevant settings.

Lines (number of lines) field, slider, and **Reset** button – default 100

FrameDur (frame duration) field, slider, and **Reset** button – default 1

Reset All button – clicking Reset All returns all values to their default settings.

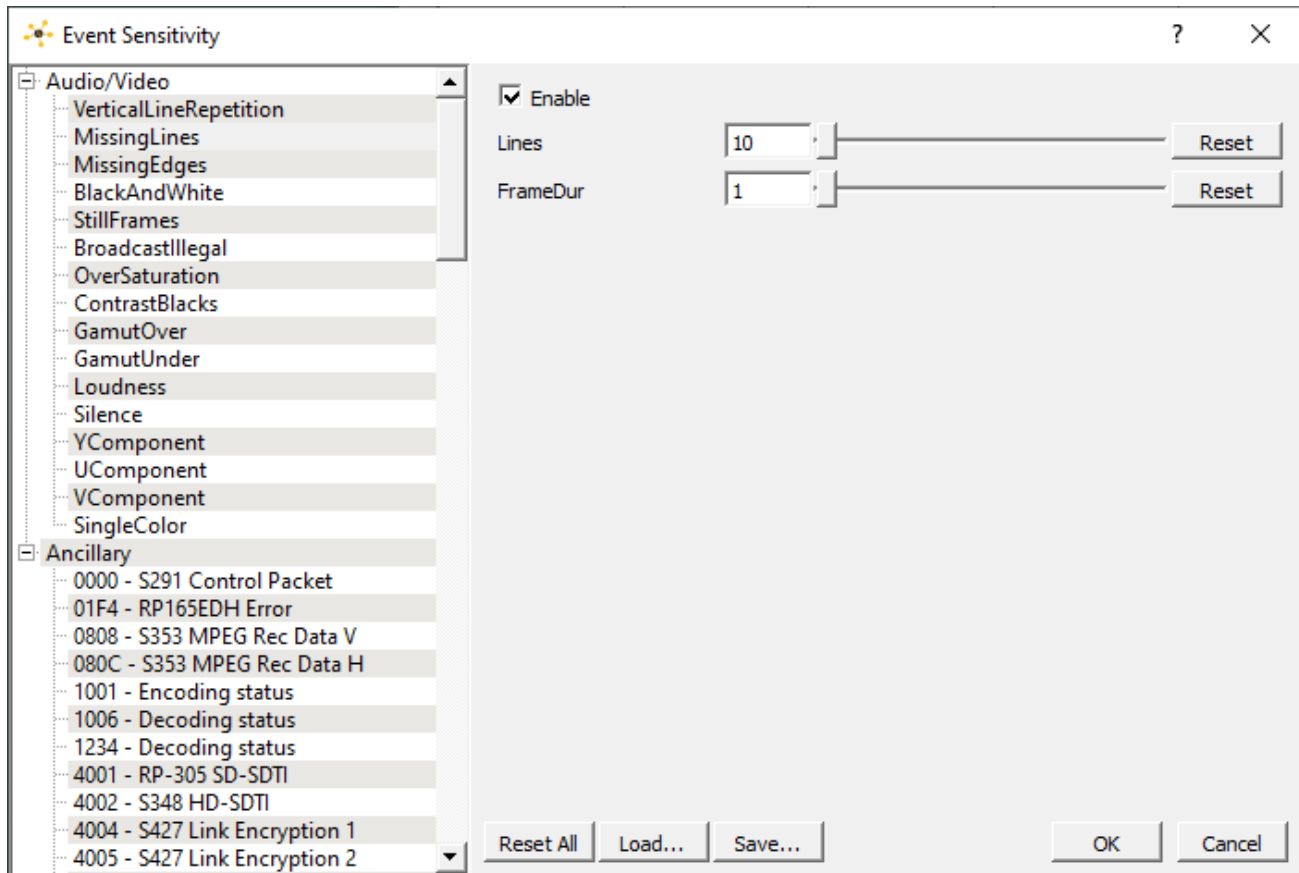
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.2 Missing Lines



Enable checkbox – click to enable checking for missing Lines, and adjust any relevant settings.

Lines (number of lines) field, slider, and **Reset** button – default 10

FrameDur (frame duration) field, slider, and **Reset** button – default 1

Reset All button – clicking Reset All returns all values to their default settings.

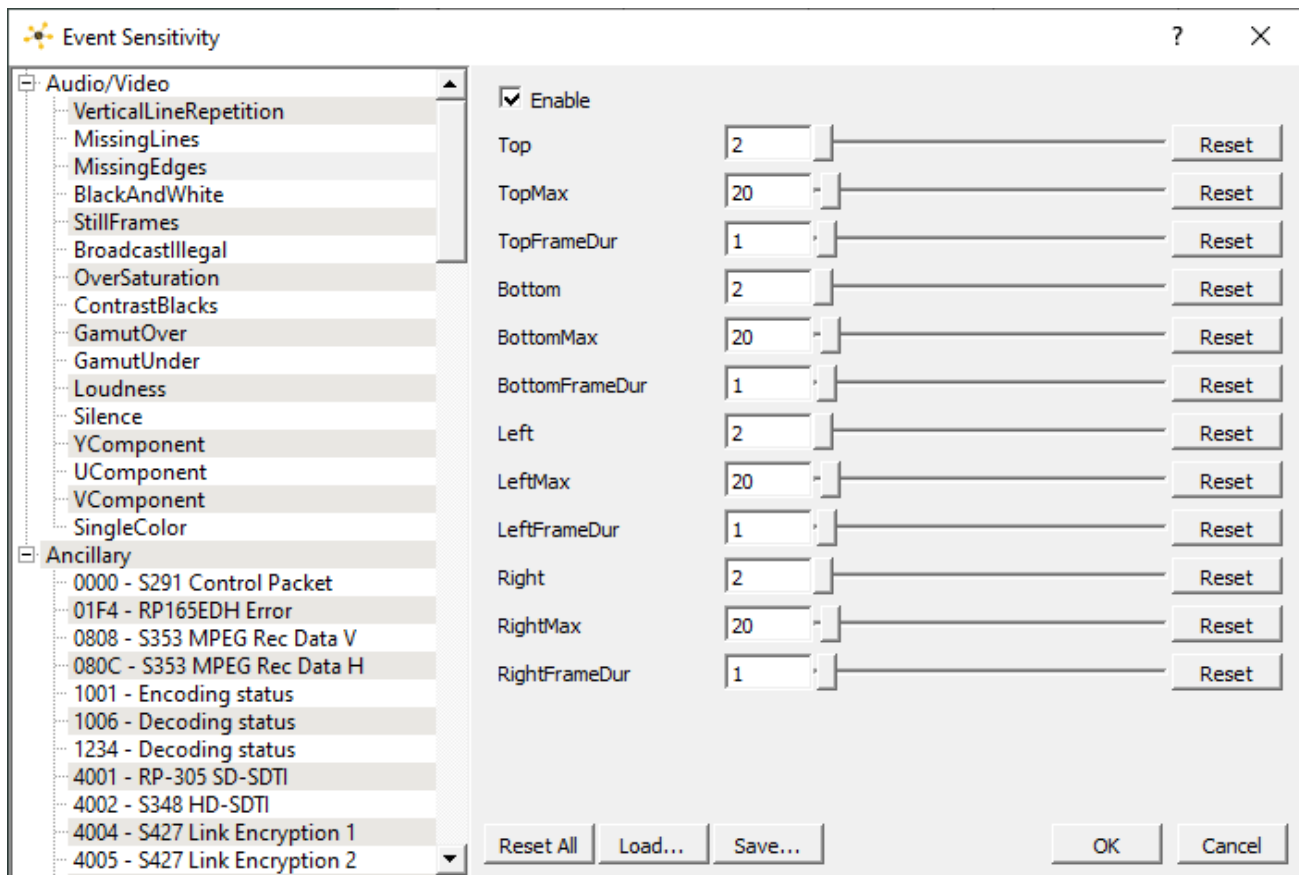
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.3 Missing Edges



Enable checkbox – click to enable checking for missing edges, and adjust any relevant settings.

Top field, slider, and **Reset** button - default 2

TopMax field, slider, and **Reset** button - default 20

TopFrameDur field, slider, and **Reset** button - default 1

Bottom field, slider, and **Reset** button - default 20

BottomMax field, slider, and **Reset** button - default 20

BottomFrameDur field, slider, and **Reset** button - default 1

Left field, slider, and **Reset** button - default 2

LeftMax field, slider, and **Reset** button - default 20

LeftFrameDur field, slider, and **Reset** button - default 1

Right field, slider, and **Reset** button - default 2

RightMax field, slider, and **Reset** button - default 20

RightFrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

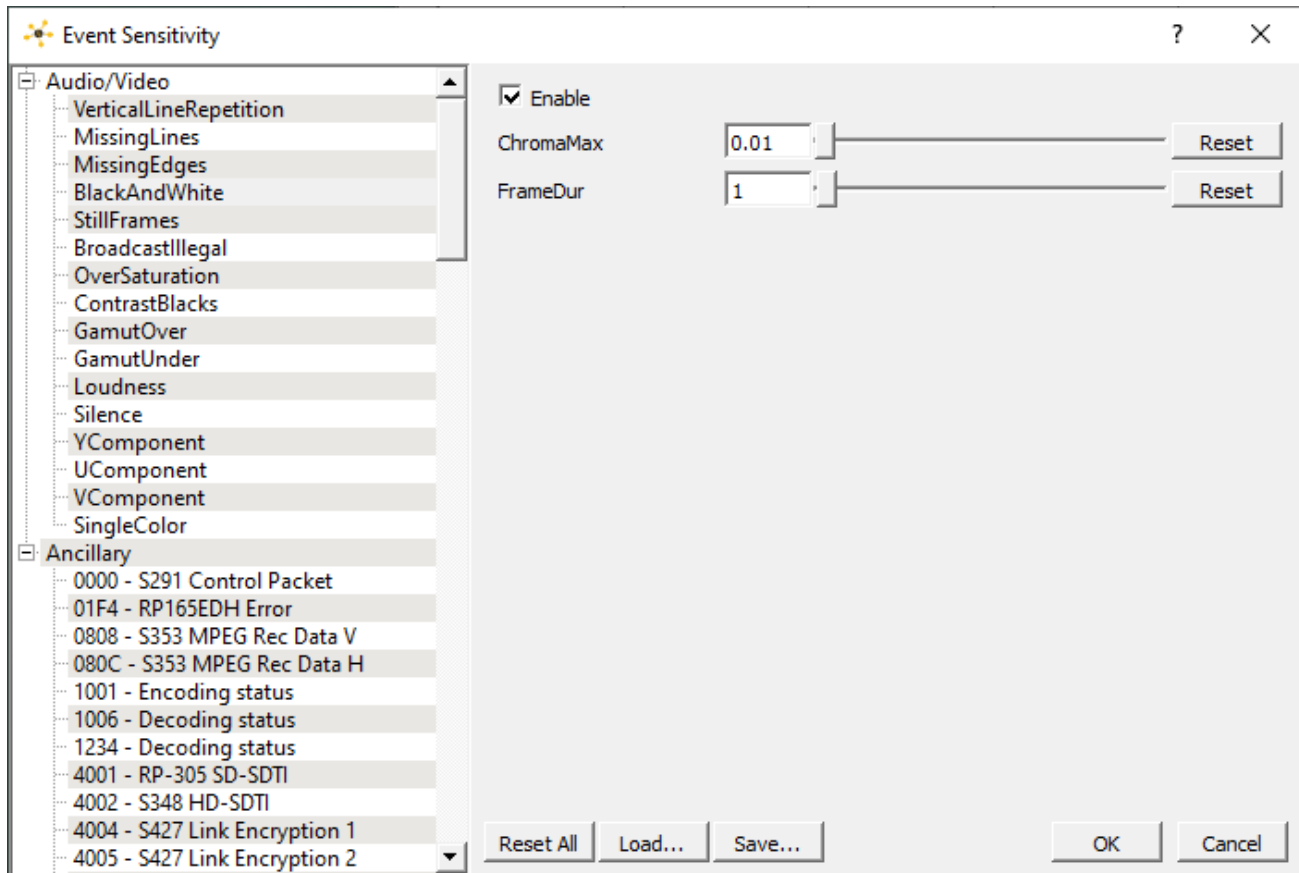
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.4 Black and White



Enable checkbox – click to enable checking the black and white levels, and adjust any relevant settings.

ChromaMax field, slider, and **Reset** button - default 0.01

FrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

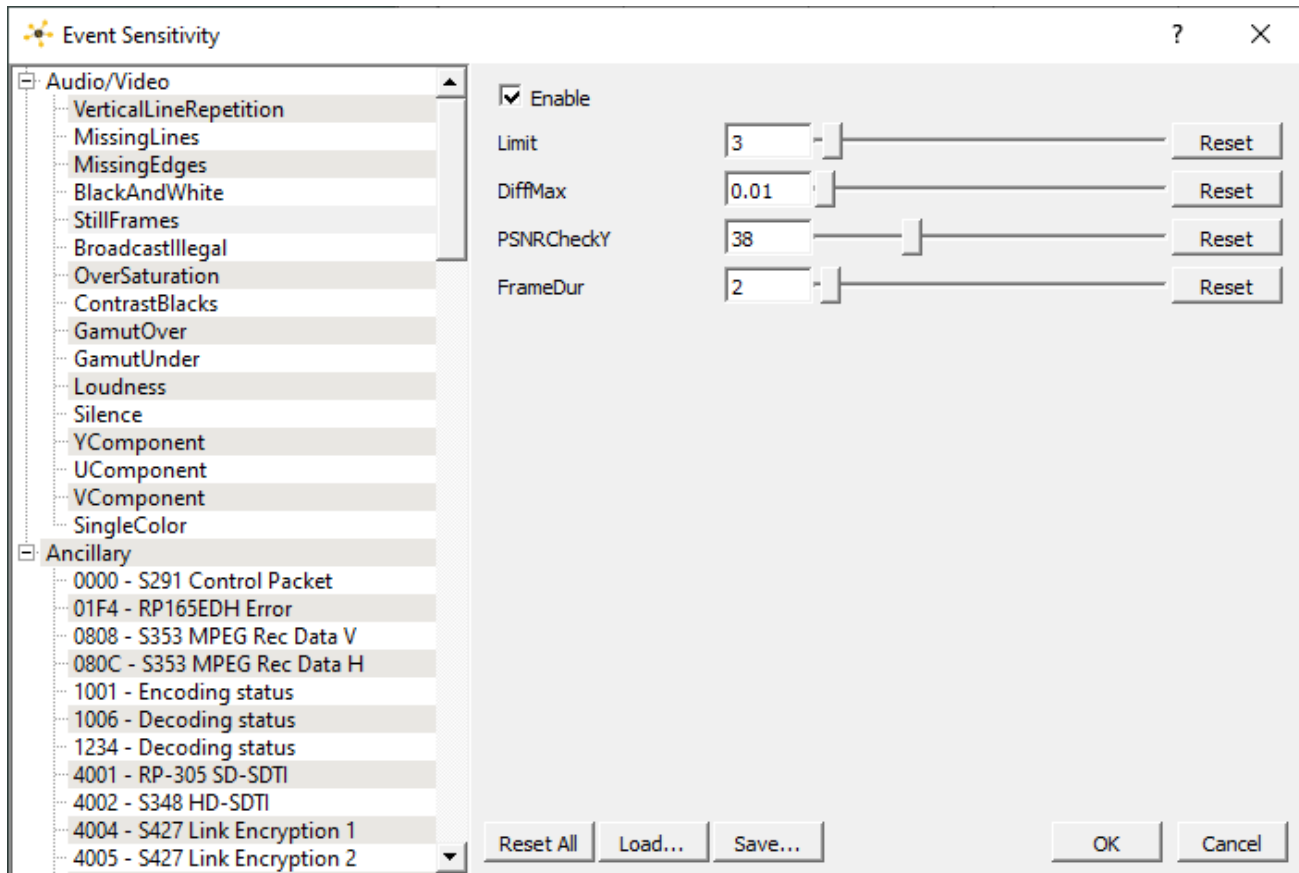
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.5 Still Frames



Enable checkbox – click to enable checking for still frames, and adjust any relevant settings.

Limit field, slider, and **Reset** button - default 3

DiffMax field, slider, and **Reset** button - default 0.01

PSNRCheckY field, slider, and **Reset** button - default 38

FrameDur field, slider, and **Reset** button - default 2

Reset All button – clicking Reset All returns all values to their default settings.

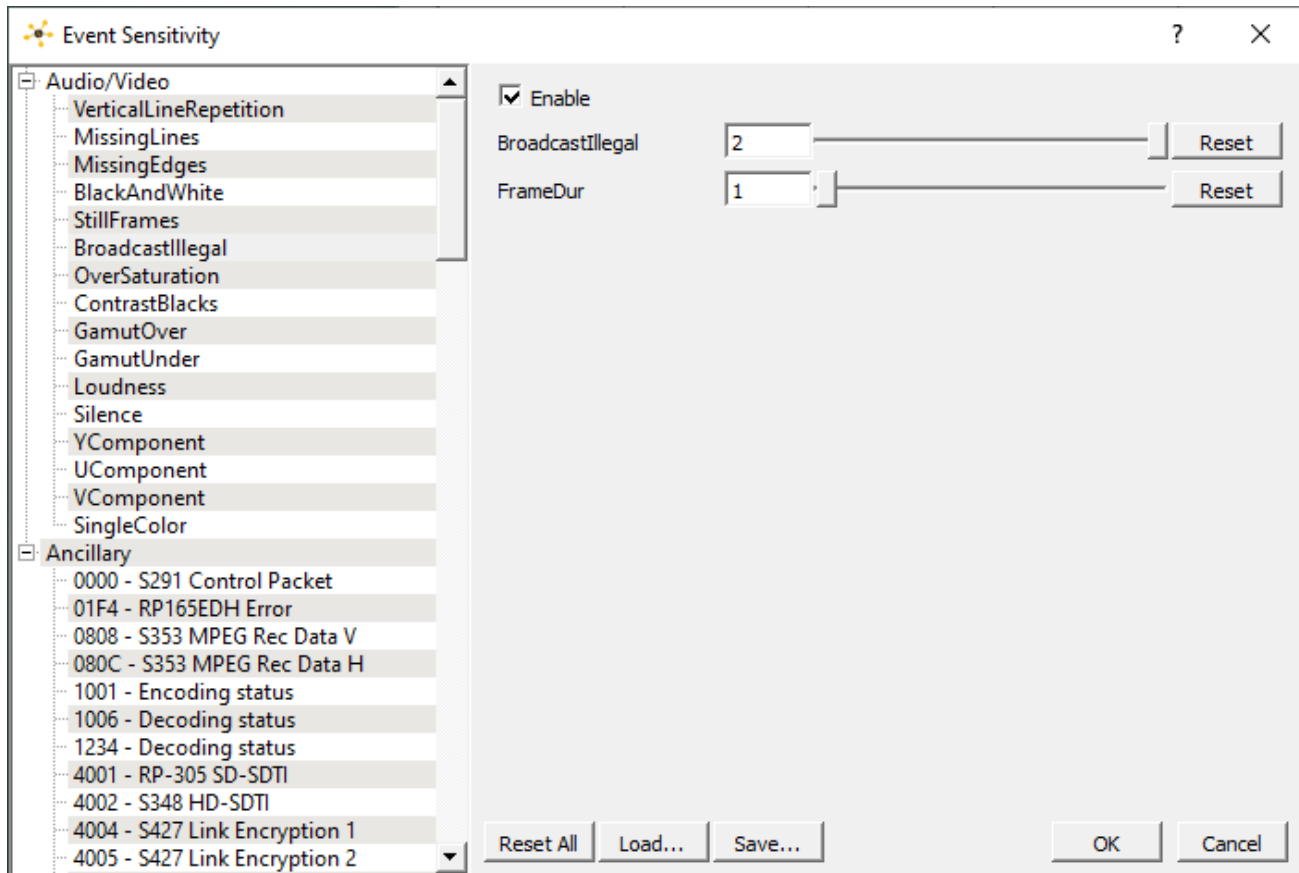
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.6 Broadcast Illegal



Enable checkbox – click to enable checking for broadcast illegal, and adjust any relevant settings.

BroadcastIllegal field, slider, and **Reset** button - default 2

FrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

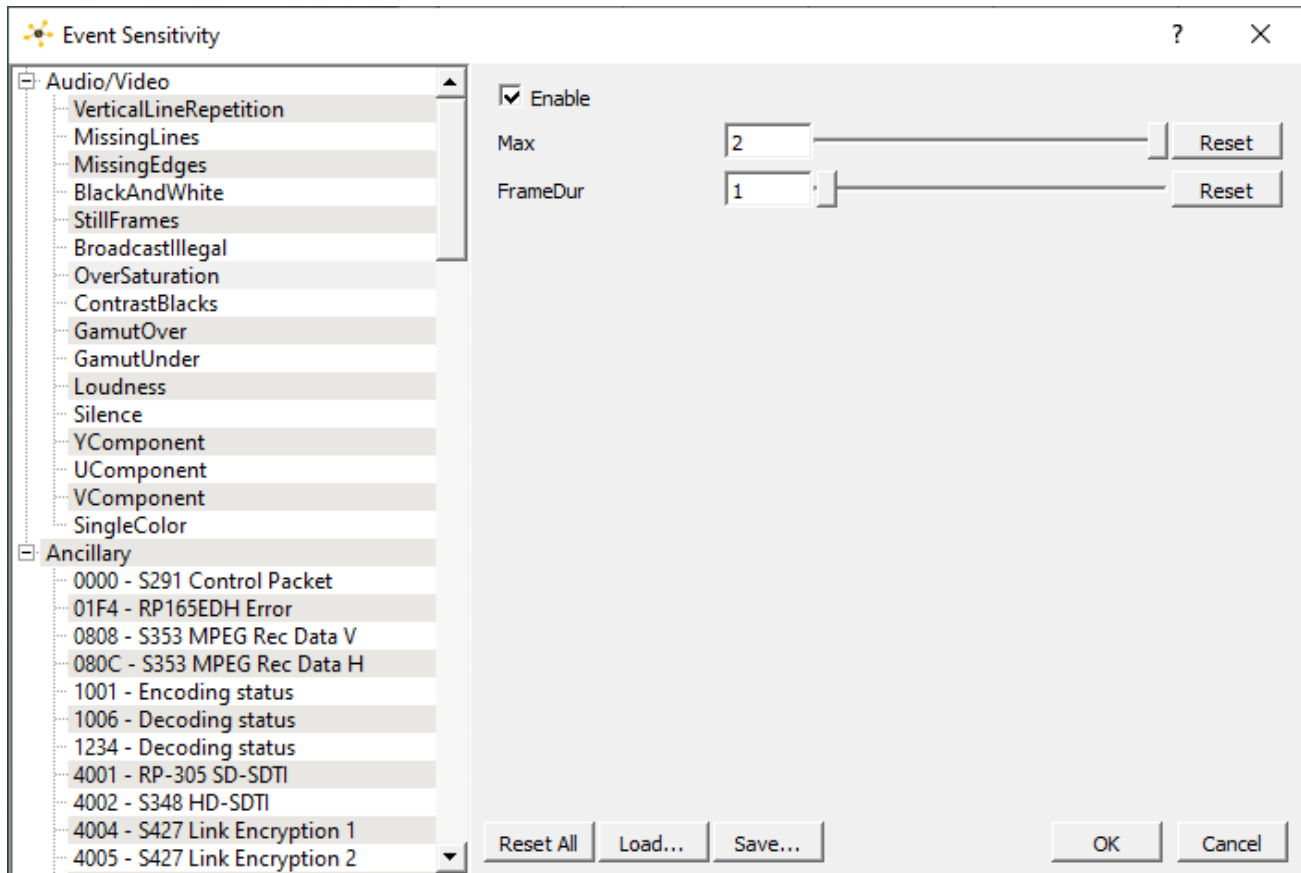
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.7 Oversaturation



Enable checkbox – click to enable checking for oversaturation, and adjust any relevant settings.

Max field, slider, and **Reset** button - default 2

FrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

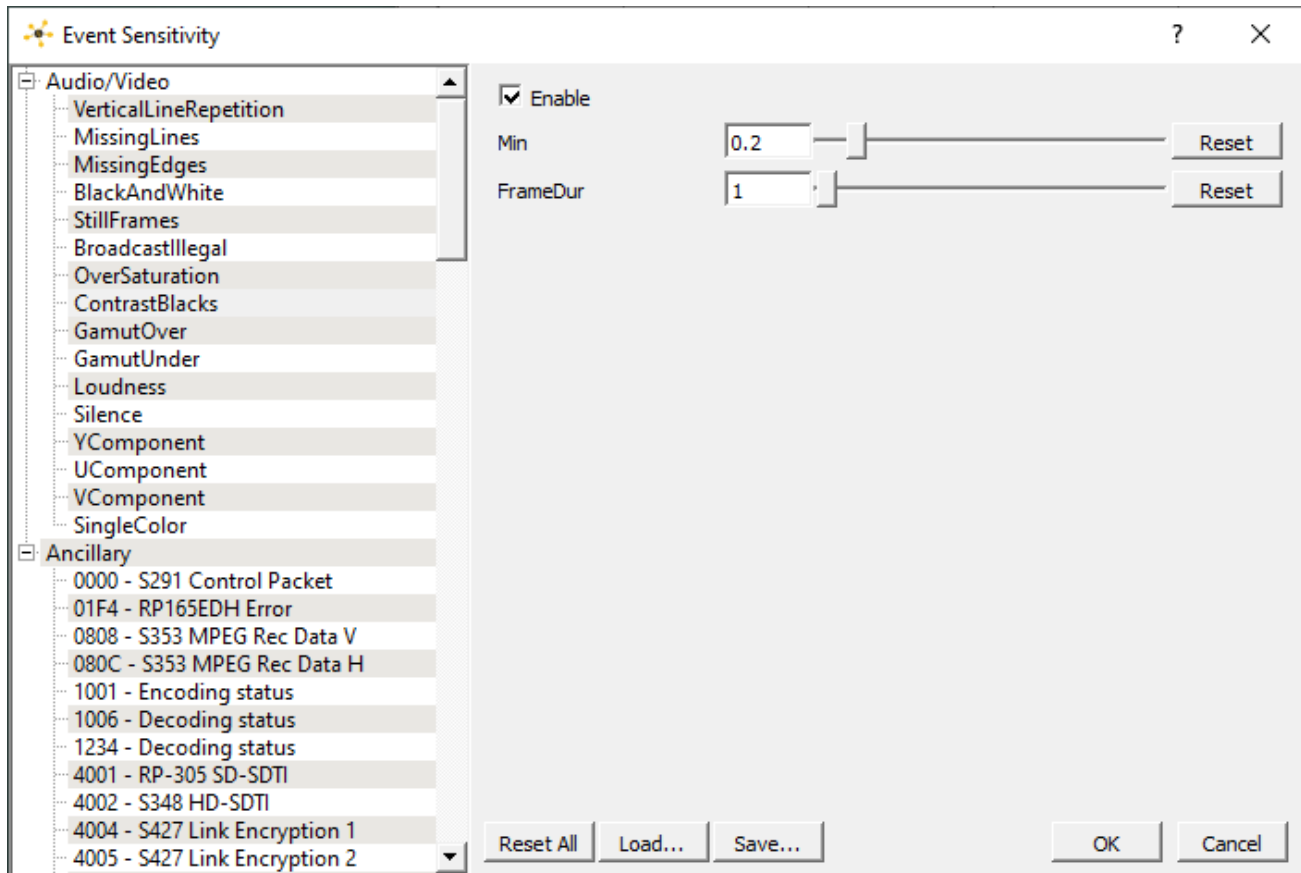
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.8 Contrast Blacks



Enable checkbox – click to enable checking for contrast blacks, and adjust any relevant settings.

Min field, slider, and **Reset** button - default 0.22

FrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

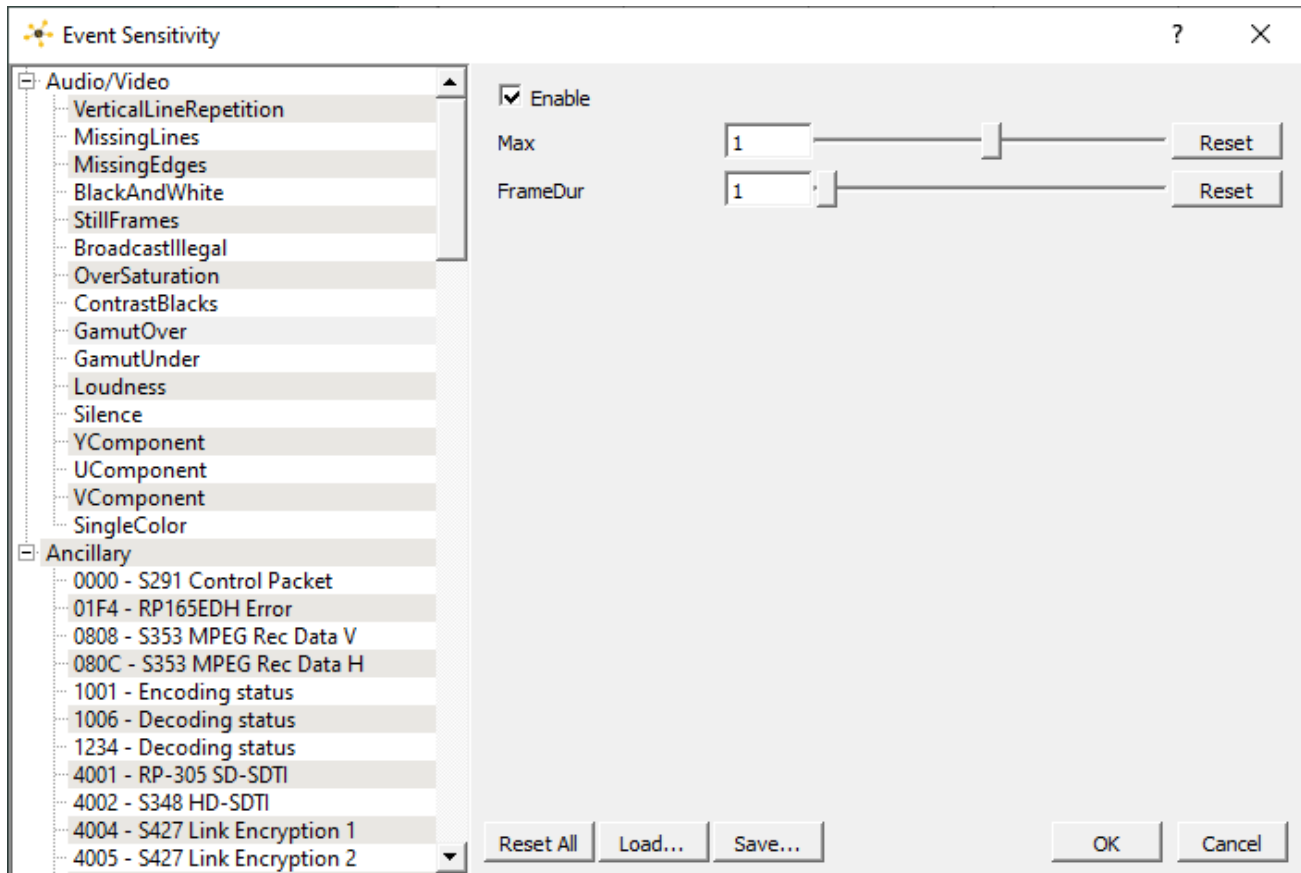
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.9 Gamut Over



Enable checkbox – click to enable checking for gamut over, and adjust any relevant settings.

Min field, slider, and **Reset** button - default 1

FrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

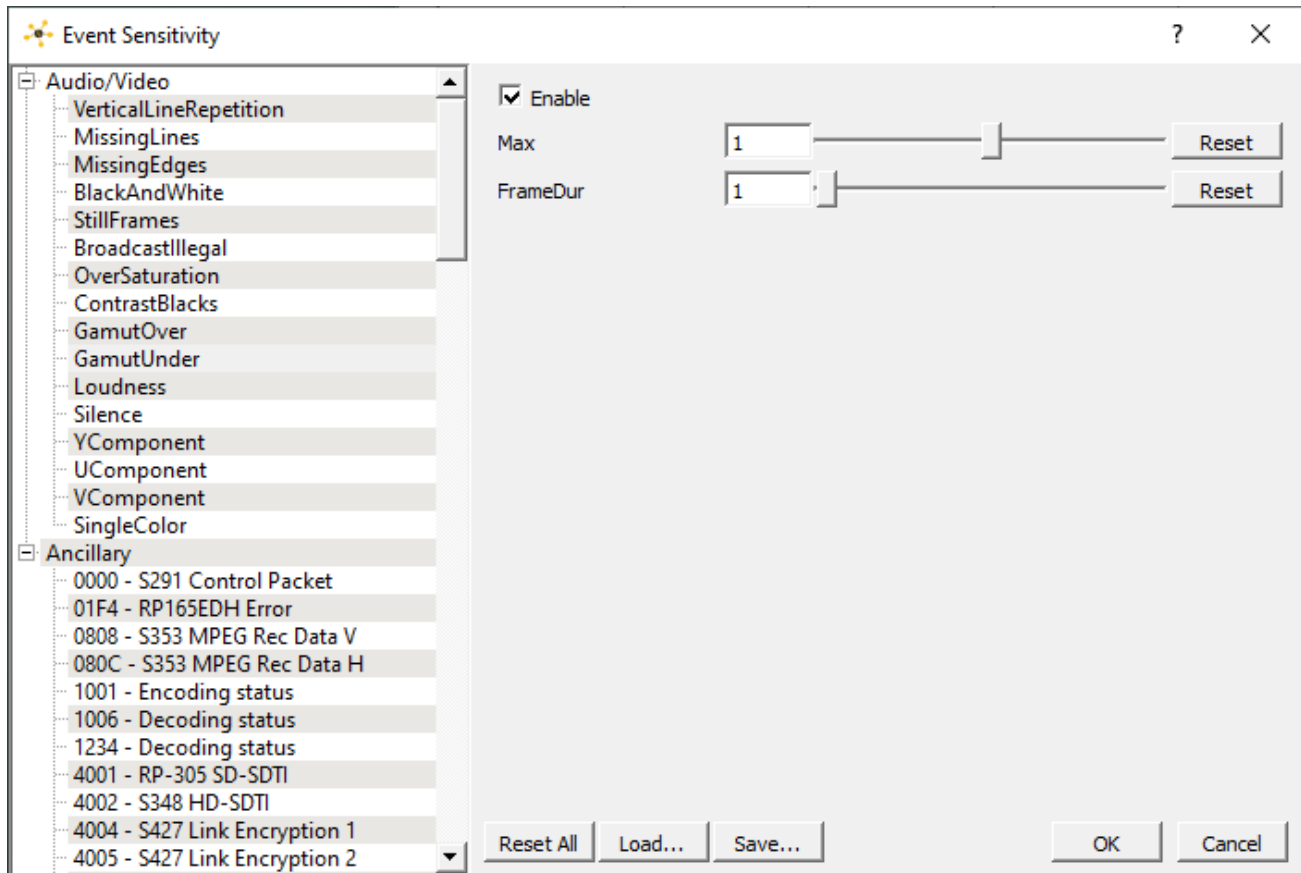
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.10 Gamut Under



Enable checkbox – click to enable checking for gamut under, and adjust any relevant settings.

Max field, slider, and **Reset** button - default 1.0

FrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

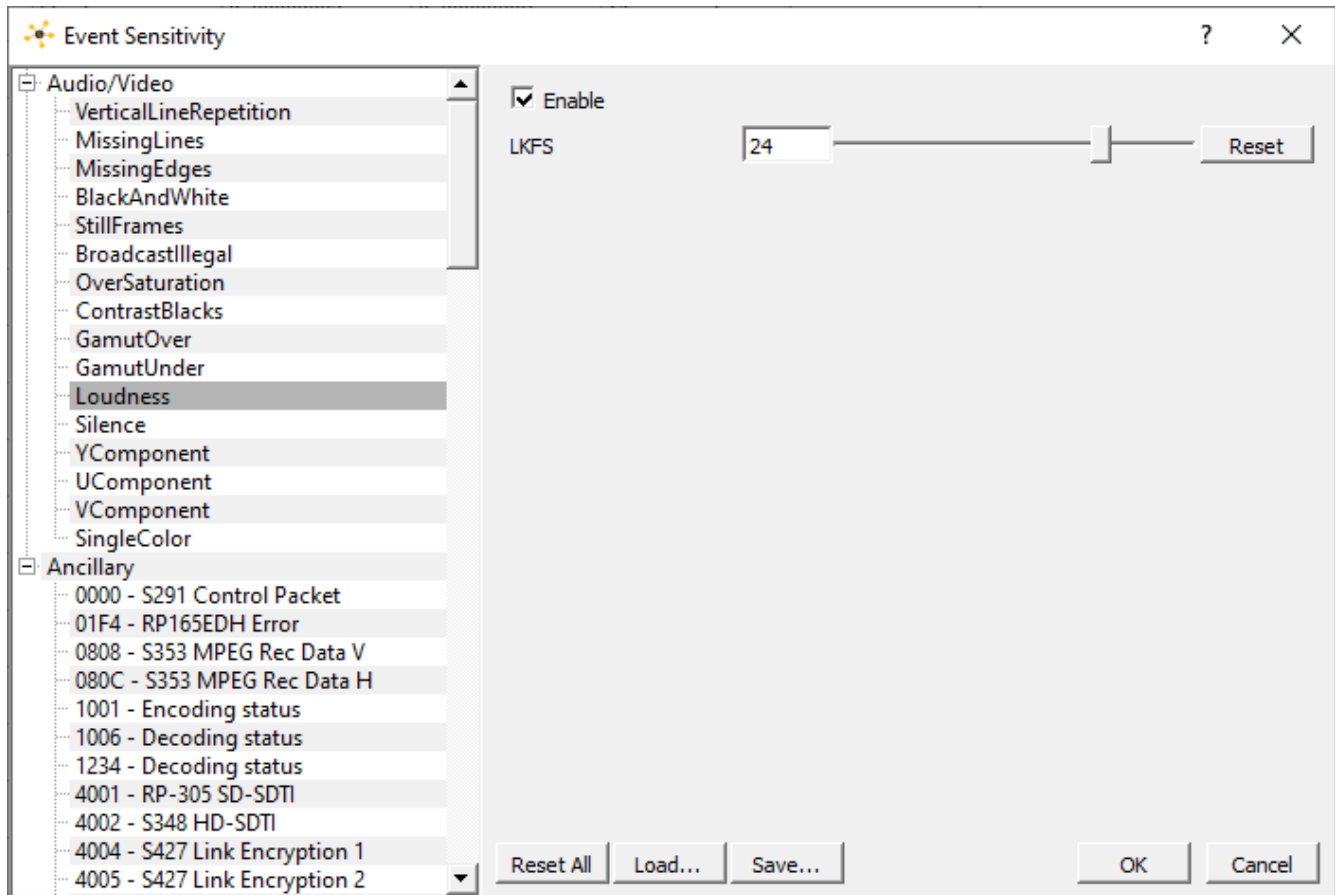
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.11 Loudness



Enable checkbox – click to enable checking for loudness, and adjust any relevant settings.

LKFS field, slider, and **Reset** button - default 24

Reset All button – clicking Reset All returns all values to their default settings.

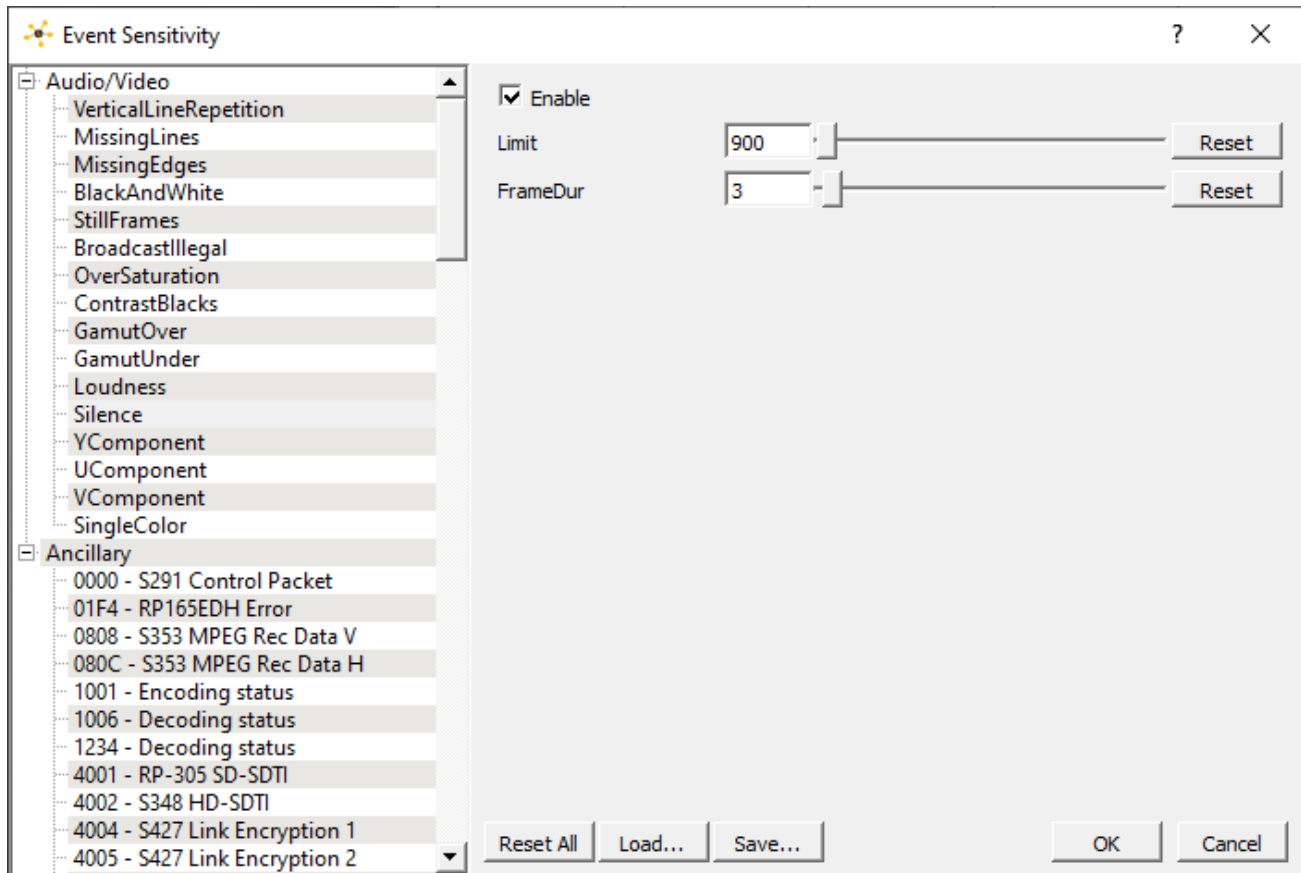
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.12 Silence



Enable checkbox – click to enable checking for silence and adjust any relevant settings.

Limit field, slider, and **Reset** button - default 900

FrameDur field, slider, and **Reset** button – default 3

Reset All button – clicking Reset All returns all values to their default settings.

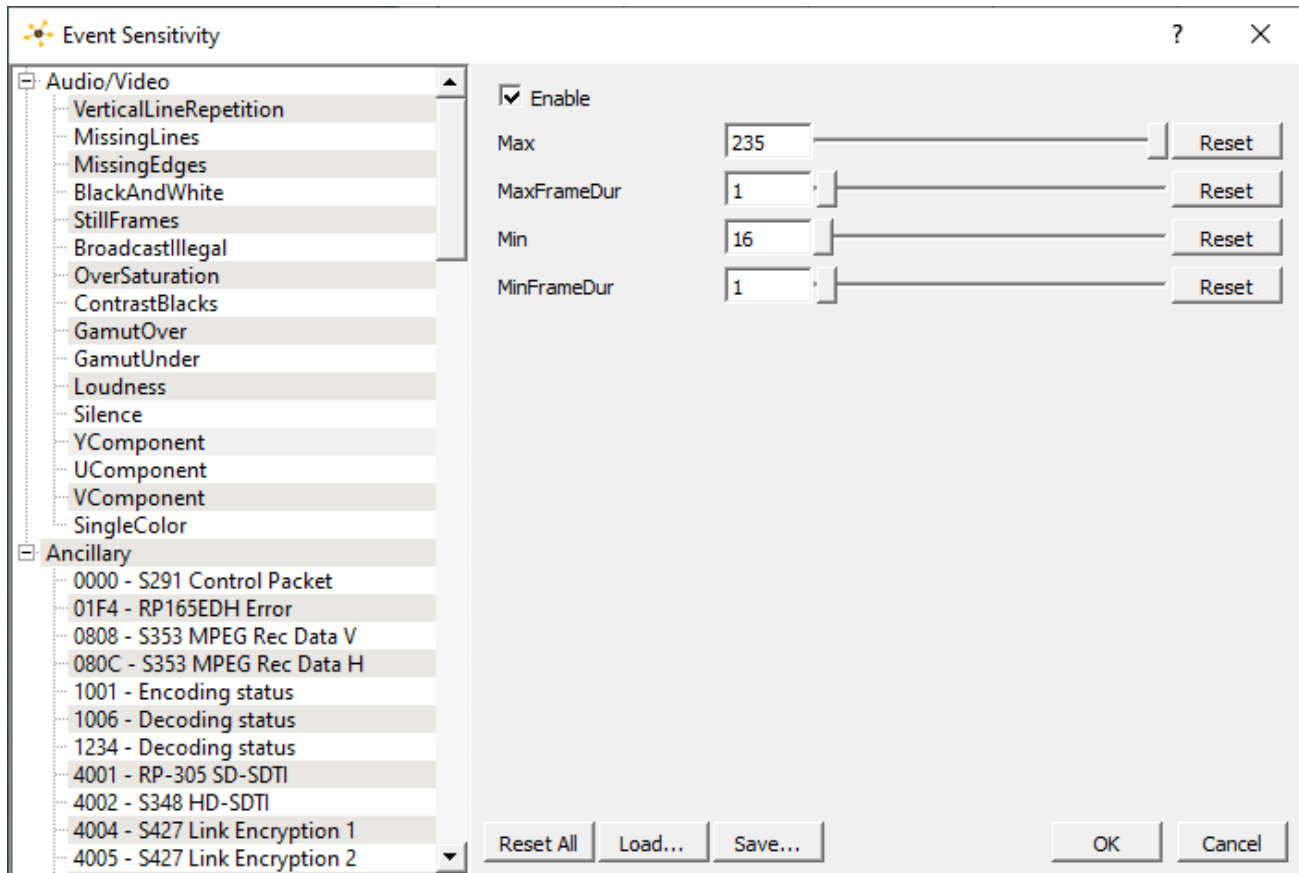
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.13 Y Component



Enable checkbox – click to enable checking the Y component and adjust any relevant settings.

Max field, slider, and **Reset** button - default 235

MaxFrameDur field, slider, and **Reset** button - default 1

Min field, slider, and **Reset** button - default 16

MinFrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

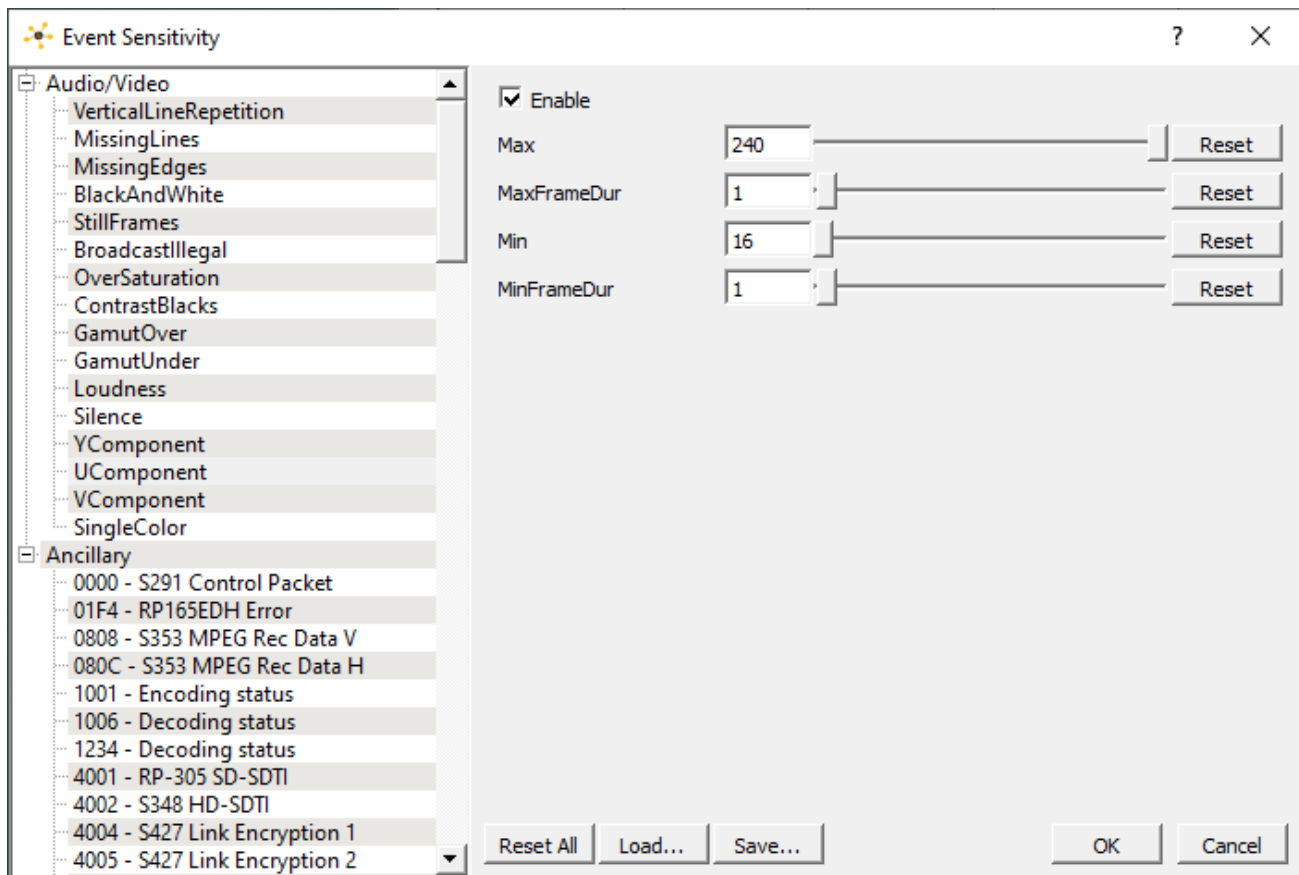
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.14 U Component



Enable checkbox – click to enable checking the U component and adjust any relevant settings.

Max field, slider, and **Reset** button - default 240

MaxFrameDur field, slider, and **Reset** button - default 1

Min field, slider, and **Reset** button - default 16

MinFrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

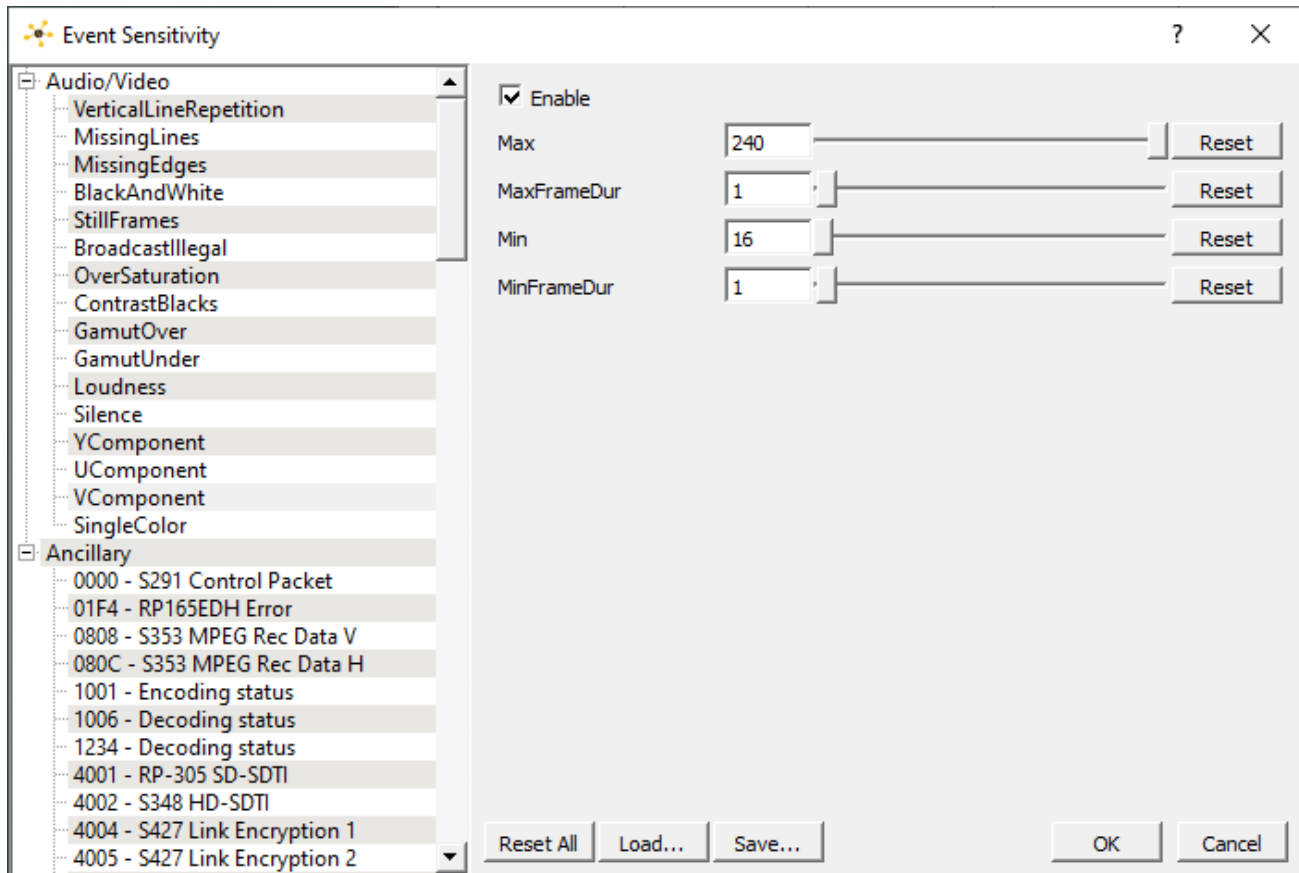
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.15 V Component



Enable checkbox – click to enable checking the V component and adjust any relevant settings.

Max field, slider, and **Reset** button - default 240

MaxFrameDur field, slider, and **Reset** button - default 1

Min field, slider, and **Reset** button - default 16

MinFrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

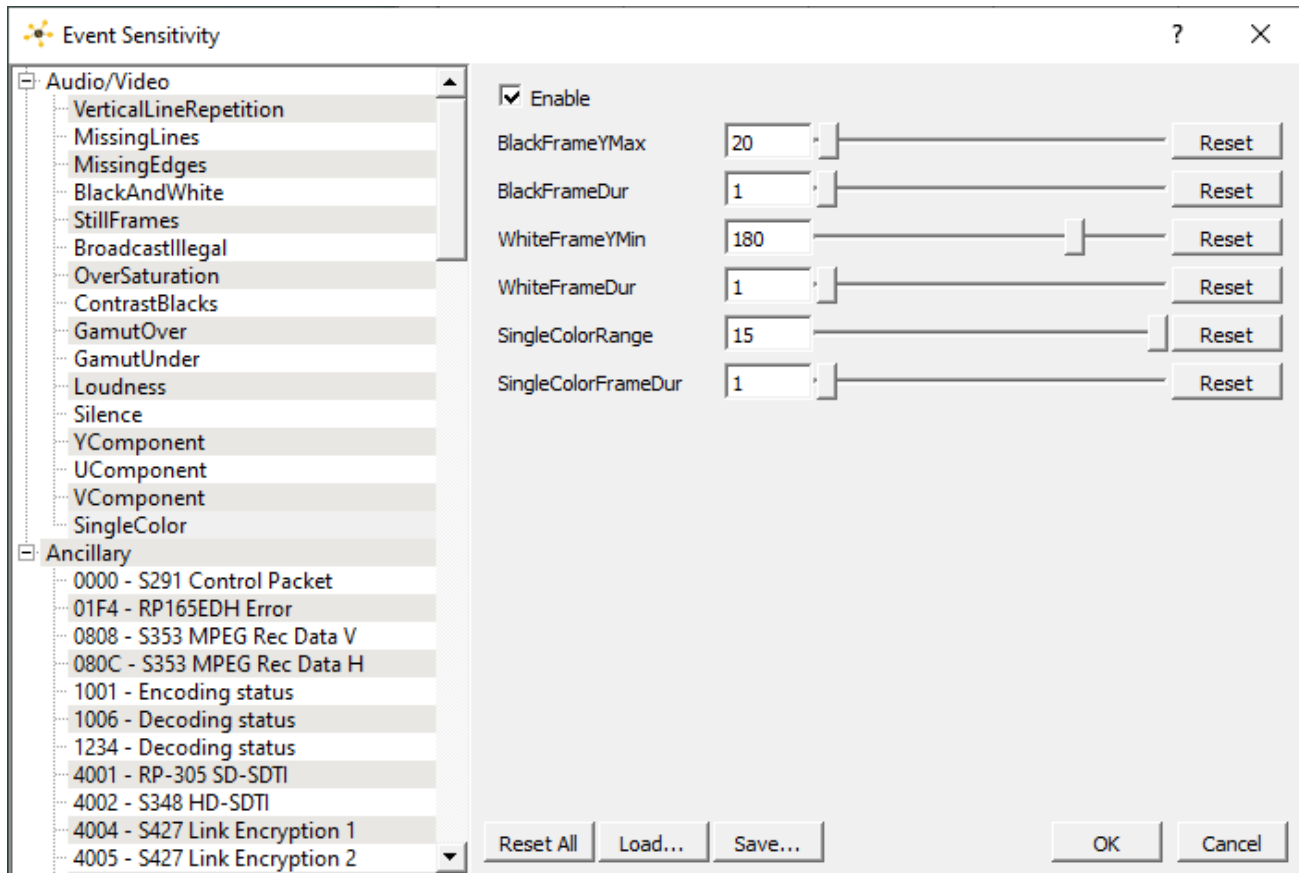
Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

OK button – press OK to enable any changes you have made, and close the Event Sensitivity window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.1.16 Single Color



Enable checkbox – click to enable checking for single color and adjust any relevant settings.

Max field, slider, and **Reset** button - default

BlackFrameYMax field, slider, and **Reset** button - default 20

BlackFrameDur field, slider, and **Reset** button - default 1

WhiteFrameYMin field, slider, and **Reset** button - default 180

WhiteFrameDur field, slider, and **Reset** button - default 1

SingleColorRange field, slider, and **Reset** button - default 15

SingleColorFrameDur field, slider, and **Reset** button - default 1

Reset All button – clicking Reset All returns all values to their default settings.

Load button – opens a browser so you can load a saved event sensitivity file.

Save button – opens a standard Save As window, so you can save the event sensitivity values to a file for later retrieval.

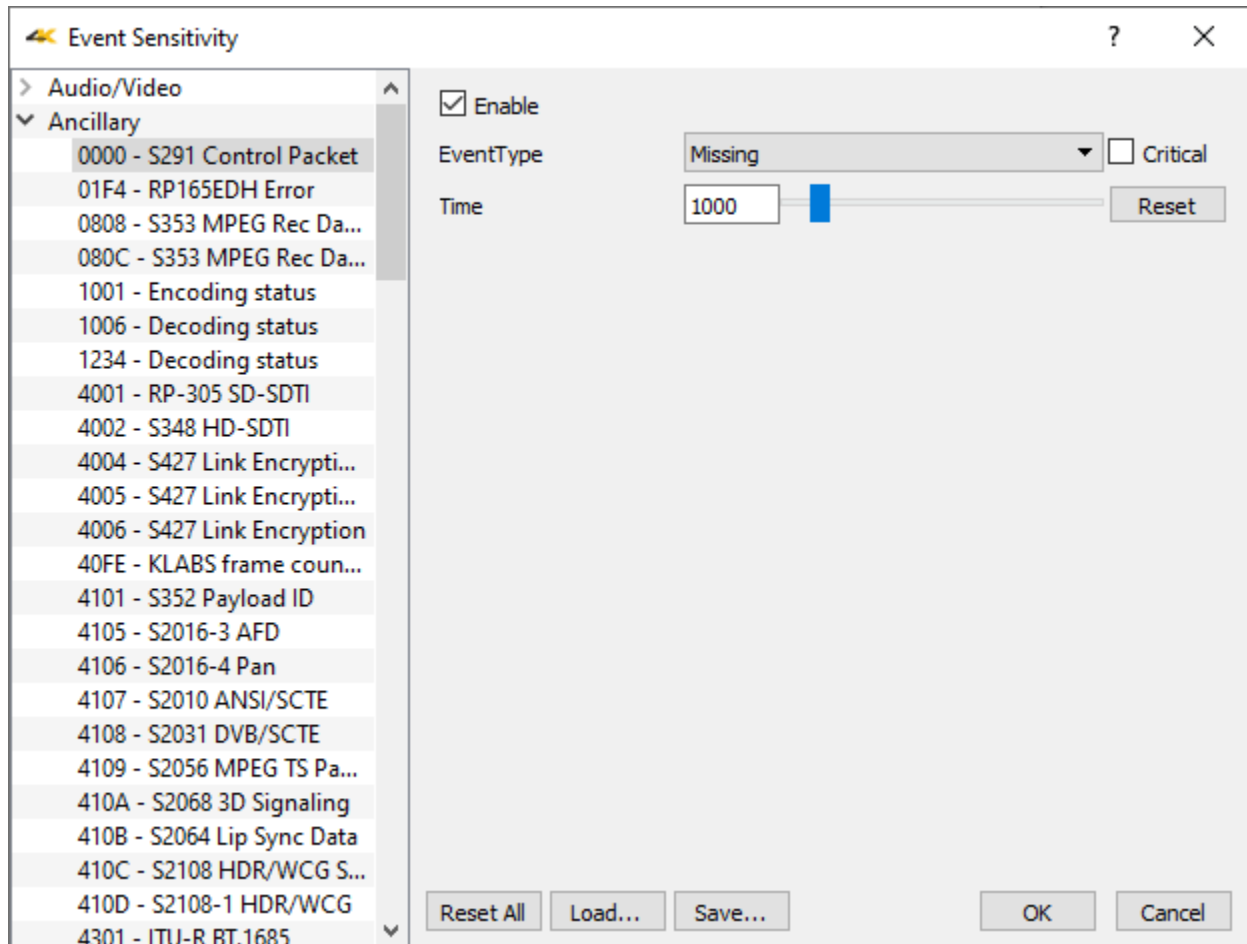
OK button – press OK to enable any changes you have made, and close the Event Sensitivity

window.

Cancel button – press Cancel to exit the Event Sensitivity window without enabling any of the changes you have made.

3.11.2 Ancillary Data Streams Sensitivity

Each type of ancillary data stream can be set to produce an entry in the error log wherever the signal meets various conditions, which can be set in this dialog. The default value is displayed, and the user can adjust a parameter by using the sliders provided. A reset button is available for each individual setting.



For each data type, the following controls are available:

Enable checkbox – click to enable checking for ancillary data and adjust any relevant settings.

EventType pulldown menu – specifies the condition which will trigger an event in the event log for the selected ancillary data type. Conditions include:

Missing – the expected data is not present

Present – the data is present

Appeared – the data is in this frame and was not in the previous frame

Disappeared – the data was present in the previous frame and is not in the current frame

Changed – the data has undergone a change

Occurred – the data occurred in this frame

Critical checkbox – check to indicate that any events in the data stream that trigger a warning are critical.

Time field, slider, and **Reset** button – default 1000

Reset – resets the values to the default settings.

3.11.2.1 Supported Data Stream Types

0000 – **S291 Control Packet** [RTP Payload format for SMPTE Ancillary data, as defined by SMPTE ST 291-1]

010F – **Unknown DID/SDID** – Unknown DID/sDID (display only)

01F4 – **RP165EDH Error** [Error checking using the RP 165 EDH packets in SD-SDI mode] the SMPTE RP165-EDH packet containing EDH (error data handling) and CRC (cyclic redundancy counts). This only appears on SD-SDI signals.

0808 – **S353 MPEG Rec Data V** [SMPTE 291M defined MPEG recoding data in VANC]

080C – **S353 MPEG Rec Data H** [SMPTE 291M defined MPEG recoding data in HANC]

1001 – **Encoding status** [current encoding status]

1006 – **Decoding status** [current decoding status]

1234 – **Decoding status** [current decoding status]

4001 – **RP-305 SD-SDTI** [Standard Definition Serial Data Transport Interface] SDTI transport in active frame space.

4002 – **S348 HD-SDTI** [SMPTE 291M defined HD-SDTI Transport in active frame space] HD-SDTI Transport in active frame space.

4004 – **S427 Link Encryption 1** [Link Encryption for 1.5Gb/s1 Serial Digital Interface type 1]

4005 – **S427 Link Encryption 2** [Link Encryption for 1.5Gb/s1 Serial Digital Interface type 2]

4006 – **S427 Link Encryption** [Link Encryption for 1.5Gb/s1 Serial Digital Interface type 0]

40FE – **KLABS frame counter** [KLABS frame counter packets]

4101 – **S352 Payload ID** [SMPTE ST 352 Video Payload Identification Codes for Serial Digital Interfaces] Payload identification, HANC space.

4105 – **S2016-3 AFD** [AFD for baseband SDI carriage as standard SMPTE 2016-1-2007, "Format for Active Format Description and Bar Data"] Vertical Ancillary Data Mapping of Active Format Description and Bar Data.

4106 – **S2016-4 Pan** [SMPTE 2016-4 Vertical Ancillary Data Mapping of Pan-Scan Information]

4107 – **S2010 ANSI/SCTE** [ANSI/SCTE 104 messages, a mechanism for signaling advertising avails, program splice points, and DRM signals]

4108 – **S2031 DVB/SCTE** [SMPTE S2031 DVB/SCTE vertical blanking interval data]

4109 – **S2056 MPEG TS Packets** [per SMPTE ST 2056, a standardized wrapper for the

- carriage of low bit rate MPEG-2 TS packets, in the 10-bit VANC space of a standard definition or high definition serial digital link in accordance with SMPTE ST 291]
- 410A – **S2068 3D Signaling** [per SMPTE 2068, Stereoscopic 3D frame compatible packing and signaling for HDTV]
 - 410B – **S2064 Lip Sync Data** [the real-time transport of audio and video fingerprints used for audio to video timing measurement. These fingerprints and their containerization are defined in SMPTE ST 2064-1]
 - 410C – **S2108 HDR/WCG Settings** [per SMPTE ST 2108-1:2018, Settings for HDR/WCG Metadata Ancillary Data Packet]
 - 410D – **S2108-1 HDR/WCG** [per SMPTE ST 2108-1:2018, HDR/WCG Metadata Ancillary Data Packets]
 - 4301 – **ITU-R BT.1685** [Structure of inter-station control data conveyed by ancillary data packets]
 - 4302 – **OP47 Caption SDP** [OP-47 Subtitling Distribution Packet - storage and distribution of Teletext data such as closed captions/subtitles in the vertical ancillary data space of the 10 bit serial HD-SDI signal complying with Recommendation ITU-R BT.1120-7]
 - 4303 – **OP47 VBI/WST MP** [OP-47 vertical blanking interval World System Teletext subtitling for HD]
 - 4304 – **ARIB-TR-B29 AV Mon** [Association of Radio Industries and Businesses - Metadata to monitor Errors of Video and Audio Signals on a Broadcasting Chain]
 - 4305 – **RDD18 Camera Params** [SMPTE RDD 18:2021 - Acquisition Metadata Sets for Video Camera Parameters]
 - 4313 – **SMPTE 346M** [time division multiplexing of various standard-definition digital video and generic 8-bit data signals over high-definition serial digital interfaces]
 - 4404 – **RP214V KLV Metadata** [Packing KLV Encoded Metadata and Data Essence into SMPTE 291M VANC Ancillary Data Packets] the SMPTE defined KLV Metadata transport in VANC space.
 - 4414 – **RP214H KLV Metadata** [Packing KLV Encoded Metadata and Data Essence into SMPTE 291M HANC Ancillary Data Packets] the SMPTE defined KLV Metadata transport in HANC space.
 - 4444 – **RP223 UMID/ID** [per SMPTE RP 223, Packing UMID and Program Identification Label Data into SMPTE 291M Ancillary Data Packets]
 - 4501 – **S2020 Audio-1** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 1]
 - 4502 – **S2020 Audio-2** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 2]
 - 4503 – **S2020 Audio-3** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 3]
 - 4504 – **S2020 Audio-4** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 4]
 - 4505 – **S2020 Audio-5** [structure and timing requirements of an asynchronous serial audio

- metadata stream with respect to an associated video signal – channel 5]
- 4506 – **S2020 Audio-6** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 6]
- 4507 – **S2020 Audio-7** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 7]
- 4508 – **S2020 Audio-8** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 8]
- 4509 – **S2020 Audio-9** [structure and timing requirements of an asynchronous serial audio metadata stream with respect to an associated video signal – channel 9]
- 4601 – **S2051 Two Frame** [SMPTE ST 2015:2014 Two-Frame Marker for progressive HDTV video formats at 48/1.001(47.95)-Hz, 48-Hz, 50-Hz, 60/1.001(59.94)-Hz, and 60-Hz frame rates]
- 5001 – **RDD8 WSS** [SMPTE RDD8 wide screen signaling for storage and distribution of subtitles] this is the SMPTE defined wide screen switching data packing in the VANC space.
- 5051 – **CineLink-2 MetaD** [CineLink-2 metadata].
- 5101 – **RP215 Film Codes** [Vertical Ancillary Data Mapping of Film Transfer and Video Production Information] the SMPTE defined recommended practice data packing for film codes in VANC space.
- 5102 – **RDD18 Metadata** [per SMPTE RDD 18:2021, Acquisition Metadata Sets for Video Camera Parameters]
- 5152 – **Tally Control** [tally control]
- 5153 – **BMD Dev Control** [Blackmagic SDI PTZ camera control protocol]
- 524D – **Rec start/stop** [record start or record stop]
- 5701 – **CBS ID Info** [Cell Broadcast Service to relay messages related to public warning]
- 5FCF – **TR-B18 Color** [Association of Radio Industries and Businesses - per ARIB technical report TR-B18, Color Frame Information for Component Interface of 525/60 and 1125/60 Television Systems]
- 5FDC – **B37 Mob Captions** [Association of Radio Industries and Businesses - per ARIB STD-B37, structure and operation of closed caption conveyed by ancillary data packets]
- 5FDD – **B37 Ana Captions** [Association of Radio Industries and Businesses - per ARIB STD-B37, structure and operation of closed caption conveyed by ancillary data packets]
- 5FDE – **B37 SD Captions** [Association of Radio Industries and Businesses - per ARIB STD-B37, structure and operation of closed caption conveyed by ancillary data packets]
- 5FDF – **B37 HD Captions** [Association of Radio Industries and Businesses - per ARIB STD-B37, structure and operation of closed caption conveyed by ancillary data packets]
- 5FE0 – **ARIB TR-B.22 ANC** [Association of Radio Industries and Businesses - per ARIB TR-B22, Operational Guidelines for Transport of the Ancillary Data for Television Program Contribution] the ARIB defined Sub information data packet in the VANC space.
- 5FFA – **ARIB TR-B.23(1)** [Association of Radio Industries and Businesses - per ARIB TR-B.23, Operational Guidelines for Ancillary Data Used to Convey Inter-Stationary Data]

- 5FFB – **ARIB TR-B.23(2)** [Association of Radio Industries and Businesses - per ARIB TR-B.23, Operational Guidelines for Ancillary Data Used to Convey Inter-Stationary Data] the ARIB defined user data 2 packet in the VANC space
- 5FFC – **ARIB TR-B.23(1)** [Association of Radio Industries and Businesses - per ARIB TR-B.23, Operational Guidelines for Ancillary Data Used to Convey Inter-Stationary Data] the ARIB defined user data 1 packet in the VANC space.
- 5FFD – **ARIB B.35ProgEx** [Association of Radio Industries and Businesses - per ARIB STD-B35, Data Program Exchange Specification for Digital Broadcasting] the ARIB defined trigger signal data packet for data broadcasting.
- 5FFE – **ARIB B.39** [Association of Radio Industries and Businesses - per ARIB STD-B39, Structure of Inter-Stationary Control Data Conveyed by Ancillary Data Packets]
- 5FFF – **ARIB B.15** [Association of Radio Industries and Businesses - per ARIB TR-B15, specifies the function of receivers and the operational guidelines in the broadcasting station of the BS and CS digital broadcasting]
- 6060 – **S12M-2 Anc TCode** [per SMPTE 12M-2, standards to label individual frames of video or film with a timecode]
- 6061 – **S12M-3 HFR-TCode** [per SMPTE 12M-3, standards to label individual frames of high frame rate video or film with a timecode]
- 6062 – **Generic Time Label** [generic time of day stamp]
- 6101 – **EIA-708 Caption** [HD captioning] the EIA standard defined closed caption data for HD-SDI in VANC space.
- 6102 – **EIA-608 Caption** [SD captioning] the EIA standard defined closed caption data for SD SDI 525i (NTSC) in VANC space.
- 6103 – **SMPTE334 WST Packet** [per SMPTE ST 334-1:2015, Vertical Ancillary Data Mapping of Caption Data and Other Related Data]
- 6104 – **SMPTE334 SDE** [per SMPTE ST 334-1:2015, Vertical Ancillary Data Mapping of Caption Data and Other Related Data]
- 6105 – **SMPTE334 ARIB Caption HD** [per SMPTE ST 334-1:2015, Vertical Ancillary Data Mapping of Caption Data and Other Related Data]
- 6106 – **SMPTE334 ARIB Caption SD** [per SMPTE ST 334-1:2015, Vertical Ancillary Data Mapping of Caption Data and Other Related Data]
- 6107 – **SMPTE334 ARIB Caption Ana** [per SMPTE ST 334-1:2015, Vertical Ancillary Data Mapping of Caption Data and Other Related Data]
- 6201 – **RP207 Program** [per SMPTE RP 207, Transport of Program Description Data in Ancillary Data Packets] the SMPTE RP207 defined program description data packet in VANC space.
- 6202 – **S334-1 Data BCast** [per SMPTE 334-1-2007, closed caption data from Ancillary data packets]
- 6203 – **RP208 VBI Data** [per SMPTE RP 208-2002, Transport of VBI Packet Data in Ancillary Data Packets] the SMPTE defined recommended practice VBI Data (vertical blanking interval data) in VANC space.

6464 – **RP196 LTC Timecode** [per SMPTE RP 196, Transmission of LTC Data as HANC Packets in Serial Digital Television Interfaces] the SMPTE defined recommended practice Time Code data packet in HANC space.

647F – **RP196 VITC Timecode** [per SMPTE RP 196, Transmission of VITC Data as VANC Packets in Serial Digital Television Interfaces] the SMPTE defined recommended practice Time Code data packet in VANC space.

8000 – **Mark Deleted** [when a mark has been deleted]

8400 – **End Packet** [signals the end of a packet]

8800 – **Start Packet** [signals the start of a packet]

A000 – **HD Aud Ctrl 8** [HD audio control 8]

A100 – **HD Aud Ctrl 7** [HD audio control 7]

A200 – **HD Aud Ctrl 6** [HD audio control 6]

A300 – **HD Aud Ctrl 5** [HD audio control 5]

A400 – **HD Aud Data 8** [HD audio data 8]

A500 – **HD Aud Data 7** [HD audio data 7]

A600 – **HD Aud Data 6** [HD audio data 6]

A700 – **HD Aud Data 5** [HD audio data 5]

D200 – **QA F1 Test** [F1 quality assurance metric]

D300 – **QA F2 Test** [F2 quality assurance metric]

E000 – **HD Aud Ctrl 4** [HD audio control 4]

E100 – **HD Aud Ctrl 3** [HD audio control 3]

E200 – **HD Aud Ctrl 2** [HD audio control 2]

E300 – **HD Aud Ctrl 1** [HD audio control 1]

E400 – **HD Aud Data 4** [HD audio data 4]

E500 – **HD Aud Data 3** [HD audio data 3]

E600 – **HD Aud Data 2** [HD audio data 2]

E700 – **HD Aud Data 1** [HD audio data 1]

EC00 – **SD Aud Ctrl 4** [SD audio control 4]

ED00 – **SD Aud Ctrl 3** [SD audio control 3]

EE00 – **SD Aud Ctrl 2** [SD audio control 2]

EF00 – **Aud Ctrl 1** [SD audio control 1]

F400 – **Error Detect** [an error has been detected]

F800 – **SD Aud Ext Data 4** [SD audio external data 4]

F900 – **SD Aud Data 4** [SD audio data 4]

FA00 – **SD Aud Ext Data 3** [SD audio external data 3]

FB00 – **SD Aud Data 3** [SD audio data 3]

FC00 – **SD Aud Ext Data 2** [SD audio external data 2]

FD00 – **SD Aud Data 2** [SD audio data 2]

FE00 – **SD Aud Ext Data 1** [SD audio external data 1]

FF00 – **SD Aud Data 1** [SD audio data 1]

3.12 Area Select



Area Select is added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Area Select		

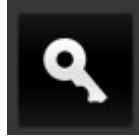
Pressing the **Area Select** button allows the user to select an area of the signal and view it through any of the scopes. With the button pressed (it will be outlined), click to drag a rectangle across the picture display.



The rest of the screen will be darkened, and the selected area will be highlighted. In the above example, the selected area of the color chart features orange, red, and magenta color chips. With the H/S scope selected, only these areas of the spectrum are seen by the scope.

Note: Vectorscope, Chromaticity, and Histogram displays will respect the boundaries of the rectangle you have selected. However, the Waveform Monitors (YCbCr and RGB) only respect the top and bottom, and have no way to constrain the left and right boundaries. So, when you select an area in a Waveform monitor, it will 'see' a band across the screen bounded by the top and bottom of the rectangle you have drawn.

3.13 License



Licensing features are available in all versions. You can use the licensing to check the status of your license, or to enable an updated, or new, license.

Pressing the license button opens the licensing dialog. Here is a system that is licensed for a long term but temporary license.

DrasticScope License Application - v8.0.0.0

204 Trial days remain. Licensed for:
-4KScope -SDIScope
-CC -4K -Camera Raw

User Name: Corey Cousineau

Email: corey@drastictch.com

Site Code: 5OEVFQ0JFOUM1MzcsRHJhc3RpY1Njb3BlIDogV2luNjQ=

Site Key:

Paste

Register

Remove

Folder

Generate

Copy

Send

You can check the status of your license here. If the system is unlicensed, you can get a license by

following the detailed instructions here:

<https://www.drastic.tv/support-59/licensing>

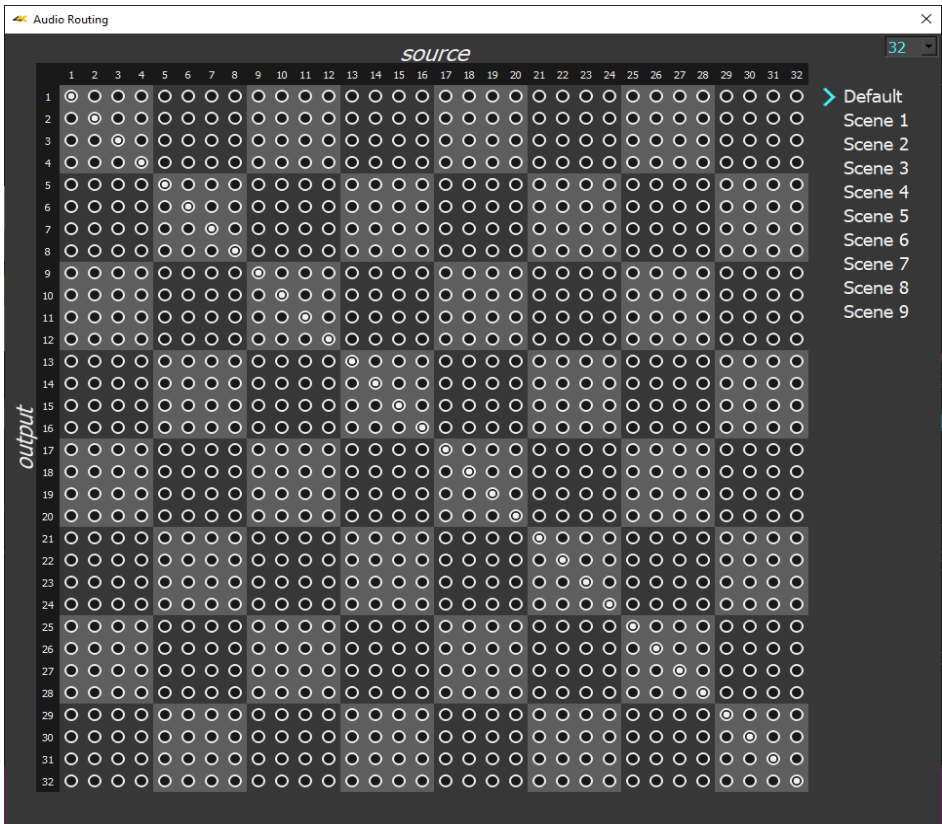
3.14 Audio Routing



Audio Routing features are added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Audio Routing		

Pressing the audio routing button opens the audio routing window. This window provides routing for up to 32 channels. The pulldown menu at the top right of the window lets the user select between 8, 16, 24, or 32 channel setups.

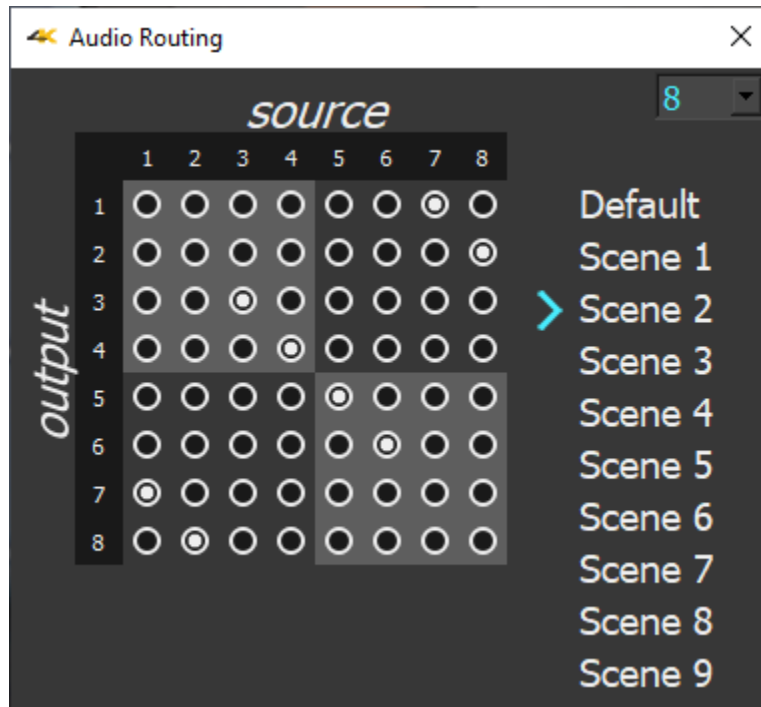


The audio routing allows the user to route the output of their audio to whichever channel they like. This feature is hardware-dependent. The above image shows a system set to 32 channels,

with no routing applied.

The audio sources come in through the top, where it says **Source**. The outputs go out through the left side, where it says **Output**.

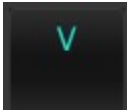
Here is an audio routing scheme where channels 1 and 2 are sent out through channels 7 and 8, and channels 7 and 8 are sent out via channels 1 and 2.



If **Default** is selected, no changes can be made, and audio routing is off. The user needs to select one of the 'scenes' to make changes. Each **Scene** will remember what you set it to last, and can be recalled as needed.

Note: most hardware (video boards and similar) is limited to 16 channel audio. Certain IP stream inputs may have as many as 32 channels of audio.

3.15 Video Proc Amp



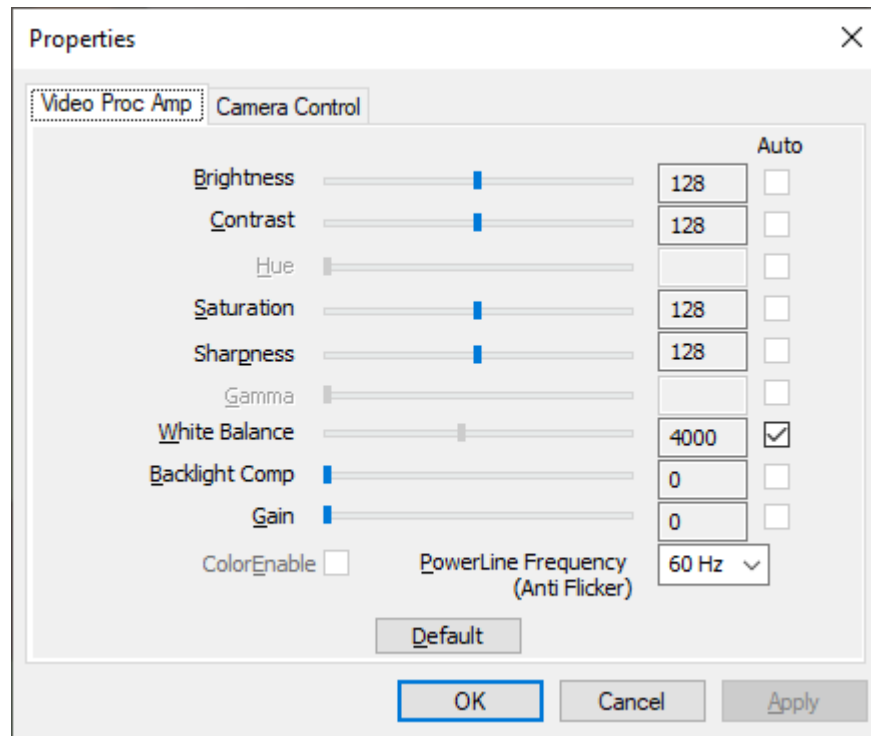
Video Proc Amp features are added at the 4KScope level.

Free	sdiScope	4KScope	HDRScope	NetXScope
		Video Proc Amp		

Where the system is set to use a USB/DirectShow/UVC device, a configuration button appears. Pressing this button opens a configuration menu for the device. The capabilities of the configuration vary depending on the device's capabilities. Below is a sample configuration menu. The device in the below examples is a simple webcam.

3.15.1.1 Video Proc Amp tab

Here is a Properties dialog with two tabs. The first tab is the Video Proc Amp.



The Video Proc Amp provides a number of controls. Your device may or may not use these controls.

Brightness – adjust the brightness, or light to dark balance

Contrast – adjust the contrast

Hue – adjust the hue, or color cast if any

Saturation – adjust the saturation, or how rich the color is

Sharpness – adjust the sharpness of edges

Gamma – adjust the gamma (color)

White Balance – adjust the location of the white point for white balancing the device

Backlight Comp – adjust the overall scene to compensate for any back lighting.

Gain – adjust any gain that has been applied to the output levels

ColorEnable – in some devices, enable color output

Powerline Frequency (anti flicker) – switch between 60 Hz and 50Hz to compensate for powerline frequency mismatch induced flicker.

Default – reset to default settings

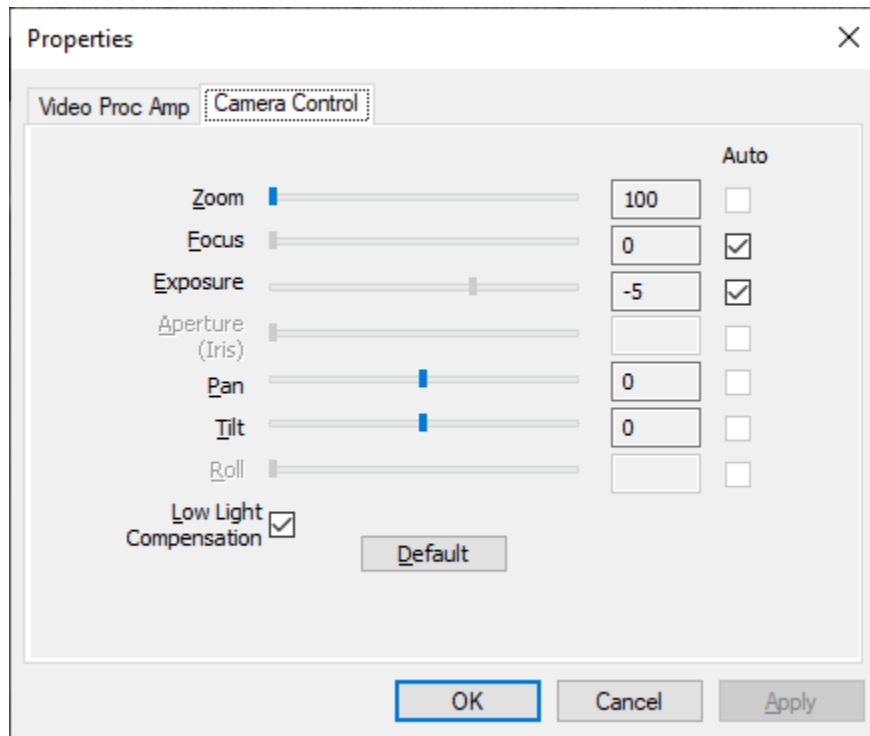
OK – Press OK to close the configuration

Cancel – close the configuration without making any changes.

Apply – enable any settings that have been changed and close the configuration.

3.15.1.2 Camera Control tab

The second tab is the Camera Control.



The Camera Control provides a number of controls. Your device may or may not use these controls.

Zoom – zoom in or out

Focus – adjust the focus

Exposure – adjust the exposure

Aperture (Iris) – adjust the aperture, or iris of the camera

Pan – in PTZ cameras, adjust the pan

Tilt – in PTZ cameras, adjust the tilt.

Roll – in specific cameras, adjust the roll

Low Light Compensation checkbox – sets the camera to use an auto gain for low lighting

Default – reset to default settings

OK – Press OK to close the configuration

Cancel – close the configuration without making any changes.

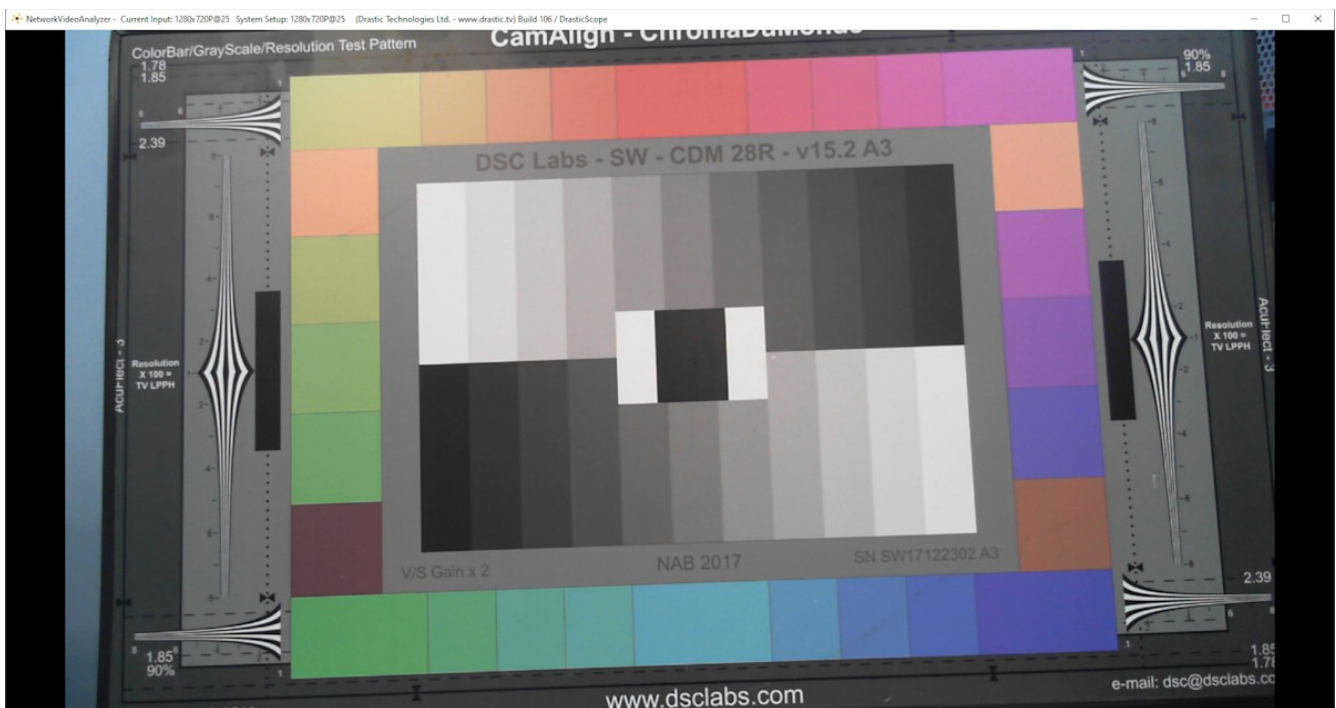
Apply – enable any settings that have been changed and close the configuration.

3.15.2 Hide Sidebar



Hide Sidebar features are present in all levels.

Pressing the **Hide Sidebar** control removes the right panel from the GUI, so you can just look at the display area.

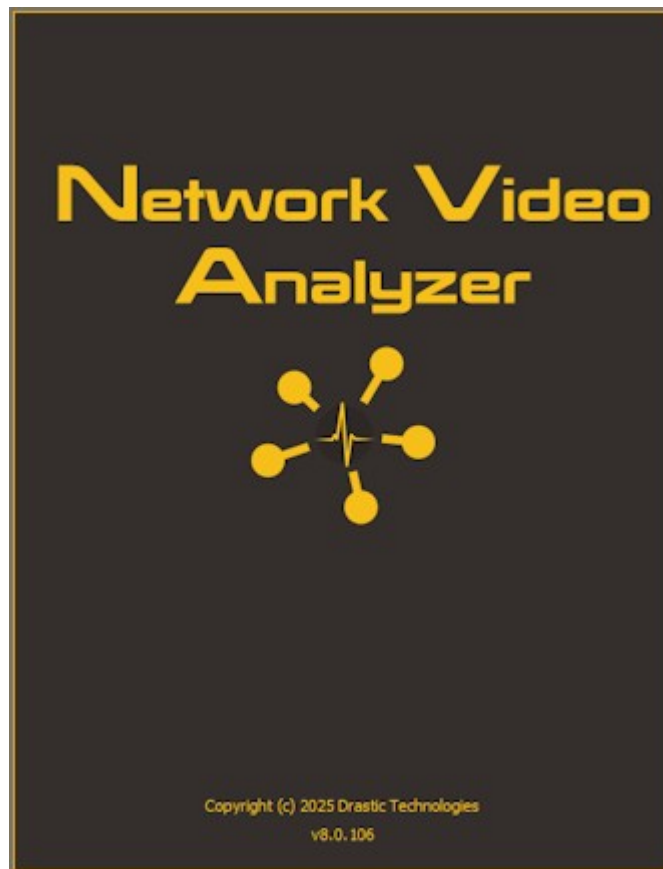


Resizing the window will return the sidebar so you can use the controls again.

3.15.3 Info/Splash Screen



The Info/Splash Screen is present in all levels. Pressing this control opens the splash screen for the version of DrasticScope you have licensed. A system licensed for NetXScope shows its splash screen in the below example.



4 Operations

DrasticScope can be used to view an input signal through its range of waveform/vectorscope tools. Features are license dependent. Supported sources include:

- ST-2110 through a supported NIC
- IP streams including SRT, RIST, UDP, RTP, TR-01, TR-07
- AJA hardware
- Bluefish444 hardware
- Blackmagic hardware
- DekTec hardware
- Matrox hardware
- USB/DirectShow/UVC devices
- NDI streams
- Desktop applications
- Adobe ScopeDirect plugin
- Avid ScopeDirect plugin
- OpenFX/Resolve ScopeDirect plugin
- Assimilate ScopeDirect plugin
- AvVr3D (UnReal Engine) ScopeDirect plugin

Once a capable system has been equipped with an install of DrasticScope, 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.

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.

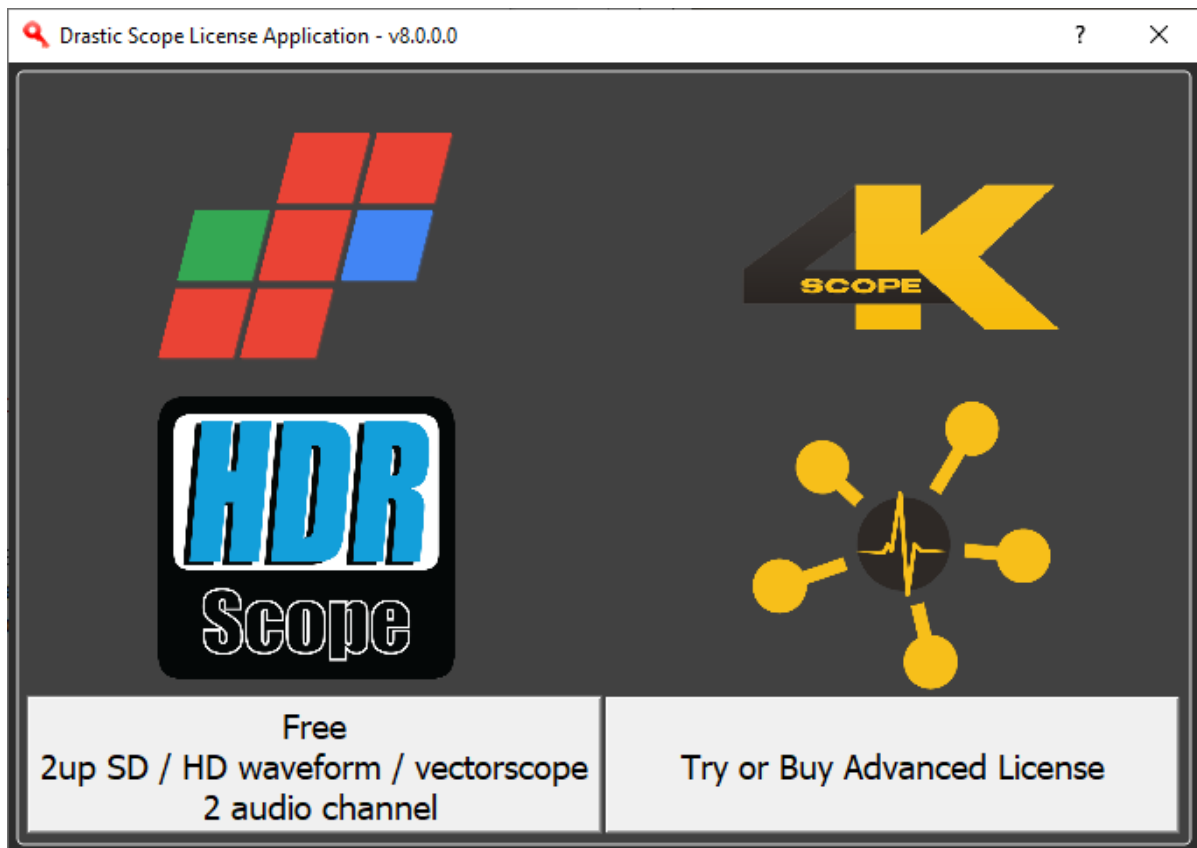
4.1 Run the Software

Run **DrasticScope** software. Or, if there is no license, you should run the licensing included with the

install. There are details below:

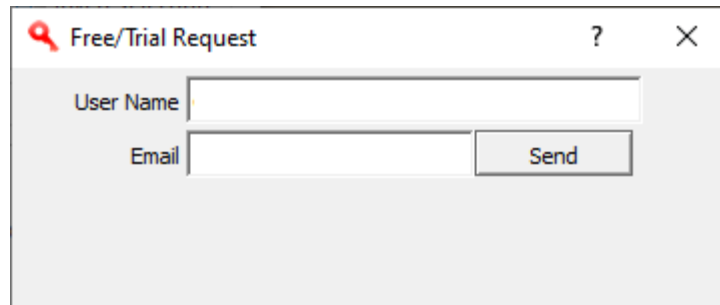
4.1.1 Get Licensed

Where there is no license, trying to run DrasticScope will open a licensing dialog.



There is an option to run in free mode, and an option to try or buy a license for a specific level of DrasticScope.

Free Mode – clicking Free opens a license request dialog, which sends an automated demo license to your email (this option requires an internet connection, along with a default email setup, on the system you want to license).

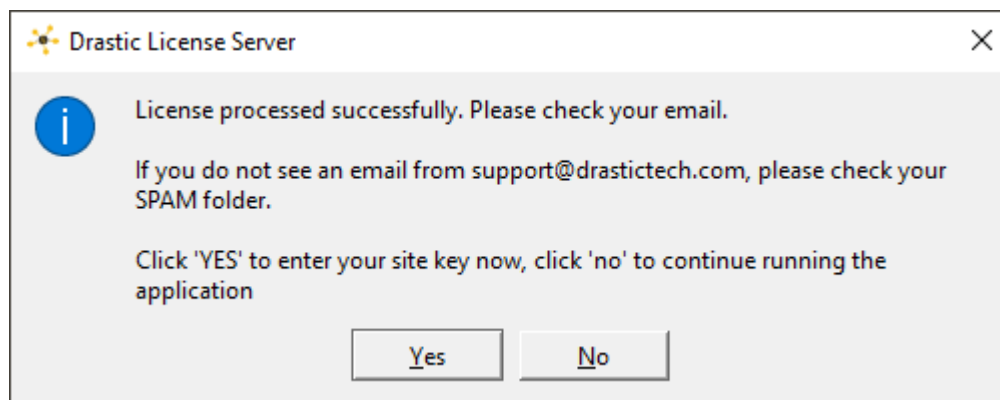
A dialog box titled "Free/Trial Request" with a red magnifying glass icon on the left and a question mark and close button on the right. It contains two text input fields: "User Name" and "Email". A "Send" button is located to the right of the "Email" field.

Free/Trial Request


User Name

Email

Enter a user name and a valid email address, press **Send**, and the automated licensing will send an email to this address with a license key. The following dialog will pop up:

A dialog box titled "Drastic License Server" with a close button in the top right corner. It features an information icon (a blue circle with a white 'i') on the left. The text inside reads: "License processed successfully. Please check your email." followed by "If you do not see an email from support@drastictech.com, please check your SPAM folder." and "Click 'YES' to enter your site key now, click 'no' to continue running the application". At the bottom, there are two buttons: "Yes" and "No".

Drastic License Server

 License processed successfully. Please check your email.

If you do not see an email from support@drastictech.com, please check your SPAM folder.

Click 'YES' to enter your site key now, click 'no' to continue running the application

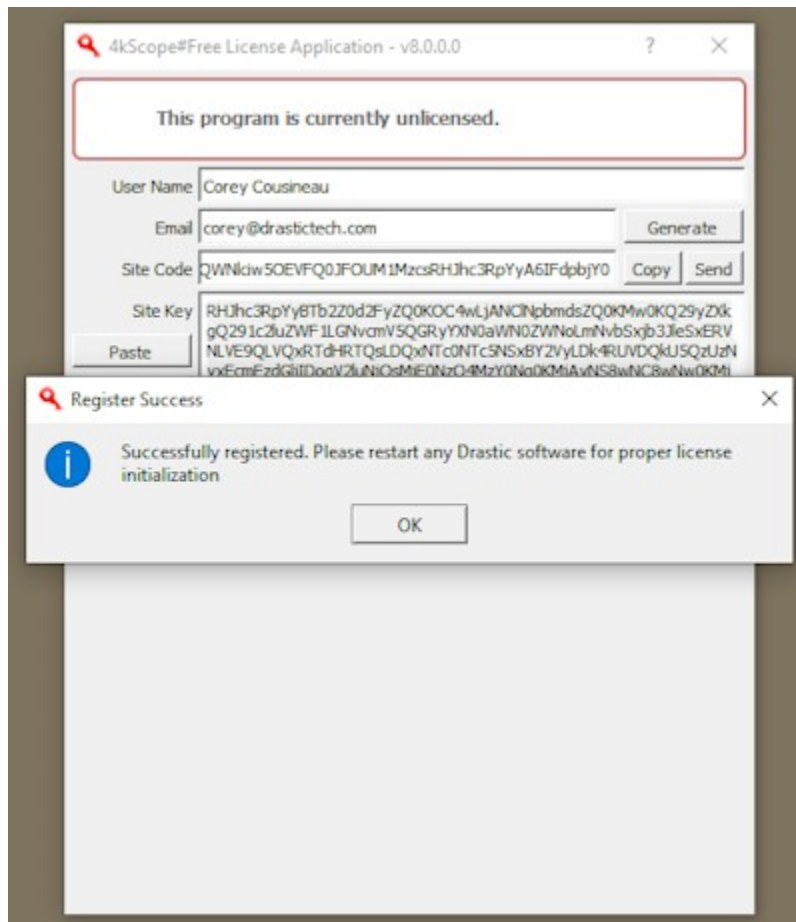
The license arrives in the inbox:



Clicking the **Yes** option in the Drastic License Server dialog opens the free license application dialog. (If you click “No”, DrasticScope will run in unlicensed mode, with overlay/watermark, nag screen, auto shut off, etc.)

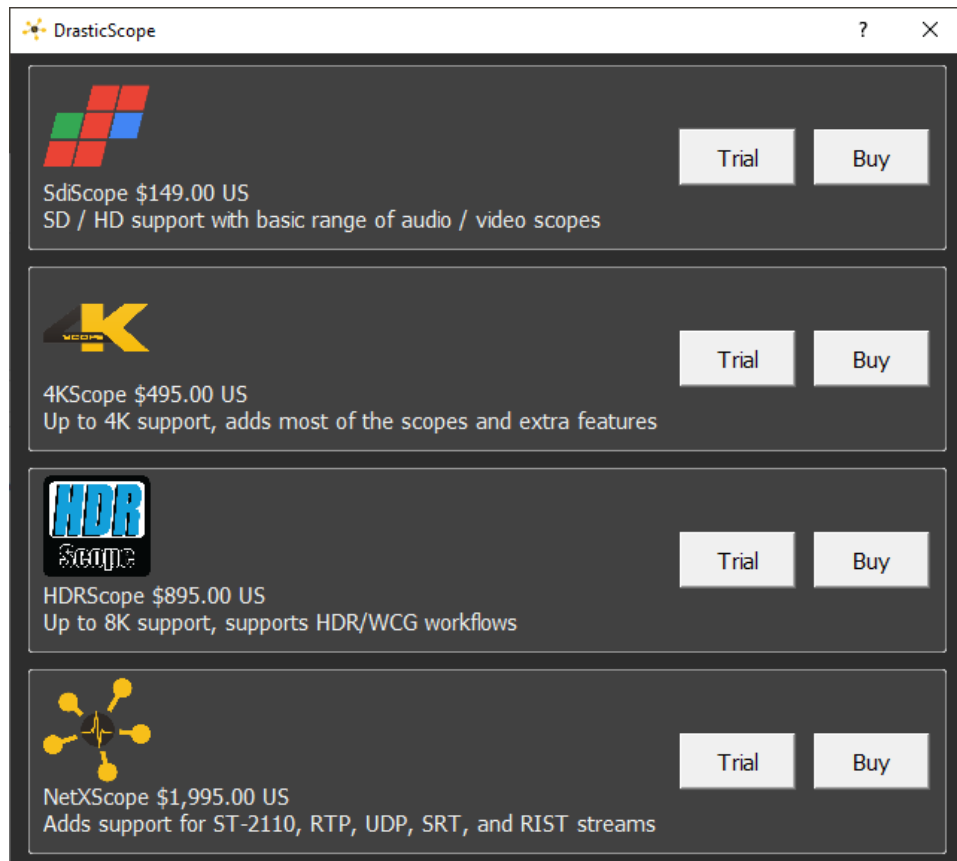
A screenshot of the '4kScope#Free License Application - v8.0.0.0' dialog box. At the top, a red-bordered box contains the text 'This program is currently unlicensed.' Below this, there are input fields for 'User Name' (containing 'Corey Cousineau'), 'Email' (containing 'corey@drastictech.com'), and 'Site Code' (containing 'QWNlciw5OEVFQ0JFOUM1MzcsRHJhc3RpYyA6IFdpbjY0'). To the right of the 'Email' and 'Site Code' fields are buttons labeled 'Generate', 'Copy', and 'Send'. Below the 'Site Code' field is a 'Site Key' field with a large text area. To the left of the 'Site Key' field are buttons labeled 'Paste', 'Register', 'Remove', and 'Folder'.

To enable Free mode, open the email and copy the site key. Paste it into the licensing dialog and click the Register button.

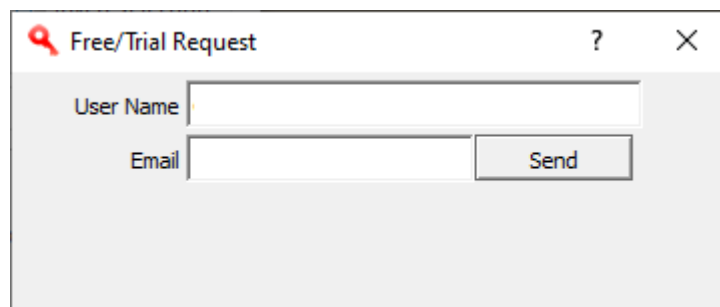


Note that Free mode uses an expired license. So, to run a copy of the Free version, you should request a temp license, which will run out and provide Free mode operation.

Try or Buy Advanced License – opens a dialog to specify a license level, either as a trial or as a purchase.

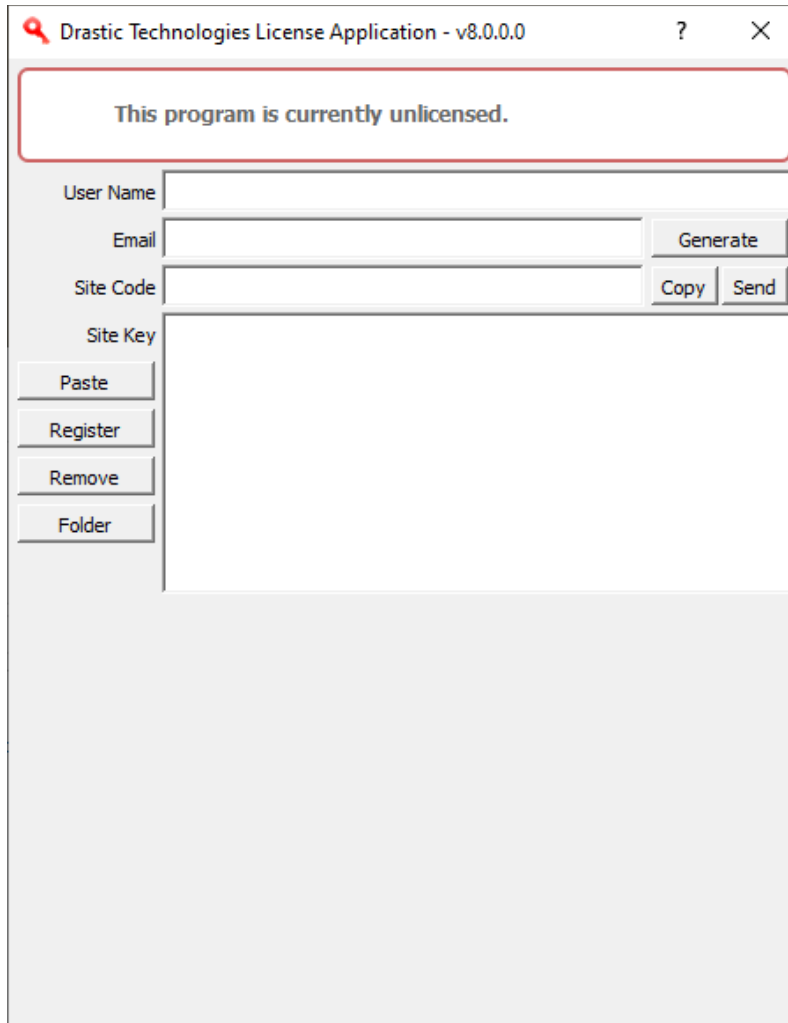


Trial – Selecting the Trial button opens the licensing dialog:



Here, the licensing process is the same as the free version, except a demo license is provided per level requested.

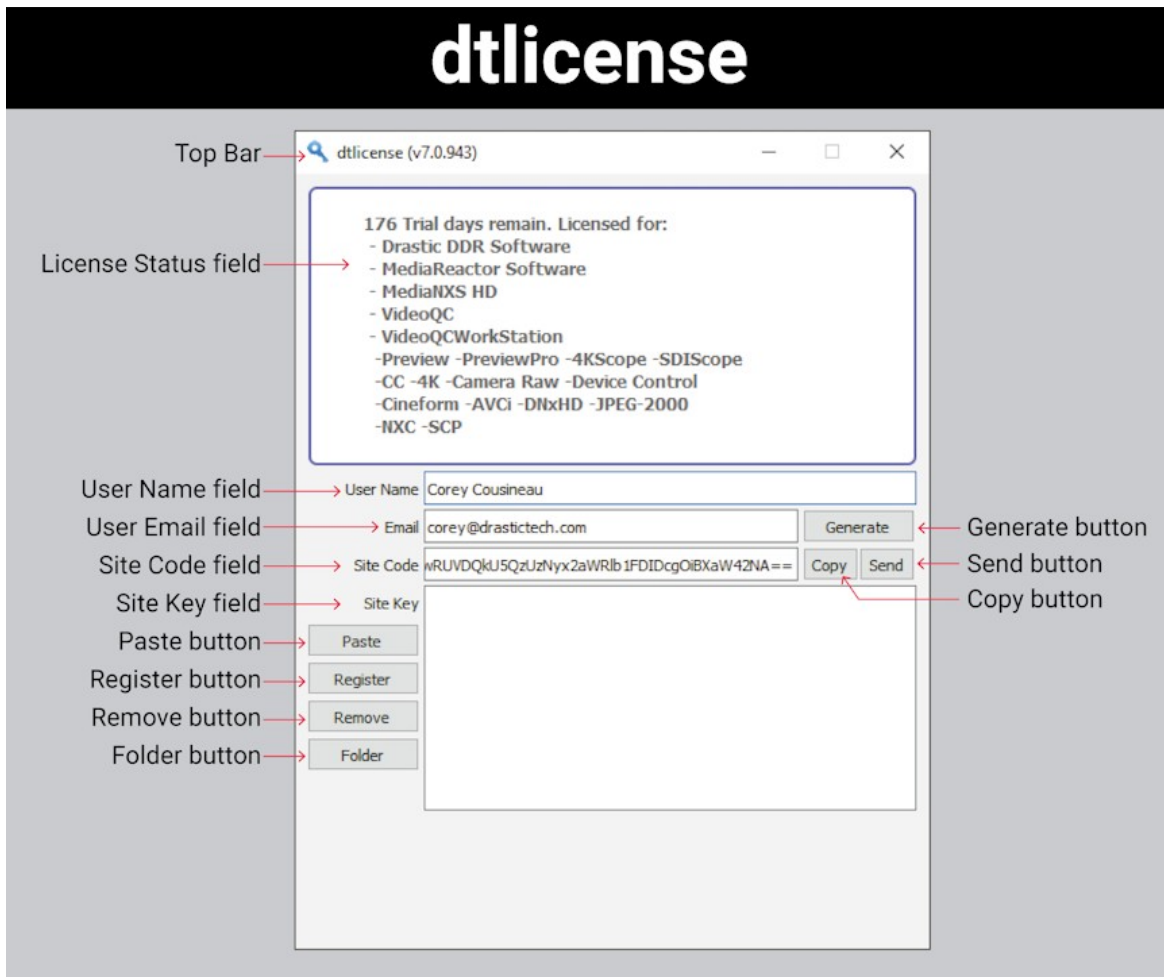
Buy – selecting the Buy option opens the Drastic License application.



The screenshot shows a window titled "Drastic Technologies License Application - v8.0.0.0". At the top, a red-bordered box contains the text "This program is currently unlicensed." Below this, there are input fields for "User Name", "Email", "Site Code", and "Site Key". To the right of the "Email" field is a "Generate" button. To the right of the "Site Code" field are "Copy" and "Send" buttons. Below the "Site Key" field is a large text area. To the left of this text area are four buttons: "Paste", "Register", "Remove", and "Folder".

If you have purchased a license and have your site key, you can use this dialog to apply it. Alternately, you can enter a user name and email, and press the Generate button to create a site code. Email us the site code, and we will reply with a site key to enable the license.

4.1.2 Licensing Controls and Displays



4.1.3 Setup Window

Confirm that the signal you wish to monitor is connected to the correct input(s) of the video board.

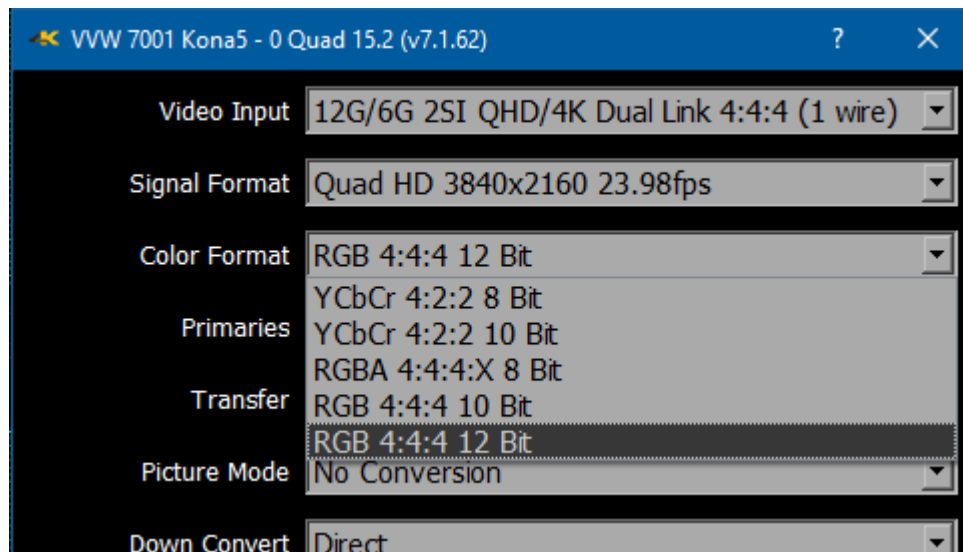
Use the **Setup dialog** to confirm or adjust any settings for the type of signal format being used. Set the signal format to match the board or device's capabilities.

4.1.4 Color Space and HDR/HLG in DrasticScope

Depending on the license, DrasticScope can support 8, 10, and 12 bit color in both YCbCr 4:2:2 and RGB 4:4:4 modes. Correct measurement of signals require the correct setup.

4.1.4.1 Input Color - YCbCr (YUV) and RGB

Once the signal format is set, the next most important is the overall color format. DrasticScope supports YCbCr (broadcast) at 8 and 10 bits, and RGB (post production) at 8, 10 and 12 bits (depending on hardware). For most SDI and HDMI signals you will want to be in YCbCr 10 bit, as this is by far the most common format. Even if the signal source is 8 bit, it will still work in 10 bit and vice versa. If you are monitoring a high end post system (Nucoda, Assimilate, Autodesk, Resolve, etc) then the input may be a 4:4:4 RGB, also known as dual link, input. In this case, it will be either a 10 bit or 12 bit signal. As 10 bit will work for both 10 and 12 source, if the image is incorrect in 12 but correct in 10, then it is likely a 10 bit source. Correct measurement of signals require the correct setup of the bit depth, color format, primaries and transfer mode of the signal you are measuring within DrasticScope.



4.1.4.2 Primaries

DrasticScope supports a wide variety of primaries. These describe the color space being used in terms of chrominance and saturation. As a general rule of thumb, the following are the standard primaries for various signal types:

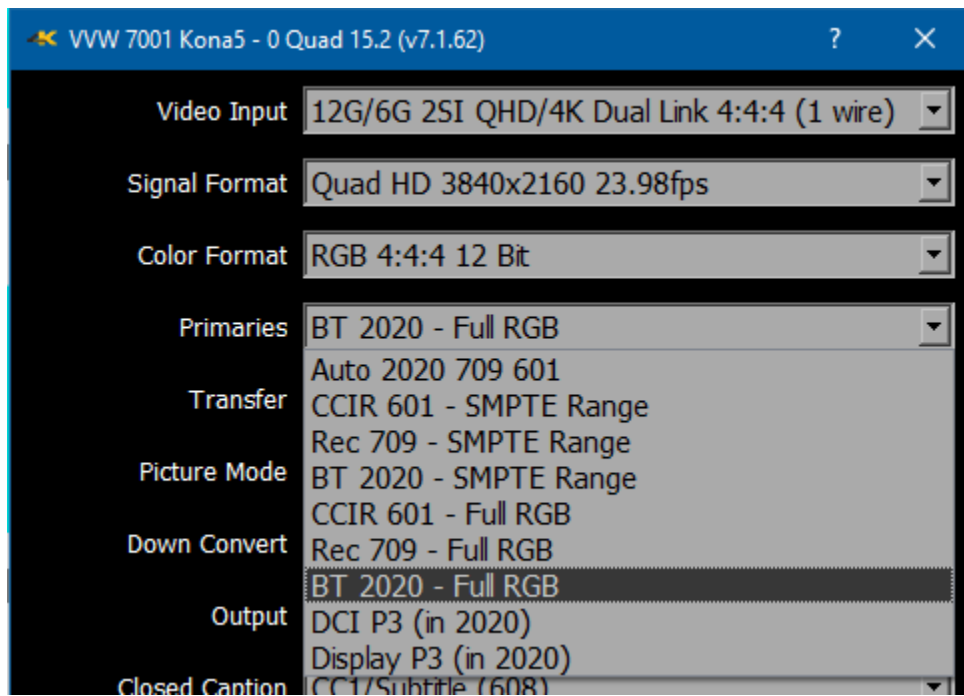
SD - CCIR 601

HD - Rec 709

QHD/4K - BT 2020 (but may be Rec 709)

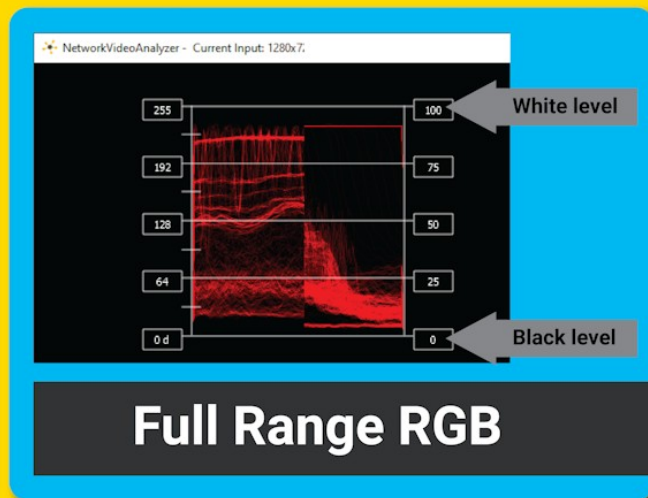
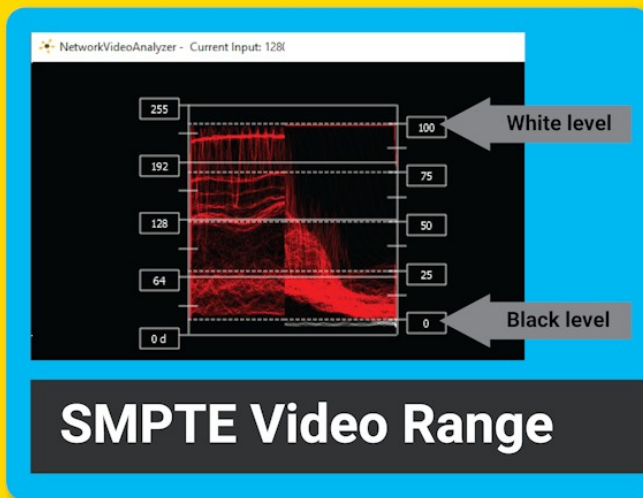
QHD/4K Post - P3/BT 2020/709 (but may be Full Range RGB)

While it is possible to mix these (e.g. send 4K with CCIR 601 primaries), it would be very uncommon. The trickiest part of this configuration can be the SMPTE Video Range vs Full Range RGB, when running in RGB modes. When producing RGB over SDI/HDMI/IP, the creation software can choose to make the 0% color (standard black) and the 100% color (standard white) to be the 0 value and 4095/1023 value. In this case it is using the 'Full' range of the RGB to describe the standard color range. As normal video has a range that allows brighter than white and darker than black, it is very common to duplicate this functionality in RGB space, making standard black 64 and standard white 3760/940. This is known as SMPTE or Video Range. If the signal is using SMPTE or FULL, and DrasticScope is set to the opposite, then the gratitudes will not line up properly. These settings must match.

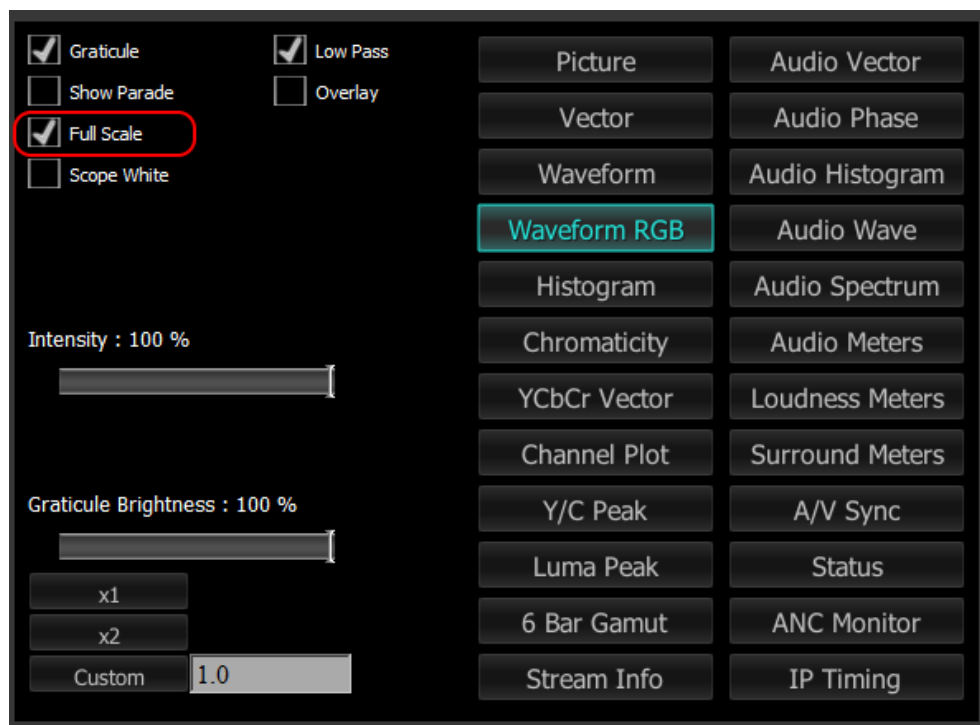


SMPTE Range vs Full Range RGB

Color Space and SMPTE Video Range vs. Full Range RGB

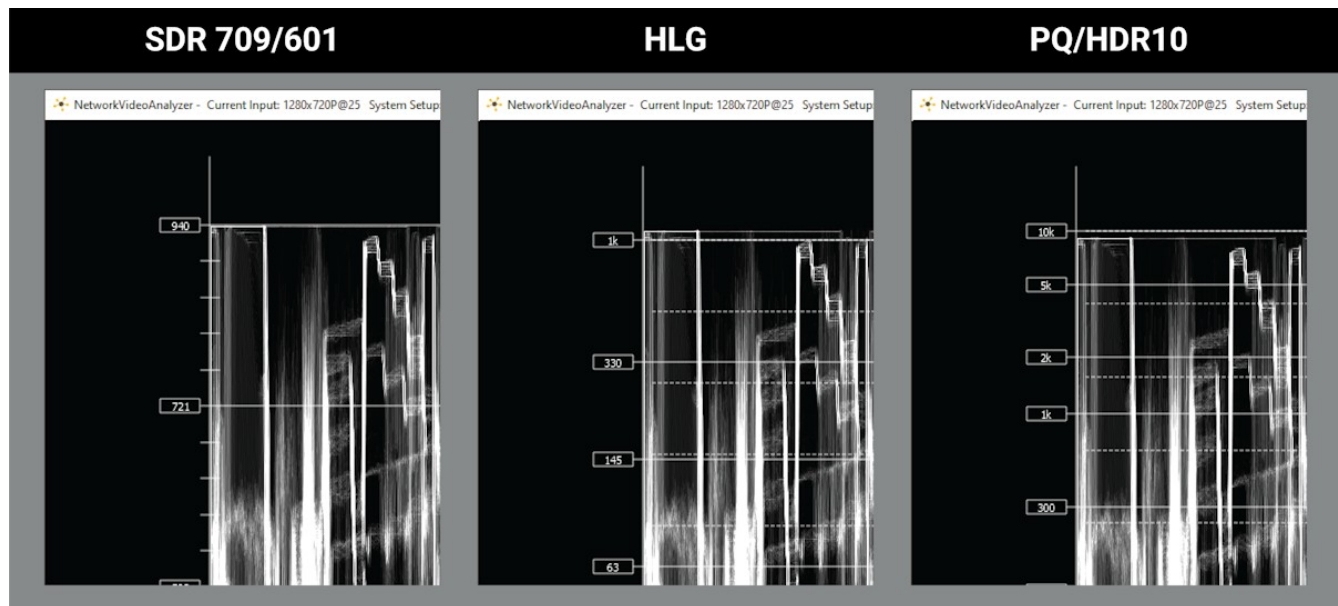


When using RGB Full, it is also important that the **RGB Waveform** Scope has its 'Full Scale' check box checked or unchecked to match. In some YCbCr cases it needs to be independent from the main primary selection.



4.1.4.3 Transfer Characteristics

The transfer characteristics describe how the luminance, or brightness, is encoded in the signal.

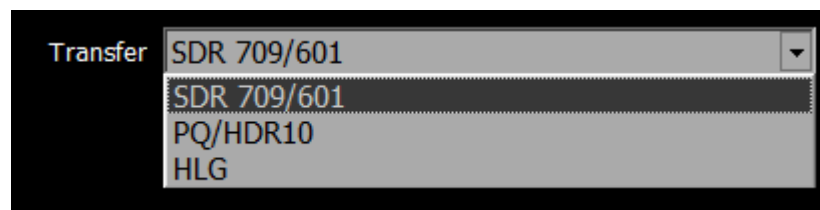


In the **Config** under **Transfer**, the following settings will need to be considered.

For a standard dynamic range (SDR) signal, this will be set to **SDR 709/601**.

If the source is an HDR10, SMPTE 2084 or HDR10+ signal, this should be set to **PQ/HDR10** (max 10,000 nits).

If the source is a hybrid log gamma (HLG) signal, it should be set to **HLG** (max 1000 nits).



4.1.5 Turning Off Background Programs in Linux

If DrasticScope is likely to be run with mostly with no direct interaction from the keyboard, and if there is a screen saver/power saver/sleep mode/kernel update set to run, these background programs can cause DrasticScope to crash.

Here is how to prevent these from running under Linux.

4.1.5.1 Disable Hibernate, Sleep

```
sudo systemctl mask sleep.target suspend.target hibernate.target  
hybrid-sleep.target
```

```
sudo systemctl disable
```

```
systemd-hibernate.service  
systemd-hybrid-sleep.service  
systemd-suspend.service
```

4.1.5.2 Disable Kernel Updates

```
/etc/yum.conf  
add, at the bottom of the file exclude = kernel*
```

4.1.5.3 Set Default Kernel

```
/etc/default/grub  
GRUB_DEFAULT=saved  
GRUB_SAVEDEFAULT=true
```

4.2 Drastic ScopeDirect Plugins

The Drastic ScopeDirect plugin allows editors to view their creative software through Drastic's software signal analysis tools, without requiring a separate system. It installs a plugin to view the video, audio, and closed captions and other ancillary data, and lets you analyze the signal with professional, industry leading, software based waveform/vectorscopes.

The DrasticScope plugin is added at the 4KScope level.

For most windows apps, we install the Drastic ScopeDirect Plugin codec during the install. With macOS, we are not doing an install, so we don't put the plugins in automatically. Also, with the Unreal plugin, it is up to the developer/creative to put the plugin in their choice of directory.

4.2.1 ScopeDirect Plugin for Adobe

4.2.1.1 Windows:

Adobe (automatically installed)

C:\Program Files\Adobe\Common\Plug-ins\7.0\MediaCore\Drastic

4.2.1.2 MacOS:

Adobe (manual unzip)

From: /Applications/HDRScope.app/Contents/Resources/DrasticScopeTransmitter.zip

To: /Library/Application

4.2.1.3 More Information

<https://www.drastic.tv/support-59/supporttipstechnical/202-using-4kscope-with-adobe-scpedirect-transmitter>

4.2.2 ScopeDirect Plugin for Avid

4.2.2.1 Windows:

Avid (automatically installed)

C:\Program Files\Avid\AVX2_Plug-ins

4.2.2.2 MacOS:

Avid (manual unzip)

From: /Applications/HDRScope.app/Contents/Resources/DrasticScope_OpenIO.zip

To: /Library/Application Support/Avid/OpenIO/

4.2.2.3 For More Information:

<https://www.drastic.tv/support-59/supporttipstechnical/201-using-4kscope-with-avid-scopedirect-openio>

4.2.3 ScopeDirect Plugin for OpenFX/Resolve

4.2.3.1 Windows:

OpenFX (automatically installed)

C:\Program Files\Common Files\OFX\Plugins\

DaVinci Resolve (manual, in an Admin terminal)

regsvr32 "C:\Program Files\FlowCaster\virtualSdi64.dll"

4.2.3.2 MacOS:

OpenFX (manual unzip)

From: /Applications/HDRScope.app/Contents/Resources/DrasticScope_Monitor.zip

To: /Library/OFX/Plugins/

4.2.3.3 For More Information:

<https://drastic.tv/support-59/supporttipstechnical/226-using-the-drastic-openfx-plugins-in-davinci-resolve>

4.2.4 ScopeDirect Plugin for Unreal Engine

4.2.5 Windows:

UnReal Engine (manual, copy plugin directories)

From: C:\Program Files\FlowCaster\DrasticUnrealScopeMonitor

To Engine: C:/Program Files/Epic Games/UE_5.2/Engine/Plugins/
or

To Project: C:/Projects/[MyGame]/Plugins/

4.2.5.1 For More Information:

<https://www.drastic.tv/support-59/supporttipstechnical/271-scopedirect-plugin-for-unreal-engine>

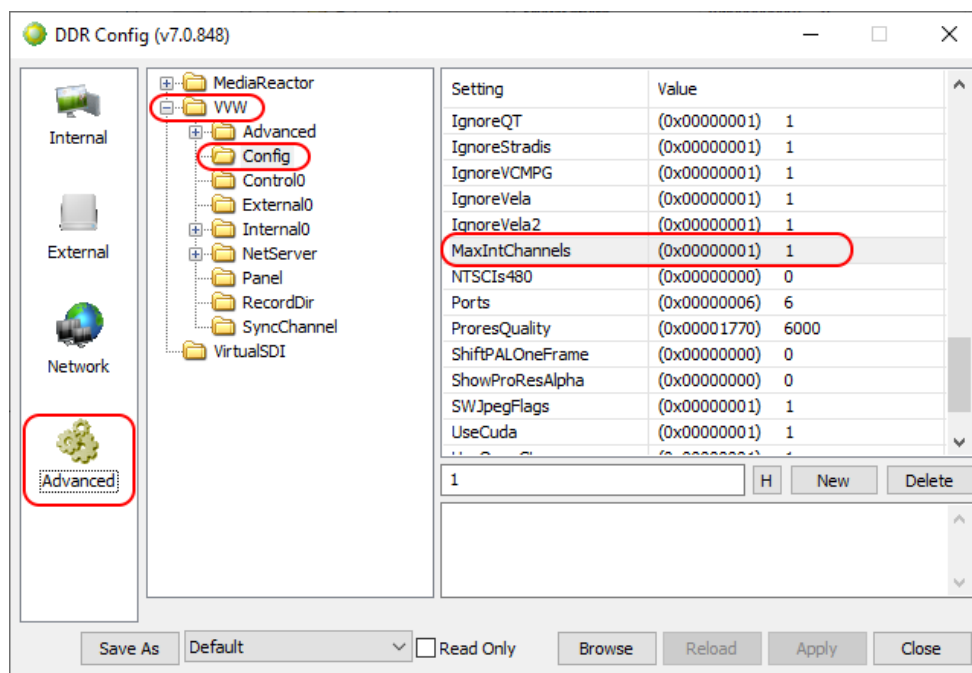
4.3 Multiple Inputs

DrasticScope (4KScope level and above) has the ability to use multiple inputs as individual inputs for some video capture boards (like AJA, Bluefish444, and some Blackmagic boards). When setting it up this way, you will lose the ability to do multi cable input for dual link, QHD/4K and other modes. Each input will be limited to one BNC. This setup can be easily reverted when not needed.

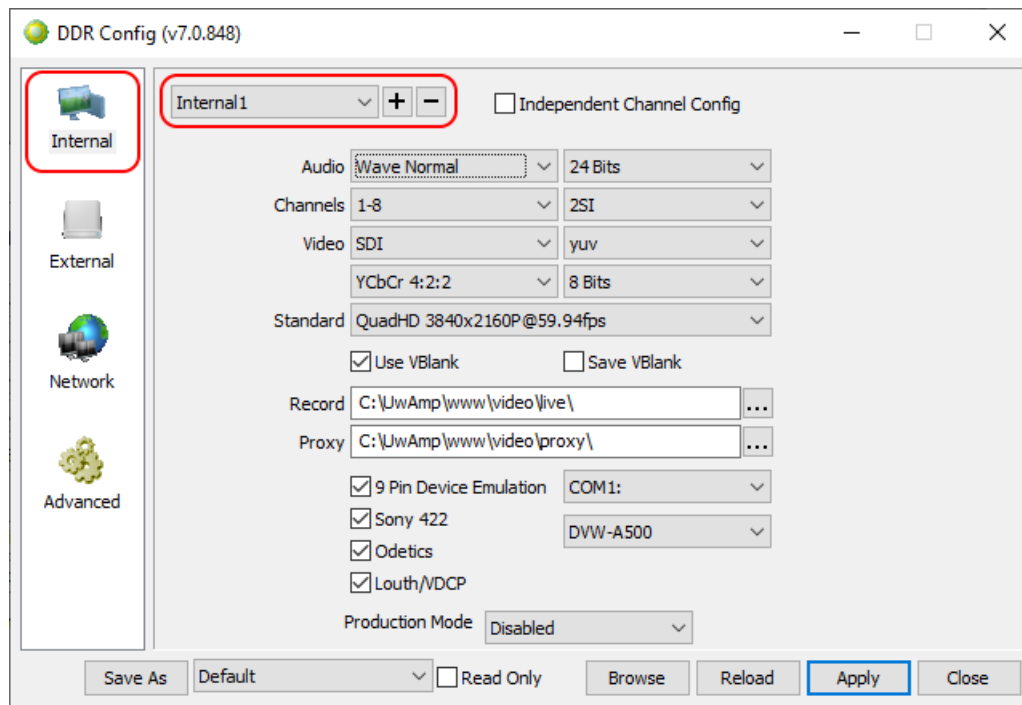
Setting up multi input mode on 4KScope/HDRScope is done by splitting your input board into 'virtual boards', normally 2, 4 or 8 per board, depending on the number of available inputs.

To change modes, close all other Drastic software and run DDRConfig.

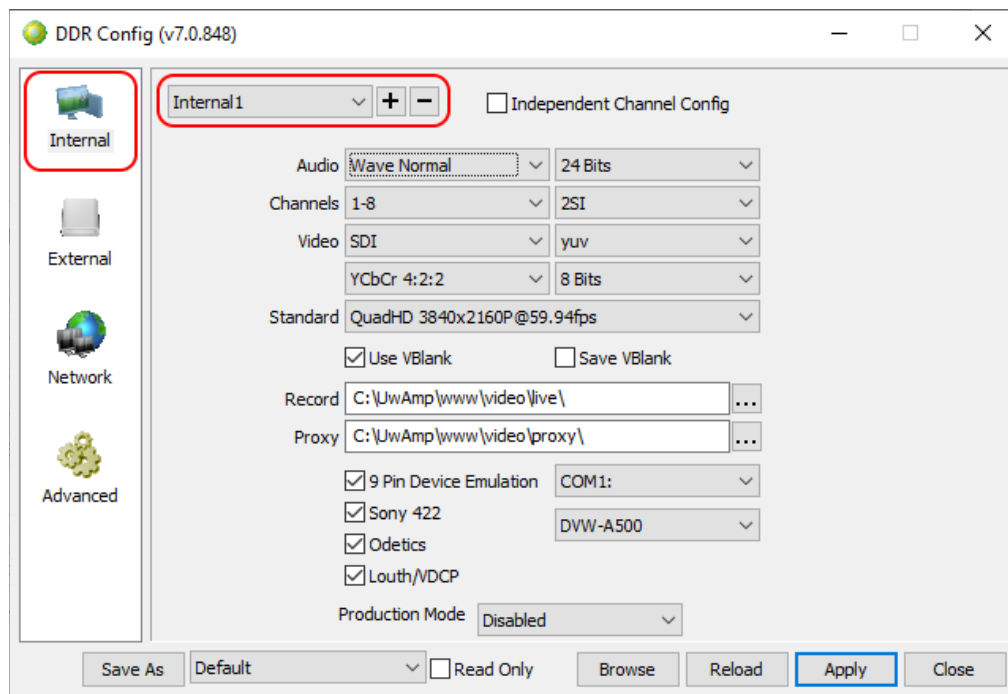
Go to the Advanced tab, open the tree to VVW\Config and change MaxIntChannels = 1



Open the tree to VVWAdvanced\VVWUNC and change UseBothBoardChannels = 1



Click on the 'Internal' tab, and then the '+' to add up to as many channels as the device supports.



Here is an example where 4KScope is set to look at a Blackmagic DeckLink 4K Extreme 12G card. The board select pulldown menu is used to select between available inputs.



4.4 Controlling DrasticScope

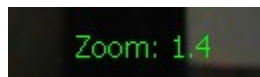
4.4.1 Mouse Control

DrasticScope features extended mouse controls. These include:

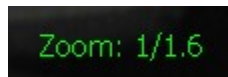
- <MouseWheel> - zoom in and out symmetrical
- <MouseWheel><Alt> - zoom X axis
- <MouseWheel><Ctrl> - zoom Y axis
- <RightClick> - reset zoom to view all
- <LeftClick>Drag - pan and scan the video image in the app
- <MiddleClick> - zoom 1:1 (only works on the picture view)
- <DoubleClick> - enter and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

When the image has been resized a message appears to remind the user.

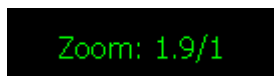
Zoom Symmetrical – provides a multiplier. So for example a 1.4 zoom provides an image 140% larger.



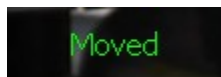
Zoom X Axis – displayed as a fraction of 1 over the zoom level.



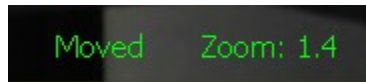
Zoom Y Axis – displayed as a fraction of the zoom level over 1.



Pan/Scan – shows that the image has moved

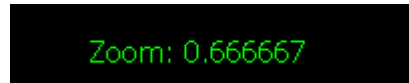


Zoom and Pan/Scan – lets you know the zoom level, and that the image has moved.



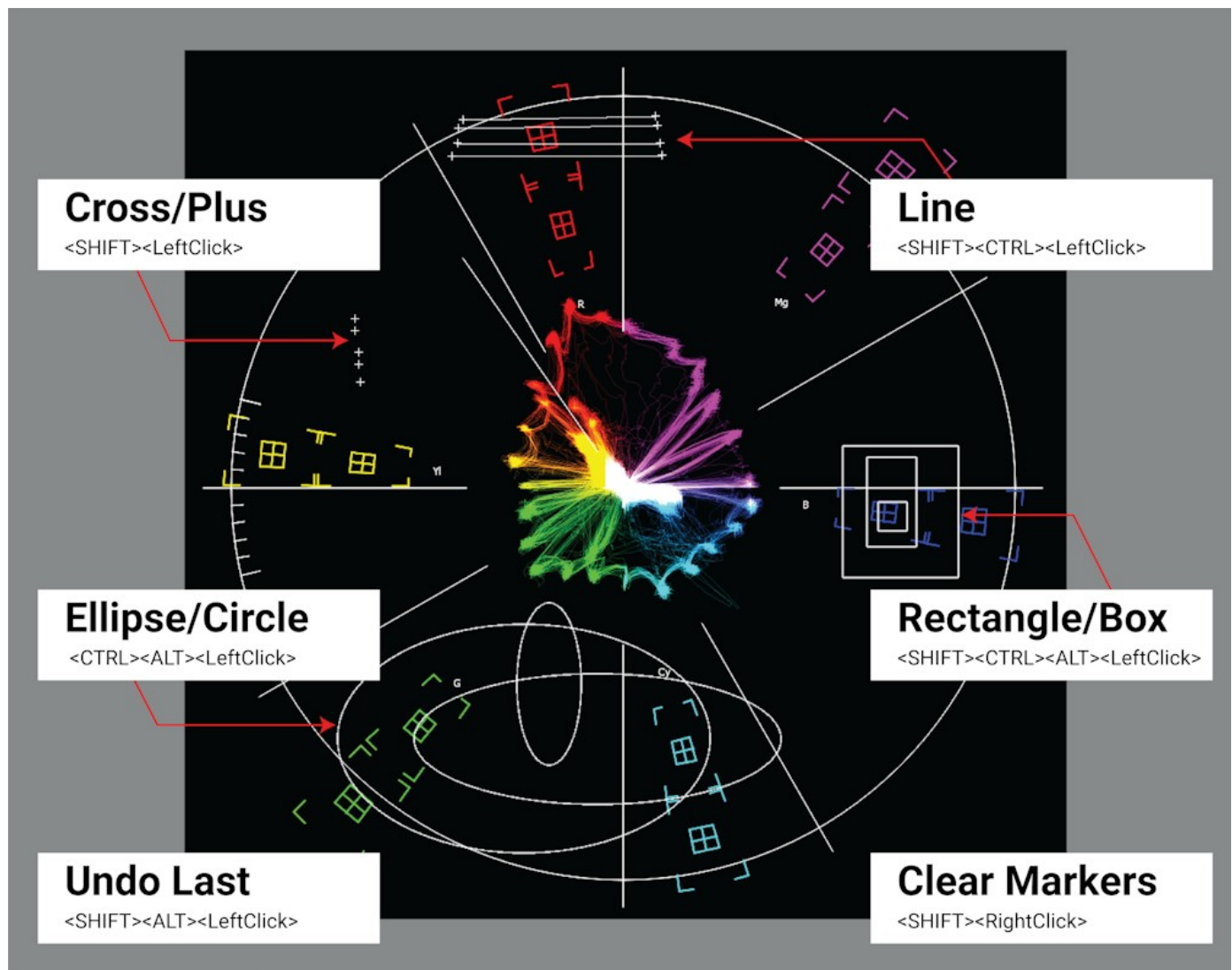
Moved Zoom: 1.4

Zoom 1:1 – sets the image to its actual size rather than scaled to fit the window. In the below example a 720p signal is set to display as 1:1, and the monitor resolution is 1080.



Zoom: 0.666667

4.4.2 Making Marks/Guides (cross, line and box)



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

4.4.3 Frame Compare

DrasticScope 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.

4.4.4 Command Line Parameters

The command line parameters can be used to allow DrasticScope to open automatically on startup in the mode and size required.

```
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
```

4.4.5 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
```

4.4.6 Capture Image

The keyboard commands can be used to capture compressed and uncompressed frames directly from

the incoming signal.

<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)

4.4.7 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> Clicks the **Freeze** button, so whatever freeze mode you have set is activated.

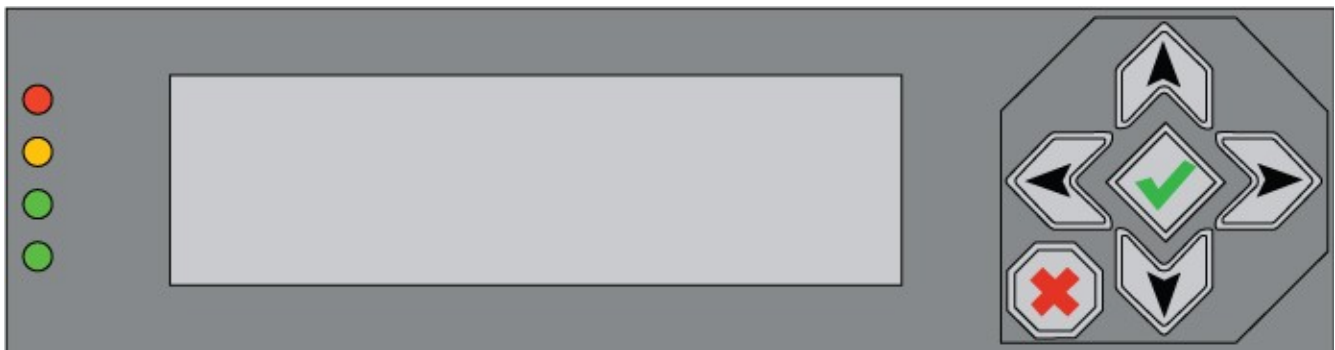
When in Data View, closes Data View and returns to the previous screen

5 DrasticScope Front Panel Controller

Use the layout menu in the DrasticScope GUI to set up the number of screens available to display scopes on.

Once the layout has been set, you can use the front panel controller to change which scope is displayed in which screen, and to set various overlays and methods of display for each scope.

5.1 Controls and Displays



Along the left are the LEDs which function as audio meters.

In the center the LCD screen displays various data and menus, and allows the user to navigate to specific scopes to choose which scopes are displayed, and to access settings for each scope.

At the right are the controls: The up/down arrows, the left/right arrows, the X, and the check mark. These provide various functions as described below.

5.2 Scope Selection

The LCD display will show all the scopes that have been set up. One of the scopes will have angle brackets around it to indicate it is selected.

You can change which scope is selected by using the up/down/left/right arrow keys.

5.3 Change Settings For the Scope

Once you have selected a scope, pressing the Check button will bring up the menus for that scope in that location. The menus let you set whether particular graticules are displayed, whether luma or parade views are displayed for particular scopes, and so on.

You can then go up/down to change the menu you are on and left/right to change the value of that menu.

Pressing the X button will bring you back to the main screen.

5.4 Change the Scope

Select the scope you want to change and press the X button; this will show the selection of available scopes and let you select a new scope for that spot.

To select a new scope to display, navigate to it and press the Check button. To cancel, press the X button. Please note, there are more scopes than will fit in one screen. To get the rest of the selections, go to the arrow on the right part of the screen and press the Check button. This will switch to the other screen of choices.

5.5 Audio Meters

The LEDs will light up as audio meters going from off to green to orange to red. The time code will be displayed at the bottom of the display, if on the main page.

5.6 The Scopes and Settings

The available scopes, overlays, settings options appear on the screen as the text in brackets (below), which are shortened to fit as fields in the LCD display.

Here are the available choices:

<pict >	LCD Picture View
<vect >	LCD Vectorscope
<wrgb >	LCD Waveform Monitor RGB
<wave >	LCD Waveform Monitor YCbCr
<gamut>	LCD Chromaticity Scope
<histo>	LCD Histogram
<timng >	LCD IP Timing
<stat >	LCD Status View
<avect>	LCD Audio Vectorscope
<aphas>	LCD Audio Phase
<ahist>	LCD Audio Histogram
<awave>	LCD Audio Waveform Monitor
<afreq>	LCD Audio Frequency
<meter>	LCD Audio Meters

<asprm> LCD Audio Spectrum
 <data > LCD Data View
 <grat >LCD Graticule

The available overlays and methods of display for the selected scopes appear on the screen as the text in brackets (below), which are shortened to fit as fields in the LCD display.

Not all choices will be available for all scopes, and certain choices may be scope-specific:

<picture > Picture Safe
 <Action > Action Safe Overlay
 <Graphic > Graphic Safe Overlay
 <Pict Frame> Picture Frame Overlay
 <Active Rgn> Active Region Overlay
 <Title Safe> Title Safe Overlay
 <waveform> Waveform Overlay
 <Graticule > Graticule Overlay
 <100% Marks> 100% Marks Overlay
 <75% Marks > 75% Marks Overlay
 <AngleMarkr> Angle Marker Overlay
 <Skin Tone > Skin Tone Overlay
 <Show Prade> Show Parade
 <Scp White > Display the scope using white only
 <Scale Type> Scale Type setting
 <Full Scale> Full Scale Setting
 <Only Luma > Display the scope using only luma
 <Color > Color
 <Intensity > Intensity setting
 <vector > Vectorscope Overlay
 <Trngl 601 > Triangle 601 Overlay
 <Trngl 709 > Triangle 709 Overlay
 <Trngl 2020> Triangle 2020 Overlay
 <Trngl P3 > Triangle P3 Overlay
 <Invert > Invert the black and white in the display
 <Black > Black setting
 <Brightness> Brightness setting
 < > Empty Space
 <[> Open Bracket
 <]> Close Bracket

Specific settings may be available in setting up certain scopes.

Action Safe
Title Safe
Picture Safe
Graphic Safe
Active Region
8 Bit Processing On/Off
LissajousXY On/Off
Lissajous On/Off
Polar On/Off
Amp Linear On/Off
Amp Logarithmic On/Off
Scale Linear On/Off
Scale Sqrt On/Off
Scale Cbrt On/Off
Scale Logarithmic On/Off
Scale R Logarithmic On/Off
Zoom In/Out
Histogram Type 1
Histogram Type 2
Wave MV Scope
Graticule On/Off
Lines On/Off
Marks 100% On/Off
Marks 75% On/Off
Angle Marker On/Off
Skin Tone Marker On/Off
Drastic Luma Stick On/Off
Chromaticity/Gamut Scope On/Off
709
2020
P3
Invert Chromaticity Display Black/White
Chromaticity Black Only
Intensity Setting
Quality Setting
Brightness Setting
Waveform Parade Display
Waveform White Only Display
Illegal Marker On/Off
Luma Only Display

- RGB Histogram Display
- HSV Histogram Display
- Spectra Histogram Display
- Overlap Histogram Display
- Color Histogram Display
- ST2084 Display
- Full Scale Display
- Intensity Setting
- Quality Setting
- Brightness Setting
- Select Audio Pair

5.7 Adding Picture Scope

- Add Picture Scope
 - Action Safe Overlay
 - Graphics Overlay
 - Picture Safe Overlay
 - Active Region Overlay
 - Title Safe Overlay

5.8 Adding Vector Scope

- Add Vectorscope
 - Graticule
 - 100% Marks
 - 75% Marks
 - Angle Marker
 - Skin Tone
 - Color
 - Intensity
 - Brightness

5.9 Adding Waveform YCbCr Scope

- Add Waveform Monitor

- Select between (Digital/MV/IRE) Scale Settings
- Graticule
- Show Parade Setting
- Luma Only Display
- White Only Display
- MV Scope Scale
- Intensity
- Brightness

5.10 Adding Waveform RGB Scope

- Add Waveform RGB
 - Graticule
 - Show Parade
 - Full Scale Setting
 - White Only Display
 - Intensity Setting
 - Brightness Setting

5.11 Adding Histogram Scope

- Add Histogram
 - Select between (YCbCr/RGB/HSV/Luma/H/S Scp) Settings
 - Graticule
 - MV Scope Scale

5.12 Adding Chromaticity Scope

- Add Chromaticity (Gamut) Scope
 - Graticule
 - TR601 Setting
 - TR 709 Setting
 - TR 2020 Setting
 - TR P3 Setting
 - Invert Black/White Setting
 - Black Only Display

5.13 Adding Status Scope

Add Status Scope
Brightness

5.14 Adding Audio Phase Scope

Add Audio Phase Scope
Graticule
Brightness Setting

5.15 Adding Audio Wave Scope

Add Audio Wave Scope
Graticule
Brightness

5.16 Configuring the Crystalfontz Front Panel Linux

/etc/udev/rules.d/99-usb-crystalfontz.rules

```
SUBSYSTEMS=="usb", KERNEL=="ttyACM[0-9]*", SUBSYSTEM=="tty",  
SYMLINK+="cryfontz", ACTION=="add", ATTRS{idVendor}=="223b", ATTRS  
{idProduct}=="0004", MODE="0666"
```

5.17 Permission Commands

```
sudo chown root:root /etc/udev/rules.d/99-usb-crystalfontz.rules
```

```
sudo chmod 0644 /etc/udev/rules.d/99-usb-crystalfontz.rules
```

```
udevadm control --reload-rules
```

6 REST API Commands

6.1 Basic Command Structure

DrasticScope REST API provides many commands that allows you to modify the number of scopes displayed, to select which scopes are displayed, and to adjust specific scope settings.

All commands to DrasticScope start with:

`http://127.0.0.1:1080/drasticcmd?`

Most commands must includes an x= and y= to specify the target scope

`http://127.0.0.1:1080/drasticcmd?x=0&y=1`

The x and y coordinates represent the positioning of scopes in the form of a grid. This grid has a maximum of 2 rows and 3 columns. The maximum number of scopes that can be displayed is 6 and the minimum is 1 scope. The image below displays 4 possible scope layouts depending on how many scopes the user would like to have active.



The x and y coordinates can range from (0,0) to (1,2). From the last layout from the image above, the first row is represented by (0,0), (0,1), (0,2) and the second row is represented by (1,0), (1,1), (1,2). Below is a more detailed explanation about the scope layout.

6.1.1 Number of Scopes

The maximum number of scopes that can be displayed is 6 and the minimum is 1. There are four possibilities on how the scope layout can be displayed. The scope layout can display either 1 scope, 2 scopes, 4 scopes or 6 scopes as provided with the image above. The linear number in the upper left corner in the image below shows each quadrant's ID in the list, while the x/y numbers identify the quadrant's display ID (for positioning and settings). When 4 scopes are visible, we hide scopes 2(0,2) and 5(1,2). For 2 scopes only 0(0,0) and 1(0,1) will be visible.



The **getscopenumber** command will return a value which represents how many scopes are being displayed. It will only return a value of 1, 2, 4 or 6 depending on how many scopes are currently visible. The command below will return how many scopes are currently visible.

<http://127.0.0.1:1080/drasticcmd?getscopenumber=>

```
{
    "response": 0.
    "value": 4
}
```

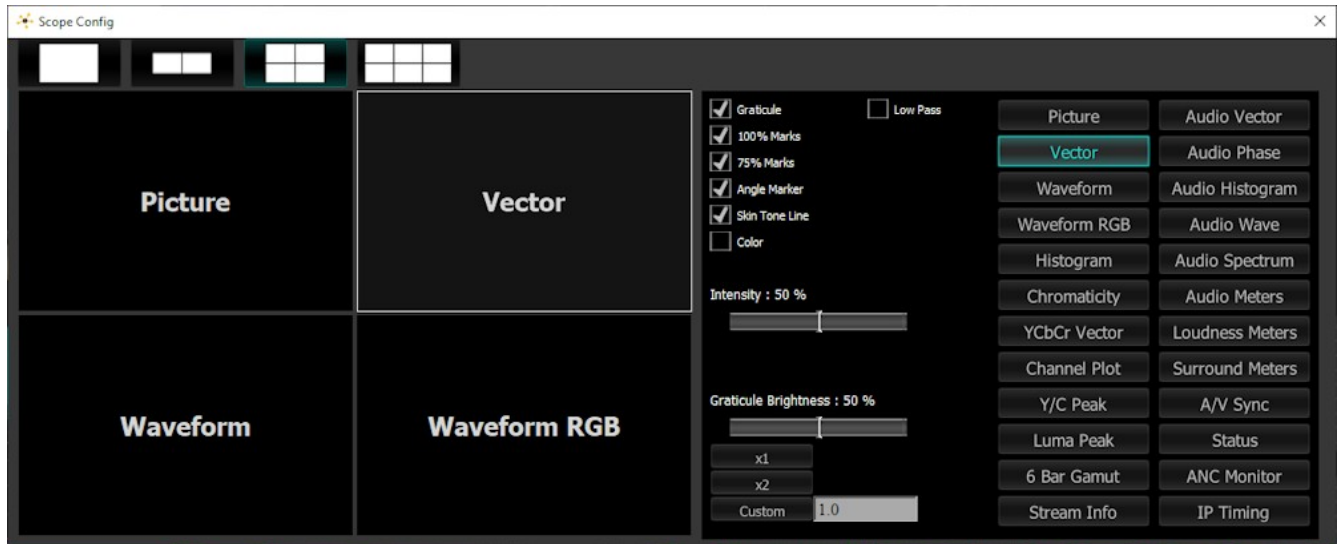
The **setscopenumber** command will allow you to change the number of scopes that are displayed. There are only 4 possible input values when using this command. **setscopenumber** can only be set to 1, 2, 4, or 6. The command below will set the number of scopes visible to 2 scopes.

<http://127.0.0.1:1080/drasticcmd?setscopenumber=2>

```
{
    "response": 0.
}
```

6.1.2 Set/Get Individual Scopes

The commands below provide ways of getting a specific scope and setting a specific scope. The user must make sure the x and y coordinates are within the range of the number of scopes present. From the image below, the selected scope is a Vectorscope as it is highlighted and has an x and y coordinate of (0,1).



The **getscope** command will return a value representing a specific scope type. The user must specify the x and y coordinates in order to get the desired scope. The list below provides scope values and their corresponding scope type. The command for getting the Vectorscope from the image above is provided below.

```
http://127.0.0.1:1080/drasticcmd?x=0&y=1&getscope=
```

```
{
  "response": 0.
  "value": 1
}
```

The user can then compare this value to the values in the list and find the corresponding scope

List of scope values vs names

- 0 = picture
- 1 = vector
- 2 = waveformrgb
- 3 = waveform
- 4 = histogram
- 5 = gamut
- = timing

- 10 = status
- 11 = audiovector
- 12 = audiophase
- 13 = audiohistogram
- 14 = audiowave
- = data

The **setscope** command will allow the user to change the scope based on the x and y coordinates and the scope type name. The command below will change the scope at (0,1) which is the Vectorscope to a Histogram scope

`http://127.0.0.1:1080/drasticcmd?x=0&y=1&setscope=histogram`

```
{
  "response": 0.
}
```

6.1.3 Set/Get Audio Meters

Not Implemented Yet

`http://127.0.0.1:1080/drasticcmd?getmeters=`

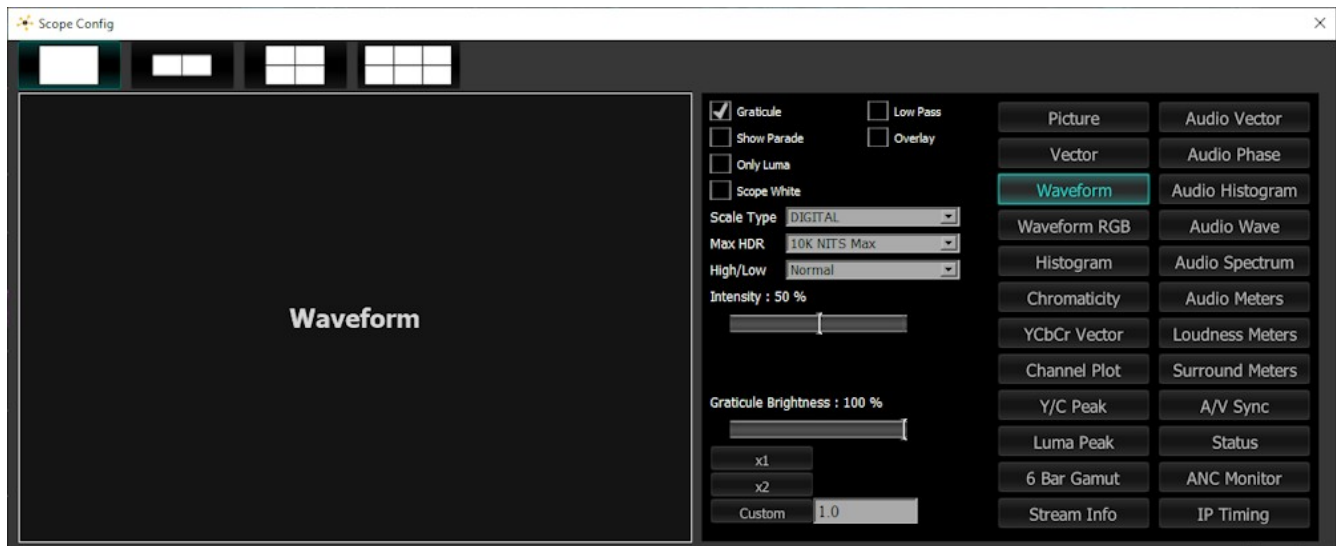
```
{
  "response": 0.
  "value": 2
}
```

`http://127.0.0.1:1080/drasticcmd?setmeters=0`

```
{
  "response": 0.
}
```

6.1.4 Set/Get Scope Settings

The commands below provide ways of getting the settings of a scope or assigning a value to a setting of a specific scope. The image below displays a Waveform scope with multiple settings such as Graticule, Show Parade, Only Luma, Scope White, Intensity and Graticule Brightness.



The list below provides correct input setting name commands according to a specific scope setting

- Active Picture = activepicture
- Graphic Safe = graphicsafe
- Picture Safe = picturesafe
- Active Region = activeregion
- Title Safe = titlesafe
- Graticule = graticule
- 100 Marks = 100marks
- 75 Marks = 75marks
- Angle Marker = anglemarker
- Skin Tone Line = skintoneline
- Color = color
- Intensity = intensity
- Brightness = brightness
- Show Parade = showparade
- Only Luma = onlyluma
- Scope White = scopewhite
- Scale Type = scaletype

- Full Scale = fullscale
- Triangle 601 = triangle601
- Triangle 709 = triangle709
- Triangle 2020 = triangle2020
- Triangle P3 = trianglep3
- Invert = invert
- Black = black
- Histogram Type = histogramtype
- Audio Vector Type = audvectortype
- Audio Histogram Log = audhistlog
- Audio Histogram Scale = audhistscale
- Display Mode = displaymode
- Freeze = freeze
- Line Select = lineselect
- Wave Hi/Lo = wavehilo
- Overlay = overlay
- Lowpass = lowpass
- Display None = display_none
- Display Luma = display_luma
- Display Red = display_red
- Display Green = display_green
- Display Blue = display_blue
- Display Edges = display_edges
- Display False = display_false
- Display Alpha = display_alpha
- Display Focus = display_focus
- Display Zebraluma = display_zebraluma
- Display Zebrachroma = display_zebrachroma
- Display Clip = display_clip
- Display Calibrate = display_calibrate
- Display HDR False = display_hdrfalse
- Display Weighted RGB = display_weightedrgb
- Display Weighted = display_weighted
- Display FlipFlop = display_flipflop
- Display Opacity = display_opacity
- Display Key Luma = display_keyluma
- Display Key Green = display_keygreen
- Display Key Chroma = display_keychroma

The **getsetting** command allows the user to get a specific setting from a scope based on the x and y coordinates provided and the setting name. From the image above, only one scope is present which is

the Waveform scope. This scope has (x,y) coordinates of (0,0). The command below will give us the value of the setting Graticule for this Waveform scope

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&getsetting=graticule`

```
{
    "response": 0.
    "value": 1
}
```

Since the Graticule box is checked, it is returning a value of 1.

The command below will return the setting value of Show Parade

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&getsetting=showparade`

```
{
    "response": 0.
    "value": 0
}
```

Since the Show Parade box is unchecked it will return a value of 0.

When dealing with checkboxes, a checkbox will either return a value of 1 or 0. If the value is 1 then a checkbox is checked, if 0 then it is not checked. Getting the setting value of Intensity or Graticule Brightness will return the numeric value it is currently set to.

Some scopes may have a pulldown menu with many options. As an example, we can assume the Waveform scope from above has a pulldown setting item called ColorSelection. ColorSelection contains options such as red, blue and green. We can say red, blue and green are stored in a list called colorsList somewhere in the back end of the code. Assume green is already selected. The command below will give us the value of the setting ColorSelection.

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&getsetting=ColorSelection`

```
{
    "response": 0.
    "value": 2
}
```

You can think of colorsList as a list that contains three items, red, blue and green with the corresponding numeric value automatically assigned.

colorsList:

- red = 0
- blue = 1
- green = 2

Each item in the list has a corresponding number value. The user can get information based on the number value returned from the setting. Since the command above returned a value of 2, the color green must be the current setting value of the scope setting ColorSelection.

The **setsetting** command allows the user to set a value to a specific setting. To set a scope setting the user must provide: the x and y coordinate of the desired scope, the scope setting name and a value to set the setting. From the image above, Scope White is unchecked. The command below will

set the Scope White setting value to 1. This will allow the Scope White checkbox to be checked

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&setsetting=scopewhite&value=1`

```
{  
    "response": 0.  
}
```

The command below will set the Graticule checkbox to be unchecked

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&setsetting=graticule&value=0`

```
{  
    "response": 0.  
}
```

If the scope setting is a checkbox, a value of only 1 or 0 should be used when setting the value. A numeric value between 0-100 can be used when assigning a value to the scope settings Intensity or Graticule Brightness. The command below will change the value of the Intensity setting from the image above from 50 to 60.

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&setsetting=intensity&value=60`

```
{  
    "response": 0.  
}
```

Referring back to the setting ColorSelection above, user can set the value of this setting using a numeric value. The command below will set the ColorSelection setting to blue.

`http://127.0.0.1:1080/drasticcmd?x=0&y=0&setsetting=ColorSelection&value=1`

```
{  
    "response": 0.  
}
```

The command above looks for the setting ColorSelection and assigns it a value of 1. The value of one is passed back into the code and will be sent to the colorsList.

colorsList:

- red = 0
- blue = 1
- green = 2

Since we set the value of the setting ColorSelection to be 1, it will now set the setting ColorSelection to a value of blue (1).

7 Version Comparison

The below chart shows the feature differences between the different versions of DrasticScope.

	Free	SDI	4K	HDR	NetX
7.1 Main Screen					
Scopes Layout: Max Scopes	2	4	6	6	6
On-GUI audio Meters	2	8	16	16	16
Audio Pair selector buttons		y	y	y	y
Hold Peak/Hold RMS, and Reset		y	y	y	y
MaxFALL/CLL				y	y
Freeze and freeze type			y	y	y
Line Select			y	y	y
7.1.1 Status box					
TimeCode: DL, DV, AL	y	y	y	y	y
Closed Captions			y	y	y
VPID			y	y	y
Ref input			y	y	y
Vid Standard			y	y	y
7.2 Features					
Remote Desktop Access with AJA Utap and Kumo Router			y	y	y
Zoom and Pan		y	y	y	y
Signal Compare (Freeze and Freeze Type)			y	y	y
User Markers and Lines		y	y	y	y
Full Screen Mode		y	y	y	y
Front Panel Support			y	y	y
Multiple Input Mode			y	y	y
REST API			y	y	y
AJA Shared Mode			y	y	y
Adobe ScopeDirect Transmitter – view the output of Adobe in			y	y	y

Drastic scopes					
Avid ScopeDirect					
OpenIO – view the output of Avid in Drastic scopes			y	y	y
OpenFX ScopeDirect plugin – view the output of Resolve or OpenFX editors in Drastic scopes			y	y	y
AvVr3D ScopeDirect – use Drastic scopes in Unreal Engine			y	y	y

7.3 Scope Config

Layout Options	2	4	6	6	6
----------------	---	---	---	---	---

7.3.1 Picture

Picture	y	y	y	y	y
Action Safe Graticule		y	y	y	y
Title Safe Graticule		y	y	y	y
Graphic Safe Graticule		y	y	y	y
Picture Frame Graticule		y	y	y	y
Active Region Graticule		y	y	y	y
Lock Pan/Zoom		y	y	y	y

7.3.2 Vectorscope

Graticule	y	y	y	y	y
100% Markers	y	y	y	y	y
75% Markers	y	y	y	y	y
Angle Marker	y	y	y	y	y
Intensity	y	y	y	y	y
Skin Tone Line		y	y	y	y
Color		y	y	y	y
Low Pass		y	y	y	y

7.3.3 YCbCr Waveform

Graticule	y	y	y	y	y
Show Parade	y	y	y	y	y
Intensity	y	y	y	y	y
Scope White	y	y	y	y	y
Scale Type	y	y	y	y	y
Low Pass			y	y	y
Only Luma			y	y	y
Overlay			y	y	y
High/Low			y	y	y

Max HDR				y	y
7.3.4 RGB Waveform					
Graticule	y	y	y	y	y
Show Parade	y	y	y	y	y
Intensity	y	y	y	y	y
Scope White	y	y	y	y	y
Full Scale		y	y	y	y
Low Pass			y	y	y
Overlay			y	y	y
7.3.5 Histogram					
YCbCr		y	y	y	y
RGB		y	y	y	y
HSV		y	y	y	y
Luma		y	y	y	y
H/S Scope			y	y	y
7.3.6 Chromaticity					
Chromaticity scope		y	y	y	y
Triangles 601, 709, 2020, P3 gamut		y	y	y	y
Triangles ACES0, ACES1, Arri, BMD, DaVinci, Canon, V Gamut, RED, S-Gamut, ProPhoto, Adobe				y	y
Invert			y	y	y
Black			y	y	y
7.3.7 YCbCr Vector (Lightning Display)					
YCbCr Vector scope			y	y	y
Marks			y	y	y
Color			y	y	y
Intensity			y	y	y
7.3.8 Channel Plot (Double Diamond)					
Channel Plot scope			y	y	y
Graticule			y	y	y
Intensity			y	y	y
7.3.9 Y/C Peak					
Y/C Peak scope			y	y	y
Graticule			y	y	y
Intensity			y	y	y

7.3.10 Luma Peak					
Luma Peak scope			y	y	y
Graticule			y	y	y
Intensity			y	y	y
7.3.11 6 Bar Gamut					
6 Bar Gamut scope			y	y	y
7.3.12 Stream Info					
Stream Info scope					y
7.3.13 Audio Vector					
Audio Vector			y	y	y
Graticule			y	y	y
mode selectors (Lissajousxy, Lissajous, Polar)			y	y	y
7.3.14 Audio Phase					
Audio Phase			y	y	y
Graticule			y	y	y
7.3.15 Audio Histogram					
Audio Histogram			y	y	y
Graticule			y	y	y
Amp/Scale selectors			y	y	y
7.3.16 Audio Wave					
Audio Wave			y	y	y
Graticule			y	y	y
7.3.17 Audio Spectrum					
Audio Spectrum			y	y	y
Graticule			y	y	y
Controls			y	y	y
7.3.18 Audio Meters					
Audio Meters			y	y	y
Scale pulldown			y	y	y
7.3.19 Loudness Meters					
Loudness Meters			y	y	y
Config			y	y	y

7.3.20 Surround Meters					
Surround Meters			y	y	y
Controls			y	y	y
7.3.21 A/V Sync					
A/V Sync Scope				y	y
7.3.22 Status					
Status		y	y	y	y
7.3.23 ANC Monitor					
ANC Monitor			y	y	y
7.3.24 IP Timing					
IP Timing					y
7.4 Application Config (gear button)					
7.4.1 Video Input					
Video Input	y	y	y	y	y
7.4.2 12G Type					
12G Type			y	y	y
7.4.3 Video Format					
SD/HD	y	y	y	y	y
Up to 4K			y	y	y
Up to 8K				y	y
7.4.4 Color Format					
Color Format	8 Bit	8/10 Bit	8/10/12 bit		
7.4.5 Primaries					
Primaries			y	y	y
7.4.6 Transfer					
Transfer			y	y	y
7.4.7 Picture Mode					
Picture Mode (up/down converter)			y	y	y
7.4.8 Down Convert					

Down Convert (monitor setup)			y	y	y
7.4.9 Output					
Output			y	y	y
7.4.10 Closed Caption					
Closed Caption			y	y	y
7.4.11 Audio Input					
Audio Input	y	y	y	y	y
7.4.12 Audio Scale					
dbFS RMS (but no pulldown menu)	y	y	y	y	y
dBu EBU R68 (+18)					
dBu EBU R68 (0)					
dBu EBU PPM			y	y	y
dBu BBC PPM					
LUFS -23 EBU 9					
LKFS -24 US 9					
7.4.13 Board Type					
Auto Select		y	y	y	y
NIC SMPTE 2110					y
Network Video streams					y
AJA	y	y	y	y	y
AJA Shared			y	y	y
Bluefish444	y	y	y	y	y
Blackmagic	y	y	y	y	y
UltraScope			y	y	y
DekTec	y	y	y	y	y
Matrox			y	y	y
USB/DirectShow/VFL/AVF (Mac)	y	y	y	y	y
NDI In			y	y	y
Desktop			y	y	y
Adobe ScopeDirect			y	y	y
Avid ScopeDirect			y	y	y
OpenFX ScopeDirect			y	y	y
Assimilate ScopeDirect			y	y	y
AvVr3D ScopeDirect			y	y	y
7.4.14 Board Select					
Board Select	y	y	y	y	y

7.4.15 Preferred Scan					
Preferred Scan	y	y	y	y	y
7.4.16 Active Region					
Active Region			y	y	y
7.4.17 Auto Follow Input					
Auto Follow Input	y	y	y	y	y
7.4.18 Scope VBlank					
Scope VBlank			y	y	y
7.4.19 Play Audio Computer Speakers					
Play Audio Computer Speakers	y	y	y	y	y
7.4.20 Audio Channels					
Audio Channels			y	y	y
7.4.21 Audio Pairs					
Audio Pair selectors in Config menu			y	y	y
7.4.22 Hide Unavailable Options					
Hide Unavailable Options	y	y	y	y	
7.4.23 Check for New Versions on startup					
Check for New Versions on Startup checkbox	y	y	y	y	y
7.4.24 Check for Updates					
Check for Updates button	y	y	y	y	y
7.4.25 License					
License	y	y	y	y	y
7.4.26 Done					
Done	y	y	y	y	y
7.4.27 Open IP (IP cam icon)					

Select NDI			y	y	y
Select SRT, RTP, UDP, RIST Types					y
2110 IP Config					y
7.5 Display Modes					
Luma Only, Red/Blue/Green Only, Focus Assist		y	y	y	y
Zebra Luma, Zebra Chroma, Clipping, Edge Difference, Calibrate, Flip Flop, Show Alpha, Opacity, Luma Key, Green Screen Key, Chroma Key Despill, Chroma Key Simple, Neutral			y	y	y
7.6 Manual					
Manual button (opens the manual)	y	y	y	y	y
7.7 Image/Preset (camera icon)					
Capture Display		y	y	y	y
Capture Frame (JPG)		y	y	y	y
Save Frame		y	y	y	y
Load Frame		y	y	y	y
Save Preset			y	y	y
Load Preset			y	y	y
7.8 Hex/Data View					
Hex View w Ancillary data display			y	y	y
7.9 Web GUI (Globe icon)					
Web GUI			y	y	y
7.10 Events/Error Log					
Events/Error Log w Event Sensitivity			y	y	y

7.11 Info/Splash screen					
Info/Splash screen	y	y	y	y	y
7.12 Area Select					
Area Select			y	y	y
7.13 License (key icon)					
License	y	y	y	y	y
7.14 Audio Routing					
Audio Routing			y	y	y
7.15 Video Proc Amp Setup					
Video Proc Amp Setup		y	y	y	y
7.16 Hide Sidebar					
Hide Sidebar	y	y	y	y	y
7.17 Info/Splash Screen					
Info/Splash Screen	y	y	y	y	y

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8.1 General

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Drastic Technologies Ltd
523 The Queensway, Suite 201
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Drastic Technologies Ltd
523 The Queensway, Suite 201
Toronto, ON, M8Y 1J7
Canada
(416) 255 5636
(416) 255 8780

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