Streambox Spectra

Using LUTs

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Note: This document reflects the current feature-set which may change without notice (Sep 2022). We will attempt to keep all users up to date on any changes.

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Using 3D LUTs

Spectra supports on-the-fly application of 3D LUTs. This can eliminate the need for an external LUTs device. Also, Streambox media players, decoders, and Sessions also support on-the-fly application of LUTs. This allows a unique review of the video, at every point of the workflow, from anywhere in the world.

Applying LUTs

You can apply one of three selected LUTs (red arrow, image above) which have been uploaded using the 'config LUT file' dialog (blue arrow, image above). These LUTs should be of the standard 3D (cube) format.

Color Profile

Under the Spectra Source tab (yellow wedge, image above), you need to specify the desired signal range (Full or Legal) and Color Space Matrix (Rec.601, Rec.709, or Rec.2020) – see green arrow. Under the Spectra Audio/Video tab (yellow wedge, image below), you will need to specify the Color Profile (4:2:2 or 4:4:4) for the encoder output (red arrow, image below).

	Spe	ctra Control Panel				
Info Network	Transport Audio/Video	Metadata Encryption Presets Source System				
Video		Audio				
Resolution	FULL 😒	AudioCodec AAC 📀				
Color Profile	4:2:2 📀	AudioChannels 2-ch(Stereo) 📀				
Color Space	DCI/ICT RGB	SampleRate 48k ᅌ				
Key frame	100 🗘	Apply Audio/Video Settings				
Advanced Profile	V					
Color Bit Depth	10 📀					
Framerate	Full ᅌ					
Prefered Quality						
Prefered Quality I	70					
Prefered Quality P	120					
De-interlace						
Min/Max Filter						
Soft Filter						
ODCT Filter						
Dynamic Status	-					
Dynamic Resolution	0 0					
downconvertHD						

LUT Application

Since 3D LUTs are always applied in RGB 4:4:4 Color Space, special care is required when working with a 4:2:2 signal or an RGB signal in Legal Range. That is, 4:2:2 or Legal Range signals are up-converted to 4:4:4, Full Range for 3D LUT application, and then down-converted for output.

4:2:2 \rightarrow 4:2:2 Pipeline with 3D LUT



When Spectra applies 3D LUT to 4:2:2 signal it must convert YCrCb to RGB 4:4:4 first, apply the LUT, then convert back to 4:2:2 where you can tag color space and convert to desired signal range.





For 4:4:4 Signal you only need to specify the signal range/levels before LUT. Then you can select either the 4:4:4 or 4:2:2 option for encoder input (Audio/Video Tab) and apply the appropriate Color Space and Range. If 4:4:4 is selected, the Native RGB, DCI/ICT, and XYZ options will use Full Range.

Please Note: Current implementation only allows 4:4:4 to 4:2:2 conversion on encoder input, in addition to 4:4:4 In/Out and 4:2:2 In/Out. 4:2:2 to 4:4:4 conversion is currently not supported on the Encoder side; that is, the output cannot be up-converted from 4:2:2 to 4:4:4.

4:4:4 \rightarrow 4:4:4 Pipeline with 3D LUT



Case 1: 4:2:2 to Rec.709 Legal (4:2:2)

Example Input signal is 4:2:2, Rec.709 in Legal Range from Camera SDI

We want to apply 3D LUT and stream in Rec.709, Legal, 4:2:2 (e.g. to decoder connected to 4:2:2 SDI monitor)

In this case you will need to specify two options:

1 - On Source tab, under 3D LUT Settings, select the following to perform a correct YCrCb to RGB conversion:

select Range: Legal Range select Matrix: Rec.709

 2 - On Audio /Video tab, select the following to transform LUT output Stream to Rec.709 4:2:2
Legal and encode: Color Profile: 4:2:2

Color Profile: 4:2:2 Color Space: **Rec.709 Legal**

Case 2: SDI Log, 4:2:2, Legal for ARRI camera to HDR, P3 D65 PQ, Full (4:2:2) Example Input signal is 4:2:2 ARRI LOG, using Rec.709 Matrix, and Legal Range.

We want to send signal to decoder connected to X300 in 4:2:2 HDR, P3 D65 PQ, Full

1 - On Source tab, under 3D LUT Settings, select the following to perform correct YCrCb to RGB conversion:

select Range: Legal Range select Matrix: Rec.709

2 - On Audio /Video tab, select the following to transform LUT output stream to HDR P3 D65 PQ, Full and encode:

Color Profile: **4:2:2** Color Space: **P3 D65 PQ Full**

Case 3: ACES from "Spectra Plugin for Resolve" (4:4:4) to 4:4:4, Rec.2020 PQ, Full

 1 - On Source tab, under 3D LUT Settings, select the following: select Range: Full Range select Matrix: Auto Note: Since signal from Spectra OFX arrives in RGB format, YCrCb to RGB Matrix is not used. Use appropriate 3D LUT for ACES to Rec.2020 PQ

2 - On Audio /Video tab, select following to transform LUT output stream to Rec.2020 PQ Legal and encode: Color Profile: **4:4:4**

Color Space: Rec.2020 PQ FULL

Case 4: ACES from "Spectra Plugin for Resolve" (4:4:4) to 4:2:2, P3 D65 PQ, Legal

 1 - On Source tab, under 3D LUT Settings, select following: select Range: Full Range select Matrix: Auto Note: Since signal from Spectra OFX arrives in RGB format, YCrCb to RGB Matrix is not used. Use appropriate 3D LUT for ACES to P3 D65 PQ

2 - On Audio /Video tab, select following to transform LUT output stream to P3 D65 PQ, Legal and encode:

Color Profile: 4:2:2 Color Space: P3 D65 PQ Full

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