Working with Color Space & Streambox Media Player and Sessions

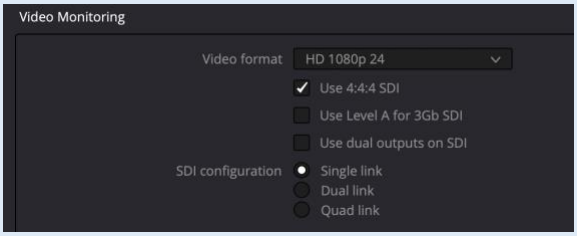
(Beta Release notes for Streambox Media Player 2.2 or above for macOS and iOS/iPadOS)

Please send questions or comments to beta@streambox.com

Streambox products are widely used for real-time colorist review. Often, colorists and editors are working collaboratively and remotely, and must ensure that all viewers are viewing the video in the same color space. To accomplish this, Streambox has updated their flagship Encoders, Cloud network, and Media Players to allow color space to be set at any *Level* in the collaboration; at the beginning within the timeline editor (Level 1), then at the Encoder (Level 2), then via the Sessions Dashboard (Streambox Cloud – Level 3), and at the end, in the Media Player itself (Level 4). Let's review.

TLDR Overview

If you are familiar with Streambox Spectra, Sessions, and have an editor like DaVinci Resolve, you can set its output, under Video Monitoring in Project Settings, to Use 4:4:4 SDI, and select an RGB color space under Color Management. Now you can set color space in the Sessions Dashboard. Otherwise, read on…



Auto Detect

When 'Auto Detect' color space is selected, the Media Player will provide additional readout in the status field of Landscape mode/orientation:

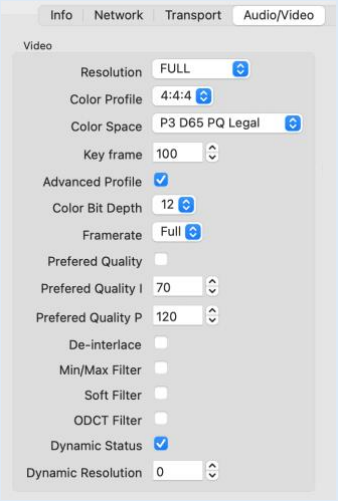
- **'Auto Stream' corresponds Level 2**
- **'Auto Sessions' corresponds to Level 3**

- When no color space is received, Media Player will display ‘Auto Rec.709 Legal’ as the default color space.

The Timeline Source (Level 1)

One common workflow is to receive a timeline stream from one of the major editing suites, like Blackmagic DaVinci Resolve, Avid Media Composer, or Adobe Premiere Pro. At this level you set the desired color profile for editing; maybe 12-bit, 4:4:4, and ACES color science. You can set the output profile to something commensurate like P3 D65 Legal.

Streambox Spectra Encoder (Level 2)

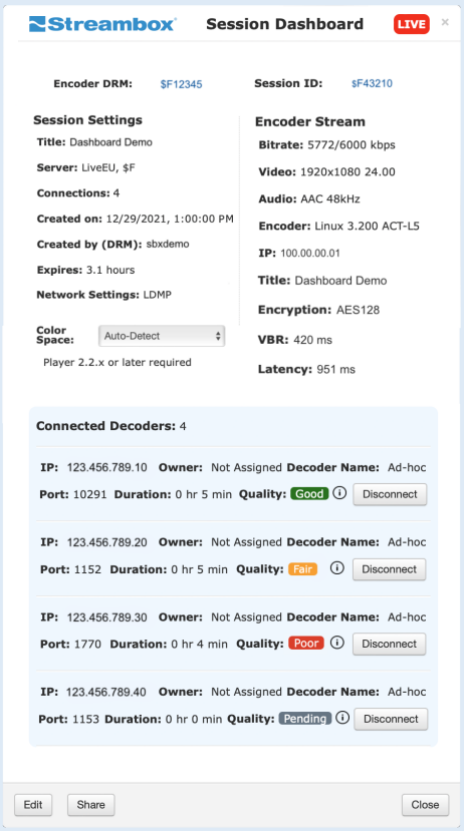


You will want to setup Streambox Spectra to receive the input from the timeline editor (see Streambox Spectra for macOS for details). It is best to choose settings that are consistent with the output of your timeline editor (see image on right). You can set the appropriate color profile under the Audio/Video tab. This will set the color profile to be streamed.

Note 1: Currently, only using a 4:4:4 video source supports this color space workflow.

Note 2: If you select the following color space values in Spectra, the stream will be set as the default Rec.709 Legal: Native RGB, DCI/ICT RGB, XYZ, Rec.601 Full (the same as DCI/ICT RGB), all of which can be redefined at downstream Levels 3 and 4.

Sessions and the Streambox Cloud Services (Level 3)



The easiest way to share real-time streams with simultaneous collaborators is with Streambox Sessions. Sessions utilizes the Streambox Cloud and allows for one-to-several real-time viewers. Streambox provides a Session dashboard from the Sessions tab. Here you can see the stats for the incoming stream and the connected collaborators receiving the stream (see image on right).

From the Color Space dropdown, you can again set the color space that will be encoded in the stream that will be received by downstream collaborators (i.e., overriding upstream color space settings). Leaving the setting at 'Auto-Detect' will pass the stream in the color space that it was received.

Note 1: Encoder transmits both source/original video format and if source signal was 4:4:4 and color space conversion was used in Spectra, Media Player will perform symmetrical YCrCb to RGB conversion as used by Encoder, including colorimetry and range.

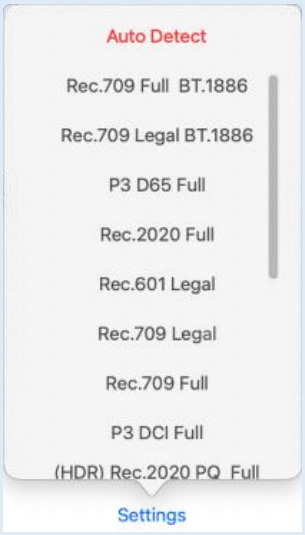
Note 2: In current Media Player release (2.2.1) , Rec.2020 colorimetry is used for YCrCb to RGB conversion where Rec.2020, P3D65, P3D63, and BT.2100 is used. For Rec.601 and DCI/ICT we use Rec.601 colorimetry. For other formats, Rec.709 colorimetry is used.

Then RGB signal is tagged with appropriate color space for Apple OS output. For Level 3, it will be color space selected for Session. If Session Color space is not defined, Player will use Color Space as defined in Level2.

Note 3: When timeline color profile is 4:2:2 the colorimetry (RGB to YCrCb) is unknown. When using Dashboard to specify color space, we apply colorimetry as per Note 2. We recommend setting the editor output color profile to 4:4:4 if you are unsure about the colorimetry used in your application.

Streambox Media Player (Level 4)

Each collaborator receiving the stream with Streambox Media Player (ver 2.2 or above, for macOS and iOS) can set the color space to their own liking. From the Settings menu, select ‘Color Space Settings’ and select from one of the available color space values (see image on right). Again, selecting ‘Auto Detect’ will render the stream with the same color space as received.



Try It Out

Setup a stream with a Session. Pull that Session with a Media Player (ver 2.2.1 or later). Try setting the color space in the dashboard to something obviously different than the original stream (to make it easy to compare) like ‘(HDR) Rec.2020 PQ Full’. Within ten seconds, you will see the change in the Media Player view. Now change the color profile in the Media Player and see what happens. Lastly, the video profile is displayed at the top in portrait view and with a tap of the screen in landscape view.