

HDR UHD Signalling

From <http://ultrahdforum.org/wp-content/uploads/2016/04/Ultra-HD-Forum-Deployment-Guidelines-V1.1-Summer-2016.pdf>

6.1.9 Signalling Transfer Function and Colour Space

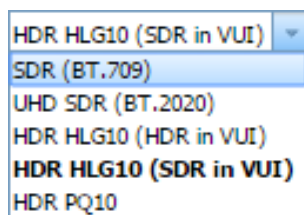
The colour space and transfer function (SDR or HDR) are typically signalled in the VUI of an H.265/HEVC or H.264/MPEG-4 AVC bitstream. As shown in the table below, there are two methods of signalling the HLG transfer function.

In one method, the SDR transfer function indicator is signalled in the VUI and the HLG transfer function indicator is transmitted using an alternative transfer characteristics SEI message embedded in the bitstream. In this way, an "HLG aware" STB or decoder/display would recognize that the bitstream refers to content coded with HLG (since it is indicated by the preferred_transfer_characteristics syntax element of the SEI). If an "HLG aware" STB is connected to a TV that does not support HLG, the STB would transmit the SDR indicator over HDMI to the TV. If it is connected to a TV that supports HLG, the STB would copy over the transfer function value in the SEI (to indicate HLG) and transmit this over HDMI to the TV.

In the other method, the HLG transfer function indicator is directly signalled in the VUI in the same way PQ or SDR would be signalled.

AVP Modes

At the time of writing (Nov 2016) the AVP has just acquired a new menu for the signalling of HDR. This menu allows the operator to set the HDR signalling type. At this point in time, there is no support for HDR signalling in SDI (so the encoder can not detect SDR/HDR, or what type of HDR is being used).



The above menu allows the HDR type to be hard coded in the TS by the AVP. The options are fairly obvious except the **HDR HLG10 (SDR in VUI)** option.

HDR HLG10 (SDR in VUI)

What HDR HLG10 (SDR in VUI) means is that in the VUI we signal that the stream is SDR, this is so that non HDR screens will use the standard transfer function for the luma scale (100 NITs). But the stream is actually a HDR stream, and newer 4K televisions will read the VUI, see it is signalled as SDR, then they will check the SEI, and see if the stream has been signalled as HDR, and so then they can decode as HDR.

This only works with HLG HDR streams, PQ10 does not work the same. HLG has built in backwards compatibility that relies on the HDR information being at the end of the transform where SDR TVs will ignore it. PQ10 (Dolby Vision) has a dual layer approach for backwards compatibility. There is an SDR stream with supplemental information that a HDR decoder combines with the SDR to create HDR outputs. This dual layer approach adds 20%-30% overhead. PQ10 also has a single layer approach for HDR, but with no backwards compatibility.

From:
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Last update: 2023/03/09 22:35

