

MP90 ENCODING GUIDE



Video

MP4 MKV TS

Audio

AAC, Dolby AC3

Image

JPG PNG GIF

Optimal Media Encoding

The purpose of this document is to provide information on encoding media for the CE labs MP90 players. The MP90 supports several formats: HEVC, MPEG-4 part 10 (h.264), Windows Media 9, and MPEG-2. Windows Media 9 can take the form of a WMV/WMA or VC-1. MPEG-2 or -4 can take the form of a program stream or transport stream. HDR10 video playback is supported as well.

Optimal 4K Playback Encoding Settings for HEVC (H.265)

Video Settings:

File Format: MP4
 Frame rate: 29.97fps
 Codec: H.265, Main(Main10 Profile)
 Max Resolution: 3840 x 2160
 Color-Space: YUV420p10le, 4:2:0 (bt709)
 Aspect Ratio (DAR): 16:9
 CU Size: 64
 GOP: No open frames
 Bit Depth: 10 bit color (preferred)
 Bit Rate: VBR = Target 30-40 Mb/s

Audio Settings:

Codec: AAC (Mpeg-4)
 Output Channels: Stereo
 Frequency: 44.1 kHz or 48 kHz
 Bit Rate: 192 kbps

**Note: Dolby ATMOS Audio pas through is supported via HDMI RAW Bitstream output.*

**Note: The player supports higher bit rates in excess of 100 Mb/s. Our optimal recommendation is 40Mb/s or less.*

VIDEO formats: HEVC/h.265 Main/Main10 Profile
 MPEG2 Main Profile
 MPEG4.2 ASP@L5
 MPEG4.10 (h.264) MP@L4.0
 WMV9 (VC-1) Advanced Profile @ L3

AUDIO formats: MPEG1 (Layers I and II)
 MPEG4 (AAC-LC 5.1
 WAV, WMA, FLAC, AC3/ E-AC3, MP3

IMAGE formats: JPG, PNG, GIF
 Max Resolution = 3840x2160 @ 5MB
 Native Aspect Ratio = 16:9 full screen

It is important to verify frame rate and use one of the industry standards. fps 24(23.976), 30(29.97), 60(59.94) Any other odd FPS can introduce issues such as Stutter. Inconsistence time-frame Judder is another issue than can occur when using 24fps content on a 60Hz or higher TV or dropped fames. The typical issues we see is when assets are used from other countries used in Europe that use a standard of 25FPS.

Supports HDR10: luminance level up to 10,000, wide-gamut Rec.2020 color space, bit depth of 10-bits.

Supports HEVC(High Efficiency Video Coding) H.265 which provides more efficient compression.

Supports average bit rates of 30-50Mb/s (a higher bit rate can provide better quality but increase size)

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Suggested programs for encoding content

The primary use of the MP90 will be playback of 4K video media. Good results have been achieved in using "ffmpeg" for encoding HEVC 4K files to use with this player. When processing already compressed files, use a CRF factor of 20 or smaller.

Notes:

The MP90 is capable of much higher bit rates. Depending upon the use case, there is a point of diminishing return where more bit rate does not equal more quality. A medium bit rate of around 50Mb/s provides excellent quality with moderate file size.

All media processing should be performed at a minimum of 10 bits. Truncating color depth to 8 bits can cause objectionable bands to become visible in areas of gradient color transitions. If 8 bit color is mandatory, use less aggressive compression.