

HEVC/H.265

POWERING THE 4K EXPERIENCE

The HEVC/H.265 encoder is optimized for real-time software encoding up to 4K60 for Main and Main 10 profiles as well as ultimate-quality offline encoding, while the decoder allows fastest ingest or playback in various profiles and levels – up to 8K60.



The MainConcept HEVC/H.265 Encoder SDK offers comprehensive encoding support for 4:2:0 Main and Main 10 profiles including support for BT.2020 enhanced color gamut as well as SMPTE 2084 based HDR-10, and HLG transfer characteristics signaling in accordance with ITU-R BT.2100-1. Depending on whether used on a 6th or 7th Generation Intel® Core™ Processor the encoder can leverage Intel Quick Sync Video technology for hardware-accelerated 8-bit / 10-bit operation and significant CPU load reduction. A similar option now available for NVIDIA® GPUs to enable hardware encoding for dedicated systems turns the MainConcept HEVC/H.265 Video Encoder into the only existing all-in-one library for broadcast production workflows. The HEVC encoder offers real-time 4K60 conversion for Main and Main 10 profiles in various profiles and levels supported in the standard. Introduced with the 8th generation of HEVC/H.265 SDK, the package supports 2-pass encoding for up to 18% improved bitrate efficiency compared to single-pass encoding.

On the decoding side, the MainConcept HEVC Decoder allows 8K60p real-time playback of progressive and interlaced streams up to 10-bit 4:4:4 on dedicated systems. To obtain high-speed performance on low-end systems, the MainConcept HEVC/H.265 Decoder SDK offers a DXVA 2.0 (DirectX Video Acceleration) option to utilize GPU power for accelerated HEVC playback on Windows with supported graphics boards. For HDR (High Dynamic Range) support, the HEVC Decoder fills dedicated HDR-10, HLG and PQ-10 data structure provided by UCC.

NEW FEATURES

- Constant Rate Factor (CRF) Encoding has been added to the HEVC/H.265 Video Encoder for optimized bitrate ladder decisions and bitrate-efficient encoding with full HRD-compliance.
- User data structures in the encoder have been revised and extended to allow for any type of custom user data.
- Ingest and decoding of Canon XF-HEVC in MXF streams (optional).
- HEVC/H.265 Decoder now with native support for interlaced streams.
- HEVC Decoder with noticeably improved output latency.

For solutions that cater to content preparation and transcoding into adaptive formats for digital delivery, such as MPEG-DASH or Apple HLS, MainConcept offers SABET™; our patent-pending Smart Adaptive Bitrate Encoding Technology that enables efficient accelerated encoding across profiles. The technology allows encoding of up to 12 output streams from a single source while maintaining equal high quality across all levels within an adaptive stream set by leveraging shared data. SABET provides software programmers the ability to enable their solutions to encode adaptive formats in less time, or with less hardware.

HEVC/H.265, the successor to AVC/H.264, more than triples the existing AVC intra-frame prediction modes to achieve significant bitrate savings, it is targeted to next-generation HDTV displays and content capture systems that feature progressive scanned frames and display resolutions from QVGA (320x240) up to 1080p and Ultra HDTV 4320p (7680x4320.) HEVC's flexible Coding Units, which can be up to 64x64 pixels, replace fixed-sized H.264 macroblocks, sub-partitioning the picture into rectangular regions. In addition, the intra-picture or inter-picture prediction types provide higher encoding flexibility. The result is a codec that can offer up to 50% reduced bitrate at the same quality when compared to AVC/H.264.

FEATURES

Smart Adaptive Bitrate Encoding Technology (SABET) *

Efficient encoding of adaptive formats to maximize transcoding resources by sharing data across profiles, which reduces total encoding time by over 30 percent.

2-Pass Encoding *

Up to 18% improved image quality compared to single-pass encoding with strict HRD- and target bitrate compliance

Constant Encoding Speed

Automatic selection of performance level based to maintain constant encoding speed for live applications.

Encoding Profiles

4:2:0 8-bit (Main) profile, and 10-bit (Main 10) profile support for 4K, 1080p and 720p. Hardware accelerated encoding of 4:2:0 8-bit (Main) profile using the 6th Gen. Intel® Core™ Processor and NVIDIA® GPU supporting NVENC, and 4:2:0 8-bit & 10-bit (Main, Main 10) profiles using the 7th Gen. Intel® Core™ Processor and NVIDIA® GPU supporting NVENC.

Decoding Profiles

4:2:0 8-bit (Main), 4:2:0 10-bit (Main 10), 4:2:0 12-bit (Main 12) and 4:2:2 8-bit (Main 4:2:2), 4:2:2 10-bit (Main 4:2:2 10) and 4:4:4 10-bit (Main 4:4:4 10), 4:4:4 12-bit (Main 4:4:4 12). Native support for progressive and interlaced streams, incl. deinterlacing.

DXVA Decoding

DXVA 2.0 hardware accelerated HEVC/H.265 video decoding for improved performance on lower powered systems.

HDR

Encoding to SMPTE 2084 based HDR-10 including SMPTE 2086 mastering display metadata and MaxFALL, MaxCLL. Support for HLG transfer characteristics signaling in accordance with ITU-R BT.2100-0. HEVC Decoder fills dedicated HDR-10, HLG and PQ-10 data structure provided by UCC.

Film Grain

Optimal retention of Film-grain to preserve cinematic look-and-feel.

Compression

I-, P-, B-Frames, Pyramid B-Frames, and fixed or adaptive GOP structure with scene change detection, adaptive B-Frame count, and slices and tiles decoding support.

Compliance

Encoder HM 16.0 compliant, with decoding support for all HM 11, 14 and HM 16.2 anchor-streams.

Rate Control

ConstantQ, CRF (Constant Rate Factor), RDOQ, CBR 1-Pass, and VBR 1- and 2-Pass.

HRD Conformance

Rate Control Extension for streaming applications.

Formats

Multiplexing and demultiplexing support for MP4 and MPEG-TS containers. Demultiplexing only support for Canon XF-HEVC in MXF*.

Quality Control

Full Pixel Motion Estimation, Sub-Pixel Motion Estimation, Deblocking, Sample Adaptive Offset (SAO), Transform Split, Transform Skip, Inter Partitioning including AMP, Intra Partitioning, Data Sign Hide, Strong Intra Smoothing, and Performance Tuning and Coding Tree Unit (CTU) Relevance Detection.

Coding Unit Support

Up to 64 x 64 to support UHD (4K) resolutions.

Fast Preview Modes

Enhanced decoding speed for lower resolution preview, e.g. in video editing, surveillance and monitoring.

Processor Architectures

Optimized for Multi-Core and Assembler.

Supported Platforms

Windows, macOS and Linux (64-bit); HEVC Decoder is also available for ARMv7 & ARMv8 platforms (iOS and Android)

* SABET, 2-pass encoding and Canon XF-HEVC decoding are optional features which can be purchased as an add-on to your existing HEVC/H.265 Encoder or Decoder license.

STREAM TYPES & FORMATS:

Elementary Streams:

Ultra HD, UHD; Generic HEVC/H.265 TS up to 4:2:0 10-bit

Transport Streams:

Ultra HD, UHD; Generic HEVC/H.265 TS up to 4:2:0 10-bit

MP4:

DASH-265, Ultra HD, UHD; Generic HEVC/H.265 MP4 up to 4:2:0 10-bit

MXF:

Canon XF-HEVC (decoding only)

MAINCONCEPT HEVC/H.265 SDK PACKAGES

HEVC/H.265 ENCODER SDK

SDK components required for HEVC encoding with supported multiplexers and audio encoders.

SABET FOR HEVC ENCODER

Optionally enables our Smart Adaptive Bitrate Encoding Technology.

2-PASS ENCODING FOR HEVC ENCODER

Optionally enables 2-Pass Encoding.

HEVC/H.265 DECODER SDK

SDK components required for HEVC decoding with supported demultiplexers and audio decoders.

CANON XF-HEVC INGEST FOR HEVC DECODER

Optionally enables Canon XF-HEVC in MXF ingest.

COMPONENTS

HEVC/H.265 ENCODER SDK

HEVC/H.265 Video Encoder
HEVC/H.265 Config Tool
AAC Encoder
Fraunhofer AAC Encoder
MP4 Multiplexer
MPEG Multiplexer

SABET FOR HEVC ENCODER

HEVC/H.265 Video Encoder
HEVC/H.265 Config Tool
AAC Encoder
Fraunhofer AAC Encoder
MP4 Multiplexer
MPEG Multiplexer

2-PASS ENCODING FOR HEVC ENCODER

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AAC Encoder
Fraunhofer AAC Encoder
MP4 Multiplexer
MPEG Multiplexer

HEVC/H.265 DECODER SDK

HEVC/H.265 Video Decoder
AAC Decoder
MP4 Demultiplexer
MPEG Demultiplexer

CANON XF-HEVC INGEST FOR HEVC/H.265 DECODER SDK

HEVC/H.265 Video Decoder
AAC Decoder
MP4 Demultiplexer
MPEG Demultiplexer
MXF Demultiplexer

TECH SPECS

- Microsoft® Windows® 7, Windows 8, Windows 10 (64-bit)
- Apple macOS 10.7 and newer, (64-bit)
- Linux - Ubuntu 14.04 LTS or CentOS 7.2 and newer (64-bit)

For Windows, macOS and Linux, the codec package consists of a Low Level API (in the C programming language). Under Windows, it additionally includes DirectShow® filters for decoding and encoding.

MORE INFORMATION:
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REQUEST YOUR DEMO SDK:
WWW.MAINCONCEPT.COM/LICENSING-FORM.HTML