

# 9992-ENC-MPEG • HEVC Upgradeable Multi-Channel MPEG2 / AVC Broadcast Encoder

The Cobalt® 9992-ENC-MPEG Multi-Channel HEVC / MPEG-2 / MPEG-4 Encoder is a multi-channel broadcast-grade encoder designed to meet the most stringent requirements for today's broadcasters. Our HEVC video encoding technology provides a dramatic compression efficiency improvement over previous video compression standards, while also supporting existing MPEG-2 and MPEG-4 AVC. The 9992-ENC-MPEG is as an industry standard openGear® card module and provides an ideal platform for transitioning to state-of-the-art encoding capabilities.

## FEATURES

**Future-Proof** – The 9992-ENC-MPEG supports MPEG-2, MPEG-4 AVC (H.264) and HEVC (H.265) with an optional license, so it can be deployed today and upgraded as your needs change.

**Industry Standard Form-Factor** – The 9992-ENC-MPEG is offered in the industry-standard openGear format, and is compatible with existing deployed openGear frames.

**High Density** – The 9992-ENC-MPEG can be licensed to support up to four independent 1080p60 input signals, or a single UHD 4Kp60 input signal. One openGear frame can support up to 10 cards, for a total of 40 HD or 10 4K channels.

**Full Audio Support** – The 9992-ENC-MPEG supports MPEG-1 Layer II, AAC-LC, HE-AAC, LPCM (SMPTE-302M) and Dolby AC-3/EAC-3 (optional license). With an optional audio board, the encoder can support up to 16 audio channels with each video service.

**Ultra Low Latency** – The 9992-ENC-MPEG can be licensed to support a low-latency mode featuring sub-frame latencies suitable for demanding contribution applications.

### Base Unit Features –

Support for one encode channel up to 1080p60

Support for MPEG-2 and MPEG-4 AVC (H.264)

Support for 4:2:0 8-bit/10-bit encoding

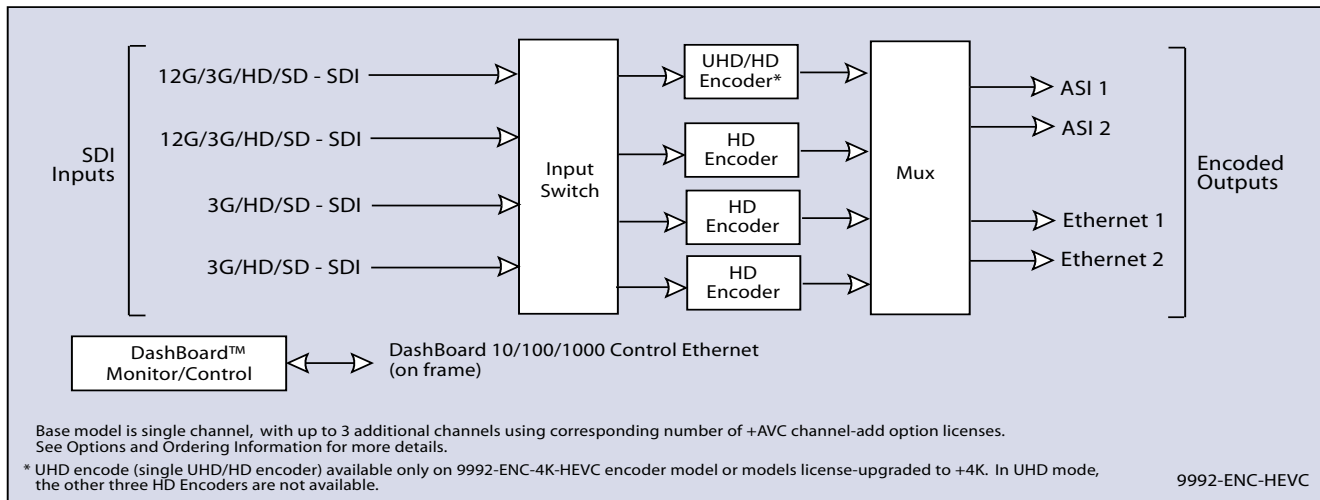
Full ancillary data support

Support for 2 stereo pairs (4 audio channels) in any combination of MPEG-1 Layer II, AAC-LC, and HE-AAC (v1/v2) modes

All network protocols (RIST and SMPTE-2022 FEC available with corresponding Options)

Remote control/monitoring via Dashboard™ software

Five-year warranty



## SOFTWARE LICENSABLE OPTIONS

**+AVC** Additional 1080p60 encoder channel with MPEG-2 and MPEG-4 AVC (up to three additional channels, for a total of four channels per unit). Each license includes two +MP1L2-AAC licenses.

**+HEVC** Enables HEVC encoding (per channel; up to four +HEVC licenses may be applied to a single unit; when running in HEVC mode all encoders must be in HEVC mode).

**+4K** Enables 4K encoding. (Requires all four encoding engines are licensed.)

**+MP1L2-AAC** MPEG-1 Layer II, AAC-LC, and HE-AAC audio encoding per pair. Three AAC licenses can be combined to allow one 5.1 surround encode.

**+ENC2-2.0** Dolby Digital/Dolby Digital Plus stereo audio encoding license.

**+ENC2-5.1** Dolby Digital/Dolby Digital Plus 5.1 Surround Sound audio encoding license.

**+RIST/ARQ-ENC** RIST RTP/ARQ support (per unit).

**+SMPTE2022** Add SMPTE-2022 support (per unit). Provides one FEC insertion per device Ethernet port (one +SMPTE2022 license maximum per device).

**+422** Adds 4:2:2 encoding support (per unit).

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## SPECIFICATIONS

### Inputs

- (2) SDI inputs each supporting 12G-SDI, 3G-SDI, HD-SDI and SD-SDI
- (2) SDI inputs each supporting 3G-SDI, HD-SDI and SD-SDI
- Support for all standard frame rates (interlaced and progressive): 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- Optional support for SMPTE-2110 baseband video over IP inputs\*
  - \* Future release availability

**Note:** Although two 12G/3G/HD/SD-SDI inputs are present, only one input can be used at a time to route to the maximum-available single UHD encoder engine.

**Note:** UHD encode (single UHD/HD encoder) available only on 9992-ENC-4K-HEVC encoder model or models license-upgraded to +4K. In UHD mode, the other three HD encoder channels are not available.

### Outputs

- (2) DVB-ASI outputs
- (2) Gigabit Ethernet ports for IP output, supporting the following protocols:
  - UDP unicast/multicast
  - RTP unicast/multicast with optional SMPTE-2022 FEC
  - HTTP Live Streaming (local or remote server)
  - RTMP (limited to H.264 only)
  - Cobalt's RTP/ARQ for contribution over the Internet
- Integrated multiplexer creates MPTS over IP or over DVB-ASI
- Support for DVB table generation
- Support for PSIP table generation\*
- Optional SMPTE-2110 baseband video over IP turnaround\*
  - \* Future release availability

### Video Pre-Processing

- Support for arbitrary down-scaling input video, extending down to 320x240
- Support for up-scaling input video\*
- Interlaced to progressive conversion
- Progressive to interlaced conversion\*
- Frame rate conversion
- Basic noise reduction filter and spatial filter
- Enhanced pre-processing filters\*
- High Dynamic Range (HDR) support\*
- Built-in frame synchronizer\*
- \* Future release availability

### Video Encoding

- Encoding Standards:
  - MPEG-2
  - MPEG-4 AVC (H.264)
  - HEVC (H.265)
- Support for up to four independent 1080p60 encode sessions<sup>(1)</sup>
- Support for UHD encoding in AVC and HEVC modes (Maximum resolution 4096x2160p60)
- Maximum bit rates:
  - UHD (4K) encoding: 150 Mb/s
  - HD encoding: 40 Mb/s<sup>(2)</sup>
- Support for 4:2:0 and 4:2:2 color spaces in all modes
- Support for 8-bit / 10-bit encoding in all modes
- Full control of GOP size and structure
- Advanced compression controls available
- Low latency options:
  - HEVC Ultra Low Latency; encoder latency is less than one frame<sup>(3)</sup>
  - MPEG-4 AVC Low Latency encoding; encoder latency is approximately 100 milliseconds
- (1) All encode sessions must use the same standard; mixed-standard encoding is not supported.
- (2) The first HD channel can be as high as 150 Mb/s.
- (3) One 4K channel or two HD channels supported in this mode.

### Audio Encoding

- Encoding Standards:
  - MPEG-1 Layer II
  - AAC-LC
  - HE-AAC (v1/v2)
  - Dolby AC-3
  - Dolby EAC-3
  - LPCM (SMPTE-302M)

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(5.1-Surround encoding available for AAC-LC, HE-AAC, Dolby AC-3 and Dolby EAC-3; subject to licensing)

Maximum number of channels supported (subject to licensing):

- MPEG-1 Layer II: 16 stereo pairs (32 audio channels)
- Dolby AC-3: 16 stereo pairs (32 audio channels)
- Dolby EAC-3: 8 stereo pairs (16 audio channels)
- AAC-LC: 8 stereo pairs (16 audio channels)
- HE-AAC (v1/v2) 8 stereo pairs (16 audio channels)

Optional support for 5.1 Surround Sound encoding, in AAC and Dolby modes. Three stereo licenses are required to enable one 5.1 surround encode.

Optional audio module: increases the capacity to 32 stereo pairs (64 audio channels), allowing full 16-channel support for the four HD inputs, in all compression modes\*

\* Future release availability

## Ancillary Data Support

Closed-Captioning: SMPTE-334M (EIA-608 and EIA-708 supported), Line 21 (SD sources)

OP-47/SMPTE RDD-08 teletext subtitles\*

AFD: SMPTE-2016, Line 20/22 WSS (SD sources)

SCTE-104 to SCTE-35 conversion

SMPTE-2038 generic ancillary data transport (timecode, KLV, etc.)

\* Future release availability

## ORDERING INFORMATION

**9992-ENC** Single-channel MPEG-2 / MPEG-4 AVC Broadcast Encoder (up to 1080p 60) (Expandable to up to four channels using +AVC licenses. Per-channel HEVC upgradeable using +HEVC licenses.)

**9992-ENC-4K-HEVC** Single-channel 4K HEVC Encoder with 12G-SDI and Quad 3G-SDI inputs. (Can also be operated as a quad-channel MPEG-2 / MPEG-4 AVC / HEVC Broadcast Encoder up to 1080p 60. (Note: All encode sessions must use the same standard.)

### Option Licenses:

**+AVC** Additional 1080p60 encoder channel

**+HEVC** HEVC encoding license (per channel)

**+4K** 4K encoder license

**+MP1L2-AAC** MPEG-1 Layer II, AAC-LC, and HE-AAC audio encoding per pair

**+ENCD-2.0** Dolby Digital/Dolby Digital Plus stereo audio encoding license

**+ENCD-5.1** Dolby Digital/Dolby Digital Plus 5.1 Surround Sound audio encoding license

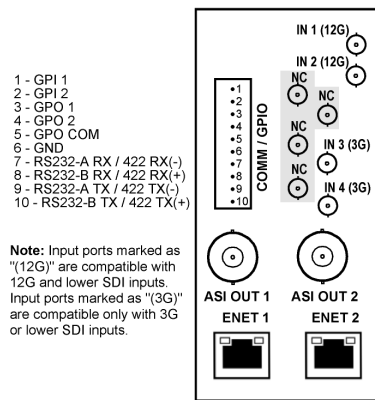
**+RIST/ARQ-ENC** RIST RTP/ARQ support (per unit)

**+SMPTE2022** Add SMPTE-2022 support (per unit)

**+422** 4:2:2 encoding support license (per unit)

### Rear I/O Modules:

**RM20-9992-ENC-B-HDBNC** 20-Slot Frame Rear I/O Module (Standard-Width) (2) 12G/6G/3G/HD-SD-SDI Coaxial Inputs, (2) 3G/HD/SD-SDI Coaxial Inputs, (2) ASI Coaxial Outputs, (2) GigE Ethernet Media Ports, COMM/GPIO Port (All SDI coaxial connectors HD-BNC.)



**Note:** Input ports marked as "(12G)" are compatible with 12G and lower SDI inputs. Input ports marked as "(3G)" are compatible only with 3G or lower SDI inputs.

RM20-9992-ENC-B-HDBNC