9992-ENC • HEVC Upgradeable AVC / MPEG2 Software Defined Broadcast Encoder

The Cobalt® **9992-ENC HEVC Upgradeable AVC / MPEG2 Software Defined Broadcast Encoder** is an upgradeable broadcast-grade encoder designed to meet the most stringent requirements for today's broadcasters. Software-defined upgradeable to add multiple channels (up to four), the 9992-ENC is also upgradeable to add HEVC video encoding technology that provides a dramatic compression efficiency improvement over previous video compression standards, while also supporting existing MPEG-2 and MPEG-4 AVC. The 9992-ENC is an industry standard openGear® card and provide an ideal platform for transitioning to state-of-the-art encoding capabilities.

FEATURES

Future-Proof – The 9992-ENC software-defined architecture 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 is offered in the industry-standard openGear format, and is compatible with existing deployed openGear frames.

High Density – The 9992-ENC 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 supports MPEG-1 Layer II, AAC-LC, HE-AAC, LPCM (SMPTE-302M) and Dolby AC-3/EAC-3 (optional license).

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

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

Full ancillary data support

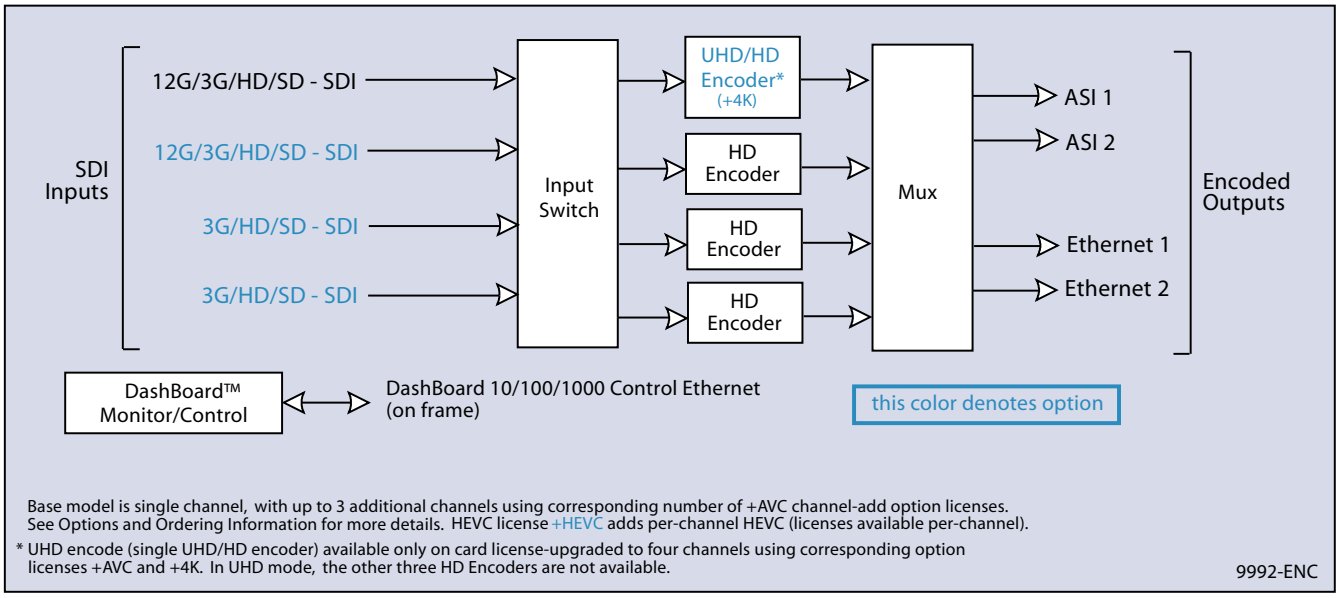
Support for 2 stereo pairs (4 audio channels) in any combination of MPEG-1 Layer II, AAC-LC, and HE-AAC (v1/v2) modes

Supports all popular formats: 480i, 576i, 720p, 1080i, 1080pSF, 1080p

Remote control/monitoring via Dashboard™ software

Hot-swappable

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.

+SRT-ENC SRT Support (per unit)

+ULL Adds support for HEVC Ultra-Low Latency support (per unit). Encoder latency is 10ms for the common frame rates. (In this mode, the maximum encoder capacity is one 4K or two HD streams.)

+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 (transport stream based option; only one license needed per unit).

+RIST/ENCRP-ENC RIST Encryption/Authentication Support (per unit). (Requires the +RIST/ARQ-ENC license to be also present on the encoder.)

+SMPTE2022 Add SMPTE-2022 support (per unit). Provides one FEC insertion per device Ethernet port (transport stream based option; only one license needed per unit).

+422 Adds 4:2:2 encoding support (transport stream based option; only one license needed per unit).

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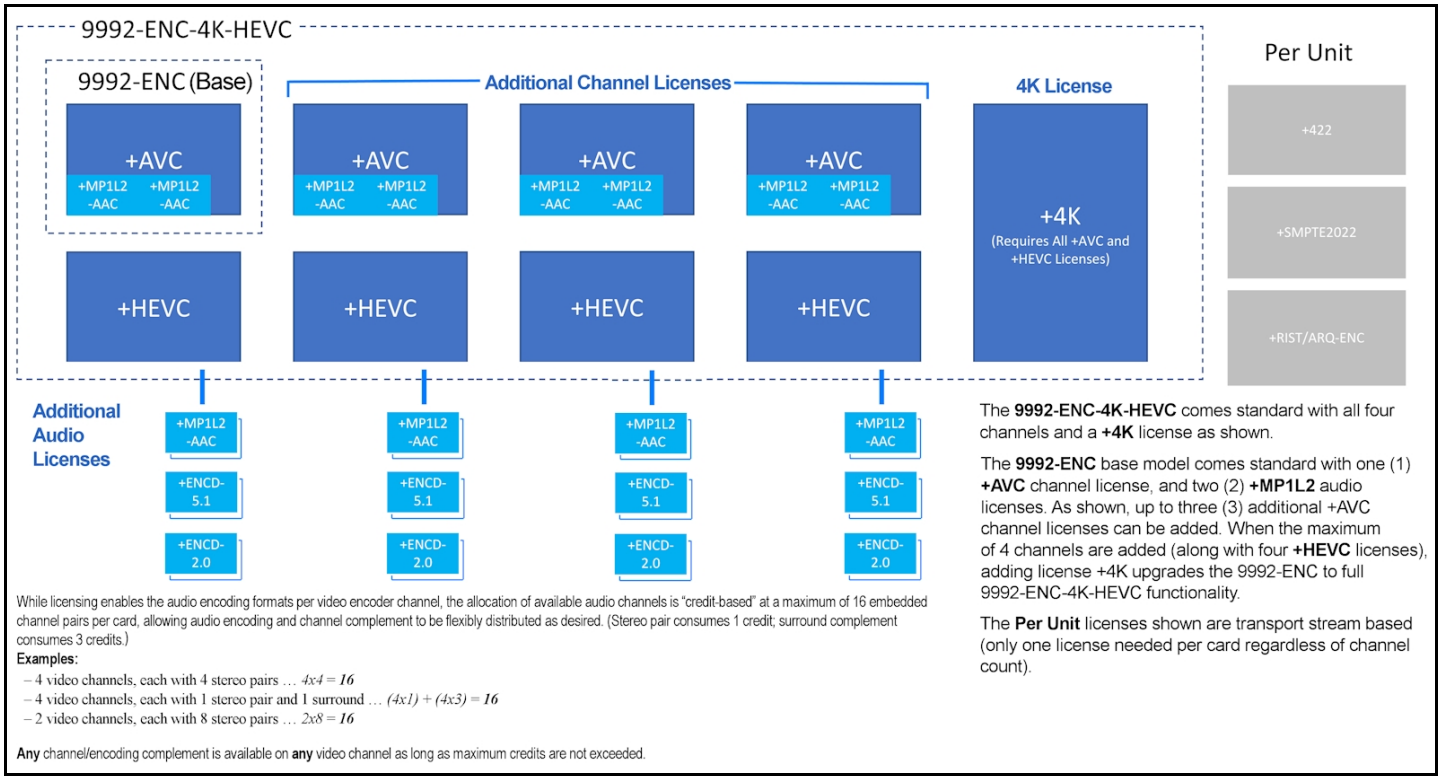

While licensing enables the audio encoding formats per video encoder channel, the allocation of available audio channels is "credit-based" at a maximum of 16 embedded channel pairs per card, allowing audio encoding and channel complement to be flexibly distributed as desired. (Stereo pair consumes 1 credit; surround complement consumes 3 credits.)

Examples:

- 4 video channels, each with 4 stereo pairs … *4x4 = 16*
- 4 video channels, each with 1 stereo pair and 1 surround … *(4x1) + (4x3) = 16*
- 2 video channels, each with 8 stereo pairs … *2x8 = 16*

Any channel/encoding complement is available on **any** video channel as long as maximum credits are not exceeded.

The **9992-ENC-4K-HEVC** comes standard with all four channels and a **+4K** license as shown.

The **9992-ENC** base model comes standard with one (1) **+AVC** channel license, and two (2) **+MP1L2** audio licenses. As shown, up to three (3) additional +AVC channel licenses can be added. When the maximum of 4 channels are added (along with four **+HEVC** licenses), adding license +4K upgrades the 9992-ENC to full 9992-ENC-4K-HEVC functionality.

The **Per Unit** licenses shown are transport stream based (only one license needed per card regardless of channel count).

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
- RTMP (limited to H.264 only)

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.

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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
* 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(1)
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(2)

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
(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.

Audio Encoding

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

(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.

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ORDERING INFORMATION

9992-ENC HEVC Upgradeable AVC / MPEG2 Software Defined Broadcast Encoder. Single-channel; expandable to up to four channels using +AVC licenses. Per-channel HEVC upgradeable using +HEVC licenses.)

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 license (each license adds one encoded pair)

+ENCD-2.0 Dolby Digital/Dolby Digital Plus stereo audio encoding license (each license adds one encoded pair)

+ENCD-5.1 Dolby Digital/Dolby Digital Plus 5.1 Surround Sound audio encoding license (each license adds one encoded pair)

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

+RIST/ENCRP-ENC RIST Encryption/Authentication support license (per unit). (Requires the +RIST/ARQ-ENC license to also be present on the encoder.)

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

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

+SRT-ENC SRT Support (per unit)

+ULL HEVC Ultra-Low Latency support license (per unit)

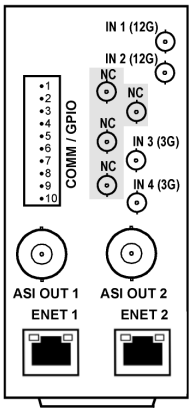
Note: The 9992-ENC is also available factory-configured as fully-featured 4K ready model **9992-ENC-4K-HEVC**. Please see 9992-ENC-4K-HEVC web page for more details.

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:** Mates to card in **odd** slot.)

1 - GPI 1
2 - GPI 2
3 - GPO 1
4 - GPO 2
5 - GPO COM
6 - GND
7 - RS232-A RX / 422 RX(-)
8 - RS232-B RX / 422 RX(+)
9 - RS232-A TX / 422 TX(-)
10 - RS232-B TX / 422 TX(+)

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