EN8040 Voyager

Voyager MPEG-4 AVC Multi-format DSNG

The new EN8040 is TANDBERG Television's second-generation AVC multi-format DSNG. It is a "flagship" product that reflects TANDBERG Television's technology leadership and unique ability to create products of the very highest class. Unmatched in so many areas, the EN8040 excels whether you are considering its features, performance or the multiple upgrade paths that we offer for upgrading existing equipment to this exemplary standard.

The EN8040 is multi-standard and multi-format. Its hardware has the ability to support a variety of advanced encoding schemes as well as DVB-S2 modulation. This combination allows considerable bandwidth savings that can equate to transmitting high-quality HD within transponder bandwidths typically used for SD today. The benefits extend to far more than simply minimizing the transponder costs for HD, and includes the prevention of expensive upgrades to the truck's transmission infrastructure, the ability to use compact, power-limited fly-away antennas robustly for SD or HD, and even the ability to also use the EN8040 for terrestrial microwave (DENG) applications, where SD standards of radio-link range and robustness can be achieved with HD.

Since the EN8040 has been designed to bring the benefits of H.264-AVC encoding to professional contribution and distribution applications, particular attention has been paid to end-to-end latency. We can offer very low latency modes for the encoder which are complimented by an optional low latency mode for the RX1290 decoder.

PRODUCT OVERVIEW

Extraordinary Picture Quality and Significant Band-width Liberation for Higher Performance Encoding

The EN8040 excels in encoding performance. Supporting a range of horizontal resolutions at 1080i and 720p, extraordinary picture quality is supported at under 6 Mbps with improved visible artifact removal.

Designed Specifically for Contribution

The EN8040 offers unbeatable encoder performance coupled with efficient DVB-S2 modulation. It is very flexible, offering separate latency—optimized MPEG-2 SD, MPEG-4 HD/SD and MPEG-4 SD encoders which can be used individually or in combination. RAS, BISS and a range of advanced audio functions combine to provide a complete integrated MPEG-4 AVC DSNG of the highest order. In addition, customer with existing E57xx DSNG can upgrade their units to EN8040 specification easily and cost-effectively.

DVB-S2 Capability Provides Major Bandwidth Savings

DVB-S2 represents a step-change in bandwidth efficiency offering a 35% increase over DVB-S. TANDBERG Television has offered DVB-S2 hardware support as standard since 2006. Customers can therefore activate DVB-S2 features via license key at any time.

Unrivaled Manufacturers Support

Should it be necessary to return a unit for upgrade or service, TANDBERG Television has a unique advance loan scheme with ready-to-ship spares always in stock to keep customers on-air. The EN8040 platform comes with a standard two-year warranty that together with the advance loan scheme offers unrivaled support.

BASE UNIT FEATURES

EN8040 Encoder (EN8040/BAS/IF) and (EN8040/BAS/LBAND)

The EN8040 can operate as an SD only encoder using SD inputs or be license enabled for H.264 AVC HD.

- MPEG-4 AVC HD real-time video encoding
  - High profile compliant at Level 4 (HP@L4)
  - Constant bit-rate encoding from 1 Mbps to 25 Mbps
  - Low latency modes
- MPEG-4 AVC SD real-time video encoding
  - Main profile at Level 3 (MP@L3) support
  - SDI and analog video inputs
  - Constant bit-rate encoding from 0.250 Mbps to 10 Mbps
- Extensive video pre-processing for optimum picture quality whatever the source
- Stereo Audio encoding
  - MPEG-1 Layer II and Dolby® Digital (AC-3)
  - Options for advanced audio and multi-channel encoding
  - Digital, analog and Serial Digital embedded inputs
- Control and monitoring via web browser, front panel
- MPEG-2 transport stream (ASI) output
- Simple license key upgrade for HOM and DVB-S2

EN8040 Encoder (EN8040/BAS/48V)

- As EN8040/BAS except with –48 VDC power supply

Note: An 18-36 volt DC power option is available for special order.

HARDWARE OPTIONS

Dual Port IP Transport Stream Output (EN8000/HWO/IPTSDUAL)

- UDP/IP or RTP/UDP/IP encapsulation of MPEG-2 transport stream output
- GbE Ethernet physical interface
- CBR or VBR multicast outputs
- Multicasts MPTS transport stream from encoder, or can split services into individual SPTS for multicasting
- User configurable network and multicast parameters

Audio Option Card (EN8000/HWO/AUDLIN2)

- Two stereo pairs supported per card
- Analog input levels: 12, 15, 18, 21, 22 and 24dB
- MPEG-1 Layer II audio encoding
- Dolby Digital® (AC-3) 2.0 encoding
- Dolby Digital® (AC-3) 1 – 5.1 channel and Dolby® E pass-through
- Linear PCM and DTS pass-through
- AES3 compliant input
- One audio option card may be fitted supporting a total of four stereo pairs in the unit, encoded as either MPEG-1 Layer II or Dolby® Digital 2.0

Advanced Audio Encoder Module (EN8000/HDC/AUD)

- Advanced audio processing module enables additional stereo audio encoding with appropriate licensing
- Pass-through audio support, including glitch suppression on Dolby® Digital (AC-3) pass-through services
- Hardware future-proofing for future audio encoding and transcoding requirements

BISS Option Card (EN8000/HDC/BISS)

- BISS (Basic Interoperable Scrambling System) for secure contribution links. Allows material to be protected from unwanted viewing using the BISS open standard. Supports BISS Modes 0, 1 and Mode E for encrypted session words (as defined in EBU Tech 3292, May 2002). This option is a daughter card and so does not occupy an option slot. The PC application for generating BISS-E encrypted session words can be downloaded from the encoder via a web browser.

REMUX

- The REMUX card will re-multiplex three external transport streams with the locally generated stream. The card supports automatic PID re-mapping and resolves conflicts automatically. The REMUX card also supports the insertion of externally generated dynamic PSIP into the transport stream.

COFDM Modulator (EN8000/HWO/COFDM)

- Provides a DVB-T output at 70 MHz to interface with most terrestrial microwave link systems

SOFTWARE OPTIONS

Clarus™ Noise Reduction (EN8000/SWO/NR)

- Improves picture quality and reduces bit-rate requirement
- Fully adaptive spatial, temporal noise reduction
- Input processing and filtering

Clarus™ Input De-Blocking Filter (EN8000/SWO/DBF)

- Reduces macro block noise introduced by previous encoder
- Improves picture quality and reduces bit-rate requirement (check availability)

Advanced Audio Coding on ICE3 (EN8000/SWO/ICE3AAC)

- Enables a stereo pair of MPEG-2 AAC-LC (Low Complexity) or MPEG-4 (High Efficiency) HE-AACv1 or HE-AAC v2 audio encoding. One or two licenses are supported.

Advanced Audio Coding on the Audio Option Module (EN8000/SWO/AOMAAC)

- Enables a stereo pair of MPEG-2 AAC-LC (Low Complexity) or MPEG-4 (High Efficiency) HE-AAC v1 or HE-AAC v2 audio encoding. One to four licenses are supported. Three licenses enables 5.1 surround sound encoding.
- Requires EN8000/HDC/AUD

MPEG-4 HE-AAC Advanced Audio Coding (EN8000/SWO/MPEG4/HEAAC)

- Enables four stereo pairs or 5.1 surround sound and one stereo pair of MPEG-4 (High Efficiency) HE-AACv1 and HE-AAC v2 audio encoding
- Requires EN8000/HDC/AUD

Dolby® Digital (AC-3) Audio Coding (EN8000/SWO/AC3)

- Enables two stereo pairs of Dolby® Digital (AC-3) audio encoding

SMPTE 2022 ProMPEG FEC (EN8000/SWO/PROFEC)

- Enables SMPTE 2022 ProMPEG FEC protection in the Dual IP output card for robust IP streaming

Simultaneous Picture-in-Picture Video Service Encoding (EN8000/SWO/HDPIP)

- Simultaneous encoding of low resolution version of main video service
- MPEG-4 AVC real-time encoding
- User selectable resolution and bit-rate
- Single box solution for PIP functionality in IPTV applications
- Supports PIP service from 96 x 96 up to full resolution SD

Simultaneous Picture-in-Picture Video Service Encoding Plus (EN8000/SWO/PIP-PLUS)

- Simultaneous encoding of low resolution version of main video service
- Enables SD simulcast of the HD input
- MPEG-4 AVC real-time encoding
- User selectable resolution and bit-rate
- Single box solution for PIP functionality in IPTV applications
- Supports PIP service from 96 x 96 up to full resolution SD

Simultaneous SD MPEG-2 Encoding (EN8000/SWO/MPEG2)

- Enables an additional SD MPEG-2 encoder to allow simultaneous encoding of the SD input

RAS (EN8000/SWO/RAS)

- Allows material to be protected from illegal viewing using TANDBERG Television's proprietary scrambling system
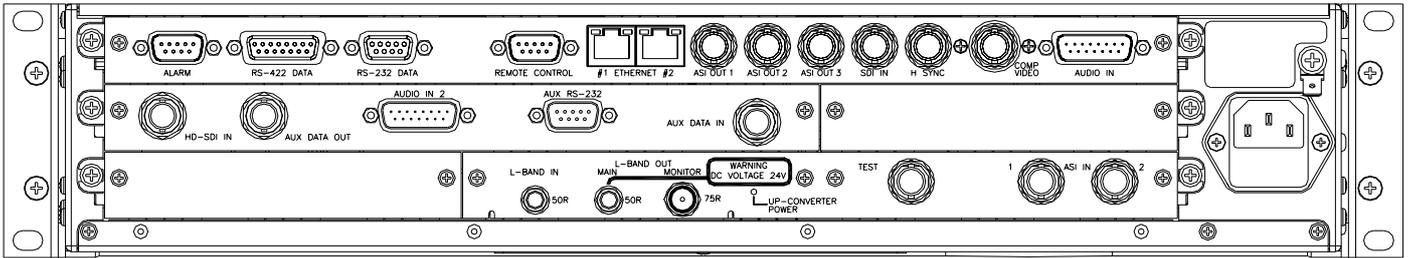
8PSK (EN8000/SWO/SM38PSK) or 16 QAM (EN8000/SWO/SM316QAM)

- Higher order modulation upgrade

DVB-S2 QPSK and 8PSK (EN8000/SWO/SM3S28PSK) / DVB-S2 16APSK (EN8000/SWO/SM3S216APSK)

- DVB-S2 modulation upgrade

SAMPLE CONFIGURATION

SPECIFICATIONS

Inputs

HD Video
HD-SDI serial digital video with EDH error detection and health monitoring

SD Video
SDI serial digital video with EDH error detection and health monitoring

Composite video (PAL/NTSC)

SDI component 625 and 525 line standard supported

Audio
Two stereo pairs input via analog audio balanced 600Ω/20kΩ or AES-EBU

Up to four stereo pairs can be de-embedded from SD SDI and up to eight stereo pairs from the HD-SDI

Studio Reference
625 and 525 line HSYNC

Outputs

Note: Base unit will have either 70 MHz IF output or L-band output. Must be specified at time of order.

Signal conditioning: EN 300 421 (DVB-S) and EN 301 210 (DVB-DSNG) EN302-307 (DVB-S2)

Modulation: QPSK, optional 8PSK, 16QAM, DVB-S2 QPSK, 8PSK, 16APSK, 32APSK

Symbol Rate: 1 to 48 Msyms variable in 1 Syms increments

IF Output Option
IF frequency: 50 to 180 MHz (1 kHz steps)

Output power: -20 to +5dBm (0.1 dB steps)

Monitor output: -20dB relative to main IF output

L-band Output Option
Frequency: 950 to 1750 MHz (1 kHz steps)

Output power: -20 to +5dBm (0.1 dB steps)

Monitor output: -30dB relative to main output

Switchable up-converter power: +24Vdc, 500mA max.

Switchable 10 MHz reference

ASI Outputs
Transport Stream: 3 x ASI Copper Single Program Transport Stream

Video Encoder

MPEG-4 AVC HD Video Compression
High profile compliant at level 4 (HP@L4)

1 Mbps to 25 Mbps

MPEG-4 AVC SD Video Compression
Main Profile at Level 3 (MP@L3)

0.250 Mbps to 10 Mbps, depending on resolution

Picture-in-Picture (option)
MPEG-4 AVC MP@L3 Progressive encoding

User selectable resolution and bit-rate

Supported Video Resolutions

HD Operation
1080 x 1920/1440/1280/960i 25

1080 x 1920/1440/1280/960i 29.97

720 x 1280/960/640p 50

720 x 1280/960/640p 59.94

SD Operation
576 lines x 720/704/640/576/544/528/480/352 pixels

480 lines x 720/704/640/576/544/528/480/352 pixels

288 lines x 352/320 pixels

240 lines x 352/320 pixels

Audio Encoder

MPEG-1 Layer II, up to six stereo pairs (option)

Dolby Digital® (AC-3) (option), up to six stereo pairs

MPEG-2 AAC-LC (option), up to six stereo pairs

MPEG-4 HE-AAC v1 (option), up to four stereo pairs or 1 x 5.1 and one stereo pair

MPEG-4 HE-AAC v2 (option) up to four stereo pairs

MPEG-4 AAC-LC 5.1 (option)

Data

RS-232 Supported baud rates 1200, 2400, 4800, 9600, 19200, 38400 baud

RS-422 n x 64 kbps from 64 to 2048 kbps (selectable) or n x 56 kbps from 56 to 1792 kbps (selectable)

Advanced Video Pre-processing

TANDBERG Clarus™ adaptive spatial and temporal noise reduction (option) and input de-blocking filters (option)

Closed captioning extraction via SMPTE 334

Image resizing (multiple resolutions)

Features

Easy-to-use front panel control

Web-based control

Accurate bit-rate control

No frame loss guarantee

Low delay modes

Physical and Power

Dimensions (W x D x H)
442.5 x 545 x 89mm (17.5" x 20.7" x 2RU)

Approximate Weight
10.5kg

Power Input
100 – 120 VAC or 220 – 240 VAC wide ranging, or -48 VDC

Environmental Conditions

Operating Temperature
-10°C to 50°C (14°F to 122°F)

Compliance

CE marked in accordance with EU Low Voltage and EMC Directives

EMC Compliance: EN55022, EN55024, AS/NZS3548, EN61000-3-2 and FCC CFR47 Part 15B Class A

Safety Compliance: EN60950, IE60950