



## EN5930 SD Encoder for MPEG-4 AVC

Achieving the best picture quality at the lowest bit-rate enables operators to broadcast more channels in their available bandwidth over digital cable, satellite and terrestrial networks - maximising return on investment of this valuable resource. For broadband operators offering TV services over xDSL networks achieving the lowest bit-rate can provide multiple simultaneous services into the home, or be used to extend the loop length over which TV services can be carried from the DSLAM to the consumers' home - maximising return on network investment.

TANDBERG Television has always led the market in providing encoding platforms that give optimum quality at the very lowest possible bit-rates. The EN5930 combines the sophisticated MPEG-4 AVC video and latest audio compression algorithms with the TANDBERG Standard Definition Intelligent Compression Engine (SD-ICE). A dedicated hardware and software implementation, based on over 10 years in-house experience of creating high performance real-time encoders.

### PRODUCT OVERVIEW

#### Market Leading Performance

Extensive video pre-processing helps get the best picture, whatever the source. A proven history of providing customers with in-field performance improvement upgrades over time, keeps our customers ahead of the market.

#### Reliable Service Delivery for any Application

Designed with all the proven system interconnect and control that our MPEG-2 product range enjoys today. In combination with the rest of the TANDBERG Television product range this makes MPEG-4 AVC deployable today in any broadcast or broadband application.

#### Enabling Hybrid Networks Operators and Legacy Migration

The EN5930 can provide MPEG-2 and MPEG-4 AVC encoding of same source in a single solution. This dual format encoding enables support migration of your consumer base from MPEG-2, or operators to broadcast across simultaneous multi-networks.

#### Advanced Features for IPTV

Options for encoding of a low resolution, low bit-rate simultaneous Picture-in-Picture (PIP) service, and direct IP multicasting from the encoder enable the EN5930 to be deployed in any IP distribution or TV over xDSL application.

#### Variable Bit-Rate Operation Modes

Option for standalone variable bit-rate operation allow IPTV operators to maximize picture quality while harvesting capacity for Internet data traffic delivery to the home. Option for Reflex™ statistical multiplexing enable satellite, cable and terrestrial operators to maximize picture quality using bit-rate sharing techniques.

### BASE UNIT FEATURES

#### EN5930 Encoder (EN5930/BAS)

- MPEG-4 AVC real-time video encoding.
- Main profile at Level 3 (MP@L3).
- SDI and analog video inputs.
- Extensive video pre-processing including:
  - Noise reduction (option).
  - Resolution changing.
  - Professional quality de-interlacing.
- 1/4 to full D1 NTSC/PAL resolutions.
- Constant bit-rate encoding from 0.256 Mbit/s to 5 Mbit/s, depending on resolution.
- Variable bit-rate and Reflex™ statistical multiplexing support (option).
- Stereo audio encoding:
  - MPEG Layer II and Dolby Digital®.
  - Options for advanced audio encoding.
  - Digital, analog and SDI embedded inputs.
- Control and monitoring via web browser, the front panel or TANDBERG nCompass Control.
- 3 ASI (MPEG-2 transport stream) outputs.

#### EN5930 Encoder (EN5930/BAS/48V)

- As EN5930/BAS except with -48Vdc power supply.

## SOFTWARE OPTIONS

### Professional Grade Noise Reduction (EN5900/SWO/NR)

- Improve picture quality and reduce bit-rate requirement. Fully adaptive spatial, temporal noise reduction.

### MPEG-2 AAC-LC Advanced Audio Coding (EN5900/SWO/MPEG2/AAC)

- Enables 2 stereo pairs of MPEG-2 AAC-LC (Low Complexity) audio encoding.

### MPEG-4 HE-AAC Advanced Audio Coding (EN5900/SWO/MPEG4/HEAAC)

- Contact TANDBERG Television for availability. Enables 2 stereo pairs of MPEG-4 (High Efficiency) HE-AACv1 audio encoding.

### Variable Bit-Rate Operation (EN5900/SWO/REFLEX)

- Enables Reflex™ statistical multiplexing between multiple encoders as part of a multiplex based system. Enables standalone automatic variable bit-rate video at a fixed quality setting for optimum bandwidth usage.
- User configurable target quality and maximum bit-rate allow optimization of bit-rate harvesting for other applications.

### Simultaneous MPEG-2 Encoding and Multiplexing (EN5900/SWO/MPEG2)

#### Professional Grade MPEG-2 Compression Engine

- 256 kbit/s – 15 Mbit/s MPEG-2 MP@ML.
- Shared video and audio inputs with MPEG-4 AVC encoder.
- Multiplexing of MPEG-2 and MPEG-4 services.
- Encoder output is Multi-Program Transport Stream (MPTS) via ASI, or IP transport stream output if option fitted.
- Simultaneous mode controlled by TANDBERG nCompass device level control.
- Reflex™ allows either the MPEG-2 or MPEG-4 encoder to be statistically multiplexed.

### Simultaneous Picture-in-Picture Video Service Encoding (EN5900/SWO/PIP)

- Simultaneous encoding of low resolution version of main video service.
- MPEG-4 AVC real-time encoding.
- Fixed resolution and bit-rate.
- Single box solution for PIP functionality in IPTV applications.

### Conversion to SMPTE VC-1 / Windows Media® 9 Series (UPG/SD/SWO/WM9)

- Software conversion to EN5920 SD SMPTE VC-1 encoder.

## HARDWARE OPTIONS

### IP Transport Stream Output (EN5900/HWO/IPTS)

- UDP/IP encapsulation of MPEG-2 transport stream output.
- 100Base-T Ethernet physical interface.
- Multicast or unicast capable.
- Service splitting of MPEG-2, MPEG-4 and PIP for streaming multiple SPTS.

### Dual Port IP Transport Stream Output (EN5900/HWO/IPTSDUAL)

- UDP/IP or RTP/UDP/IP encapsulation of MPEG-2 transport stream output.
- Dual port 100/1000 Base-T Ethernet physical interface.
- CBR or VBR multicast outputs.
- User configurable network and multicast parameters.

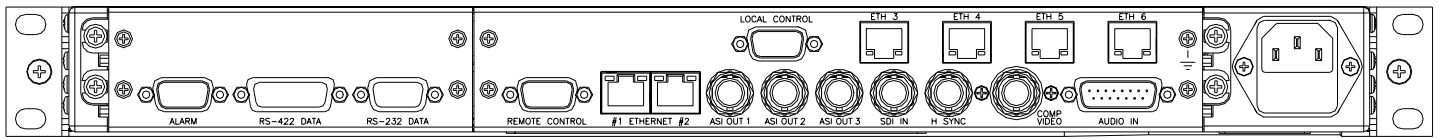
### Additional Audio Encoder (EN5900/HWO/AUDLIN2)

- Additional two stereo pairs of audio encoding in either MPEG Layer II or Dolby Digital® format.
- Audio services may be associated with video service, or as radio services.

### E3 ATM Output (EN5900/HWO/ATMS34)

- ATM encapsulation of MPEG-2 transport stream output.
- E3 Physical Interface (34 Mbit/s) with AAL-1 & AAL-5 support.

## SAMPLE CONFIGURATION



## SPECIFICATIONS

<b>Inputs</b>	<b>Supported Video Resolutions</b>	<b>Physical and Power</b>
<b>Video</b> SDI serial digital video with EDH error detection and health monitoring Analog composite video (PAL/NTSC) SDI component 625 and 525 line standard supported	<b>Resolutions Supported by MPEG-4 AVC Encoder</b> 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	<b>Dimensions (w x d x h)</b> 442.5 x 545 x 44.5mm (17.5" x 20.7" x 1RU) <b>Approximate Weight</b> 7.5kg <b>Power Input</b> 100 – 120 Vac or 220 – 240 Vac wide ranging –48Vdc
<b>Audio</b> 2 stereo pairs input via analog audio balanced 600Ω/20kΩ or AES-EBU or SDI. Up to 4 stereo pairs can be de-embedded from SDI	<b>Audio Encoder</b> MPEG Layer II Dolby Digital® MPEG-2 AAC-LC (option) MPEG-4 HE-AAC (option) Up to 2 stereo pairs audio encoding	<b>Environmental Conditions</b> <b>Operating Temperature</b> -10°C to 50°C (14°F to 122°F)
<b>Studio Reference</b> 625 and 525 line HSYNC	<b>Advanced Video Pre-Processing</b> TANDBERG Television adaptive spatial and temporal noise reduction (option) Closed captioning extraction from VBI Image resizing (multiple resolutions) Professional grade de-interlacer	<b>Compliance</b> 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, IEC60950 Safety Compliance EN60950, IEC60950
<b>Outputs</b> <b>MPEG Transport Stream</b> DVB-ASI (3 ports) MPEG-TS over IP (100/1000BaseT 2 ports) (option)	<b>Features</b> Easy-to-use front panel control Web based control Auto frame-rate input switching Simple pre-configured set-ups Accurate bit-rate control No frame loss guarantee	
<b>Video Encoder</b> <b>MPEG-4 AVC Video compression</b> Main profile at level 3 (MP@L3) 0.256 Mbit/s to 5 Mbit/s, depending on resolution Interlace & progressive encoding support <b>MPEG-2 Video Compression (option)</b> Main profile at Main level (MP@ML) 0.256 kbit/s – 15 Mbit/s <b>Picture-in-Picture (option)</b> MPEG-4 AVC MP@L3 progressive encoding 96 x 96 pixels at 175 kbit/s		

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