E5710

MPEG-2 Standard Definition Encoder

MPEG-2-based digital video head-ends continue to be a critical part of the encoding landscape for terrestrial, telco, satellite and digital cable service providers. The ability to obtain excellent picture quality at low bit-rates remains the most important performance factor for encoders and is a hallmark of TANDBERG Television's E5710 MPEG-2 encoder. The E5710 is ideal for real-time broadcast-quality encoding, digital video turn-around and efficient video delivery over any last-mile network.

The E5710 is a highly reliable and adaptable MPEG-2 encoding platform with an extremely flexible backplane, enabling many options for audio encoding, re-multiplexing and multiple output formats. For service providers with sufficient bandwidth who want to rely on MPEG-2's outstanding performance and long development history for their television services, the E5710 is the industry gold standard for MPEG-2 encoding, with a myriad of feature upgrades, software licensing options and performance enhancements available.

PRODUCT OVERVIEW

Outstanding Quality and Market Leading Performance

The E5710 MPEG-2 encoder provides extensive video pre-processing features developed by TANDBERG Television's world class in-house encoding laboratory in which customers can optimize encoding performance for their specific needs. The E5710's top performance record, combined with multiple options suitable for a wide range of professional video applications, provide a level of quality and flexibility that is unmatched by the competition.

Upgradeable Hardware and Software Future-proofs Investment

The E5710 features two expansion slots for upgradeable hard-ware options. These options include MPEG-2 multi-pass encoding or upgrades to MPEG-4 AVC SD and HD encoding with TANDBERG Television's Intelligent Compression Engine (ICE) version 3, as well as software options that enable a wide variety of different applications. Service providers are not locked-in to legacy technology or single purpose devices as their needs and services change.

Comprehensive Operational Options

The E5710 offers breadth and depth in operational capabilities including Variable Bit-Rate (VBR) and Constant Bit-Rate (CBR) modes, Reflex™ statistical multiplexing and audio capabilities allowing operators to design their ideal encoding system and maximize their bandwidth capacity. For content protection, the E5710 supports both RAS and BISS for secure contribution networks.

Reliable, Efficient Management

The E5710 can be remotely controlled via a web browser and can also be efficiently managed and maintained through integration into TANDBERG Television's nCompass control system. This scalable system enables reliable, remote management and monitoring, reducing the need for costly, on-site operation.

BASE UNIT FEATURES

E5710 Encoder (M2/ENC/E5710)

The encoder features two physical expansion slots for hardware options and has a range of software enabled options to suit specific applications. These expansion slots facilitate several hardware options including upgrade paths for either multi-pass encoding (E5770) or Windows Media® Video 9 Series encoding (EN5920) or MPEG-4 AVC SD (EN8030) or MPEG-4 AVC HD (EN8090).

- SDI and composite video inputs
- Analog, digital AES-EBU and embedded SDI audio input
- MPEG-1 Layer II Audio
- Dolby® Digital (AC-3) 1-5.1 and Dolby® E channel pass-through
- Fully exhaustive motion estimation
- Extensive pre-processing features
- Support for a wide range of VBI data formats
- Closed caption support input via RS-232 or SDI SMPTE 334
- Conversion of EIA 608 to EIA 708 format
- Support for Splice Points and special features for VOD ingest
- Three ASI outputs plus wide range of optional telco interfaces
- Control via front panel, SNMP, RS-232/RS-485, web browser or nCompass Control systems
- Film mode detection (3:2 pull down)
- Data insertion supporting RS-232 data and RS-422
- Flexible expansion support (two slots available)
- Upgrade paths for SD and HD MPEG-4 AVC

SOFTWARE OPTIONS

Performance Upgrade (M2/ESO2/PU)

- The performance upgrade enables advanced TANDBERG Television coding algorithms that increase the efficiency by at least 0.8 Mbps per channel. It also reduces the lower bit-rate limit to 256 kbps and enables bit-rate saving features such as adaptive GOP and long GOP.

Auto Concatenation (M2/ESO2/ACON)

- Aligns the encoder to the previous encoder's GOP structure to significantly reduce coding artifacts caused by successive coding and decoding

Noise Reduction (M2/ESO2/NR)

- Four levels of professional-grade adaptive noise reduction plus three fixed levels of noise reduction

Reflex and VBR (M2/ESO2/VBR)

- Automatic variable bit-rate at a fixed quality setting for optimum bandwidth usage in stand-alone or Reflex statistical multiplexing modes

MPEG-2 422P@ML (M2/ESO2/422)

- For professional editing quality pictures, 1.5 Mbps to 50 Mbps

SMPTE 2022 ProMPEG FEC (M2/ESO2/PROFEC)

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

RAS (M2/ESO2/RAS)

- Allows material to be protected from illegal viewing using TANDBERG Television's proprietary scrambling system

Dolby® AC-3 Two Channel Encoding (M2/ESO2/AC3)

- Enables Dolby® Digital (AC-3) stereo encoding. The first two stereo pairs are free of charge

DTS (Digital Theater System) (M2/ESO2/DTS)

- Enables pass-through of pre-encoded DTS audio

NABTS VBI Extraction (M2/ES02/525VBIDATA)

- Enables the extraction of GEMSTAR and EIA 516 NABTS data from the VBI and carriage in a transports stream packet

Digital Program Insertion (M2/ESO2/DPI)

- Enables carriage of DPI messages as per SCTE 35 controlled by either DVS 525 or contact closure read by the GPI input option card

HARDWARE OPTIONS

Please contact TANDBERG Television or an approved reseller to confirm which combinations of options are supported.

Audio Option Card (M2/EOM2/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
- Up to two audio option cards may be fitted supporting a total of six stereo pairs in the unit
- AES3 compliant input

G703 Output (M2/EOM2/G703)

- Supports both DS-3 at 44.736 Mbps and E3 at 34.368 Mbps

Range of ATM Outputs (M2/EOM2/ATMS34, M2/EOM2/ATMS45, M2/EOM2/ATMS155)

- Range of ATM outputs to support AAL-1 & AAL-5

REMUX (M2/EOM2/REMUX)

- Re-multiplex three external MPTS transport streams with the locally generated stream
- Supports automatic PID re-mapping and resolves service name conflicts
- Supports insertion of externally generated dynamic PSIP
- Supports insertion of DVB sub-titles

SMPTE 310 (M2/EOM2/SSI)

- This card provides three SMPTE 310 SSI outputs to support links to 8VSB transmitters in ATSC applications

IP Output (M2/EOM2/IPTSDUAL)

- Dual output with 100/1000BaseT Ethernet physical interfaces
- UDP/IP or RTP/UDP/IP encapsulation of MPEG-2 transport stream
- Multicast or unicast capable
- Supports multiple SPTS streams

SMPTE 310 (M2/EOM2/SSI)

- This card provides three SMPTE 310 SSI outputs to support links to 8VSB transmitters in ATSC applications

ASI Optical (M2/EOM2/ASI-OPT)

- This card provides an ASI optical output as specified by EN 50083-9

GPI Contact Closure Input (M2/EOM2/GPI)

- Reads one of eight input signals to trigger SCTE 35 messages
- Other functions and encoder parameters may be controlled by contact closures. Please contact TANDBERG Television or an approved reseller for further details

BISS Scrambler Card (M2/EDCOM2/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). An application for generating encrypted session words can be downloaded from the encoder via a web browser
- This option is a daughter card on the motherboard and so does not occupy an option slot

Upgrade to SD or HD Advance Video Compression (UPG/HWO/ICE3/SD) or (UPG/HWO/ICE3/HD)

- The Intelligent Compression Engine option card supports the latest MPEG-4 AVC encoding, either SD or HD

SAMPLE CONFIGURATION
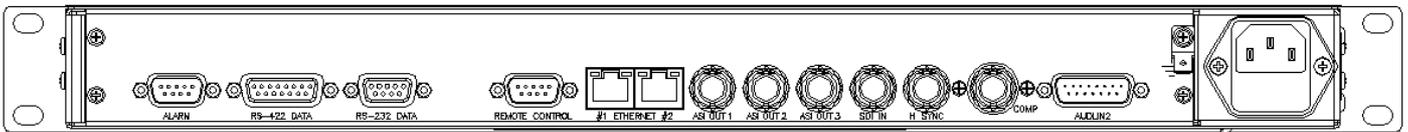
SPECIFICATIONS

Inputs

Video

Analog composite video (PAL/NTSC) 10 bit sampling

SNR >60dB

SDI serial digital video 625 and 525 line standard supported with EDH error detection and health monitoring

HSYNC support for 625 and 525 line

Audio

Two stereo pairs input via analog, AES-EBU or SDI

Analog audio balanced 600/20k

Input levels: 12, 15, 18, 21, 22 and 24dB

Up to Four stereo pairs can be de-embedded from SDI

Outputs

3 x ASI copper Single Program Transport Stream

Video Encoder

MPEG-2 MP@ML

1.5 to 15 Mbps (without performance upgrade)

0.256 to 15 Mbps (with performance upgrade)

Performance upgrade option enables long GOP and adaptive GOP features

MPEG-2 422P@ML (option)

1.5 to 50 Mbps

"Pixel Perfect" fully exhaustive motion estimation

Reflex statistical multiplexing support (option)

Vertical Resolutions 576, 288 (PAL), 480, 240 (NTSC)

Horizontal Resolutions 720, 704, 640, 544, 528, 480, 352

Audio Encoder

2 x stereo audio channel processing

MPEG-1 Layer II audio encoding standard

Encoding rates from 32 kbps to 384 kbps

Dolby® Digital (AC-3)

Encoding rates from 56 kbps to 640 kbps

Dolby® Digital (AC-3) 1 – 5.1 channel, Dolby® E, linear

PCM and DTS pass-through

VBI

World Standard Text (WST - ETS300472) 625 only

Closed captioning EIA-608, EIA-708 and SCTE 20

Closed captions inserted by line 21, SMPTE 333 or SMPTE 334

Nielsen data AMOL I & AMOL II, 525 only

NABTS - 525 line only (option)

Video Index and Active Format Descriptor (AFD)

Video programming signal (VPS) 625 only

Wide screen signaling (WSS) 625 only

Time Code from VITC

Advanced Pre-processing

Adaptive bandwidth

Border processing

TANDBERG Television professional grade adaptive spatial & temporal noise reduction offering four adaptive levels plus three fixed levels (option)

"Auto-Concatenation" I frame detection and alignment system – optimizes re-encoding performance (option)

Film mode inverse 3:2 pull-down

Scene cut detection

Frame re-synchronization

Features

Selectable range of delay modes for low latency operation

Front panel LCD with easy set-up and operation

Sixteen fully adjustable operational configurations

Internal test tone and test pattern generation

Auto switching on loss of input source to test pattern, colored image, last good video frame with selectable text message

Input freeze frame and audio silence detection

Logo insertion

SCTE 35 controlled by SCTE104 or GPI contact closure

Data

VANC data extraction up to 500 kbps

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

RS-422 n x 64 kbps from 64 kbps to 2048 kbps

(selectable) or n x 56 kbps from 56 kbps to 1792 kbps (selectable)

Control

Front panel

nCompass Control supported via dual Ethernet

RS-232 & RS-485 interfaces for remote control

Support for external SNMP control

Support for SNMP traps

Full control & monitoring via web browser

Physical and Power

Dimensions (W x D x H)

442.5 x 545 x 44.5mm (17.5" x 20.7" x 1RU)

Approximate Weight

10.5kg

Power Input

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

Consumption

100W no options, 250W maximum, depending on the option cards selected

Environmental Conditions

Operating Temperature

-10°C to 50°C (14°F to 122°F)

Operating Humidity

<95% non-condensing

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

Optional Outputs

Dual Gig-E IP (optional ProMPEG FEC)

ATM 34 Mbps, 45 Mbps

ATM 155 Mbps, Multi-mode, Single-mode & Copper

G.703

ASI Optical

SMPTE 310 (SSI)