

E5710



MPEG-2 Standard Definition Encoder

MPEG-2-based digital video headends 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 bitrates 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 turnaround 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 hardware 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 Bitrate (VBR) and Constant Bitrate (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 2 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
- 3 ASI outputs plus wide range of optional telco interfaces
- Control via front panel, SNMP, RS-232/RS-485, web browser or TANDBERG nCompass Control systems
- Film mode detection (3:2 pull down)
- Data insertion supporting RS-232 data and RS-422
- Flexible expansion support (2 slots available)
- Upgrade paths for Multi-Pass SD MPEG-2 and SD VC-1
- Upgrade paths for SD and HD MPEG-4

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 Mbit/s per channel. It also reduces the lower bitrate limit to 256 kbit/s

Auto Concatenation (M2/ESO2/ACON)

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

Noise Reduction (M2/ESO2/NR)

- Four levels of professional-grade adaptive noise reduction plus 3 fixed levels of noise reduction

Reflex™ and VBR (M2/ESO2/VBR)

- Automatic variable bitrate 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 Mbit/s to 50 Mbit/s

ProMPEG FEC (M2/ESO2/PROFEC)

- Enables 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 Sound) (M2/ESO2/DTS)

- Enables pass-through of pre-encoded DTS audio

NABTS VBI Extraction (M2/ESO2/525VBIDATA)

- 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.

Multi-Pass Upgrade (M2/EOM2/MPM)

- Upgrades the E5710 to an E5770 to enable the highest quality encoding solution for a multichannel environment

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 6 stereo pairs in the unit
- AES3 compliant input

Advanced Audio Option Card (M2/EOM2/ADVAUD)

- 8 audio channels configurable as 4 x 2 stereo pairs, 5.1 surround plus a stereo pair or 7.1 surround
- AES3id compliant inputs
- AAC (ISO 13818-7 LC) Encoding. Mono, Dual mono, Stereo, 5.0 and 5.1 encoding, 64 kbit/s to 256 bit/s
- Linear PCM (Q2 2006)

G703 Output (M2/EOM2/G703)

- Supports both DS-3 at 44.736 Mbit/s and E3 at 34.368 Mbit/s

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

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

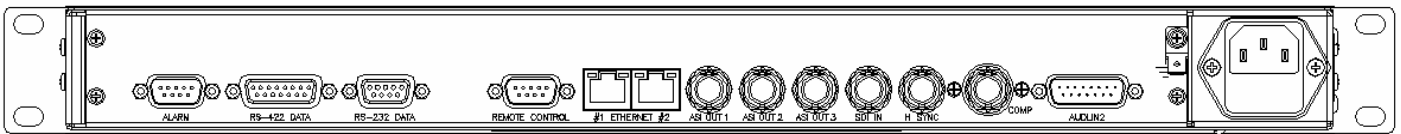
Multi-Pass Upgrade (M2/EOM2/MPM)

- Upgrades the E5710 to an E5770 to enable the highest quality encoding solution for a multichannel environment

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) 10bit 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
 2 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 4 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 Mbit/s (without performance upgrade)
 0.256 to 15 Mbit/s (with performance upgrade)
 Performance upgrade option enables long GOP and adaptive GOP features
 MPEG-2 422P@ML (option)
 1.5 to 50 Mbit/s
 "Pixel Perfect" fully exhaustive motion estimation
 TANDBERG 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 32kbit/s to 384kbit/s
Dolby Digital® (AC-3)
 Encoding rates from 56 kbit/s to 640 kbit/s
 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.
 Nielson 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 spatio & temporal noise reduction offering 4 adaptive levels plus 3 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
 16 fully adjustable operational configurations
 Internal test tone and test pattern generation
 Auto switching on loss of input source to test pattern, coloured 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 500kbps
 RS-232. Supported baud rates 1200, 2400, 4800, 9600, 19200, 38400 baud
 RS-422 n x 64 kbit/s from 64 kbit/s to 2048 kbit/s (selectable) or n x 56 kbit/s from 56 kbit/s to 1792 kbit/s (selectable)

Control

Front panel
 TANDBERG 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 -48Vdc
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, IEC60950

Optional Outputs

Dual GigE IP (optional ProMPEG FEC)
 ATM 34 Mbit/s, 45 Mbit/s
 ATM 155 Mbit/s, Multi Mode, Single Mode & Copper G.703
 ASI Optical
 SMPTE 310 (SSI)