

The E5780 and E5782 are top performing High Definition MPEG-2 encoders providing rapid on-air capabilities and easy-to-use features.



### Business Benefits

#### Assured quality output

- High performance encoding in all modes
- Advanced pre-processing

#### Flexibility

- Switch between multiple high definition or standard definition modes
- Expansion slots

#### Get on air quickly

- Easy configuration and control
- Support for internally generated PSIP and PSI information

### Application

Offering both standard (SD) and high definition (HD) encoding modes, the E5780 is ideal for professional ATSC and DVB broadcasters. It is able to encode at multiple profiles in both modes and the E5782 also supports HD 4:2:2 for HD contribution and digital cinema applications.

### Base Unit Features

#### **E5780 & E5782 High Definition Encoder (M2/ENC/E5780, M2/ENC/E5780/ATSC, M2/ENC/E5782)**

The unit supports a wide range of SD and HD formats for maximum usage and flexibility.

- The E5782 model supports 4:2:2 HD
- Supports DVB-T or ATSC standards
- Provides internally generated static PSIP & PSI
- Interfaces for insertion of dynamic PSIP/PSI
- Front panel control and operation for SPTS applications
- Advanced hierarchical motion estimation
- TANDBERG professional grade noise reduction
- Film mode detection (3:2 Pulldown)
- Closed caption support input via RS-232, HD SDI SMPTE 334  
Converts EIA 608 to EIA 708 format
- MPEG Layer II Audio and Dolby Digital® (AC-3) two channel encoding
- Dolby Digital® (AC-3) 1-5.1 and Dolby® E channel pass-through
- Data insertion supporting RS-232 data and RS-422
- Flexible expansion support (4 slots available)

### Software Options

#### **Noise Reduction (M2/ESO2/HDNR)**

Four levels of professional-grade adaptive noise reduction.

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

Enables Dolby Digital (AC-3) stereo encoding.

#### **DTS (Digital Theater Sound) (M2/ESO2/DTS)**

Enables pass through of pre-encoded DTS audio.

#### **RAS (M2/ESO2/RAS)**

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

### Software Options (continued)

#### **Reflex™ and VBR (M2/ESO2/HDVBR)**

Automatic variable bit-rate at a fixed quality setting for optimum bandwidth usage in stand-alone or Reflex™ Statistical Multiplexing modes. Statistical multiplexing is possible amongst mixed groups of SD and HD encoder as well groups of HD encoders.

#### **Multi-Pass (M2/ESO2/HDMULTIPASS)**

Significantly improves statistical multiplexing by improving the bit rate prediction. This option allows the HD E5780 to be placed in the same pool as the SD E5770.

#### **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.

#### **NABTS VBI Extraction (M2/ES02/525VBIDATA)**

Enables the extraction of GEMSTAR and EIA 516 NABTS data from the SD VBI and carriage in a transport stream packet.

#### **4:2:2 HD Upgrade (UPG/HD/SWO/422)**

Upgrades the E5780 to the E5782 to support 4:2:2 profile.

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### Hardware Options

#### **Audio Option Card (M2/EOM2/AUDLIN2)**

- Two stereo pairs supported per card
- Analog input levels: 12, 15, 18, 21, 22 and 24dB
- MPEG Layer II audio encoding
- Dolby Digital® (AC-3) encoding
- Dolby Digital® (AC-3) 1 – 5.1 channel and Dolby E pass-through
- Linear PCM and DTS pass-through

One audio option card may be fitted supporting a total of 4 stereo pairs in the unit.

#### **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, 64kbps to 256bps
- Linear PCM (Q2 2006)

#### **BISS Option 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). 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.

#### **G.703 Output (M2/EOM2/G703)**

The G.703 card 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.

#### **ASI Optical (M2/EOM2/ASI-OPT)**

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

#### **SSI – SMPTE 310 (M2/EOM2/SSI-US)**

This card provides three SSI outputs to support links to 8VSB transmitters in ATSC applications.

#### **GPI Contact Closure Input (M2/EOM2/GPI)**

This card can read one of eight input signals to trigger SCTE 35 messages.

**Note:** Other functions and encoder parameters may be set by contact closures, please contact TANDBERG Television or an approved reseller for further details.

**Hardware Options (continued)****REMUX & PSIP Insertion (M2/EOM2/REMUX)**

The REMUX card will re-multiplex three external MPTS transport streams with the locally generated stream. The card supports automatic PID re-mapping and resolves service name conflicts.

The REMUX card also supports the insertion of externally generated dynamic PSIP into the transport stream.

**IP Output (M2/EOM2/IP)**

- UDP/IP encapsulation of MPEG-2 transport stream output
- Supports transport stream rates up to 80 Mbit/s (including FEC).
- Includes support DVB IPI FEC
- 10 / 100 Base-T Ethernet physical interface
- Multicast or unicast capable
- Support multiple SPTS streams

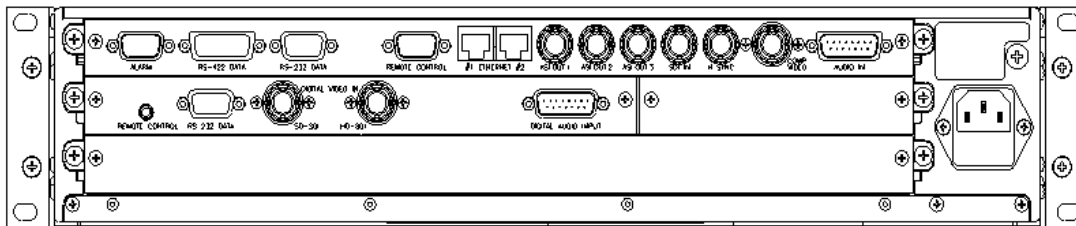
**IP Output (M2/EOM2/IP/PROFEC)**

- UDP/IP encapsulation of MPEG-2 transport stream output
- Supports transport stream rates up to 80 Mbit/s (including FEC).
- Includes support for Pro MPEG FEC
- 10 / 100 Base-T Ethernet physical interface
- Multicast or unicast capable
- Support multiple SPTS streams

**IP Output (M2/EOM2/IPTSDUAL)**

- Dual output
- UDP/IP or RTP/UDP/IP encapsulation of MPEG-2 transport stream output
- 100 / 1000 Base-T Ethernet physical interface
- Multicast or unicast capable
- Support multiple SPTS streams

## Typical Configuration



### 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
- HDSDI (SMPTE 292M)

#### Audio

- Analog input levels: 12, 15, 18, 21, 22 and 24dB
- 2 x AES/EBU digital audio inputs
- Up to 4 stereo pairs can be extracted from the SDI or HD SDI input.
- Input levels: 12, 15, 18, 21, 22 and 24dB
- 2 x analog audio's balanced 600Ω/20kΩ
- Sampling rates of 32KHz, 44.1KHz & 48KHz

### OUTPUTS

- 3 x ASI copper Single Program Transport Stream

### VIDEO ENCODER

- MPEG-2 422P@ML 2 to 50 Mbit/s (in SD mode)
  - MPEG-2 MP@ML 1.5 to 15 Mbit/s
  - MPEG-2 MP@HL 2 to 90 Mbit/s (480p and 576p)
  - MPEG-2 MP@HL 6 to 90 Mbit/s (720p and 1080i)
  - MPEG-2 422P@HL 6 to 90 Mbit/s (720p and 1080i)\*
- \*Only supported on the E5782

### AUDIO ENCODER

- 2 x stereo audio channel processing
- **MPEG Layer II audio encoding standard**
  - Encoding rates from 32kbit/s to 384kbit/s
- **Dolby Digital® (AC-3)**
  - Encoding rates from 56kbit/s to 640kbit/s
- Dolby Digital® (AC-3) 1 – 5.1 channel, Dolby-E, linear PCM and DTS pass-through

### VBI

- **Supported standard definition VBI MPEG-2 MP@ML**
  - World standard text (WST)
  - Closed Captioning
  - SCTE 20
  - Nielson data AMOL I & AMOL II
  - Program delivery control (PDC)
  - Video programming signal (VPS)
  - Wide screen signaling (WSS)
  - Time Code from VITC
- **Supported standard definition VBI MPEG-2 422P@ML**
  - All types when encoded as picture information
- **Supported high definition VBI MPEG-2**
  - EIA-708 Closed caption insertion via RS-232 interface or via HDSDI (SMPTE 334)
  - World standard text (WST) via SD SDI or CVBS
  - Closed Captioning via SD SDI, CVBS, SMPTE 333 or SMPTE 334
  - Time Code from VITC in HD SDI (SMPTE RP 188)

### ADVANCED PRE-PROCESSING

- Wide ranging hierarchical motion estimation search
- TANDBERG Spatio & temporal noise reduction
- Film Mode 3:2 pulldown
- Frame re-synchronization

### SUPPORTED HD RESOLUTIONS

- 1080 x 1920/1440/1280/960pSF 23.976
- 1080 x 1920/1440/1280/960pSF 24
- 1080 x 1920/1440/1280/960pSF 25
- 1080 x 1920/1440/1280/960i 25
- 1080 x 1920/1440/1280/960i 29.97
- 1080 x 1920/1440/1280/960i 30
- 720 x 1280/960p 50
- 720 x 1280/960p 59.94
- 720 x 1280/960p 60
- 576 x 720/704p 50
- 480 x 720/704p 59.94
- 480 x 720/704p 60

### FEATURES

- Selectable range of delay modes for low latency operation less than 550ms in HD mode and less than 100ms in SD mode.
- 16 fully adjustable operational configurations
- Internal test tone and test pattern generation
- Auto switching on loss of input source to predefined screen.
- Logo insertion (bug burning)
- SCTE 35 controlled by DV525 or GPI contact closure

### DATA

- 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 LCD with quick access keys and alpha numeric keypad
- TANDBERG Multiplex Element Manager and TANDBERG Device Controller supported via dual Ethernet
- RS-232 & RS-485 inputs and outputs for remote control
- Support for external SNMP control

### PHYSICAL AND POWER

- 2RU 19" Rack mountable chassis
- **Dimensions:** (W x H x D)  
442.5 x 88.9 x 499.5mm (17.25 x 3.5 x 19" approx.)
- **Weight:** 12Kg approx.
- **Power Input:**  
100 - 120Vac / 220 - 240Vac wide ranging auto sensing
- **Consumption:**  
150W (250W fully populated)

### 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 EEC low voltage and EMC directives EN55022, EN55024: 1998, EN61000-3-2 for EMC and the EN/IEC60950 Safety Standard as a minimum where applicable.
- Also meets other relevant requirements and national standards derived from international requirements on which the above European Standards are based and FCC Pt 15 Class A.

### OPTIONAL OUTPUTS

- IP, including FEC
- Dual Gig-E IP
- ATM 34 Mbit/s, 45 Mbit/s
- ATM 155Mbit/s, Multi-Mode, Single Mode & copper
- G.703
- ASI Optical
- SMPTE 310 (SSI)