E5740

Voyager MPEG-2 Standard Definition DSNG

Broadcasters and satellite news gathering organizations are covering more live events, sports and news spots than ever before and need reliable technology that will make it easier and more efficient to deliver video from the field. TANDBERG Television's E5740 Voyager encoder is a versatile 2RU MPEG-2 platform that delivers remarkable performance and is trusted by the majority of news gathering organizations for its high-quality encoding and easy upgrade path to MPEG-4 AVC and HD.

The E5740 is a smart choice for broadcasters seeking increased efficiencies in operations to stay competitive. With multiple HD upgrade options to quickly add either MPEG-2 HD or MPEG-4 SD/HD, the E5740 offers impressive and unprecedented upgradeability. A DVB-S2 capable modulator comes as standard enabling customers to benefit from the 35% increase in transmission efficiency that this typically provides over DVB-S. Other performance and feature enhancing upgrades are also available including a powerful MPEG multiplexing card (REMUX) to add MCPC capability and a data card that works with an internal IRD option to provide bi-directional support for IP data and telephony. The E5740 achieves all of this performance whilst remaining exceptionally easy-to-use and with multiple control options. It is also supported by our Voyager 'advance loan' scheme and guaranteed for two years.

PRODUCT OVERVIEW

Flexible Options for Serving a Wide Range of Customer Needs

The E5740 is an extremely flexible, high-end encoder/modulator that can be upgraded to provide HD encoding, allowing both improved bandwidth efficiencies and best quality. It features best-in-class MPEG-2 SD encoding in 4:2:0 and 4:2:2 profiles. The E5740 has four free option card slots for upgrades and adding features.

Extensive Communications Capabilities

DSNG trucks need to be real communications centers with scalable options. The E5740 offers bi-directional support for IP data and telephony. The ability to add communication solutions through card options provides real functional, as well as cost-saving benefits.

Unrivalled Manufacturers Support

News gathering organizations cannot afford to have their truck down for any reason. 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 E5714 platform comes with a standard two-year warranty that together with the advance loan scheme offers unrivalled support.

DVB-S2 Capability Provides Major Bandwidth Savings

DVB-S2 offers up to a 35% improvement in transmission efficiencies compared to DVB-S. DVB-S2 is a modem technology so the benefits are in addition to savings offered by TANDBERG Television's premium encoding technology. The E5740 L-band and IF models come with a DVB-S2 capable modulator as standard which can be activated via licence key to enable its advanced features.

DENG Capability

The E5740 can be used for DENG (Terrestrial Microwave) applications either with or without the internal DVB-S2 modulator. The COFDM modulator option card therefore makes the E5740 a dual purpose DSNG/DENG transmitter.

BASE UNIT FEATURES

- Voyager E5740 L-BAND DSNG (M2/VOY/E5740-LBAND)
- Voyager E5740 IF DSNG (M2/VOY/E5740-IF)

The E5740 provides premium MPEG-2 SD encoding, coupled with an advanced DVB-S2 modulator. It also offers unmatched potential for customization and upgrade. Featuring 4 option slots, the E5740 can be expanded to provide up to 8 stereo audios. Other possibilities include an internal IRD card, MPEG-2 HD encoder, MPEG-4 AVC HD/SD encoder and an internal multiplexer card. RAS and BISS can be added without occupying option card slots.

Note: The DVB-S / S2 modulator provides either an L-band output or 70 MHz IF output. The correct card must be specified at time of ordering.

Note: A DC (18-36V) power supply option will be available mid 2008.

HARDWARE OPTIONS

FXS SNG Communications Card (providing telephony and network connectivity) (TP/COMMS/FXS)

- 4 FXS/Tieline voice, serial data (V.24, V.11, RS-530, V.35 or RS-449) and IP/network connection (10/100BaseT)

FXS Software Upgrade for additional 4 FXS Channels (TP/VOC/SWO/FXS8)

- FXS software upgrade for STU-IIB/STU-III relay on first 4 voice channels (TP/VOC/SWO/STU)

FXO SNG Communications Card (TP/COMMS/FXO)

- 4 FXO/Tieline voice, serial data (V.24, V.11, RS-530, V.35 or RS-449) and IP/network connection (10/100BaseT)

FXO Software Upgrade for additional 4 FXO Channels (TP/VOC/SWO/FXO8)

- FXO software upgrade for STU-IIB/STU-III relay on first 4 voice channels (TP/VOC/SWO/STU)

Audio Option Card (M2/EOM2/AUDLIN2)

- Two stereo pairs supported per card
- Analogue input levels: 12, 15, 18, 21, 22 and 24dB
- MPEG-1 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
- Up to 3 audio option cards may be fitted supporting a total of 8 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, 64 kbps to 256bit/s
- Linear PCM

REMUX (M2/EOM2/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.

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.

QPSK Direct Conversion Demodulator and MPEG Decoder Hardware Option (M2/EOM2/ASISATDEC)

- Implements QPSK demodulation capable of supporting low symbol rates and MPEG decoder capable of decoding all MPEG modes supported by the encoder. A direct ASI input to the MPEG decoder is implemented on this combined option.

IP Output (M2/EOM2/IPTSDUAL)

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

G.703 Output (M2/EOM2/G703)

- The G.703 card 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

M2/EOM2/COFDM

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

Upgrade to HD MPEG-2 (UPG/HD/HWO/420 and UPG/HD/SWO/422)

- The HD MPEG-2 upgrade can support both 4:2:0 (E5780 equivalent) and 4:2:2 MPEG-2 HD (E5782 equivalent)

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

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. A complimentary 30 day trial license is available upon request.

Low Symbol Rate Software Option (M2/ESO2/LSYM)

- Low symbol rate operation, down to 300 ksyms, allows operation on a tight link budget using low power amplifiers and small dishes

8PSK (M2/ESO2/SM38PSK) / 16 QAM (M2/ESO2/SM316QAM)

- Higher order modulation upgrade

DVB-S2 QPSK and 8PSK (M2/ESO2/SM3S28PSK) / DVB-S2 16APSK (M2/ES02/SM3S216APSK)

- DVB-S2 modulation upgrade

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 3 fixed levels of noise reduction

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

- 1.5 Mbps to 50 Mbps

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

- Enables Dolby Digital® (AC-3) 2.0 stereo encoding. The first two stereo pairs are free of charge

Digital Program Insertion (M2/ESO2/DPI)

- Allows carriage of DPI messages as per SCTE35 control by either DVS 525 or contact closure read by GPI input option card

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

- Enables pass-through of pre-encoded DTS audio

NABTS VBI Extraction (M2/ES02/525VBIDATA)

- Enables the extraction of NABTS data from the VBI and carriage in a transport stream packet as per EIA 516

ProMPEG FEC (M2/ESO2/PROFEC)

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

SPECIFICATION

Inputs

Video

Analogue 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, AES-EBU, SDI or analog audio balanced 600Ω/20kΩ

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

Up to 4 stereo pairs can be de-embedded from SDI

Outputs

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

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

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

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

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

Transport Stream: 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

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) 2.0, 1 - 5.1 channel, Dolby® E, -linear PCM and DTS pass-through

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 Pre-processing

TANDBERG 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

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, colored image, last good video frame with selectable text

DVB-S2 capable modulator

Logo insertion

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 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

Consumption

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

Optional Upgrades

Video Encoding

MPEG-2 422P@ML bit-rate range 1.5 to 50 Mbps

Performance Upgrade

Saves circa 0.8 Mbps channel

Advanced Noise Reduction

Removes noise to aid compression efficiency

RAS/BISS Scrambling

RAS and/or BISS scrambling (as per EBU Tech 3292 May 2002) protects material from illegal viewing

Higher Order Modulation and DVB-S2

8PSK, 16 QAM, DVB-S2 QPSK, 8PSK, 16APSK, 32APSK,

Low Symbol Rate

Allows symbol rate to go down to 300 ksyms

Option Cards

(Note: Contact TANDBERG Television for permissible permutations)

Additional Audio

Up to 3 audio cards allowing a max. of 8 stereo pairs

Internal Remultiplexer

Up to 13 channel MCPC operation, max. 50 Mbps

QPSK Demodulator & MPEG Decoder

For QPSK only demodulation using direct conversion option combined with MPEG decoder with direct ASI I/P

IP

Dual GigE IP output for streaming

Communications Card

Provides telephony and IP connectivity

Range of Telco Interface Cards

For telco interface connectivity (ATM & G.703)

MPEG-2 HD Option Card

Provides HD encoding upgrade to E5784/E5788 specification

MPEG-4 HD/SD Option Card

Provides HD encoding upgrade to EN8040 specification