

E5750



Voyager MPEG-2 Standard Definition DENG

Broadcasters and news gathering organizations want pictures from anywhere in the world, live, and at an instant. Increasingly, they are looking to mobile microwave links to cover news events in places where using satellite is difficult, such as in the world's largest cities, or where satellite is too slow or expensive, as during natural disasters or fast-breaking events. New technology includes digital COFDM systems, which have rapidly replaced analog transmission because they are fast to set-up, more efficient and don't have point-to-point link limitations. TANDBERG Television's E5750 Voyager Digital ENG system is designed for this market, offering robust, long-range DENG transmission with outstanding MPEG-2 encoding, highest picture quality and a flexible array of options.

The E5750 is available in 4:2:0 and 4:2:2 encoding versions in a 2RU chassis, offering a complete range of quality options including ultra high-performance encoding for special events. The encoder also supports a range of low-latency modes to reduce encoding delay, and can be upgraded to MPEG-2 high definition (HD) or MPEG-4 AVC (SD and HD) with option cards.

TANDBERG Television can configure the E5750 with a DVB-S2 modulator card along with the COFDM modulator, providing a dual-purpose DENG/DSNG system for maximum flexibility and convenience. The unit supports all of the major DVB-T modes and can support RF output with the addition of a RF up-converter card. TANDBERG Television's extensive video pre-processing combined with advanced encoding techniques provides superior picture quality and a longer transmission range over the COFDM link.

PRODUCT OVERVIEW

Highly Flexible DENG Platform

The E5750 is easily adaptable from fast-paced newsgathering to concerts and high-quality sporting events with its 4:2:0 and 4:2:2 encoding capabilities. The 2RU chassis allows up to five option cards, which enables a highly customized solution. Options include MPEG-2 HD or MPEG-4 AVC HD/SD encoding formats for lower bitrate, higher quality delivery. TANDBERG Television's powerful REMUX option card provides MPEG multiplexer and multi-channel MCPC capability.

D.C. Power and Remote Control Support for External Up-converters

ENG delivery can require additional amplification and external RF frequency conversion. The E5750 can support a TRIAX option card for transferring the modulated IF signal over large distances. The card provides DC power (+48V) to support an external, integrated up-converter and power amplifier for all established DENG frequency bands. For shorter cable distances between the DENG equipment and the TX antenna an internal RF up-converter card can be used

Dual Purpose DENG and DSNG Platform

The E5750 with an integrated COFDM modulator can also be equipped with a DVB-S2 modulator, which can provide up to 35% bandwidth savings for satellite applications. This provides a highly flexible dual-purpose platform for newsgathering operations, allowing news teams to decide the best method for delivery based on their needs at any given time.

Upgrade Paths to High Definition

The E5750 can be upgraded to provide either MPEG-2 HD or MPEG-4 AVC HD and SD. The ability to provide MPEG-2 is retained in both cases. Our MPEG-4 HD option has proven to be of great value to those finding that using MPEG-2 HD increases bitrate too much, causing transmission range and stability problems that using MPEG-4 HD solves.

BASE UNIT FEATURES

Voyager E5750 DENG (M2/VOY/E5750)

- COFDM modulator supporting all major DVB-T modes
- Input confidence monitoring
- Easy-to-use front panel with alphanumeric keypad and 8 soft keys
- Flexible expansion support – up to 5 slots available
- 16 fully adjustable operational configurations
- Selectable range of delay modes for low latency operation

HARDWARE OPTIONS

Note: Contact TANDBERG Television or an approved reseller to confirm which combinations of options are supported.

L-Band Satellite Modulator (M2/EOM2/SM3LBAND)

- Allows an L-Band satellite modulator to be added to the E5750
- The L-Band satellite modulator includes a switchable 10MHz reference and switchable block up-converter d.c. power. The modulator is hardware-ready for HOM and DVB-S2 as standard

IF Satellite Modulator (M2/EOM2/SM3IF)

- Allows an IF satellite modulator to be added to the E5750. The modulator is hardware-ready for HOM and DVB-S2 as standard.
- Audio Option Card (M2/EOM2/AUDLIN2)
- Two stereo pairs supported per card
- Analogue 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
- Up to two audio option cards may be fitted supporting a total of 6 stereo pairs in the unit

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 service name conflicts.
- 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

TRIAX Output Card (M2/EOM2/TRIAX)

- Provides a direct TRIAX interface for transferring the modulated IF signal over large distances. The card also provides DC power (+48V) from an additional PSU and in-band communications to support an external integrated up-converter and power amplifier. This is mounted close to the transmit antenna to minimize high-frequency cable losses.

Up-Converter Card (M2/EOM2/UPCON)

Provides an SHF output at final frequency. Up-converter cards are available supporting all of the existing and new DENG bands

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
- 10/100BaseT 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 / 100BaseT Ethernet physical interface
- Multicast or unicast capable
- Supports multiple SPTS streams

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
- Supports multiple SPTS streams

HDV Card (M2/EOM2/HDV)

- DV (FireWire) input connector
- Provides an ASI output
- Works with the REMUX option card
- Connects directly to an HDV camcorder or tape deck to provide a low-cost but high-quality solution for HD newsgathering
- Card will fit into any free option slot
- Host encoder is free to transmit an additional, simultaneous SD service

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

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

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

- For professional editing quality pictures 1.5 Mbit/s to 50 Mbit/s

RAS (M2/ESO2/RAS)

- Allows material to be protected from illegal viewing using TANDBERG Television's proprietary scrambling system
- Low symbol rate software option (M2/ESO2/LSYM) – for satellite modulator option
- Low symbol rate operation, down to 300 kSym/s, allows operation on a tight link budget using low power amplifiers and small dishes

8PSK/16QAM (M2/ESO2/SM38PSK, M2/ESO2/SM316QAM) – for satellite modulator only

- Higher order modulation upgrades

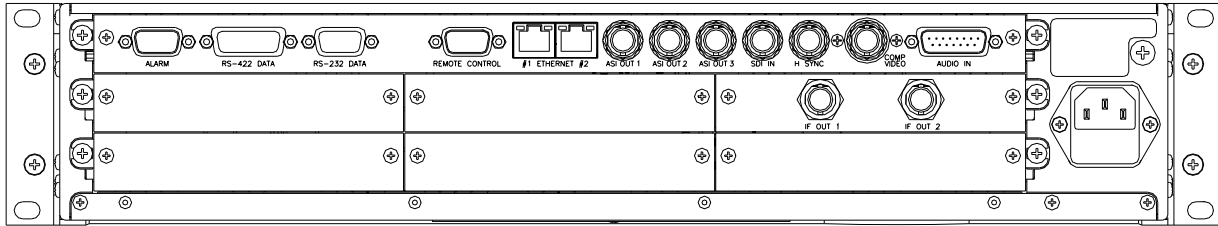
DVB-S2 QPSK and 8PSK (M2/ESO2/SM3S28PSK) / DVB-S2 16APSK (M2/ESO2/SM3S216APSK)

- DVB-S2 modulation upgrade

NABTS VBI Extraction (M2/ESO2/525VBIDATA)

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

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 600Ω/20kΩ

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

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

Outputs

OFDM Modulator

Main 70 MHz IF output, nominal 0dBm

Monitor 70 MHz IF output, -10dBm only with AVS boards

6, 7 or 8 MHz bandwidth

QPSK, 16QAM or 64QAM modulation

Selectable guard interval and FEC Rate

2k carriers or 8k carriers

Compliant to ETS 300 744

Transport Stream

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 Layer II Audio Encoding Standard

Encoding rates from 32 kbit/s to 384 kbit/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

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 signalling (WSS) 625 only

Time code from VITC

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Advanced Pre-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

Control

Front panel LCD with quick access keys

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 -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, IE60950