

HE4000

High-Definition and Standard Definition Encoder

HIGHLIGHTS

- ▶ *Modulated 70 and 140 IF and L-Band with internal 10MHz High Stability Reference*
- ▶ *DVB QPSK, 8PSK and 16QAM Modulator With One-Touch Control Buttons*
- ▶ *100/1000 Base-T IP with COP3 FEC*
- ▶ *DVB-S2 Modulator with QPSK, 8PSK & 16APSK*
- ▶ *DS-3 / E3 Interface*
- ▶ *4:2:0 or 4:2:2, 1 Mbps to 160 Mbps*
- ▶ *PGCA & BISS Conditional Access*
- ▶ *Superior Low Bit Rate performance*
- ▶ *Backlit Alphanumeric Full-Travel Buttons*
- ▶ *HD/SD operation & Internal Multiplexer*
- ▶ *Fully ATSC, MPEG-2 and DVB Compliant*
- ▶ *Broadcast Quality Video and Four Stereo Audio Channels*
- ▶ *Internal Remultiplexer available*
- ▶ *Composite PAL/NTSC, SDI & HDSDI Video Inputs*



DESCRIPTION

The HE4000 is Tiernan's industry-leading dual program video encoder, using the latest advanced Tiernan Technology to offer the unique combination of simultaneous high- definition and standard-definition video encoding. The HE4000's highly flexible design architecture enables custom configurations to suit any encoding requirement. The HE4000 can be ordered with a complete set of the most advanced features available today or ordered in a cost effective minimal configuration. Most advanced features are available as field software upgrades.

COST EFFECTIVE: In its minimal configuration, the HE4000 can simultaneously encode one HD and one SD video stream as well as up to four stereo audio pairs making it perfect for both HD contribution, distribution or ATSC multicast applications.

MAXIMUM FLEXIBILITY: The HE4000 can be equipped with an advanced satellite modulator making it the ideal encoder for both contribution as well as distribution. The HE4000 can be configured to eliminate the need for an external network interface by offering numerous data interface options including IP, COP3 IP, E3, DS-3, and others. The HE4000 includes front panel video and audio confidence monitors providing verification of input sources. The flexible architecture of the HE4000 allows for a future proof upgrade path to H.264 part 10 and other advanced encoding standards.

FLEXIBLE FEATURES: The HE4000 can be configured for ultra high-quality HD encoding, using Tiernan's PurePEG HD Technology which features an innovative combination of video pre-processing and analytical encoding for the highest picture quality. PurePEG HD Technology provides for improved picture quality, especially at lower HD bit rates. An auxiliary transport stream input provides for PSI/SI/PSIP tables to be multiplexed into the output transport stream. Additionally, an option module allows for the input transport stream to contain programs and/or components to be multiplexed with the transport stream generated internal to the HE4000.

The HE4000 provides for several output transport stream interfaces. ASI/SMPTE-310M are always included. All telephony, data and modulation interfaces are available.

The HE4000 has an embedded Web Browser Interface to allow for easy command and control programming. It also offers the options of RS-232 proprietary command line M&C, or via SNMP. Full local front panel control is standard.

SECURE TRANSMISSION: BISS Mode 1 and Mode E are supported by the HE4000, in addition to the Tiernan proprietary Privacy Guard Conditional Access (PGCA). PGCA is a fixed key scrambling system that is included as a standard feature in most Tiernan encoders and decoders. It is addressable, and allows the decoder addresses to be added or deleted from the authorization list using the HE4000 front panel or remote control interface.

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TECHNICAL SPECIFICATIONS

STANDARD FEATURES:

Audio:

Input:

Encoding:

- AES/EBU Digital Audio Input - Qty 4, 75 Ohm BNC
- Balanced Analog Audio - Qty 1, DB-9, Qty 4 optional
- Four Channels (Stereo Pairs) Total. Each Channel Independently Configurable For:
 - MPEG-1, Layer 2
 - Dolby® 2 Channel Encoding (AC-3 2.0)
 - Dolby® E/Uncompressed Supported via SMPTE 302M
 - Pass-Through (e.g. For Externally Encoded AC-3 5.1)
 - AES/EBU Embedded Audio

Standard Definition Video:

Inputs:

Pre-Processing:

Encoding:

- SDI (SMPTE-259M): Qty 1, 75 Ohm BNC
- Composite (PAL/NTSC): Qty 1, 75 Ohm BNC
- Tiernan's Proprietary **PurePEG** Artifact Reduction Technology
- One Channel, Who's Source May Be One of the Following:
 - SD SDI Input
 - Composite Input
 - Internal Video Test Pattern Generator

Encoding Supported:

- Flexible GOP Structures
- MP@ML 4:2:0 (1 to 15 Mbps)/422P@ML 4:2:2 (2.5 to 50 Mbps)

High Definition Video:

Input:

Loop-Through:

Pre-Processing:

Encoding:

- SDI (SMPTE-292M): Qty 1, 75 Ohm BNC
- SDI (SMPTE-292M): Qty 1, 75 Ohm BNC, Active Only When The Unit is Powered
- Tiernan's Proprietary **PurePEG HD** Artifact Reduction Technology
- One Channel, Whose Source May Be One of the Following:
 - HD SDI Input
 - Internal Video Test Pattern Generator

Encoding Supported:

- MP@HL 4:2:0 up to 80 Mbps/422P@HL 4:2:2 up to 160 Mbps
- Flexible GOP Structures
- 1080i (30, 29.97, 25, 24* fps) (1920 x 1080i or 1440 x 1080i)
- 720p (60, 59.94, 50, 48* fps)
- 480p (60, 59.94 fps)

Formats/Frame Rates:

Auxiliary Data:

- Synchronous: 1 bps to 20 Mbps, RS-422, DCE, Internal or External Clock Source
- Asynchronous: 1200 to 38400 bps, RS-232, DCE

Transport Stream Input:

- ASI, Up To 80 Mbps: Qty 1, 75 Ohm BNC

Transport Stream Output:

- ASI Output, 1 Mbps to 160 Mbps: Qty 2, 75 Ohm BNC
- SMPTE-310M Output, 19.392568 or 38.785316 Mbps: Qty 1, 75 Ohm BNC
- Optional, QPSK/8PSK/16QAM DVB Modulator:
 - 1 to 45 Msps
 - 70/140 MHz IF on 75 Ohm BNC: Qty 1
 - L-Band Output on 50 Ohm SMA: Qty 1
 - Monitor on 50 Ohm F-Type: Qty 1
- Optional DVB-S2 QPSK, 8PSK & 16QAM or 16APSK Modulator
- Optional G.703 E3/T3 Interface on 75 Ohm BNC
- Optional 100 or 1000Base-T IP with COP3 FEC
- Optional Chaining Multiplexer
- Additional Interfaces Available (Please Contact Tiernan Customer Service Department)

Management & Control:

- Embedded Web Browser Interface For Command & Control
- RS-232 Proprietary Command Line Monitor & Control
- Proprietary Command Line Monitor & Control Over Telnet
- SNMP
- Fully Featured Front Panel

Physical:

- 2RU - 8.9 cm High x 44.5 cm Wide x 53.3 cm Deep (3.5" x 17.5" x 21")
- Weighs Less Than 12.7 kg (28 lbs.)

Power Supply:

- Autoranging 90 to 132 VAC and 180 to 240 VAC; 50/60 Hz Universal Power Supply
- 100 Watts Typical

Operating Conditions:

- Ambient Temperature: 0° to +50°C

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