

HIGHLIGHTS

- MPEG-2 and MPEG-4 AVC SD/HD 4:2:0/4:2:2 8/10-bit encoding
- Broad SD/HD format support
- Low-delay mode
- Integrated modulator supporting DVB-S and DVB-S2 with roll-off factor up to 5%
- Simultaneous L-band, IP and DVB-ASI outputs
- User-friendly front-panel controls or web-based management
- BISS scrambling
- 1:1 stand-alone redundancy
- Eight stereo pairs of audio encoding
- ASI cascading
- Fast boot time



Ellipse® 3000 contribution encoders leverage Harmonic's industry-leading compression expertise and a flexible system architecture to bring new levels of video quality and workflow efficiency to broadcast contribution applications. Multifformat, multi-codec versatility, low latency and an optional integrated modulator make this all-new compression platform ideal for both digital satellite newsgathering (DSNG) and fixed contribution. A compact footprint and plug-and-play deployment deliver the additional benefit of low cost of ownership.

Ellipse 3000 encoders support all SD and HD MPEG-2 and MPEG-4 AVC codecs at 4:2:0 or 4:2:2 chroma subsampling and 8 or 10 bits. Fully firmware upgradeable, the encoders offer a smooth and cost-effective migration path from MPEG-2 SD 4:2:0 8-bit to AVC HD 4:2:2 10-bit compression schemes, making them among the most versatile contribution encoders available. Options for remultiplexing and cascading allow the devices to operate on a stand-alone basis with no need for external multiplexers or PSI generators.

At just 1 RU, compact and rugged Ellipse 3000 encoders are a perfect fit for DSNG vehicles, teleports and flyaway packages operating on the C, Ku or Ka bands. Two models are available, assuring the deployment of systems precisely tailored to a user's application:

- **Ellipse 3100**
For fixed contribution over IP networks; featuring simultaneous IP and DVB-ASI outputs
- **Ellipse 3200**
For DSNG applications; adds an integrated DVB-S/S2/DSNG modulator with simultaneous L-band, IF and DVB-ASI output

BUSINESS BENEFITS

Pristine Video Quality

The use of AVC HD 4:2:2 10-bit encoding enables the transmission of exceptionally vivid video, augmenting your ability to offer customers the highest video quality available.

“Pay-As-You-Grow” Scalability

Video codecs and formats are easily added in Ellipse 3000 encoders via firmware upgrade, enabling a scalable migration path that provides operational flexibility and business continuity and extends the system's value.

Low CAPEX and OPEX

The integrated modulator in the Ellipse 3200 eliminates the need to purchase costly external stand-alone devices for satellite uplink. DVB-S2 technology improves spectral efficiency by utilizing advanced coding techniques, delivering bandwidth savings up to 30% compared to DVB-S. The small system footprint and low power consumption inherent to both Ellipse 3000 encoders further reduce operating expenses.

Integrated Redundant Path Support

Simultaneous L-band, IF and DVB-ASI outputs on Ellipse 3000 encoders provide alternate distribution channels in the event of link failure.

Integrated Multiplexing

A single “master” Ellipse 3000 encoder can aggregate up to 50 Mbps of content from “slave” encoders into one MPTS output, eliminating the need for external multiplexers.

End-to-End Contribution Solution

Ellipse 3000 encoders are the perfect complement to Harmonic's ProView™ 7100 integrated receiver-decoder. Compress AVC HD 4:2:2 10-bit video with the Ellipse 3000, then use the ProView 7100 for decompression at the same sampling and bitrate, and the result is a contribution workflow with nearly lossless video quality.

Content Protection

Ellipse 3000 encoders help prevent signal interception with industry-standard BISS (Basic Interoperability Scrambling System) mode 1 and BISS-E encryption.

TECHNICAL BENEFITS

Video Encoding

Utilizing the industry's most advanced silicon and ASIC compression technologies, Ellipse 3000 encoders offer superior-quality compression at data rates up to 80 Mbps with CABAC (context-adaptive binary arithmetic coding).

Audio Encoding

Ellipse 3000 encoders support up to four stereo audio channels (or up to eight mono channels) as either embedded/AES or as two analog stereo channel inputs. A range of sampling rates, an internal sample rate convertor (SRC) and an advanced coding scheme ensure reliable and high-quality audio encoding.

Low Delay

Low latency on Ellipse 3000 encoders helps eliminate awkward pauses during handoffs between field and studio talent, and is available for all encoding modes.

Ease of Use

Controlled by a front-panel operating menu or web GUI, the simple Ellipse 3000 menu structure is specifically tailored for contribution applications, with frequently used, operation-critical controls available via hot keys.

Plug and Play

Fast boot times prepare Ellipse 3000 encoders for action right out of the box, and configuration presets allow multiple user settings to be saved and quickly recalled, increasing the ability to get on air fast. Switching between 4:2:2 low-delay and 4:2:0 modes, for instance, is easily accomplished on the GUI, eliminating the need to manually change settings for different production setups.

Resilience Against Packet Loss

In video-over-IP applications, Ellipse 3000 encoders employ the SMPTE 2022 protocol to minimize packet loss by inserting forward error correction (FEC) packets in the transport stream. These packets are used by the reception device to detect lost packets and automatically recover from losses when they occur.

Efficient Multicast of Multiple Services

Ellipse 3000 encoders support the creation of multiple single-program transport streams, which can be multicast to 16 different ports or IP addresses. A separate PSI is generated for each SPTS. Users may choose optional BISS scrambling with a separate scrambling key for each SPTS.

High-Speed Data Transmission over Satellite

The Ellipse 3200 encoder supports data transmission of up to 20 Mbps via ETSI EN301 192 DVB MPE encoding, which enables IP packet transmission via satellite using an MPEG-2 transport stream.

Modulated Outputs

The on-board modulator on the Ellipse 3200 offers DVB-S/S2/DSNG transmission modes with QPSK, 8PSK, 16QAM and 16APSK constellations. The encoder supports IF or L-Band outputs, which can directly feed the up converter, providing a very compact uplink package. The integrated modulator supports standard and extended roll-off factors of 15%, 10% and 5%, enabling highly efficient utilization of transponder bandwidth.

L-Band Monitoring

The Ellipse 3200 encoder's L-band monitoring output provides real-time, on-the-spot monitoring of modulated information as it is transmitted.

Compact Footprint

Ellipse 3000 encoders occupy just 1 RU without the need for ventilation space above or below, saving real estate and reducing power consumption.



Ellipse 3200 back panel

VIDEO

Video Compression	MPEG-2 SD 4:2:0 MPEG-2 SD 4:2:2 MPEG-2 HD 4:2:0 MPEG-2 HD 4:2:2 MPEG-4 AVC 4:2:0 SD MPEG-4 AVC 4:2:2 SD 8/10 bits MPEG-4 AVC 4:2:0 HD MPEG-4 AVC 4:2:2 HD 8/10 bits
Profiles and Levels	MPEG-2 MP@ML MPEG-2 M@HL MPEG-4 AVC MP@L4.0 MPEG-4 AVC HP@L4.0 Hi422P@L4.1
Video Formats	PAL NTSC
Resolutions	
480 (NTSC)	Auto, 720x480, 704x480, 640x480, 544x480, 528x480, 480x480, 368x480, 352x480, 352x240
576 (PAL)	Auto, 720x576, 704x576, 640x576, 544x576, 528x576, 480x576, 368x576, 352x576, 352x288
720	Auto, 1280x720, 960x720, 640x720
1080	Auto, 1920x1080, 1440x1080, 1280x1080, 960x1080
MPEG-2, MPEG-4 Pre-Processing	Scene cut detection Analog/digital time base corrector (TBC) to handle raw VTR outputs Automatic frame resizing Motion compensated temporal filter Noise reduction filters Low pass filter
MPEG-4 AVC Video In-Loop Processing	Deblocking filter

AUDIO

Number of Channels	Up to four digital stereo channels AES/EBU, embedded or two analog channels Up to eight digital channels AES/EBU, embedded or eight analog channels (optional)
Audio Formats	
Standard	MPEG-1 Layer 2 Dolby® Digital (AC-3) 5.1 passthrough
Optional	AC-3 2.0 MPEG-2 AAC LC MPEG-4 HE-AAC v1, v2 Linear audio passthrough Dolby-E passthrough
Operating Modes	Joint stereo, single channel, dual channel
Sampling Frequencies	32, 44.1, 48 kHz

VIDEO AND AUDIO INPUT

Video Inputs	Composite (PAL/NTSC) SD-SDI (SMPTE-259M) with EDH HD-SDI (SMPTE-292M) Support video loop-through
Audio Inputs	Four balanced XLR inputs Eight terminal block inputs (optional) Integrated sample rate converter (SRC)
DVB-ASI	Built-in multiplexer for encoder cascading Passive loop-through for cascading
Sync Lock	Black burst with loop-through capability
Data	Asynchronous RS-232 up to 115 Kbaud MPE (Multi Protocol Encapsulation) Up to 20 Mbps

VIDEO AND AUDIO OUTPUT

DVB-ASI	
Output Rate	350 Kbps-120 Mbps
Number of Connectors	Three for Ellipse 3100 One for Ellipse 3200
DVB Scrambling (optional)	
	BISS mode 1, BISS-E
IP Output	
	Dual GbE IP output, RJ-45, auto-negotiation Auto MDI/MDIX crossover UDP/RTP TOS, TTL configurable values SMPTE-2022 FEC (optional) M-SPTS support (optional)

SATELLITE MODULATOR OUTPUT (ELLIPSE 3200 ONLY)

L-Band	
DVB-S EN 300-421	QPSK
DVB-DSNG EN 210 301 (optional)	QPSK, 8PSK, 16QAM
DVB-S2 EN 302 307 (optional) Frequency	QPSK, 8PSK, 16APSK
Symbol Rate	950-1750 MHz (50 Hz steps)
Roll-Off Factor	50 kbps -15 Msps
Output Power	15%, 10% and 5%
Spurious Level	-50 dBm to -7 dBm (0.5 dB steps)
Monitoring Output Power	-65 dBc@-10 dBm
Monitoring Output Frequency	-45 dBm
Features	
	Transmit frequency Constant code rate modulation (CCM) 16 Kb and 64 Kb FEC block support Pilot mode External block up converter (BUC) support DC Feed for BUC up to 24 VDC 400 mA Selectable 10 MHz reference clock (in-band or external)
IF	
DVB-S EN 300-421	QPSK
DVB-DSNG EN 210 301 (optional)	QPSK, 8PSK, 16QAM
DVB-S2 EN 302 307 (optional)	QPSK, 8PSK, 16APSK
Frequency	50-180 MHz (1 kHz steps)
Output Power	-30 dBm to 5 dBm (0.5 dB steps)
Spurious Level	-65 dBc@ -10 dBm
Selectable Output Impedance	50 Ω/75Ω
L-Band Monitoring Output Power	-45 dBm
L-Band Monitoring Output Frequency	1080 MHz

SYSTEM MANAGEMENT

Remote	Web-based management, SNMP
Local	Graphical front panel with quick access keys and alphanumeric keypad
Software Upgrades	Via FTP
Dry Contact Alarms (GPI)	One output for various status and faults
Presets	Up to 60 different configurations

POWER

Input Voltage Range	90-260 VAC -48 DC (optional)
Consumption	Up to 88 W Up to 100 W (with DC power feed for BUC)

PHYSICAL

Dimensions (W x H x D)	17.1 in x 1.75 in x 19.1 in (1 RU) 43.9 cm x 4.4 cm x 48.9 cm
Weight	10 lbs/6 kg

ENVIRONMENTAL

Operating Temperature Range	+32° to +122° F 0° to +50° C
Storage Temperature Range	-4° to +158° F -20° to +70° C
Operating Humidity	85% non-condensing
Electromagnetic Compliance	FCC part 15 EN 55022, EN 55024
Safety	EN 60950 RoHS directive 2002/95/EC

