AVP 2000 / AVP 3000 Encoder

The AVP 2000 / 3000 Encoder has been designed specifically to address the demands of today's broad range of Contribution, DSNG, and Primary Distribution (C&D) applications delivering the most flexible solution in the market. Based on a compact 1RU form factor chassis with up to six hot swappable option slots with a single power supply unit (PSU), making it an ideal solution for the whole spectrum of high resilience to high density requirements. For applications demanding higher service resiliency then there is an option to have dual power supplies ensuring the unit delivers maximum performance, flexibility and reliability.

A comprehensive range of processing options are available in the AVP Encoder including MPEG-4 AVC and HEVC which depending on the modules deployed enable operators to encode multiple formats as ASI and/or IP outputs.

An integrated satellite modulator option offers high order DVB-S/S2/S2X modulation on both IF and L-Band outputs.

Standard definition, high definition and ultra high definition in 4:2:0 and 4:2:2 modes are supported and for highest quality feeds the unit supports both 10-bit precision and p50/59.94 frame rates.

A key aspect of the AVP is usability and it features a fully functional front panel to meet the demand of the contribution environment, including ease of operations, and quick menu access. In addition for those configuring the unit by PC a simplified user interface is available with all the commonly used controls on a single page. Overall the AVP offers broadcasters and network operators the most advanced video and audio compression technology available today and is key part of MediaKind's C&D portfolio which also include receivers, and control and management software for scheduling.

Product Overview

High Flexibility, Reliability and Serviceability

The AVP Encoder is the basis for the most efficient video compression engines available to the broadcast market.

The platform itself is designed to address both the need for density with up to six option slots and the need for high resilience by making all the option slots hot swappable and the addition of a dual PSU version of the chassis. A standard IP interface and a wide range of separate I/O options provide interfacing to multiple hybrid networks concurrently. This includes an integrated DVB-S and DVB-S2 satellite modulator providing high order modulation on IF and L-Band outputs. The AVP allows in-field serviceability, portability and system reconfiguration to address the widest range of C&D applications

Leading High Quality Compression

The AVP Encoder supports the CE-HEVC encoder module providing support for HEVC and MPEG-4 AVC video compression. Each module can encode a single UHD (4k) video service or up to 4 HD video services. It supports 4:2:2 or 4:2:0, 8 or 10-bit video, and can provide low and super low end to end latency encoding modes.

So the AVP Encoder pushes encoding efficiency, serviceability and upgradeability to new levels of excellence.

Efficient Use of Spectrum

It also supports DVB-S2 and DVB-S2X high order modulation on both IF and L-Band outputs. DVB-S2 gives a 30 % performance gain compared to DVB-S, and DVB-S2X gives up to 20% performance gain compared to DVB-S2.

Front Panel Operations

A front panel provides complete unit control in mobile environments. Its unique ergonomic new design is the result of development based on industry feedback and includes:

- Rotary control for fast selection and key-pad for easy value insertion

- Quick access menus specifically designed for mobile operations with customizable shortcuts and ample configuration storage

- Audio metering

Base Unit Features

- Six slot single PSU AVP2000/BAS/1AC/A

- Four slot dual PSU AVP2000/BAS/2AC/A

- Six slot dual PSU with Flying Leads AVP2000/BAS/2ACFL/A

Base Chassis Functionality

- Control via 2x electrical Ethernet (100/1000BaseT)

- Data I/O via 4x electrical Ethernet (100/1000BaseT) with optional in-band control over Data I/O

- License keys stored with option cards for maximum portability

- Multiplexing and MPEG-2 Transport Stream generation

- SMPTE 2022-1/-2 (Pro-MPEG) FEC on a single SPTS/MPTS

- Encryption of output MPEG-2 Transport Stream using Basic Interoperable Scrambling System (BISS) for secure contribution links Supports BISS modes 0,1and E

- SI table generation

- Service level Remux (Requires AVP/HWO/ASI/IO/A)

Platform Processing Capacities

- Up to four CE-HEVC modules

- Multiple concurrent I/O options

Basic Modulation Value Pack[1]

- DVB-DSNG 8PSK and 16QAM modulation

- DVB-S2 QPSK and 8PSK

- Enable extended symbol rate range from 45 Msym/s to 66 Msym/s

Advanced Modulation Value Pack[1]

- DVB-S2X MODCODs and FECs.

- Higher order modulation support of DVB-S2 QPSK, 8PSK, 16APSK, 32APSK and 64APSK

[1] Only available when the when the AVP/HWO/SATMOD/A card is fitted

Hardware Options

CE-HEVC Series Encoder Modules
(CE/HWO/CE-HEVC/BNC/A)

(CE/HWO/HEVC/SFP/B)

- Up to four modules per chassis depending on configuration
- 4 x 3G/HD/SD-SDI, video input
  /BNC variant co-axial cable inputs
  /SFP variant has SFP slots
- 1 UHD or 4 HD encodes per module[2]
- HEVC and MPEG-4 AVC encoding capabilities[2]
- 4:2:0 and 4:2:2 chroma sampling modes
- 8 or 10-bit precision
- 1 Mb/s to 100 Mb/s video bit-rate[2]
- Multiple low latency modes
- Up to 32 stereo pairs of audio encoding and pass -through[2]
- VANC data extraction and support for generic VANC (SMPTE 2038)

External Synchronisation Module
(CE/HWO/EXTSYNC/A)

- One slot per module. Up to one module per chassis
- Supports synchronization of all encoders in the chassis to support single PCR operation
- 10 MHz or HSYNC input

ASI I/O Module
(CE/HWO/ASI/IO/A)

- One slot per module
- 2 x ASI MPEG-2 Transport Stream outputs configured as mirrored or independent (230Mbps max shared between 2 outputs, 200Mbps max on any 1 output).
- 2 x ASI inputs for Transport Stream pass-through to SatMod

G703 Module
(CE/HWO/G703/A)

- One slot per module
- Supports E3 and DS3 output connectivity

GPI Module
(CE/HWO/GPI/A)

- One slot per module
- Supports GPO relay triggers for "Alarm" and "Failure" modes
- Supports manual SCTE-35 splice point insertion

Satellite Modulator
(AVP/HWO/SATMOD/A)

- SatMod card for DSNG

---

[2] *Exact capabilities depend on module and Value Packs; please refer to CE-HEVC datasheet for a more detailed description.*

Specifications

Transport Stream Interfacing

Input	2x Electrical Ethernet (100/1000BaseT)
Output	2x Electrical Ethernet (100/1000BaseT) Physical port redundancy with active-active and active-standby operation Multicast streaming

Satellite Modulator

Satellite Modulator	Base unit supports both 70 MHz IF output and L-band output. DVB-CID support. Signal conditioning: EN 300 421 (DVB-S) and option for EN 301 210 (DVB-DSNG) EN302-307 (DVB-S2) Modulation: QPSK and option for 8PSK, 16QAM, DVB-S2 QPSK, 8PSK, 16APSK, 32APSK DVB-S2X QPSK, 8PSK, 16APSK, 32APSK, 64APSK (Roll Off 0.05, 0.10, 0.15, 0.20, 0.25 0.35) Symbol Rate: 1 Msym/s to 45 Msym/s (variable in 1 Sym/s increments). Optional extension to 66 Msym/s
FEC Rates	FEC rates: 1/2, 2/3, 3/4, 5/6 and 7/8 (DVB-S QPSK) 2/3, 5/6 and 8/9 (DVB-DSNG 8PSK) 3/4 and 7/8 (DVB-DSNG 16QAM) 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9 and 9/10 (DVB S2 QPSK) 3/5, 2/3, 3/4, 5/6, 8/9 and 9/10 (DVB-S2 8PSK) 2/3, 3/4, 4/5, 5/6, 8/9 and 9/10 (DVB-S2 16APSK) 3/4, 4/5, 5/6, 8/9 and 9/10 (DVB-S2 32APSK) 13/45, 9/20, 11/20 (DVB-S2X QPSK) 23/36, 25/36, 13/18 (DVB-S2X 8PSK) 5/9, 26/45 (DVB-S2X 8APSK-L) 26/45, 3/5, 28/45, 23/36, 25/36, 13/18, 7/9, 77/90 (DVB-S2X 16APSK) 5/9, 8/15, 1/2, 3/5, 2/3 (DVB-S2X 16APSK-L) 2/3 (DVB-S2X 32 APSK-L) 11/15 (DVB-S2X 64 APSK) 32/45, 7/9, 4/5, 5/6 (DVB-S2X 64 APSK-L)
IF Output Option	IF frequency: 50 MHz to 180 MHz (1 kHz steps) Output power: -30 dBm to +5 dBm (0.1 dB steps) Monitor output: -30 dB relative to main IF output
L-band Output Option	Frequency: 950 MHz to 2150 MHz (1 kHz steps) Output power: -40 dBm to +5 dBm (0.1 dB steps) Monitor output: -30 dB relative to main output Switchable up-converter power: +15 V and 24 VDC, 500 mA max. Switchable 10 MHz reference

Management

Management	2x Electrical Ethernet (100/1000BaseT) SNMP v1/v2/v3, for alarm traps User management via web browser Fully functional front panel control Support by nCompass

Physical and Power

Dimensions (W x H x D)	44.20 x 4.45 x 59.69 cm (17.40 x 1.75 x 23.5 inches)
Weight	8.0 kg (17.6 lbs) unpopulated
Input Voltage	100-240 VAC 50/60 Hz
Input Power	50W (chassis only) Up to 350W (depending on option modules fitted)

Environmental Conditions

Operating Temperature	-10°C to +50°C (14°F to 122°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Relative Operating Humidity	10% to 90% (non-condensing)

Compliance

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