MediaKind CE-a Series Option Module

The CE-a Series encoder module represent the highest density, multi-functional, platform for Contribution and Primary Distribution (C&D) applications.

The ability to fit up to six hot swappable modules within a single AVP chassis enables broadcasters, operators and service providers to dimension their networks in the most cost-effective way for the needs of today allowing functionality to be upgraded gradually, future proofing investment. The CE-a module is built on a flexible platform capable of encoding both MPEG-2 and MPEG-4 AVC, while supporting C&D specific low delay modes, professional audio encoding, pass-through standards and generic VANC carriage.

The encoder module provide a uniquely modular software upgradeable solution that allows customers to exploit the advantages of MPEG-4 AVC compression, while maintaining compatibility with the existing generation of MPEG-2 Video based networks.

In conjunction with the extremely flexible multiple I/O options of the AVP chassis, the CE-a encoder module can be used in the widest variety of satellite and terrestrial networks.

Product Overview

Outstanding Innovation Delivers the Most Dense Contribution and Distribution Encoder

The CE-a option module is the latest addition to the AVP Contribution Encoder range. Based on two decades of encoder design experience, the CE-a option module provides multi-functional video encoding for 4:2:0 contribution and distribution applications. The ability to fit up to six multi-format hot-swappable modules in a single AVP chassis provides unmatched flexibility and cost-effective density.

Hot Swappable Support

The CE-a module is hot swappable to allow on-site servicing, unit re-purposing and maximum portability.

Software Upgradeability

The CE-a module is based on the same future-proof, software upgradeable platform as the rest of the AVP platform. This enables users to dimension their networks for the needs of today, ensuring the most cost-effective path to tomorrow's expansions.

Maximum Flexibility

The ability to fit multiple multi-codec encoder modules within a single chassis, support multiple concurrent and independent outputs, contribution and distribution audio format and the carriage of generic VANC data allows customers to target the widest variety of applications across a multitude of different networks.

Efficient Use of Spectrum

The CE-a module delivers compression efficiency that allows at least 30 percent or more bandwidth savings compared to MPEG-2 Video at contribution rates.

Option Module Features

CE-a Encoder

(CE/HWO/CE-a/A)

- Single slot per module. Up to six modules per chassis depending on configuration
- HD/SD-SDI, video input
- Digital AES-EBU and embedded SDI audio input
- Generic VANC extraction and carriage (SMPTE 2038)
- Test pattern and test tone generators
- Hot swappable

Supported Modules

The CE-a module is purposely built on a single software upgradeable platform. This dedicated hardware allows the encoder to be configured exactly for the needs of the network, while maintaining the portability, the re-purposing capabilities and the easy upgrade path required by today's flexible contribution and distribution operations.

The ability to fit six hot swappable software upgradeable modules within a single chassis, provides service providers, operators and programmers with the most dense and cost-effective solution for 4:2:0 video delivery and the ability to dimension any infrastructure for the needs of today, while maximizing future expansion and return on investment.

The following table lists the profiles and capabilities, feature set is decided by adding Value Packs to the base card. Additional Value Packs can be added at any time.

Value Packs

SD Value Pack

(CE/SWO/VP/a/SD)

- MPEG-2 SD encode
- MPEG-4 SD encode
- 2 x 2.0 MPEG-1 LayerII audio encode
- Splice point conditioning
- Motion Compensated Temporal Filtering

HD Value Pack

(CE/SWO/VP/a/HD)

- MPEG-2 SD encode
- MPEG-4 SD encode
- MPEG-2 HD encode
- MPEG-4 HD encode
- 4 x 2.0 MPEG-1 LayerII audio encode
- Splice point conditioning
- Motion Compensated Temporal Filtering

Audio Contribution Value Pack
(CE/SWO/VP/CONT/AUDIO)

- Phase Aligned Audio (PAA)
- 2 x 2.0 MPEG-1 Layer II audio encode

Additional MPEG-1 Layer II Encoding
(CE/SWO/M1L2)

- Enables one pair of MPEG-1 Layer II Audio encoding
- Up to six additional pairs of audio per encoder module can be supported to make a total of eight pairs per module
- NOTE: 2 licenses are included as standard

Dolby® Digital Stereo Encoding
(CE/SWO/DOLBY/AC3)

- Enables one pair of Dolby® Digital (AC-3) stereo audio encoding
- Up to six independent pairs per encoder module can be supported

Advanced Audio Coding
(CE/SWO/AAC)

- Enables one pair of Advanced Audio Coding (AAC-LC, HE-AAC, HE-AACv2) stereo audio encoding
- Up to six independent pairs per encoder module can be supported

Phased Aligned Audio (Patent Pending)
(CE/SWO/PAA)

- MediaKind Phase Aligned Audio algorithm for 5.1 and 7.1 audio carriage in contribution and distribution networks
- Requires at least three pairs of MPEG-1 layerII audio encoding enabled

Dolby Digital Audio Value Pack
(CE/SWO/VP/DOLBY/AC3)

- 1 x 2.0 Dolby Digital audio encode
- 3 instances required for 5.1

AAC Audio Value Pack
(CE/SWO/VP/AAC)

- 1 x 2.0 AAC audio encode
- 3 instances required for 5.1

MPEG-1 LayerII Audio Value Pack
(CE/SWO/VP/M1L2)

- 1 x 2.0 MPEG-1 LayerII audio encode

Specifications

CE-a Video and Audio Encoder Option Module

CE-a Video and Audio Encoder Option Module	Single slot per module One to six CE-a option modules per chassis Full support for module level hot swap

Inputs

Video	HD/SD-SDI serial digital video with EDH error detection and health monitoring HSYNC support for single PCR operation (separate hardware option for HSYNC input) Input Level 800 mV ptp ±10 percent Return loss >15 dB, 10 MHz to 270 MHz
Audio	Up to eight stereo pairs embedded on HD-SDI Up to four stereo pairs via AES EBU (Connector via D-Type to XLR) Supports both balanced (AES3) and unbalanced (AES3id) digital audio inputs 48 kHz sampling rate

Advanced Pre-processing

Advanced Pre-processing	Clarus™ professional grade adaptive spatial and temporal noise reduction, offering four adaptive levels (option) Frame re-synchronization Scene cut detection and I-frame insertion

Video Encoder

Video Encoder	MPEG-4 AVC Main Profile @ Level 4.0 (CE/SWO/VP/a/SD) MPEG-4 AVC High Profile @ Level 4.0 (CE/SWO/VP/a/SD) + (CE/SWO/VP/a/HD) MPEG-2 Video Main Profile @ Main Level MPEG-2 Video Main Profile @ High Level (CE/SWO/VP/a/HD) 1 Mbps to 25 Mbps bit-rate range CABAC entropy encoding Manual CABAC switching-point override (CE/SWO/VP/a/SD) Triple pass "Pixel Perfect" fully exhaustive motion estimation CBR and Low Delay modes GOP processing includes adaptive GOP structure and adaptive GOP length
Video Resolutions	Only with CE/SWO/VP/a/HD Value Pack 1920, 1440 x 1080i 25 1920, 1440 x 1080i 29.97 1280, 960 x 720p 50 1280, 960 x 720p 59.94 Only with CE/SWO/VP/a/SD or CE/SWO/VP/a/HD Value Pack 720, 704, 640, 544, 528, 480, 352 x 576i 25 720, 704, 640, 544, 528, 480, 352 x 480i 29.97

Audio Encoder

Audio Encoder	Up to 8 x stereo audio channel processing
MPEG-1 Layer II encoding standard	Encoding rates from 32 kbps to 384 kbps, up to 8 pairs
Dolby® Digital (AC-3)	Encoding rates from 56 kbps to 640 kbps (option) - maximum of 6 pairs Pass-through of pre-encoded Dolby Digital, up to 8 streams
Advanced Audio Coding	Encoding of AAC-LC (64 kbps to 320 kbps), HE-AAC (48 kbps to 128 kbps) and HE-AACv2 (32 kbps), up to 6 pairs
Dolby®E pass-through	Up to four streams
Up to four streams	Up to four independent stereo pairs
Phased Aligned Audio (PAA)	Encoding of 6 or 8 audio channels with time synchronous samples

Ancillary Data

Ancillary Data	SMPTE 334-1 Closed Captions SMPTE 2016-3 AFD and Bar Data SMPTE 12-2 Time code extraction and carriage (ETSI TS101 154) SMPTE 2038 Generic VANC data extraction, up to 2 Mbps

Features

Features	Internal test tone and test pattern generation Auto switching on loss of input source to test pattern, last good video frame with selectable text message Optional PID elimination on loss of input

Physical and Power

Approximate Weight	0.33 kg (0.73 lbs) per CE-a/A option module
Power Consumption per module	Less than 40 Watts

Environmental Conditions

Operating Temperature	-10°C to 50°C (14°F to 122°F)
Operating Humidity	< 95% non-condensing