CE1

Contribution Encoder

The CE1 Contribution Encoder is an essential part of MediaKind's Contribution and Distribution offering, which enables live events to be captured reliably, in the highest possible quality and with low transmission latency and bandwidth.

The CE1 is the latest generation of contribution encoder from MediaKind and provides exceptional performance, low latency video compression capability, with the additional benefits of support for the latest IP standards such as UHD SMPTE ST 2110, SRT, RIST and Zixi as well as BISS-CA encryption to prevent unauthorized access to valuable, high quality contribution feeds.

The satellite modulator output option is available for news gathering applications making MediaKind CE1 the 7th generation DSNG platform.

The CE1 provides a highly flexible contribution encoding platform that can provide basic MPEG 4:2:0 8 bit HD video encoding all the way up to the highest quality, low bitrate HEVC 4:2:2 10 bit UHD, High Dynamic Range, Wide Color Gamut video encoding. It also offers lossless light compression using JPEG-XS

A basic CE1 can be configured today and easily upgraded when required by the addition of software licenses, or hardware option cards.

In a world of rapidly changing standards and technology it is important to invest in equipment that offers confidence in future-proofing.

The CE1 is based on a ruggedized X86 server platform, with four PCIE option card slots, giving it great potential to support new standards and protocols as they are developed and adopted.

Product Overview

Multi-Channel Contribution Encoder

The CE1 is a compact, flexible, multi-channel contribution encoder capable of addressing a wide range of use cases. It can be configured to meet your exact requirements through the simple range of hardware and software options, and can be easily upgraded in the future as your needs change.

Encoding flexibility

4:2:0 8 bit MPEG-4 AVC or HEVC encoding can be provided using just the CE1 base unit processing power, but for UHD and 4:2:2 10 bit support with low latency mode the additional processing power required is provided by an video encoding option card.

JPEG-XS can be performed on the CE1 base unit without the accelerator card. Up to 16 JPEG-XS is possible on the G9 Server.

All IP Workflow

The CE1 supports an IP workflow using SMPTE ST 2110 for inputs, and SRT/RIST/Zixi for IP outputs. An optional 25G Ethernet NIC is available to enable SMPTE ST 2110 input up to UHD resolution.

The CE1's inclusion of NMOS IS-04 and IS-05 provides the connection management for this type of workflow.

Secure Delivery of High Value Content

With the value of content, particularly high quality, high value content such as UHD sports content increasing, it remains important to prevent unauthorized access to it. The CE1 supports BISS-CA, the latest 128 bit, rotating key, content protection standard, as well as the long established BISS-1/E encryption

Contribution to public cloud

As content production and playout in public or private cloud instances begins to be adopted, the ability to push content in to the cloud, even over unmanaged and error prone networks becomes important. The CE1 can provide support for SRT (Secure Reliable Transport), RIST and Zixi to ensure error free contribution to the cloud and RTMP to publish directly to Social Media platforms.

Automated High Availability

For outside content providers who need to transmit the highest quality live events, high reliability and availability is provided by the CE1. MediaKind removes the single point of failure by processing the streams in a 1+1 active/active configuration, unaided by any separate management system while maintaining PTS & PCR alignment. This results in a standalone automated seamless switch, whether a TSoIP, SDI or SMPTE ST 2110 workflow.

Unit Features

The CE1 base unit is a compact single 'RU' unit that is only 560 mm deep, thus fitting in standard racks and flight cases as well as OB environments.

Dual hot swappable power supplies help provide the reliability required when covering premium events.

There are four option card slots which enables a wide range of options to be supported so that the unit can not only be customized to meet your needs today, but can easily have its capabilities expanded in the future if required.

The option cards available include:

- SDI Input (4 x SDI ports) with an additional External Sync input
- Dual 25GbE NIC with SMPTE ST 2110 acceleration
- Dual 10GbE NIC with SFP+
- Encoder Accelerator card for 4 x HD or 3 x1080p or 1 x UHD for low latency 4:2:0 or 4:2:2 MPEG-4 AVC and HEVC compression
- ASI Input/output (4 ports)
- Satellite Modulator

The CE1 feature licenses include:

- HD (includes SD) and UHD encode licenses containing audio encode and pass-through capabilities
- Advanced Stream Processing that includes multiplexing, SRT, RIST and Zixi
- Content Protection that enables BISS-CA encryption (BISS-1/E encryption is included as standard)

Specifications

I/O Connectivity

SDI Input	SDI option card: Provides 4 x HD SDI or 4 x 3G SDI or 1 x 12G SDI inputs *HD SDI: SMPTE 292M* *3G SDI: SMPTE 424M* *12G SDI SMPTE 2082* *Embedded Audio: SMPTE 299M (HD)* *SDR/HDR Signalling: SMPTE ST 425-5* *External sync Genlock (Black and burst)*
IP Input/Output	**Base unit** 2 x 100/1000BaseT Ethernet ports via RJ45 connector **Dual 10GbE NIC option card:** Dual SFP+ cages 10GBASE optical transceivers or 10Gbe SFP DAC **Dual 25GbE NIC option card:** Dual SFP28 cages Can support 1GbE, 10GbE or 25GbE Can provide hardware acceleration for SMPTE ST 2110 input *Note: SMPTE ST 2110 input requires the dual 25GbE NIC option card.*
ASI Input/Output	**ASI option card:** Provides 4 x ASI configured as Inputs or Outputs Connector: 4 x B NC (F) 75 Ohm Max. input rate: 208 Mbps Packet length: 188/204 byte packets Standard: EN50083-9
Satellite Modulator	RF output - SMA 50 Ohm connector RF monitoring output - SMA 50 Ohm connector 10MHz Input/Output reference - SMA 50 Ohm connector

Control and Monitoring

Front Panel	Limited control and monitoring is available through the front panel keypad and display.
IP	Full control and status monitoring is provided via: • Web browser user interface • REST API *Note: If control and monitoring is required via an option card network port contact your MediaKind representative for availability.*

Video and Audio Processing

Video and Audio Input	**SDI** (requires SDI option card) 4 x SD 480i/576i or 4 HD 1080i/720p inputs for 4:2:0 encoding 4 x 1080i/720p inputs or 3 x 1080p or 1 UHD input for 4:2:0 or 4:2:2 encoding UHD SDI input can be either 4 x 3G SDI or 1 x 12G SDI **SMPTE ST 2110** (requires Dual 25GbE NIC option card) SMPTE ST 2110 support: -20 (video) support for UHD, 1080p, 1080i and 720p at 4:2:2 10 bit formats. -30, -31 (audio) support for up to 6 channels (for 5.1) in 0.125ms or 1ms audio packets -40 (data) support for AFD, CC, SCTE104, SMPTE 2031 and OP-47 Teletext AMWA NMOS IS-04 & IS-05
Video Encoding	**UHD*** 4:2:2 10 bit or 4:2:0 8 bit HEVC encoding 2160p 23.98, 24, 25, 29.97, 50 or 59.94 frame rates Standard latency and low latency mode **HD multiple channels** 4:2:2 10 bit* or 4:2:0 8 bit MPEG-4 AVC or HEVC encoding 4:2:0 8 bit MPEG-2 encoding Single channel HD MPEG-2 4:2:2 1080i25/29.97 or 720p50/59.94 or 1080p50/59.94 frame rate CBR output Standard Latency , Low latency mode* **SD multiple channels** 4:2:0 8-bit MPEG-2, MPEG-4 AVC or HEVC 4:2:2 8-bit MPEG-2 480i 29.97, 576i 25 Standard Latency *Requires the Encoder accelerator Card
Audio Encoding	MPEG-1 Layer-II, AAC, HE-AAC, HE-AAC v2 Dolby Digital® 2.0 / 5.1, Dolby Digital Plus® 2.0, 5.1, Dolby AC-3®
Audio Pass-through	Dolby E® Dolby Digital®, Dolby Digital Plus® Linear PCM (as SMPTE 302)

All processing functions need the appropriate software licenses to have been purchased

Output Stream Processing

Transport Stream Output	Single or multi-service MPEG Transport Stream(s) UDP or RTP encapsulated RTMP/RTMPS
Encryption	BISS v1 Mode 1 and E BISS v2 Fixed Key and CA Mode SRT and RIST* Encryption modes (fixed key 128/256 AES)
SRT, RIST* and Zixi	SRT listener and caller RIST Zixi sender
High Availability	Automated (standalone) 1+1 **output** synchronisation with PTS alignment (either SDI or ST 2110 inputs)

Satellite Modulator

Connectivity	RF output - SMA 50 Ohm connector RF monitoring output - SMA 50 Ohm connector 10MHz Input/Output reference - SMA 50 Ohm connector	
RF output	L-Band frequency range L-Band Output Power IF frequency range IF output Power IF Monitor Output power	950 MHz to 2150 MHz by 1 KHz step -35 dBm up to +5 dBm (0.1 dB steps) 50 MHz to 180 MHz by 1 Hz step -35 dBm up to +5 dBm (0.1 dB steps) -20dB on the RF output
Modulation	Type: Constellation: Roll-off: Symbol rate:	DVB-S, DVB-DSNG, DVB-S2, DVB-S2X QPSK, 8PSK, 16APSK to 32APSK** DVB-S/DSNG: 35 % DVB-S2: 20, 25 or 35 % DVB-S2X: 5, 10, 15, 20, 25, 35 % 0.05 to 36 MSym/s**
Other functions	Carrier ID insertion Spectrum inversion Test mode: PRBS, Dummy PL frame, Carrier ID only Configurable option to switch off / mute output at startup	

** Please contact MediaKind for higher symbol rates

Physical and Power

	M2 Base Unit	G9 1067 Base Unit
Dimensions (W x D x H)	440 x 560 x 44mm (17.2 x 22 x 1.75“ approx.)	438 x 781 x 43.2mm (17.2 x 30.8 x 1.75" approx.)
Input Voltage	110 VAC / 240 VAC	90-264 VAC
Power Consumption	550 Watt max	840 Watt max
Cooling	Integrated fans	Integrated fans

Environmental Condition

	M2 Base Unit	G9 1067 Base Unit
Operating Temperature	0°C to 50°C (32° to 122°F)	10 to 35°C (50 to 95°F)
Storage Temperature	-20°C to 65°C (4° to 150°F)	-40 to 70°C (-40 to 158°F)
Relative Humidity	5% to 95% (Non-condensing)	50 to 90% (Non-condensing)

Compliance

	M2 Base Unit	G9 1067 Base Unit
Compliance	CE Marked in accordance with all applicable EU and UKCA Directives	
EMC Compliance	EN 55011: 2016 + A11:2020, EN 55032: 2015 + A11:2020, EN IEC 61000-6-4: 2019, EN 61000-3-2: 2019, EN 61000-3-3: 2013 + A1:2019, EN 55035:2017 + A11:2020, ETSI EN 300 386 V2.2.1 FCC 47 CFR Part 15 Subpart B, ANSI	EN 55032:2015 +AC:2016, EN 55035:2017 +A11:2020, EN61000-3-3:2013 +A1:2019, EN 61000-3-2:2019, FCC 47 CFR Part 15 Class A digital device (USA)
Safety Compliance	EN 62368-1:2014, UL 62368-1, 2nd Edition 2014-12-01, CSA C22.2 No. 62368-1-14	EN 62368-1:2020 +A11:2020
RoHS Compliance	EN IEC 63000:2018	
REACH	REACH Regulation (EC) No 1907/2006	