

High Density 8-bit SMPTE ST-2110 to IP Encoder

The DenzCoder platform consists of eight-bit and ten-bit encoders/decoders. They support high density SMPTE ST-2110 applications with a focus on encoding, decoding and transport. Both eight-bit and ten-bit DenzCoders come in 1RU (up to 2 nodes) or 2RU (up to 4 nodes) form factors.

Eight-bit encoding provides closed caption support and is used primarily for confidence monitoring or IPTV streaming applications which require only closed caption. Ten-bit encoding adds support for full ancillary metadata (CC, SCTE 35, etc) for broadcasting applications.

Each node in both the 1u or 2u form factors can either encode or decode. The only limitation is that you cannot do both on the same node at the same time.

Each node can simultaneously encode multiple streams, or decode multiple streams. With one encoder or one decoder, you can simultaneously encode or decode as many streams as you wish, subject only to the hardware resources provisioned on that node.

You can easily configure a node to encode, and subsequently, reconfigure it to decode.

DenzCoder's unique strength derives from the efficiency of its very high speed networking. 25 Gbps fiber adapters are beginning to become common. Each DenzCoder node features not one, but *two* 25Gbps ports, plus a third GBE port. More importantly, only DenzCoder has software that can "pipeline" the streams coming in or going out to those network cards fast enough to get them to the CPU for processing. *No other vendor can match this.*

Because of its unique design, the DenzCoder family can achieve latencies as low as 3 frames on encode and 4 frames on decode. *We lead the market with this capability. The DenzCoder platform therefore, is demonstrably ahead of all competition in latency and density.*

The DenzCoder 8-bit Encoder Platform comes as either a 1u rackmount (1-2 nodes/blades) or a 2u rackmount (1-4 nodes/blades) SMPTE ST-2110 to IP encoder. (1-2 nodes/blades) SMPTE ST-2110 to IP encoder. It is designed for ultra high density IP packet transport via its 50Gbps network interfaces (2 x 25Gbps) per node. Its primary

purpose in encoding is for monitoring, or broadcast applications in which the program content is limited to 8-bit, as in cases where closed caption is metadata required.

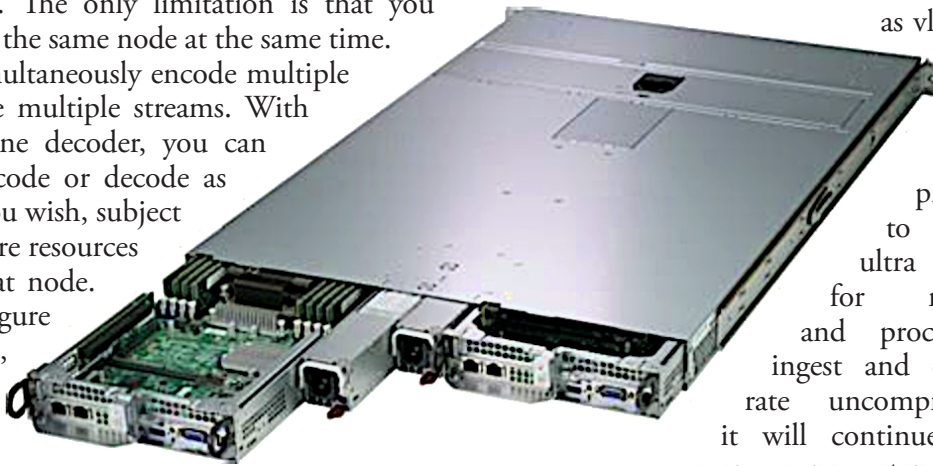
The DenzCoder encodes and transports the uncompressed 8-bit SMPTE ST-2110 input to compressed streams, from your 2110 network to other network hosts. From there streams can be monitored or distributed. Typically, the output might be high-quality, low-latency h.264/AAC MPEG encoded transport streams (1-300Mbps each), via udp or rtp protocol. Output may be unicast or multicast, depending on your routing needs. These output streams

can serve for monitoring with a client such as vlc, or for routing to other hosts for other purposes such as archiving.

The platform allows production facilities to concentrate numerous ultra high density streams for manageable transport and processing. Its ability to ingest and encode such very high rate uncompressed streams means it will continue to serve its purpose even as new standards bring ever greater resolutions to media streaming. It enables smart and efficient management of 2110 production work flows.

High quality real or near-real-time encoding/decoding, with latency as low as three frames becomes a simple question of populating and provisioning the nodes correctly. Choosing the right DenzCoder TV model consists of "rules of thumb," such as four cores per stream for SMPTE ST-2110 to IP (or two to three cores vice versa). Both 1u and 2u form factors feature 2nd Gen Intel® Xeon processors, with two sockets per node, and up to 28 cores, plus a GPU to supercharge transcoding. Each node can be populated with up to 4TB memory. Both feature redundant power supplies, of course.

Once encoded, you can transport the streams with our RIST error correction protocol products. This enables the encoded outbound streams to be sent over public IP with our own LibRist technology, with no packet loss to distribution points. In effect, the DenzCoder builds bridges from the islands in which the acquisition devices for the industry preferred 2110 standard may be currently isolated.



System Overview DenzCoder 8-Bit

Encoding

- MPEG-4/AVC High/High422 (8-bit) up to 50Mbps
- Low latency - 30-80ms encode latency
- CBR and Constrained VBR Input/INPUT
- Uncompressed IP (SMPTE 2022-6/7 and SMPTE 2110)
- Bars and tone with editable text on signal-loss

Video

- 1080i @ 25, 29.97Hz
- 1080p @ 23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
- 720p @ 50Hz, 59.94Hz, 60Hz
- 576i @ 25Hz (PAL)
- 480i @ 29.97Hz (NTSC)

Audio

- (up to 8 stereo pairs)
- MPEG-1 Layer II audio (MUSICAM)
- AAC-LC (HE-AAC is too high latency)
- SMPTE 302M
- Opus

Metadata

- CEA-608/CEA-708 captioning
- Timecode passthrough

Multiplexing

- MPEG Transport Stream with full T-STD compliance

Output

- UDP/RTP (including 2022-7 seamless switching)
- SMPTE 2022 FEC
- RIST ARQ for public internet delivery

Hardware

CPUs/Memory (per node)

- Dual Socket P (LGA 3647) 2nd Gen Intel® Xeon® Scalable Processors (6230R is our standard)
- Up to 28 Cores
- 96 GB RAM, Up to 4 TB Memory total
- Intel® C621 chipset

I/O (per node)

- 6 Gbps SATA 3
- Dual Port 25 Gbps Fiber Network Adapters (SFP28/SFP+/SFP)
- 1 RJ45 GBE LAN (*usually used for management, SNMP, etc.*)

GPU

- Nvidia Quadro series

Power/Physical

- 2200W Redundant Power Supplies with PMBus; 1200W with Input 100-127Vac
- Dimensions: 437 x 44 x 718 mm (2u form factor); 438 x 88 x 774 mm (4u form factor).

Decoding

- MPEG-4/AVC High/High422 up to Level 4.2 (8-bit)

Input Formats

- UDP/RTP (including 2022-7 seamless switching)
- SMPTE 2022-1 FEC
- RIST ARQ for public internet delivery

Video

- 1080i @ 25, 29.97Hz
- 1080p @ 23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
- 720p @ 50Hz, 59.94Hz, 60Hz
- 576i @ 25Hz (PAL)
- 480i @ 29.97Hz (NTSC)

Audio

- (up to 8 stereo pairs)
- MPEG-1 Layer II
- AAC-LC
- SMPTE 302M
- Opus

Metadata

- CEA-608/CEA-708 closed captioning
- Timecode passthrough

Output

- Uncompressed IP (SMPTE 2022-6/7 and SMPTE 2110)

