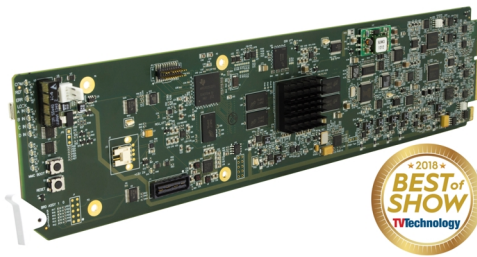


9904-UDX-4K • 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter / Frame Sync / Embed/De-Embed Audio Processor



The Cobalt® 9904-UDX-4K 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync/Embed/De-Embed Audio Processor is Cobalt's next generation of advanced scaler/frame synchronizers for the openGear® platform. The 9904-UDX-4K upconverts 12G/6G/3G/HD/SD to either UHD1 3840x2160 Square Division Multiplex (SDM) or Two-Sample Interleave (2SI) quad 3G-SDI based formats, or can output ST 2082 12G-SDI for single-wire 4K transport. With both 12G-SDI and quad 3G-SDI inputs, the 9904-UDX-4K can downconvert 12G and quad UHD. The 9904-UDX-4K provides an HDMI 2.0 output for economical 4K video monitoring. The 9904-UDX-4K offers numerous options, including SDR-to-HDR conversion and color correction.

The 9904-UDX-4K-IP model offers the same functionality as the 9904-UDX-4K SDI-based model, but additionally also provides dual 10GigE ports providing support for the emerging uncompressed video/audio/data over IP standards.

The 9904-UDX-4K-DSP model provides the same functionality as the 9904-UDX-4K SDI-based model, and also offers a DSP-based platform that supports multiple audio DSP options, including Dolby® Real-Time Loudness Leveling automatic loudness processing, Dolby® E/D/D+ encode/decode, and Linear Acoustic® UPMAX™ automatic upmixing. Embedded audio and metadata are properly delayed and re-embedded to match any video processing delay, with full adjustment available for audio/video offset.

The high-density openGear® design allows for up to five 9904-UDX-4K to be installed in one 2RU openGear® frame. Card control/monitoring is available via DashBoard user interface, integrated HTML5 web interface, SNMP, or Cobalt's RESTful-based Reflex protocol.

Alternate Models:

- 9904-UDX-4K-IP** 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync/Embed/De-Embed Audio Processor with Dual 10GigE IP Ports
- 9904-UDX-4K-DSP** 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync with DSP Advanced Audio Processing



FEATURES

High-density openGear comprehensive UHD UDX solution

Full up/down conversion between HD/3G, ST 2082 12G-SDI single-wire, and SDQS/2SI quad 3G-SDI based formats, with ST 2082 12G-SDI single-wire and quad 3G UHD available at both input and output

Supports Square Division Multiplex (SDM) and Two-Sample Interleave (2SI) quad UHD formats

12G-SDI and quad 3G frame sync and user delay

Supports SNMP and Cobalt's Reflex (JSON) Protocols

Noise Reduction and Detail Enhancement provide image quality optimization

Remote control/monitoring via Dashboard™ software, OGCP-9000 remote control panels, integrated HTML5 web interface, SNMP, or Cobalt's RESTful-based Reflex protocol

Five year warranty

OPTIONS

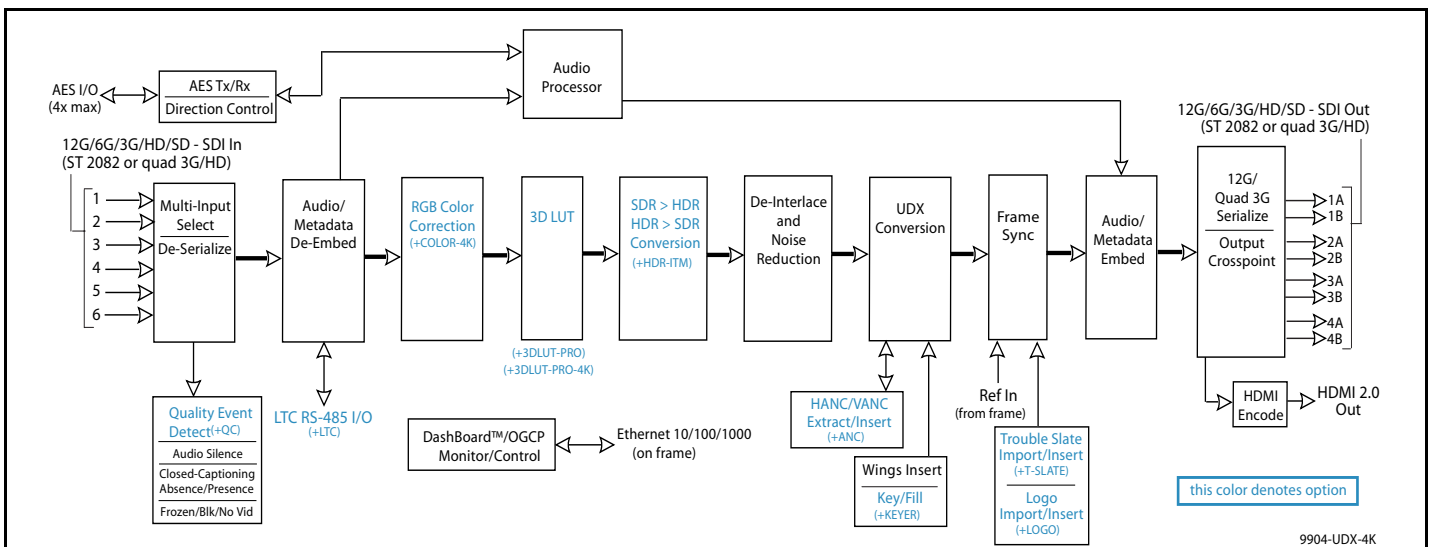
SDR/HDR Conversion Options (+HDR-ITM-4K, +HDR-ITM) - Provides sophisticated and comprehensive (yet easy to use) Technicolor® Intelligent Tone Management™ SDR-to-HDR conversion. Provides basic one-button Basic modes, as well as full-parameter expert modes.

3D LUT Options (+3DLUT-PRO-4K, +3DLUT-PRO) - 3D LUT (Lookup Table) options provide 33 cube LUT mapping between 10-bit RGB and HDR color spaces.

Color Correction Options (+COLOR-4K, +COLOR) - Provides full RGB color corrector (offset, gain, gamma) with extended YCbCr proc controls with white hard clip, white soft clip, black hard clip, and saturation clip.

SL-HDR Options (+SL-HDR-4K, +SL-HDR) - Provides SL-HDR functionality that allows HDR metadata encoding, accommodating SDR and HDR devices/decoders on a single stream, as well as specific SL-HDRv1 and/or SL-HDRv2 functionality. Contact Cobalt Sales for more information, or to arrange a hardware demo/evaluation.

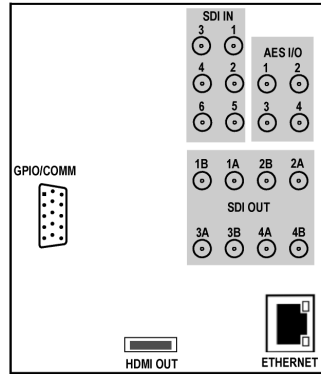
Audio LTC I/O Option (+LTC)



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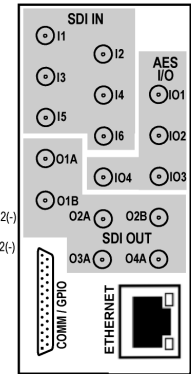
- COMM / GPIO**
- 1 - *COM A_RX2 / 422(+)
 - 2 - *COM A_TX2 / 422(+)
 - 3 - COM B_RX2 / 422(+)
 - 4 - GPO OUT1
 - 5 - GND
 - 6 - *COM A_RX1 / 422(-)
 - 7 - *COM A_TX1 / 422(-)
 - 8 - COM B_RX1 / 422(-)
 - 9 - GPI IN5 / GPO OUT 2
 - 10 - GPI IN4
 - 11 - GPI IN1
 - 12 - GPI IN2
 - 13 - GPI IN3
 - 14 - NC
 - 15 - NC

* Port can be GUI-configured as two RS-232 ports (Tx and Rx), or as a full-duplex RS-422 port.



RM20-9904-B-HDBNC

- COMM / GPIO**
- 13 - COMM_RX2/422(+)
 - 12 - GND
 - 11 - COMM_A_TX2/422(+)
 - 10 - GND
 - 9 - GPO 2
 - 8 - GND
 - 7 - GPI IN 3
 - 6 - GPI IN 1
 - 5 - GPO COM
 - 4 - NC
 - 3 - GND
 - 2 - NC
 - 1 - GPI IN 5
 - 25 - COMM_A_RX1/422(-)
 - 24 - GND
 - 23 - COMM_A_TX1/422(-)
 - 22 - GND
 - 21 - GPO 1
 - 20 - GPI IN 4
 - 19 - GPI IN 2
 - 18 - GND
 - 17 - NC
 - 16 - NC
 - 15 - NC
 - 14 - GPI IN 6



RM20-9904-D-HDBNC

SPECIFICATIONS

12G/6G/3G/HD/SD-SDI Input/Outputs

(6) 75Ω inputs (max)

(8) 75Ω outputs (max)

SDI Formats Supported: SMPTE ST2082-1,10, 424M, 292M, SMPTE 259M-C. All inputs/outputs 12G compliant and SDQS/2SI quad 3G compliant.

Return Loss:

> 15 dB up to 1.485 GHz

> 10 dB up to 3 GHz

> 7 dB up to 6 GHz

> 5 dB up to 12 GHz

Input Cable Length:

60m Belden 1694A cable at 11.88 Gbps

120m Belden 1694A cable at 2.97 Gbps

240m Belden 1694A cable at 1.485 Gbps

400m Belden 1694A cable at 270 Mbps

Output Signal Level: 800 mV ± 10%

DC Offset: 0 V ± 50 mV

Rise and Fall Time @ 11.88 Gbps: < 45 ps

Alignment Jitter (12G/3G/HD/SD): < 0.3/0.3/0.2/0.2 UI

Frame Sync Audio/Video Delay

Max offset: 20 frames

Latency (min): 1 frame

User Audio Delay Offset from Video

Bulk delay control: -33 msec to +3000 msec.

Per-channel delay controls: -800 msec to +800 msec

HDMI Output

HDMI 2.0 Output; type A standard connector

Frame Reference Input

(2) reference from frame bus. SMPTE 170M/318M "Black Burst", SMPTE 274M/296M "Tri-Level"

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ORDERING INFORMATION

9904-UDX-4K 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync/Embed/De-Embed Audio Processor

RM20-9904-B-HDBNC 20-Slot Frame Rear I/O Module (Double-Width) (6) 12G/6G/3G/HD/SD/SD-SDI Inputs, (8) 12G/6G/3G/HD/SD/SD-SDI Processed Outputs, (4) AES I/O (User Selectable), GPIO/COMM (HD-15 connector), HDMI 2.0 Output (type A standard connector), 100/1000 BaseT Ethernet Port (All coaxial connectors HD-BNC.)

RM20-9904-D-HDBNC 20-Slot Frame Rear I/O Module (Standard-Width) (6) 12G/6G/3G/HD/SD/SD-SDI Inputs, (8) 12G/6G/3G/HD/SD/SD-SDI Processed Outputs, (4) AES I/O, GPIO/COMM, 100/1000 BaseT Ethernet Port (All coaxial connectors HD-BNC.)

Options:

+HDR-ITM-4K 4K SDR/HDR Conversion Option

+HDR-ITM SDR/HDR Conversion Option

+3DLUT-PRO-4K 3D LUT 4K Option (compatible with up-mapping to HDR and processing for down-conversions to HD SDR color space)

+3DLUT-PRO 3D LUT Option (compatible with processing for down-conversions to HD SDR color space)

+COLOR-4K 4K Color Correction Option

+COLOR Color Correction Option

+SL-HDR-4K SL-HDR 4K Option

+SL-HDR SL-HDR Option

+LTC Audio LTC I/O Option