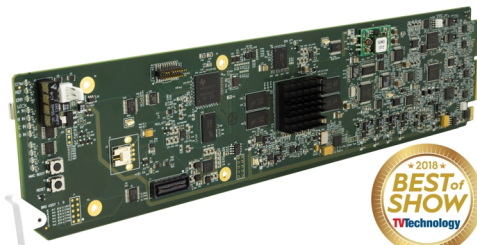


# 9904-UDX-4K-DSP • 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync with DSP Advanced Audio Processing



The Cobalt® **9904-UDX-4K-DSP 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync with DSP Advanced Audio Processing** is Cobalt's next generation of advanced scaler/frame synchronizers for the openGear® platform.

The 9904-UDX-4K-DSP 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-DSP offers numerous options, including SDR-to-HDR conversion and color correction.

The 9904-UDX-4K-DSP offers a DSP-based platform that supports multiple advanced 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-DSP cards 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.



## 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

DSP-based platform supports multiple audio DSP options, with multiple instances available using allocatable license "credits"

Dolby encoding/decoding, Dolby Real-Time Loudness Leveling (RTL) loudness leveling with full parametric control setup, and Linear Acoustic UPMAX™ upmixing DSP audio options available

Supports SNMP and Cobalt's Reflex (JSON) Protocols

Full embedded audio processing with user delay offset and AES I/O

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.

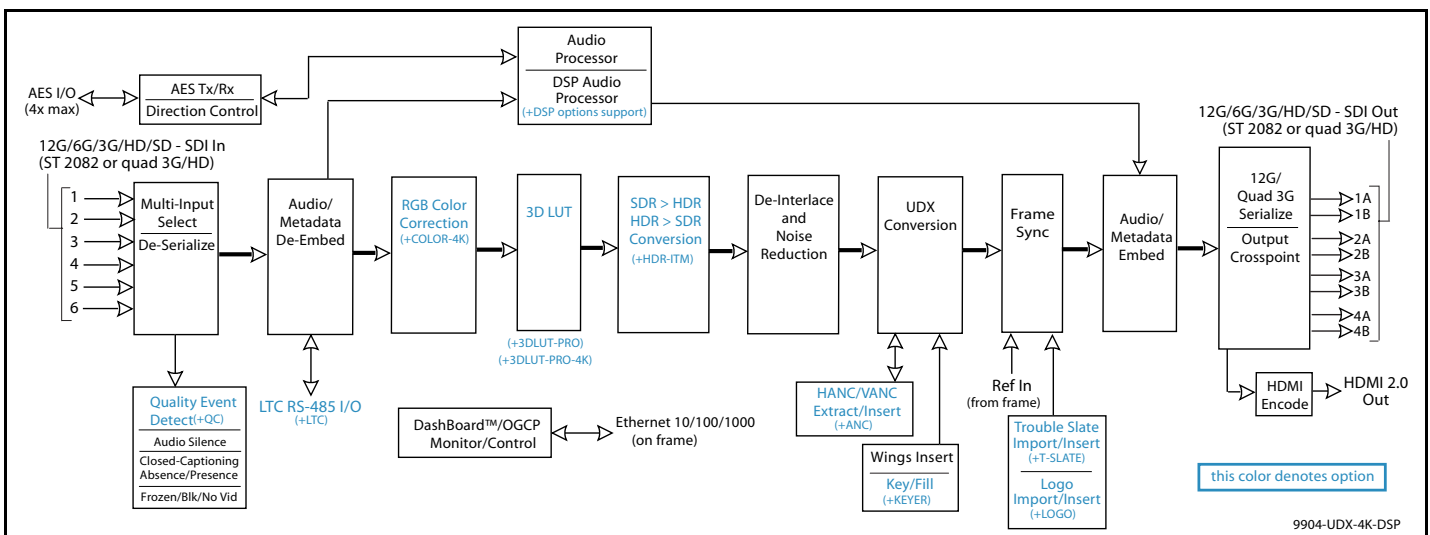
3D LUT Options (+3DLUT-PRO-4K, +3DLUT-PRO) – 3D LUT (Lookup Table) options provide 33 cube LUT mapping between 10-bit RGB and HDR color spaces.

Dolby® / Linear Acoustic® DSP Audio Options (+DSP)

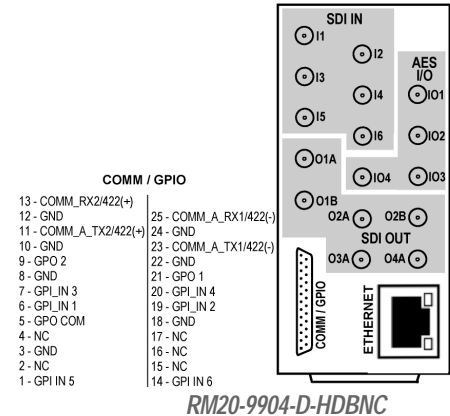
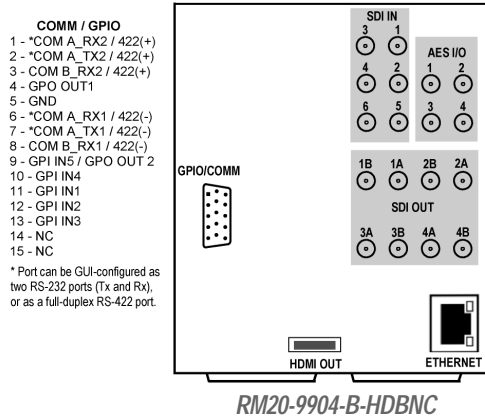
Color Correction Options (+COLOR-4K, +COLOR) – Provides full RGB color corrector (offset, gain, gamma) with extended YCbCr proc controls with white hard clip, white soft clip, black hard clip, and saturation clip.

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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## 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"

# 9904-UDX-4K-DSP • 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync with DSP Advanced Audio Processing

## ORDERING INFORMATION

**9904-UDX-4K-DSP** 12G/6G/3G/HD/SD UHD Up/Down/Cross Converter/Frame Sync with DSP Advanced Audio Processing

**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

**+3DLUT-PRO** 3D LUT Option

**+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

**+DSP-RTLL-5.1** Dolby® Real-Time Loudness Leveling 5.1-Channel Surround Sound Loudness Processor

**+DSP-RTLL-2.0** Dolby® Real-Time Loudness Leveling 2.0-Channel Stereo Loudness Processor

**+DSP-ENCD-5.1** Dolby® Digital / Digital Plus 5.1 Encoder

**+DSP-ENCD-2.0** Dolby® Digital / Digital Plus 2.0 Encoder

**+DSP-DEC** Dolby® E / Dolby® Digital / Dolby® Digital Plus Decoder

**+DSP-UPMIX-LA** Linear Acoustic UPMAX™ 2.0-to-5.1 Upmixer