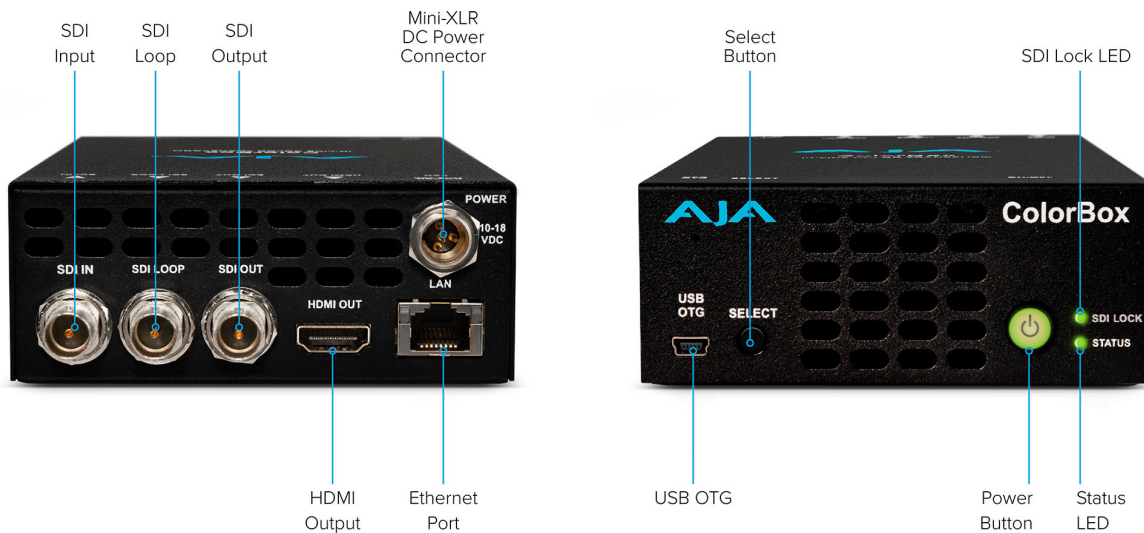




ColorBox

In-line HDR/SDR Color Transforms, 12G-SDI and HDMI 2.0, LUTs, Colorfront, ORION-CONVERT, BBC HLG LUTs, NBCU LUTs

<https://www.aja.com/products/colorbox>



HDR/WCG Real Time Processor

- HDR Conversions
 - HDR to HDR
 - HDR to SDR
 - SDR to HDR
- Colorimetry
 - BT.709 and BT.2020

Video Formats

- (4K) 4096x2160p
- (UltraHD) 3840x2160p
- (2K) 2048x1080p
- (HD) 1920x1080p
- (HD) 1920x1080i
- (HD) 1280x720p

Color Processing Pipeline

- Processes in 12-bit RGB
- 5x pipelines; AJA Color, Colorfront, ORION-CONVERT, BBC HLG LUTs, NBCU LUTs
- 7x processing nodes plus Overlay in AJA Color; 4x 1-D LUTs, 2x 3x3 Matrices, 1x 3-D LUT

AJA Color Pipeline (ACP)

- 7x nodes in order of processing:
 - 1D LUT, 3x3 Matrix, 1-D LUT, 3-D LUT, 1-D LUT, 3x3 Matrix, 1-D LUT, Overlay
- Supports 10 and 12-bit 1-D LUTs
- Supports custom 33 point .LUT and .CUBE format 3-D LUTs*
- Supports custom .LUT format 1-D LUTs
- Supports custom .SPIMTX format matrices
- Tetrahedral 3-D LUT interpolation
- 3-D LUT configurable as LUT or Dynamic
- 1-D LUTs configurable as LUT, Dynamic, or Color Corrector
- 3x3 Matrix configurable as Matrix, Dynamic, or Proc Amp
- Configurable Color Space, Range, and Transfer Characteristic
- Nonvolatile storage of 16x 3-D LUTs, 16x 1-D LUTs, and 16x 3x3 Matrices

*Various 3-D LUT sizes are supported, but will be converted to 33 point for processing

Dynamic LUT Processing

- Supports third party apps for automatic loading and display of 3-D LUTs
- Reflects dynamic changes in real time from source software
- Full frame LUT processing
- Supported by
 - Pomfort Livegrade Pro and Studio
 - Assimilate Live Looks and Live Assist

Colorfront Pipeline

- Processing Based on Human Perception Model
- Perceptually optimized color volume remapping
- Preserves the original creative intent
- Input Video Dynamic Range/Color Gamut
 - SDR BT.709
 - PQ BT.2020
 - HLG BT.2100
- Output Video Dynamic Range/Color Gamut
 - SDR BT.709
 - PQ BT.2020
 - HLG BT.2100

ORION-CONVERT Pipeline

- Conversion algorithm that uses floating point math
- Pre and post transform Knee and Amount controls
- Display-Light and Scene-Light Modes
- Configurable HDR and SDR IRE Reference anchor points
- Configurable HDR Peak Nits sets system gamma for display light

conversions

- Configurable Output Clamping
- Input Video Dynamic Range/Color Gamut
 - SDR BT.709
 - PQ BT.2020
 - HLG BT.2100
- Output Video Dynamic Range/Color Gamut
 - SDR BT.709
 - PQ BT.2020
 - HLG BT.2100

BBC HLG LUTs Pipeline

- Mathematical dynamic range mapping per ITU-R BT.2408
 - SDR/BT.709 Scene Referred to HLG/BT.2100 v1.5
 - SDR/BT.709 Scene Referred to HLG/BT.2100 Strict v1.5
 - SDR/BT.709 Scene Referred UpMap to HLG/BT.2100 v1.5
 - SDR/BT.709 Scene Referred UpMap to HLG/BT.2100 Strict v1.5
 - SDR/BT.709 Display Referred to HLG/BT.2100 v1.5
 - SDR/BT.709 Display Referred UpMap to HLG/BT.2100 v1.5
 - SDR/BT.2020 Display Referred to HLG/BT.2100 v1.5
 - SDR/BT.2020 Display Referred UpMap to HLG/BT.2100 v1.5
 - PQ 1000 Nits Display Referred to HLG/BT.2100 v1.5
 - PQ 4000 Nits Display Referred to HLG/BT.2100 v1.5
 - S-Log3/BT.2020 100% Scene Referred to HLG/BT.2100 v1.5
 - S-Log3/BT.2020 200% Scene Referred (SR-Live) to HLG/BT.2100 v1.5
 - HLG/BT.2100 to SDR/BT.709 Scene Referred v1.5
 - HLG/BT.2100 to SDR/BT.709 Scene Referred Strict v1.5
 - HLG/BT.2100 to SDR/BT.709 Display Referred v1.5
 - HLG/BT.2100 to SDR/BT.709 Display Referred Super White v1.5
 - HLG/BT.2100 to PQ 1000 Nits Display Referred v1.5
- RGB Color Corrector and ProcAmp

NBCU LUTs Pipeline

- NBCU LUTs developed by NBCUniversal Media, LLC
 - 1-NBCU_SDR2HLG_DL_v1, SDR UpMap to HLG using Display Light v1.0
 - 2-NBCU_SDR2HLG_SL_v1, SDR to HLG using Scene Light v1.0
 - 3-NBCU_HLG2SDR_DL_v1.1, HLG to SDR using Display Light v1.1
 - 4-NBCU_SDR2PQ_DL_v1, SDR UpMap to PQ using Display Light v1.0
 - 5-NBCU_PQ2SDR_DL_v1, PQ to SDR using Display Light v1.0
 - 7-NBCU_HLG10002PQ_v1, HLG 1000 Nits to PQ v1.0
- RGB Color Corrector and ProcAmp

Video Input and Output SDI

- 1x 12G-SDI Input BNC, SMPTE-292/424/2081/2082
- 2x 12G-SDI Output BNCs, SMPTE-292/424/2081/2082
- YCbCr 4:2:2/4:4:4
- RGB 4:4:4, SMPTE or Full level
- 10 or 12-bit
- 1x 12G-SDI
 - (4K) 4096x2160p 23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60
 - (UltraHD) 3840x2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- 1x 6G-SDI
 - (4K) 4096x2160p 23.98, 24, 25, 29.97, 30
 - (UltraHD) 3840x2160p 23.98, 24, 25, 29.97, 30
- 1x 3G-SDI (Level A or B-Dual Link)
 - (2K) 2048x1080p 23.98, 24, 25, 47.95, 48, 50
 - (2K) 2048x1080PsF 23.98, 24, 25
 - (HD) 1920x1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
 - (HD) 1920x1080PsF 23.98, 24, 25, 29.97, 30
 - (HD) 1920x1080i 50, 59.94, 60
 - (HD) 1280x720p 50, 59.94, 60
- 1x 1.5G-SDI
 - (2K) 2048x1080p 23.98, 24, 25, 29.97, 30

- o (2K) 2048x1080PsF 23.98, 24, 25
- o (HD) 1920x1080p 23.98, 24, 25, 29.97, 30
- o (HD) 1920x1080PsF 23.98, 24, 25, 29.97, 30
- o (HD) 1920x1080i 50, 59.94, 60
- o (HD) 1280x720p 50, 59.94, 60

Note: Raster and Frame Rate Dependent, please see ColorBox Video Formats in Documents and Manual

Video Output HDMI

- 1x HDMI Type A connector*, HDMI v2.0b
- HDR infoframe generation with pass-through for Colorimetry and Transfer Characteristic
- YCbCr 4:2:2
- RGB 4:4:4, SMPTE or Full level
- 8, 10, or 12-bit (HFR 4K/UltraHD 4:4:4 limited to 8-bit)
- 4K/UltraHD/2K/HD

*If a connected monitor doesn't support HDMI protocol the unit automatically switches to DVI protocol (which does not pass audio)

Note: Raster and Frame Rate Dependent, please see ColorBox Video Formats in Documents and Manual

Video Processing

- Nominal video delay is less than 1/2 video line
- Motion adaptive deinterlacer
- Proc Amp controls
- Color corrector
- Legalizer

Frame Store

- Capture and Recall up to 4K/UltraHD 16-bit .TIFF
- Capture and Recall .TIFF, .PNG, .JPEG
- Capture input or output
- Nonvolatile storage of 16 images

Test Pattern Generator

- 10 or 12-bit
- 9x patterns built-in
- SDR and HDR test patterns

Ancillary Data

- All embedded ANC packets pass-through, including camera ancillary data
- Overlay ancillary data on image

Audio Input Digital

- SDI embedded audio, 24-bit, 16-channel

Audio Output Digital

- SDI embedded audio, 24-bit, 16-channel
- HDMI embedded audio, 24-bit, 8-channel

Network Interface

- 1x RJ-45, 10/100/1000 Ethernet
- Embedded web server for remote control
- REST Interface
- WiFi control available via 3rd party WiFi USB adapter*

*Lynksys AC1200 and Netgear AC1900

USB Interface

- 1x Mini-USB for IP configuration using AJA eMini-Setup

Presets

- 10 Pipeline Presets per mode (AJA Color, Colorfront, ORION-CONVERT, BBC HLG LUTs, NBCU LUTs)
- Startup Preset

Size (w x d x h)

- 4.10" x 7.54" x 1.66" (104.1 x 191.6 x 42.1 mm)

Weight

- 1.0 lb (0.5 kg)

Power

- External power supply required
- Enclosure: 10-18VDC regulated, 4-pin mini-XLR, 16W typical 3G-SDI, 21W typical 12G-SDI, 25W max.
- AC Adapter, included: 100-240VAC, 50/60 Hz, universal input, 60W
- Optional spare AC adapter sold separately, AJA-PWR-12-60W

Environment

- Safe Operating Temperature: 0 to 50 C (32 to 122 F)
- Safe Storage Temperature (Power OFF): -40 to 60 C (-40 to 140 F)
- Operating Relative Humidity: 10-90% noncondensing
- Operating Altitude: <3,000 meters (<10,000 feet)