FS | HDR

Real Time HDR/WCG Conversion with Colorfront Engine™ Video Processing

HDR colorfront

AJA VIDEO SYSTEMS

FS | HDR

$7,995 US MSRP*

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FS-HDR is an HDR to SDR, SDR to HDR, and HDR to HDR universal converter/ frame synchronizer, designed specifically to meet the HDR (High Dynamic Range) and WCG (Wide Color Gamut) needs of production, broadcast, OTT, post and live event AV environments.

FS-HDR offers two modes for comprehensive HDR/WCG conversion and signal processing. Single channel mode provides a full suite of 4K/UltraHD processing and up, down, cross-conversion to and from 2K, HD or SD. Four channel mode offers four 2K/HD/SD channels of simultaneous processing and conversion.

Real Time HDR Conversion for 4K/UltraHD/2K/HD

4-Channel 2K/HD/SD or 1-Channel 4K/UltraHD HDR and WCG frame synchronizer and up, down, cross-converter

Bulletproof reliability. Incredible Conversion Power.

FS-HDR is your real world answer for up, down, cross-conversions and real time HDR transforms, built to AJA's high quality and reliability standards.

Powered by the Colorfront Engine™, FS-HDR's extensive HDR and WCG processing support enables real time processing of a single channel of 4K/UltraHD/2K/HD including simultaneous output of both 4K/UltraHD and 2K/HD with your choice of HDR/SDR transforms on each or up to four channels of 2K/HD simultaneously. FS-HDR also enables the conversion of popular camera formats from multiple vendors into the HDR space, plus conversion to-and-from BT.2020/BT.709, critical for the widespread deployment of HDR alongside SDR in broadcast and OTT workflows.

4K/UltraHD delivery, processing and synchronization is fast becoming the next standard and FS-HDR gets you there with a wealth of digital video connectivity including 4x 3G-SDI with fiber options**, as well as 6G-SDI and 12G-SDI over Coax or Fiber**. 8K workflows are even attainable when using four FS-HDRs in gang operations with AJA's FS-HDR Control Link software.

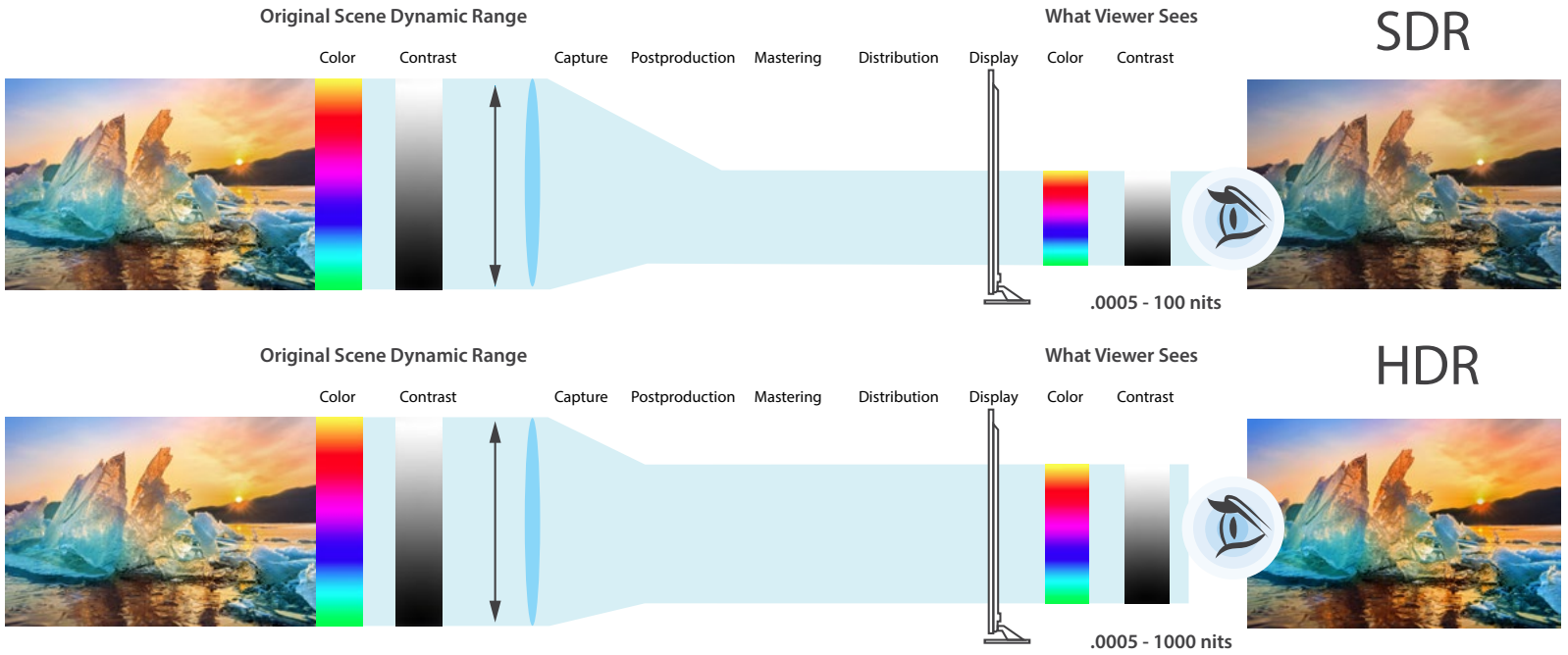
In single channel mode, FS-HDR will scale up your HD or SD materials to 4K/UltraHD and back, with a vast array of audio channels over SDI, AES, and MADI for an incredible 272 x 208 matrix of audio possibilities. In four channel mode, independent transforms can be applied to each 2K/HD or SD channel. In both cases, you can additionally monitor an SDR preview of the HDR results as needed, simplifying your production chain.

Maintaining Perceptual Integrity.

FS-HDR's HDR/WCG capabilities leverage video and color space processing algorithms within the Colorfront Engine, specially-licensed by AJA from Colorfront, and developed by Colorfront's award winning team of color scientists.

** Pricing is for US only. International pricing will vary. Please contact a local AJA Reseller for pricing details.*
*** with optional SFP modules*

FS | HDR



Comprehensive HDR Conversions

Modern cameras are inherently HDR capable with their wide dynamic ranges available from the sensor on, and for live events and broadcasts, it's crucial to translate their Log and Gamut capabilities to the accepted standards now being employed for HDR delivery. With support for leading cameras on input, and output to Perceptual Quality (PQ) which is at the heart of HDR10 as well as support for widely accepted Hybrid Log Gamma (HLG), FS-HDR takes the pain out of HDR conversion and makes real time camera to HDR workflows instantly possible. With SDR to HDR conversion, you can even bring in your current materials and upgrade them to match your live HDR programming output. For live event large LED displays, utilize FS-HDR for HDR to HDR conversion, and for enriching your SDR sources, SDR to HDR conversion. Comprehensive parametric controls of the Colorfront Engine transform algorithm enables management of color expansion, ambient lighting, SDR highlights and speculars into the HDR space. Built-in HLG LUTs licensed from the BBC provide simple, fixed HDR conversions. Additionally, the FS-HDR supports the ability to upload custom 3D LUTs as well as dynamic LUTs for live transforms from compatible software.

FS-HDR conversion tools support ITU-R BT.2408 Operational Practices in HDR Television Production.

Colorfront Engine

Input Formats:

- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- PQ P3D65 1000 Nits
- Hybrid Log Gamma BT.2100
- Sony® S-Log3 S-Gamut3
- Sony S-Log3 S-Gamut3 Cine
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut
- Panasonic® V-Log
- RED Log3G10 Wide Gamut
- Canon Log 2
- Canon Log 3

Output formats:

- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- Hybrid Log Gamma BT.2100
- Sony S-Log3 S-Gamut3
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut

Adjustable Parameters:

- HDR Amount
- Ambient Light Compensation
- HDR Log Look
- SDR Softness
- Master Lift
- Red Lift
- Green Lift
- Blue Lift
- Master Gamma
- Red Gamma
- Green Gamma
- Blue Gamma
- Master Gain
- Red Gain
- Green Gain
- Blue Gain
- Saturation
- Exposure
- Color Temp
- Tint
- BT.2408 Mode

BBC HLG 3D LUTs

Conversions:

- SDR Scene Referred (SR) to HLG
- SDR (SR) Up Conversion to HLG
- SDR Display Referred (DR) to HLG
- SDR (DR) Up Conversion to HLG
- PQ 1000 nit to HLG
- PQ 4000 nit to HLG
- S-Log3 100% to HLG
- S-Log3 200% (SR Live) to HLG
- HLG to SDR Scene Referred (SR)
- HLG to SDR Display Referred (DR)
- HLG to PQ 1000 nit

User 3D LUTs

Supports:

- Upload using web GUI
- 33 point .cube format
- Store up to 10 LUTs

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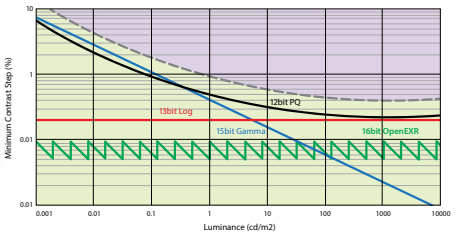
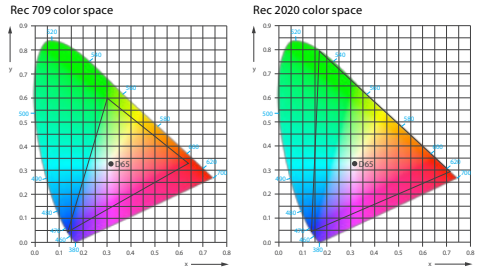




Real Time Camera Log Conversions

SDR equates to around 6-stops of dynamic range, HDR expands that to about 15 stops, greatly increasing both dynamic range and an expanded color gamut, producing a much richer and fuller image, closer to what cameras today are intrinsically capable of and closer to the ultimate goal, the Human Vision System (HVS).

FS-HDR can take this incoming imagery from the most popular professional cameras in the world today and convert their Log output in real time to 4K/UltraHD or multiple channels of 2K/HD and output as either HDR, SDR or both simultaneously.

This dramatically simplifies workflows in a mixed camera environment, as FS-HDR can take in multiple camera log formats and provides for a unified workflow output to HDR or SDR capable switchers and more.

Additionally, FS-HDR provides the ability to convert to Sony S-Log3 on output for workflows requiring a Log feed to compatible switchers and more when needed.

Colorfront Engine™

FS-HDR's HDR/WCG capabilities leverage video and color space processing algorithms within the Colorfront Engine, specially-licensed by AJA from Colorfront, and developed by Colorfront's Academy Award winning CTO Bill Feighter and Lead Engineer Tamas Perlaki.

Powered by Colorfront Engine, FS-HDR's extensive HDR and WCG processing support enables real time processing, including parametric controls for HDR transforms, of a single channel of 4K/UltraHD/2K/HD including down-conversion to HD HDR or up to four channels of 2K/HD simultaneously.

The "secret sauce" in terms of the Colorfront Engine is that the emphasis is on maintaining perceptual integrity and creative intent, not "just the math" to convert between color spaces.

The algorithms available in FS-HDR result in a final image that benefits from years' worth of work on the industry's biggest productions; field tested, critiqued and supported by the industry's greatest artists.

PQ, HLG and Log

To facilitate the most flexibility for emerging HDR pipelines, it has to be recognized that HDR is a new toolset and standards are evolving to serve different needs, all designed to produce the same result; gorgeous, rich imagery perceivable in both 4K/UltraHD and 2K/HD.

FS-HDR recognizes this and provides you choice.

Preserving as much of the camera sensor detail and range as possible with support for Log inputs as well as HDR and SDR standards, FS-HDR transforms this data to the standards now being employed for HDR delivery.

FS-HDR makes your real time HDR workflows come to life in the formats you need, including Perceptual Quality (PQ) HDR10 and Hybrid Log Gamma (HLG), or Log formats such as Sony S-Log3, and ARRI Log C Wide Gamut, as well as BT.709 and BT. 2020 transformations.

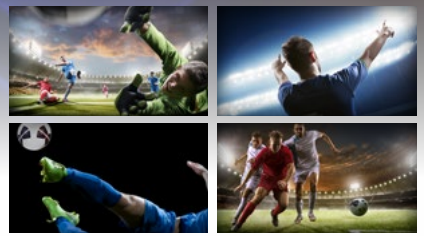
Convert Today's SDR to HDR

FS-HDR opens a range of exciting possibilities for the integration of SDR materials into HDR within a range of workflows.

To mix your HDR live programming with legacy SDR sources for broadcast and live event feeds, you are going to need SDR to HDR conversions to match your HDR sources and feeds for seamless integration.

FS-HDR includes SDR to HDR conversions with a range of transformation options, allowing you to bring in your current SDR materials and upgrade them to match your live HDR programming output.

For live event large LED displays with high nit counts, utilize FS-HDR for real time HDR to HDR, or SDR to HDR conversions, bringing your screens to rich and colorful life.



Single Channel Mode

Single channel mode for 4K/UltraHD or 2K/HD frame sync and conversion including HDR conversions:

- 4K/UltraHD/2K/HD/SD video processing and up, down, cross-conversion.
- A full range of I/O options for 4K/UltraHD including 4x 3G-SDI, with 6G and 12G-SDI on optional SFP Coax or Fiber SFPs.
- Supports Two Sample Interleave (2SI) and Square Division (Quadrant) pixel mapping as well as P, PsF, and Interlace video formats.
- An Enhanced Single Channel mode provides simultaneous 4K/UltraHD and 2K/HD outputs with independent SDR/HDR controls. Perfect for delivering a simultaneous 4K/UltraHD HDR feed and a 1080i/720p SDR feed.
- Using Gang Operations with FS-HDR Control Link software, 4x FS-HDRs can be used in unison to support 8K needs.

Four Channel Mode

Four channel mode for simultaneous independent 2K/HD/SD channels including HDR conversions:

AJA's powerful hardware conversion technology ensures the highest image quality for your productions. Key conversion features include:

- 2K/HD/SD up, down-conversion
- SD/SD aspect ratio conversion
- HD/HD cross-conversion (720p/1080i)

Incredible Digital Connectivity

FS-HDR offers the connectivity to meet the demands of your projects.

FS-HDR utilizes standard BNC as well as optional SFP inputs and outputs to integrate easily into a variety of workflows and facilities with support for SDI workflows all the way up to 12G.

FS-HDR has Coax and Fiber* inputs and outputs to accept 4K/UltraHD/2K/HD/SD resolution SDI signals in Single Channel Mode. In Four Channel mode 2K/HD/SD inputs can be routed to multiple locations simultaneously without the need for any external signal distribution.

A looping Reference Input allows the FS-HDR to be locked to your house reference signal for rock solid stability.

Optional SFPs include:
- *12G-SDI HD-BNC coax*
- *12G-SDI Single Mode 1310nm fiber*
- *3G-SDI Single Mode 1310nm fiber*
- *3G-SDI Multi-Mode 850nm fiber*
- *3G-SDI CWDM fiber*

Remote Configuration & Control

FS-HDR is network ready and supports SNMP monitoring and web-based remote control.

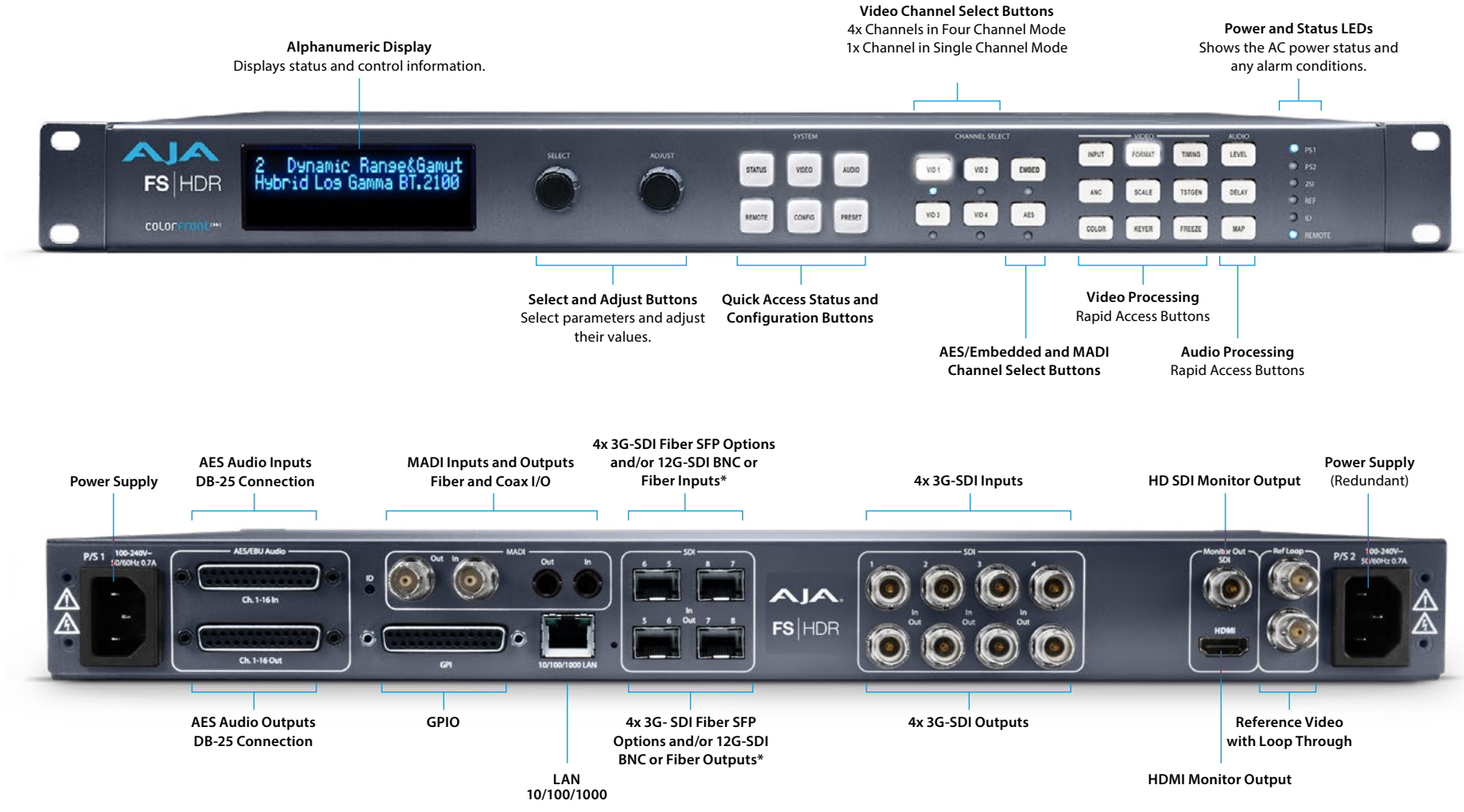
FS-HDR features unique over the network control of HDR settings from within its elegant interface, including parametric controls for HDR transforms and color correction; available from any browser, anywhere.

Units can be connected to any Ethernet network via the built-in 10/100/1000MB Ethernet port, allowing control and configuration of multiple FS units from any web browser on a connected computer. Settings can be saved and applied to multiple units, ensuring consistency and quick configuration in large installs.

A new stand-alone app, FS-HDR Control Link, can be run on a local PC to provide communications between the FS-HDR and a 12-knob Tangent kB panel, providing tactile and immediate control of Colorfront Engine parameters, well suited to live production.

** with optional SFP modules*

Connections

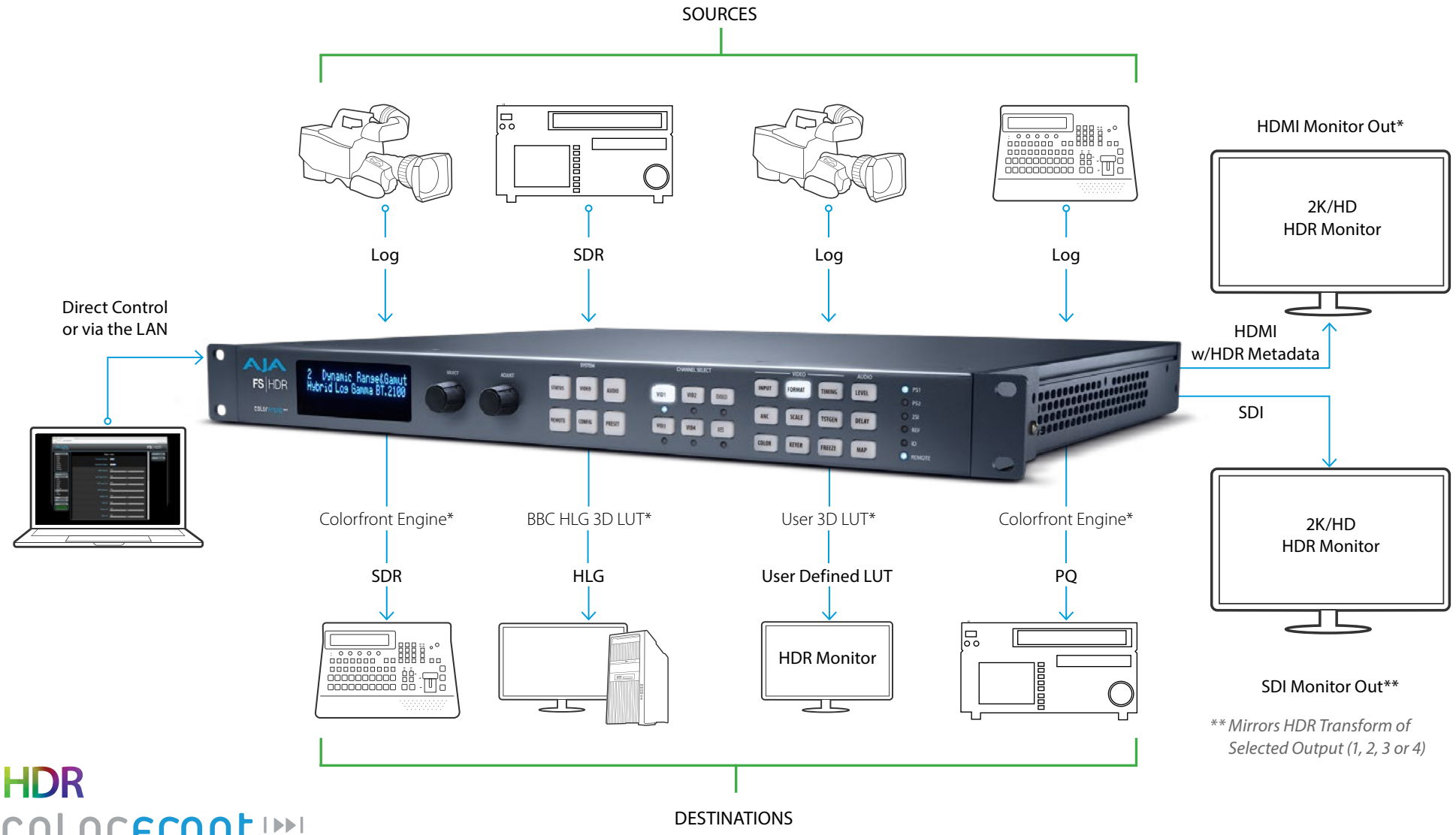


Click here For full product specifications visit www.aja.com/products/fs-hdr#techspecs

** with optional SFP modules*

HDR Workflow Example: 2K/HD

Four Channel Mode



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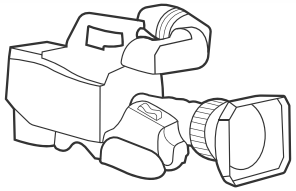
** Each channel's transform can be individually configured for Colorfront Engine, BBC HLG 3D LUT, or User 3D LUT*

HDR Workflow Example: 4K/UltraHD/2K/HD/SD

Single Channel Mode



Inputs: Dynamic Range/Color Gamut

- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- PQ P3D65 1000 Nits
- HLG BT.2100
- Sony S-Log3 S-Gamut3
- Sony S-Log3 S-Gamut3 Cine
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut
- Panasonic V-Log
- Red Log3G10 Wide Gamut
- Canon Log 2
- Canon Log 3

SDI or Fiber

Direct Control or via the LAN

HDMI Monitor Out*

2K/HD HDR Monitor

HDMI w/HDR Metadata

SDI

SDI or Fiber

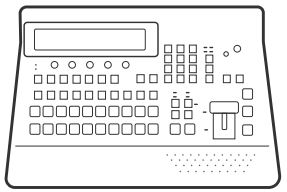
2K/HD HDR Monitor

SDI Monitor Out*

** Mirrors HDR Transform of Output*

Outputs: Dynamic Range/Color Gamut

- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- HLG BT.2100
- Sony S-Log3 S-Gamut3
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut



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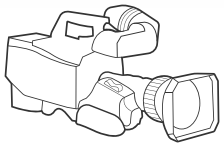
Enhanced Single Channel Mode

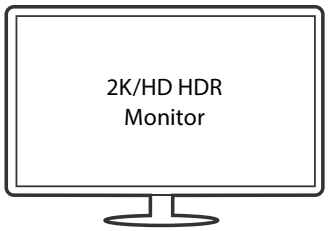


Input: 4K/UltraHD Input

Formats
- (4K) 4096 x 2160p
- (UltraHD) 3840 x 2160p

Dynamic Range/Color Gamut
- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- PQ P3D65 1000 Nits
- HLG BT.2100
- Sony S-Log3 S-Gamut3
- Sony S-Log3 S-Gamut3 Cine
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut
- Panasonic V-Log
- Red Log3G10 Wide Gamut
- Canon Log 2
- Canon Log 3

HDMI Monitor Out*



SDI or Fiber

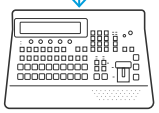
HDMI
w/HDR Metadata

SDI Monitor Output

SDI

SDI or Fiber

Direct Control or via the LAN



Output: 4K/UltraHD Output

Formats
- (4K) 4096 x 2160p
- (UltraHD) 3840 x 2160p

Dynamic Range/Color Gamut
- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- HLG BT.2100
- Sony S-Log3 S-Gamut3
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut

Monitor Output: 2K/HD Output

Formats
- (2K) 2048 x 1080p
- (HD) 1920 x 1080p
- (HD) 1920 x 1080PsF
- (HD) 1920 x 1080i
- (HD) 1280 x 720p
- (SD) 525i, 625i

Dynamic Range/Color Gamut
- SDR BT.709 100 Nits
- PQ BT.2020 1000 Nits
- HLG BT.2100
- Sony S-Log3 S-Gamut3
- Sony S-Log3 BT.2020
- ARRI Log C Wide Gamut

** Mirrors HDR Transform of Output*

Many workflows require simultaneous delivery of a UltraHD HDR feed along with an HD SDR feed, such as 1080i or 720p. FS-HDR's Enhanced Single Channel mode provides this feature all within a single unit. With the FS-HDR in Single Channel Mode, fed by a 4K or UltraHD input, and with the output format configured for 4K or UltraHD (i.e., no up or down conversion), the SDI Monitor Output becomes a second configurable 2K/HD/SD output.

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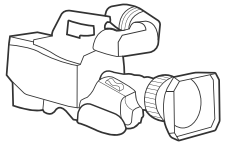
The channel's transform can be configured for Colorfront Engine, BBC HLG 3D LUT, User 3D LUT, or Dynamic 3D LUT

User 3D LUT 4K Workflow Example



4K Source Video
SDI or Fiber

User 3D LUT Output

4x 3G-SDI
Output

4K/UltraHD/2K/HD
HDR/SDR Monitor

LUT Box Applications

FS-HDR's new User 3D LUT transform mode allows a user to upload their own user generated 33 point .cube format LUTs using FS-HDR's web GUI and store up to 10 LUTs at a time.

These user LUTs can be used in Single Channel Mode to accomplish a custom LUT transform for 4K and UltraHD material or in Four Channel mode seperate LUTs can be applied on up to 4 seperate 2K/HD sources simultaneously for a wealth of custom needs, all in a single 1RU device.

On Set Applications

Productions often require a specific look that matches a show's particular aesthetic. With User 3D LUTs applied, the camera team and director can utilize the FS-HDR for live monitoring of on-set camera feeds with shot specific Look LUTs applied, ensuring all creative decisions made on set will line up with the desired aesthetic end result when entering post production. This is ideal for bringing a standard desired look to a production, applying a creative LUT previously designed for the sake of the project or potentially loading a film emulation LUT for a particular look.

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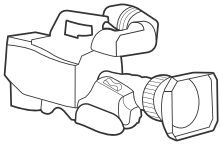
Dynamic LUT 4K Workflow Example

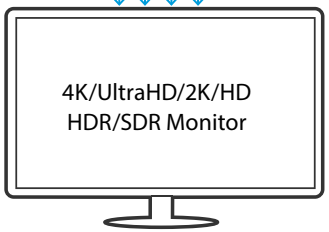


4K Source Video
SDI or Fiber

Dynamic LUT Output

4x 3G-SDI
Output

3rd Party Software Control



FS-HDR now supports Dynamic LUT uploads from 3rd party software for live playout with the ability to see changes as you implement them.

Support for Dynamic LUTs is available in Single Channel Mode.

3rd party software support is available now for TV logic WonderLookPro and soon for Pomfort LiveGrade Pro with more to come from other 3rd party software vendors.

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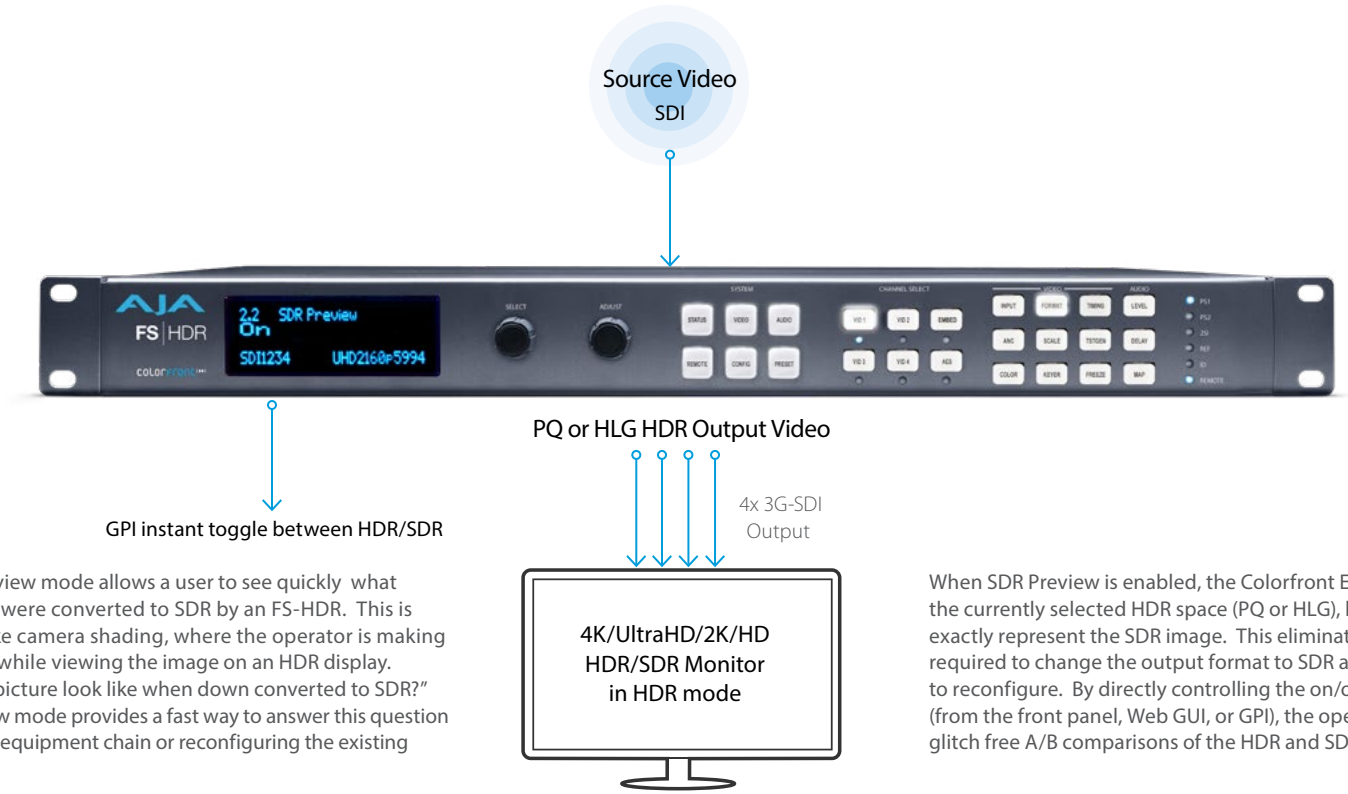
SDR Preview Workflow



The Colorfront Engine™ SDR Preview mode allows a user to see quickly what an HDR output will look like if it were converted to SDR by an FS-HDR. This is extremely useful in functions like camera shading, where the operator is making adjustments to an HDR camera while viewing the image on an HDR display. A key question is "what will this picture look like when down converted to SDR?" The FS-HDR's unique SDR Preview mode provides a fast way to answer this question without requiring an HDR to SDR equipment chain or reconfiguring the existing HDR monitor.

When SDR Preview is enabled, the Colorfront Engine maps the video into the currently selected HDR space (PQ or HLG), but with values that will exactly represent the SDR image. This eliminates the time typically required to change the output format to SDR and then wait for the display to reconfigure. By directly controlling the on/off state of SDR Preview (from the front panel, Web GUI, or GPI), the operator can make quick, glitch free A/B comparisons of the HDR and SDR images.

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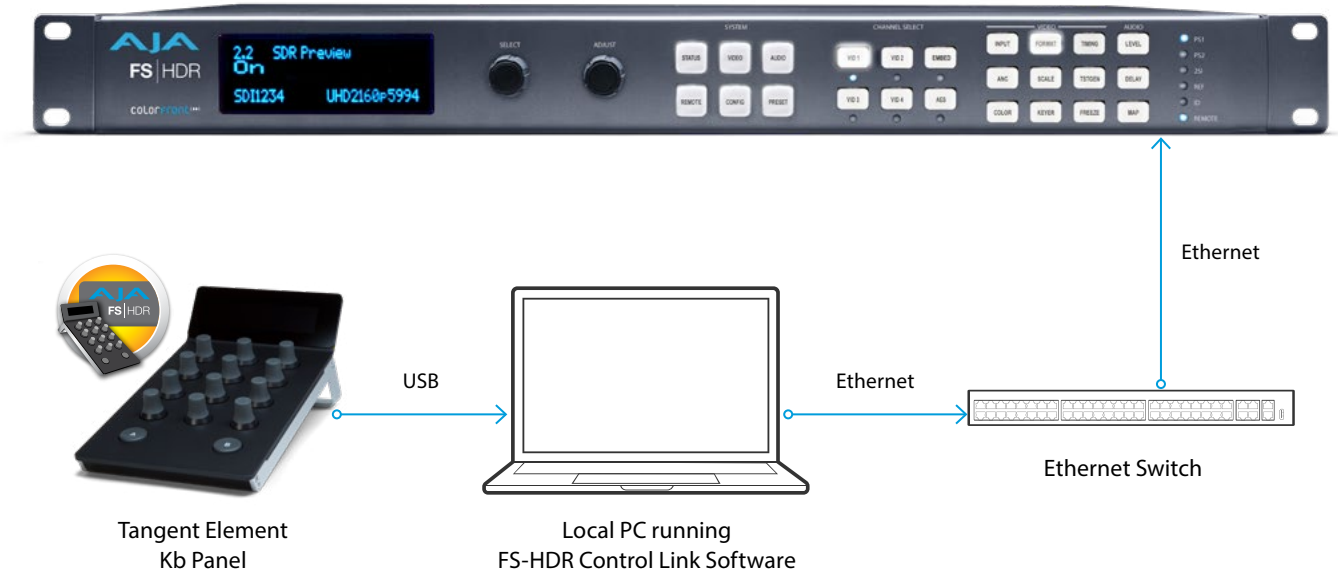
Remote Control of the Colorfront Engine™



A free AJA application, FS-HDR Control Link for Windows and Mac enables remote control support of the Colorfront Engine via the popular 12 knob Tangent kB panel. The app implements a communication path between the panel and the FS-HDR's REST interface. The app provides easy access to the Colorfront Engine transform parameters via the Tangent panel and a GUI interface on the PC. It also supports ganging multiple FS-HDRs operating in Single Channel mode for simultaneous control of all Colorfront Engine parameters.

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Tech Specs

HDR/WCG Real Time Processor

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

Video Processing Transforms

- Each processing channel can independently select from:
  - Colorfront Engine
  - BBC HLG 3-D LUTs
  - User 3-D LUTs
  - Dynamic 3-D LUTs (Single Channel Mode only)

Colorfront Engine (CFE) Advanced HDR Conversions

- Processing Based on Human Perception Model
- Perceptually optimized color volume remapping
- Preserves the original creative intent
- Parametric controls including HDR functions and color corrector
- Input Video Dynamic Range/Color Gamut
  - SDR BT.709 100 Nits
  - PQ BT.2020 1000 Nits
  - PQ P3D65 1000 Nits
  - Hybrid Log Gamma BT.2100
  - Sony S-Log3 S-Gamut3
  - Sony S-Log3 S-Gamut3 Cine
  - Sony S-Log3 BT.2020
  - ARRI Log C Wide Gamut
  - Panasonic V-log
  - RED Log3G10 Wide Gamut
  - Canon Log 2
  - Canon Log 3 Output Video Dynamic Range/Color Gamut
  - SDR BT.709 100 Nits
  - PQ BT.2020 1000 Nits
  - Hybrid Log Gamma BT.2100
  - Sony S-Log3 S-Gamut3
  - Sony S-Log3 BT.2020
  - ARRI Log C Wide Gamut
- SDR Preview mode
- ITU-R BT.2408 mode

BBC HLG 3-D LUT HDR Conversions

- Mathematical dynamic range mapping per ITU-R BT.2408
  - SDR/BT.709 Scene Referred to HLG/BT.2100
  - SDR/BT.709 Scene Referred UC to HLG/BT.2100
  - SDR/BT.709 Display Referred to HLG/BT.2100
  - SDR/BT.709 Display Referred UC to HLG/BT.2100
  - PQ 1000 nits to HLG/BT.2100
  - PQ 4000 nits to HLG/BT.2100
  - S-Log3/S-Gamut3 100% to HLG/BT.2100
  - S-Log3/S-Gamut3 200% (SR-Live) to HLG/BT.2100
  - HLG/BT.2100 to SDR/BT.709 Scene Referred
  - HLG/BT.2100 to SDR/BT.709 Display Referred
  - HLG/BT.2100 to PQ 1000 nits

User 3-D LUT Processing

- Supports custom 33 point .cube format 3-D LUTs
- Configurable Colorspace, Scale, and HDR Transfer Characteristic
- Nonvolatile storage of 10 fixed LUTs

Dynamic 3-D LUT Processing

- Supports third party apps for automatic loading and display of 3-D LUTs
- Reflects dynamic changes in real time from source software
- Single Channel Mode only
- Supported by TV Logic WonderLookPro
- Supported by Pomfort LiveGrade Pro

Modes of Operation

- Four Channel Mode - Four Independent 2K, HD, or SD Video Processors
- Single Channel Mode - One 4K, UltraHD, 2K, HD, or SD Video Processor
- Enhanced Single Channel Mode - One 4K, UltraHD Video Processor with simultaneous 4K/UltraHD and 2K/HD/SD outputs

Video Formats

- (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (4K) 4096 x 2160PsF 23.98, 24, 25, 29.97, 30
- (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (UltraHD) 3840 x 2160PsF 23.98, 24, 25, 29.97, 30
- (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 1920 x 1080PsF 23.98, 24, 25, 29.97, 30
- (HD) 1920 x 1080i 50, 59.94, 60
- (HD) 1280 x 720p 50, 59.94, 60
- (SD) 625i 50
- (SD) 525i 59.94
- YCbCr, 4:2:2, 10-bit

Video Input Digital

- 4x 3G-SDI inputs, 4x BNC
- 4x 12G-SDI inputs, 4x Fiber or HD-BNC (optional SFP modules)
  - SFP coax module, 12G/6G-SDI, dual HD-BNC
  - SFP fiber module, 12G/6G-SDI, Single Mode, dual LC or single LC, SMPTE-297
  - SFP fiber module, 3G-SDI, Single Mode, dual LC, single LC, or single SC, SMPTE-297
  - SFP fiber module, 3G-SDI, Multi-Mode, dual LC or single LC, SMPTE-297
- 12G/6G/3G/HD/SD, SMPTE-259/292/424/2081/2082
  - Single Link 12G/6G-SDI (with optional SFP module)
  - Quad Link 3G-SDI Level A or B-DL (4x 3G), SMPTE-425-5
  - Dual Link 3G-SDI Level B-DS (2x 3G), SMPTE-425-3
  - Single Link 3G-SDI Level A, B-DL, or B-DS, SMPTE 425
  - Quad Link HD-SDI (4x 1.5G)
  - Dual Link HD-SDI (2x 1.5G), SMPTE-372
  - Single Link HD/SD
- Quadrant (Square Division) or 2SI (Two Sample Interleave) 4K/UltraHD input pixel mapping
- 8x 1 selector feeds video processor(s)

Video Output Digital

- 4x 3G-SDI outputs, 4x BNC
- 4x 12G-SDI outputs, 4x fiber or HD-BNC (optional SFP modules)
  - SFP coax module, 12G/6G-SDI, dual HD-BNC
  - SFP fiber module, 12G/6G-SDI, Single Mode, dual LC or single LC, SMPTE-297
  - SFP fiber module, 3G-SDI, Single Mode, dual LC, single LC, or single SC, SMPTE-297
  - SFP fiber module, 3G-SDI, Single Mode, dual LC, CWDM, SMPTE-297
  - SFP fiber module, 3G-SDI, Multi-Mode, dual LC or single LC, SMPTE-297
- 12G/6G/3G/HD/SD, SMPTE-259/292/424/2081/2082
  - Single Link 12G/6G-SDI (with optional SFP module)
  - Quad Link 3G-SDI Level A or B-DL (4x 3G), SMPTE-425-5
  - Dual Link 3G-SDI Level B-DS (2x 3G), SMPTE-425-3
  - Single Link 3G-SDI Level A, B-DL, or B-DS, SMPTE 425
  - Quad Link HD-SDI (4x 1.5G)
  - Dual Link HD-SDI (2x 1.5G), SMPTE-372
  - Single Link HD/SD
- Quadrant (Square Division) or 2SI (Two Sample Interleave) 4K/UltraHD output pixel mapping

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(Tech Specs are Continued on Next Page)

Tech Specs *(Continued)*

Monitor Output Digital

- 1x BNC, 1x 3G-SDI output
  - 3G-SDI/HD/SD, SMPTE-259/292/424, 10-bits
  - 4K/UltraHD automatically down-converted to 2K/HD
  - Enhanced Single Channel Mode - Video Formats
    - (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
    - (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
    - (HD) 1920 x 1080PsF 23.98, 24, 25, 29.97, 30
    - (HD) 1920 x 1080i 50, 59.94, 60
    - (HD) 1280 x 720p 50, 59.94, 60
    - (SD) 625i 50
    - (SD) 525i 59.94
- Enhanced Single Channel Mode - Output Video Dynamic Range/Color Gamut
  - SDR BT.709 100 Nits
  - PQ BT.2020 1000 Nits
  - Hybrid Log Gamma BT.2100
  - Sony S-Log3 S-Gamut3
  - Sony S-Log3 BT.2020
  - ARRI Log C Wide Gamut
- 1x HDMI, 1x HD output
  - 2K/HD/SD, HDMI v1.4a
  - 4K/UltraHD automatically down-converted to 2K/HD
  - HDR Infoframe generation to support HDR displays per HDMI v2.0b and CTA-861-G
  - Crop control

Video Processing

- Motion adaptive deinterlacer
- Proc amp controls
- Color corrector
- Legalizer
- Frame rate conversion/film cadence removal/insertion (3:2, 1:2, 2:1, 2:3)
- Adjustable delay 0-6 frames with H and V timing controls in lines and pixels
- Closed Captioning conversion (CEA-608/CEA-708)
- AFD input detection, down-convert control, and output pass through or overwrite
  Freeze (manual or on input signal loss) to black or last good frame
- Matte generator for background fill
- Video test generator with SDR and HDR patterns
- Nominal video delay HD/SD, 2 frames (LFR), 4 frames (HFR)

Format Conversion

- Convert any supported input format to any supported output format, within the same frame rate family. These three families are:
- 59.94, 29.97, 23.98
- 50, 25
- 60, 30, 24

Scaling

- Supported in 2K/HD/SD formats
  - Zoom in and out
  - Reposition
  - Region of Interest (ROI)

Up-Conversion

- Hardware 10-bit
- Zoom 14:9: results in a 4:3 image zoomed slightly to fill a 14:9 image with black side bars
- Zoom Letterbox: results in image zoomed to fill fullscreen
- Zoom Wide: results in a combination of zoom and horizontal stretch to fill a 16:9 screen; this setting will introduce a small aspect ratio change

Down-Conversion

- Hardware 10-bit
- Anamorphic: fullscreen
- Letterbox: image is reduced with black top and bottom added to image area with the aspect ratio preserved
- Crop: image is cropped to fit video output format

Aspect Ratio Conversion for SD to SD

- Letterbox: Transforms SD anamorphic material to a letterboxed image
- H Crop: Produces a horizontally stretched effect on the image; transforms anamorphic SD to full frame
- SD Pillarbox: Produces an image in the center of the screen with black borders on the left and right sides and an anamorphized image in the center
- V Crop: Transforms SD letterbox material to an anamorphic image

Audio Input Digital

- 48 kHz sample rate
- 8x SDI embedded inputs (16-Channels each)
- 128-Channels, 24-bit (20-bit SD), SMPTE-272/299
- 8x balanced AES inputs (16-Channels), 1x DB-25
  - 16-Channels, 24-bit, AES-3
- 2x MADI inputs, 1 BNC, 1x ST Fiber
  - 128-Channels, 24-bit, AES-10

Audio Output Digital

- 48 kHz sample rate
- 1x SDI embedded output per Video Processor (16-Channels each)
  - 16-Channels (in single Video Processor mode), 24-bit (20-bit SD), SMPTE-272/299
  - 64-Channels (in four Video Processor mode), 24-bit (20-bit SD), SMPTE-272/299
- 8x balanced AES outputs (16-Channels), 1x DB-25
  - 16-Channels, 24-bit, AES-3
- 2x MADI outputs, 1x BNC, 1x ST Fiber
  - 128-Channels, 24-bit, AES-10

Audio Processing

- 277 x 208 mono audio matrix, route 1 to 1, 1 to many
  - Inputs: 128 embedded, 16 AES, 128 MADI, 2 stereo mixdowns, 3 tone generator
  - Outputs (Four Channel mode): 16 AES, 128 MADI, 64 embedded
  - Outputs (Single Channel mode): 16 AES, 128 MADI, 16 embedded
- Input adjustment controls for each channel
  - Gain +18 to -18 dB in 0.5 dB steps
  - Phase invert
- Input adjustment controls for each channel pair
  - Delay -16ms to +1sec in 20.8 us steps
- Two independent 5.1 or 7.1 to stereo mixdown processors with gain adjust
- High quality Sample Rate Conversion supported on all audio inputs
- SRC bypass for non-PCM audio (e.g. Dolby E, AC-3, etc)
- Audio tone generator (mute, 400 Hz, 1 kHz)

Reference Input

- External, 2x BNC
  - Looping, nonterminating
  - Blackburst or tri-level sync

Genlock

- Lock to External Reference
- Lock to SDI input 1 thru 8
- Free run based on Temperature Compensated Crystal Oscillator

Network Interface

- 1x RJ-45, 10/100/1000 Ethernet
- Embedded web server for remote control
- SNMP

User Interface

- Display
- Keypad with status LEDs
- Two rotary/push knobs
- Comprehensive alarm indicators

FS-HDR Control Link Application

- Real time remote control of Colorfront Engine Parameters
- Supports Tangent Kb USB 12 knob panel
- Ganging feature provides simultaneous control of multiple FS-HDRs
- Enables 8K HDR transform pipelines when controlling 4x FS-HDR simultaneously

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Tech Specs *(Continued)*

Presets

- Four Channel and Single Channel mode each support 40 Presets

GPI

- 1x 25-pin D-Connector
  - Four optically isolated GPI inputs
  - Four optically isolated GPO outputs

Size (w x d x h)

- 17.5" x 16.0" x 1.75" (1RU) (444.5 x 406.4 x 44.45 mm)

Weight

- 7.9 lb (3.6 kg)

Power

- 100-240 VAC 50/60 Hz (Dual, redundant power supplies), 55W typical; 70W max.

Environment

- Safe Operating Temperature: 0 to 40 C (32 to 104 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)

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Five Year Warranty

AJA Video warrants that FS products will be free from defects in materials and workmanship for a period of five years from the date of purchase.

About AJA Video Systems, Inc.

Since 1993, AJA Video has been a leading manufacturer of video interface and conversion solutions, bringing high quality, cost effective digital video products to the professional, broadcast and postproduction markets. AJA products are designed and manufactured at our facilities in Grass Valley, California, and sold through an extensive sales channel of resellers and systems integrators around the world. For further information, please see our website at **www.aja.com**

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