KONA Family

KONA 3 and KONA LHi Hardware Scalar Acceleration

Final Cut Pro users will love our DVCPRO HD, HDV and Apple Dynamic RT Extreme hardware scalar acceleration, developed in close cooperation with Apple and available exclusively on high-end KONA cards. KONA hardware takes a portion of the codec processing load off the CPU, allowing more RealTime effects in Final Cut Pro when outputting.

With KONA, any HD-SDI source (or SD-SDI up-converted source) can be captured using the DVCPRO HD codec—giving you HD quality at remarkably low data rates, allowing even the internal Mac SATA storage to be used for HD capture, playback, and RT effects.

Of course, you'll obtain still better performance and more RT when using a disk array, but this feature allows HD to be used where only SD would have been considered due to drive bandwidth or budget constraints.

How does KONA 3 and KONA LHi accelerate DVCPRO HD, HDV and Apple's Dynamic RT?

Because KONA's precision hardware does part of the work, the Mac has more time available to process RT effects. This means more RT-effects power, and more RT streams. Most broadcast codecs, including DVCPRO HD and HDV, use a two-step process:

First the video is scaled to a lower horizontal pixel count, and then the video is compressed. This is done because the slightly scaled video results in a favorable trade-off between resolution and codec efficiency. KONA hardware not only dramatically speeds up the scaling part of the job, but it's also done with full 10-bit broadcast quality. When using the Final Cut Pro HDV codec, the KONA hardware acceleration allows instantaneous realtime playback for both monitoring and recording. Even KONA's down-converter works in realtime with HDV, allowing SD monitoring, dubs, or mastering. This KONA functionality allows HDV to be used with professional equipment. The Panasonic DVCPRO HD format takes advantage of KONA hardware as well. KONA precision hardware allows capture and playback of HD-SDI video to and from the DVCPRO HD codec at a quality level virtually indistinguishable from native FireWire, while freeing up valuable RT processing power. For Final Cut Pro's Dynamic RT feature, KONA hardware is used to offload the video scaling as the "Playback Video Quality" dynamically adjusts. This allows more playback power—and because KONA handles it seamlessly, the Dynamic RT you see on the Mac monitor is the same as that shown on your professional broadcast monitor output from the KONA card.

With KONA 3 we had the speed and ability to work much faster than ever before. When you're cutting live bumpers everything is happening very quickly and the reliability of your gear is paramount. The KONA 3 worked flawlessly and provided seamless workflow transitions as our tape moved from Final Cut Pro into Motion and Sound Track Pro then back into Final Cut Pro and back to air. Needless to say, the production team was ecstatic with the performance output quality and volume."

Ryan Leimbach — ABC sports editor, Superbowl XL

KONA quick reference guide

	KONA 3	KONA LHi	KONA LSe
SD (NTSC and PAL)	yes	yes	yes
HD (720p, 1080i, 1080p, 1080sf)	yes	yes	-
2K (2048 x 1556, 2048 x 1080) Dual-Link HD, 2K HSDL, 4:4:4 RGB	yes	-	-
3G SDI single-link 4:2:2	-	yes	-
HDMI v1.3a Input/Output	-	yes	-
HD to SD Down-conversion (10-bit, in hardware)	yes	yes	-
SD to HD Up-conversion (10-bit, in hardware)	yes	yes	-
HD to HD Cross-conversion (1080 to/from 720, 10-bit, in hardware)	yes	yes	-
12-bit Analog Video (component, Composite, and Y/C)	output SD/HD	input/output SD/HD	input/output SD
10-bit SDI Digital Video (BNC)	input/output SD/HD	input/output SD/HD	input/output SD
Analog Audio (balanced XLR)	-	input/output 2-channel	input/output 2-channel
AES Digital Audio (balanced XLR)	input/output 8-channel	input/output 2-channel	input/output 2-channel
Embedded SDI Audio (via BNC)	input/output 16-channel	input/output 8-channel	input/output 8-channel
Professional Genlock	yes	yes	yes
RS-422 Machine Control	yes	yes	yes
DVCPRO HD hardware scaling acceleration (in FCP)	yes	yes	-
HDV hardware scaling acceleration (in FCP)	yes	yes	-
Dynamic RT hardware scaling acceleration (in FCP)	yes	yes	-
1RU Breakout Box	yes	yes	yes
3-year AJA Warranty with Advanced Exchange	yes, included	yes, included	yes, included

Broadcast-quality conversions

KONA 3 features full 10-bit, broadcast-quality, motion-adaptive SD to HD up-conversion, HD to HD cross-conversion, HD to SD down-conversion, and automatic HD/SD 12-bit component analog output. This is the equivalent of combining AJA's stand-alone HD D/A converter, HD to SD down-converter, and SD to HD up-converter into one convenient, cost-efficient desktop video product. The quality of the KONA 3 conversions is identical to the award-winning AJA stand-alone conversion products. Since all conversion functionality on the KONA 3 is hardware-based, it is available full time, all the time, on ingest or playback. Uniquely, the KONA 3 can even cross-convert 720p 23.98 to 1080PsF 23.98. Cross-conversion is particularly valuable in today's HD post environment where being able to produce 720p or 1080i signals helps streamline dailies and deliverables creation.

Internal SD/HD hardware downstream keyer

The AJA KONA 3 features a powerful hardware downstream keyer that can place graphic files with an alpha channel over the video being input to the board—or a selectable color matte, or the contents of the card's framebuffer (AJA TV/Final Cut Pro). The downstream keyer can also key a QuickTime clip that has an alpha channel– a flying logo perhaps—by playing it in the AJA TV application over live video coming into the card.

Audio

KONA 3's extensive audio I/O support allows for easy integration with professional audio equipment; tie the KONA 3 to a digital audio mixer or DAW output with 8-channel 24-bit 48kHz or 96kHz AES audio via balanced XLR connections. For multi-channel audio mastering, 16-channel SDI embedded 24-bit 48kHz audio is provided. KONA 3 also features high-quality input sample-rate conversion on AES inputs, which eliminates the need for audio source synchronization.

Connectivity

KONA 3 provides breakout cables to connect to standard broadcast devices. For SDI video, the card features two HD/SD inputs and two outputs, one connection for Genlock input, and three BNCs which may be configured for HD/SD analog video output. Also included is a 9-pin connector for RS-422 machine control.

The optional K3-Box for KONA 3 simplifies connectivity in professional post-production environments by offering a 19-inch, 1RU rack-mountable breakout box that attaches to the KONA 3 card. This option offers all the same inputs and outputs as the standard breakout cable, and can be easily rack-mounted or placed on top of a broadcast monitor or editing console. Additional functionality over the standard breakout cable comes in the form of BNC AES input/output connectors, 2-channel RCA analog audio monitoring jacks, and looping BNC Genlock reference connectors. If you're using a Digital Betacam, DVCPro50, HDCAM, DVCPRO HD, D5, or HDCAM SR VTR—or any other professional device–you'll have the proper connections.

Dual link HD support

KONA 3 supports Dual Link 4:4:4 HD-SDI, with full bandwidth 4:4:4 RGB at 10-bits for 1080i, 1080p, 1080PsF and 720p formats. KONA 3 can also convert between 4:4:4 and 4:2:2 formats for single link HD-SDI monitoring and output.

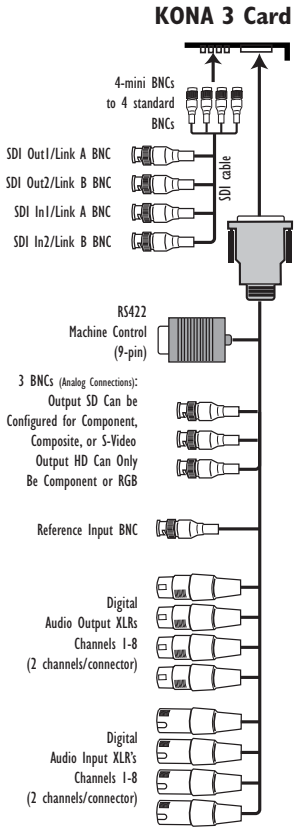
2K support

As the most capable 2K card available for the Mac, you can use KONA 3 to ingest from HSDL (high speed data link) equipped sources and record simultaneous 2K DPX files and 2K QuickTime reference movies using the AJA VTR Xchange application. You can also work with existing 2K material, like sequential DPX or Cineon files, by using AJA's DPXToQT Translator application to create QuickTime files that can be used by a wide variety of QuickTime based applications. RED digital media—proxy files or transcoded material— is also supported at 2K resolutions.

Use KONA 3 to output at 2K, interfacing with other available 2K products such as digital disk recorders and 2K projectors. KONA 3 also allows 2K files to be viewed with a user selected crop function on HD 1080PsF supported video monitors. This functionality helps lower the price barrier for viewing 2K material. The 1080 HD playout can additionally be down-converted to SD in realtime, giving users a powerful solution for multi-format video playout of 2K material and flexible tape mastering options. Offline editing can be done in Final Cut Pro, and because of the flexibility of Final Cut Pro and QuickTime, a 2K conform on the Mac is possible using the KONA 3.

All of the KONA 3 capabilities add up to the most reliable, feature rich, and highest-performance card available for OSX and Final Cut Pro. KONA 3 is the right tool for the discerning post-production professional.

KONA 3 standard connections



Workflow examples

RED 2K REDCODE Editing with Final Cut Pro and AJA KONA 3

- Shoot 4K with RED Camera
- Copy .r3d files onto local storage
- Import REDCODE "h" resolution QuickTime proxy files into Final Cut Pro.
- Edit REDCODE media at 2K resolution (typically 2048x1024).
- AJA provides an Easy Setup for working with RED material at this frame size. Note: the default video output for the AJA Final Cut Pro Easy Setup is 1920x1080 so that typically available HD monitors can be used. Alternately, the KONA 3 video output can be configured for 2K and output to 2K projectors is also possible.

For more information on working with RED, consult www.aja.com

Apple ProRes 422 editing

- Ingest media via SDI or HD-SDI to the Apple ProRes 422 or Apple ProRes 422 (HQ) format and framerate that is appropriate for your workflow.
- Use the AJA KONA 3 to convert your source video if needed: SD sources may be upconverted to HD and captured as Apple ProRes 422 or Apple ProRes 422 (HQ). 720p to 1080i and 1080i to 720p crossconversions can also be performed on ingest when encoding to Apple ProRes 422 and Apple ProRes 422 (HQ).
- Edit in the appropriate Apple ProRes 422 or Apple ProRes 422 (HQ) format and framerate; AJA provides a variety of Easy Setups for specifically working with Apple ProRes 422 and Apple ProRes 422 (HQ) content.
- With the AJA Easy Setup selected, video preview to professional monitors is enabled.
- Master to a variety of tape formats with RS-422 device control. Note: The AJA KONA 3 may be used to convert to the appropriate format/framerate for output.

Cross platform workflows

A variety of compressions can be selected for cross-platform editorial.

Typically, QuickTime files tend to be a good choice for cross-platform workflows. Some codecs are available to users on either a Mac or PC as part of any QuickTime installation. AJA also provides the ability to work with certain QuickTime codes on either Mac or Windows operating systems such as: '2vuy' (aka "Uncompressed 8-bit 4:2:2"), '2Vuy' (aka "AJA Kona 2Vuy Codec"), 'v210' (aka "Uncompressed 10-bit 4:2:2"), 'R10k' (aka "AJA Kona 10-bit RGB Codec") and 'R10g' (aka "AJA Kona 10-bit Log RGB Codec"). Beginning with version 3.5 of the XENA software, DVCPRO HD QuickTime media can also be shared between Mac and Windows .

Apple also provides an Apple ProRes QuickTime Decoder for QuickTime on Windows so this high-quality media can also be shared across platforms. For high-end finishing such as visual effects and color correction, DPX files are a good cross-platform file type. Both the Mac and Windows software for AJA hardware can work with DPX files.

"The AJA KONA 3 card offers shooter-producers total confidence in its ability to move to and from virtually any HD or SD format or resolution."

Barry Braverman — Digital Content Producer

KONA LHi NEW

Flexible connectivity at an affordable price

KONA LHi Features

- 3G/HD/SD SDI input/output
- HDMI v1.3a w/Deep Color at 30/36 bits per pixel input/output
- 12-bit HD analog component input/output
- 12-bit SD analog component, composite, or S-Video input/output
- 10-bit Hardware-based realtime up/down/cross-conversions
- DVCPRO HD hardware acceleration
- HDV hardware acceleration
- Dynamic RT hardware acceleration
- 2-ch balanced XLR AES digital audio and 2-ch balanced XLR analog audio input/output
- 8-ch SDI embedded audio input/output
- HD/SD Genlock and RS-422 machine control
- LTC Input (on Reference input)
- Support for Final Cut Studio applications, Adobe applications and more
- Breakout cables standard, affordable breakout box optional
- 3-year warranty

The AJA KONA LHi bridges the gap between legacy analog devices and the latest 3G SDI and HDMI v1.3a enabled products. KONA LHi interfaces with the latest PCIe Apple Mac OSX hardware and QuickTime software applications. AJA drivers offer integrated support for Apple Final Cut Studio. KONA LHi allows editing, monitoring and mastering of professional quality video in an affordable, easy to use product.

KONA LHi offers a full host of no-compromise features: 10 or 8-bit uncompressed video, 3G/HD/SD SDI I/O including support for 1080p50/60, analog composite/S-Video/SD-HD component video I/O, 2-channel AES/8-channel SDI embedded audio I/O, 2-channel balanced audio I/O, and broadcast-quality hardware-based up/down/cross-conversion for flexible SD and HD post production. Also, HDMI v1.3a capability at 30 bits per pixel allows full support of the latest 10-bit monitors.

The KONA LHi comes standard with a breakout cable and can also be connected to an optional breakout box for rack mounted I/O convenience and added connectivity in the form of additional BNC digital AES/EBU connectors and RCA monitoring jacks.

Use the KONA LHi hardware-based flexible connectivity to capture to QuickTime™ at 10-bit and 8-bit uncompressed formats as well as Apple ProRes 422, DVCPRO HD and more.

AJA Control Panel application

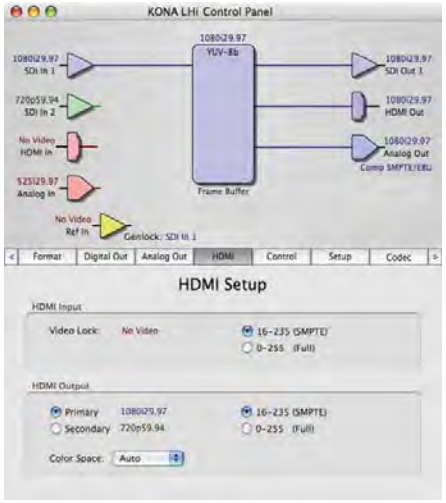
As a member of the AJA KONA family of products, the KONA LHi uses the AJA Control Panel application to configure various hardware parameters. The AJA Control Panel application can auto detect input format and frame rate, configure hardware-based up/down/cross-conversions, and more.

Connectivity

If your post production facility works with a wide variety of formats, frame rates and audio/video sources, the AJA KONA LHi provides the connectivity you need. Connect everything from an HDMI enabled camera to an HD-SDI VTR to KONA LHi. Connection to any of your legacy analog video signals is also possible. Via an Input PassThrough mode, you can even configure the card to act as a converter within your computer, allowing you to embed or disembed audio or convert a signal like HDMI to HD-SDI.

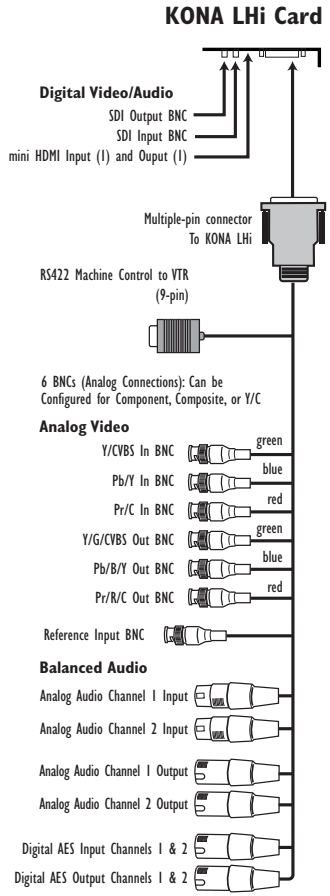
Broadcast-quality conversions

Like the AJA KONA 3 product, the KONA LHi features full 10-bit, broadcast-quality, motion-adaptive SD to HD up-conversion, HD to HD crossconversion, HD to SD down-conversion, and automatic HD/SD 12-bit component analog output. Since all of KONA LHi's conversions are hardware-based, they are available all the time - during ingest or playback. Outputs can be configured independently allowing you to have simultaneous HD and SD output - or two different types of HD - 720 or 1080 - output at the same time via cross-conversion.



KONA LHi Control Panel

KONA LHi standard connections



Specifications

KONA3 Specifications

Video Input
Dual-rate (SD or HD)
HD/SD "SDI", SMPTE-259/292/296
Single Link 4:2:2
Dual-link HD 4:4:4
2K HSDL (High Speed Data Link) 4:4:4

Video Formats
525i 23.98 (intermediate format only)
525i 29.97
625i 25
720P 23.98 (intermediate format only)
720P 50
720P 59.94
720P 60
1080i 25
1080i 29.97
1080i 30
1080PsF 23.98
1080PsF 24
1080P 23.98
1080P 24
1080P 25
1080P 29.97
1080P 30
1080P 50
1080P 59.94
1080P 60
2048 x 1080P 23.98
2048 x 1080P 24
2048 x 1080PsF 23.98
2048 x 1080PsF 24
2048 x 1556PsF 14.98 (HSDL data rate)
2048 x 1556PsF 15 (HSDL data rate)
2048 x 1556psf 23.98 (playback rate)
2048 x 1556PsF 24 (playback rate)

Video Output
Digital:
SD-SDI, SMPTE, 259M, 10-bits, BNC
HD-SDI SMPTE, 292/296, 10-bits, BNC
Dual-link HD 4:4:4 and 2K HSDL 4:4:4
Analog:
SD and HD Output, 12-bits, BNC
HD: YPbPr, RGB
SD: YPbPr, RGB (component mode) or Composite + Y/C (composite mode with simultaneous Y/C)

Downstream Keyer:
Will output graphics with alpha channel over video, matte or framebuffer, or framebuffer content over incoming video or matte

Audio
24-bit SDI embedded audio,
16 channel, 48kHz
24-bit AES audio, 8 channel, 96kHz or 48kHz
16-bit capable

Up-Conversion
Hardware 10-bit
Anamorphic: full-screen
Pillar box 4:3: results in a 4:3 image in center of screen with black sidebars
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 full screen
Zoom Wide: results in a combination of zoom and horizontal stretch to fill a 16:9 screen; this setting can introduce a small aspect ratio change

Down-Conversion
Hardware 10-bit
Anamorphic: full-screen
Letterbox: image is reduced with black top and bottom added to image area with the aspect ratio preserved
Crop: image is cropped to fit new screen size

Cross-Conversion
Hardware 10-bit
1080i to 720P
720P to 1080i
720P to 1080PsF

SD to SD Aspect Ratio Conversion
Letterbox: This transforms SD anamorphic material to a letterboxed image.
H Crop: Will produce a horizontally stretched effect on the image; transforms anamorphic SD to full frame
SD Pillarbox: Will produce 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; Will transform SD letterbox material to an anamorphic image.

Reference Input
Color Black or Tri-level sync
(Ref input is looping/non-terminating on the K3-Box; terminated on supplied breakout cable)

Machine Control
RS-422, Sony 9-pin protocol

KONA LHi Specifications

Video Input
Digital:
3G/HD/SD SDI, SMPTE-259/292/296/424
HDMI v1.3, 30/36 bits/pixel,
RGB or YUV, 2.25Gbps, SD,
HD, 1080p50/60
Analog:
Composite/S-Video (Y/C):
NTSC, NTSCJ, PAL 12-bit A/D, 2x oversampling
3 line adaptive comb filter decoding
SD Component:
SMPTE/EBU N10, Betacam 525 line,
Betacam 525J, RGB
12-bit A/D, 2x oversampling
HD Component:
YPbPr
12-bit A/D

Video Formats
525i 29.97
625i 25
720p 50
720p 59.94
720p 60
1080i 25
1080i 29.97
1080i 30
1080PsF 23.98
1080PsF 24
1080P 23.98
1080P 24
1080P 25
1080P 29.97
1080P 30
1080P 50
1080P 59.94
1080P 60

Video Output
Digital:
3Gb SD and HD-SDI, SMPTE-259/292/296/424
HDMI v1.3, 30/36 bits/pixel,
RGB or YUV, 2.25Gbps, SD,
HD, 1080p50/60
Analog:
Composite/S-Video (Y/C):
NTSC, NTSCJ, PAL
12-bit D/A, 8x oversampling
SD Component:
SMPTE/EBU N10, Betacam 525 line,
Betacam 525J, RGB
12-bit D/A, 8x oversampling
HD Component:
YPbPr, RGB
12-bit D/A, 2x oversampling

Audio
Digital:
24-bit SDI embedded audio,
8 channel, 48kHz
24-bit AES audio, 2 channel, 48kHz
16-bit capable
Analog:
24-bit A/D and D/A, 2 channel balanced XLR, 48kHz
+24dbu Full Scale Digital
+/- 0.2db 20 to 20kHz frequency response

Up-Conversion
Hardware 10-bit
Anamorphic: full-screen
Pillar box 4:3: results in a 4:3 image in center of screen with black sidebars
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 full screen
Zoom Wide: results in a combination of zoom and horizontal stretch to fill a 16:9 screen; this setting can introduce a small aspect ratio change

Down-Conversion
Hardware 10-bit
Anamorphic: full-screen
Letterbox: image is reduced with black top and bottom added to image area with the aspect ratio preserved
Crop: image is cropped to fit new screen size

Cross-Conversion
Hardware 10-bit
1080i to 720P
720P to 1080i
720P to 1080PsF

SD to SD Aspect Ratio Conversion
Letterbox: This transforms SD anamorphic material to a letterboxed image.
H Crop: Will produce a horizontally stretched effect on the image; transforms anamorphic SD to full frame
SD Pillarbox: Will produce 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; Will transform SD letterbox material to an anamorphic image.

Reference Input
Color Black or Tri-level sync
(Ref input is looping/non-terminating on the KLHi-Box; terminated on supplied breakout cable)

Machine Control
RS-422, Sony 9-pin protocol

KONA LSe Specifications

Video Input
SD-SDI SMPTE-259
Composite/S-Video (Y/C):
NTSC, NTSCJ, PAL
12-bit A/D, 2x oversampling
3 line adaptive comb filter decoding
Component:
SMPTE/EBU N10,
Betacam 525 line, Betacam 525J, RGB
12-bit A/D, 2x oversampling

Formats
525i 29.97 , 625i 25

Video Output
Digital:
SD-SDI, SMPTE, 259M, 10-bits, BNC
Analog:
Composite/S-Video (Y/C):
NTSC, NTSCJ, PAL 12-bit D/A, 8x oversampling
Component:
SMPTE/EBU N10, Betacam 525 line,
Betacam 525J, RGB
12-bit D/A, 8x oversampling

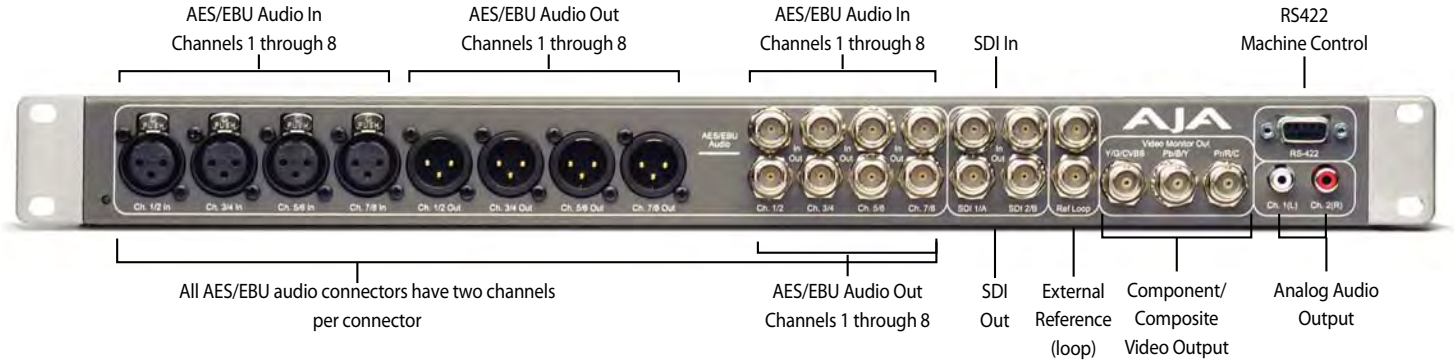
Audio
Digital:
24-bit SDI embedded audio, 8 channel, 48kHz
24-bit AES audio, 2 channel, 48kHz
16-bit capable
Analog:
24-bit A/D and D/A, 2 channel balanced XLR, 48kHz
+24dbu Full Scale Digital
+/- 0.2db 20 to 20kHz frequency response

Reference Input
Color Black
(Ref input is looping, non-terminating on the Breakout Box; terminated on supplied breakout cable)

Machine Control
RS-422, Sony 9-pin protocol

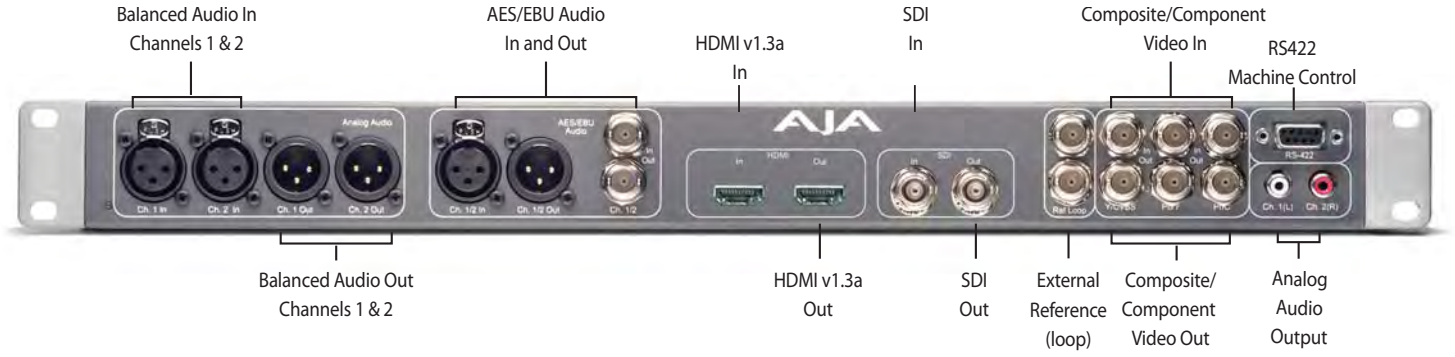
Connections

K3-Box for KONA 3 (Optional)



KONA 3 breakout cables (supplied)

KLHi-Box for KONA LHi (Optional)



KONA LHi & LSe breakout cables (supplied)