

# KONA

FOR PC SOFTWARE

Published: 10/31/11

## Installation and Operation Guide

Because it matters.

**AJA**<sup>®</sup>  
VIDEO SYSTEMS

## Trademarks

---

AJA®, KONA®, Ki Pro®, KUMO®, and XENA® and are registered trademarks of AJA Video, Inc, Io Express™, Io HD™, Io™, and Because It Matters™ are trademarks of AJA Video, Inc. Apple, the Apple logo, AppleShare, AppleTalk, FireWire and Macintosh are registered trademarks of Apple Computer, Inc. Final Cut Pro, QuickTime and the QuickTime Logo are trademarks of Apple Computer, Inc. TASCAM is a registered trademark of TEAC Corporation.

All other trademarks are the property of their respective holders.

## Notice

---

Copyright © 2011 AJA Video, Inc. All rights reserved. All information in this manual is subject to change without notice. No part of the document may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopying or recording, without the express written permission of AJA Inc.

## FCC Emission Information

---

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by AJA Video can effect emission compliance and could void the user's authority to operate this equipment.

## Contacting Support

---

To contact AJA Video for sales or support, use any of the following methods:

180 Litton Drive, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.271.3190

Fax: 530.274.9442

Web: <http://www.aja.com>

Support Email: [support@aja.com](mailto:support@aja.com)

Sales Email: [sales@aja.com](mailto:sales@aja.com)

When calling for support, first read the Chapter on *Troubleshooting* at the back of this manual. You can often save time and effort by looking there first for simple remedies and information on how to get support from AJA.

## Limited Warranty

AJA Video warrants that this product will be free from defects in materials and workmanship for a period of three years from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify AJA Video of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by AJA Video, with shipping charges prepaid. AJA Video shall pay for the return of the product to the Customer if the shipment is to a location within the country in which the AJA Video service center is located. Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. AJA Video shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than AJA Video representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by the use of non-AJA Video parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product.

THIS WARRANTY IS GIVEN BY AJA VIDEO IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. AJA VIDEO AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. AJA VIDEO'S RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE WHOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER AJA VIDEO OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.



## Table of Contents

Trademarks .....	ii
Notice .....	ii
FCC Emission Information .....	ii
Contacting Support .....	ii
Limited Warranty .....	iii

### Chapter 1: Introduction

Overview .....	1
Applications Supported .....	1
Capture Formats .....	2
DVCProHD Support .....	2
KONA Models Covered in this Manual .....	2
KONA 3G Features .....	3
Dual Link .....	3
KONA 3G Workflow .....	3
Broadcast-quality Conversion .....	4
Video + Key SDI output .....	4
KONA 3G Audio .....	4
KONA 3G I/O .....	4
KONA LHi Features .....	5
KONA LHi I/O .....	5
HD/SD Conversion .....	5
KONA LHe Plus Features .....	6
KONA Software .....	6
What's In The Box? .....	7
Minimum System Requirements .....	8
Understanding Disk Storage Methods .....	8
Cable Connections .....	8
Using the Breakout Cable and Card Endplate Connectors .....	8
Using Breakout Boxes .....	11
Connector Descriptions—LHe Plus/LHi Cables and KL-Box .....	12
Connector Descriptions—KONA 3G Cables and K3G-Box .....	13
In This Manual .....	15

### Chapter 2: Installation and Hardware Configuration

Installation Overview .....	17
Unpacking .....	18
Shipping Box Contents .....	18
Computer Requirements for KONA Cards .....	19
AJA Data Rate Calculator Application for Windows .....	19
AJA KONA System Test .....	19
Installing the KONA Card .....	20
Cabling KONA .....	22
Using The 3G Breakout Cable .....	22
Using The LHe Plus/LHi Breakout Cable .....	23
A Typical System .....	24
Genlock and Your System .....	25

Installing KONA Software .....	25
Software Installation Procedure .....	25
Re-Installation & Repair .....	30

### Chapter 3: Setup and Configuration

Setup Overview .....	31
Selection of Primary & Secondary Formats .....	31
Primary and Secondary Format Options Supported by KONA cards .....	32
Convert Mode .....	33
KONA Format Setup Options .....	35
Capture, Preview, and Playback—Differences and Similarities .....	37
Capture Overview .....	37
Preview Overview .....	37
Playback Overview .....	37
Support for Capture, Preview and Playback .....	38
KONA DVCProHD Support .....	38
KONA Capture .....	38
AJA's Hardware Scaling Support .....	39
Codec Requirements .....	39

### Chapter 4: Using AJA's Machina Application

Machina Capture/Playback Application .....	41
KONA Realtime Performance .....	41
Machina Overview .....	42
Shortcuts and Display Features .....	42
Full-screen Desktop Display .....	43
Setup Window .....	43
Activation Options .....	43
Capture Options .....	44
Play Options .....	46
Device Control Options .....	47
General Options .....	48
Capture Window .....	49
File Options .....	50
Clip Options .....	51
Display Options .....	51
Overlay Options .....	52
Capture Controls .....	53
Play Window .....	55
File Options .....	55
Display Options .....	56
Leader/Trailer Options .....	56
Play Controls .....	57
Output Modes .....	58

**Chapter 5: Using Adobe CS5.5 Applications**

Overview .....	61
Adobe Premiere Pro Realtime Performance .....	62
Beginning a Project with KONA Presets .....	63
Options Set in Premiere Pro Preferences .....	65
Premiere Pro Capture Options Panel .....	67
Capture Options .....	68
Desktop Display Options .....	69
File Options .....	70
Premiere Pro Playback Options .....	72
Using Photoshop CS5.5 .....	74
Configuration Option Panels .....	76
Using the AJA Capture Plugin .....	77
Image Options Menu .....	78
General Options Menu .....	79
Status Display .....	79
Play/Record Controls .....	80
Using the AJA Preview Plugin .....	81
Using After Effects .....	83
KONA After Effects CS5.5 Plugin Overview .....	83
Using the After Effects Preview Plugin .....	84

**Chapter 6: Using Eyeon Fusion**

Using Eyeon Fusion .....	85
Preview Options .....	86
Activation .....	87
Primary & Secondary Formats .....	87

**Chapter 7: Third-Party Applications**

Native Support for KONA for PC Products .....	89
Drastic Technologies Media NXS .....	89

**Appendix A: Troubleshooting**

If You Run Into Problems .....	91
Updating Software .....	91
Support .....	91
Frequently Asked Questions .....	92

**Appendix B: Specifications**

KONA 3G Specifications .....	95
KONA LHi Specifications .....	97
LHe Plus Specifications .....	99



# Chapter 1: Introduction



KONA 3G – SD, HD, 3G,  
Dual Link, HSDL, HDMI out



KONA LHi – SD, HD,  
HDMI, Analog



KONA LHe Plus – SD, HD,  
Analog

## Overview

The AJA KONA series brings the highest quality 3G, 2K, HD, and SD video and audio to a Windows workstation. This manual discusses the KONA for PC software plug-ins that provide powerful features to Windows video applications. Although this manual is written for the Windows plug-ins, it also applies to AJA Mac Plug-ins for Adobe which run under OSX Snow Leopard and Lion (the screens and functions are mostly identical).

## Applications Supported

With KONA Software version 5.5.2 for PC's professional features, you can run these Windows platform applications (application software not included).

- Adobe Premiere Pro CS5.5
- Adobe After Effects CS5.5
- Adobe Photoshop CS5.5
- Eyeon Fusion 6.x (64-bit only)

KONA for PC software also offers AJA's own Machina software for incredible standalone file capture, preview and playout with full machine control. Third-party native support for KONA cards is also available in applications such as Avid Liquid Chrome, Sony Vegas, and Sonic CineVision (see "[Native Support for KONA for PC Products](#)" on page 89).

**Note:** AJA KONA and Io Express users can receive a free copy of Drastic Software's MediaNXS LE(TM) control software for Windows. The MediaNXS LE software provides you with a wide range of advanced functionality including: batch capture, EDL export and advanced image monitoring tools. Click on the link below to go to the Drastic website and download the software or find out more.

<http://www.medianxs.com/>

KONA version 5.5.2 software and plugins are also compatible with the Bootcamp Windows environment on Macintosh machines running OSX Snow Leopard or better.

Currently offered KONA card models require a PCIe bus. KONA cards offer high-quality digital and analog interfaces for use in broadcast, editing and graphics/animation work. The KONA 3G card can capture SDI, HD-SDI, Dual Link 4:4:4 HD-SDI, and HSDL. The 3G card also provides an HDMI 1.4a output. KONA LHi captures analog and digital HD/SD data and also supports HDMI in and out. KONA LHe Plus provides flexible standard definition and high definition capture and playback, a hardware downconverter for working in mixed SD/HD environments—and it supports both analog and digital audio/video I/O.

## Capture Formats

When capturing, you can record data in the following file formats:

- DPX
- Cineon
- TGA
- TIFF
- BMP
- YUV
- AVI
- QuickTime
- MXF MPEG (Sony Vegas only)

## DVCProHD Support

KONA cards also include a DVCProHD Library that enables users to capture, edit, and play back DVCProHD compressed QuickTime files in KONA for PC supported applications.

For more information on using DVCProHD for:

- Compressed Online Editing,
- Compressed Offline Editing,
- Import, Editing, and Playing Multiple Media Types,
- Cross-Platform Workflow with KONA and DVCProHD

Please see the whitepaper DVCProHD Editing with KONA at:

[http://www.aja.com/pdf/AJA\\_whitepaper\\_DVCProHD\\_editing.pdf](http://www.aja.com/pdf/AJA_whitepaper_DVCProHD_editing.pdf)

## KONA Models Covered in this Manual

**Note:** This manual covers the installation and operation of KONA LHe Plus, KONA LHi, and KONA 3G models and discusses using them with supported applications. The current version KONA 3G is documented here. For information about the earlier KONA 3/3X, you may find the user manual online at:

[http://www.aja.com/pdf/KONA\\_PC\\_Manual\\_5.0pdf](http://www.aja.com/pdf/KONA_PC_Manual_5.0pdf)

Instructions for installing the optional breakout boxes are shipped with the option.

## KONA 3G Features

KONA 3G features 10-bit uncompressed video 3G/HD/SD SDI I/O, new HDMI 1.4a output for stereoscopic monitoring to consumer 3D displays, 8-channel AES digital audio I/O (16-channel AES with optional K3G-Box) and 16-channel SDI embedded audio I/O, real-time hardware-based up/down/cross conversion to support a range of SD and HD, dual-link HD, even 2K formats, a hardware-based downstream keyer and more.

It captures uncompressed 10-bit and 8-bit digital video and 24-bit 48 kHz digital audio in Standard definition (SMPTE 259M), High definition (SMPTE 292M), Dual Link High Definition (SMPTE 372M), and 3G-SDI (SMPTE 424M).

KONA 3G features include:

- SDI, HD-SDI, Dual Link SD and HD-SDI, HSDL, and 3G-SDI
- HDMI 4.1a output supporting stereoscopic 3D.
- KONA software plugins and support for third-party applications
- AJA's standalone Machina capture/playback software
- Native support for uncompressed DPX, Cineon, TGA, TIFF, BMP, YUV, and AVI and QuickTime files
- Support for 2K frame formats
- Look Up Table support (LUT)
- 4-lane PCI-express bus interface (KONA 3G)
- Broadcast-quality hardware 10-bit up-convert, down-convert and cross-convert.
- 12-bit HD component and SD component/composite analog output
- 16-channel SDI embedded audio and 8-channel 48 kHz AES audio
- RS-422 machine control
- Cables standard, K3G-Box breakout optional

### Dual Link

KONA 3G supports Dual Link 4:4:4 HD-SDI. KONA 3G Dual Link supports full-bandwidth 4:4:4 RGB at 10-bits (12-bit capable) for 1080i, 1080p, and 720p formats. KONA 3G can also convert between 4:4:4 and 4:2:2 formats for Single Link HD-SDI output.

### KONA 3G Workflow

The KONA 3G path allows you to go straight from telecine to disk with 2K media eliminating the steps of using tape stock and then digitizing those tapes for the nonlinear editor. KONA 3G capture from 2K telecine directly creates 2K DPX, QuickTime, Cineon, AVI, TGA, TIFF, or BMP files. Material can be played out at 2K via HSDL (High Speed Data Link) at 15 fps.

KONA 3G allows 2K files to be viewed on HD 1080 24P-supported video monitors. This 1080 HD playout can also be down-converted to SD in realtime, giving the 2K DI pipeline a solution for multi-format video playout of 2K material.

By generating 2K files directly from a Telecine in a multitude of file formats and bit-depths, you have files available for use on any system and at any stage in production. A colorist, effects artist, and editor can immediately use the files.

KONA 3G supports any popular uncompressed SD or HD format, including Dual Link, 2K, and 2.970 Gb/s 3G-SDI. It captures and plays back uncompressed 10-bit and 8-bit digital video. KONA 3G also includes a variety of 10-bit broadcast-quality features—hardware-based up-, down-, and cross-conversion to and from HD.

KONA 3G is a 4-lane PCI-express bus card.

## Broadcast-quality Conversion

KONA 3G features full 10-bit, broadcast-quality, SD-to-HD up-conversion, HD- to-SD down-conversion, SD and HD cross-conversion, and automatic HD/SD 12-bit component analog output. The quality is identical to AJA's stand-alone products and all functionality is hardware-based making it available all the time on digitize or playback. KONA 3G offers hardware-based 1080-to-720 or 720-to-1080 cross-conversion further streamlining dailies and deliverables creation at true broadcast picture quality in realtime. For maximum flexibility, hardware-based aspect ratio conversion can be applied to standard definition capture and output.

## Video + Key SDI output

This feature is available on the output settings in Machina, After Effects, and Premiere Pro. To use Video + Key, set the SDI-1 Output to 'Video + Key (V)' or 'Video + Key (K)'. The SDI-2 then output automatically changes to the complimentary setting.

**Note:** Video + Key is limited to 8-bit RGBA files.

## KONA 3G Audio

KONA 3G's extensive audio support makes installation simple, working with 8-channel 24-bit 48 kHz audio via BNC connections, and 16-channel embedded 24-bit SDI/HD-SDI audio (capture and playback).

KONA 3G also features high-quality input sample-rate conversion on AES inputs, which eliminates the need for audio source synchronization.

## KONA 3G I/O

KONA 3G offers two HD/SD SDI inputs and outputs and a component analog output, each independently switchable between HD and SD (SD analog can be configured as composite). For example, if you are working in HD, you can have simultaneous HD-SDI, SD-SDI, and HD or SD component analog output. Using KONA 3's always-available format conversion features, monitoring can be as simple as a single composite monitor for both SD and HD projects. Dual Link can be monitored via Dual Link HD-SDI outputs, Single Link HD-SDI, or HD component analog. The KONA 3G also provides an HDMI output.

When you plug in KONA 3G's breakout cables they automatically configure. For SDI video, the card features two HD/SD inputs and two outputs for Single or Dual Link, one connection for Genlock input, and three for HD/SD component analog video out. Also included is a 9-pin D connector for RS-422 machine control. The SDI inputs and outputs use a separate cable with special mini-BNC connectors on one end and full-size BNCs on the other for ease of connection and superior reliability.

The K3G-Box for KONA 3G simplifies interfacing by offering a 19-inch, 1RU rack-mountable breakout box that attaches to the KONA 3G with just two custom cables and a standard HDMI mini-to-HDMI cable (included with KONA 3G). This option offers all the same inputs and outputs as the standard breakout cable, and can be easily rackmounted or placed on top of a broadcast monitor or editing desk. Additional functionality includes BNC AES output, 2-channel RCA analog audio monitoring, and looping BNC Genlock reference connectors. Proper connections are provided for a Betacam deck, HDCAM, DVCPRO HD, D5, D9, or even HDCAM SR.

## KONA LHi Features

The KONA LHi card provides the Windows workstation with both HD and SD analog and digital I/O, and HDMI input and output. The LHi SDI I/O BNCs also support 3G-SDI, consisting of a single 2.970 Gbit/s serial link, standardized in SMPTE 424M.

KONA LHi Features include:

- 10-bit Uncompressed SD/HD Capture Card
- 12-bit HD Analog Component I/O
- 12-bit SD Analog Component or Composite/YC I/O
- 3G, HD-SDI, or SD-SDI input I/O
- HDMI input and output with v1.3a Deep Color at 30 bits per pixel
- 2-channel balanced XLR AES and 2-channel balanced XLR Analog Audio I/O
- 8-channel SDI Embedded Audio I/O
- Broadcast-quality hardware 10-bit up-convert, down-convert and cross-convert.
- Native support for DPX, Cineon, TGA, TIFF, BMP, YUV, AVI and QuickTime files
- HD/SD Genlock
- RS-422 Machine Control
- Cables standard, KLHi-Box breakout box optional
- AJA KONA software, including application plugins and AJA Machina capture/payout software
- PCI-express (PCIe) bus interface
- LTC selectable on reference input

## KONA LHi I/O

The KONA LHi comes standard with a breakout cable, and also works with the optional KLHi-Box for rackmounted I/O convenience. It offers multi-channel audio and 16/24/32-bit AES/EBU digital audio at 48 kHz for digital production. By including hardware sample-rate conversion on AES inputs, KONA LHi eliminates source synchronizing requirements.

Supporting Digital SD/HD and Analog SD/HD I/O, KONA LHi fits many diverse workflows including analog component connections from HDV cameras providing direct ingest of HDV-acquired material into uncompressed or any other supported file format. These 12-bit analog inputs and outputs, and 10-bit digital I/Os, ensure that KONA LHi can interface to almost any SDI or analog device.

KONA LHi is a 4-lane PCI-express bus card that provides HDMI in/out and has 1 SDI/HD input and 1 SDI/HD output. HDMI input and output, effectively allows use of inexpensive but high-quality HD camcorders for input and HDMI monitors for low-cost HD program monitoring.

## HD/SD Conversion

KONA LHi also provides 10-bit hardware HD-to-SD up-, down-, or cross-conversion that can be applied to any or all inputs or outputs. Digitize HD into space-efficient SD for off-line work. Monitor HD files on an SD monitor. Make analog or digital SD tape masters from an HD project.

## KONA LHe Plus Features

---

The KONA LHe Plus card offers the best solution for affordable SD/HD capture and playback. It offers a cost-effective solution for capture, playback, and printing video for non-linear editing and visual effects/motion graphics.

KONA LHe Plus features include:

- 10-bit uncompressed SD/HD QuickTime capture card
- 12-bit HD Analog Component I/O
- 12-bit SD Analog Component/Composite/S-Video I/O
- 10-bit hardware HD-to-SD downconversion
- HDV hardware acceleration
- Dynamic RT Extreme hardware acceleration
- One SDI or HD-SDI Input
- Two independent SDI/HD-SDI outputs
- 2-channel analog balanced XLR audio I/O
- 2-channel AES XLR audio I/O
- 8-channel SDI embedded audio I/O
- HD/SD genlock on analog video inputs
- RS-422 Machine Control
- Final Cut Pro, Motion, After Effects, Combustion, and more
- Cables standard
- Optional KL-box Breakout Box—provides rack mounting and flexible easy I/O (KL-box cabling is included with the KL-box). When ordering, specify a KL-box for the KONA LHe Plus since it uses a unique cable.

The KONA LHe Plus supports DPX, Cineon, TGA, TIFF, BMP, YUV, AVI and QuickTime files

### KONA LHe Plus I/O

KONA LHe Plus can operate with either the standard breakout cable (included) or optional KL-Box for rackmounted I/O convenience. KONA LHe Plus provides high quality analog and digital 10-bit resolution SMPTE SDI standard and high definition video connections. KONA LHe Plus also has great audio I/O support—2-channel balanced XLR analog, 2-channel XLR AES, and multi-channel embedded SDI audio. KONA LHe Plus includes hardware sample-rate conversion on AES inputs eliminating source synchronizing requirements.

## KONA Software

---

KONA software consists of KONA application software (Machina™), KONA driver software, and KONA plug-in software for 3rd-party applications. This suite of software allows KONA to work in a variety of workflows. The plug-ins provide tightly integrated KONA source selection and control within 3rd-party applications. KONA software provides direct support for Adobe Creative Suite 5.5 including Premiere Pro, Adobe After Effects, Adobe Photoshop, and also Eyeon Fusion 6 (64-bit) (application software not included).

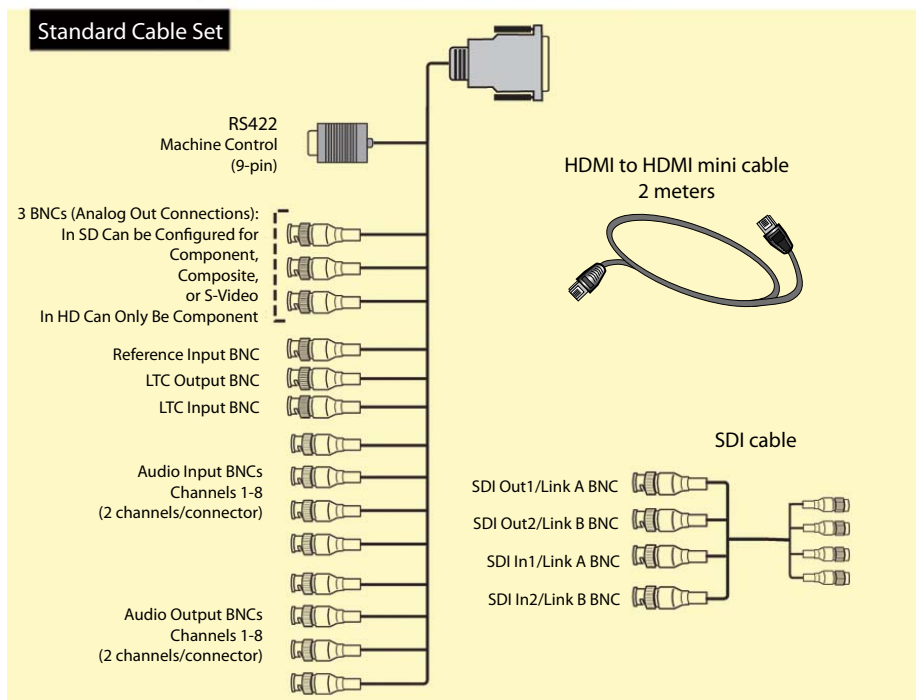
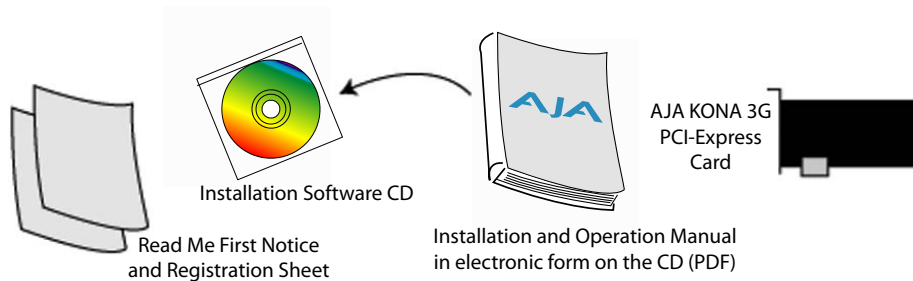
With a Windows workstation, and KONA, you have a high-quality cost-effective system for standard definition, high definition, digital and analog video production workflows (features vary with each model). Software is supplied on CD and on the web for download of the latest software versions, including:

- AJA's Machina Capture/Playback application
- Drivers for the card itself
- All files necessary for interfacing with third-party software applications

## What's In The Box?

When you unpack your AJA KONA LHe Plus, LHi or KONA 3G, you'll find the following components:

- AJA KONA for PC Software and Documentation CD-ROM – this CD contains the software installer to place KONA drivers, plugins, and the AJA Machina capture/playback application on a Windows workstation. The CD also contains a wide variety of useful information. (A separate CD is provided with Mac OSX Installation software for KONA use on Macs.)
- The KONA model you ordered
- Cable assembly – the appropriate KONA Standard Breakout cable for your KONA card (KONA 3G includes HDMI output cable)
- Read Me First Notice – late-breaking news and/or errata related to KONA and the documentation
- Registration Sheet – register your card by mail or online (details provided)



**KONA Shipping Box Contents (KONA 3G contents shown)**

## Minimum System Requirements

---

AJA Video recommends that your system meet minimum hardware and software requirements to achieve a satisfactory level of performance when operating it. System requirements are subject to change as new versions of operating systems, QuickTime, and workstations become available. For the most up-to-date Minimum System Requirements see the AJA website at:

<http://www.aja.com/support/kona/kona-system-configuration.php>

### Understanding Disk Storage Methods

To ensure performance and quality, the disk storage system used with the Windows workstation must be able to meet the demands of storing realtime uncompressed media. At the very minimum, the disk storage system must be able to provide and maintain a consistent 50 MB/s transfer rate from the workstation to disk (read/write). There are a variety of system configurations and peripherals that can provide this level of performance. Refer to “[Computer Requirements for KONA Cards](#)” on page 19 for information on testing data rates and storage performance.

## Cable Connections

---

KONA offers unsurpassed cable connectivity for a video/audio capture card. Connections are made via the supplied breakout cable and connectors mounted on the KONA Card endplate.

### Using the Breakout Cable and Card Endplate Connectors

The breakout cables for the three KONA models are shown on the following page.

#### KONA LHi and LHe Plus Connectors

The KONA LHi and LHe Plus models use a breakout cable that supports:

- Reference Input (BNC connector)
- Component/Composite/S Video Input (3x BNC)
- Component/Composite/S Video Output (3x BNC)
- AES In (2x XLR)
- AES Out (2x XLR)
- Balanced Audio In (2x XLR)
- Balanced Audio Out (2x XLR)
- RS-422 Machine Control (9 pin D)

Connectors on the KONA LHi card endplate additionally provide:

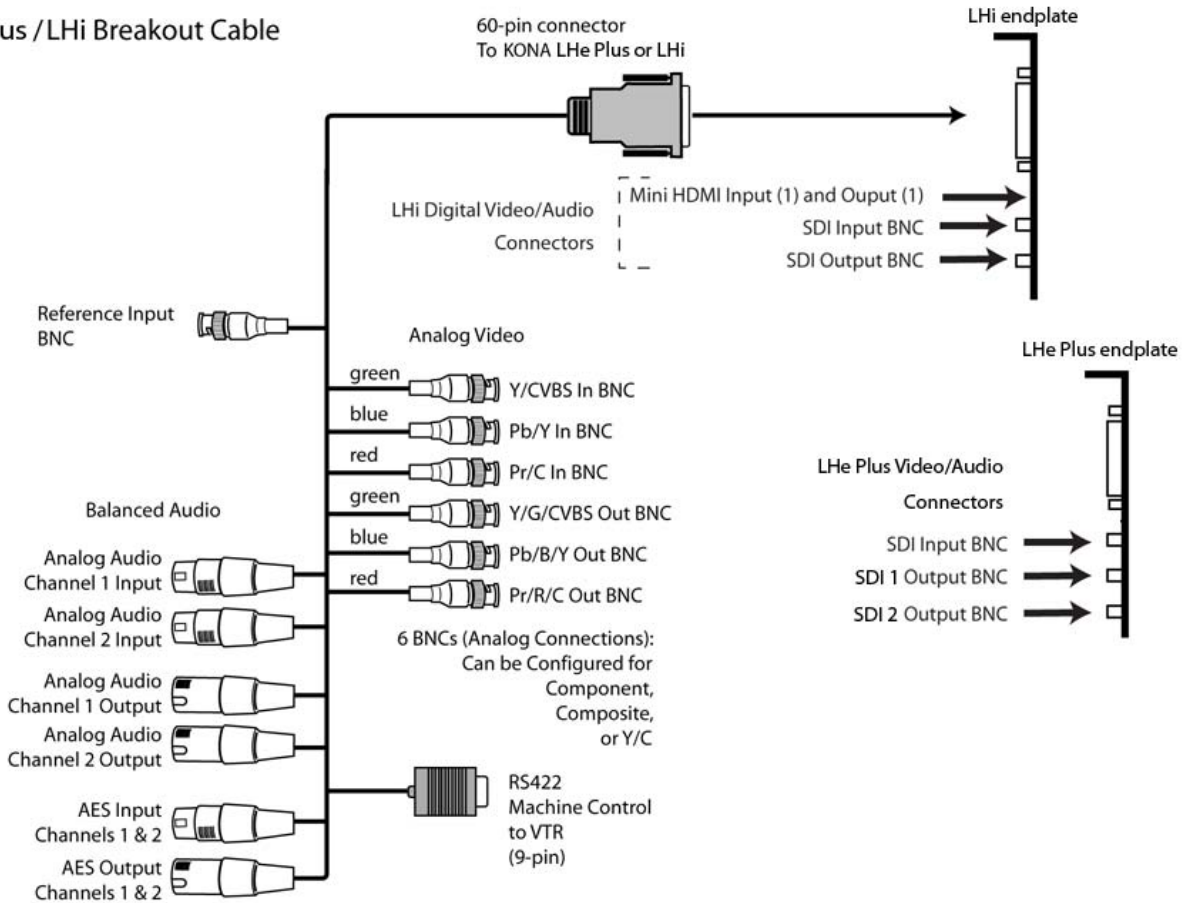
- Standard-definition or High-definition SDI input (1 BNC) and output (1 BNC)
- HDMI input and output (2x HDMI mini-connectors)

### KONA LHe Plus Connectors

KONA LHe Plus uses a breakout cable to provide the same audio/video, RS-422 Machine Control, and reference I/O as the LHi model.

The KONA LHe Plus endplate provides one BNC for SDI/SDI HD input and two independent SDI/SDI HD output BNC's.

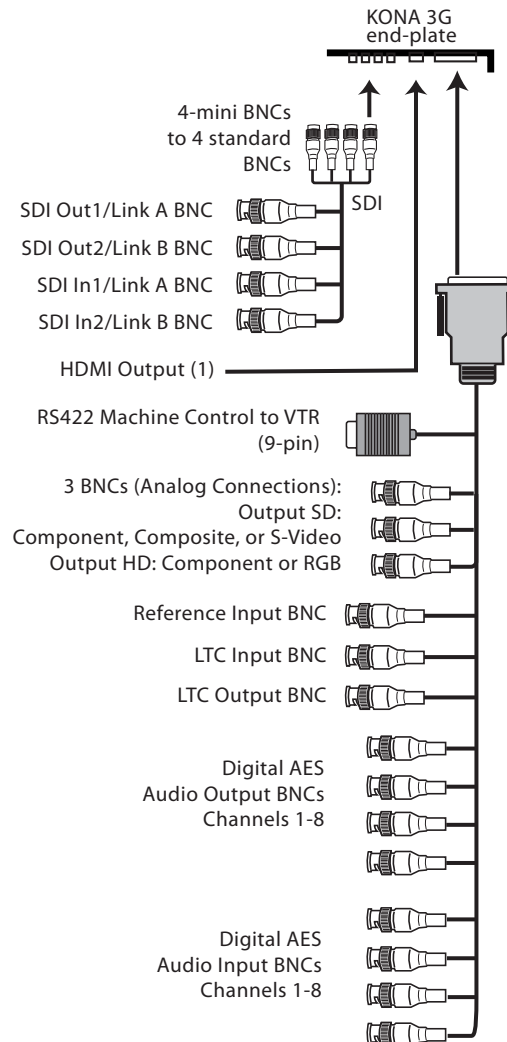
#### LHe Plus /LHi Breakout Cable



**Breakout Cables for LHe Plus and LHi Models**

## KONA 3G Connectors

KONA 3G provides complete I/O connectivity choices in two multi-signal breakout cables and one HDMI-to-HDMI mini output cable. One multi-signal cable provides AES/EBU digital BNC connections and analog video monitoring connections. The other has 4 mini-connectors on one end and 4 BNCs on the other providing SDI connections for both Single Link and Dual Link SD/HD SDI connections. Cable connections are marked on both the KONA card endplate and on the cable connectors for easy identification.



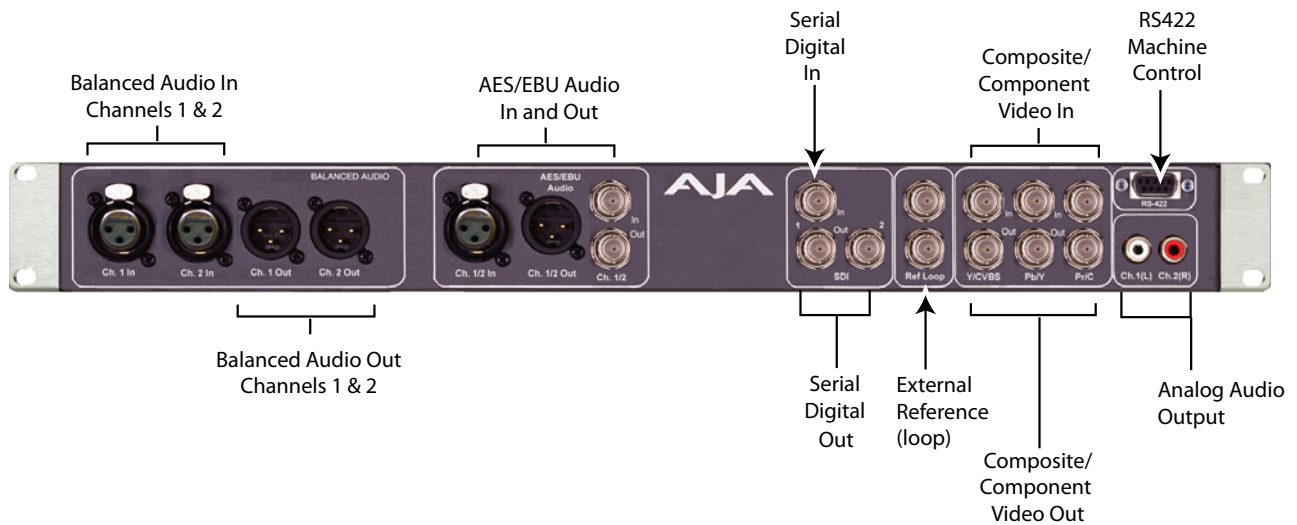
### **KONA 3G Breakout Cable**

## Using Breakout Boxes

The KONA product line offers two optional 19" 1RU rack-mountable breakout boxes that attach to the KONA card via cables that connect to the back of the Box. These cables are supplied with the Box. The breakout boxes offer the same inputs and outputs as the standard breakout cables and more. Breakout boxes can be easily rackmounted or placed on top of a broadcast monitor or editing desk.

### KONA KL-Box for LHe Plus

The KONA KL-Box is connected via one 60-pin to 60-pin, and one 3-BNC to 3-BNC cable. When you purchase the KL-Box, you get two-channel unbalanced audio output (2 RCA Jacks) not available with the standard cable. When ordering a KL-Box, specify the KONA card model you'll be using the KL box with to ensure you get the proper cable set.

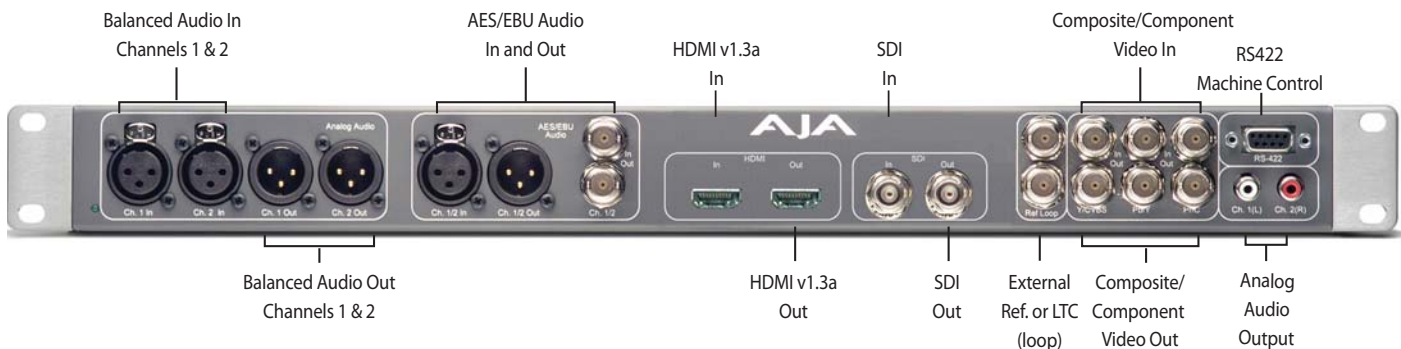


### KL-Box Model Breakout Box

### KONA KLHi-Box for LHi Cards

The KONA KLHi-Box offers the same connections as the KL-Box except a single connector is provided for the following: SDI input, SDI output, HDMI v1.3a input, and HDMI v1.3a output.

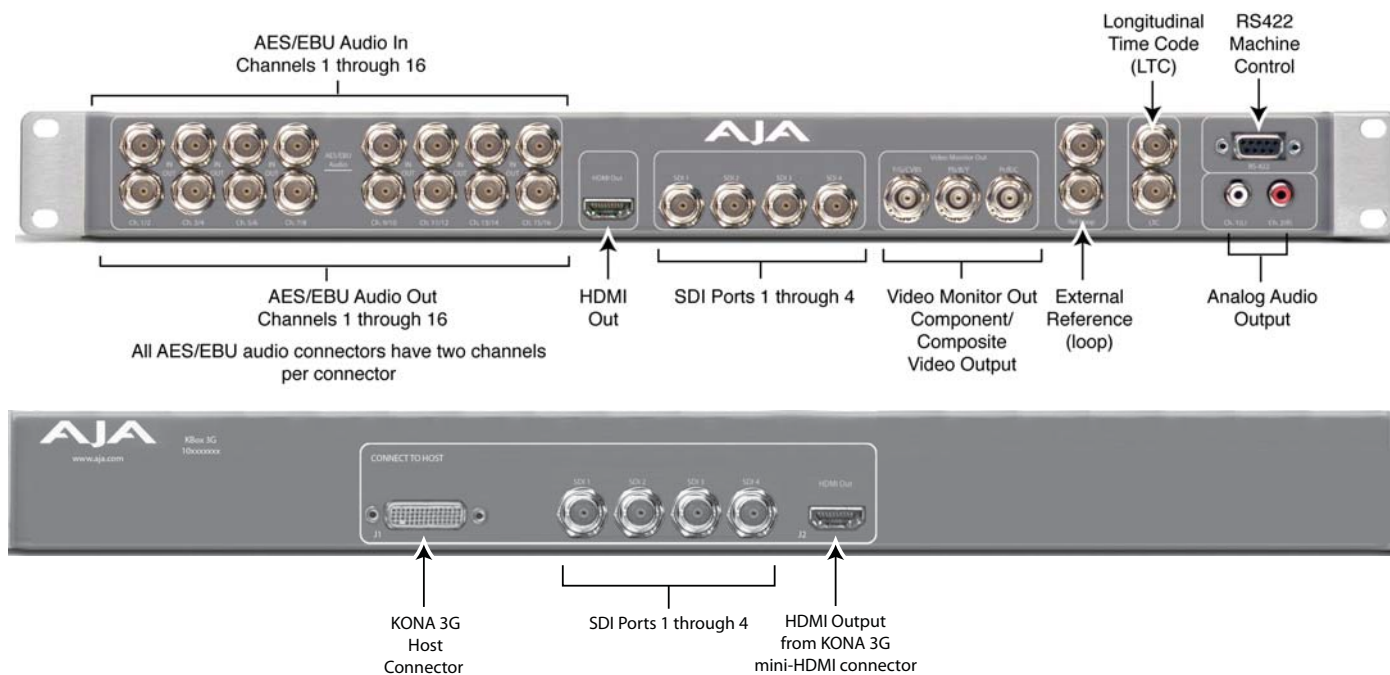
**Note:** The HDMI connectors on the breakout box are full-size, not mini as on the LHi endplate.



### KLHi-Box Model Breakout Box

## K3G-Box for KONA 3G

The K3G-Box for KONA 3G offers convenient connector access and additional functionality including simultaneous BNC AES output, 2-channel RCA analog audio monitoring, and looping BNC connection for Genlock reference and LTC timecode. If you're using a digital Betacam deck, HDCAM, DVCPRO HD, D5, D9 or even an HDCAM SR, you'll have the proper connections.



### K3G-Box Model Breakout Box (front & rear view)

## Connector Descriptions—LHe Plus/LHi Cables and KL-Box

Connectors on the standard cable set are labelled by their function for easy installation and maintenance. Connectors on the optional KL-Box are similarly labelled.

### SDI Input and Outputs

BNC connectors are provided on the KONA LHe and LHi card endplates for one SD-SDI or HD-SDI input. The LHe Plus has two, and LHi has one SDI output (format independent of the input). The SDI input and outputs support video and embedded 24-bit digital audio. Use SDI wherever possible for the best quality 10-bit uncompressed video input, capture and output. If peripheral equipment has a variety of inputs/outputs, look to see if it has SDI I/O, and use it where possible. Most high-end professional broadcast equipment supports SDI (VTRs, cameras, media storage servers, etc.).

### HDMI Input and Output

Two HDMI mini-connectors on the LHi endplate (full-size HDMI connectors on the KLHi Box) provide for input and output of HDMI compatible video (version 1.1) and multi-channel embedded audio (8 channels). HDCP is not supported on either input or output. The LHi's HDMI output does not have HDCP, and input sources having HDCP are not supported. The HDMI input is designed to support long cable runs—up to 100 ft. when using 22 or 24AWG HDMI cable, or up to 50 ft. using 28 or 30AWG HDMI cable. The HDMI output supports standard HDMI cables only.

## 2-Channel Digital AES/EBU Audio Inputs And Outputs

One female XLR connector is provided for the channel 1 and 2 inputs, while a male XLR connector carries channel 1 and 2 outputs. AES/EBU signals are handled internally as 24-bit digital. The optional KL-Box also provides XLR audio connections on the front panel.

**Note:** AES XLR connections are digital and cannot be used with analog equipment having XLR connectors.

## Analog 2-Channel Balanced Audio

Two sets of analog XLR connectors, one for each channel, support balanced audio connections. Male XLRs are provided for outputs and female XLRs are provided for inputs. Balanced audio (differential) connections provide better analog audio quality over longer cable runs. Most professional quality VTRs and audio equipment have XLR style connectors for analog audio. Analog audio signals are converted internally to 24-bit digital.

## Analog 2-Channel Unbalanced Audio (KL-Box only)

On the KL-Box are two analog output connectors, one for each channel. These connectors are RCA-style phono jacks.

## RS-422 Machine Control

A female DE-9 connector on the LHi/LHe Plus breakout cable provides connection for VTRs, camcorders, disk media servers, and other devices using RS-422 SMPTE (Sony) protocol. This RS-422 connector is also present on the optional KL-Box (connector pinout is Sony 9-pin protocol).

Connectors on the standard cable set are labelled for their function for easy installation and maintenance. Connectors on the optional K3G-Box (breakout box) are similarly labelled.

## 8-Channel Digital AES/EBU Audio Inputs and Outputs

When using the standard cables, BNC connections are provided for AES/EBU audio input/output. Four BNC connectors are provided for audio input and four for audio output. Each BNC carries two channels. The connectors are labeled for input/output and channels.

The optional K3G-Box provides BNC audio connections on the front panel for 16-channels of audio input and output.

## Analog 2-Channel Unbalanced Audio (breakout box only)

On the breakout box are two analog output connectors, one for each channel. These connectors are RCA-style phono jacks.

## RS-422 Machine Control

A female DE-9 connector provides connection for VTRs, camcorders, disk media servers, and other devices using RS-422 SMPTE (Sony) protocol. This connector is present on both the general I/O cables and the optional K3G-Box (connector pinout is Sony 9-pin protocol.)

## Connector Descriptions— KONA 3G Cables and K3G-Box

## SDI Inputs and Outputs

On the KONA 3G card, mini-connectors are provided for two SDI inputs and two SDI outputs for Single or Dual Link. A cable with four Mini-connectors on one end and four BNCs on the other end is provided for connecting equipment to the SDI inputs and outputs.

KONA 3G has four video outputs altogether:

- two SDI outputs that are used for both High- and Standard-definition (SD/HD-SDI)
- two monitor outputs (discussed later), one component analog and one HDMI 1.4a.

Each of the four outputs is independently switchable between HD and SD. For example, if you are working in HD, you can have simultaneous HD-SDI, SD-SDI, and HD-component analog output.

SDI inputs and outputs support video and 8-channel embedded 24-bit digital audio. Use SDI wherever possible for the best quality 10-bit uncompressed video input, capture, and output. If peripheral equipment has a variety of inputs/outputs, look to see if it has SDI I/O, and use it wherever possible. Most high-end professional broadcast equipment supports SDI (VTRs, cameras, media storage servers, etc.).

## HDMI Output

An HDMI mini-connector on the KONA 3G endplate (full-size HDMI connectors on the K3G-Box) provides output of HDMI compatible video and multi-channel embedded audio (8 channels). HDCP is not supported on the output.

## Analog Monitor Out (Component/Composite HD/SD)

Both the standard I/O cable and the optional K3G-Box feature two groups of three BNC connectors each, for input and output of component, composite and Y/C functions. The signals are labelled on both the cable and K3G-Box connectors.

The analog component output can be switched between SD and HD. KONA 3G features 12-bit component video output for both HD and SD. SD can be switched to composite and Y/C. (The same three BNC connectors share component and Y/C functions.) This allows use of an inexpensive analog monitor for both HD and SD work. You can even use a composite video monitor. For Dual Link HD-SDI output, HD or SD can be monitored through the component output. Dual Link HD can be output as 4:4:4 RGB.

Component video signals are generally higher quality than composite, but not as high-quality as serial digital (SDI).

**Note:** About RGB: Although RGB is used less in today's video systems, KONA 3G supports it for A/V Monitor output. However, because the KONA 3G (and SMPTE SDI's) native format is YPbPr, AJA recommends using YPbPr when the monitor supports it. The YPbPr format provides "headroom" for "superwhite" and superblack"—and these video levels will be clipped when transcoding to RGB. Also, the RGB/YPbPr transcoding involves a level translation that results in mathematical round-off error. RGB can be configured in the Playout setup panel of the specific application you are using with KONA 3G.

**Note:** About YPbPr: KONA 3G supports three different types of YPbPr:

- SMPTE/EBU N10
- Betacam (NTSC)
- Betacam (NTSC-J [Japan]).

These three formats differ in level only and can be configured in the Playout setup panel of the specific application you are using with KONA 3G.

## Reference Video

A single BNC on the standard KONA cable—or two BNC connectors on the K3G-Box (looping)—allow you to synchronize KONA outputs to your house analog reference video signal (or black burst). If you have a sync generator or central piece of video equipment to use for synchronizing other video equipment in your studio, connect its analog composite output here. When KONA outputs video, it locks to this reference signal. When connecting a reference video source, the locking signal should be the same format as the Primary format selected in KONA software. It is possible in some circumstances to use an alternate format video signal if the basic frame rate is compatible.

## In This Manual

---

This manual is written for the KONA for PC software. The AJA Windows plug-ins information is shown throughout the manual using example Windows 7 screens and discussion. This text also applies to AJA Mac Plug-ins for Adobe which run under OSX Snow Leopard and Lion (the screens and functions are mostly identical). For both Windows 7 and Snow Leopard or Lion platforms, use this manual for understanding AJA's Plug-ins for Adobe CS5.5.

Chapter 1 is the introduction you're reading, listing features, box contents, system requirements, and connection hardware.

Chapter 2 provides complete instructions for installing the AJA KONA card. The user is guided through unpacking, installing the card into a Windows workstation, installing KONA Software From CD, cabling the system and getting it up and running. Important configuration information is also provided on video settings and use of genlock/external reference.

Chapter 3 discusses KONA features that are common across all its plug-ins and the KONA Machina application. Here you'll find a basic overview of how KONA operates and is configured, from making source and format selections to capturing, previewing, and playing back video and audio.

Chapter 4 discusses operational aspects of KONA when used with AJA's Machina capture/playback application.

Chapter 5 discusses operational aspects of KONA when used with Adobe Creative Suite 5.5 including Premiere Pro CS5.5 editing and motion graphics software, After Effects compositing software, and Photoshop CS5.5 photo/graphics editing application.

Chapter 6 discusses operational aspects of KONA when used with Eyeon Fusion v6.0 (64-bit) software (PC only).

Chapter 7 discusses other third-party applications that provide native support for KONA cards (PC).

Chapter 8 discusses troubleshooting problems with your system and what to do when there's a problem you can't solve. It also provides a list of Frequently Asked Questions (FAQs).

Appendix A contains the technical specifications for the product.



# Chapter 2: Installation & Hardware Configuration



## Installation Overview

---

The installation and set up of a KONA with a PC is very simple. All of the steps of installation and hardware configuration are described in this chapter and are summarized as follows:

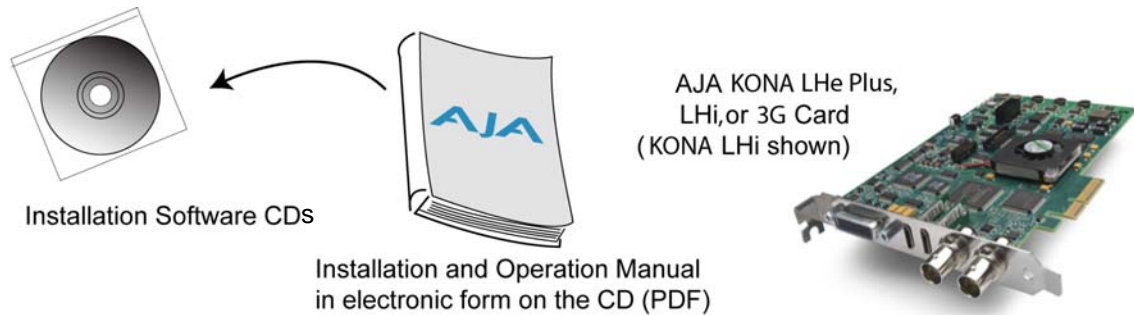
1. Unpack the shipping box
2. If not previously installed on your PC, ensure that your editing or capture/playback applications are installed as detailed in their user documentation. These applications must be installed and have been run at least once prior to installing AJA KONA software to allow proper interface setup.
3. Configure your Workstation as appropriate for your workflow requirements. A URL to AJA Support is provided for getting the latest tested and approved KONA and RAID storage configurations.
4. Install the latest AJA KONA software on your Workstation.
5. Cable the system audio and video sources, VTR, audio monitor, and video monitor. If you purchased the optional KL-Box or K3-Box, install it in an equipment rack or place it on a desk and connect its two cables to the KONA card. If you are using the standard cable set instead, connect those directly to the equipment.

These steps are explained in greater detail in the following pages.

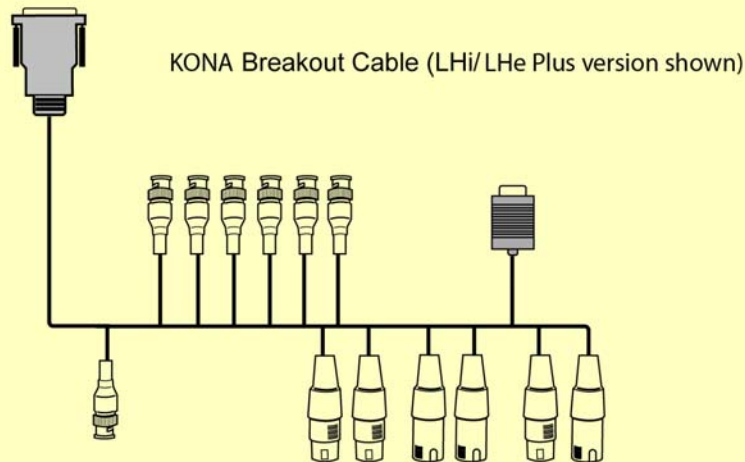
## Unpacking

### Shipping Box Contents

Your KONA card is shipped with a breakout cable and two CDs: one KONA for PC and one KONA for Mac. Each CD contains software and an **Installation and Operation** manual (a PDF on the CD) for that platform. If you purchased the optional KL-Box or K3-Box breakout box, it ships with its own set of cables and instructions for connection to the KONA card.



### Standard Cable



### Contents, KONA Shipping Box

As you unpack the shipping box(es), carefully examine the contents. Ensure you received everything and nothing was damaged in shipment. If you find any damage, immediately notify the shipping service and supply them with a complete description of the damage then contact your AJA dealer or distributor for details on how to have your KONA repaired or replaced. AJA will repair or replace damaged items.

Save packing materials and the shipping box. If you ever require service or move your system—use the packaging materials and box for safe shipment.

## Computer Requirements for KONA Cards

For the most up-to-date computer system requirements for KONA, consult the AJA website:

PC:

<http://www.aja.com/support/kona-pc/kona-pc-system-configuration.php>

MAC:

<http://www.aja.com/support/kona/kona-system-configuration.php>

### AJA Data Rate Calculator Application for Windows

AJA offers a Data Rate Calculator utility for KONA users as a resource for configuring systems and determining storage requirements. This application calculates data rates and storage requirements for a given video size, format, and frame rate and is available for download at:

PC:

<http://www.aja.com/support/kona-pc/kona-pc-3g.php>

MAC:

<http://www.aja.com/products/software.php>

(See **Utilities and Optional** at the bottom of the webpage.)

**Note:** Note: It is the storage vendor's responsibility to maintain sustained playback. Many benchmark utilities show a speed test in an ideal setting but will not sustain that data rate for sequential data reads/writes as required in a true video editing environment. Use the calculator to determine the data rate required and then proceed to the system test described below.

### AJA KONA System Test

KONA System Test is available on the AJA website at the support pages provided for the Data Rate Calculator ("[AJA Data Rate Calculator Application for Windows](#)" on page 19).

(See **Utilities and Optional** at the bottom of the webpage.) KONA System Test is a Windows utility for measuring system performance with AJA KONA Video Capture cards. The application includes disk drive speed tests and video data copy (DMA) speeds. The disk speed tests differ from standard disk I/O performance applications in that they specifically test the system under conditions typically encountered with video capture, playback, and editing.

**Note:** Note: Most of the disk performance tests are generic and don't require an AJA KONA Video Capture card. The DMA performance tests do require a KONA card and AJA KONA Driver software to operate.

We suggest the best test is to fill your storage disk to 80% and then test capture at the highest data rate you will use. Use Machina Capture Status display to monitor lost frames ("Capture Controls" on page 53).

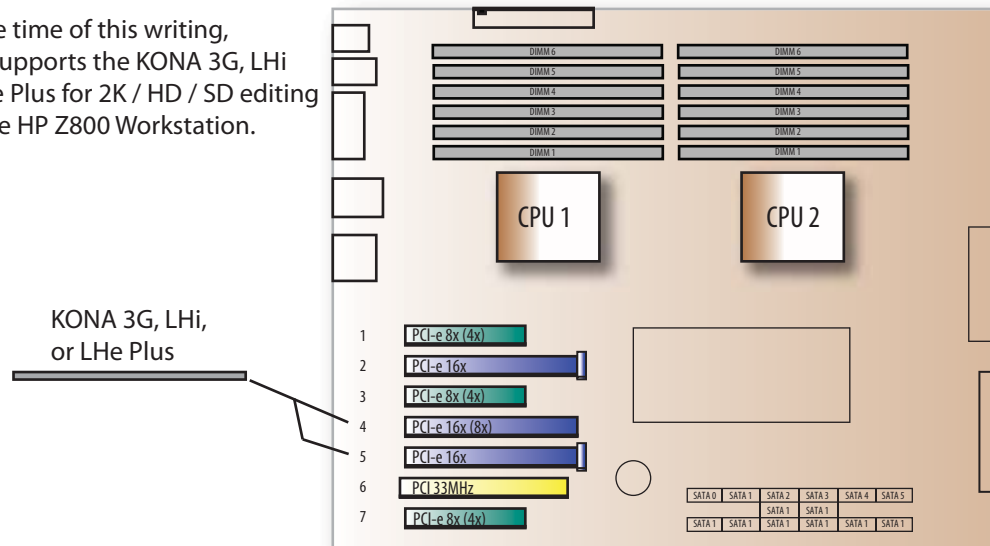
## Installing the KONA Card

1. Place the PC in a well-lit convenient area, where you will have easy access to the chassis access door.
2. Touch the outside of the PC to discharge any static electricity in your body. Remove the power cable from the back of the PC.
3. Open the PC to gain access to the card slots as described in your Workstation User Manual.
4. Remove the KONA card from its protective anti-static bag; place the card on top of the bag.
5. To install the KONA card and RAID controller card (SCSI or Fibre Channel), refer to the AJA website for the latest installation updates at the URL provided.

Because of hardware and software changes, AJA engineers are constantly testing and grading workstation performance. The AJA website is your best source of up-to-date approved workstation configurations.

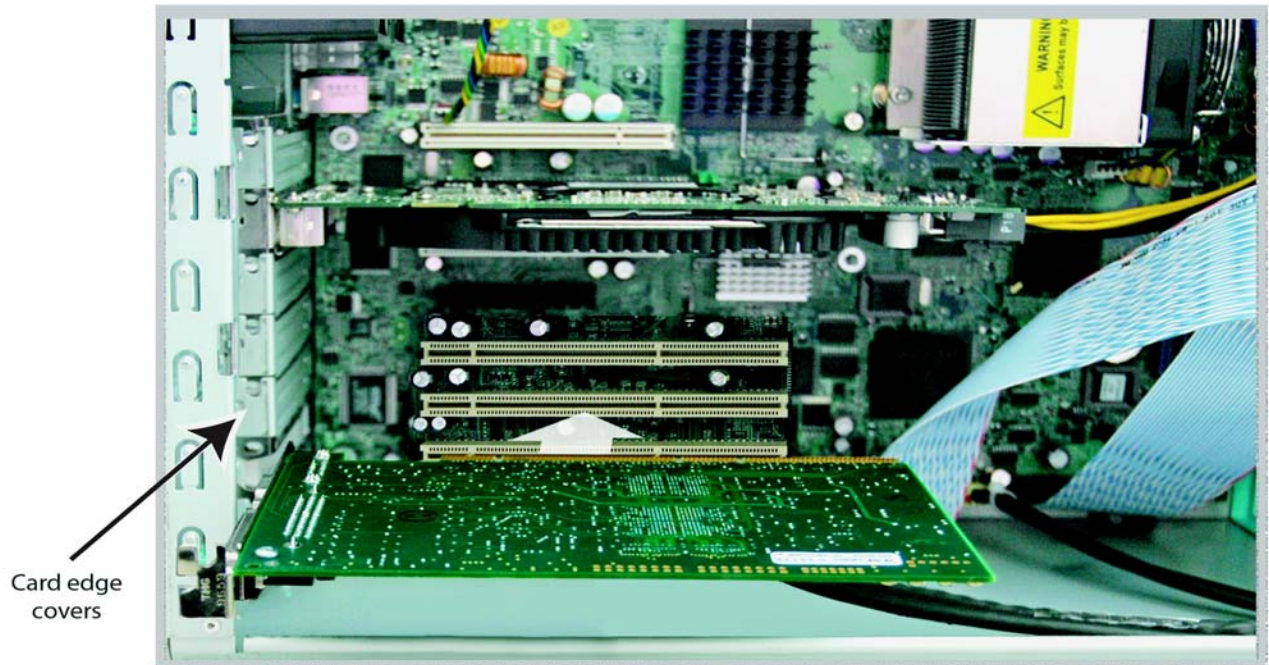
**Note:** Always put the RAID controller and KONA on separate PCI busses. This improves performance by reducing bus contention.

At the time of this writing, AJA supports the KONA 3G, LHi & LHe Plus for 2K / HD / SD editing on the HP Z800 Workstation.



**KONA Card placement in HP Z800 Motherboard**

6. Open the card retainer bar on the left side of the chassis cardcage. Remove the card edge access cover from the desired slot where you will be inserting the KONA card.
7. Holding the KONA card by the card edge plate and an outside edge, carefully insert the KONA card by rocking it slowly into the slot. Ensure the card edge aligns properly with the PC's opening (where the card edge cover was just removed) and that it is fully seated in the slot.
8. Secure the card in the slot replacing the card retainer bar.
9. Replace the PC's panel/door removed in step 3.

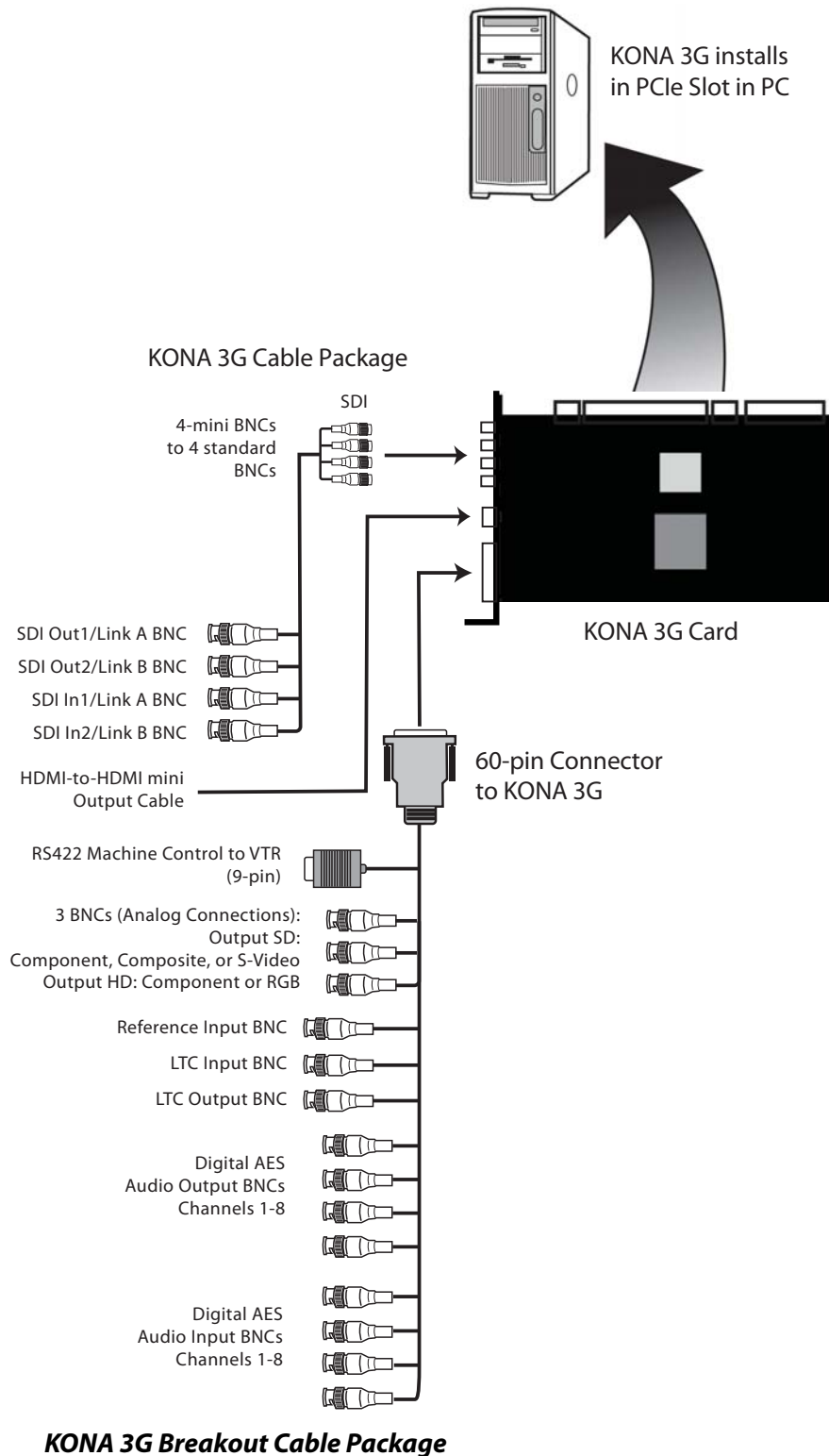


***Locate the correct PCIe Slot and Insert the KONA Card (typical installation shown)***

## Cabling KONA

Make video and audio input/output connections according to your workflow requirements. Each connector is described in detail in [Chapter 1](#). In this section, KONA cable connections are shown and described for KONA 3G and LHi/LHe Plus breakout cables.

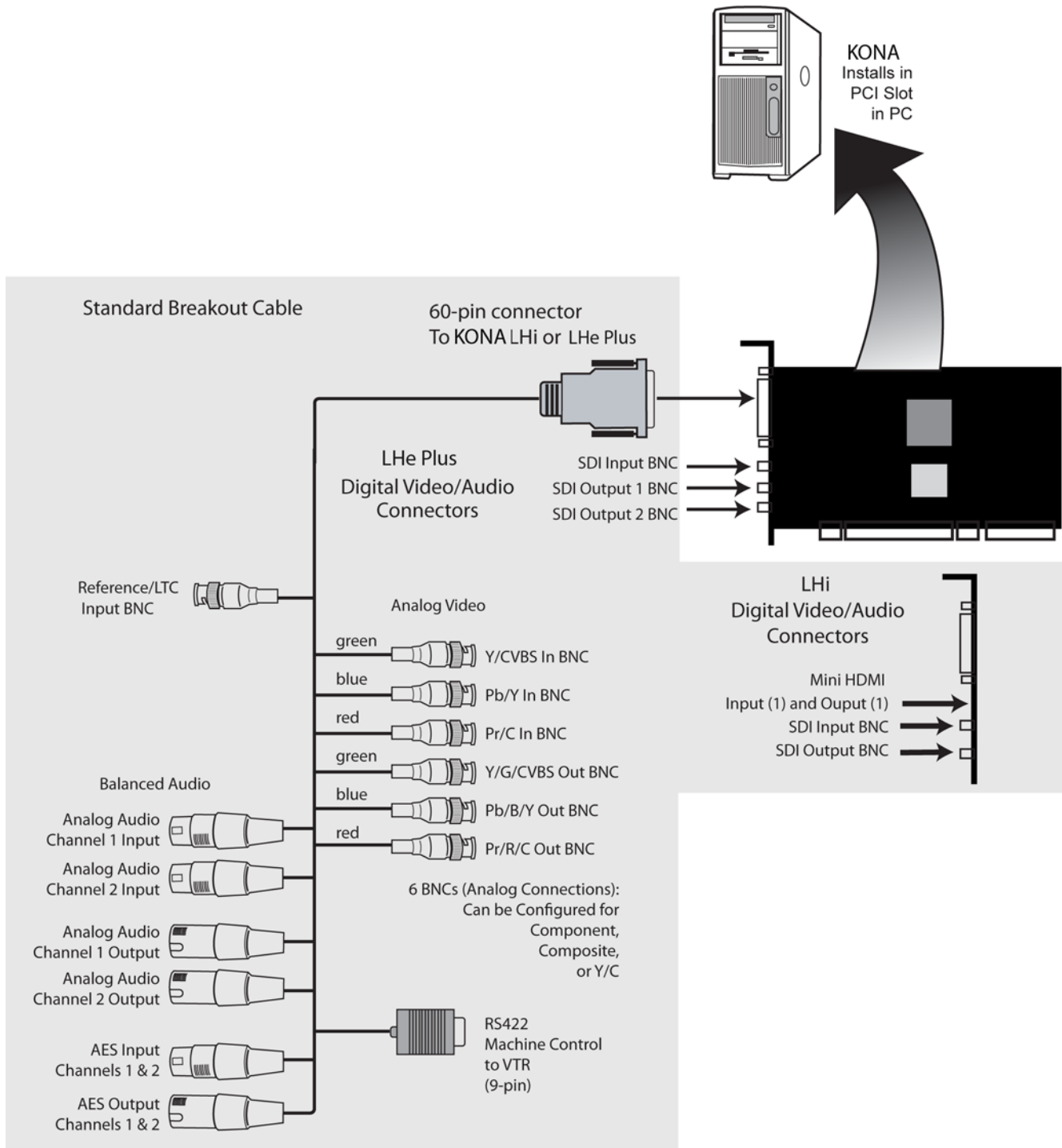
### Using The 3G Breakout Cable



### Dual-link Connections

Using the KONA 3G card, you can take advantage of the speed and quality of Dual-link SDI I/O. When connecting for dual-link, use the normally separate inputs and outputs numbered 1 & 2 as A and B components of the dual-link (thus the connectors are labeled 1A/2B). When configuring KONA Capture plugins, you will select Dual-link for your SDI input and output modes.

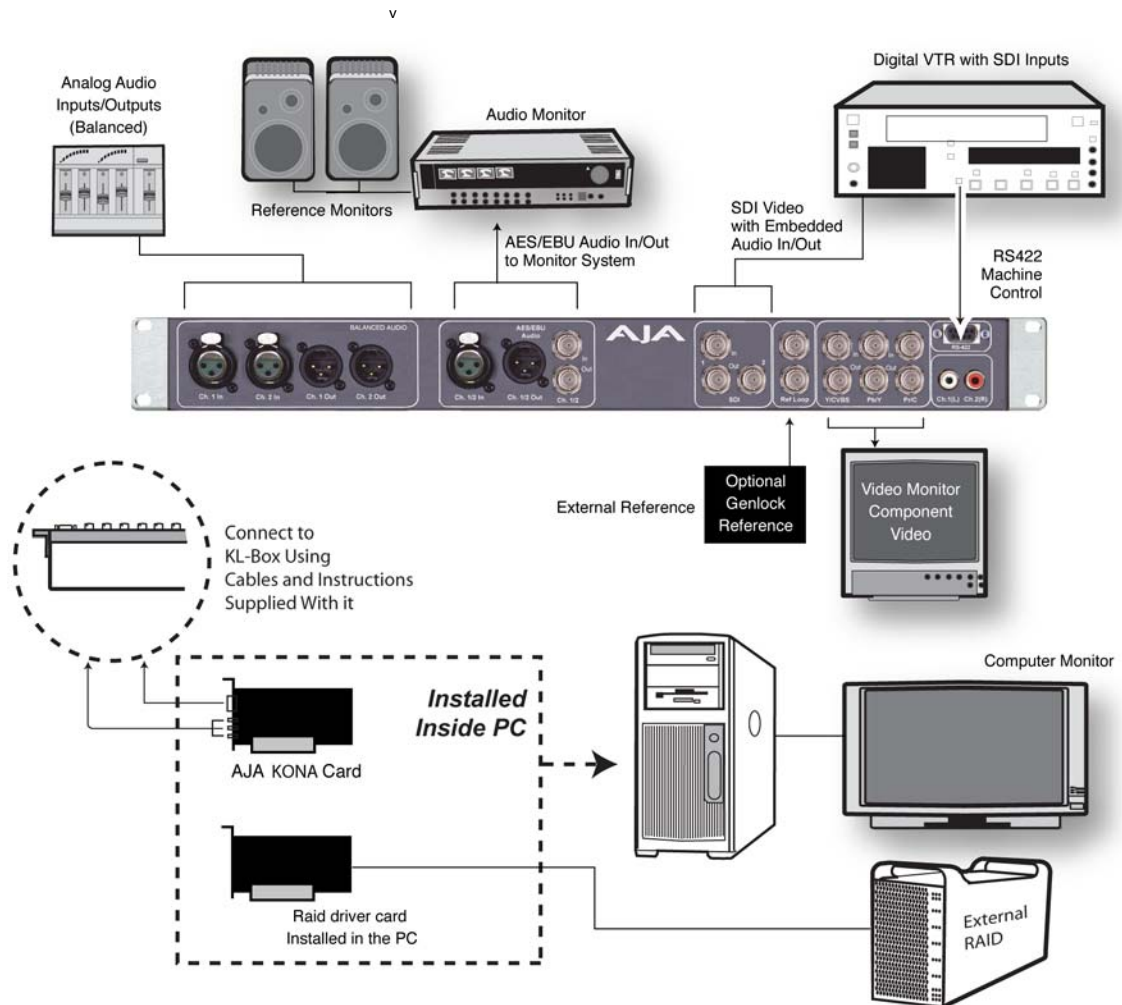
### Using The LHe Plus/ LHi Breakout Cable



## A Typical System

The following figure shows a typical system interconnections for a system with digital A/V sources using the KL-Box for KONA LHe Plus or LHi cards. Your system may differ depending on VTRs, audio monitoring, and video monitoring.

1. If desired, connect your house reference sync to the KONA Ref Loop connector (BNC). The second KONA Ref Loop connector on the KL-Box (if used) can be connected to the VTR or terminated with a 75-ohm terminator.
2. Connect a Video Monitor to the KONA Component Analog Video Out BNC connectors (preferred), or connect to a composite monitor.
3. Connect a 9-pin DE-9 machine control cable between your VTR's RS422 control port and the KONA breakout cable RS-422 machine control connector.
4. Connect two SDI cables between KONA (BNCs are on the card endplate) and your digital VTR (Digital Betacam etc.): one from KONA SDI In to the VTR SDI Out, and one from KONA SDI Out to the VTR SDI In. The KONA SDI connections have embedded audio so the VTR must be configured accordingly.
5. If you have an AES/EBU-ready audio monitoring system, connect the two channels of AES/EBU output from KONA's XLR connectors (channels 1 and 2) to the monitoring system AES/EBU inputs. If instead you have an analog audio monitoring system, you can use either the XLR balanced audio connectors or the two RCA-style unbalanced stereo output jacks on the Optional KL-Box for output.



**Typical System Connections—Shown with Optional KL-Box**

## Genlock and Your System

For video stability and proper system operation, it's always best to genlock all equipment to house sync. Although genlock is not absolutely required for KONA or your system, you will have better quality and repeatable operation using it. Usually, this means using a black burst generator output looped through the system. On the KONA cables and optional KL-Box, KLHi-Box, and K3G-Box breakout boxes, house sync is connected to "Ref Loop".

**Note:** If you are using the KONA LHi, be sure to set the Reference/LTC connection to Reference in the Machina Control Panel (Windows).

## Installing KONA Software

If your PC has previously had another video capture or multimedia card installed, remove the card and uninstall any related software before installing KONA. Also, always uninstall existing KONA software before installing a new version. This will prevent hardware/software conflicts.

**Note:** Before proceeding, ensure that your capture, editing, or compositing Application Software (Adobe or other) is installed as detailed in its user documentation. These applications should be installed and run at least once prior to installing AJA KONA software.

Download the latest KONA software from the AJA website or, if that is not possible, use the CD-ROM supplied with the KONA system to install necessary software drivers and AJA's Machina Capture/Playback application (if desired). Software updates occasionally become available to AJA KONA owners on our website at:

<http://www.aja.com/support/index.php>

We recommend checking for both software updates and additional product information before installation and periodically thereafter.





The installation procedure is described below. You cannot use KONA with third-party applications until the AJA KONA software has been installed on the host workstation.

If you add KONA supported applications at a later date and have not previously installed the appropriate plugins, you must run the install program again selecting the appropriate application support software to be installed.

## Software Installation Procedure

Locate the AJA KONA Software download or CD ROM packaged with your system and follow the procedure below to install the required software on the host system. The KONA for PC software is intended for Windows 7 64-bit workstations.

The KONA for PC 5.5.2 Installation Software is divided into the packages shown below. The AJA Retail Software package must be installed first. We recommend you install the AJA Machina Control application next, followed by your desired Application Software (Fusion and Adobe CS5.5 are shown here).

Name	Date modified	Type	S
 AJA_Retail_Software-5.5.2-x64	10/13/2011 2:18 PM	Windows Installer ...	
 AJA_Machina_Software-5.5.2-x64	10/17/2011 9:25 AM	Windows Installer ...	
 AJA_Fusion_Software-5.5.2-x64	10/13/2011 2:16 PM	Windows Installer ...	
 AJA_Adobe_Software-5.5.2-x64	10/13/2011 2:15 PM	Windows Installer ...	

### KONA for PC Installer Packages

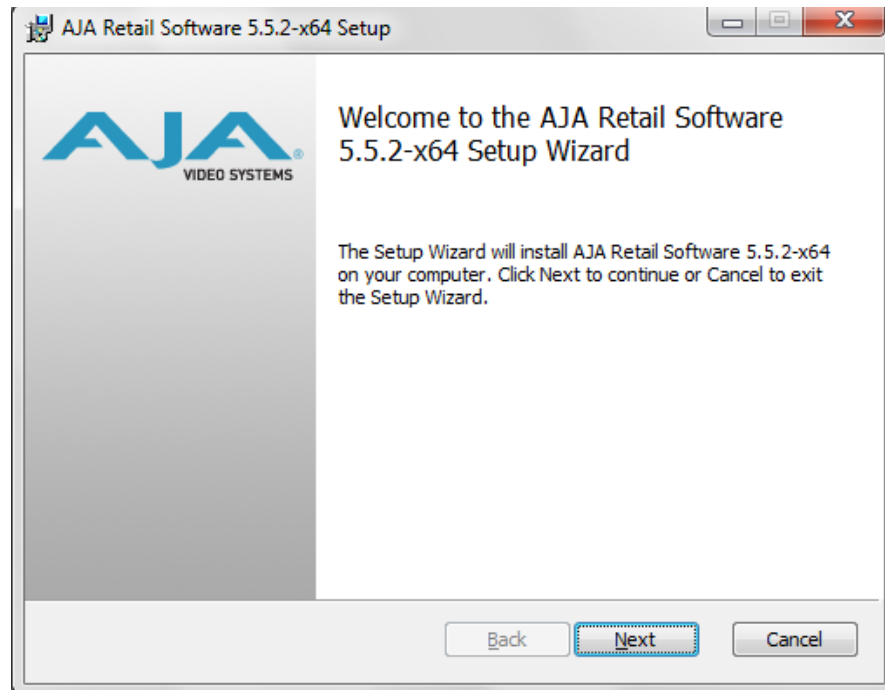
**Note:** Before installing KONA software, turn off any virus protection and security software that you have installed on your computer.

This section describes the AJA Retail Software package installation. The subsequent installations are essentially the same but do not require restart of the computer.

Double click on the download package or insert the KONA CD into the PC.

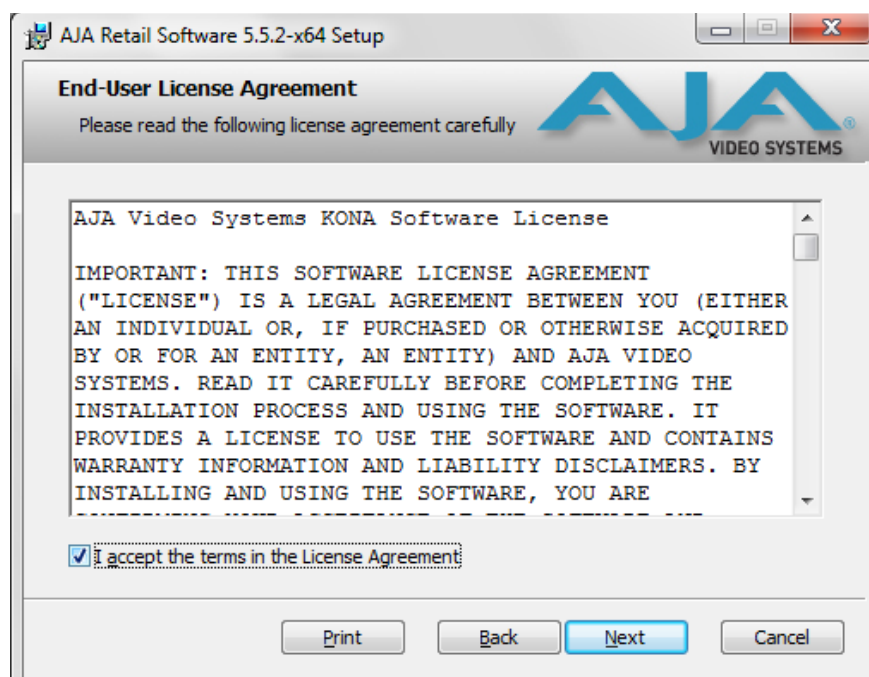
## Install Wizard

The KONA installation program will launch and extract the necessary KONA drivers for installation on the desired hard drive.



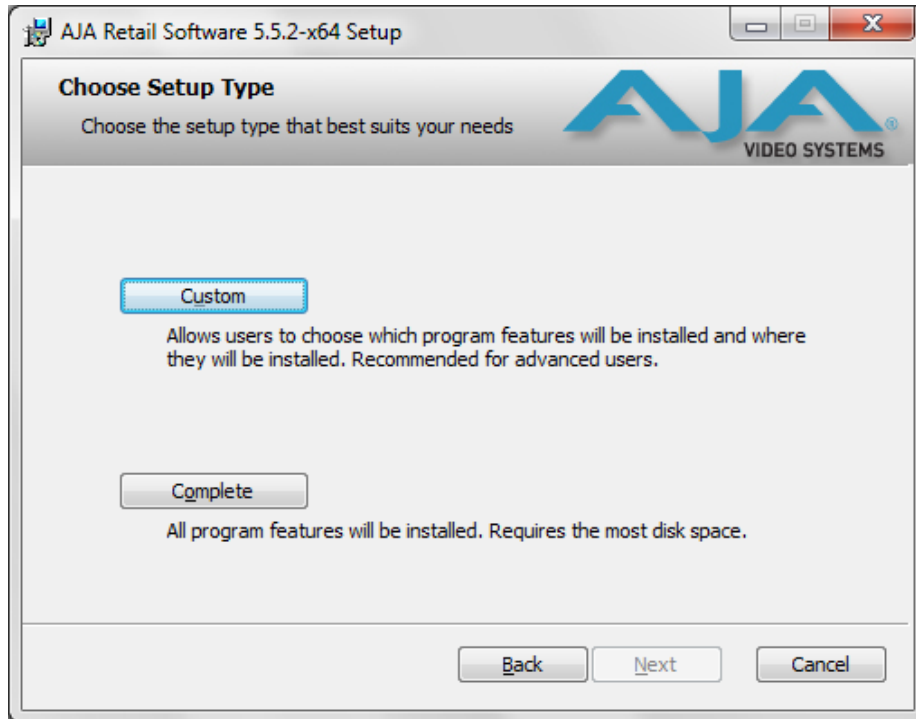
### Install Wizard Welcome

When you see the Welcome page, click "Next" to view the KONA license agreement.



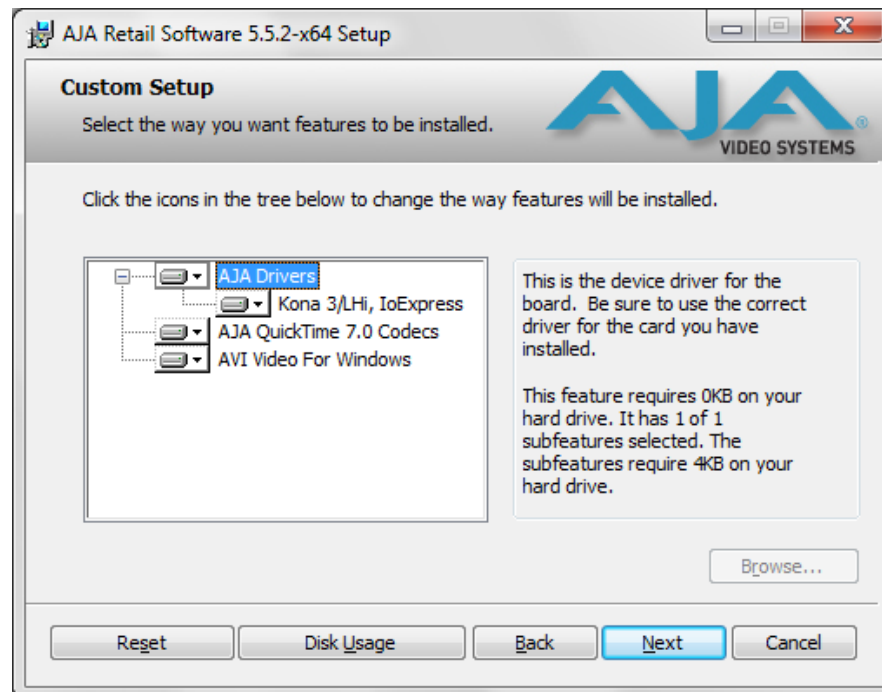
### **License Agreement**

Read the KONA license agreement and check the Agreement box to accept. You will be asked to choose the type of installation you would like to perform.



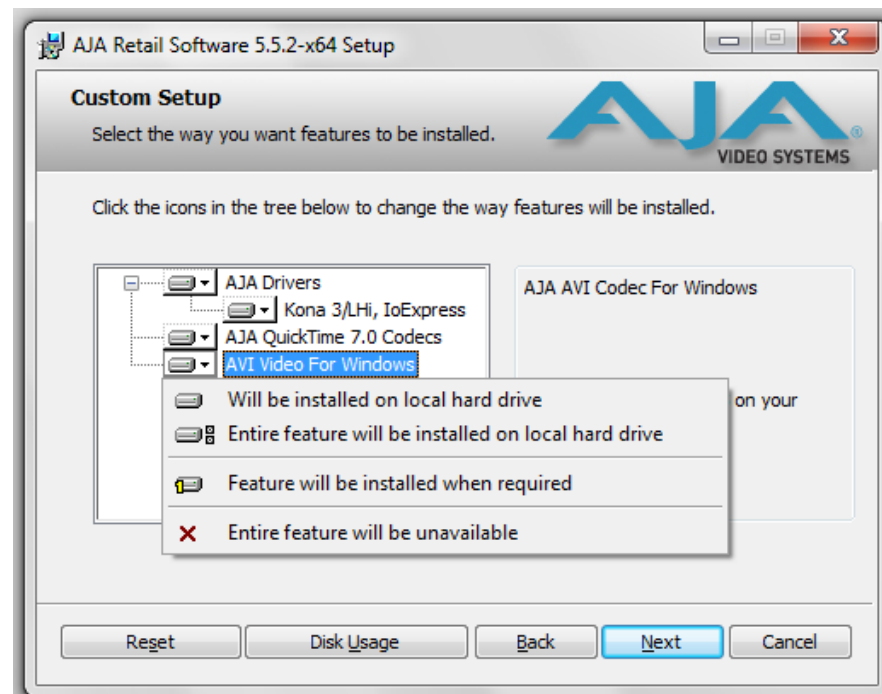
### **Installation Type**

If you don't have all the KONA supported products installed on your workstation, you may choose to perform a Custom installation (default) and select only the software necessary for your applications. Otherwise, use the "Typical" installation. The following screens depict the more elaborate Custom installation.



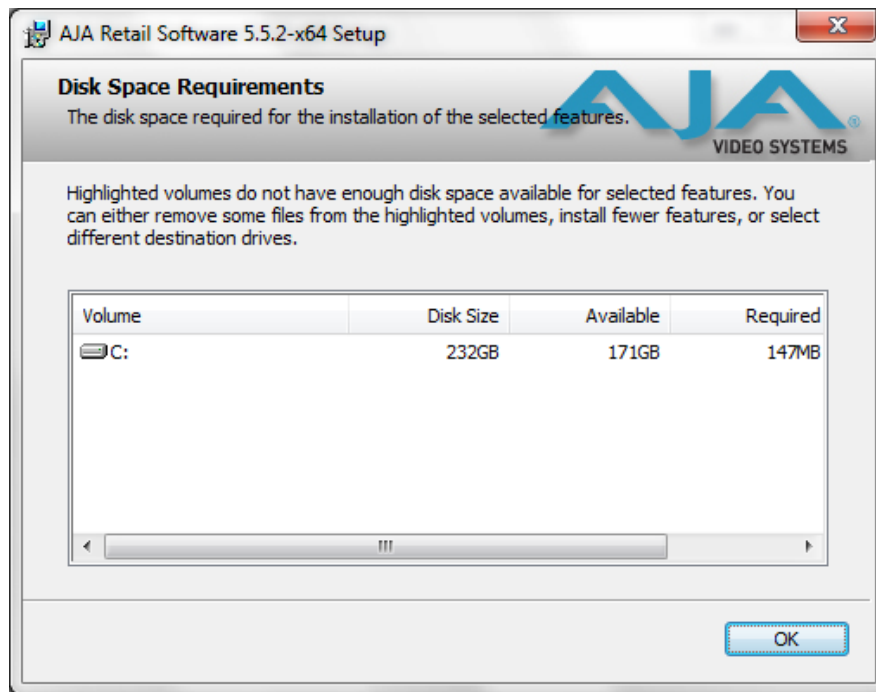
### **Custom Installation Menu**

You may deselect an Item for installation by using the pulldown to make it unavailable.



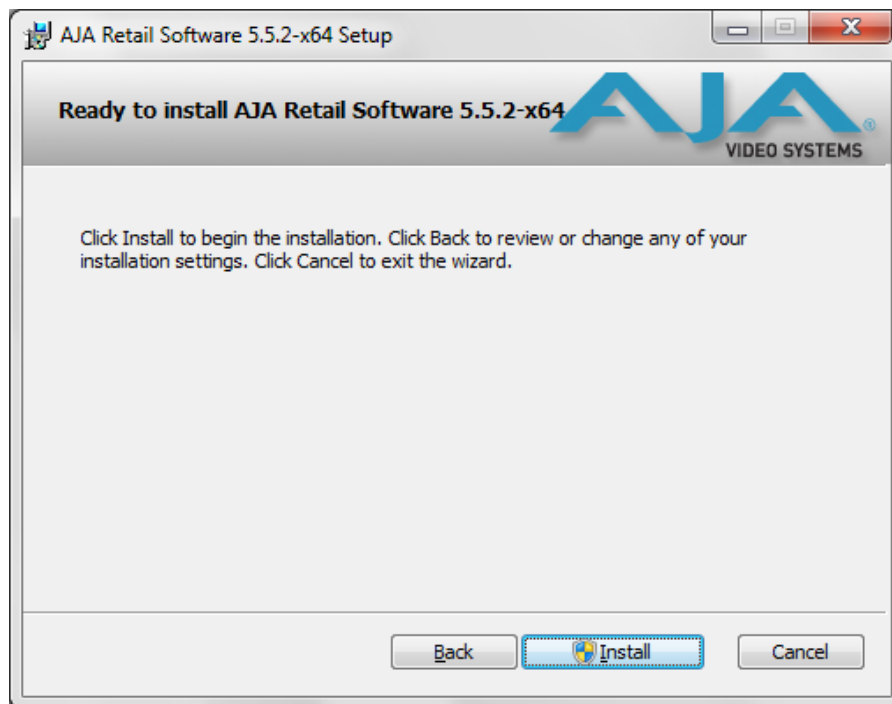
### **Custom Selections Pulldown Menu**

Use the second level options choose the specific drivers and plugins you would like installed. Disabled selections are marked with a red X. Before clicking Next to install, you can verify your disk space availability by clicking the Disk Usage button.



### **Workstation Disk Usage Display**

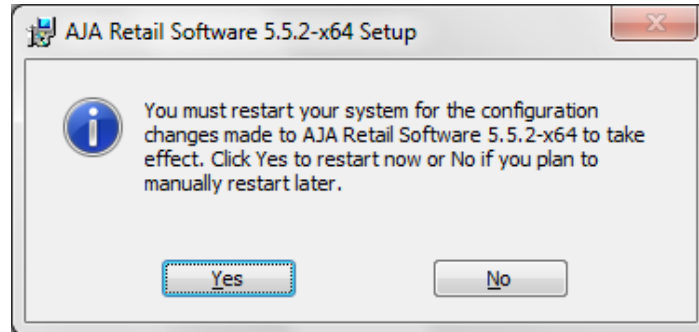
To return to the installation click OK. Click Next to begin the installation. screen.



### **Begin Driver and Plugin Installation**

When the installer has completed copying the KONA software to disk, you may see a standard Windows Logo test warning. Click on the “Continue Anyway” button to finish the installation.

When the installation is completed, a final screen will be displayed announcing that “Setup has finished installing AJA KONA on your computer.” Click on the Finish button after the installation is complete. The AJA Retail installation requires you restart the computer after installation to activate the KONA card.



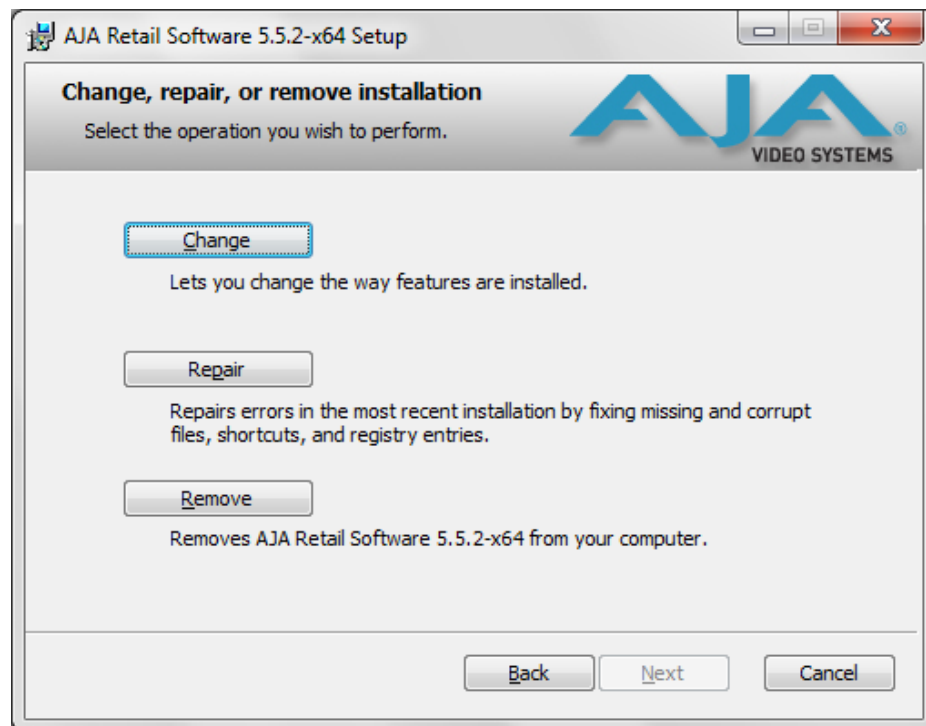
### **Restart Screen**

You may now repeat this installation procedure for Machina and your chosen Application plugins.

## **Re-Installation & Repair**

If you have problems running your newly installed pluggins or need to re-install for added applications, you can relaunch the install package and access the following window.

**Note:** Note: Always uninstall KONA software before installing a new version.



### **Change, Repair, or Remove Installation Menu**

# Chapter 3: Setup & Configuration

## Setup Overview

---

This Chapter discusses the KONA features that are common across all its plug-ins and the Machina application. Here you'll find a basic overview of how KONA operates and is configured, from making source and format selections to capturing, previewing, and playing back video and audio.

## Selection of Primary & Secondary Formats

---

In KONA's operation, the Primary Format is that which is written to disk. The Secondary Format is set to match the format of the input device (if the Primary Format is a conversion) or to match the format that is set for an output monitor if you're monitoring a conversion and the Primary Format is the format on the input device.

**Note:** The KONA Secondary Format nomenclature places (O) or (I) at the end of the signal format: (O) indicates the selected secondary format is for output only. (I) indicates the format selection is that of an input only.

The Secondary Format isn't used if there are no conversions. In all of the applications supported by KONA, you can set these formats. In the Adobe applications (Premiere Pro, After Effects, and Photoshop), the KONA plug-ins provide similar ways of making these choices. In each application, though their interfaces may differ, these choices are virtually the same.

The Primary Format menu allows you to select the video format to be used in the current project. Analog output is always available and performs a conversion, if necessary, based on the Primary or Secondary Format.

**Note:** No frame rate interpolation is applied for conversions from one frame rate to another.

## Primary and Secondary Format Options Supported by KONA cards

Video Signal Formats	KONA LHe Plus	KONA LHi	KONA 3G
720x576 @ 25.00i	Yes	Yes	Yes
720x576 (Wide) @ 25.00i	Yes	Yes	Yes
720x486 @ 29.97i	Yes	Yes	Yes
720x486 (Wide) @ 29.97i	Yes	Yes	Yes
720x480 @ 29.97i	Yes	Yes	Yes
720x480 (Wide) @ 29.97i	Yes	Yes	Yes
1280x720 @ 23.976p	Yes	Yes	Yes
1280x720 @24.00p	Yes	Yes	Yes
1280x720 @ 25.00p	Yes	Yes	Yes
1280x720 @ 29.97p	Yes	Yes	Yes
1280x720 @ 30.00p	Yes	Yes	Yes
1280x720 @ 50.00p	Yes	Yes	Yes
1280x720 @ 59.94p	Yes	Yes	Yes
1280x720 @ 60.00p	Yes	Yes	Yes
1920x1080 @ 23.976sF	Yes	Yes	Yes
1920x1080 @ 24.00sF	Yes	Yes	Yes
1920x1080 @ 25.00sF	Yes	Yes	Yes
1920x1080 @ 29.97sF	Yes	Yes	Yes
1920x1080 @ 30.00sF	Yes	Yes	Yes
1920x1080 @ 25.00i	Yes	Yes	Yes
1920x1080 @ 29.97i	Yes	Yes	Yes
1920x1080 @ 30.00i	Yes	Yes	Yes
1920x1080@50i	Yes	Yes	Yes
1920x1080@59.94i	Yes	Yes	Yes
1920x1080@60i	Yes	Yes	Yes
1920x1080 @ 23.976p	Yes	Yes	Yes
1920x1080 @ 24.00p	Yes	Yes	Yes
1920x1080 @ 25.00p	Yes	Yes	Yes
1920x1080 @ 29.97p	Yes	Yes	Yes
1920x1080 @ 30.00p	Yes	Yes	Yes
1920x1080 @ 50.00p		Yes	Yes
1920x1080 @ 59.94p		Yes	Yes
1920x1080 @ 60.00p		Yes	Yes
2048x1080@23.976sF			Yes
2048x1080@24.00sF			Yes
2048x1080@23.976p			Yes
2048x1080@24.00p			Yes
2048x1556@14.98p			Yes
2048x1556@15.00p			Yes

Primary to Secondary conversion allows you to set down-, up-, and cross-conversion depending on the KONA model and formats supported.

## Convert Mode

Allows selection of a conversion mode for up-, down-, or cross-conversion between High-definition and Standard-definition, or High-definition to High-definition formats. The choices offered depend on the KONA model present and the Primary and Secondary format chosen. KONA 3G and LHi models support up-, down-, and cross-conversion plus SD-to-SD aspect ratio conversions. LHe Plus provides down-conversion

### KONA LHi & KONA 3G Conversion Options:

Primary Video Format	Secondary Format Options
720x480 @ 29.97i 720x480 (Wide) @ 29.97i 720x486 @ 29.97i 720x486 (Wide) @ 29.97i	1920x1080 @ 29.97i 1280x720 @ 59.94p 720x486 @ 29.97i
720x576 @ 25.00i 720x576 (Wide) @ 25.00i	1920x1080 @ 25.00i 1280x720 @ 50.00p 720x576 @ 25.00i
1280x720 @ 23.976p	720x486 @ 29.97i 1920x1080 @ 29.97i
1280x720 @ 24.00p	1920x1080 @ 30.00i
1280x720 @ 25.00p	720x576 @ 25.00i 1920x1080 @ 25.00i
1280x720 @ 29.97p	720x486 @ 29.97i 1920x1080 @ 29.97i
1280x720 @ 30.00i	1920x1080 @ 30.00i
1280x720 @ 50.00p	720x576 @ 25.00i 1920x1080 @ 25.00i
1280x720 @ 59.94p	720x486 @ 29.97i 1920x1080 @ 29.97i
1280x720 @ 60.00p	1920x1080 @ 30.00i
1920x1080 @ 23.976sF	720x486 @ 29.97i
1920x1080 @ 24.00sF	None Available
1920x1080 @ 25.00sF	720x576 @ 25.00i 1280x720 @ 50.00p
1920x1080 @ 29.97sF	720x486 @ 29.97i 1280x720 @ 59.94p
1920x1080 @ 30.00sF	1280x720 @ 60.00p
1920x1080 @ 25.00i	720x576 @ 25.00i 1280x720 @ 50.00p
1920x1080 @ 29.97i	720x486 @ 29.97i 1280x720 @ 59.94p
1920x1080 @ 30.00i	1280x720 @ 60.00p

All conversions use AJA 10-bit hardware on the card.

To do a down-conversion on an HD input (KONA 3G and LHi models):

- Set the Primary Format as an SD format
- Select the correct HD format with an (I) input designation for the Secondary Format, then
- Choose a “– Secondary” Video Input type

To do an up-conversion on an SD project for HD output (KONA 3G and LHi):

- Set the Primary Format as an SD format
- Select the correct HD format with an (O) output designation for the Secondary Format, then
- Choose a “– Secondary” SDI1/2 Output type and an HD Analog Output

Down-conversion display mode choices that may be available include (KONA 3G and LHi):

- 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 horizontally to fit new screen size

Up-conversion display mode choices that may be available include (KONA 3G and LHi):

- Anamorphic: full-screen
- Pillarbox 4x3
- Zoom 14x9
- Zoom Letterbox
- Zoom Wide

For Cross-conversion (KONA 3G models):

- Set the Primary Format as an HD format (what you want the input converted to)
- Select the correct input HD format with an (I) input designation for the Secondary Format

KONA 3G cross-conversion allows you to convert from one format of HD to another, such as 1080i @ 29.97 to 720p @ 59.94. KONA 3G does not perform 2K to HD cross-convert, but can display a cropped cut of the 2K on an HD monitor. In addition to HD-to-HD cross-conversion, KONA 3G also can perform SD to SD hardware based aspect-ratio conversion for capture and output. This is controlled the same as all other up/down/cross-conversions. Use it by selecting a ‘Secondary Video Format’ that matches the ‘Primary Video Format’ and then specifying the conversion using the ‘Convert Mode’ control.

## KONA Format Setup Options

### Video Input

Each KONA plug-in, and the stand-alone Machina application, offer a Video Input pull-down menu to select an appropriate signal type for your input. (The current selection is reported in the display of the pull-down menu.)

Video Input always shows all the available input options based on your Primary and Secondary format configuration. KONA software looks at 1) what model you have, 2) Primary Format, and 3) Secondary Format (in that order) to determine the appropriate input options.

Video Input Options Supported by KONA cards include:

- Single Link SDI
- Composite NTSC
- S-Video NTSC
- Component Betacam NTSC
- Component SMPTE NTSC
- Composite NTSC-J
- S-Video NTSC-J
- Dual Link HD (KONA 3G only)
- Component Betacam NTSC-J
- Component SMPTE NTSC-J
- Composite PAL
- S-Video PAL
- Component Betacam PAL
- Component SMPTE PAL
- Component XVGA (HD only)
- HSDL (KONA 3G only)

### Audio Input

Use the Audio Input pull-down menu to select the appropriate signal type for your input. (The current selection is reported in the Status Display.)

Audio Input Options Supported by KONA cards include:

- Embedded SDI
- Digital AES/EBU - XLR
- Digital AES/EBU - BNC (only applies if you are using a KL- or K3-Box)

### SDI Outputs 1 & 2

When using KONA LHe Plus and LHi cards, the SDI outputs will be Single Link only, if there is no Secondary Video Output Format selected. If you have a Secondary format selected, you can choose between Single Link SDI – Primary and Single Link SDI – Secondary as your output. KONA 3G also offers Dual Link output which uses both output connectors for a single A/B channeled output (SDI Output 2 automatically becomes Dual Link).

On KONA LHi, there is only one SDI output, but there is an HDMI output. You can independently configure the SDI output to HD or SD, and the HDMI input to SD or HD. The LHi has a hardware-based downconverter, so you can output SD if desired, when playing back HD (or in E-to-E).

### Analog Output

Analog format choices in the Analog Output pull-down menu vary depending upon file format.

- Composite + S-Video NTSC
- Composite + S-Video NTSC-J
- Component Betacam NTSC
- Component Betacam NTSC-J
- Component SMPTE
- Component XVGA (HD only)
- Composite PAL
- S-Video PAL
- Component Betacam PAL
- Component SMPTE PAL
- Component RGB

**Note:** When SD and HD formats are available as Primary and Secondary formats, you can choose between SD and HD raster for the Analog Output.

### Audio Level

Choose between +6 dB (US) monitor level and +0 dB (EBU).

### Timecode Input

Select the type of timecode used by the source video machine—RS-422, Embedded SDI (RP188) or choose to input an External LTC timecode source input via the KONA RS-422 port.

**Note:** SMPTE RP 188 defines a standard for the transmission of time code and control code in the ancillary data space of a digital television data stream. Time code information is transmitted in the ancillary data space as defined in ANSI/SMPTE 291M. Multiple codes can be transmitted within a single digital video data stream. Other time information, such as realtime clock, DTTR tape timer information, and other user-defined information, may also be carried in the ancillary time code packet instead of time code. The actual information transmitted through the interface is identified by the coding of a distributed binary bit. Equipment manufacturers can use the meta data for different purposes.

### Desktop Display Options

Select one of four modes of desktop display:

- Off
- Display while idle only (this mode is suggested)
- Display during capture only
- Display Always

Display to Desktop uses system resources and could affect performance. Choose Capture Speed, Width, and Height as appropriate for your system capabilities.

### Desktop Speed:

- Full Speed – Every frame is displayed to desktop during playback
- Half Speed – Every other frame is displayed to desktop during playback
- Quarter Speed – one out of every four frames is displayed to the desktop

Half Speed and Quarter Speed will reduce the system load that the Display-To-Desktop is using to draw video to your computer.

**Desktop Capture Width and Height:** These selections allow you to reduce the resolution of the desktop capture display. The captured file will be full-resolution. Only the displayed image is reduced to save processing resources during capture. The choices available are:

- Full Resolution
- Half Resolution
- Quarter Resolution
- Eighth Resolution
- Sixteenth Resolution

## File Options

KONA supports the following Video and Audio Formats:

### Video Formats:

- 8-bit YUV 4:2:2 – ‘2vuy’
- 8-bit YUV 4:2:2 – ‘2Vuy’
- 10-bit YUV 4:2:2 – ‘v210’
- 8-bit RGB 4:4:4 – ‘rgb’
- 8-bit RGB 4:4:4 – ‘bgr’
- 8-bit RGBA 4:4:4:4 – ‘argb’
- 8-bit RGBA 4:4:4:4 – ‘rgba’
- 8-bit RGBA 4:4:4:4 – ‘bgra’
- 10-bit Log RGB 4:4:4 – ‘R10g’
- 10-bit RGB 4:4:4 – ‘R10k’
- 10-bit RGB 4:4:4 – ‘r10k’

### Audio Formats:

- 48 kHz 16-bit PCM Mono
- 48 kHz 24-bit PCM Mono
- 48 kHz 32-bit PCM Mono
- 48 kHz 16-bit PCM Stereo
- 48 kHz 24-bit PCM Stereo
- 48 kHz 32-bit PCM Stereo

KONA 3G supports up to 16 channels of audio (eight stereo pairs), while the other KONA cards support up to eight (four stereo pairs). Adobe Premiere Pro CS5.5 supports six channels.

## Capture, Preview, and Playback—Differences and Similarities

The services that KONA provides differs based on the plug-ins. Some applications, like Adobe Premiere when used with its KONA plug-in, offer full support for media capture, previewing from RAM, and playback to monitors and to an attached VTR with full machine control. Other applications and their KONA plug-ins offer different levels of support. This section describes the support provided by each KONA plug-in and the Machina standalone application and discusses what each of these capabilities mean.

### Capture Overview

Capture records the source signal to your storage system from the chosen input connector(s), digitizing and encoding the media (audio and video) to disk as you’ve directed in your KONA configuration settings. Media may be recorded directly as configured as the Primary Format (framebuffer) or with some type of conversion performed—a Secondary Format at the input (set up in KONA configuration) is converted to the Primary Format (as allowed by the KONA model you have).

For those applications that do not directly support capture via KONA, you can always use Machina to perform the capture and then load the media into the desired application as a QuickTime, AVI, or still image file.

### Preview Overview

Preview is the viewing of captured media from RAM memory in the computer. It is not necessarily realtime since it’s affected by CPU performance and other real world factors such as other activities that might be occurring on the host computer. RAM preview occurs on the computer monitor. The purpose of preview operations is to review the captured material and perform editing/trimming operations.

### Playback Overview

Playback differs from Preview in that the media is read directly from disk storage and output, as configured, to KONA outputs. Playback also outputs machine control signals to the RS422 connector directing VTR operations. Playback is frame-accurate and suitable for broadcast and print-to-tape.

## Support for Capture, Preview and Playback

The following table shows for each of the KONA for PC plug-ins and the Machina application, which Capture, Preview, and Playback services are provided.

Application or Plug-in	Capture Y/N	Preview Y/N	Playback Y/N	Notes
Machina	Y	Y	Y	Use tabbed windows to configure
Adobe Premiere Pro CS5.5 Plug-in	Y	Y	Y	Capture & Preview: file-> capture Playback: project->"project settings" ->General->"playback settings" button
Adobe After Effects CS5.5 Plug-in	N	Y	N	AJA plug-in screen available under Windows menu
Adobe Photoshop CS5.5 Plug-in	Y	Y	N	Capture 1 frame: file->Import->"AJA image capture"
Eyeon Fusion Plug-in	N	Y	N	Preview: file->preferences->"global and new comp defaults"->preview->options->"display file sequences on" -> AJA Preview  To Edit AJA Settings: file->preferences->"global and new comp defaults"->I/O -> AJA Preview
Drastic Software's MediaNXS LE	Y	Y	Y	<a href="http://www.medianxs.com/">http://www.medianxs.com/</a>

## KONA DVCProHD Support

AJA includes a DVCProHD codec for capture and editing with the KONA card. The KONA installer includes Adobe Premiere Pro project presets specifically for use with DVCProHD compressed files. These project presets have raster sizes that match the non-standard resolutions and pixel aspect ratios of DVCProHD. They are especially useful when the bulk of the project media will be DVCProHD.

### KONA Capture

DVCProHD compressed Quicktime files can be captured from HD-SDI or analog sources using either AJA's Machina, or Adobe Premiere Pro CS5 (see Capture setup instructions for the specific application). All normal capture instructions apply except for the following:

- "File Type" must be Quicktime
- "Video Subtype" must be DVCProHD
- "Primary Video Format" should be set to the real HD raster size

For example, if capturing from a 1920x1080 source, that same raster should be selected in the "Primary Video Format" control in the capture settings. The encoder will automatically scale the video down to the appropriate DVCProHD resolution. When using KONA DVCProHD project presets, these settings will already be preset.

Once capture is completed a Quicktime file will exist on the specified hard disk. If capturing in Adobe Premiere Pro, the Quicktime file will automatically be imported into the current Premiere project bin.

For more information on using DVCProHD for:

- Compressed Online Editing,
- Compressed Offline Editing,
- Import, Editing, and Playing Multiple Media Types,
- Cross-Platform Workflow with KONA and DVCProHD

see the whitepaper DVCProHD Editing with KONA at

[http://www.aja.com/pdf/AJA\\_whitepaper\\_DVCProHD\\_editing.pdf](http://www.aja.com/pdf/AJA_whitepaper_DVCProHD_editing.pdf)

## **AJA's Hardware Scaling Support**

Most AJA hardware has built in hardware-based scaling support that allows for DVCProHD resolution up-sampling and down-sampling to be done in real-time, with very high quality. This hardware-based scaling is done during capture and during playback or output from the editing timeline. The KONA LHi and the KONA 3G both have this support built in.

## **Codec Requirements**

The DVCProHD support included with KONA for PC requires the presence of the KONA card, and works only in the applications using the card. Quicktime files captured with KONA can be used in other applications, and even on other platforms, but they require the presence of a third party DVCProHD Quicktime codec like the one included in Final Cut Pro, or the standalone Quicktime decoder by Calibrated Software ([www.calibratedsoftware.com](http://www.calibratedsoftware.com)).



# Chapter 4: Using AJA's Machina Application

## Machina Capture/Playback Application

Machina (pronounced: mock'-en-uh) is AJA's powerful standalone capture/playback application that includes full VTR machine control. It is an easy-to-use interface that provides access to any and all KONA supported file formats, video standards, and video conversions. Captured files can be imported into virtually any software package that supports these file formats—such as 3D animation programs, audio editing programs, and more. With Machina, you can also accurately output files exported from these same programs to tape.

The Machina application is part of the software package that came with your KONA card. If you haven't already done so, launch the KONA Install CD, follow the prompts, and click on the Machina short-cut placed on the desktop to launch Machina.

This chapter addresses configuration and setup unique to use of KONA LHe Plus, LHi, and 3G models with Machina.

### KONA Realtime Performance

With KONA LHi running Machina, in realtime you can:

1. Capture uncompressed analog or digital SD and HD, component/composite, or S-Video to: DPX, Cineon, Tiff, Targa, Bitmap, Quicktime, AVI, or YUV
2. Down-convert from HD to SD during capture or playback
3. Playback to two displays simultaneously, SD-SDI and analog

With KONA LHe Plus running Machina, in realtime you can:

1. Capture uncompressed analog or digital SD and HD, component/composite, or S-Video to: DPX, Cineon, Tiff, Targa, Bitmap, Quicktime, AVI, or YUV
  2. Down-convert from HD to SD during capture or playback
- Playback to three displays simultaneously, SD/HD SDI and analog

With KONA 3G running Machina, in realtime you can:

1. Capture Uncompressed digital SD or HD via SDI or Dual Link to: DPX, Cineon, Tiff, Targa, Bitmap, Quicktime, AVI, or YUV
2. Up-convert SD to HD, Cross-convert 1080i <-> 720p, and Down-convert SD to HD during capture or playback
3. Display to three monitors with various conversions

**Note:** AJA KONA now includes a codec for capture and editing compressed DVCProHD. See ["KONA DVCProHD Support" on page 38](#)

## Machina Overview

AJA's Machina provides three tabbed windows that perform the following:

- Setup – set Activation, Capture, Playback, Device Control, and General options
- Capture – set Capture file and Clip options and Control the capture
- Play – set Playback file options and Control the playback



### *Machina Application Interface – Setup Menu*

This section of the manual will discuss each of these windows in detail and discuss how various Pull-down menu options, hot-text entry fields, and play/record controls function and interact.

**Note:** The specific options available to you are determined by the currently active AJA capture device model installed in your workstation. This section will describe all possible options for Machina and note any options exclusive to KONA.

## Shortcuts and Display Features

### Keyboard Shortcuts

Space Bar – Use it to start and stop playback of media. Pressing the Space Bar starts playback from the location of the Edit Line.

I key – press to set an In-point when trimming a clip.

J key – press to shuttle backward through the clip. Press repeatedly to move at a faster rate (2x, 4x, etc.).

K key – press to stop playback at the current position.

L key – press to shuttle forward through the clip. Press repeatedly to move at a faster rate (2x, 4x, etc.).

O key – press to set an Out-point when trimming a clip in Machina.

Left Arrow key (<-) – press to move one frame backward.

Right Arrow key (->) – press to move one frame forward.

Up Arrow key – press to start playback (forward).

Down Arrow key – press to start playback backward.

## Full-screen Desktop Display

To use Machina for full-screen preview during capture or playback, first maximize the Machina window, then hit the Escape key. This can be especially useful for monitoring capture or playback in the absence of a full-resolution monitor. In full-screen mode you can use the mouse to control picture position and zoom for detail monitoring of graphic elements or frame-cut results (see “Display Sizes” on page 52 in this section).

## Setup Window

To configure the Machina operation, click on the Setup tab at the top of the window. In the left-most column are the Activation Options. The next column will toggle between Capture and Playback options when you click on the arrow tabs to the left and right of the header text. Next, Device Options address machine control settings. Finally, General Options establish paths to file storage directories for Video and Audio files and enable other options.

## Activation Options

### Board

**Note:** The term **Board** in this case refers to the AJA capture device being controlled by an application. In this section you will find the terms “board,” “card,” or “capture device” used interchangeably.

The Board window/menu reports the current Type of AJA capture device (Io Express or KONA card) selected.

**Note:** Using multiple AJA capture devices in the same workstation is possible but not always practical due to motherboard and disk system bandwidth limitations.

### Activation Mode

Machina and KONA plugins in Adobe applications can be set for Automatic or Manual activation using the Activation Mode pull-down menu. Automatic is the default setting and is recommended for normal operation. Current activation status is reported below the pull-down menu.

The KONA card can be accessed by multiple application client windows but only one can have control at a time (for example, Adobe Premiere Pro and Adobe Photoshop). In automatic mode, an application or plugin can take active control when the KONA card is not being used. When the controlling application is done (and any processing initiated is complete), control is released, making the KONA card available to others.



**Note:** If the application window you click on does not access KONA (reporting KONA Status: Active), either another application window is still processing operations or it is set in Manual activation mode. (Remember: only one client window can have control of the KONA card at a time.) If it is controlled by an application in Manual mode, you must either un-check the enable check-box or select Auto in the Activation Mode pull-down menu to relinquish control.

In Manual mode, you must click on the enable check-box to activate board-control.

## KONA Information

At the bottom of the Machina Setup screen, in the left hand column, you'll find vital information about your specific KONA card —license type, serial number, and version. This information will be helpful if you ever need technical support.

## Capture Options

To the right of “Activation Options” there is a column that can toggle to either “Capture Options” or “Play Options.” The arrow buttons on either side of the Capture Options/Play Options button determine which of the two is displayed. Under Capture Options, you can select the appropriate formats and settings for your project.

The Primary Format menu allows you to select the video format used in your current project. The Secondary Video Format allows KONA to perform up-, down-, and cross-conversion of input or output video (as supported by your KONA model).

Analog output is always available.

### Primary and Secondary Video Options Supported by KONA

See “[Selection of Primary & Secondary Formats](#)” on [page 31](#) for Primary/Secondary video format and conversion information.

**Note:** No frame rate interpolation is applied for conversions from one frame rate to another.

Throughout Machina, choices are always presented based on which KONA card you are using and what it can do with the signals available and the inputs/ outputs selected. For example, the LHi and KONA 3G cards offer up-, down-, and cross-conversion for supported formats. KONA LHe Plus does HD to SD down-conversion only.

### YUV<->RGB Range

This control mode should almost never be changed from its CGR default. This setting is only for highly-knowledgeable users that must define how color values will be mapped when doing the color space conversion—far less than 1% of all users should ever need to use it. Use this feature only for capturing YUV source into an RGB file, or to play an RGB file out to YUV. The CGR setting maps the typical YUV values to typical RGB values. For example, 8bit YUV 16 is mapped to 8 bit RGB 0, and YUV 235 to RGB 255. The ‘SMPTE’ setting for this control maps YUV into RGB using the exact YUV values. Therefore, 8 bit YUV 16 will map to RGB 16, and so forth. Only change this setting from its default if you are absolutely sure you know the benefits/ consequences. This feature is not the same as a broadcast safe limiter.



## Video Input

Use the Video Input pull-down menu to select the appropriate signal type of your input. (The current selection is reported in the display of the pull-down menu.)

Video Input always shows all the available input options based on your Primary and Secondary format configuration. KONA software looks at 1) what model you have, 2) Primary Format, and 3) Secondary Format (in that order) to determine what input options are appropriate.

Video Input Options supported by KONA cards include:

- Single Link SDI
- Composite NTSC
- S-Video NTSC
- Component Betacam NTSC
- Component SMPTE NTSC
- Composite NTSC-J
- S-Video NTSC-J
- Dual Link 4:4:4 HD-SDI (KONA 3G only)
- Component Betacam NTSC-J
- Component SMPTE NTSC-J
- Composite PAL
- S-Video PAL
- Component Betacam PAL
- Component SMPTE PAL
- Component X VGA (HD only)
- HSDL (KONA 3G only)

## Audio Input

Use the Audio Input pull-down menu to select the appropriate signal type for your input. (The current selection is reported in the Status Display.)

Audio Input Options Supported by KONA cards include:

- Embedded SDI
- Digital AES/EBU - XLR (using either breakout cable or breakout box)
- Digital AES/EBU - BNC (only applies if you are using KONA 3G or a breakout box with BNC connectors for AES/EBU)
- Analog (KONA 3G requires K3G-Box)

## SDI Outputs 1 & 2

The SDI outputs will be Single Link, Dual Link (available with KONA 3G card only), or Video+Key (also only available with KONA 3G card). If you have assigned a Secondary Video Format, you can select either the Primary or Secondary format for the SDI Output:

- Single Link SDI – Primary
- Single Link SDI – Secondary
- Dual Link SDI – Primary (KONA 3G model only)
- Dual Link SDI – Secondary (KONA 3G model only)

On KONA LHi, there is only one SDI output, but there is an HDMI output. You can independently configure the SDI output to HD or SD, and the HDMI input to SD or HD. The LHi has a hardware-based downconverter, so you can output SD if desired, when playing back HD (or in E-to-E).

On KONA 3G, the two SDI outputs can also be configured to output a Video signal on one SDI output and a Key video signal on the second SDI output for use with external devices that support separate video and key (switchers, DVEs, etc.). This feature is also available on the output settings in After Effects CS5, and Photoshop CS5. To configure separate video and key, set the SDI-1 Output to 'Video + Key (V)' or 'Video + Key (K)'. The SDI-2 output will then automatically change to the complimentary setting. Video + Key is limited to 8 bit RGBA files.

## Analog Output

Analog format choices in the Analog Output pull-down menu vary with selected file format.

Analog Output Options Supported by KONA cards include:

- Composite + S-Video NTSC
- Composite + S-Video NTSC-J
- Component Betacam NTSC
- Component Betacam NTSC-J
- Component SMPTE
- Component XVGA (HD only)
- Composite PAL
- S-Video PAL
- Component Betacam PAL
- Component SMPTE PAL
- Component RGB

## Timecode Input

Select the type of timecode used by the source video machine — RS-422, Embedded SDI (RP188) or choose to input an External LTC timecode source input via the KONA RS-422 port.



**Note:** SMPTE RP 188 defines a standard for the transmission of timecode and control code in the ancillary data space of a digital television data stream. Timecode information is transmitted in the ancillary data space as defined in ANSI/SMPTE 291M. Multiple codes can be transmitted within a single digital video data stream. Other time information, such as real time clock, DTTR tape timer information, and other user-defined information, may also be carried in the ancillary timecode packet instead of timecode. The actual information transmitted through the interface is identified by the coding of a distributed binary bit. Equipment manufacturers can use the meta data for different purposes. After configuring Machina Capture Options, select the Play options by clicking on the toggle arrows on either side of the Capture Options title header.

## Play Options

**Primary Format, and Output Type** settings are all the same for playback mode as those described previously. Refer to [“Capture Options” on page 44](#).

### Audio Sync

Choose to sync audio output to either the Primary Format or the Secondary format if it is available. When a Primary/Secondary conversion is done, there may be a 0.5 or 1 frame delay introduced. Audio Sync will ensure that either the Primary or Secondary format is kept in sync.

### Audio Sample Rate

KONA cards support 48 kHz.

### Timebase

Use the Timebase pull-down menu to choose between:

- Frames
- Timecode (NDF)
- Timecode (DF)
- Reference

Using the Reference pull-down menu, select timing Reference source — Free Run, from External (genlock), or from the video Input signal.

## Device Control Options

Device Control Options set options for the RS-422 machine control interface on the KONA card. These functions support Print-to-Tape machine control.



### *Machina Device Control Options*

#### **Timecode Format**

Use this pull-down to select the timecode base supported by your VTR.

- Base 24
- Base 25
- Base 25 (50 frames per second)
- Base 30 DF (drop-frame, 30 frames per second)
- Base 30 NDF (non-drop-frame, 30 frames per second)
- Base 30 DF (drop-frame, 60 frames per second)
- Base 30 NDF (non-drop-frame, 60 frames per second)

## Timecode Source

Choose between a separate-channel Longitudinal Timecode (LTC) or Vertical Interval Timecode (VITC) transported in the video signal's vertical interval or include both (LTC + VITC).

Click on the Hot Text items to enter a value for:

- Preroll – 0 to 15; the number of frames required to start the source machine before capture
- Handles – 0 to 60; the number of frames added to the front and back of a sequence for editing flexibility
- Timecode Offset – -30 to +30; timecode adjustment (in frames) forward or back to compensate for discrepancies between the source's burned-in timecode and that of the captured sequence.

## General Options

### Video/Audio Directory Setup

Use these hot text fields to enter the path of the default capture/playback directories.

### Enforce Memory Alignment

For almost all cases this checkbox should remain unchecked. However on certain types of RAID Controllers (usually RAID5 SATA), when reading or writing to disc, to or from system memory, memory alignment must be done on a 512-byte address alignment. Enabling this option insures that reading/writing is done to a 512-byte address in system memory. But there is a performance cost. Due to re-alignment, reading/writing is not guaranteed to be in realtime.

### Audio Files Setup

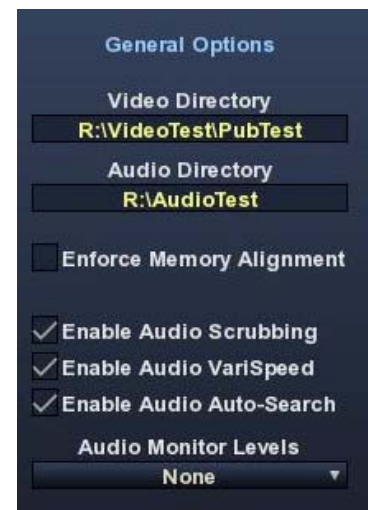
Three audio enable check boxes, when checked, allow you to:

- Enable Audio Scrubbing – Audio will play while you move through frames using the scrub bar (see Play Controls).
- Enable Audio Variable Speed – Audio will play at the same speed the video is played (rather than 1x only).
- Enable Audio Auto-Search – KONA software will automatically load the Audio Track list with audio files that have been generated with the same name as the selected video file.

**Note:** When Audio Auto-Search is active, existing file names in the list will be removed or over-written when the Video File is loaded. (Does not affect the actual audio files.)

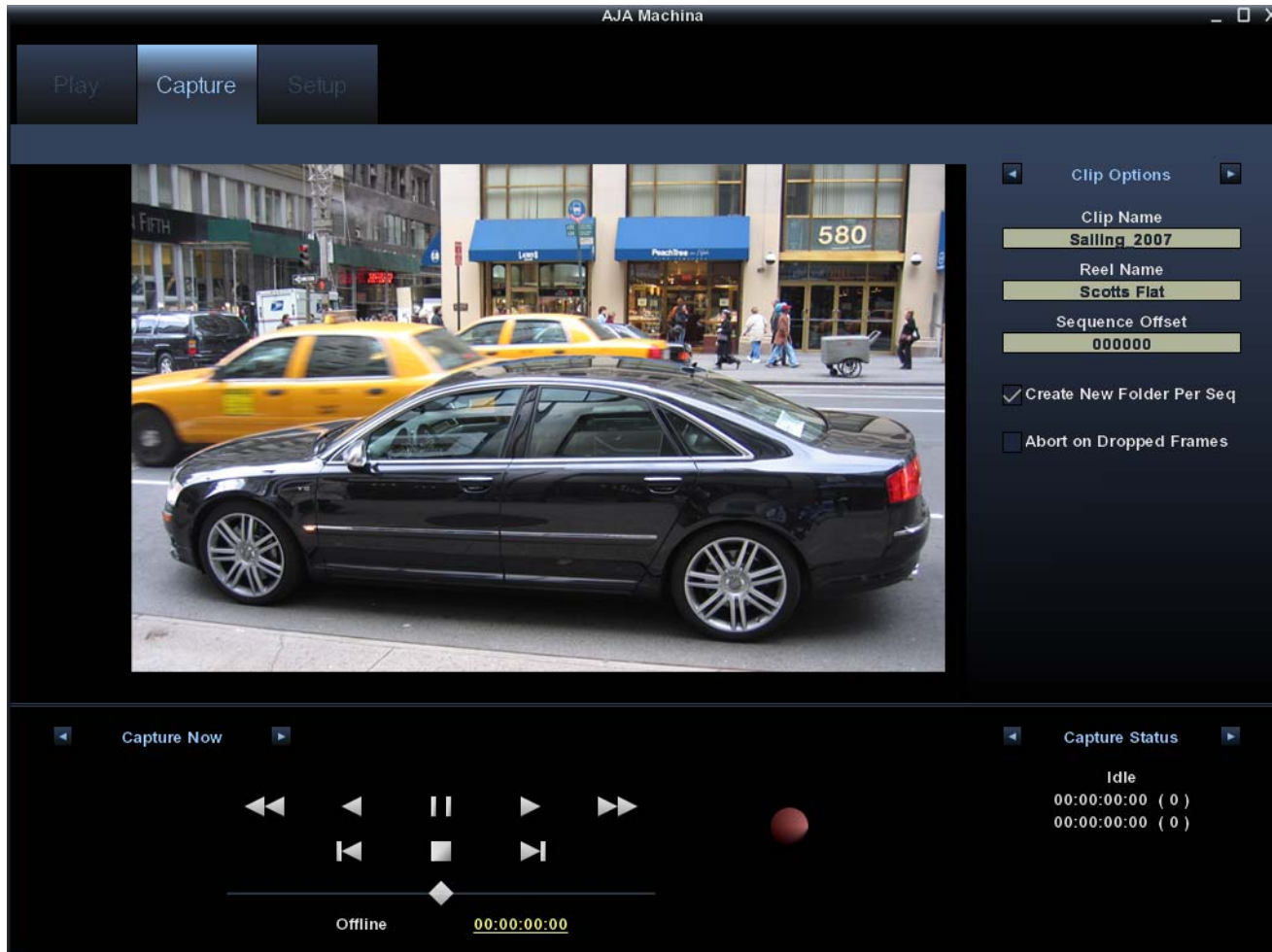
### Audio Monitor Levels

Choose between +6 dB (US) monitor level and +0 dB (EBU).



## Capture Window

Click on the Capture tab to bring up the Capture window. The figure below shows the Clip Options panel. Also available by clicking on the hot toggle buttons left and right of the title header are File Options and Display Options and Overlay Options.



*Machina Capture Window*

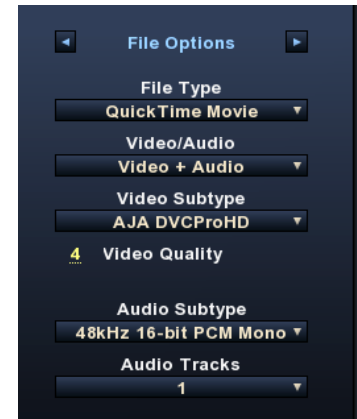
## File Options

In the File Options menu you will configure the capture file you will be creating by setting the following.

### Type

The Type pull-down menu provides a choice of video/audio file formats:

- QuickTime Movie
- TGA Sequence
- AVI Movie
- BMP Sequence
- DPX Sequence (KONA 3G & LHi only)
- TIF Sequence
- Cineon (KONA 3 & LHi only)
- YUV Sequence



### Video/Audio

Use this pull-down menu to select the video/audio input combination you will capture:

- Video Only
- Audio Only
- Video – (minus) Audio – video and audio are recorded in separate files
- Video + (plus) Audio (QuickTime only) – video and audio are recorded in the same file

The options shown are determined by the selected file format. QuickTime captured audio is either embedded with the video file or captured to separate .mov files. All other formats capture audio to Wave Files.

### Video Subtype

Video Capture Formats supported by KONA cards (varying according to file type) include:

- 8-bit YUV 4:2:2 – '2vuy'
- 8-bit YUV 4:2:2 – '2Vuy'
- 10-bit YUV 4:2:2 – 'v210'
- 8-bit RGB 4:4:4 – 'rgb'
- 8-bit RGB 4:4:4 – 'bgr'
- 8-bit RGBA 4:4:4:4 – 'argb'
- 8-bit RGBA 4:4:4:4 – 'rgba'
- 8-bit RGBA 4:4:4:4 – 'bgra'
- 10-bit Log RGB 4:4:4 – 'R10g'
- 10-bit RGB 4:4:4 – 'R10k'
- 10-bit RGB 4:4:4 – 'r10k'

### Audio Subtype

Audio Capture Formats supported by KONA cards include:

- 48 kHz 16-bit PCM Mono
- 48 kHz 24-bit PCM Mono
- 48 kHz 32-bit PCM Mono
- 48 kHz 16-bit PCM Stereo
- 48 kHz 24-bit PCM Stereo
- 48 kHz 32-bit PCM Stereo

## Audio Track

Select the number of audio tracks for this project. KONA models support up to 16 tracks depending on the Model.

## Clip Options

### Clip Name

In the Clip Options menu, click on the Clip Name to name the file you will be creating. Subsequent file numbers will increment from this one.

### Reel Name

Click on the hot text field to enter a source tape name—the name of the tape on the VTR. Only QuickTime and DPX files store this information.

### Sequence Offset

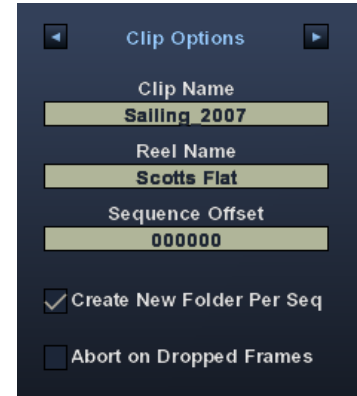
When capturing file-per-frame sequences, after naming a file, you can set a Sequence Offset number that will determine the beginning number of the file sequence.

### Create New Folder Per Sequence

A check-box is provided to enable this automatic function. When you check this selection, Machina will gather each frame capture sequence in a new folder, based on clip names, on your disk. (Not applicable to QuickTime or AVI movie files.)

### Abort on Dropped Frames

Checking this box causes a capture to automatically stop any time that KONA detects frames are being dropped for some reason. This ensures you don't waste storage space and time capturing when there may be a problem with the capture.



## Display Options

Display Options configure how the desktop display operates for capture.

### Display Type

The Display Type pull-down menu provides a choice of display rendering formats: OpenGL Texture or OpenGL DrawPixels. This setting changes the way the PC's GPU handles video overlay on your desktop monitor. OpenGL Texture should always be used whenever possible. Note, however that this setting is not guaranteed to work on all boards. It has been tested primarily with high-end nVidia workstation graphics cards. Using OpenGL Texture mode will allow any applied LUTs to be displayed on the desktop display as well as on the video output.

Open GL DrawPixels should only be used when you are experiencing display problems. Typically, this will be for graphics cards that are not AJA approved, and that have less OpenGL support. This mode does not allow applied LUTs to be displayed on the desktop. This mode also has many limitations when working with YUV files. When using this setting, files may appear pixelated on the desktop display. This does not affect the quality or resolution of the video being captured or output from the KONA card.



## Display To Desktop

This setting determines when the desktop monitor overlay is present. Choice include:

- OFF – always off (no display)
- While Idle Only – displays whatever is present at the selected input while idle; when capturing, there is no display (saving system resources)
- While Capture Only – only display while capturing
- Always – display during capture and when idle

## Display Sizes

The desktop monitor display will be sized according to this setting. You can choose from select sizes (25% to 800%), enter a custom size (Custom), or have KONA fit the display size according to your Machina screen (Fit). If you use Custom, use the hot text fields underneath Display Sizes to enter a specific percentage and X and Y origin points.

You can also zoom picture size by clicking on the Size hot text field and dragging to the left or right. Zoom can also be done using the scroll-wheel of your mouse (especially helpful when viewing the display in Full-screen mode, see [“Shortcuts and Display Features” on page 42](#)). To move the picture within the display, just click in the display area and drag the picture.

## Overlay Options

The final options selection in the Capture window is Overlay Options. These overlay controls allow you to insert a graphic file supporting alpha channel transparency to apply an effect or insert a bug (logo) over the video content.

### Enable Overlay

Enable/disable the overlay using this checkbox.

### Mixer Coefficient

Adjust the overlay file transparency (range: 0 to 1000). Double-click on the field to select and enter a value or click-drag left or right to increment or decrement (respectively).

### Foreground Video

Select the blending mode for the foreground layer:

- Full Image
- Pre-Mult Alpha
- UnShaped

### Background Video

Select the blending mode of the background layer.

### Graphic File

Click in the text entry field to browse for the overlay file you want to use. Click on the trash can to the left to delete the current selection.



## Use as Background Video

Check this box to place the Graphic File on the Background layer and place the motion video in the foreground layer.

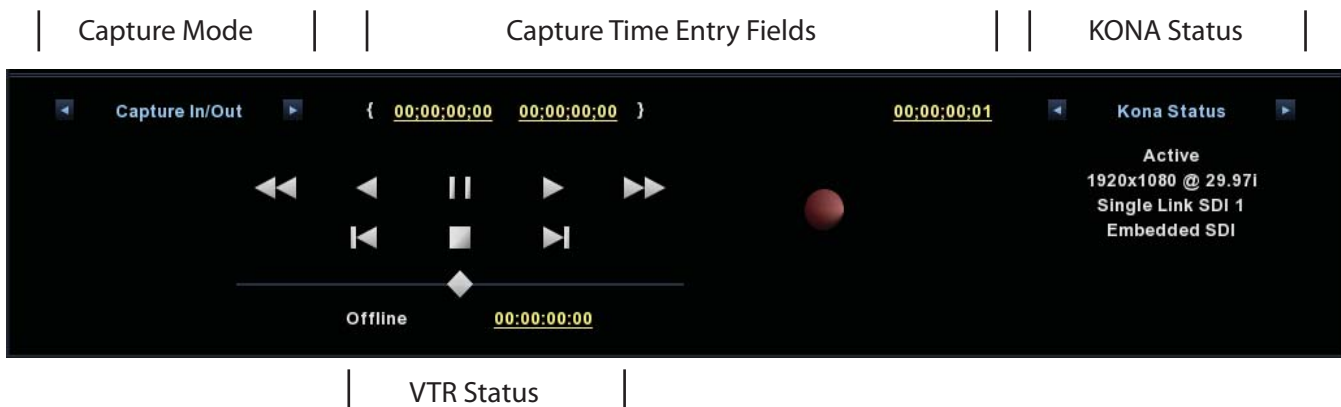
## Capture Controls

Standard tape deck icons provide hot buttons for the Capture process. They are:

⏮	Rewind (8x)	⏭	Fast Forward (8x)
⏪	Reverse Play	⏩	Reverse 1 frame
⏸	Still	■	Stop
▶	Play (1x)	⏪	Forward 1 frame

The slider on the bottom is a variable speed forward/reverse control. Positions from left to right are: (Reverse) 16x, 8x, 4x, 2x, 1/2, 1/4, Still, (Forward) 1/4, 1/2, 2x, 4x, 8x, and 16x.

The red button is for Record.



## Machina Capture Controls

The toggle buttons on the top-left step through one of three capture modes:

- Capture Now – manual record/stop (“crash”) capture
- Capture Duration – capture a specified number of frames after manual start, based on the timebase of the selected Primary Format
- Capture In/Out – initiate and end capture using timecode-based in and out settings

The selected mode will activate the appropriate hot text for that mode (to the right of the Capture Mode selection). Click the hot text to enter a timecode value (hours:minutes:seconds:frames). The bottom display indicates the current machine status and timecode from the VTR.

## Capture In/Out Mode

The capture in-point is entered by clicking on the left field of eight digits. The out-point can be set by clicking on the right field of eight digits. Alternatively, you can specify a duration in the Duration field and the in- or out-point (whichever you have not entered) will be entered automatically according to duration.

**Note:** The in-point/out-point field values are inclusive. If both are set to the same value, the capture duration will be 1 frame.

To load the current VTR timecode setting in either field (in-point or out-point) click on the hot text field and enter from your keyboard.

**Note:** When a hot text field has a dotted underline, you can left-click and hold on the field and drag your cursor to increment or decrement the value.

## VTR TC

The current VTR timecode is displayed on the bottom of the control pane and you can click on it and enter a timecode to perform a seek to that timecode on the VTR. The VTR must be online and in remote rather than local control mode (as reported to the left of the current timecode).

## Capture/KONA Status

Click on the hot toggle buttons of the Status header to switch between Capture Status and KONA Status. Capture Status reports current state of activity, capture duration and number of frames captured in ( ), and the number of frames that may have been dropped.

KONA Status reports Active/Inactive status, Primary Format setting, Video Input type, and Audio Input type.

## Play Window



***Machina Play Screen***

### File Options

On the right side of the desktop display, you can use the hot buttons at the top to toggle between File Options, Display Options, and Leader/Trailer Options. In File Options, the current file name and path is loaded into the Video field. Alternatively, you can click on the path hot text to select a file, delete it using the trash icon at the left, or turn it on/off using the check-box at the right.

Format, Colorspace, and total number of frames in the file is reported below the path text.

You can preview the effects of a color Look Up Table by clicking on the LUT hot text or delete the selected LUT file by clicking on the trash icon.

You can edit the Audio Track list that is automatically loaded with audio files that have been generated with the same name as the selected video file. QuickTime embedded audio files are automatically appended with a number and will be loaded numerically into the track list. Click on the trash icon to delete a track. Click on the check-box on the right to enable/disable a track. To manually enter audio files, simply double-click on a track in the list.

## Display Options

In the Display Options menu you will configure how the desktop display operates during playback operations.

### Display Type

The Display Type pull-down menu provides a choice of display rendering formats: *OpenGL Texture* or *OpenGL DrawPixels*. This setting changes the way the PC's GPU handles video overlay on your desktop monitor. OpenGL Texture should be used whenever possible. These options were described in detail earlier under the Capture screen options.

### Display To Desktop

This setting determines when the desktop monitor overlay is present. Choice include:

- OFF – always off (no display during scrubbing or playback)
- While Scrubbing Only – displays media as you scrub through it via the playhead; during playback there is no display (saving system resources)
- While Playing Only – displays media only during playback
- Always – display during playback and when idle

### Display Sizes

The desktop monitor display will be sized according to this setting. You can choose from select sizes (25% to 800%), enter a custom size ("Custom"), or have KONA fit the display size according to your Machina screen ("Fit"). If "Custom" is chosen, use the hot text fields underneath Display Sizes to enter a specific percentage and/or X and Y origin.

## Leader/Trailer Options

Leader/Trailer Options allow you to add colorbars, test tone, and black field in a leader to your clip and black field as trailer. Note that the dotted underline indicates that you can left-click down and scroll the mouse to increment/decrement these values.



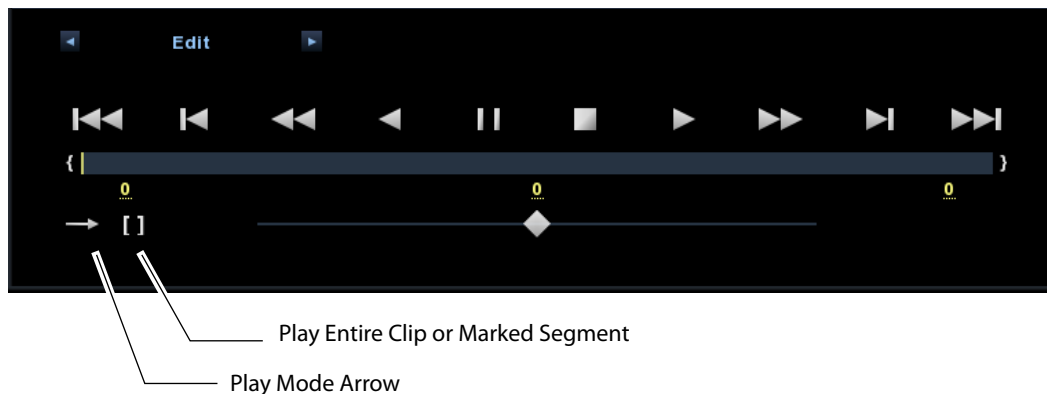
**Leader/Trailer Options**

## Play Controls

There are two modes of play control—one for Edit and one for Output. Click the hot buttons at the top-left of the pane to toggle between the two modes.

**Edit Mode** – In Edit mode, immediately under the mode toggle buttons are standard tape deck icons providing hot buttons for the Play process. They are:

⏮	Go-to-Previous "Most Significant" frame	⏪	Reverse 1 frame
⏮	Rewind (8x)	⏪	Reverse Play
⏸	Still	■	Stop
▶	Play (1x)	⏩	Fast Forward (8x)
▶	Forward 1 frame	⏩	Go-to-next "Most Significant" frame



### **Edit Mode Play Controls and Scrub Bar**

Below the Play buttons is a Scrub Bar that allows you to click and drag along the loaded sequence to view individual frames and mark In/Out- points for playback of frame subsets. To set an in-point, click on the left bracket. To set an out-point, click on the right bracket.

To set an in-point, click on the left-most hot text numeral below the bar and enter the desired frame number. Similarly, enter the out-point by clicking on the right side hot text numeral.

**Note:** The "first" or "last" frame may be for the entire sequence or for frames in an in/out-marked subset. In this case, first, last, in, and out frames become "Most Significant Frames." For example, clicking on the Go-to-1st button will move you to the first Most Significant Frame to the left. Clicking on the Go-to-Next button will move you to the first Most Significant Frame to the right.

The slider on the bottom is a variable speed forward/reverse control. Positions from left to right are: (Reverse) 16x, 8x, 4x, 2x, 1/2, 1/4, Still, (Forward) 1/4, 1/2, 2x, 4x, 8x, and 16x.

## Play Modes

Select a Play type by clicking the Play hot toggle buttons above the controls. Choose between: Play All or Play Range.

You can select one of three Play Modes by clicking on the Play Mode arrow to the left of the slider control. You will step through the following modes:

- Once (single arrow) – play once through in forward or reverse
- Bounce (double-ended arrow) – play continuously, alternating between forward and reverse play
- Loop (double right-pointing arrow) – play repeatedly, looping in one direction

If you have designated an In/Out sub-segment you can use the hot text brackets (to the right of the Play Mode arrow) to play either the entire clip [ ] or the marked segment only { }.

## Output Modes

Toggle the Play Mode to Output and standard VTR controls and machine control timecode hot text will appear. Beneath the Output mode header are hot-buttons that allow you to choose between two modes of output—Insert Edit or Print-To-Video. Print-To-Video and Insert Edit will output the loaded clip from its in/out- points (if any exist) or from the first to last frame (if no in/out-points have been set).



*Play Controls for Insert Edit*

## Insert Edit

In this mode, you can select the Video/Audio content that you want to insert by checking the desired content boxes at the left. Then set an in-point that the recording VTR will use to initiate recording of your segment. Duration is determined by the length of the clip you are outputting.

**Note:** The **Preview Edit** check-box controls whether the insert edit is in “Preview” mode or not. In preview mode, the deck never goes into record but just simulates the edit without putting anything to tape. You must un-check this box to perform the actual Insert Edit.

## Print-to-Video Mode

This mode allows you to manually put a clip to tape using the VTR's current position. You have the option of adding Delay frames. KONA will wait this many frames after the tape machine's start command, before it outputs the clip. The Duration Field displays the total length of the clip that will go to tape. Click on the green hot button to launch the output sequence.



**Play Controls for Print-to-Video**

## Assemble Edit Procedure

Assemble Edit features exist in both Machina and the AJA capture Plug-in for Premiere Pro. These features create a two step process for Assemble Editing. The procedure require the tape to have at least a few seconds of timecode already on it. If it does not have any timecode, a small segment near the front of the tape must be blackened to provide this initial timecode. This procedure assumes you are using a blank tape:

1. Blacken the Tape – This must be done in Machina
  - a Insert the tape and be sure it is cued to the right location
  - b Verify that the video cables and RS422 are connected correctly
  - c In the lower left hand corner of the "Play" tab in Machina, set the "Edit/Output" toggle to "Output".



**Blacken Tape Mode**

- d Next set the toggle button below, to "Blacken Tape"
- e In the timecode clock to the immediate right of the toggle buttons, enter your desired beginning timecode
- f Click the green "Record" button and allow the deck to blacken about 30 seconds of the tape

2. Punch-In Assemble (This can be performed either in Machina or Premiere Pro)
  - a Cue the tape to a location where there is timecode
  - b Set the edit toggle to "Punch-In Assemble"



### ***Punch-in Assemble Mode***

- c Specify the timecode where you would like the "Punch-In" to begin
- d Set the timecode generation setting on your deck to "regen"
- e Click the record button to begin the assemble edit.

### **Play/KONA Status**

Click on the hot toggle buttons of the Status header to switch between Play Status and KONA Board Status. Play Status reports current state of activity, play duration selected for the current playback, total number of frames in ( ), and lastly, the number of frames that may have been dropped. KONA Status reports Active/Inactive status, Primary Format setting, Video Input type, and Audio Input type.

# Chapter 5: Using Adobe CS5.5 Applications

## Overview

---

There are KONA plugins for both Mac and Windows versions of the Adobe Applications and functions are virtually the same. This chapter will describe the Windows menus and note exceptions.

AJA Software for KONA is tightly integrated with Adobe Premiere Pro CS5.5, Photoshop, and After Effects (not included with KONA). KONA allows a user to bring in supported Premiere Pro CS5 compressed formats and provides plug-ins and drivers that add functionality to the Premiere Pro application.

**Note:** You should have Adobe CS5 applications installed on your workstation before installing KONA software. The KONA installation adds required files to your Adobe application directories. Also, CS5 pluggins for Mac come in a separate installer that must be run along with the standard KONA for Mac installer. See KONA downloads at:

<http://www.aja.com/support/index.php>

After you install the KONA software on your workstation, all you need to do to begin using it is to become familiar with the AJA plugins and how Adobe CS5 applications access KONA options.

The manual you are reading does not provide operational information for Adobe CS5 except as related to KONA operations. Please read the Adobe Premiere Pro, Photoshop, and After Effects CS5 user documentation for information on configuration and operation.

**Note:** AJA Windows Software operates on both AJA KONA cards and Io Express at different functional levels. Some setup screens may use either KONA or Io Express interchangeably when referring to your AJA capture hardware.

The chapter you are reading addresses configuration and setups supported by KONA. Topics covered include:

- Adobe Premiere Pro Realtime Performance
- Beginning a Project with KONA Presets
- KONA Capture Options
- KONA Playback Options
- Using Adobe Photoshop CS5
- Using After Effects CS5.5

## Adobe Premiere Pro Realtime Performance

---

With KONA, Adobe Premiere Pro CS5.5 can perform the following functions in Realtime:

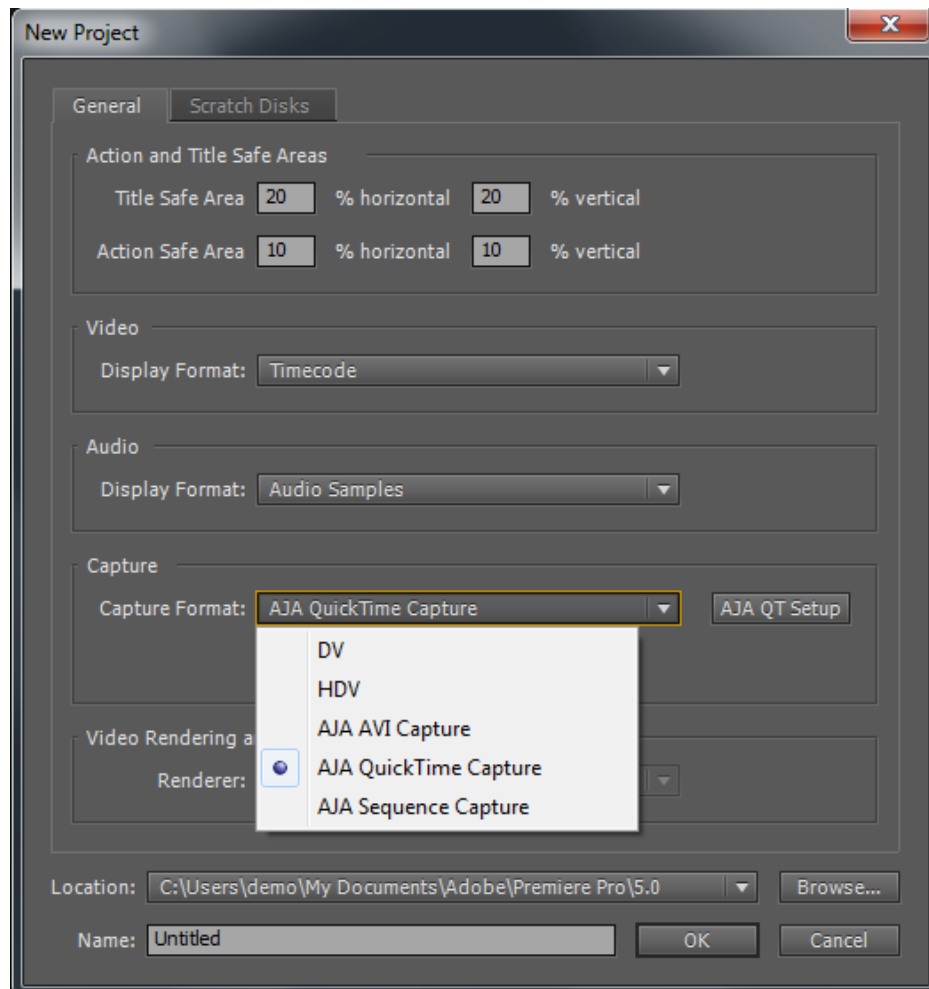
- KONA LHe Plus can capture uncompressed analog or digital SD and HD, component or composite, or S-Video to the supported file formats.
- KONA LHi can capture uncompressed analog or digital SD and HD, HDMI, component or composite, or S-Video to the supported file formats.
- KONA 3G can capture uncompressed digital SD or HD via SDI or Dual Link and uncompressed digital 2K via HSDL at 15 fps to the supported file formats.
- Playback of DPX, Cineon, Tiff, Targa, BMP, Quicktime, AVI, YUV, and HDV MPEG.

**Note:** This happens automatically. Files of these types that match the resolution and frame rates of the projects will play in realtime as long as they are uncompressed and in one of the supported colorspace. The exception is HDV, which of course is compressed. For HDV to playback RT it must be in a 1080 project and the frame rate or the file must match that of the project.

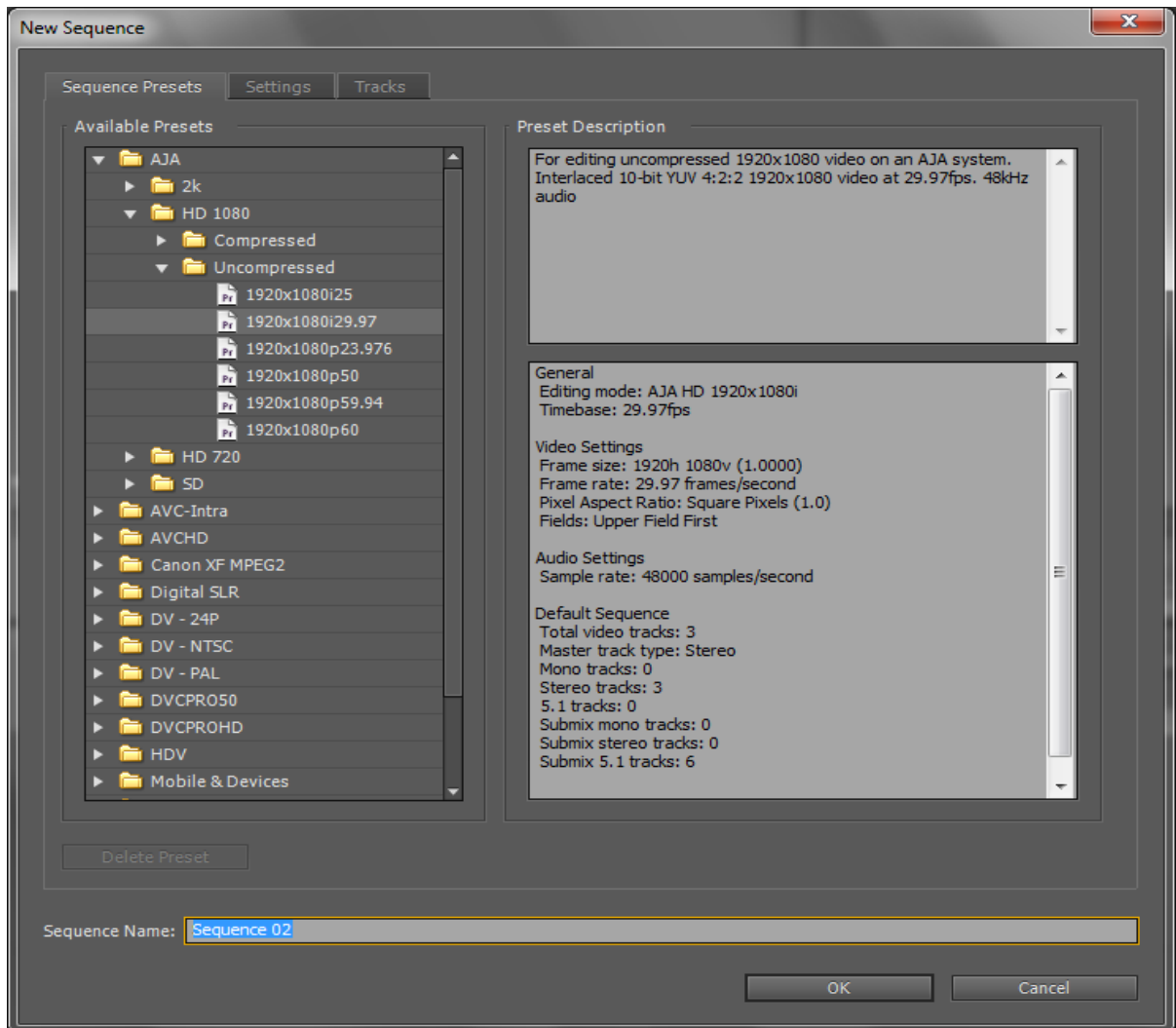
- Crop – happens automatically when an imported file is too large for the project size. Using Premiere Pro's Motion Effects positioning, this realtime crop is keyframable (Timeline Option "Render RT files of different resolution" box must be unchecked). This also occurs when you use the Adobe Crop effects which can be found in the effects folders under Transform.
- Up/Down/Cross Convert the playback from the timeline. (Cross- and up-convert are supported by the KONA 3G, and LHi cards only.)

## Beginning a Project with KONA Presets

Opening Adobe Premiere Pro CS5.5, you will select New Project from the Quick Start Screen and choose an AJA Capture Format from the pulldown menu, name the project, and click OK to access the New Sequence setup panel with presets or click the AJA Setup button to customize your workflow in the Capture Options panel “[Capture Options](#)” on page 68.



**KONA Adobe Premiere Pro CS5.5 New Project panel**



### ***New Sequence Setup Panel***

Using the New Sequence Setup panel, you can select from AJA Presets. The KONA Presets offer typical project settings.

The Description field summarizes the parameters for each preset including:

- Frame raster size
- Frame rate
- Field order
- Capture file format
- Sequence settings
- Timebase
- Pixel Aspect Ratio
- Audio sample rate
- Video Rendering format

You can adjust the preset Capture setting by going to Project>Project Settings>General to access the AJA Setup menu. See [“Capture Options” on page 68.](#)

### **Options Set in Premiere Pro Preferences**

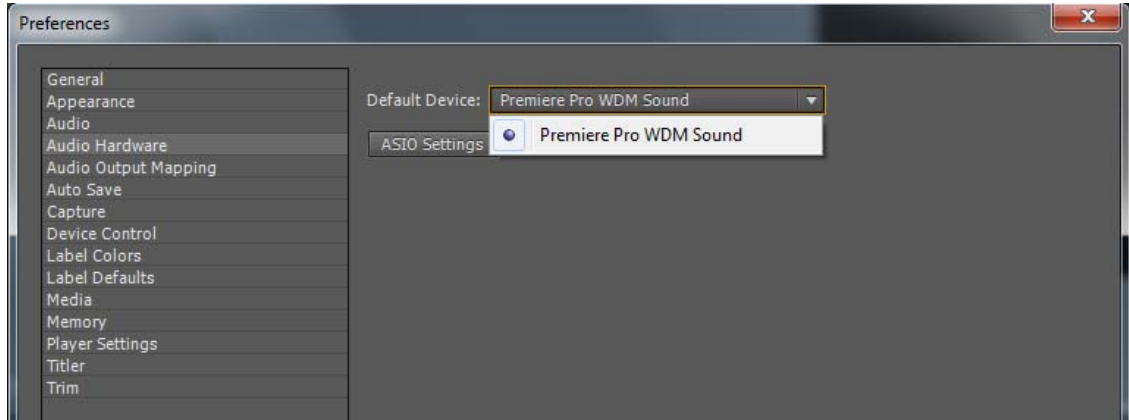
Some settings that determine both capture and playback characteristics for KONA are accessed through Premiere Pro Preferences.

In Adobe Premiere Pro CS5.5 Preferences (under Edit>Preferences) you can set up global (default) settings for:

- Audio Hardware
- Audio Output mapping
- Device Control

### Audio Hardware

Select “Premiere Pro WDM Sound” from the pull-down menu for your audio hardware. If you see “KONA ASIO” **do not** select it for use with KONA.

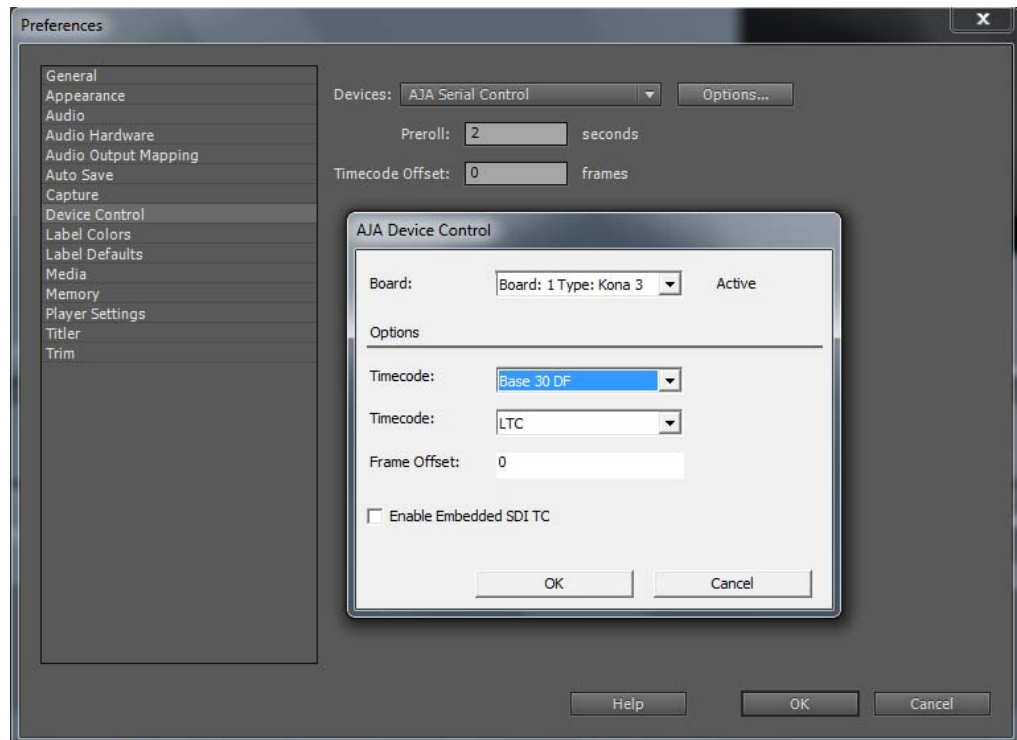


**Audio Hardware Preferences**

## Device Control

Device Control Options are settings for the RS-422 machine control interface on KONA.

Always use the AJA Serial Control and the KONA RS-422 port for KONA capture



### **Edit>Preferences>Device Control>Options**

Enter the desired value for:

Preroll – 0 to 15; the number of frames required to start the source machine before capture.

Timecode Offset – -30 to +30; timecode adjustment (in frames) forward or back to compensate for discrepancies between the source's burned-in timecode and that of the captured sequence.

Click on the Options button to pull up the AJA Device Control window.

**Timecode Format** – Use this pull-down to select the timecode base supported by your VTR.

- Base 24
- Base 25
- Base 25 NDF (50 frames per second)
- Base 30 DF (30 frames per second)
- Base 30 NDF (30 frames per second)
- Base 30 DF (60 frames per second)
- Base 30 NDF (60 frames per second)

The timecode format is used for both monitoring the RP-188 timecode embedded in the digital data stream and for selecting a timecode offset (if required) for the attached VTR (connected to KONA's RS-422 port).

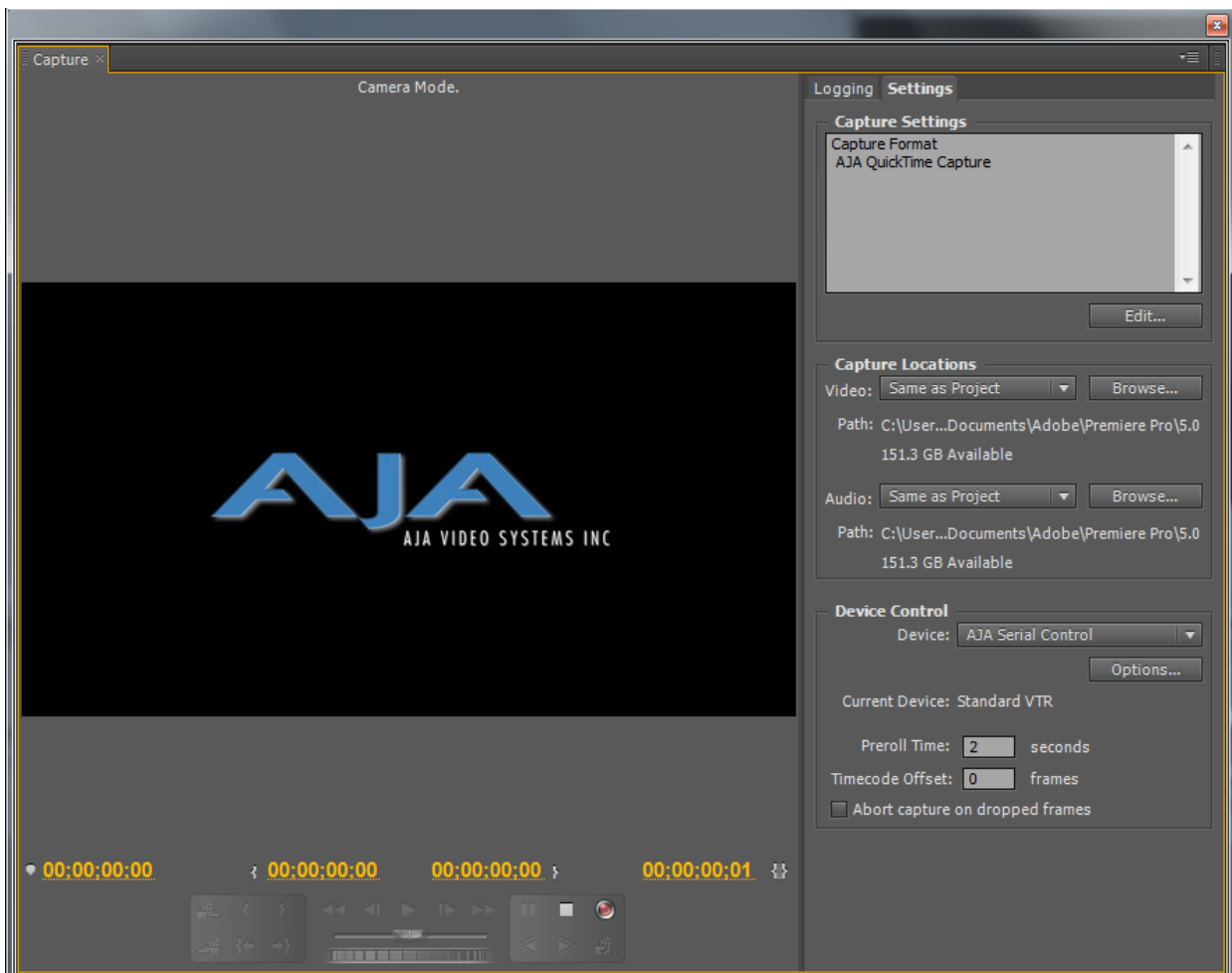
### Timecode Source

Choose between a separate-channel Longitudinal Timecode (LTC) or Vertical Interval Timecode (VITC) transported in the video signal's vertical interval or include both (LTC + VITC).

## Premiere Pro Capture Options Panel

Using the Capture Options panel you can change or adjust details for the selected Preset. The following settings can be accessed:

- Capture Options – change Capture Format for the Adobe Premiere Pro CS5.5 project and access settings for KONA Capture.
- Desktop display options
- File video/audio formatting options



**AJA Capture Options panel**

## Capture Options

Under Capture Options, select the appropriate formats and settings for your project.

### Primary and Secondary Video Options Supported by KONA

In KONA operation, the Primary Format is the captured media format written to disk—the video format used in your current project. Secondary format is used to perform up-, down-, and cross-conversion of the input or output video. Selections vary according to the particular Primary format used.

Analog output is always available.

**Note:** No frame-rate interpolation is applied for conversions from one frame-rate to another.

See [“Selection of Primary & Secondary Formats” on page 31](#). for more video format and conversion information.

### YUV<->RGB Range

This control mode is not often used in most workflows. For information refer to [“YUV<->RGB Range” on page 44](#).

### Video Input

Use the Video Input pull-down menu to select the appropriate signal type of your input. (The current selection is reported in the display of the pull-down menu.)

Video Input always shows all the available input options based on your Primary and Secondary format configuration. KONA software looks at 1) what model you have, 2) Primary Format, and 3) Secondary Format (in that order) to determine what input options are appropriate. Video Input Options Supported by KONA cards include:

- Single Link SDI•
- Composite NTSC•
- S-Video NTSC•
- Component Betacam NTSC•
- Component SMPTE NTSC•
- Composite NTSC-J•
- S-Video NTSC-J•
- Dual Link HD (KONA 3G only)•
- Component Betacam NTSC-J
- Component SMPTE NTSC-J
- Composite PAL
- S-Video PAL
- Component Betacam PAL
- Component SMPTE PAL
- Component XVGA (HD only)
- HSDL (KONA 3G only)

### Audio Input

Use the Audio Input pull-down menu to select the appropriate signal type for your input. (The current selection is reported in the Status Display.)

Audio Input Options Supported by KONA include:

- Embedded SDI
- Digital AES/EBU – XLR (using either breakout cable or breakout box, except on KONA 3G)
- Digital AES/EBU – BNC (only applies if you are using a breakout box with BNC connectors for AES/EBU)
- Analog (KONA 3G requires K3G-Box)

## SDI Output 1

When using KONA LS and LHi cards, the SDI outputs will be Single Link only, if there is no Secondary Video Output Format selected. If you have a Secondary format selected, you can choose between Single Link SDI – Primary and Single Link SDI – Secondary as your output. KONA 3G also offers Dual Link output which uses both output connectors for a single A/B channeled output (SDI Output 2 automatically becomes Dual Link).

On KONA LHi, there is only one SDI output, but there is an HDMI output. You can independently configure the SDI output to HD or SD, and the HDMI input to SD or HD. The LHi has a hardware-based downconverter, so you can output SD if desired, when playing back HD (or in E-to-E).

## Analog Output

Analog format choices in the Analog Output pull-down menu vary depending upon file format.

- Composite + S-Video NTSC•
- Composite + S-Video NTSC-J•
- Component Betacam NTSC•
- Component Betacam NTSC-J•
- Component SMPTE•
- Component XVGA (HD only)
- Composite PAL
- S-Video PAL
- Component Betacam PAL
- Component SMPTE PAL
- Component RGB

**Note:** When SD and HD formats are available as Primary and Secondary formats, you can choose between SD and HD raster for the Analog Output.

## Audio Level

Choose between +6 dB (US) monitor level and +0 dB (EBU).

## Timecode Input

Select the type of timecode used by the source video machine—RS-422, Embedded SDI (RP188) or choose to input an External LTC timecode source input via the KONA RS-422 port.

**Note:** SMPTE RP 188 defines a standard for the transmission of timecode and control code in the ancillary data space of a digital television data stream. Timecode information is transmitted in the ancillary data space as defined in ANSI/SMPTE 291M. Multiple codes can be transmitted within a single digital video data stream. Other time information, such as real time clock, DTTR tape timer information, and other user-defined information, may also be carried in the ancillary timecode packet instead of timecode. The actual information transmitted through the interface is identified by the coding of a distributed binary bit. Equipment manufacturers can use the meta data for different purposes.

## Desktop Display Options

### Display To Desktop

Select one of four modes of desktop display:

- Off
- Display while idle only (this mode is suggested)
- Display during capture only
- Display Always

Display to Desktop uses system resources and could affect performance. Choose Capture Speed, Width, and Height as appropriate for your system's capabilities.

## Display Capture Speed

- Full Speed – Every frame is displayed to desktop during playback
- Half Speed – Every other frame is displayed to desktop during playback
- Quarter Speed – One out of every four frames is displayed to the desktop

Half Speed and Quarter Speed will reduce the system load that the Display-To-Desktop is using to draw video to your computer.

## Desktop Capture Width and Height

These selections allow you to reduce the resolution of the desktop capture display. The captured file will be full-resolution. Only the displayed image is reduced to save processing resources during capture. The choices available are:

- Full Resolution
- Half Resolution
- Quarter Resolution
- Eighth Resolution
- Sixteenth Resolution

## File Options

The Premiere Pro Project Setting>Capture menu allows you to select one of the following AJA file formats from the Capture Format pulldown menu:

- AJA AVI Capture
- AJA QuickTime Capture
- AJA Sequence Capture

Within the AVI and QuickTime formats, you can select one of the following subtypes by clicking on the Setup button to the right to bring up the AJA Capture Options menu.

**Note:** Capture file format options vary by KONA card model. The tables provided reflect a comprehensive list of supported formats (for KONA 3G).

Under the File Options panel, select a video format subtype:

AVI files in the following Subtypes	QuickTime files in the following Subtypes
8-Bit YUV 4:2:2 – '2vuy'	8-Bit YUV 4:2:2 – '2vuy'
8-Bit YUV 4:2:2 – '2Vuy'	8-Bit YUV 4:2:2 – '2Vuy'
8-Bit YUV 4:2:2 – 'uyvy'	10-Bit YUV 4:2:2 – 'v210'
10-Bit YUV 4:2:2 – 'v210'	10-Bit YUV 4:2:2 – 'V210'
8-Bit RGB 4:4:4 – 'bgr'	8-Bit RGB 4:4:4 – 'rgb'
8-Bit RGB 4:4:4:4 – 'bgra'	8-Bit RGB 4:4:4 – 'bgr'
8-Bit RGB 4:4:4 – 'bgr' T2B	8-Bit RGBA 4:4:4:4 – 'argb'
8-Bit RGB 4:4:4:4 – 'bgra' T2B	8-Bit RGBA 4:4:4:4 – 'rgba'
10-Bit Log RGB 4:4:4 – 'R10g'	8-Bit RGBA 4:4:4:4 – 'bgra'
10-Bit RGB 4:4:4 – 'R10k'	10-Bit Log RGB 4:4:4 – 'R10g'
10-Bit RGB 4:4:4 – 'r10k'	10-Bit RGB 4:4:4 – 'R10k'
	10-Bit RGB 4:4:4 – 'r10k'
	16-Bit RGB 4:4:4 – 'b48r'

When you select AJA Sequence Capture, the File Options panel allows you to choose a Sequence Type:

- TGA Sequence
- DPX Sequence (LHi and KONA 3G only)
- Cineon (LHi and KONA 3G only)
- BMP Sequence
- TIF Sequence
- YUV

Within these sequence types, KONA (model dependent) supports the following video formats:

<b>DPX Sequences in the following Subtypes</b>	<b>Cineon Sequences in the following Subtypes</b>
10-Bit Log RGB 4:4:4 (BE) T2B 10-Bit RGB 4:4:4 (BE) T2B 10-Bit Log RGB 4:4:4 (BE) B2T 10-Bit RGB 4:4:4 (BE) B2T 10-Bit Log RGB 4:4:4 (LE) T2B 10-Bit RGB 4:4:4 (LE) T2B 10-Bit Log RGB 4:4:4 (LE) B2T 10-Bit RGB 4:4:4 (LE) B2T	10-Bit Log RGB 4:4:4 (BE)
<b>TGA Sequences in the following Subtypes</b>	<b>BMP Sequences in the following Subtypes</b>
10-Bit Log RGB 4:4:4 (BE) T2B 10-Bit RGB 4:4:4 (BE) T2B 10-Bit Log RGB 4:4:4 (BE) B2T 10-Bit RGB 4:4:4 (BE) B2T 10-Bit Log RGB 4:4:4 (LE) T2B 10-Bit RGB 4:4:4 (LE) T2B 10-Bit Log RGB 4:4:4 (LE) B2T 10-Bit RGB 4:4:4 (LE) B2T	8-Bit RGB 4:4:4 B2T 8-Bit RGBA 4:4:4:4 B2T 8-Bit RGB 4:4:4 T2B 8-Bit RGBA 4:4:4:4 T2B
<b>TIF Sequences in the following Subtypes</b>	<b>YUV Sequences in the following Subtypes</b>
8-Bit RGB 4:4:4(LE) B2T 8-Bit RGBA 4:4:4:4(LE) B2T 8-Bit RGB 4:4:4(LE) T2B 8-Bit RGBA 4:4:4:4(LE) T2B 8-Bit RGB 4:4:4(BE) B2T 8-Bit RGBA 4:4:4:4(BE) B2T 8-Bit RGB 4:4:4(BE) T2B 8-Bit RGBA 4:4:4:4(BE) T2B 16-Bit RGB 4:4:4(LE) B2T 16-Bit RGB 4:4:4(LE) T2B	8-Bit YUV 4:2:2

### Audio Formats

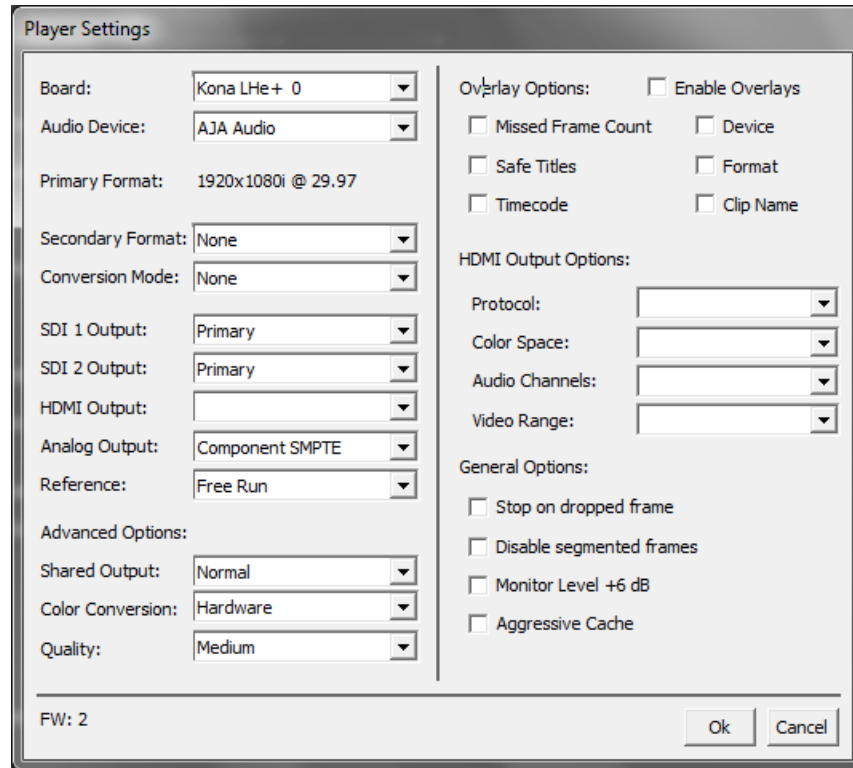
- 48 kHz 16-bit PCM Mono•
- 48 kHz 24-bit PCM Mono•
- 48 kHz 32-bit PCM Mono•
- 48 kHz 16-bit PCM Stereo
- 48 kHz 24-bit PCM Stereo
- 48 kHz 32-bit PCM Stereo

### Audio Tracks

Select the number of audio tracks for this project, KONA supports up to eight (four stereo pairs) for KONA LHi/LS or 16 for KONA 3G. Adobe Premiere Pro CS5.5 supports six channels.

## Premiere Pro Playback Options

To access AJA Playback settings, in Premiere Pro, highlight (select) the Sequence Panel. Then either use the fly-down menu in the top right corner of the Premiere Pro project window, or go to Sequence>Sequence Settings, and click on the Playback Settings button.



### Player Settings Panel

**Note: Primary Format, SDI and HDMI Outputs** have the same functionality as described in the Sequence Capture Options panel. See [“Capture Options” on page 68.](#)

### Audio Device

Select “AJA Audio” to output your project audio through the KONA. To complete audio setup refer to [“Options Set in Premiere Pro Preferences” on page 64.](#)

### Analog Output

Analog Output Options Supported by KONA include:

- Composite + Y/C
- Component (SMPTE/EBU N10)
- Component (Beta)

### Reference:

Select a source for the video reference signal:

- Free Run (none)
- SDI Input
- Reference Input (LTC/Ref connector)
- HDMI Input

## Overlay Options

Enable and select overlay information to be included in the playback by checking the appropriate boxes. These overlay controls allow you to insert a graphic file supporting alpha channel transparency to apply an effect or insert a bug (logo) over the video content.

## HDMI Output Options

HDMI video output offers these options:

- Protocol – choose Auto Detect, HDMI, or DVI
- Color Space – select Auto Detect or YCbCr 10bit (KONA does not support RGB)
- Audio Channels – choose 8 or 2 to be embedded
- Video Range – select SMPTE or Full Range

## Advanced Options

**Shared Output** – the pulldown offers these options:

- Normal – choose for normal output connector routing
- Stereoscopic – select for use with Cineform First Light to control the 3D output. When selected and used with KONA 3G, the stereoscopic playback will be output on separate SDI outputs, left and right. (For playback output on a single SDI output, you can configure Cineform First Light to superimpose the left/right; see Cineform First Light documentation for details).
- Video + Key – choose this selection to output a video signal to one SDI output and a related Key signal to a second SDI output (useful for outputting to a video switcher for example).

**Color Conversion** – this menu lets you choose between AJA Hardware or Software conversion.

**Quality** – This setting can be used to adjust the visual quality and editing/playback performance of an AJA sequence in Premiere Pro. The quality setting is actually a setting that tells Premiere Pro which algorithms to use when rendering frames. This will apply to both scrubbing and playback. Lower quality settings tell Premiere to use faster algorithms for functions like deinterlacing, color conversion, transforms, and other effects with a slight penalty on visual quality. Higher quality settings use more complex algorithms, which may result in visually better results but at the cost of playback and scrubbing speed and performance.

## Aggressive Cache

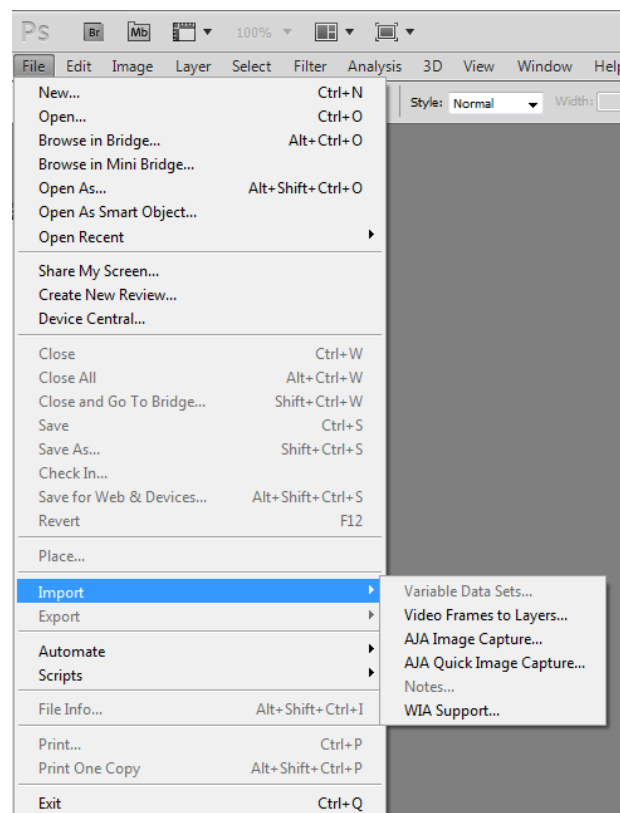
Under General options you can choose to enable Aggressive Cache. When this Option is enabled, AJA's plugins will read further ahead in the timeline during playback operations. The feature should be used to mitigate minor frame dropping issues. Particularly, this feature was created because some DSLR clips can take a very long time to open, and subsequently cause frames to drop when they are played back. Using this feature will consume more RAM, and may make scrubbing and stop/start commands slightly less responsive. The ideal way to use the feature is to leave it off at all times, and then to only turn it on for mastering/layout to tape.

## Using Photoshop CS5.5

Adobe Photoshop CS5.5 (not included with KONA) accepts KONA plugins and drivers to closely integrate KONA functions into the application. After you install the KONA software on your workstation, all you need to do to begin using it is to become familiar with the Plugins and how Photoshop works with KONA.

With Photoshop open, you'll go to the File pull-down menu and select Import>AJA Capture to set up your workflow, source device control, and other KONA options. Then access Export>AJA Preview Setup to configure the preview output to your monitor. Quick capture and simple send-to-preview functions are also available in these menus.

The manual you are reading does not provide operational information for Adobe Photoshop CS5.5. Please read the Photoshop user documentation provided with the application for information on configuration and operation. The chapter you are reading addresses configuration and setup unique to use of KONA with Adobe Photoshop CS5.5.



### ***AJA Image Capture in Photoshop File>Import Menus***

The KONA Photoshop plugin is a software application that is integrated into the Photoshop CS5.5 application and is accessed under the File menu. The Capture plugin provides you with standard tapedeck style play/record functions, status display, and configuration options. The Preview plugin allows you to adjust output formats and view your current project frame on a monitor connected to a KONA output before rendering to file.

In this section, you will read about the various pull-down options, hot-text entry fields, and play/record controls and how they interact.

**Note:** The specific options available to you are determined by the AJA capture device that is installed in your workstation and you are currently controlling. This section will describe all options for the Photoshop plugin when used with KONA.

There are three functional areas in the Capture screen as indicated in the following illustration—Status Display, Play/Record Controls, and Configuration Options.



### **KONA Photoshop Capture Plugin Layout**

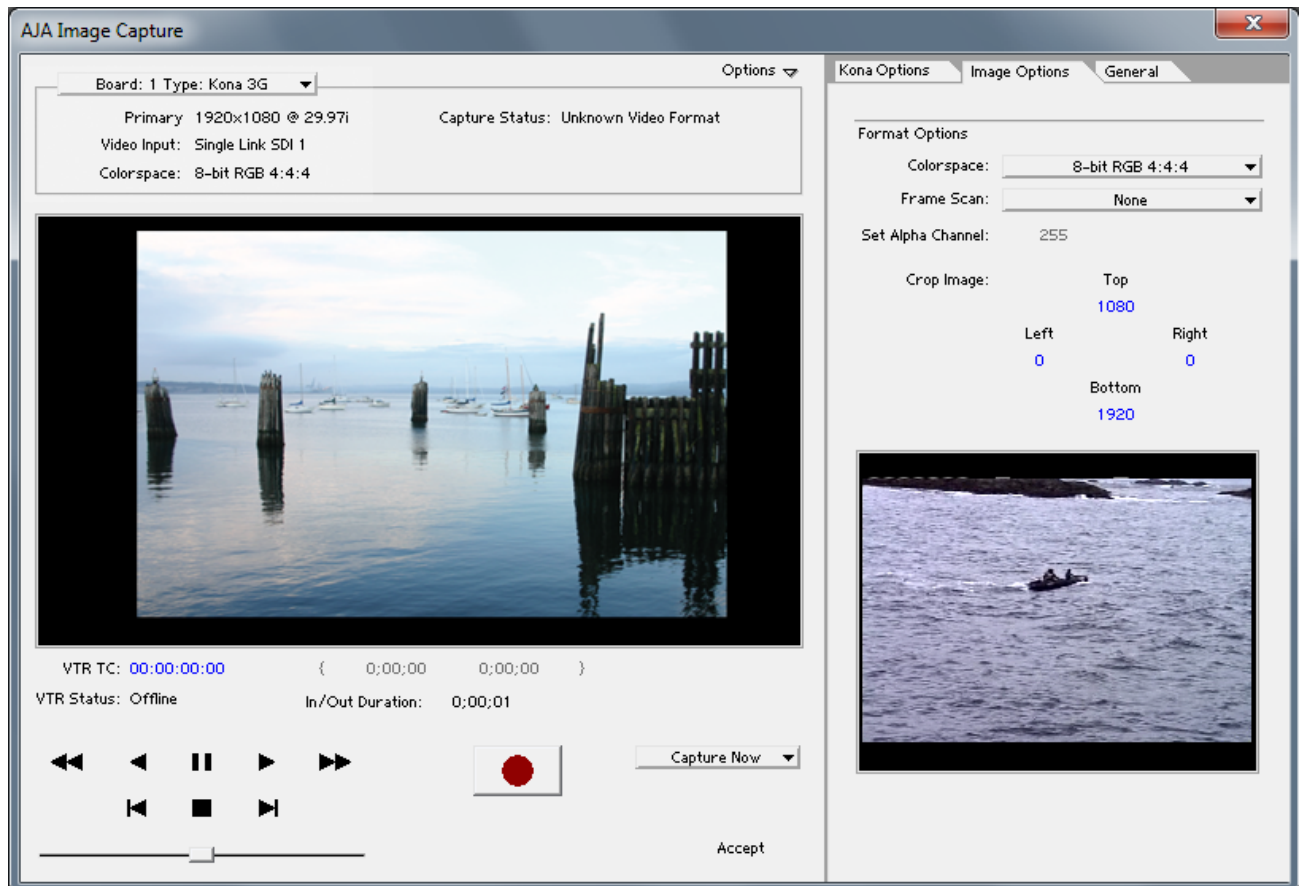
The **Status Display** area is read-only information about configuration, current status, and performance.

The **Play/Record Controls** offer standard tape deck controls and more. The hot-text fields beneath the video display are for writing and reading timing data. Capture mode will determine which fields are operational.

**Note:** Capture Play controls are RS422 machine controls for running a VTR tape deck with timecode data.

- The Configuration Options section contains tabbed menu selections that provide:
- KONA Options – KONA workflow configuration options
- Image Options – Image formatting colorspace, frame, and crop information

If you don't see the Configuration Options section, click on the Options triangle switch above the Status Display. In normal operation, you may decide to hide this section when it is not needed.



### ***File>Import>AJA Image Capture***

## **Configuration Option Panels**

The first Configuration Options tab selects the KONA Options panel for setting Board Activation mode and Capture format options.

### **Activation Mode**

A KONA plugin can be set for Automatic or Manual activation using the Activation Mode pull-down menu. Automatic is the default setting and is recommended for normal operation. In this mode, you merely click between the open plugins to make one active.

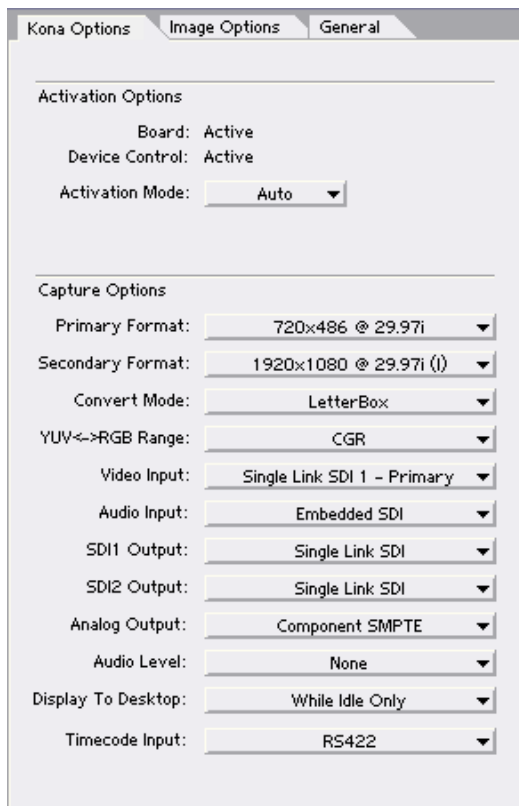
**Note:** Only one plugin window can have control of the AJA capture device at a time. If the window you click on does not access the KONA (reporting Board: Active), either another window is still processing operations or it is set in Manual activation mode and must be disabled (check-box empty).

In Manual mode, you must check the Enable KONA box to activate the board control and uncheck it to release control. Upon startup of either Photoshop CS5.5 application, if the launched plugin window is in Manual mode, the window will NOT activate until the enable box is clicked again.

The Preview plugin does not need activation since it grabs only one frame (the current working frame) at a time for output to the monitor. It grabs the data on a priority basis when it can. The rest of the time it is off.

## Using the AJA Capture Plugin

First, activate the KONA from the Capture window and set up your workflow by defining Input and Output formats and timing options. To do this, click on the KONA Options tab. (KONA stores the workflow settings you make until they are next changed.) Next, access the Image Options tab to set colorspace and framing options and make Alpha Channel (for RGBA scanned-in images) and image crop settings if required. Finally, use the General Options menu to set timecode and other machine control options.



### ***KONA Options Menu***

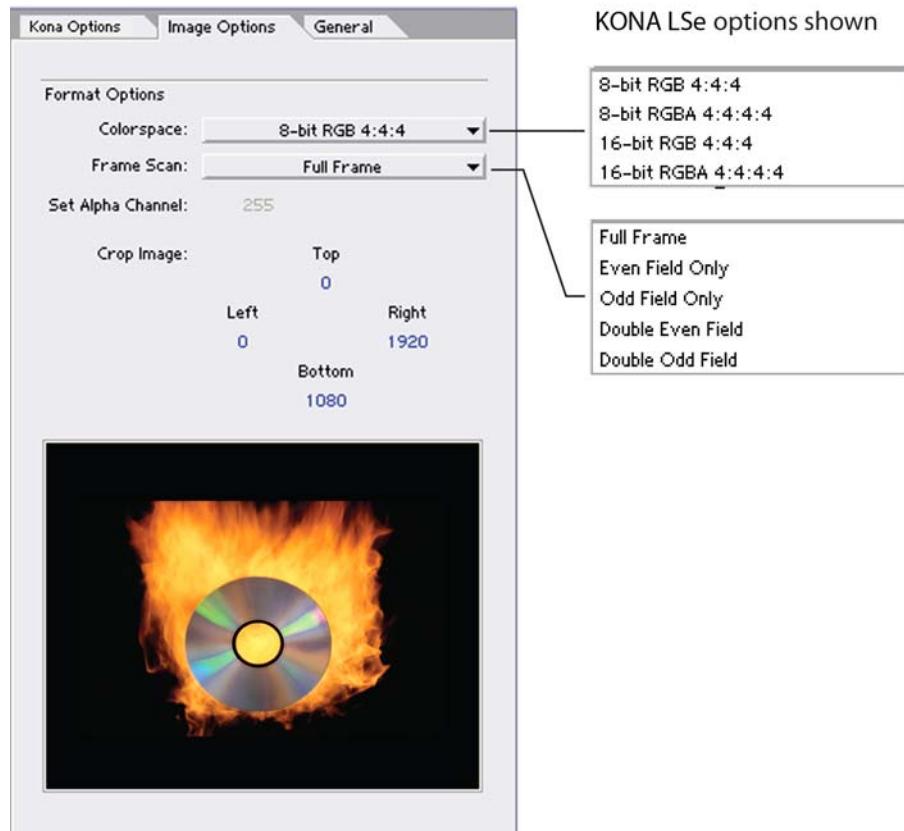
### **Capture Options**

These options are the same as those for Premiere Pro except for Display to Desktop. See ["Capture Options" on page 68.](#)

**Display to Desktop** allows you turn off the desktop capture display or "Display while idle only." The latter is the suggested mode.

## Image Options Menu

After configuring KONA Options, select the Image Options tab. In the Image Options menu there are four configuration settings—Colorspace, Frame Scan, Set Alpha Channel, and Crop Image.



**Photoshop Plugin Image Options Tab**

**Note:** You can enlarge the thumbnail capture image to full-screen by double-clicking on the image. To return, double-click again.

**Colorspace** – Choose between 8- and 16-bit color in either RGB 4:4:4, or RGBA 4:4:4:4 mode.

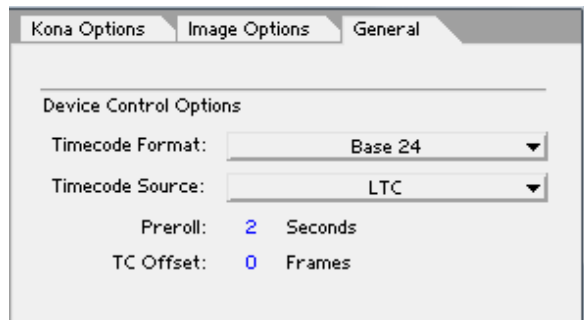
**Frame Scan** – Work with a Full Frame or capture Even or Odd fields only in single or double modes.

**Set Alpha Channel** – The Alpha channel image applies only to RGBA scanned-in images and then you can set it to 255 (default) which is zero transparency or 0 which is 100 percent transparency when the image is imported into Photoshop.

**Crop Image** – Use the hot text fields to enter value for pixels cropped from Top, Left, Right, and Bottom of the captured image. When you import (Accept) the image into Photoshop, it will be cropped to these specifications.

## General Options Menu

Under the General tab, you will find Device Control Options. These functions are for the RS-422 machine control interface on KONA. They support Print-to-Tape machine control.



### General Options Tab

Under the General tab, you will find Device Control Options. These functions are for the RS-422 machine control interface on the KONA card. They support Print-to-Tape machine control.

**Timecode Format** – Use this pull-down to select the timecode base supported by your VTR.

- Base 24
- Base 25
- Base 25 (50 frames per second)
- Base 30 DF (drop-frame, 30 frames per second)
- Base 30 NDF (non-drop-frame, 30 frames per second)
- Base 30 DF (drop-frame, 60 frames per second)
- Base 30 NDF (non-drop-frame, 60 frames per second)

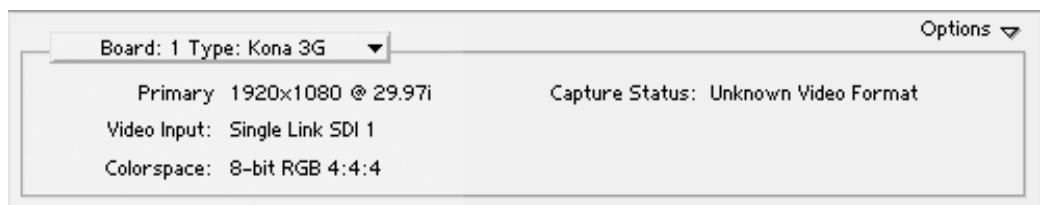
**Timecode Source** – Choose between a separate-channel Longitudinal Timecode (LTC) or Vertical Interval Timecode (VITC) transported in the video signal's vertical interval or include both (LTC + VITC).

Click on the Hot Text items to enter a value for:

- Preroll – 0 to 15; the number of frames required to start the source machine before capture
- Timecode Offset – -30 to +30; timecode adjustment (in frames) forward or back to compensate for discrepancies between the source's burned-in timecode and that of the captured sequence.

## Status Display

If you have more than one AJA capture device installed in your workstation, you can select another device to work with by using the Board pull-down menu at the top. If they are set for Auto Activation and are idle (not processing), you will immediately take control of the new Board (see Basic Plugin Operations and Configuration).



### Photoshop Capture Window Status Display

The Status Display section of the Photoshop Capture plugin, in the left column, reports the settings that you have selected for the KONA to use when you have control of it:

- Primary Format
- Video Input type
- Selected Colorspace

In the right column Capture Status reports the detected signal status of the KONA input:

Off Line – the capture plugin does not control the KONA

Idle – Ready, the plugin has control and the proper input signal is present

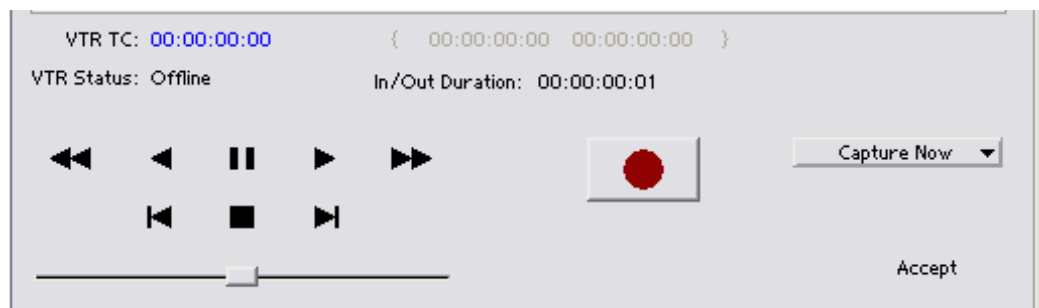
Video Input Not Detected – no input present

## Play/Record Controls

Standard tape deck icons provide hot buttons for the Play/Record RS-422 machine control of a source VTR. They are:

- |                |                      |
|----------------|----------------------|
| ◀◀ Rewind (8x) | ▶▶ Fast Forward (8x) |
| ◀ Reverse Play | ◀ Reverse 1 frame    |
| ⏸ Still        | ■ Stop               |
| ▶ Play (1x)    | ▶ Forward 1 frame    |

The slider on the bottom is a variable speed forward/reverse control. Positions from left to right are: (Reverse) 16x, 8x, 4x, 2x, 1/2, 1/4, Still, (Forward) 1/4, 1/2, 2x, 4x, 8x, and 16x. The red Record button is used to initiate a capture.



### ***Photoshop Capture Window Play/Record Controls***

The pull-down menu on the right enables one of two capture modes:

- Capture Now – manual record/stop (“crash”) capture
- Capture In/Out – initiate a capture using timecode-based in or out settings

The selected mode will activate the appropriate hot text for that mode. Clicking the hot text brings up an entry field (hours:minutes:seconds:frames). The upper left display indicates the current timecode from the VTR.

**Capture In/Out** – Enter a timecode Capture point by clicking on either the left field or right field of eight digits in the bracketed fields above the In/Out Duration field. Since Photoshop capture is a single-frame function, the In and Out settings will always be the same and the frame duration will always be one frame.

**Note:** The in-point/out-point field values are inclusive. When both are set to the same value, the capture duration will be 1 frame.

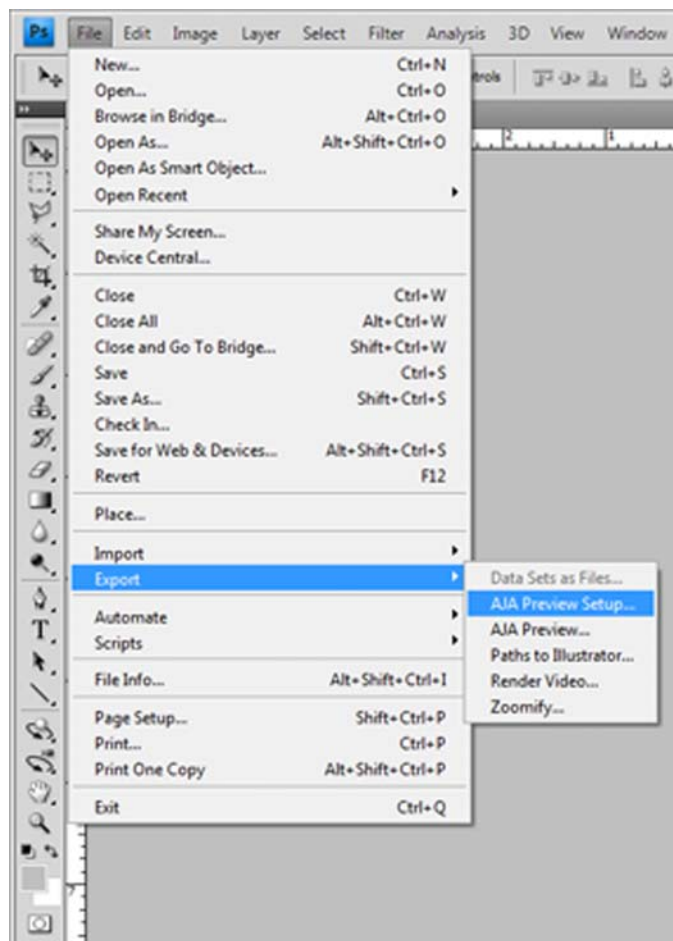
To load the current VTR timecode setting in either field (in-point or out-point) click on the bracket ( { or } ) next to the field.

**VTR TC** – The VTR timecode field displays the current machine timecode and you can click on it to roll the VTR to another frame setting. The VTR must be online and in remote rather than local control mode (as reported in the **VTR Status** field.)

**Accept** – When you have successfully captured the frame you wish to use in Photoshop, Click on Accept in the bottom right corner of the Play/Record pane. The KONA capture plugin will close and your frame will be opened in Photoshop for editing.

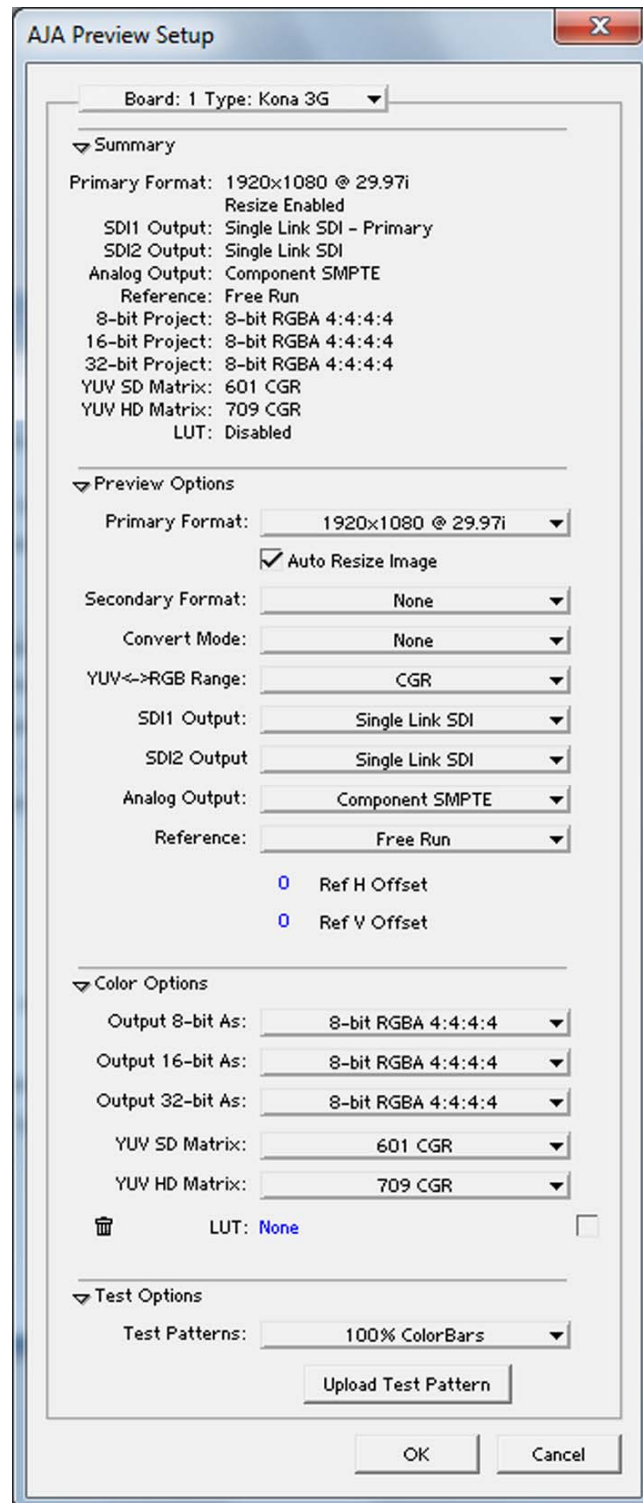
## Using the AJA Preview Plugin

The Preview Plugin allows you to view on a monitor the current frame you are working on in Photoshop CS5.5. Go to File>Export>AJA Preview Setup to configure previews. When you have Preview Setup the way you want it, subsequent Previews are output by selecting AJA Preview (below AJA Preview Setup).



**AJA Export Plugins for Photoshop**

The pull-down menu at the top allows you to select any AJA capture device you have installed in your workstation (subject to Activation rules). A check box is provided to enable/disable the Preview function.



**AJA Preview Setup Menu for Photoshop**

The **Summary** section reports current configuration settings.

In **Preview Options**, Primary format is the current format you are using for your project. KONA does not support conversion so the Secondary signal format and Convert mode are inactive. One SDI output is available and it is always Single Link. Select Analog output type (as applicable), and select timing Reference mode—Free Run, External (genlock), or from the video Input signal (SDI or HDMI).

In **Color Options**, KONA does not support colorspace conversion so this function is inactive.

Finally, for picture quality adjustment, you can output a Test Pattern selection using the pull-down menu under **Test Options**. Click OK to output your Preview.

## Using After Effects

### KONA After Effects CS5.5 Plugin Overview

A KONA After Effects CS5.5 Preview plugin adds KONA functions to the After Effects CS5.5 application. The KONA plugin screen is accessed under the **Window** pulldown menu. The Preview plugin allows you to view the current frame of your working timeline in various formats on a monitor connected to a KONA output. The **Status Display** area is read-only information about configuration, current status, and performance.

This section discusses settings common across plugin windows and how they interact.

#### Activation Mode

A KONA plugin can be set for Automatic or Manual activation using the Activation Mode pull-down menu. Automatic is the default setting and is recommended for normal operation. In this mode, you merely click between the open plugins to make one active.

**Note:** Only one plugin window can have control of the KONA at a time. If the window you click on does not access the card (reporting Board: Active), either another window is still processing operations or it is set in Manual activation mode and must be disabled (check box blanked).

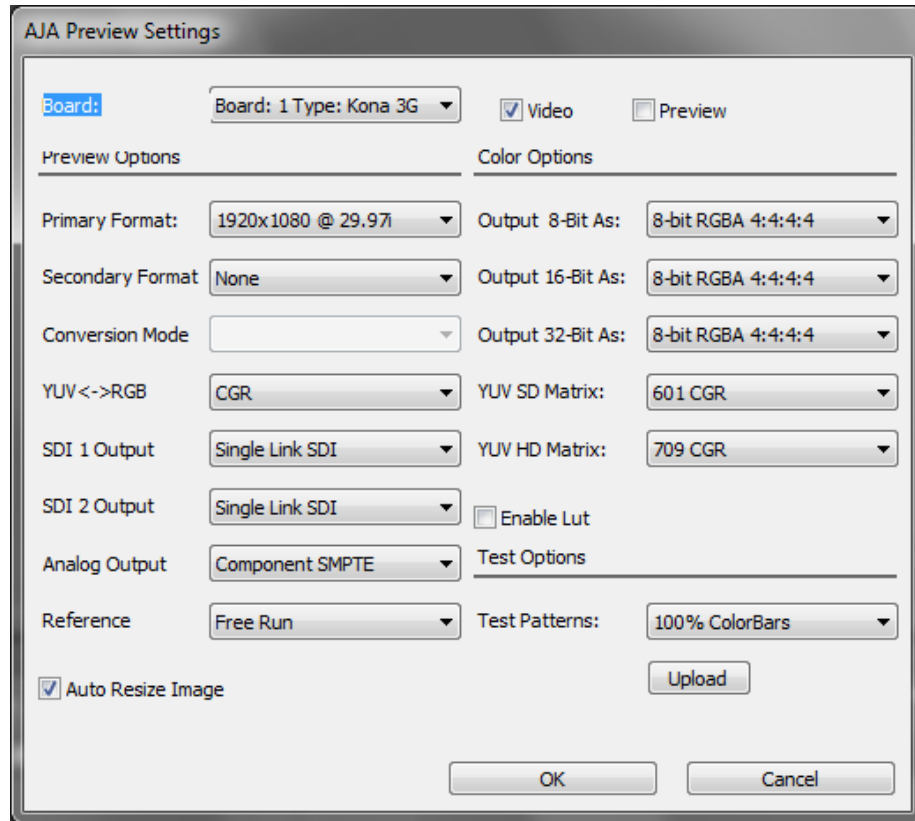
In Manual mode, you must check the Enable KONA box to activate KONA control and un-check it to release control. Upon startup of the After Effects CS5.5 application, if the launched plugin window is in Manual mode, the window will NOT activate until the enable box is clicked again.

#### After Effects CS5.5 and Preview Note

Double clicking on a captured Project File in the project bin will sometimes open the file in an After Effects CS5.5 player which can be previewed. Some formats will result in the file opening in a third-party viewer (QuickTime for example)—but the file cannot be previewed in that viewer.

## Using the After Effects Preview Plugin

The Preview Plugin allows you to view on a monitor the current frame you are working on in the timeline as it will appear at the KONA output. A summary area at the top of the Preview window shows how the KONA is currently configured. If you wish to change it, you can use the *Preview Options* below.



**AJA Preview Settings**

Board: Board: 1 Type: Kona 3G  Video  Preview

**Preview Options** **Color Options**

Primary Format: 1920x1080 @ 29.97i Output 8-Bit As: 8-bit RGBA 4:4:4:4

Secondary Format: None Output 16-Bit As: 8-bit RGBA 4:4:4:4

Conversion Mode: Output 32-Bit As: 8-bit RGBA 4:4:4:4

YUV<->RGB: CGR YUV SD Matrix: 601 CGR

SDI 1 Output: Single Link SDI YUV HD Matrix: 709 CGR

SDI 2 Output: Single Link SDI  Enable Lut

Analog Output: Component SMPTE **Test Options**

Reference: Free Run Test Patterns: 100% ColorBars

Auto Resize Image

### **AJA Preview Plugin**

In **Preview Options**, you can vary the Primary and Secondary signal formats, Convert mode, YUV to RGB range (see earlier discussion under the AJA Capture Plugin), SDI and Analog output type (as applicable), and select timing Reference mode—Free Run, External (genlock), or from the video Input signal.

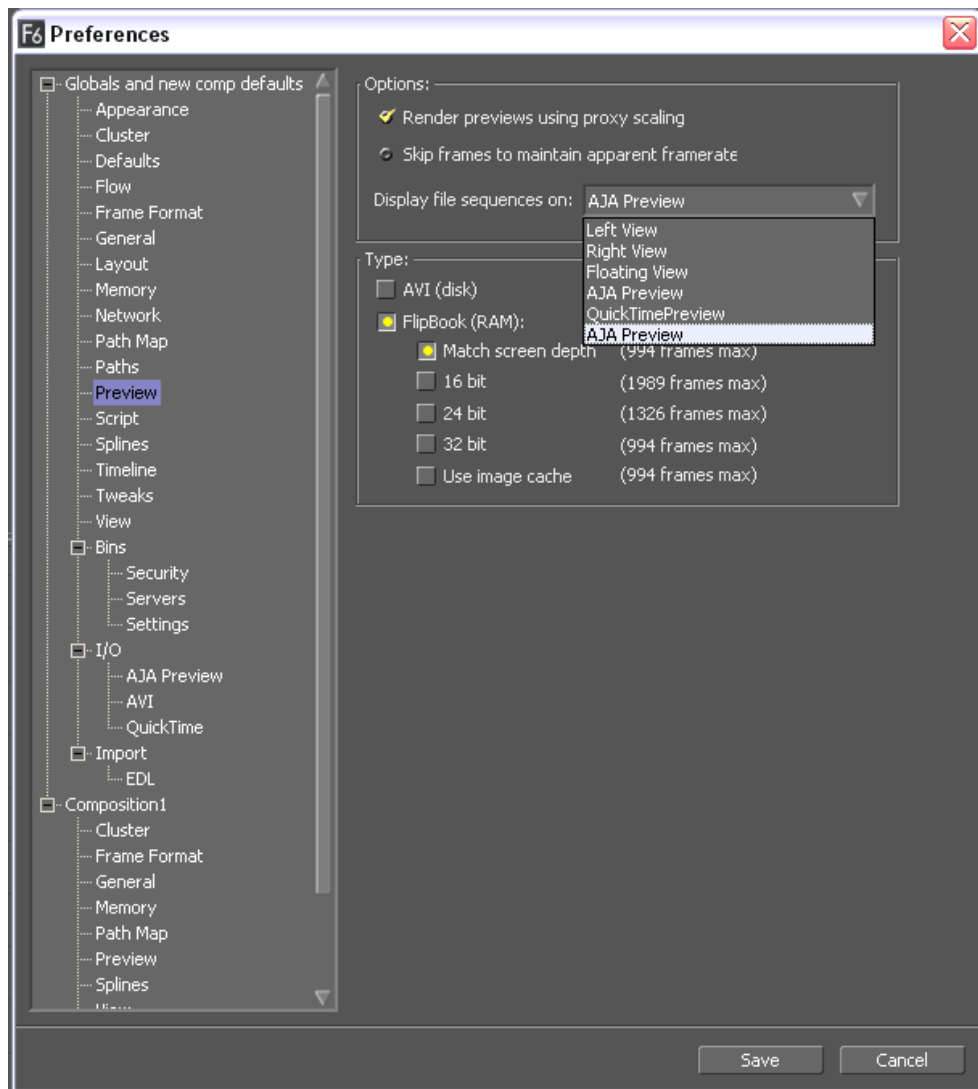
**Color Options**, KONA does not currently support colorspace conversion.

You can output a Test Pattern selection using the pull-down menu under **Test Options**.

# Chapter 6: Using Eyeon Fusion

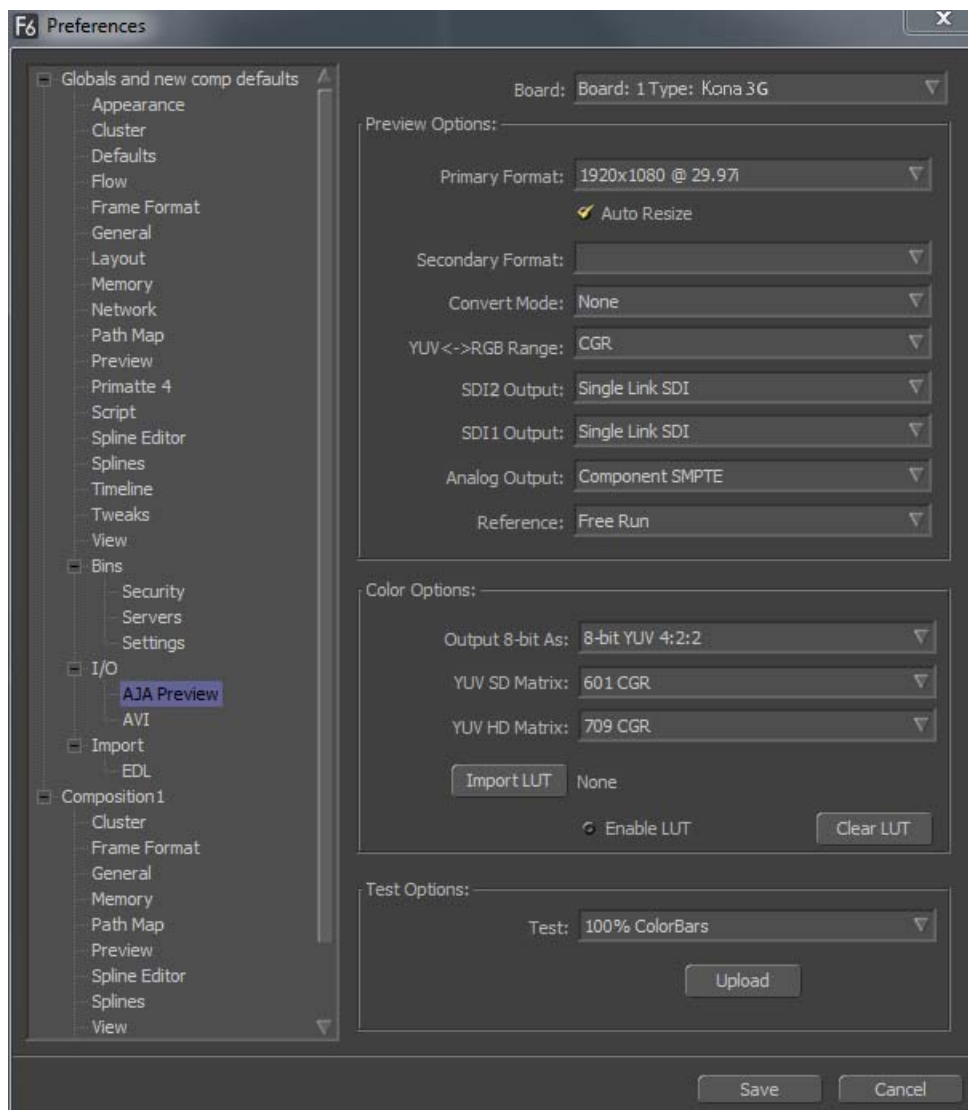
## Using Eyeon Fusion

The KONA Fusion 6 plugin is a software application integrated into Fusion that allows you to preview your current Fusion project from the KONA output. Go to *File>Preferences* to setup AJA Preview. Note: KONA Software for Windows version 5.5 is for 64-bit Eyeon Fusion only.



**Selecting AJA Preview for Fusion**

Under *Globals and new comp defaults*->*Preview* select *AJA Preview* from the “*Display file sequences on:*” pull-down menu. To set up AJA Preview formatting, continue down to the *I/O* selections under *Globals and new comp defaults* and then choose *AJA Preview*.



### **AJA Preview Setup Menu for Fusion**

## **Preview Options**

If there is more than one AJA capture device installed in your system, a pull-down menu at the top allows you to select which device to control (subject to Activation rules).

In **Preview Options**, you can change the Primary and Secondary video signal formats and Analog output type (as applicable), and select timing Reference mode—Free Run, External (genlock), or from the video Input signal.

Finally, for picture quality adjustment, you can output a Test Pattern selection using the pull-down menu under **Test Options**. Click OK to output your Preview.

**Note:** Fusion AJA Preview, in most cases, will not be in realtime for any RAM Preview.

## Activation

**Note:** Only one plugin window can have control of the KONA card at a time. If the application window you click on does not access the card (panel fields are inactive), either another application is still processing operations or it may have a Manual activation mode and must be disabled (check box blanked) to release control of the KONA. Activation Mode is available in these applications:

- AJA's Machina
- Adobe After Effects CS5.5
- Adobe Photoshop CS5.5

## Primary & Secondary Formats

The Primary Format menu allows you to select the video format to be used in the current project in the KONA framebuffer. (The current selection is reported in the display of the pull-down menu.) Secondary Format allows you to perform signal format conversions.

Choices are always presented based on which AJA capture device you are using and what signal formats it supports.

### Primary Video Formats Supported

Refer to ["Selection of Primary & Secondary Formats "](#) on page 31 for detailed information on video formats and conversions.



# Chapter 7: Third-Party Applications

## Native Support for KONA for PC Products

The following third-party applications provide native support for specified AJA KONA for PC capture cards. This list is not all-inclusive. Other applications not listed may also support KONA cards. If you have problems related to hardware functions while using these applications, contact AJA Support and we will do our best to promptly verify and resolve them. If your problems are software related please contact the application manufacturer. Contact phone numbers and URLs are provided below.

**Note:** Some vendors may have a fee structure for customer support services.

Application	KONA Card Supported	Support Contacts
Drastic Technologies Media NXS	KONA 3, KONA 3G, LHi,	1-416-255-5636 <a href="mailto:support@drastictech.com">email: support@drastictech.com</a>
CineForm Prospect HD, Prospect 4K, Neo HD, Neo HD 3D, & Neo 4K	KONA 3, KONA 3G, LHi	<a href="http://supportcenteronline.com/ics/support/default.asp?deptID=614">http://supportcenteronline.com/ics/support/default.asp?deptID=614</a>
The Foundry NUKE	KONA 3G, LHi	<a href="http://www.thefoundry.co.uk/products/nuke/">http://www.thefoundry.co.uk/products/nuke/</a>

### Drastic Technologies Media NXS

The Media NXS software-based digital disk recorder application supports KONA 3G, and LHi, cards for uncompressed capture and playback. Media NXS supports a wide range of hardware platforms including Uncompressed 8/10-Bit Y'CrCb and video standards ranging from NTSC/PAL to 1080x1920 HDTV.



# Appendix A: Troubleshooting

## If You Run Into Problems

---

One useful way to find the source of problems is to isolate your system to the smallest size where the problem still occurs and then note all the symptoms. This serves to eliminate areas not involved in the problem and makes finding the problem easier.

Once you've noted problem symptoms, look through the following table and see if any of the symptoms are listed. If so, check the items listed. If you later need to call for customer service, let them know all of the things you've tried and when and how the symptoms appeared.

## Updating Software

---

Check for software updates on the AJA Video website:

<http://www.aja.com/support/index.php>

If any are available, download the file and read any associated instructions prior to installing the software.

## Support

---

When calling for support, first check over your system configuration and ensure everything is connected properly and that current Final Cut presets and Easy Setups match what you are trying to do. Even if you cannot find the cause of the problem, having this information at hand will help when you call Apple or AJA Customer Support for help.

If the problem is unknown or you need general help, first contact the dealer where you purchased the product. AJA dealers offer product support for many service requirements.

If the problem is a Final Cut Pro operational issue, Mac Pro system issue, or Xserve RAID issue, then call Apple Customer Support for help.

If the problem is an AJA Video KONA issue, contact AJA Video Customer Support using one of the methods listed below:

Contacting by Mail Address:

180 Litton Drive, Grass Valley, CA. 95945 USA  
Telephone: 1.800.251.4224 or 1.530.274.2048  
Fax: 1.530.274.9442

Web: <http://www.aja.com>  
Support Email: [support@aja.com](mailto:support@aja.com)

## Frequently Asked Questions

---

### **Can I use SATA Drives for RAID storage with the KONA product line?**

AJA always recommends the use of SCSI or Fibre Channel storage solutions for use with KONA products.

### **I updated the KONA software and my KONA hardware is now missing, Why?**

A function of the uninstaller is removing the current driver for the KONA card. In doing this the KONA hardware is removed completely. A “plug and play” request must be made to install a new driver for the hardware. This can be done by either restarting the system or going into device manager and searching for new hardware. On startup the computer automatically looks for new or uninstalled hardware.

### **Can the KONA handle HDV, P2, XDCam, or AVCHD? If so how?**

HDV, XDCam, P2, and AVCHD files will play real-time in Premiere Pro when using AJA supplied project presets. Alternatively, you can use KONA to capture uncompressed from these cameras if they have SDI, HDMI, or Analog outputs.

### **Does KONA Offer Support for compressed codecs?**

All KONA cards can capture DV 25 and DV 50 compressed QuickTime files from analog and digital sources through their available inputs. Also, DVCProHD compressed QuickTime files can be captured for HD resolutions. Please see our DVCProHD white papers (see the whitepaper DVCProHD Editing with KONA and KONA at

[http://www.aja.com/pdf/AJA\\_whitepaper\\_DVCProHD\\_editing.pdf](http://www.aja.com/pdf/AJA_whitepaper_DVCProHD_editing.pdf)).

### **I am using After Effects for compositing and sometimes my preview is not in real time—why is this?**

RAM Preview should be very close to real-time for HD in After Effects. Please ensure you have the following settings for proper RT RAM preview.

1. Make sure that the “Primary Format” of the AJA Preview Panel in AE matches the resolution and frame rate of your After Effects Composition.
2. Also, RT RAM Preview is only possible with 8-bit AE Projects and with the “8-bit RGBA 4:4:4:4” setting for the “Output 8-bit As:” found in the AJA Preview Panel Color Options. Other color spaces and AE Project depths require a software transformation of the video data before being displayed—thus slowing down preview.
3. Next, please ensure that the “Resolution” setting for “Time Controls” is set to “Full”. If not set to “Full,” the image that the AJA Preview Panel receives and sends to the KONA board during RAM Preview will not be sent at “Full Resolution” and thus will either be software resized to Full Resolution before sending to the KONA Board for display, or will be center cropped before sending. The latter choice is controlled by the checkbox in the AJA Preview Panel labeled “Auto Resize Image” under the “Primary Format” Setting.
4. If RAM Preview is still not real-time, you can try some of the following – setting your Zoom to “100%” in your AE Composition, making sure the “Frame Rate” of the AE Time Controls” matches the frame rate of the “Primary Format” in the AJA Preview Panel, and muting audio in the AE Time Controls.

**Note:** In some cases the available bandwidth of the motherboard limits the cards ability to output full frame rate 1080i 29.97 RGBA.

**How does KONA hardware Up-convert, Cross-convert or Down-convert?**

The KONA 3G and LHi can perform many different conversions of a video source. They can convert only when video is passing across the board. So in capture or playback you have the ability to convert video in hardware in real-time with no CPU/Memory cost.

**Can I work with 720p variable frame rates?**

KONA will automatically remove duplicate frames from varicam footage as long as the RP-188 flags are set correctly. However, this footage will have 29.97 fps timecode. KONA does not attempt time code conversion, so the timecode in captured files will not be reliable.

**What file formats are supported by KONA?**

We support the following formats:

<b>AVI files in the following Subtypes</b>	<b>QuickTime files in the following Subtypes</b>
8-Bit YUV 4:2:2 – ‘2vuy’ 8-Bit YUV 4:2:2 – ‘2Vuy’ 8-Bit YUV 4:2:2 – ‘uyvy’ 8-Bit YUV 4:2:2 – ‘v210’ 8-Bit RGB 4:4:4 – ‘bgr’ 8-Bit RGB 4:4:4:4 – ‘bgra’ 8-Bit RGB 4:4:4 – ‘bgr’ T2B 8-Bit RGB 4:4:4:4 – ‘bgra’ T2B 10-Bit Log RGB 4:4:4 – ‘R10g’ 10-Bit RGB 4:4:4 – ‘R10k’ 10-Bit RGB 4:4:4 – ‘r10k’	8-Bit YUV 4:2:2 – ‘2vuy’ 8-Bit YUV 4:2:2 – ‘2Vuy’ 8-Bit YUV 4:2:2 – ‘v210’ 8-Bit RGB 4:4:4 – ‘rgb’ 8-Bit RGB 4:4:4 – ‘bgr’ 8-Bit RGB 4:4:4:4 – ‘argb’ 8-Bit RGB 4:4:4:4 – ‘bgra’ 8-Bit RGB 4:4:4:4 – ‘rgba’ 10-Bit Log RGB 4:4:4 – ‘R10g’ 10-Bit RGB 4:4:4 – ‘R10k’ 10-Bit RGB 4:4:4 – ‘r10k’
<b>DPX Sequences in the following Subtypes</b>	<b>Cineon Sequences in the following Subtypes</b>
10-Bit Log RGB 4:4:4 (BE) T2B 10-Bit RGB 4:4:4 (BE) T2B 10-Bit Log RGB 4:4:4 (BE) B2T 10-Bit RGB 4:4:4 (BE) B2T 10-Bit Log RGB 4:4:4 (LE) T2B 10-Bit RGB 4:4:4 (LE) T2B 10-Bit Log RGB 4:4:4 (LE) B2T 10-Bit RGB 4:4:4 (LE) B2T	10-Bit Log RGB 4:4:4 (BE)
<b>TGA Sequences in the following Subtypes</b>	<b>BMP Sequences in the following Subtypes</b>
8-Bit RGB 4:4:4 B2T 8-Bit RGB 4:4:4:4 B2T 8-Bit RGB 4:4:4 T2B 8-Bit RGB 4:4:4:4 T2B	8-Bit RGB 4:4:4 B2T 8-Bit RGB 4:4:4:4 B2T 8-Bit RGB 4:4:4 T2B 8-Bit RGB 4:4:4:4 T2B
<b>TIF Sequences in the following Subtypes</b>	<b>YUV Sequences in the following Subtypes</b>
8-Bit RGB 4:4:4(LE) B2T 8-Bit RGB 4:4:4:4(LE) B2T 8-Bit RGB 4:4:4(LE) T2B 8-Bit RGB 4:4:4:4(LE) T2B 8-Bit RGB 4:4:4(BE) B2T 8-Bit RGB 4:4:4:4(BE) B2T 8-Bit RGB 4:4:4(BE) T2B 8-Bit RGB 4:4:4:4(BE) T2B	8-Bit YUV 4:2:2

---

### **Are there any important things to be aware of when setting up a RAID for Video capture?**

Many SCSI and Fiber raids that use SATA or IDE with a backplane and controller often offer user settings for configurations. Be sure to format the Physical disk in a 512 Block size and never exceed a single volume size of 2TB. Multiple 2TB (or below) can be striped together by the OS for larger capacity storage.

### **I captured a QuickTime file and then renamed it when the system prompted me to save it—why did it take so long to save?**

When KONA is capturing, it creates separate audio & video files based on the name the clip is logged with and then multiplexes the audio & video together at the end of the capture. If the user renames this clip after the capture, a duplicate clip has to be regenerated and re-multiplexed.

# Appendix B: Specifications

## KONA 3G Specifications

### PCI Bus

PCIe 4-lane compatible

### Video Formats

Standard Def	HD 720	HD 1080	2K
525i 29.97	720p 23.976	1080i 25	2048 x 1080p 23.976
525i 29.97 (WIDE)	720p 24	1080i 29.97	2048 x 1080psf 23.976
625i 25	720p 25	1080i 30	2048 x 1080p 24
625i 25 (WIDE)	720p 29.97	1080p 23.976	2048 x 1080psf 24
480i 29.97	720p 30	1080psf 23.976	2048 x 1556p 14.98
480i 29.97 (WIDE)	720p 50	1080p 24	2048 x 1556p 15
	720p 59.94	1080psf 24	
	720p 60	1080p 25	
		1080psf 25	
		1080p 29.97	
		1080psf 29.97	
		1080p 30	
		1080psf 30	
		1080p 50	
		1080p 59.94	
		1080p 60	

### Video Input

#### Digital:

SD, HD, and 3G SDI, SMPTE-259/292/424  
Single Link 4:2:2  
Single Link 3G HD 4:4:4  
2K HSDL (High Speed Data Link) 4:4:4

#### Analog:

SD and HD Output, 12 bits, BNC  
HD: YPbPr, RGB  
SD: YPbPr, RGB (component mode)  
Composite/YC (composite mode)  
12-bit D/A

## 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  
HDMI v1.4a, 30/36 bits/pixel, RGB or YUV, 2.25Gbps

### Analog SD and HD Output, 12-bits, BNC:

HSD and HD Output, 12-bits, BNC  
HD: YPbPr, RGB  
SD: YPbPr, RGB (component mode) or  
Composite + Y/C (composite mode with simultaneous Y/C)

## Audio

16/24/32-bit 48 kHz synchronous  
16-channel SDI/HD-SDI embedded audio  
sample rate conversion on AES inputs  
(no source synchronization required)

## Up-Conversion

Hardware 10-bit

Aspect conversion modes:

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 sidebars  
Zoom Letterbox – zooms a 16:9 Letterbox source  
to 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 – 16:9 image with black top and bottom

Crop – image is cropped for full-screen image

## Cross-Conversion

Hardware 10-bit

1080i to 720p

720p to 1080i

## SD to SD Aspect Ratio Conversion

16:9 to 4:3 Letterbox

16:9 to 4:3 Horizontal Crop

4:3 to 16:9 Pillarbox

4:3 to 16:9 Vertical Crop

## Reference Input

Analog Color or HD Tri-level  
1 BNC on standard breakout cable  
(75 Ohm terminating)

## Machine Control

RS-422, Sony 9-pin protocol

## KONA LHi Specifications

### KONA LHi

PCIe 4-lane compatible

### Look Up Tables

Real-time primary LUT  
Import/export text-based LUT files

### File Import/Export

Import (capture) and export (playback) standard file formats: DPX, Cineon, TGA, TIFF, BMP, and AVI, QuickTime.

### Video Formats

Standard Def	HD 720	HD 1080
525i 29.97	720p 23.976	1080i 25
625i 25	720p 24	1080i 29.97
	720p 25	1080i 30
	720p 29.97	1080p 23.976
	720p 30	1080psf 23.976
	720p 50	1080p 24
	720p 59.94	1080psf 24
	720p 60	1080p 25
		1080psf 25
		1080p 29.97
		1080psf 29.97
		1080p50, 59.94, 60
		1080p 30
		1080psf 30

### Video Input

Digital:

HD-SDI/SDI, SMPTE-259/292/296  
HD-SDI 1.5Gb and 3Gb  
HDMI v1.3, 30 bits/pixel,  
RGB or YUV, 2.25Gbs, SD, HD, 1080p50/60

Analog:

SD and HD Input, BNC  
HD: YPbPr, RGB  
SD: YPbPr, RGB (component mode)  
Composite/YC (composite mode)  
12-bit A/D

### Video Output

SD and HD Output, BNC  
HD: YPbPr, RGB  
SD: YPbPr, RGB (component mode)  
Composite/YC (composite mode)  
12-bit D/A

HD-SDI 1.5Gb and 3Gb  
 HDMI v1.3, 30 bits/pixel,  
 RGB or YUV, 2.25Gbs, SD, HD, 1080p50/60

### Audio Input

Digital:

2-channel 16/24/32-bit AES/EBU, 48 kHz sample rate  
 Synchronous or Non-synchronous  
 (Internal sample rate conversion)  
 16/24/32-bit SMPTE-259 SDI embedded audio, 8-Ch, 48 kHz synchronous

Analog:

2-channel balanced input  
 +24dbu Full-scale Digital (0dbFS)  
 16/24/32-bit D/A, 48 kHz sample rate  
 +/- 0.2db 20 to 20 kHz Frequency Response

### Audio Output

Digital:

2-channel 16/24/32-bit AES/EBU, 48 kHz sample rate  
 16/24/32-bit AES/EBU, 48 kHz sample rate  
 16/24/32-bit SMPTE-259 SDI embedded audio, 8-Ch, 48 kHz synchronous

Analog:

2-channel balanced output  
 +24dbu Full-scale Digital (0dbFS), 16/24/32-bit D/A, 48 kHz sample rate  
 +/- 0.2db 20 to 20 kHz Frequency Response

### Up-Conversion

Hardware 10-bit

Aspect conversion modes:

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 sidebars  
 Zoom Letterbox – zooms a 16:9 Letterbox source  
 to 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 output, 16/24/32-bit internal processing

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 horizontally

### Cross-Conversion

Hardware 10-bit

1080i to 720p, 720p to 1080i

### SD to SD Aspect Ratio Conversion

16:9 to 4:3 Letterbox

16:9 to 4:3 Horizontal Crop

4:3 to 16:9 Pillarbox

4:3 to 16:9 Vertical Crop

**Reference Input**

Analog Color or HD Tri-level  
 1 BNC on standard breakout cable (75 Ohm terminating)  
 KLHI-Box (optional): 2 BNCs, passive loop  
 BNC assignable as LTC input

**Machine Control**

RS-422, Sony 9-pin protocol  
 Connector provided on KONA LHI breakout cable and on optional KLHI-Box.

**LHe Plus Specifications**

**Formats**

Standard Def	HD 720	HD 1080
525i 59.94	720p 50	1080i 50
625i 25	720p 59.94	1080i 59.94
	720p 60	1080i 60
		1080PsF 23.98
		1080PsF 24
		1080PsF 25
		1080PsF 29.97
		1080PsF 30
		1080P 23.98
		1080P 24
		1080P 25
		1080P 29.97
		1080P 30

**Video Input**

Digital: 8 or 10 bit HD-SDI/SDI, SMPTE-259/292/296, Dual-rate

Analog:

Composite/S-Video (Y/C): NTSC, NTSCJ, PAL  
 12 bit A/D, 2x oversampling  
 3 line adaptive comb filter decoding  
 +/- .25 db to 5.0 MHz Y Frequency Response  
 +/- .25 db to 1 MHz C Frequency Response  
 .5% 2T pulse response  
 < 1.5% Diff Phase  
 < 1.5% Diff Gain

Component: SMPTE/EBU N10, Betacam 525 line, Betacam 525J, RGB  
 12 bit A/D, 2x oversampling  
 +/- .25 db to 5.5 MHz Y Frequency Response  
 +/- .25 db to 2.5 MHz C Frequency Response  
 .5% 2T pulse response  
 <2 ns Y/C delay inequity

## Video Output

Digital: SD-SDI, SMPTE, 259M, 10-bits, BNC  
 HD-SDI SMPTE, 292/296, 10-bits, BNC

### Analog:

Composite/S Video: NTSC, NTSCJ, PAL  
 12 bit D/A, 8x oversampling  
 +/- .2 db to 5 MHz Y Frequency Response  
 +/- .2 db to 1 MHz C Frequency Response  
 .5% 2T pulse response  
 < 1% Diff Phase  
 < 1% Diff Gain

SD Component: SMPTE/EBU N10, Betacam 525 line,  
 Betacam 525J, RGB  
 12 bit D/A, 8x oversampling  
 +/- .2 db to 5.5 MHz Y Frequency Response  
 +/- .2 db to 2.5 MHz C Frequency Response  
 .5% 2T pulse response  
 <1 ns Y/C delay inequity

Analog SD and HD Output, 12-bits, BNC:

HD: YPbPr, RGB

SD: YPbPr, RGB (component mode)

Composite/YC (composite mode)

## Audio Input

Digital: 2-channel 24 bit AES/EBU, 48KHz sample rate  
 Synchronous or Non-synchronous  
 (Internal sample rate conversion)  
 24 bit SMPTE-259 SDI embedded audio, 8-ch, 48kHz synchronous

Analog: 2-channel balanced input  
 +24dbu Full Scale Digital  
 24 bit A/D, 48 KHz sample rate  
 +/- 0.2db 20 to 20 KHz Frequency Response

## Audio Output

Digital: 2-ch 24-bit AES/EBU, 48 KHz sample rate  
 24 bit SMPTE-259 SDI embedded audio, 8-ch, 48 KHz synchronous

Analog: 2-channel Balanced output (XLR)  
 +24dbu Full Scale Digital (0dbFS)  
 24 bit D/A, 48 KHz sample rate  
 +/- 0.2db 20 to 20 KHz Frequency Response  
 2-channel unbalanced output (RCA-jack): requires KL-Box option

**Down-Conversion**

Hardware: 10-bit output, 24-bit internal processing

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 horizontally

**Reference Input**

Analog Color Black or HD Tri-level

1 BNC on standard breakout cable (75 ohm terminating)

KL-Box (optional): 2 BNCs, passive loop-through

**Hardware Acceleration Provided**

DVCProHD hardware acceleration

HDV hardware acceleration

Dynamic RT Extreme hardware acceleration

**Machine Control**

RS-422, Sony 9-pin protocol

Connector provided on KONA LHi breakout cable and on optional KLHI-Box.

