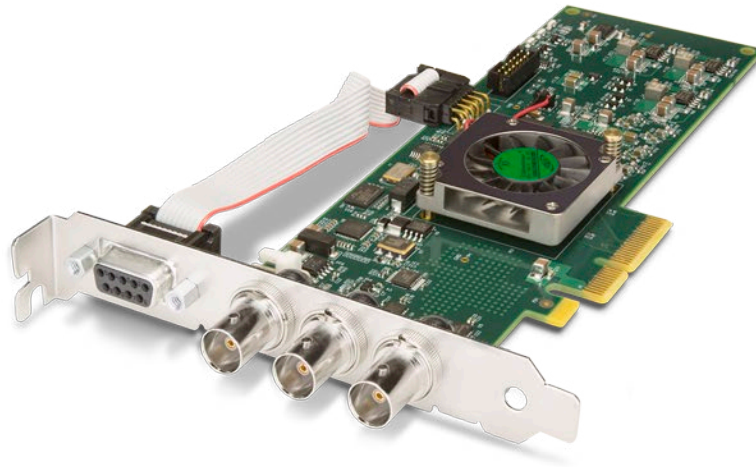


KONA 1

Single Channel Capture and Display



Installation and Operation Guide

Version 14.2
Published July 3, 2018



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Contacting AJA Support

When calling for support, have all information at hand prior to calling. To contact AJA for sales or support, use any of the following methods:

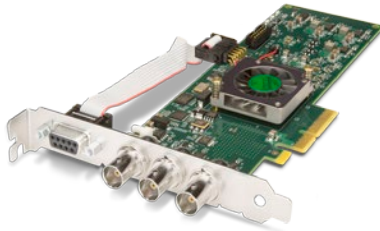
Telephone	+1.530.271.3190
FAX	+1.530.271.3140
Web	https://www.aja.com
Support Email	support@aja.com
Sales Email	sales@aja.com

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Chapter 1 – Introduction



Overview

The AJA KONA 1 card brings the highest quality 2K, HD, and SD video and audio to computers running Mac, Windows or Linux Operating Systems. KONA 1 can simultaneously capture and playback 3G-SD video, supports embedded SDI audio input and output, and has genlock with reference and LTC input.

KONA 1 Features

- 3G-SDI formats supported
- Embedded SDI audio in
- Embedded SDI audio out
- Mini PCIe form factor
- Genlock with reference input
- LTC input
- RS-422 machine control (9-pin)

NOTE: A Low Profile version of the KONA 1 card with the same functionality is available for developers.

AJA Software & Utilities

AJA's KONA software and hardware were developed for powerful integrated video/audio capture, editing, and production with a variety of 3rd-party software. With KONA and a qualified computer, you have the ultimate system for production, post-production, broadcast, and streaming work. AJA software is distributed as a unified package which includes all the software, firmware, plugins, and utility programs for AJA's Io, KONA, and T-TAP products.

Four retail packages are available, one for Mac, one for Windows, and two for Linux (one package for Ubuntu, one package for Red Hat/CentOS).

NOTE: Support for the Linux OS retail drivers is based on the Linux application used and comes from the application's vendor.

To download AJA software, go to the AJA website:

<https://www.aja.com/en/support/downloads/>

For a complete software compatibility list, see the AJA website link:

<https://www.aja.com/en/category/edit/compatibility>

Mac, Windows and Linux Packages

These packages include:

Drivers

AJA device drivers for tightly integrated hardware/software operation.

AJA Control Panel

The Control Panel provides:

- Source selection and control of your AJA hardware.
- A block diagram to show visually what routing and processing is being performed.

AJA Control Room

Control Room is a cross-platform software application for ingest, playback and output with AJA devices.

AJA System Test

System Test provides accurate and detailed evaluations of drive and system performance statistics, allowing you to measure the capabilities of your system for recording and playing back various resolutions and codecs. The application includes:

- System Disk Test
- AJA Device Test
- Disk + Device Test
- System Report

The application tests Read and Write, Capture and Playback speeds in both Megabytes per second and Frames per second. 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: Theoretically the best test (or simulation) is to fill your storage disk to 80% and then test capture at the highest data rate you will use.

Additional with Mac and Windows Packages

3rd-Party Plugins

AJA provided plugins for popular 3rd-party Professional Video Applications from Adobe, Avid, Apple, Telestream, and others.

System Requirements

AJA Video recommends that your system meet minimum hardware and software requirements to achieve a satisfactory level of performance. Updates to system requirements are subject to change.

NOTE: See Software Vendor system requirements for GPU recommendations and additional hardware requirements and recommendations.

AJA recommends:

- Mac OS 10.12 Sierra or later
- Win 10 or later with all updates

- Linux Redhat/CentOS 7
- Linux Ubuntu 14.04 LTS and Ubuntu 16.04 LTS
- 2.5 GHz quad core i7 minimum, for 2K/HD
- 8GB RAM minimum, 16GB or more recommended, especially for High Frame Rate applications
- A reasonably fast and powerful graphics card, with plenty of on-board memory. Examples (may be specific to application version and/or host CPU) include:
 - Nvidia K5200
 - Nvidia K4200
 - Nvidia M6000
 - Nvidia M5000
 - Nvidia M4000
 - AMD W7100
 - AMD W8100
- Media storage with adequate bandwidth to sustain the capture and playback of the material you expect to be working with.

NOTE: For large scale installations with shared storage, or for very high performance requirements, AJA recommends consultation with an experienced a system integrator. A consultant will be able to assist with many important variables.

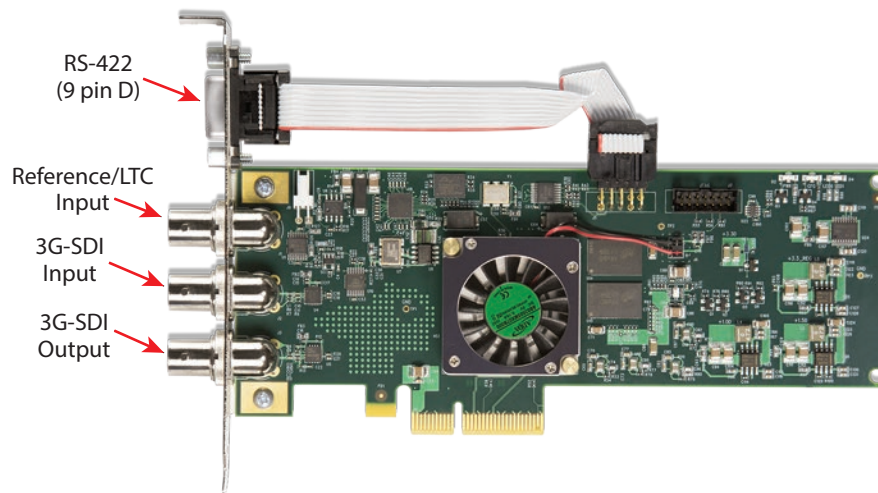
Disk Storage Methods

To ensure performance and quality, the disk storage system used with the workstation must be able to meet the demands of storing real-time uncompressed media. At the very minimum, the disk storage system must be able to provide and maintain a consistent 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.

For more on disk storage performance see "[AJA System Test](#)" on page 6

<DT>KONA 1 Cable Connections

Figure 1. KONA 1 Card



RS-422 Machine Control

A female 9-pin D connector provides connection for VTRs, camcorders, disk media servers, and other devices using RS-422 SMPTE (Sony) protocol.

BNC Connectors

The KONA 1 endplate provides three BNCs:

- Reference/LTC input (top)
- 3G-SDI input (middle)
- 3G-SDI output (bottom)

Chapter 2 – Installation

Installation Overview

The installation and set up of a KONA card is simple, and may vary slightly depending on your system.

For the most up-to-date Mac system requirements for KONA, see the following AJA website:

<https://www.aja.com/en/support/kona-system-configuration/>

For the most up-to-date Windows system requirements for KONA, see the following AJA website:

<https://www.aja.com/en/support/kona-pc-system-configuration/>

Unpacking

Shipping Box Contents

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

NOTE: 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.

Installing the KONA Card

The KONA card can be installed into a PC chassis, legacy Mac Pro chassis with PCIe slots, or into a Thunderbolt PCIe external chassis.

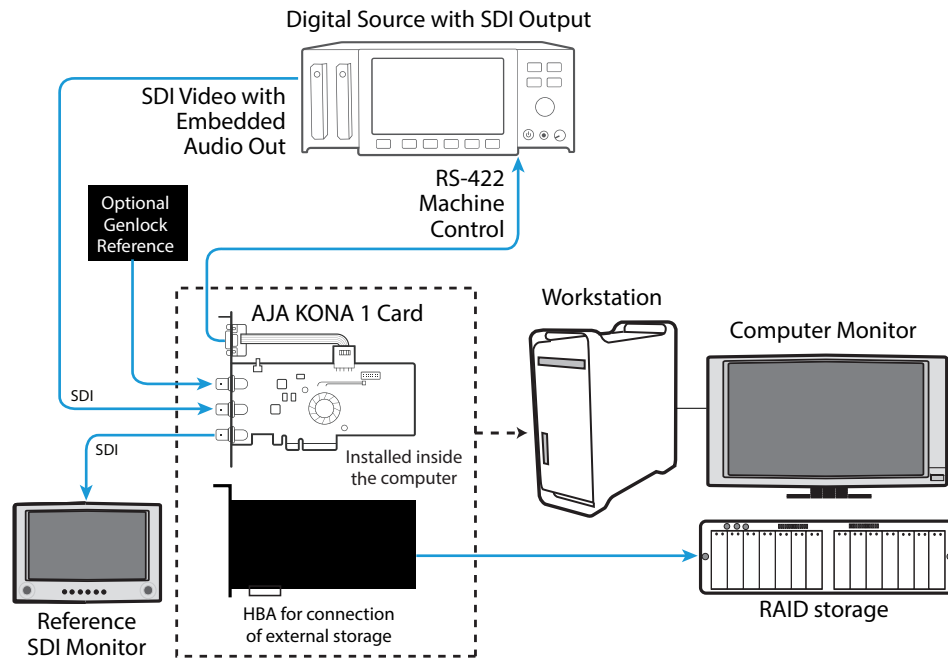
1. Turn off power to the host chassis.
2. Touch the outside of the chassis to discharge any body static.
3. Remove the power cable from the back of the chassis.
4. Open the chassis.
5. Locate a recommended PCIe slot (see the AJA website for slot selection instructions).
6. Remove the backplate and screw from the PCIe slot.
7. Touch the chassis to discharge any body static.
8. Remove the KONA card from its anti-static bag.
9. Carefully insert the card by rocking it slowly into the slot. Ensure the card aligns properly with the slot opening and is fully seated.
10. Replace the screw to secure the card.
11. Close the chassis.
12. Power up the chassis.

NOTE: Always put a RAID controller and KONA on separate PCIe busses. This improves performance by reducing bus contention.

Cabling the System

KONA 1 Cable Connections

Figure 2. Example KONA 1 System



Typical System

Figure 2 shows typical system interconnections for KONA 1 with a digital A/V source (in this example a DVR). Your system may differ depending on devices, audio monitoring, and video monitoring.

1. If desired, connect your house reference sync to the Reference BNC connector.
2. Connect an SDI Video Monitor to the KONA 1 Video Out BNC connector. If your monitor can extract embedded audio, you will be able to both see and hear the output from the KONA 1 card.
3. Connect a 9-pin machine control cable between your VTR's RS422 control port and the KONA 1 machine control connector.
4. Connect an SDI cable between the KONA 1 SDI In BNC connector to the VTR SDI Out. The KONA 1 connections carry embedded audio so the VTR should be configured accordingly.

Installing KONA 1 Software

NOTE: Always uninstall previous versions of KONA software before updating your software.

Download

Go to the AJA website and download the latest KONA 1 driver software containing the AJA Control Panel application:

<https://www.aja.com/en/support/downloads/>

System software updates may occasionally become available to AJA KONA 1 owners on our website (www.aja.com). We recommend checking occasionally for both software updates and additional product information.

NOTE: If your computer has previously had another video capture or multimedia device installed, ensure you uninstall any related software before installing KONA 1. This will prevent any hardware or software conflicts.

Software Package Installation and Re-installation

Before installing the KONA 1 software package, ensure that your capture/editing application is installed as detailed in its user documentation. You cannot use KONA 1 with a third-party application until the application has been installed and run at least once on your workstation. Next, install the AJA software package.

If you add KONA 1 supported applications at a later date and have not previously installed the appropriate drivers, you must run the install program again selecting the appropriate application support software to be installed.

Important MacOS High Sierra Installation Information

With the introduction of macOS High Sierra (v10.13), Apple now requires that third party application developers be identified during kernel extension installations. Failure to do so will make AJA devices fail to operate (Unsupported AJA Device).

Depending on your macOS version and AJA Desktop Software installation history, the following installation outcomes are possible:

MacOS Sierra and Earlier Supported Versions

No problems exist for AJA software installation or updates with these earlier versions of macOS.

Earlier MacOS to High Sierra Update

No problems should occur if you already have the AJA Desktop Software package installed on macOS Sierra (or earlier) and update your Mac to High Sierra. The identification of AJA as a trusted developer is passed from the earlier macOS to the High Sierra macOS.

MacOS High Sierra First AJA Desktop Software Install

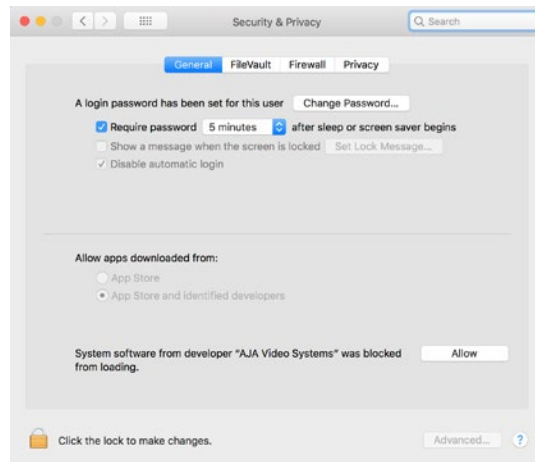
No problems should occur if your Mac is running High Sierra macOS, you install AJA Desktop Software for the first time, and you follow the instructions shown during installation.

Figure 3. MacOS High Sierra Blocked Message Prompt



Do NOT click **OK**. Instead click **Open Security Preferences** (or go to System Preferences>Security and Privacy) and then click **Allow** for AJA Video Systems developer.

Figure 4. MacOS High Sierra System Preferences, Allow Developer



NOTE: If after successful installation, you remove AJA applications from your computer using the AJA Uninstaller, developer identification is retained by macOS High Sierra. Re-installation should proceed without any problems.

Recovery from Installation Approval Failure

If you just clicked OK during installation and skipped the developer approval step, the AJA Desktop Software installation will complete, but essential extension installations will not occur and AJA devices will not be operational (Unsupported AJA Device).

Apple has engineered a time window, within which you can belatedly approve a developer after a partial installation. If you go to System Preferences>Security and Privacy, within 30 minutes of a partial installation, the developer message and Approve button will be available for use. After 30 minutes, however, the message and button are removed from the window. Recovery from this involves uninstalling all AJA files (some manually), reinstalling the AJA Desktop Software package, and clicking on Allow for AJA Video Systems developer.

Recovery Procedure

1. Run the AJA Uninstaller, located in the AJA Utilities folder in the Mac Applications folder.
2. Access the Users Library, which is hidden. To access the library:
 - A. Go to the Finder.
 - B. In the Finder Menu Bar and click on **Go**.
 - C. Hold down the **Option** key. The Library folder appears as long as the **Option** key is held down.
3. Go to Library>Preferences and delete all **com.aja.*.*** files. There may be one file or several files.
4. Remove AJA Control Panel from the Dock, if applicable.
5. Restart the Mac.
6. Install the AJA Desktop Software package.
7. During installation click on **Open Security Preferences** (or go to System Preferences,>Security and Privacy).

8. Under the **General** tab click on the **Allow** button for AJA Video Systems. The button is only available for 30 minutes.

Firmware Update Procedure

After the AJA Software Package has been installed on a computer with your AJA hardware installed, the firmware on that AJA device can be updated if a newer version of firmware is included with that software package.

1. Open the AJA Control Panel application.
2. If more than one AJA device is connected, choose the device you want to update by selecting its name from the drop-down menu at the top of the screen.
3. Go to the Control Panel Firmware Screen.
4. Select the firmware version (if multiple versions exist) in the Desired dropdown.
5. Click on Install. Messages appear and when finished, firmware update completed messages are shown.
6. Click Shutdown to power down the computer.
7. Restart the computer.
8. Open AJA Control Panel. The AJA hardware with the updated firmware should be recognized by the Control Panel application.

Chapter 3 – Operation



Using KONA with Professional Video /Audio Software

After you install the AJA software package on your computer, you're ready to begin capturing and playing back video and audio using your choice of third-party software. You can go here for AJA software and documentation:

<https://www.aja.com/en/support/downloads/>

For further support information and downloads for third-party software and DirectShow for Developers, go to:

<https://www.aja.com/en/category/edit/compatibility>

Capture Formats

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

- DPX
- TGA
- BMP
- QuickTime
- MXF

NOTE: Support by KONA 1 of QuickTime for Windows has been discontinued. Instead, AJA supports ProRes Playback on Windows via our own libraries.

NOTE: Other file types can be captured using third-party capture applications such as Sienna, Softron, Tools on Air, Drastic Technologies or Quadrus.

AJA Control Panel Overview

The AJA Control Panel is a software application that provides a simple visual showing how the KONA hardware is currently configured and allows you to make changes. You can change signal input and output parameters and define the video processing that will be performed.

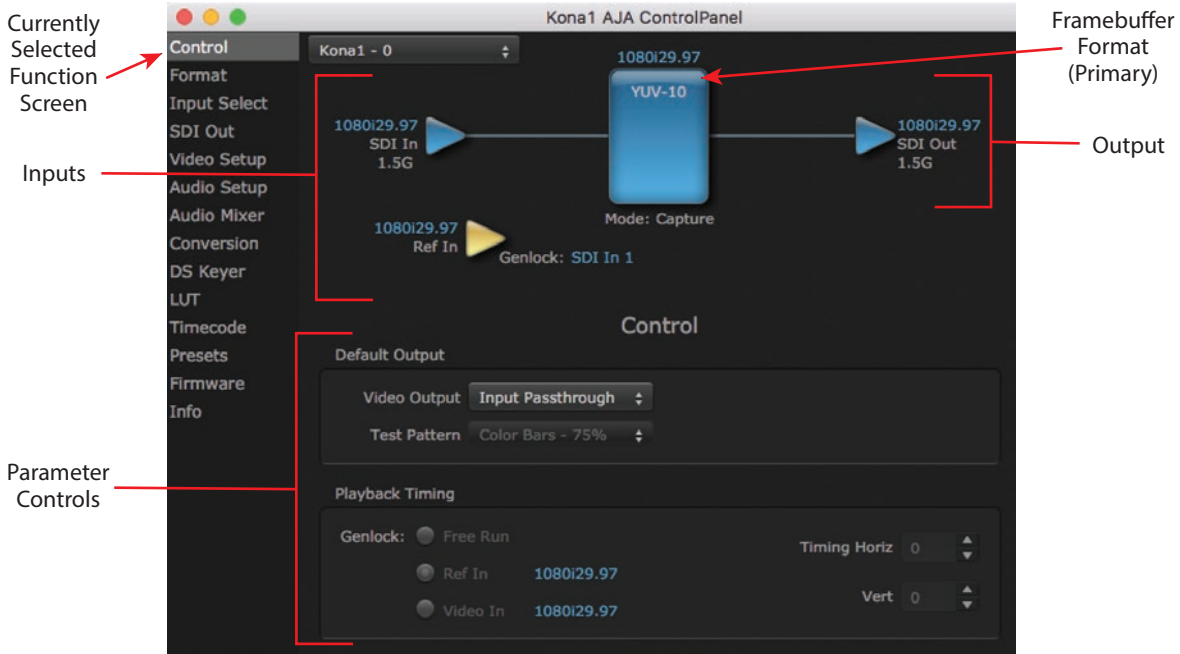
The AJA software installer automatically installs the Control Panel application on your computer.

AJA Control Panel User Interface

The AJA Control Panel user interface includes a visual block diagram of the unit's current configuration. The current status, input and output settings, and many other details are depicted in the color-coded block diagram. Below this block diagram are various controls for changing operating parameters, which will vary depending on which function screen has been selected.

The left side of the AJA Control Panel provides a navigation list of available function screens. Clicking on a link (or alternatively, a related element in the block diagram) displays a function screen corresponding to that topic.

Figure 5. AJA Control Panel, Block Diagram and Controls

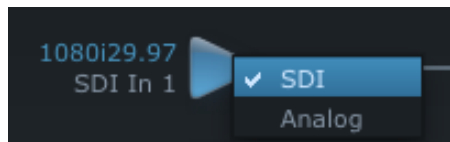


Block Diagram Area

The top block diagram area of the Control Panel screen is a visual representation of the processing, if any, that's currently occurring, including inputs/outputs, reference source, and system status. Lines between inputs, the framebuffer, and outputs, show a video path. Where there are no lines, there is no connection; this can be because an input or output isn't selected in the Input Select menu. The lines will also show whether the outputs are video or video + key.

You can click any of the function screen selection links in the left column to view its current settings or click on an icon to call up its related settings screen. You can also right-click or Control-click to see context-sensitive information and choices.

Figure 6. Context Sensitive Menu



Color Meanings

All items in the AJA Control Panel block diagram are color-coded to show what is happening in real time. This applies to both icons and text. These colors indicate:

Blue

Video is same format as the Primary Format (framebuffer)

Yellow

Reference video (black burst or other reference source)

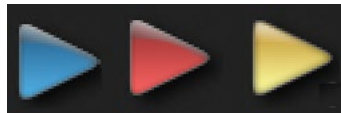
Red

The selected operation cannot be performed

Input/Output Icons

The input and output icons are triangles that together with their color show all the input and outputs and their status (selected, not selected, input present or not, format, etc.). A complete video path is shown when inputs and outputs are connected with lines going to/from the framebuffer.

Figure 7. Input/Output Icons



Framebuffer

The framebuffer is the “engine” where your third-party applications interface with the AJA device. The framebuffer has a format (called the “Primary Format”) and color space that it follows, as defined in the linked menu screens or via external application software.

Primary Format

The Primary Format is the media format written to disk and used in your project. This is the format that the framebuffer will use and is shown in the Control Panel using the color blue. It is the format that the third-party application software will either receive from the AJA hardware, or is sending to the hardware. All icons in blue are the same as the Primary Format used by the framebuffer. Also any text descriptions in the block diagram that appear in blue indicate that something is in the primary format.

Presets

Setups can be named and saved as a snapshot (Preset) for recall at any time. You can save various AJA device Control Panel configurations associated with your frequent tasks. You don't have to spend time resetting interface configurations, just load the previously saved Preset for each task. See ["Saving, Loading and Deleting Presets" on page 36](#) for more information.

If you work on multiple systems and want to carry your saved setups to another location, you can copy your saved Preset files on to movable storage and load them into any computer running the AJA Control Panel application.

Mac OS Preset Files Storage Location

- From the Finder, hold down the Option key (to display the Library directory) and click on Go/Library/Application Support/AJA/<device name>/Presets/

- c:\Users\

Default Preferences

When an AJA device starts up, a preference can determine what settings it will have it when it begins to operate. The AJA Control Panel offers two default preference settings:

- Local Preference - A preference stored from the last AJA device's Control Panel settings to be used on next startup of AJA Control Panel. This occurs on next restoration of the default state (triggered by start up of host CPU, startup of the AJA device, or when a third-party application releases the AJA device).
- Global Preference - A preference saved for use as a global default start state for an AJA device that can be shared by multiple users, applied on first startup, or by pressing the Control Panel **Reset Device...** button.

Local Preference

The Local Preference file (com.aja.devicesettings) exists to immediately and automatically store all parameter changes made by a user on a particular AJA device. When any control is changed in the Control Panel, that change is recorded in the Local Preference file stored in a unique location on that computer that is dedicated to that particular device, serial number, and logged-in user. Then, when AJA Control Panel is restarted for any reason, the AJA device being controlled restores the settings being used when Control Panel was last closed.

The Local Preference file can be accessed at the following locations.

On Mac:

- From the Finder, hold down the Option key (to display the Library directory) and click on Go/Library/Preferences/com.aja.devicesettings.

On Windows:

- C:\Users\

NOTE: Clicking on the AJA Control Panel "Erase All Prefs" button deletes the existing Local Preference file from this location. This file will be recreated as soon as any Control Panel setting is changed.

NOTE: Clicking on the AJA Control Panel "Reset Device..." button will delete the existing Local Preference file. If a Global Preference file is found, these settings are reloaded. If a Global Preference file is not found, "factory defaults" are loaded and the device is set to that state

Global Preference

An administrator can establish a house standard for an AJA device by copying a preference file to a shared computer location. Once placed at that location, it becomes a Global Preference file where it will establish a standard default startup state for all users of that AJA device using that computer system. These settings preempt the initial AJA factory default settings, and are applied when an AJA device is first powered up, or when the Control Panel **Reset Device** button is pressed.

To establish a Global Preference, the administrator first configures the AJA device (which automatically creates a "com.aja.devicesettings" Local Preference file in the location identified above) and then copy or move or that file to the correct computer locations (manually or by pushing it out across the network) on all the computers that use the AJA device.

NOTE: If the user makes changes to an AJA Device's Control Panel settings, those changes are saved to the Local Preference file, which will take priority over the Global Preference file.

The shared computer locations for a Global Preference file are:

On Mac:

- From the Finder, click on Go/Computer/<System HD>/Users/Shared/AJA/ and copy or move the "com.aja.devicesettings file" described above to this location.

NOTE: The "AJA" folder needs to be created manually at this location before moving the preference file into it.

On Windows there are three possible shared locations depending on your system:

- C:\Users\Public\Aja\
- C:\Users\All Users\Aja\
- C:\ProgramData\Aja\

Copy or move the "com.aja.devicesettings file" described above to one of these locations.

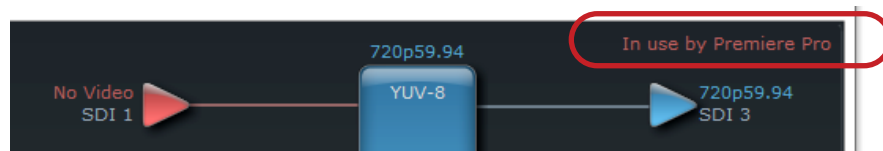
NOTE: The AJA Control Panel Info screen displays the path to the Global Preference file on that computer.

NOTE: Clicking on the AJA Control Panel Erase All Prefs button does NOT delete an existing Global Preference file from this location.

Controlling Application

It is important to understand that the computer can contain many applications that can use the AJA device (as you switch from window to window) and it may not always be obvious which currently controls it.

Figure 8. Control Panel In Use Message (in red)

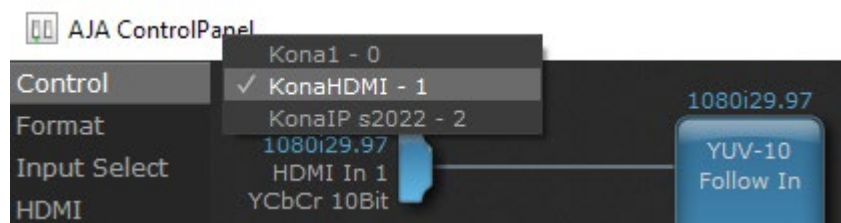


In the top right corner, the Control Panel displays the name of the application controlling the unit. In some cases, applications may not always properly "let go" of the I/O interface as another takes over—you'll be able to tell by looking at the Control Panel.

Using Multiple AJA Devices

More than one AJA device can be used with your host computer. Using AJA Control Panel, you can choose which installed AJA device an application uses. If you have more than one device installed, you will see a device name in a pulldown menu on the upper left of the screen. To "target" a specific installed device for use, click on the text and select from the list in the pulldown.

Figure 9. Control Panel Screen Showing Multiple AJA Devices



When you launch an application, the application will use the device that is currently selected in AJA Control Panel. When an application is running, you can change the “targeted” device with the pulldown menu. The running application will retain its connection to the previously selected device. If you change the “targeted” device and then launch a different application, that application will use the new device, while the first application you launched will continue to use the other AJA device.

Performance of multi-device use depends on a variety of factors: CPU usage, RAM, disk IOPS/ bandwidth for streams of video, etc. and therefore performance may vary. Also be aware that multiple input/output streams are only supported by software that is explicitly designed for a multi-device environment.

Control Recommendations

We recommend you have the Control Panel running and visible at all times. When the Control Panel is running in the background (not front-most) you can see what the interface is doing and who has control of it.

Function Screens

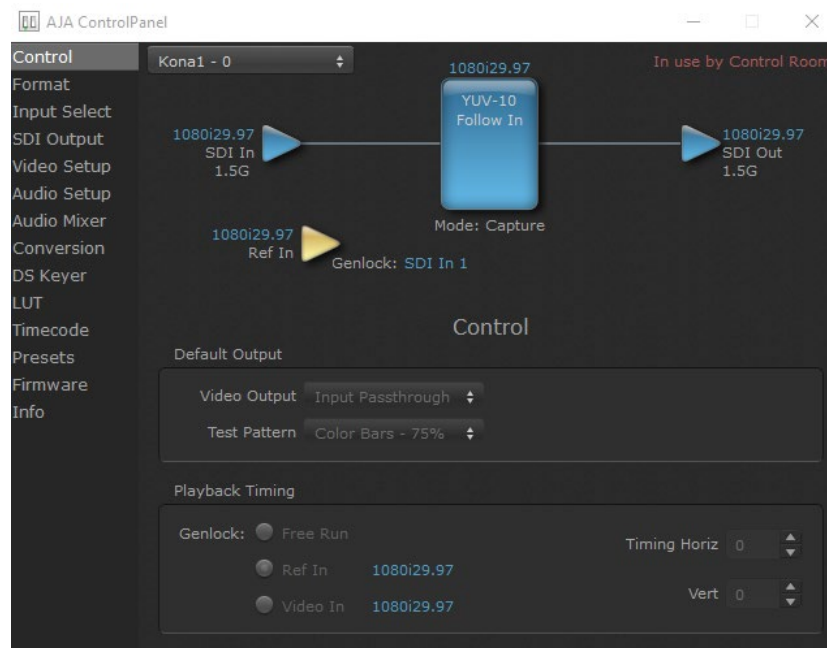
Listed below are the function screens for KONA 1 and what they are used for.

Table 1. KONA 1 Function Screens

Screen	Functions
Control	Configure some basic KONA 1 operation options and output timing.
Format	Select the framebuffer primary video format and any secondary formats for conversion of inputs/outputs
Input Select	View and edit input selections and audio mapping.
SDI Output	Select output format.
Video Setup	Configure Video such as composite black level, progressive format and ancillary data (Closed Caption) option.
Audio Setup	Configures Audio options such as analog audio monitor level.
Audio Mixer	Select and mix audio sources for monitoring.
Conversion	(Mac platform only) Select codec options such as whether paused video is full frame or single field, pulldown settings, and color space conversion.
DS Keyer	Setup and control the insertion of keyed video from the frame buffer or graphics files with alpha channel.
LUT	Load a lookup table (LUT) file to adjust the calibration of color for any source.
Timecode	Monitors SMPTE 12M-2 timecode and configure timecode window burn output.
Presets	Add or delete saved preset configurations (handy for quick and easy recall of different KONA 1 settings for varied workflows).
Firmware	Install firmware from your currently installed AJA software package.
Info	Display status information and the firmware version number. This information is generally intended for troubleshooting/support.

AJA Control Panel Operation

Control Screen



The KONA 1 card can be controlled by various software applications running on a host computer. The Control screen is where you select how the KONA 1 directs video and is used by application software. This screen also provides control for configuring output timing with regard to external reference video and horizontal/vertical delay. The top of the Control Screen shows the currently selected AJA device if more than one is available in your system.

Default Output

This is where you select what the KONA 1 card will output as a default when no application has control of the board, such as when the Mac Finder or Windows Navigation Pane is active. Since KONA 1 can be controlled by software applications as well as its own control panel, the output can change dynamically. When you select many video applications, they will take control of the KONA 1 inputs and outputs. However, when an application that doesn't take control is active, these settings determine what KONA 1 will output.

Input Passthrough

This selection directs KONA 1 to route video from its selected input through the card for processing and output. When this selection is chosen, all Primary/Secondary Format selections are available for selection in controlling the output. This in effect makes the KONA 1 card a converter. No applications other than the AJA Control Panel need be open to convert audio and video from one format to another.

Test Pattern

This selection directs the KONA 1 card to output a choice of preset pattern when no other application is using the KONA 1 card. You can choose from:

Black, Color bars (75% or 100%), Ramp, Multiburst, Line Sweep, Multi Pattern, Flat Field, Check Field, White, Border, Linear Ramp, Slant Ramp, Zone Plate, Color Quadrant, or Color Quad Border.

Load File

In addition to the preset test pattern choices, a "Load File..." selection at the bottom of the menu allows you to load any standard RGB graphics file (.tif, .psd, etc.) into the frame buffer for display.

NOTE: The graphic file will not be scaled to fit. If it's smaller than the current frame buffer format, KONA 1 will center it in the frame. If it's larger than the current frame buffer format, it will be cropped on the right and bottom. Some graphics formats and bit depths may not be supported. Once a graphic file is loaded into the frame buffer it will be retained until it is overwritten by another graphic or test pattern, or when power is turned off. Graphic file names are only "remembered" in the menu until the AJA Control Panel application is closed.

Hold Last App

This selection directs KONA 1 to hold and output the last frame of video from the last application to control KONA 1. This can be helpful when operating in an environment where you're switching back and forth between multiple application windows.

Playback Timing

Use these controls to set Genlock and Timing adjustment.

Genlock

Selects how KONA 1 will synchronize program video:

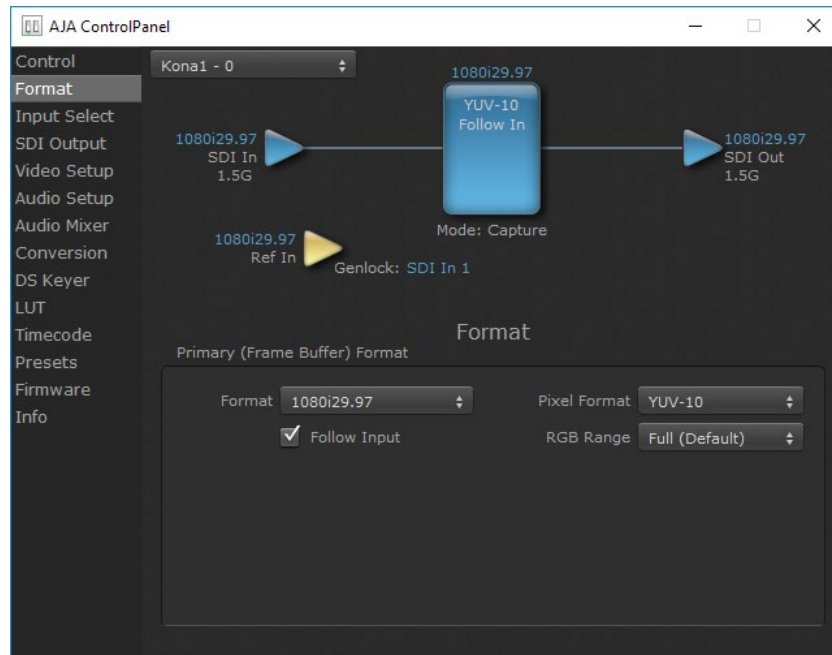
- Freerun: In this mode, KONA 1 generates sync without an external reference source
- Ref In: Directs KONA 1 to use the Ref Video source for sync (usually an analog black burst video signal)
- Video In: Directs KONA 1 to use whichever video input source has been selected in the Inputs Screen for sync

Timing (Horiz and Vert):

These two pull-downs allow output timing adjustment with reference to the Ref Video source selected:

- Horizontal selects a number of pixels (clocks) to offset
- Vertical specifies a number of lines to offset

Format Screen



The Format Screen shows the video format currently in use by the KONA 1 framebuffer (called the Primary Format) and allows you to change it.

IMPORTANT: Do not confuse this Format function screen conversion, which uses AJA hardware and operates on either Mac or PC, with the separate Conversion function screen, which uses QuickTime for conversion and is only available on Mac.

Primary (Frame Buffer) Format

When a change is made via the Video Format pull-down or by clicking an icon and selecting a new format via a contextual menu, the block diagram will change to reflect the new format. In the case of a Secondary Format, the formats available can vary based on what the Primary Format is and the input signal (frame rates of input sources limits the to/from conversion choices).

Pixel Format

Use this pulldown menu to choose: YUV-10, YUV-8, RGB-10, or ARGB-8 or RGB-12.

RGB Range

The RGB Range pulldown menu allows you to select either Full-range (0-1023) or SMPTE range (typically 64-940) for RGB color output.

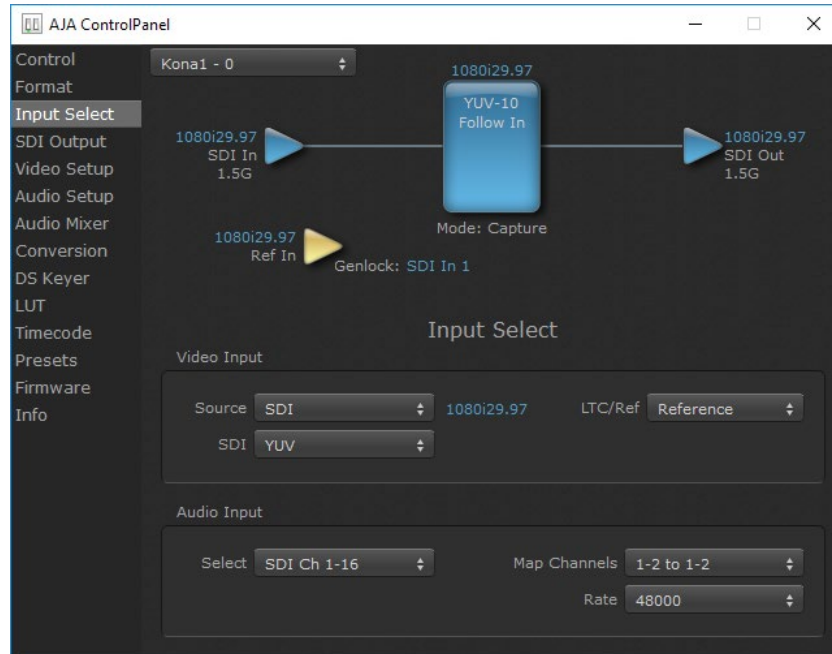
NOTE: The AJA Control Panel software uses the abbreviation "sf" instead of "PsF" when referring to "progressive segmented frame" formats. In the manual and in other literature you may see either of these acronyms used interchangeably. Visually, it is easier to recognize:

- "sf" for progressively segmented frame formats
- "p" for progressive frame formats

Follow Input

Enabling the Follow Input checkbox allows the Control Panel Buffer to auto-switch to whatever is the detected input format. This feature works only if the controlling application supports input-based capture—AJA Control Room for example.

Input Select Screen



On the Input Select Screen, you can view the currently selected video and audio input sources and map audio sources to the channels supported by your editing application. Two information panes in the screen are provided: Video Input and Audio Input.

Video Input

Source

The pulldown menu allows you to see and change the currently selected video format that KONA 1 has detected (if any). In the KONA 1 example shown above, video is selected at the SDI1 input and the format is 1080i with a frame rate of 29,97. Since this text is shown in blue, you can tell that it matches the framebuffer's primary format selected in the "Formats" screen. By looking at the input source, you can determine how the primary format should likely be set (unless you want to perform a conversion on the input). If you wish to select a different input, use the pulldown to select either SDI 1, 2, or Dual Link for two-wire 4:4:4 RGB, or Stereo 3D. For 3G single-link, choose the SDI Source used and select Stereo 3D from the SDI pulldown menu.

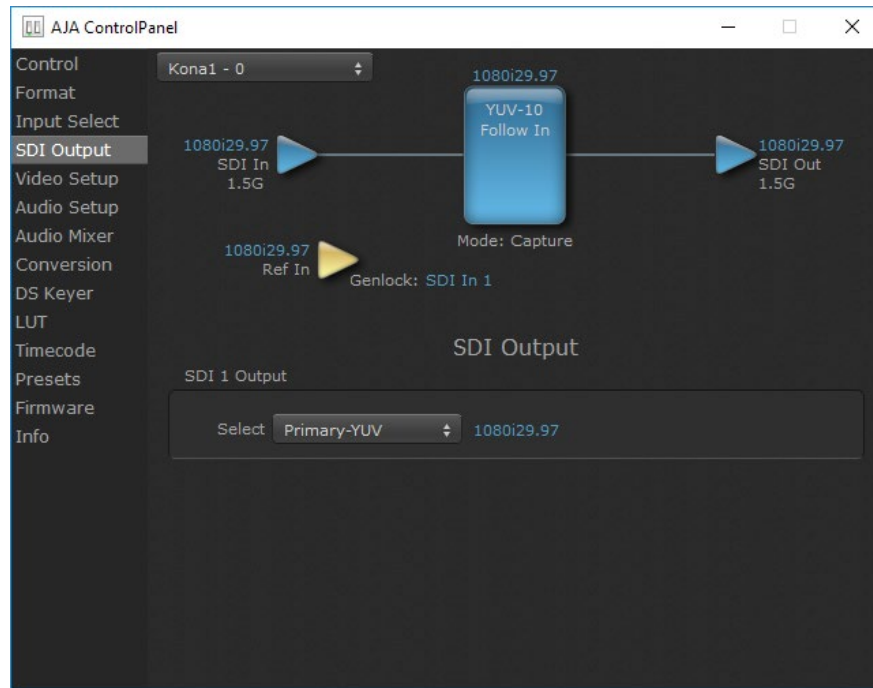
SDI

Select from YUV, RGB-SMPTE, RGB-Full, or Stereo 3D.

Audio Input

This pulldown menu allows you to pick where the audio comes from. KONA 1 supports up to 8 channels of embedded audio. You can choose from the 16 channels embedded in the SDI, which 8 to bring in (1-8 or 9-16). Here, if only two channels were selected in the third-party application you are using, you can select which two channels from the eight embedded will be mapped to that application.

SDI Output Screen



The SDI Out Screen shows the current settings for both of the SDI outputs. Because the outputs can be configured independently, one output may be the Primary format and the other output may be the Secondary format. If an input/output has no video, it will be indicated on the block diagram ("No Video").

Select SDI Output 1

Primary-YUV

When selected, this indicates that the SDI output is set to the same format as the framebuffer. That value will be listed in blue.

Secondary

When selected, this indicates that the SDI output is set to a format different from the framebuffer (Primary Format). That secondary format value will be listed in green. This shows that active processing of the video is taking place (format change and possibly up- or down-conversion).

RGB-SMPTE and RGB-Full

Selects RGB color output, an alternative to Primary-YUV above.

Video+Key

When selected, this indicates that the SDI 3 video is set to the same format as the framebuffer. SDI 4 is set to a video key signal associated with SDI 3 (the shape to be cut out from the video - this will appear as a black and white image/matte). Using the second KONA 1 output as an Alpha Channel key, with the video output, may be useful for feeding production switchers, DVEs or other professional video equipment. If Video+Key has been selected as an output, the block diagram will indicate the SDI outputs with video in blue and the key in red.

Stereo

When selected, this indicates that SDI 1 represents the left eye output and SDI 2 represents the right eye output of stereoscopic material. KONA 1 also offers single link 3Gb output of multiplexed Stereo 3D.

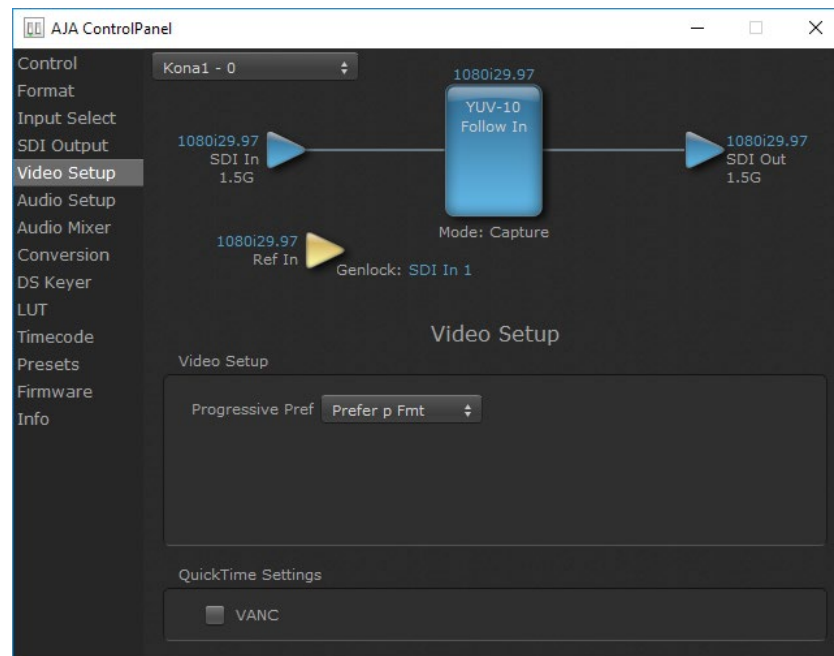
Transport Options

- Dual Link - Output (SMPTE 372M) using dual-link transport.
- 3Gb - Output (SMPTE 424M) using a single-link transport.

Select SDI Output 2

Same as SDI Output 1, except no transport selection.

Video Setup Screen



The Video Setup screen shows various other settings which will affect how video inputs and outputs behave, and how KONA 1 interacts with some software applications.

Video Setup

Analog Black Level

Choices available for Black Level are the two Composite analog formats. Choices presented are for US or Japan:

- 7.5 IRE (NTSC US)
- 0 IRE (NTSC Japan)

Progressive Formats

Radio buttons allow you to choose between PsF (progressive segmented frames) and p (progressive frames) non-interlaced output. This feature is used to default the hardware to use either p or PsF output over SDI when it has not been specified by the application.

Application Settings

VANC Checkbox

When checked ON, the VANC checkbox tells earlier model KONA cards to capture and process any ancillary data in the SDI stream. This can include Closed Captioning data, and other types of metadata. Applications such as Premiere Pro and Final Cut Pro will not capture or output this data through the KONA card if this box is not checked on.

NOTE: KONA 1 does not require enabling the VANC checkbox for Closed Captioning.

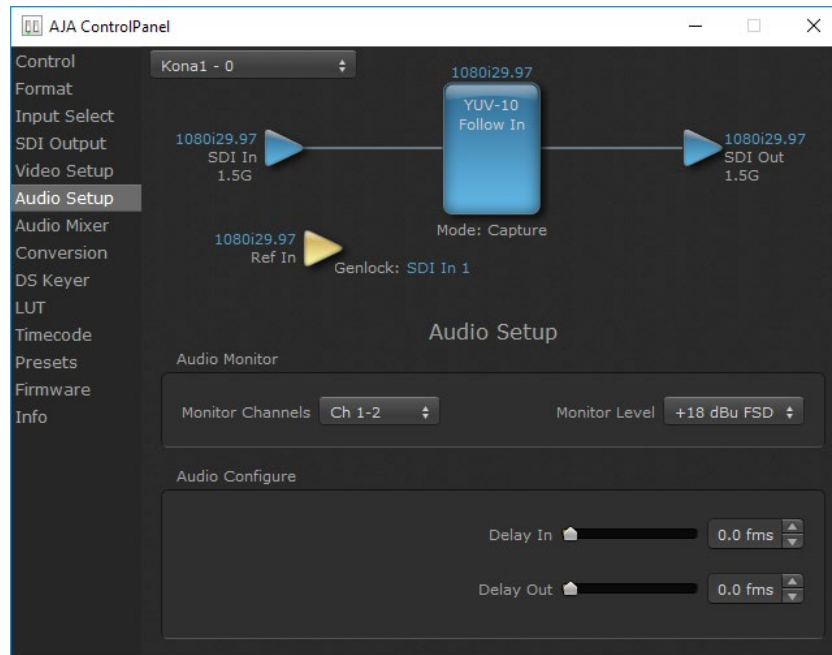
VOut Filters

These controls enable/disable output capabilities in the QuickTime VOut filter. This filter is used by older applications that are built on legacy QuickTime architecture such as FCP7, AJA TV, VTR Exchange, and older versions of After Effects. Boxes that are checked will define what framerate and resolution types will appear in the list of available formats in the AJA hardware. For example, if 25/50 is unchecked, then all resolution/framerate combinations with 25 or 50 fps will not appear in the list of capabilities for the installed AJA hardware, when using software that relies on the QuickTime VOut filter.

Geometry Checkboxes

The 2K or RED checkbox needs to be enabled for that format to be presented and selectable in applications like AJA VTR Xchange and AJA TV.

Audio Setup Screen



The Audio Setup Screen shows the current settings for the audio output, allowing you to re-configure it when desired.

Audio Monitor

Monitor Channels

Selects which two audio channels are monitored. Select from:

- Ch 1-2 through Ch 15-16

Monitor Level

This selection determines the analog audio output level (“FSD” is full-scale-deflection reading as measured on a VU meter). This setting affects the Audio Mixer screen. Select from:

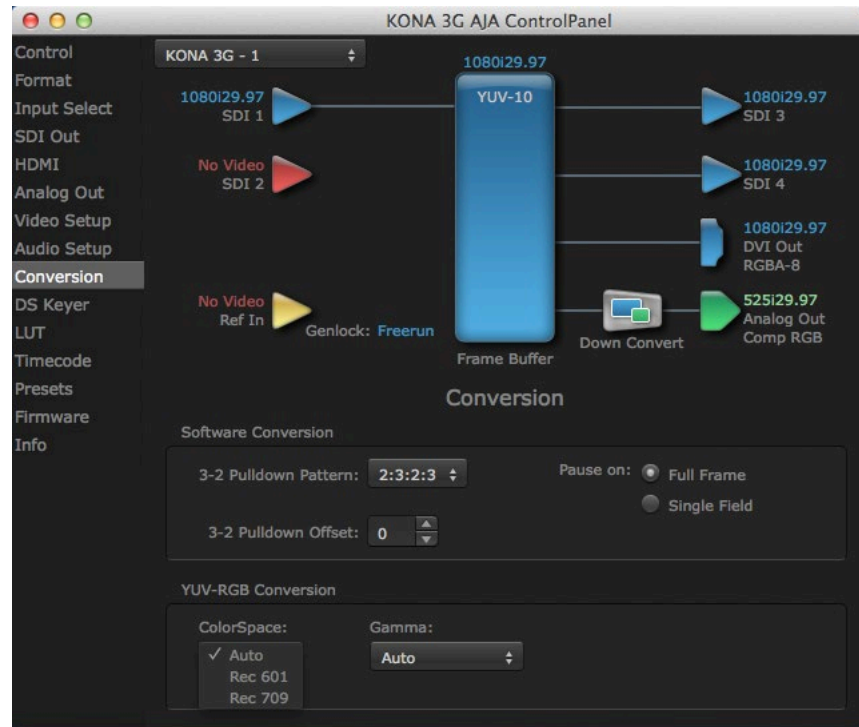
- +24dBu, +18dBu, +15dBu, or +12dBu

Audio Configure

Here you can set up to 6 frames (in tenths of a frame) of delay for audio input and output. The AJA Control Panel delays all audio outputs—SDI, HDMI, and Analog.

IMPORTANT: If you use this Control Panel delay, do not use other delay settings in your applications. They can conflict.

Conversion Screen (Mac OS only)



In the Mac OS version of the AJA Control Panel, this screen offers controls that determine how the card behaves with 3rd-party applications.

IMPORTANT: Do not confuse this Conversion function screen, which uses QuickTime for conversion and is only available on Mac, with the Format function screen which uses AJA hardware for conversion and operates on either Mac or PC.

Software Conversion

These parameters can affect pulldown and pause behavior. This group of software conversion parameters apply ONLY when using legacy QuickTime based applications on Mac OS. These applications include things like FCP7, VTR Exchange, and AJA TV. Applications like FCPX, Premiere Pro, Media Composer and Control Room, no longer use these legacy QuickTime Components.

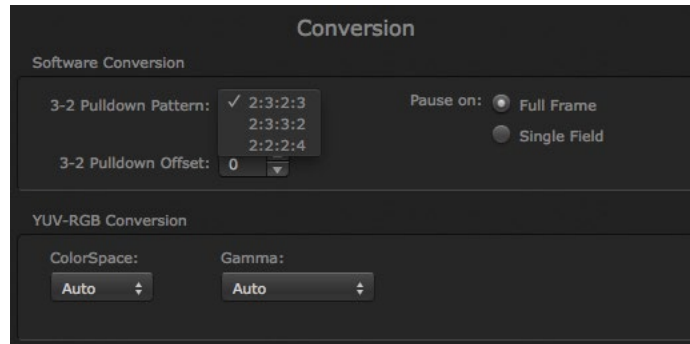
3:2 Pulldown Pattern

The value selected from this list is used whenever, due to format selection, you've chosen to do 24 frames-per-second to 30 conversion where extra fields will be added to pad the existing ones. Depending on video content, selection of different field patterns may be useful in reducing jitter due to the content of adjacent fields. The numbers in the pattern choices specify the frequency with which inserted fields will be repeated. For example, "2:3:2:3" means duplicate a field twice, then the next field three times, then the next twice, and then back to three times.

3:2 Pulldown Offset

The 3-2 Pulldown offset is used if the 3-2 pulldown feature is removing the wrong frames. This setting lets you adjust when the pulldown begins in a sequence of frames.

Figure 10. AJA Control Panel, Codec Screen, Frame-padding Pattern Choices



Pause On

These two choices determine what happens when the editing application is paused in stop mode:

- Full Frame: both fields are displayed resulting in some jitter while paused
- Single Field: a single field is displayed, showing no flicker (useful when color correcting or whenever the flickering would be a distraction).

YUV-RGB Conversion

These pulldowns select industry standard color space and gamma transfer functions for the YUV-RGB conversion, or allow you to direct the KONA 1 to automatically determine it for you.

Colorspace

Choose from:

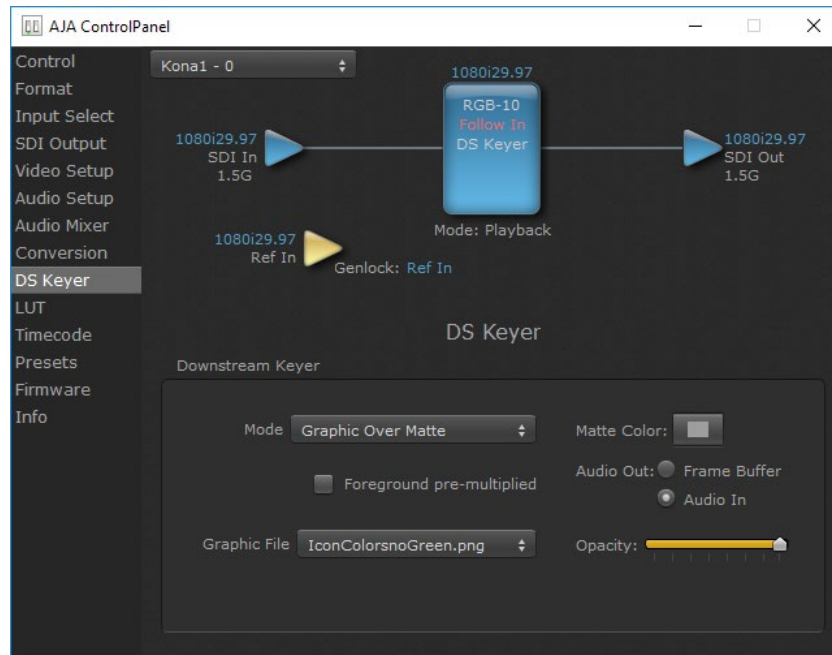
- Rec 601
- Rec 709
- Auto

Gamma

Choose from the following:

- Linear (1.8)
- Rec 601 (2.20)
- Rec 709 (2.22)
- Auto

Downstream Keyer Screen



KONA 1 has a hardware-based downstream keyer that is ideal for putting logos, “bugs” or other video material with an alpha channel on top of video being played out or printed to tape. A typical application would be putting a television station’s call letters or channel over program video content. Keyed video can be from the KONA 1’s internal Frame Buffer (from storage, video In, KONA TV, etc.) or from a graphics file that has an alpha channel (PhotoShop etc.).

Settings in the DS Keyer Screen provide control over how the keyer operates and whether it’s turned on or off.

Downstream Keyer

Mode

- Downstream Keyer Off - When this pulldown menu item is selected the downstream keyer will be turned off.
- Frame Buffer over Matte - Places the keyed video with alpha channel currently in the Frame Buffer over a fixed color matte determined by the “Matte Color” setting set separately.
- Frame Buffer over Video In - Places the keyed video currently in the Frame Buffer over the video input for playout or print-to-tape.
- Graphic over Matte - Places a graphics file having an alpha channel (chosen in “Graphic File” pulldown) over a fixed color matte determined by the “Matte Color” setting set separately.
- Graphic over Video In - Places a graphics file having an alpha channel (chosen in “Graphic File” pulldown) over the video input for playout or print-to-tape.
- Graphic over Frame Buffer - Places a graphics file having an alpha channel (chosen in “Graphic File” pulldown) over the current contents of the KONA 1 card’s Frame Buffer (which might be from storage, video In, KONA TV, etc.).

Matte Color

Only available when the pulldown “Frame Buffer over Matte” or “Graphic over Matte” are selected—pressing this button brings up a color selection dialog. The dialog provides a variety of ways to select a matte color including a color wheel, color picker (choose from a location anywhere on the computer screen), numeric sliders, swatches, “crayons”, and spectrums. The matte chosen will be used as a video background under the keyed video.

Foreground pre-multiplied (checkbox)

Use to avoid “matte lines” and improve the appearance of the foreground (key) being composited over the background.

Audio Out

- **Frame Buffer** - Select audio out to be routed from the contents of the Frame Buffer.
- **Audio In** - Select audio out to be routed from KONA 1’s currently selected input(s).

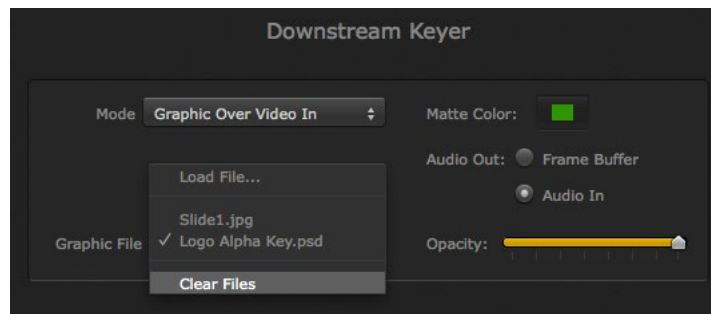
Opacity

This slider controls the transparency of the keyed video (over the background) from translucent to completely opaque.

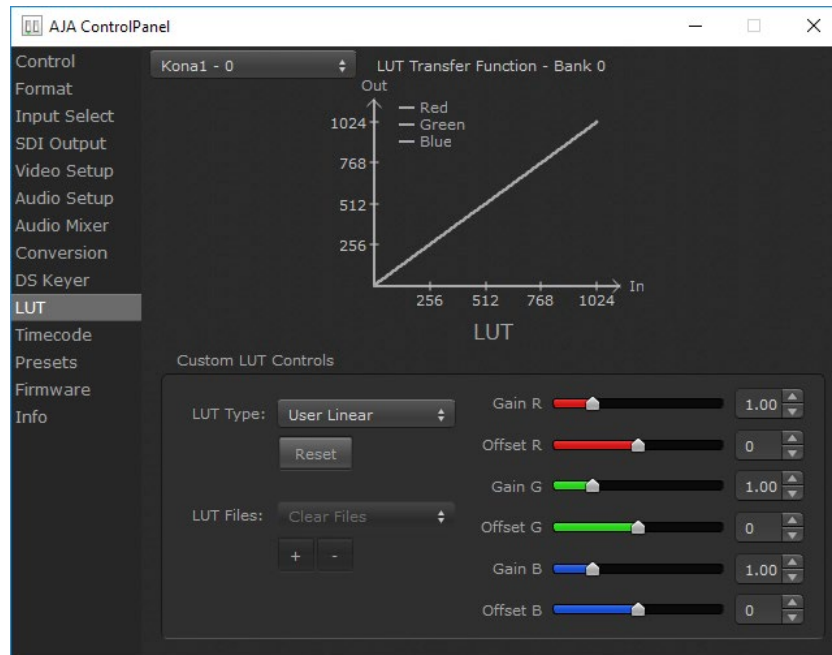
Graphic File Load

This pulldown allows you to choose from any recently accessed file or select a new file (“Load File...”), which then brings up a file dialogue. Remember that the file raster (pixel x pixel count) should match the primary format in the frame buffer or the secondary format if upconverting. Example: you wish to key a logo on top of your 1920x1080 footage, the still image with alpha channel that you load should be 1920x1080.

Figure 11. Downstream Keyer Graphic Selection



LUT Screen



The LUT screen controls allow you to create a custom color look up table (LUT) on the output, for matching a production "look" on a specific display.

Users can also specify their own custom LUTs by creating a LUT file and uploading it to an AJA Video Device using the LUT (lookup table) screen in the Control Panel.

Custom LUT Controls

The LUT Transfer Function screen displays an approximate representation of the effect of the current LUT settings. When the controls are activated by selecting a User LUT Type, Red, Blue, and Green curves show the transfer functions of each color.

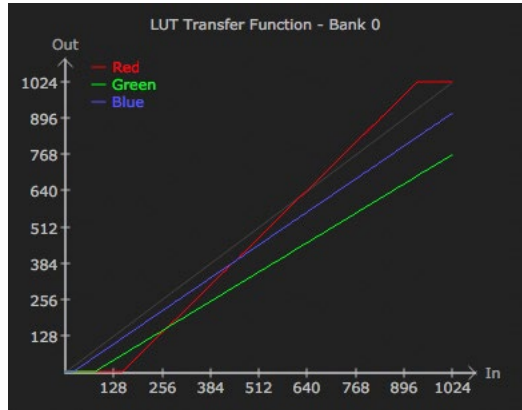
NOTE: The displayed curves are approximate. Curves for some extreme settings may diverge significantly from the actual transfer functions.

LUT Type

Selects the type of LUT. Choose from

- Auto - LUT will be automatically selected. This setting intelligently applies the type of LUT required in the majority of use cases. For example, if the Frame Buffer is set to SD 608 and the Output set to HD 709, then an industry standard curve for changing 608 to 709 color space is applied.
- Linear - A linear 1:1 LUT is applied, resulting in no color change (every value for source is mapped to the same value for output).
- SMPTE-FullRange - A conversion LUT from SMPTE to Full Range is applied.
- FullRange-SMPTE - A conversion LUT from Full Range to SMPTE is applied.
- User Linear - Activates the Gain and Offset controls, allowing the manual creation of a custom LUT. Initial default setting is linear.

Figure 12. Example LUT Transfer Function Curves



- User Film Stream - Activates the Gain and Offset controls with a default curve matching Grass Valley FilmStream cameras, and also allowing manual creation of a custom LUT.
- User LUT File - See "[LUT Files](#)" below.

Gain and Offset Controls

When activated, the controls on the right allow adjustment of Gain and Offset for Red, Blue and Green.

- Sliders - The sliders on the right can be used to change the values for each color.
- Numeric Entry - You also enter a numeric value by clicking on the displayed number, and can increase or decrease the values clicking on the up/down arrow boxes.
- Cut and Paste - Right clicking on a displayed number opens a Cut, Copy, Paste dropdown menu for convenient numeric entry.

Reset

Clicking on the Reset button resets the currently selected LUT Type to its default values (not active for a User LUT file).

LUT Files

The User LUT File setting above activates the LUT Files dropdown, allowing the selection of a previously saved LUT file. You can create a custom LUT file using most text editors or spread sheets, provided the data is arranged according to the LUT File Format Specification that follows (see "[LUT File Format Specification](#)" on [page 34](#)).

Uploading Custom User LUT file

Once the LUT file is created, you can upload it with the following steps:

1. Before loading a LUT, make sure you are using an RGB/RGBA frame buffer format, and that you have a AJA Video Device that supports LUTs.
2. Open AJA Control Panel and select the "LUT" pane.
3. Click the "LUT Type" popup and choose "User LUT File" menu item. Note "LUT Files" options become enabled.
4. Click the "+" button and use the navigation dialog to choose a custom LUT file. The LUT is now loaded.

LUT File Format Specification

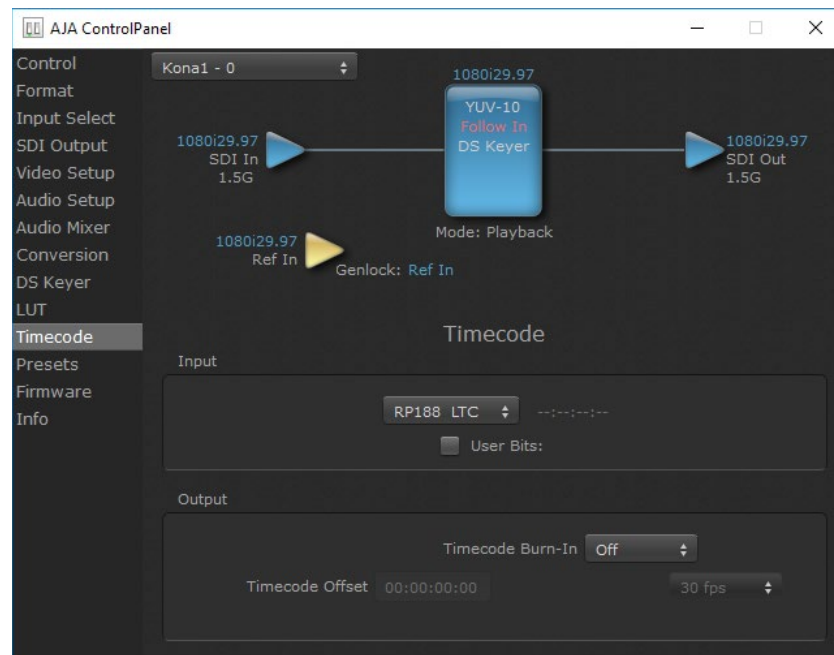
LUT files are normal text files that contain 1025 lines (numbered 0 - 1024). Each line contains 3 integer values in the range 0 - 1023, representing 10 bit R, G, B component output values. Component values may be separated by one or more commas, spaces, or tabs. The example below show LUT File contents for Line 0, Line 1, Line 2, and Line 1024, with several valid ways to separate the numbers in a line.

- 16, 17, 17
- 17 18 18
- 19 19 21
- ...
- 1000, 1022, 1023

In the example above, the first line (Line 0) represents the output values for the case where R=0, G=0, or B=0. In other words, if the R component of a pixel is set to 0, then set R component value to 16. Likewise, if G is set to 0, then set G to 17. The second line (Line 1) does a similar thing for input component values equal to 1.

A simple way to construct a LUT file is to use a Spreadsheet like Excel. Simply fill 3 columns and 1025 rows with LUT data, and save the result as a "CSV" file.

Timecode Screen



The Timecode Screen selects the timecode stream read for applications that use it (for example, when the timecode source is set to "Use control panel setting," AJA Control Room will read the selected stream). It is also used for monitoring the RP-188 timecode embedded in the digital data stream, and can be used for selecting a timecode offset (if required).

Timecode Input Settings

RP-188 Timecode <n>

In RP-188 timecode (SMPTE 12M-2) there can be multiple timecode types in the data stream. Use this pull-down to select the one you wish to monitor:

- RP188 LTC (Linear timecode)
- RP188 VITC 1 (Vertical Interval timecode)
- RP188 VITC 2
- LTC Port input

The selection will be displayed in the timecode value to the right of the pull-down.

User Bits

For monitoring a variable framerate (VFR) timecode (such as Varicam), you may wish to check the User-bits box. If you set this checkbox, KONA 1 will detect and interpret the user-bits and display them next to the checkbox. You will see the original framerate (30 fps in the figure below) followed by the adjusted frame padding (two digits reporting discarded and retained frame padding).

NOTE: SMPTE 12M-2 is the updated name and specification for what was RP-188.

Timecode Output Settings

Use QT Timecode (Mac OS Only)

This feature is for Final Cut Pro 7 (or earlier), AJA Control Room, and AJA TV only. When checked, it directs KONA 1 to output timecode from the QuickTime timecode track.

Timecode Burn-in

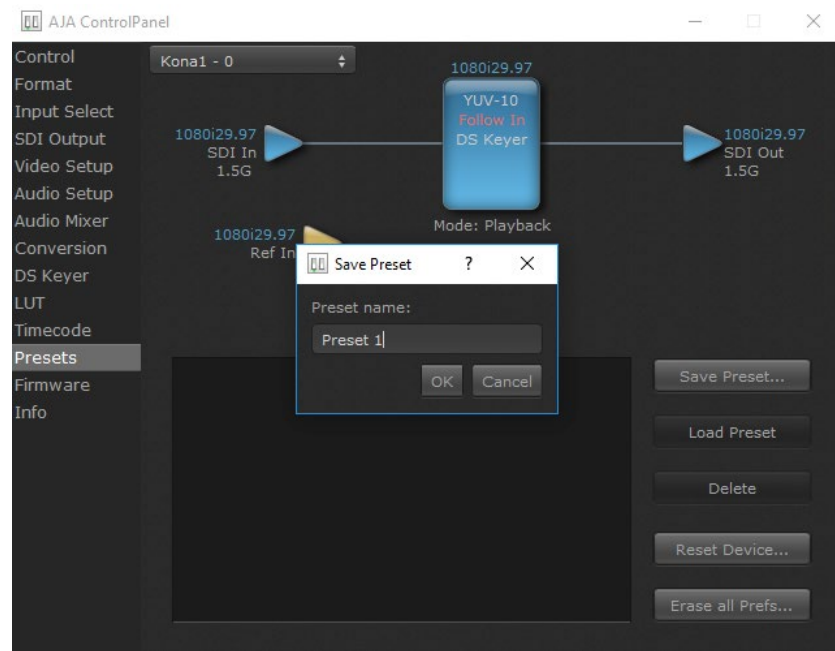
This pulldown selects whether the timecode value is displayed in a “burned-in” window in video output. If set to “OFF”, timecode will not be keyed over the video. If set to “Timecode”, then the timecode value will be keyed over the output video for all of the KONA 1 outputs. This can be useful for synchronizing, choosing edit points, dailies, and many other purposes.

Timecode Offset (entry field and FPS pull-down)

When QuickTime timecode is disabled, this text entry field allows you to generate a timecode based on the offset entry. You can select a framerate from the pulldown menu at the right side of the pane. Use that same value here as the source video to ensure the timecode is synchronized.

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 real time 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.

Presets Screen



After configuring the AJA Control Panel screens, you can then save all your settings as a snapshot for later recall, called a preset. In this way, you can organize presets for all your typical tasks, eliminating manual reconfiguration.

Saving, Loading and Deleting Presets

To save a preset, simply go to the Presets screen and click "Save Preset". A dialog will be presented asking you for a file name. Enter a meaningful name and click "OK". Thereafter the preset will be available under the Control Panel "Presets" list.

From the Presets screen you can manage your collection of presets easily. To Load or Delete a stored preset, just select it with your mouse and then click the "Load Preset" or "Delete" button respectively .

Transferring Saved Presets

If you want to use a saved Preset on another workstation, you can simply copy the file on removable storage and install it at the new location. The Preset files are stored at:

Mac OS Preset Files Storage Location

- From the Finder, hold down the Option key (to display the Library directory) and click on Go/Library/Application Support/AJA/<device name>/Presets/

Windows Preset Files Storage Location

- c:\Users\<username>\AppData\Local\AJA\Control Panel\<device name> Presets\

Reset to Default

When you click the "Reset Device" button the Default User Preference file will be deleted and AJA Control Panel will do one of the following:

- If a Default Global Preference is found, it is loaded and the device is set to this state.
- If a Default Global Preference file is not found, "factory defaults" are loaded and the device is set to this state.

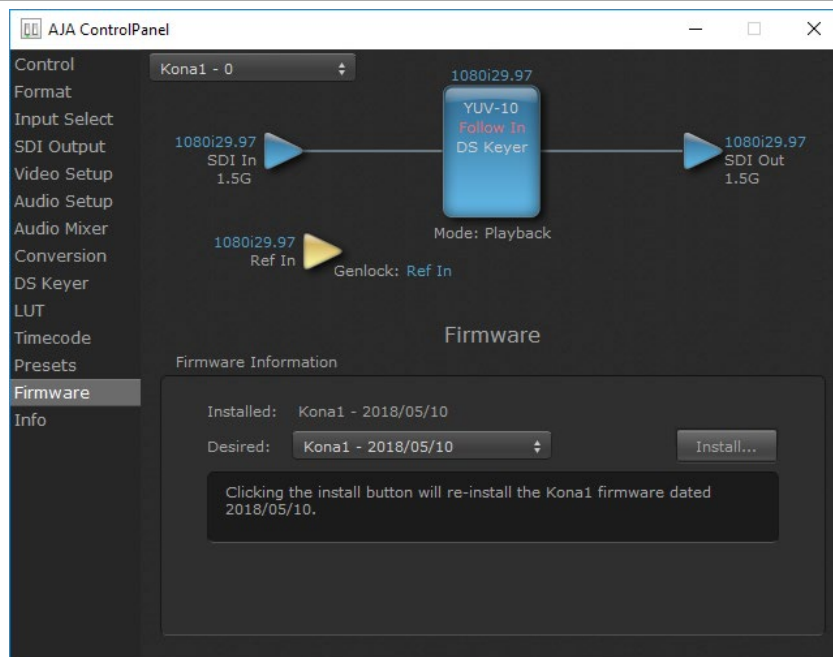
NOTE: See ["Default Preferences" on page 17](#) for more information.

Erase all Prefs

For technical support purposes you may be required to remove the current Preference settings. Clicking on the "Erase all Prefs" button deletes the current Default User Preference file without accessing a Default Global Preference file, if one exists. Current AJA device settings are not altered, but changing any setting will immediately regenerate a Default User Preference file with the changed settings.

NOTE: Clicking on the AJA Control Panel Erase All Prefs button does NOT delete an existing Global Preference file from that shared location.

Firmware Screen

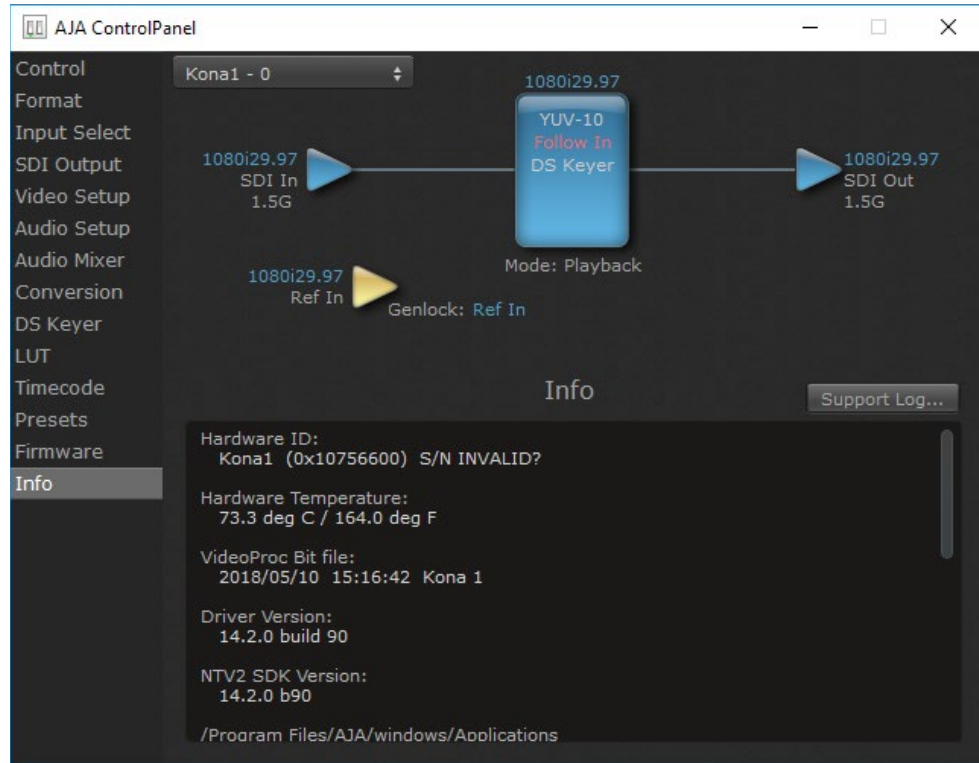


Use the Firmware link to access the firmware update/changeover screen. Click **Install** to erase the current firmware and load the desired firmware.

You will be required to power-cycle your computer to finish the changeover.

See ["Firmware Update Procedure" on page 13](#) for details.

Info Screen



This screen shows the KONA software files that have been installed on your system. This information may be needed if you talk to an AJA Customer Service representative to determine if files are missing or need updating.

Appendix A – Specifications

KONA 1 Tech Specs

Video Formats

- (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (2K) 2048 x 1080PsF 23.98, 24, 25
- (HD) 1080i 50, 59.94, 60
- (HD) 1080PsF 23.98, 24, 25, 29.97, 30
- (HD) 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 720p 50, 59.94, 60
- (SD) 625i 50
- (SD) 525i 59.94

Video Input Digital

- 3G-SDI, SMPTE-259/292/296/424

Video Output Digital

- 3G-SDI, SMPTE-259/292/296/424

Audio Input Digital

- 16-Channel 24-bit SDI embedded, 48 kHz synchronous

Audio Output Digital

- 16-Channel 24-bit SDI embedded, 48 kHz synchronous

Reference / LTC Input

- Analog Color Black or HD Tri-level sync
- LTC

Electrical Interface

- 2-lane PCIe 2.0

Machine Control

- RS-422, Sony 9-pin protocol
- 9-pin D-connector pinout is as follows:
 - 1 GND
 - 2 RX-
 - 3 TX+
 - 4 GND
 - 5 No Connection
 - 6 GND
 - 7 RX+
 - 8 TX-
 - 9 GNDShell GND

Size (w x d x h)

- 0.55" x 6.61" x 2.16" (13.97 x 167.89 x 54.86 mm)

Weight

- 0.3 lb (0.3 kg)

Environment

- Safe Operating Temperature: 0 to 40 C (32 to 104 F)
- Safe Storage Temperature (Power OFF): -40 to 60 C (-40 to 140 F)
- Operating Relative Humidity: 10-90% noncondensing
- Operating Altitude: <3,000 meters (<10,000 feet)

Appendix B – Safety & Compliance

Federal Communications Commission (FCC) Compliance Notices

Class B Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15, Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian ICES Statement

Canadian Department of Communications Radio Interference Regulations

This digital apparatus does not exceed the Class B limits for radio-noise emissions from a digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications. This Class B digital apparatus complies with Canadian ICES-003.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique respecte les limites de bruits radioélectriques visant les appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada. Cet appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada.

European Union and European Free Trade Association (EFTA) Regulatory Compliance

This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHTENSTEIN, NORWAY, SWITZERLAND

Declaration of Conformity

Marking by this symbol indicates compliance with the Essential Requirements of the EMC Directive of the European Union 2014/30/EU.



This equipment meets the following conformance standards:

Safety

EN 60065: 2014 (T-Mark License),

IEC 60065: 2014, (CB Scheme Report/Certificate)

Additional licenses issued for specific countries available on request.

Emissions

EN 55032: 2012, CISPR 32: 2015

EN 61000-3-2: 2014, EN 61000-3-3: 2013

Immunity

EN 55103-2: 2009, EN 61000-4-2:2009, EN 61000-4-3:2006 +A1:2008 +A2:2010,

EN 61000-4-4:2004+ A1:2010, EN 61000-4-5:2006, EN 61000-4-6:2009,

EN 61000-4-11:2004

Environments: E2, E3 and E4

The product is also licensed for additional country specific standards as required for the International Marketplace.



Warning! This is a Class B product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

Achtung! Dieses ist ein Gerät der Funkstörgrenzwertklasse B. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention! Ceci est un produit de Classe B. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

Recycling Notice



This symbol on the product or its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste for recycling, please contact your local authority, or where you purchased your product.

Korea KCC Compliance Statement

<p>B급 기기 (가정용 방송통신기자재)</p>	<p>이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.</p>
<p>Class B (Broadcasting Communication Equipment for Home Use)</p>	<p>As an electromagnetic wave equipment for home use (Class B), this equipment is intended to use mainly for home use and may be used in all areas.</p>

Taiwan Compliance Statement

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

This is a Class B product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438, Class B. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japan Compliance Statement

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

This is a Class B product based on the standard of the VCCI Council (VCCI 32: 2016). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Translated Warning and Caution Messages

The following caution statements, warning conventions, and warning messages apply to this product and manual.



Warning Symbol



Caution Symbol

Before Operation Please Read These Instructions



Warning! Read and follow all warning notices and instructions marked on the product or included in the documentation.

Avertissement! Lisez et conformez-vous à tous les avis et instructions d'avertissement indiqués sur le produit ou dans la documentation.

Warnung! Lesen und befolgen Sie die Warnhinweise und Anweisungen, die auf dem Produkt angebracht oder in der Dokumentation enthalten sind.

¡Advertencia! Lea y siga todas las instrucciones y advertencias marcadas en el producto o incluidas en la documentación.

Aviso! Leia e siga todos os avisos e instruções assinalados no produto ou incluídos na documentação.

Avviso! Leggere e seguire tutti gli avvisi e le istruzioni presenti sul prodotto o inclusi nella documentazione.



Warning! Do not use this device near water and clean only with a dry cloth.

Avertissement! N'utilisez pas cet appareil près de l'eau et nettoyez-le seulement avec un tissu sec.

Warnung! Das Gerät nicht in der Nähe von Wasser verwenden und nur mit einem trockenen Tuch säubern.

¡Advertencia! No utilice este dispositivo cerca del agua y límpielo solamente con un paño seco.

Aviso! Não utilize este dispositivo perto da água e limpe-o somente com um pano seco.

Avviso! Non utilizzare questo dispositivo vicino all'acqua e pulirlo soltanto con un panno asciutto.



Warning! Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

Avertissement! Ne bloquez aucune ouverture de ventilation. Suivez les instructions du fabricant lors de l'installation.

Warnung! Die Lüftungsöffnungen dürfen nicht blockiert werden. Nur gemäß den Anweisungen des Herstellers installieren.

¡Advertencia! No bloquee ninguna de las aberturas de la ventilación. Instale de acuerdo con las instrucciones del fabricante.

Aviso! Não obstrua nenhuma das aberturas de ventilação. Instale de acordo com as instruções do fabricante.

Avviso! Non ostruire le aperture di ventilazione. Installare in conformità con le istruzioni del fornitore.



Warning! Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

Avertissement! N'installez pas l'appareil près d'une source de chaleur telle que des radiateurs, des bouches d'air de chauffage, des fourneaux ou d'autres appareils (amplificateurs compris) qui produisent de la chaleur.

Warnung! Nicht in der Nähe von Wärmequellen wie Heizkörpern, Heizregistern, Öfen oder anderen Wärme erzeugenden Geräten (einschließlich Verstärkern) aufstellen.

¡Advertencia! No instale cerca de fuentes de calor tales como radiadores, registros de calor, estufas u otros aparatos (incluidos amplificadores) que generan calor.

Aviso! Não instale perto de nenhuma fonte de calor tal como radiadores, saídas de calor, fogões ou outros aparelhos (incluindo amplificadores) que produzam calor.

Avviso! Non installare vicino a fonti di calore come termosifoni, diffusori di aria calda, stufe o altri apparecchi (amplificatori compresi) che emettono calore



Warning! Unplug this device during lightning storms or when unused for long periods of time.

Avertissement! Débranchez cet appareil pendant les orages avec éclairs ou s'il est inutilisé pendant de longues périodes.

Warnung! Das Gerät ist bei Gewitterstürmen oder wenn es über lange Zeiträume ungenutzt bleibt vom Netz zu trennen.

¡Advertencia! Desenchufe este dispositivo durante tormentas eléctricas o cuando no se lo utilice por largos periodos del tiempo.

Aviso! Desconecte este dispositivo da tomada durante trovoadas ou quando não é utilizado durante longos períodos de tempo.

Avviso! Utilizzare soltanto i collegamenti e gli accessori specificati e/o venduti dal produttore, quali il treppiedi e l'esoscheletro.



Warning! Only use attachments and accessories specified and/or sold by the manufacturer.

Avertissement! Utilisez seulement les attaches et accessoires spécifiés et/ou vendus par le fabricant.

Warnung! Verwenden Sie nur Zusatzgeräte und Zubehör angegeben und / oder verkauft wurde durch den Hersteller.

¡Advertencia! Utilice solamente los accesorios y conexiones especificados y/o vendidos por el fabricante.

Aviso! Utilize apenas equipamentos/acessórios especificados e/ou vendidos pelo fabricante.

Avviso! Utilizzare soltanto i collegamenti e gli accessori specificati e/o venduti dal produttore.



Warning! Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been dropped.

Avertissement! Référez-vous au personnel de service qualifié pour tout entretien. L'entretien est exigé quand l'appareil a été endommagé de quelque manière que ce soit, par exemple lorsque le cordon d'alimentation ou la prise sont endommagés, que du liquide a été versé ou des objets sont tombés dans l'appareil, que l'appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement ou est tombé.

Warnung! Das Gerät sollte nur von qualifizierten Fachkräften gewartet werden. Eine Wartung ist fällig, wenn das Gerät in irgendeiner Weise beschädigt wurde, wie bei beschädigtem Netzkabel oder Netzstecker, falls Flüssigkeiten oder Objekte in das Gerät gelangen, das Gerät Regen oder Feuchtigkeit ausgesetzt wurde, nicht ordnungsgemäß funktioniert oder fallen gelassen wurde.

¡Advertencia! Consulte al personal calificado por cuestiones de reparación. El servicio de reparación se requiere cuando el dispositivo ha recibido cualquier tipo de daño, por ejemplo cable o espigas dañadas, se ha derramado líquido o se han caído objetos dentro del dispositivo, el dispositivo ha sido expuesto a la lluvia o humedad, o no funciona de modo normal, o se ha caído.

Aviso! Remeta todos os serviços de manutenção para o pessoal de assistência qualificado. A prestação de serviços de manutenção é exigida quando o dispositivo foi danificado mediante qualquer forma, como um cabo de alimentação ou ficha que se encontra danificado/a, quando foi derramado líquido ou caíram objectos sobre o dispositivo, quando o dispositivo foi exposto à chuva ou à humidade, quando não funciona normalmente ou quando foi deixado cair.

Avviso! Fare riferimento al personale qualificato per tutti gli interventi di assistenza. L'assistenza è necessaria quando il dispositivo è stato danneggiato in qualche modo, ad esempio se il cavo di alimentazione o la spina sono danneggiati, è stato rovesciato del liquido è stato rovesciato o qualche oggetto è caduto nel dispositivo, il dispositivo è stato esposto a pioggia o umidità, non funziona correttamente o è caduto



Warning! Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Avertissement! La sécurité de la prise polarisée ou de la prise de type mise à la terre ne doit en aucun cas être empêchée de fonctionner. Une prise polarisée a deux broches, l'une étant plus large que l'autre. Une prise de type mise à la terre a deux broches et une troisième broche pour la mise à la terre. La broche large ou la troisième broche sont fournies pour votre sécurité. Si la prise fournie ne s'insère pas dans votre prise femelle, consultez un électricien pour le remplacement de la prise femelle obsolète.

Warnung! Der Sicherheitszweck des gepolten bzw. Schukosteckers ist zu berücksichtigen. Ein gepolter Stecker verfügt über zwei Pole, von denen einer breiter als der andere ist. Ein Schukostecker verfügt neben den zwei Polen noch über einen dritten Pol zur Erdung. Der breite Pol bzw. der Erdungspol dienen der Sicherheit. Wenn der zur Verfügung gestellte Stecker nicht in Ihren Anschluss passt, konsultieren Sie einen Elektriker, um den veralteten Anschluss zu ersetzen.

¡Advertencia! No eche por tierra la finalidad del tipo de enchufe polarizado con conexión a tierra. Un enchufe polarizado tiene dos espigas, una más ancha que la otra. Un enchufe con conexión a tierra tiene dos espigas iguales y una tercera espiga que sirve para la conexión a tierra. La espiga ancha, o la tercera espiga, sirven para su seguridad. Si el enchufe suministrado no encaja en el tomacorriente, consulte con un electricista para reemplazar el tomacorriente obsoleto.

Aviso! Não anule a finalidade da segurança da ficha polarizada ou do tipo ligação terra. Uma ficha polarizada tem duas lâminas sendo uma mais larga do que a outra. Uma ficha do tipo de ligação à terra tem duas lâminas e um terceiro terminal de ligação à terra. A lâmina larga ou o terceiro terminal são fornecidos para sua segurança. Se a ficha fornecida não couber na sua tomada, consulte um electricista para a substituição da tomada obsoleta.

Avviso! Non compromettere la sicurezza della spina polarizzata o con messa a terra. Una spina polarizzata ha due spinotti, di cui uno più largo. Una spina con messa a terra ha due spinotti e un terzo polo per la messa a terra. Lo spinotto largo o il terzo polo sono forniti per motivi di sicurezza. Se la spina fornita non si inserisce nella presa di corrente, contattare un elettricista per la sostituzione della presa obsoleta.



Warning! Since the Mains plug is used as the disconnection for the device, it must remain readily accessible and operable.

Avertissement! Puisque la prise principale est utilisée pour débrancher l'appareil, elle doit rester aisément accessible et fonctionnelle.

Warnung! Da der Netzstecker als Trennvorrichtung dient, muss er stets zugänglich und funktionsfähig sein.

¡Advertencia! Puesto que el enchufe de la red eléctrica se utiliza como dispositivo de desconexión, debe seguir siendo fácilmente accesible y operable.

Aviso! Dado que a ficha principal é utilizada como a desconexão para o dispositivo, esta deve manter-se prontamente acessível e funcional.

Avviso! Poiché il cavo di alimentazione viene usato come dispositivo di sconnessione, deve rimanere prontamente accessibile e operabile.



Warning! Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device.

Avertissement! Protégez le cordon d'alimentation pour que l'on ne marche pas dessus ou qu'on le pince, en particulier au niveau des prises mâles, des réceptacles de convenance, et à l'endroit où il sort de l'appareil.

Warnung! Vermeiden Sie, dass auf das Netzkabel getreten oder das Kabel geknickt wird, insbesondere an den Steckern, den Steckdosen und am Kabelausgang am Gerät.

¡Advertencia! Proteja el cable de energía para que no se le pise ni apriete, en especial cerca del enchufe, los receptáculos de conveniencia y el punto del que salen del equipo.

Aviso! Proteja o cabo de alimentação de ser pisado ou de ser comprimido particularmente nas fichas, em tomadas de parede de conveniência e no ponto de onde sai do dispositivo.

Avviso! Proteggere il cavo di alimentazione in modo che nessuno ci cammini sopra e che non venga schiacciato soprattutto in corrispondenza delle spine e del punto in cui esce dal dispositivo.



Warning! Disconnect the external AC power supply line cord(s) from the mains power before moving the unit.

Avertissement! Retirez le ou les cordons d'alimentation en CA de la source d'alimentation principale lorsque vous déplacez l'appareil.

Warnung! Trennen Sie die Wechselstrom-Versorgungskabel vom Netzstrom, bevor Sie das Gerät verschieben.

¡Advertencia! Cuando mueva la unidad desenchufe de la red eléctrica el/los cable(s) de la fuente de alimentación CA tipo brick.

Advertência! Remova os cabos CA de alimentação brick da rede elétrica ao mover a unidade.

Avvertenza! Scollegare il cavo dell'alimentatore quando si sposta l'unità.

Warranty and Liability Information

AJA VIDEO SYSTEMS, INC.

Limited Warranty on Hardware

AJA Video Systems, Inc. (AJA Video) warrants that the hardware product, not including storage modules or software components, will be free from defects in materials and workmanship for a period of three (3) years from the date of purchase. AJA Video warrants that the storage modules provided as part of the hardware product will be free from defects in materials and workmanship for a period of one year from the date of purchase. AJA Video provides a separate software warranty as part of the license agreement applicable to software components.

If a hardware product or storage module (hereafter, a “product”) proves to be defective during the applicable 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.

To obtain service under this warranty, the Customer must notify AJA Video of the defect before expiration of the warranty period and make suitable arrangements for the performance of service by contacting AJA Video support through the channels set forth on the support contacts web page at <http://www.aja.com/support>. Except as stated, the Customer shall bear all shipping, packing, insurance and other costs, excluding parts and labor, to effectuate repair. Customer shall pack and ship the defective product to a service center designated by AJA Video, with shipping charges prepaid. AJA Video shall pay to return the product to Customer but only if to a location within the country in which the AJA Video service center is located.

This warranty shall not apply to any defect, failure or damage caused by negligent, inadequate or improper use, handling or maintenance. Without limiting the foregoing, AJA Video shall not be obligated to furnish service under this warranty or repair any damage or malfunction a) resulting from attempts by personnel other than AJA Video representatives to install, repair or service the product, b) resulting from improper use or connection to incompatible equipment, c) caused by the use of non-AJA Video parts or supplies, d) if the product 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, or e) resulting from being dropped or otherwise subjected to undue force, exposure to moisture or other corrosive or conductive substances, exposure to strong magnetic fields, use with improperly regulated power supplies, exposure to electric shock, use in temperatures outside the specified operating range, or otherwise failing to treat the product in accordance with the standard of care appropriate to sensitive and delicate electronic equipment.

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Limitation of Liability

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Governing Law and Language; Your Rights.

This limited warranty is the only warranty provided by AJA Video on the hardware product. It supersedes all prior or contemporaneous understandings regarding such subject matter. No amendment to or modification of this warranty will be binding unless in writing and signed by AJA Video. The laws of the State of California, USA will govern this warranty and any dispute arising from it. Any translation of this Agreement is intended for convenience and to meet local requirements and in the event of a dispute between the English and any non-English versions, the English version of this warranty will govern. This limited warranty gives you specific legal rights and you may have other rights that vary from jurisdiction to jurisdiction, some of which are noted above.

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