KONA HDMI

Four Channel HDMI Capture

HDMI 1   HDMI 2   HDMI 3   HDMI 4

Installation and Operation Manual

AJA
VIDEO SYSTEMS

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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

AJA's KONA HDMI card brings the highest quality HDMI capture of video and audio to computers running Mac, Windows or Linux Operating Systems. The AJA KONA HDMI card can simultaneously capture two channels of HDMI 2.0 video (up to 4K/UltraHD p60), up to four channels of HDMI 1.4b video (up to 2K/HD p60), or combinations of both formats, depending on the controlling application used. SD HDMI video is also supported.

KONA HDMI Features

- Standard PCIe form factor
- Four full size HDMI inputs
- HDMI 2.0 and 1.4b formats for broadcast supported
- HDR material can be captured / passed-through with AJA Control Room (including using PS4 Pro as a source for up to 4K/UltraHD p60 HDR content)
- Each HDMI port supports up to 8 channels of embedded audio
- Application Support:
  - AJA Control Room (single channel capture)
  - Adobe Premiere Pro CC
  - Avid Media Composer
  - Wirecast (multichannel switching and capture)
  - vMix (multichannel switching and capture)
  - DirectShow (Windows applications multichannel capture)
  - V4L2 (Windows applications multichannel capture)

Input / Capture Capabilities

AJA Control Room

- Single channel ingest of up to 4K/UltraHD p60 on either port 1, or port 2.
- Single channel ingest of up to 2K/HD p60 on any port 1 through 4.
- HDR material can be captured / passed-through (including using PS4 Pro as a source for 4K/UltraHD p60 HDR content).

Telestream Wirecast

- Single, Dual, Triple or Quad channel ingest of up to 2K/HD p60 on ports 1-4
- Single channel ingest of up to 4K/UltraHD p60 on either port 1, or port 2.

- Dual channel ingest of up to 4K/UltraHD p60 on port 1, and up to 4K p30 on port 2 (or vice versa).
- Mixed channel ingest of up to 4K/UltraHD p60 on channel 1, together simultaneously with two channels of up to 2K/HD p60 on channels 2-4.

NOTE: *KONA HDMI cards are configured for Wirecast using the AJA Multi-Channel Configuration application, not the AJA Control Panel application.*

To change between the above ingest configurations, you will need to create different set ups using the AJA MultiChannel Config Application (installed with the AJA software package for KONA HDMI). For example, if you want to change from capturing all four HDMI inputs to capturing one 4K/UltraHD p60 signal on port 1 and 2K/HD signals on ports 2 and 3, you need to stop capturing, set up channels on ports 1, 2, and 3 differently, and then resume capturing in the new configuration.

NOTE: *The above combinations are available for AJA SDK developers, V4L2 developers and DirectShow developers and their customers.*

AJA Software & Utilities

AJA's KONA software and hardware were developed for powerful integrated video/audio capture, editing, and production with a variety of software, including AJA MultiChannel Config, AJA Control Panel, AJA Control Room, Telestream's Wirecast, plus developer supported applications such as vMix and others. 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 Multi-Channel Config

AJA's multi channel configuration tool for use with Telestream's Wirecast application.

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 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 provides a dedicated plug-in for Telestream Wirecast which is included when you install the desktop software package.

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 your software vendor's support pages for GPU recommendations and additional hardware requirements and recommendations.*

AJA recommends:

- Mac OS 10.12 Sierra or later (including 10.15 Catalina)
- 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 HD
- 3.5 GHz eight core minimum, faster processors and more cores recommended, for UltraHD/4K workflows, especially with high frame rate
- 16GB RAM minimum, 32GB or more recommended, especially for UltraHD/4K or 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:
  - NvidiaK5200
  - 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 7*.

Cable Connections

KONA HDMI Connectors

The KONA HDMI endplate provides four full size HDMI connectors.
- HDMI port 1 = up to 4K/UltraHD p60 (also capable of 2K/HD and SD)
- HDMI port 2 = up to 4K/UltraHD p60 (also capable of 2K/HD and SD)
- HDMI port 3 = up to 2K/HD p60 (also capable of SD)
- HDMI port 4 = up to 2K/HD p60 (also capable of SD)

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 AJA device 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

Figure 1. KONA HDMI 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. Remove the power cable from the back of the chassis.
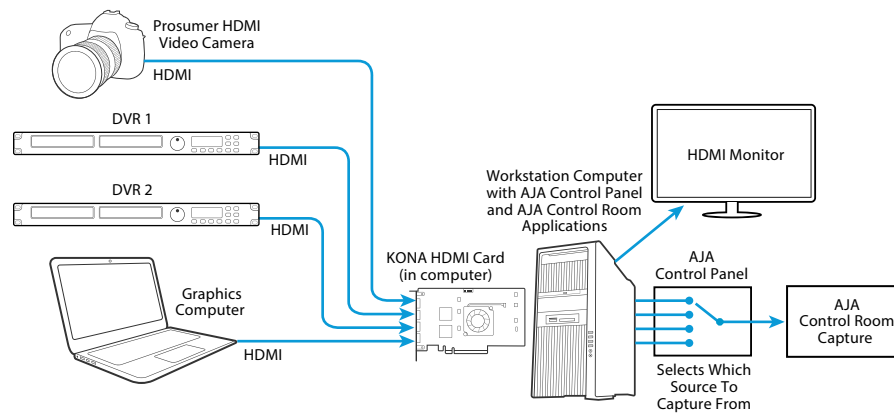
3. Open the chassis.

4. Locate a recommended PCIe slot (see the AJA website for slot selection instructions).

5. Remove the backplate from the PCIe slot.

6. Touch the chassis to discharge any body static.

7. Remove the KONA card from its anti-static bag.

8. Carefully insert the card by rocking it slowly into the slot. Ensure the card aligns properly with the slot opening and is fully seated.

9. Secure the card in the chassis.

10. Close the chassis.

11. 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 HDMI Cable Connections

Example 1: KONA HDMI Digital Video Capture with AJA Control Room
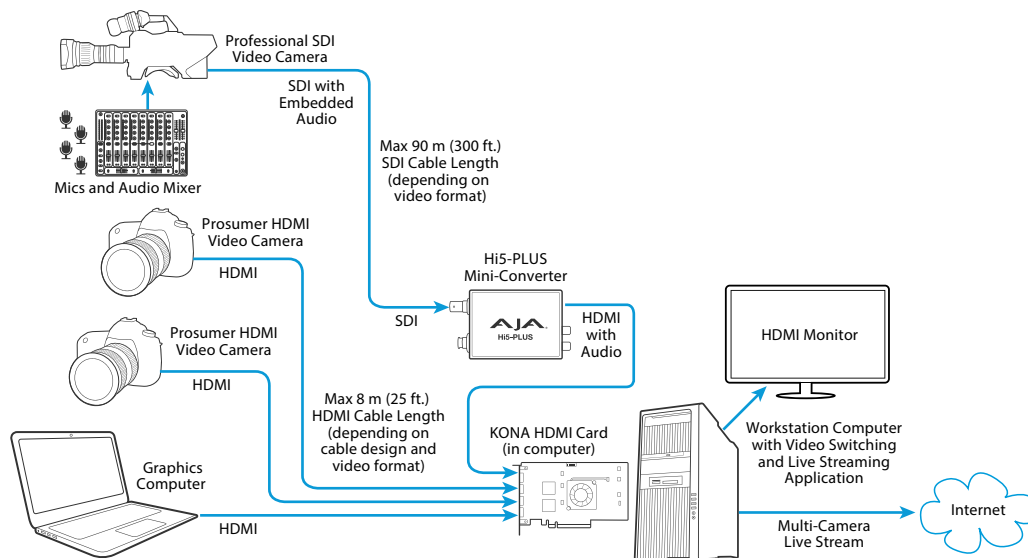

Connect up to four HDMI sources, and then use AJA Control Panel to instantly select which source to capture using AJA Control Room.

NOTE: *AJA Control Room cannot monitor or playback embedded HDMI audio though the KONA HDMI card (the card has only inputs). However, the audio is captured along with the video, and / or passed through to your software of choice.*
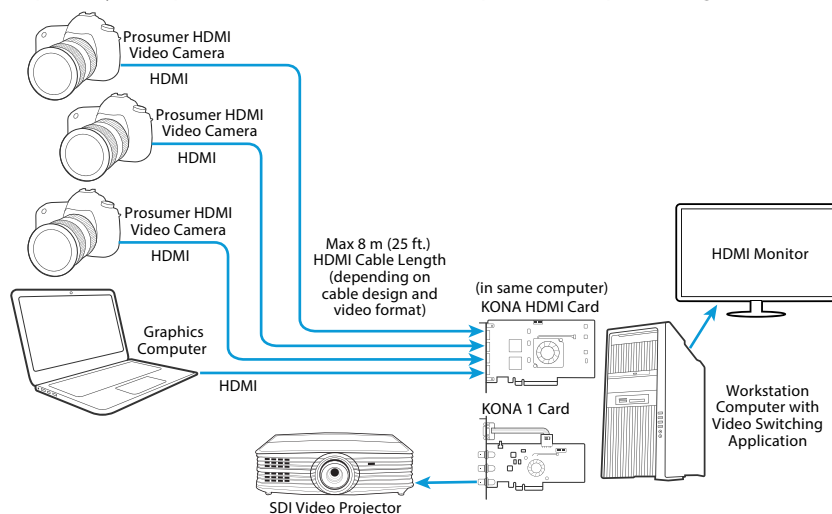
Example 2: KONA HDMI Multi-Camera Live Stream

Professional SDI
Video Camera

SDI with
Embedded
Audio

Mics and Audio Mixer

Max 90 m (300 ft.)
SDI Cable Length
(depending on
video format)

Prosumer HDMI
Video Camera

HDMI

Hi5-PLUS
Mini-Converter

Prosumer HDMI
Video Camera

HDMI

SDI

AJA
Hi5-PLUS

HDMI
with
Audio

HDMI Monitor

Max 8 m (25 ft.)
HDMI Cable Length
(depending on
cable design and
video format)

KONA HDMI Card
(in computer)

Workstation Computer
with Video Switching
and Live Streaming
Application

Graphics
Computer

HDMI

Internet

Multi-Camera
Live Stream

Use a variety of HDMI sources from the same clock family (e.g. p30 with p60, or p25 with p50), to provide up to four streams of live content delivered to the application of your choice via KONA HDMI. With a video switching and live streaming application (i.e. Wirecast or vMix), you can connect up to four HDMI sources with an installed KONA HDMI card and then live switch between all four sources for a live stream. In this example, the application (or full screen output thereof) are being fed to the HDMI monitor via the host computers GPU, while the show is also bring streamed.
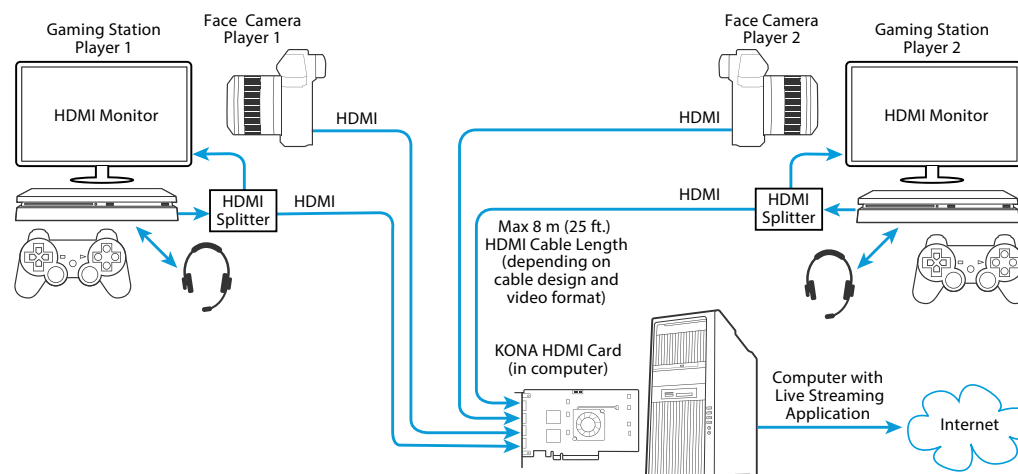
Example 3: KONA HDMI with KONA 1 Multi-Camera Live Event

Multiple AJA cards in the same Mac, PC or thunderbolt chassis can be used with multi-channel switching / capture softwares such as Wirecast and vMix. This expands your options in terms of different input and output configurations.

Prosumer HDMI
Video Camera

HDMI

Prosumer HDMI
Video Camera

HDMI

Prosumer HDMI
Video Camera

HDMI

Max 8 m (25 ft.)
HDMI Cable Length
(depending on
cable design and
video format)

(in same computer)
KONA HDMI Card

HDMI Monitor

Graphics
Computer

HDMI

KONA 1 Card

Workstation
Computer with
Video Switching
Application

SDI Video Projector

With a video switching application, you can connect up to four HDMI sources with an installed KONA HDMI card, live switch between all four sources, and send the video to a projector using a KONA 1 card installed in the same computer.

Example 4: KONA HDMI Two Gamers Live Stream

Stream or record both gameplay and face cameras for two players using a single KONA HDMI card.

NOTE: *PS4 Pro and other HDR capable consoles will identify the KONA HDMI card as a valid sink for HDR, meaning HDR gameplay can either be passed-through, and / or captured.*

Installing KONA HDMI Software

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

Download

Go to the AJA website and download the latest KONA HDMI 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 HDMI 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 HDMI This will prevent any hardware or software conflicts.*

Software Package Installation and Re-installation

Before installing the KONA HDMI software package, ensure that your capture/ editing application is installed as detailed in its user documentation. You cannot use KONA HDMI 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 HDMI 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.

AJA Desktop Software firmware and software versions are tightly integrated. If back-revving to an earlier version, for example, you may be prompted to update your firmware to match; i.e. update your AJA device to an earlier version of the firmware than you currently have 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 kernal 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.
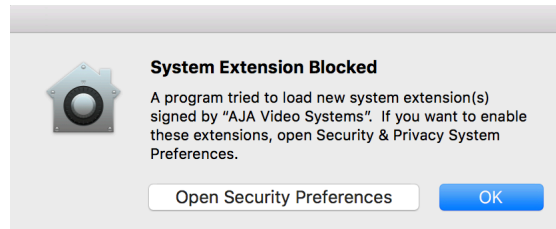
Earlier MacOS to High Sierra Update

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.

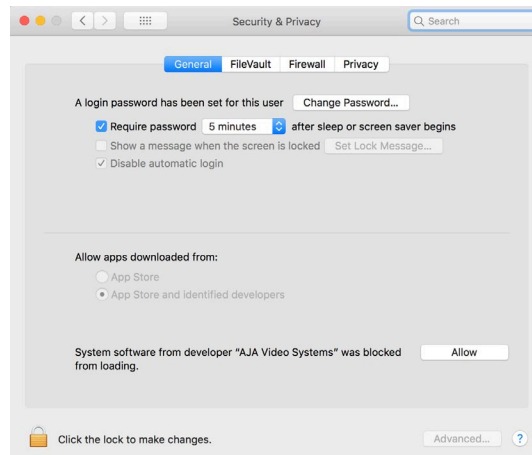### MacOS High Sierra First AJA Desktop Software Install

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 2. 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 3. MacOS High Sierra System Preferences, Allow Developer

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

KONA HDMI Developer Information

AJA SDK – for macOS, Windows, Linux

You need to be an existing AJA Developer or otherwise go through application process. Contact "Sales@AJA.com" to begin the application process.

V4L2 – for Linux

Compile the AJA V4L2 driver components per desired platform (Ubuntu / CentOS). Downloads and instructions are available at:

https://github.com/aja-video/ntv2-v4l2

Directshow – for Windows

Directshow Filters are available at:

https://www.aja.com/support/directshow

Capture Formats using AJA Control Room

When capturing, you can record data in the following file formats:
- BMP
- DPX
- MOV (QuickTime)

NOTE: Support by KONA of QuickTime for Windows has been discontinued.

- MXF
- TGA

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 parameters and define the video processing that will be performed.

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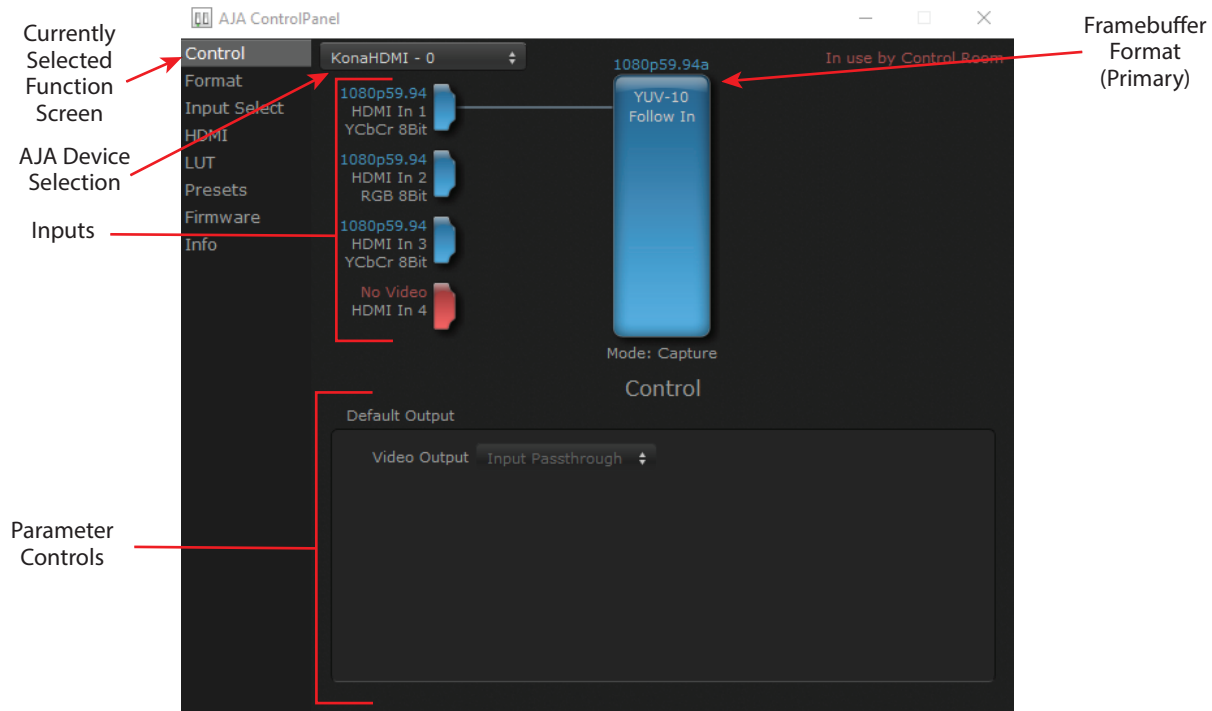
AJA Control Panel User Interface

The AJA Control Panel user interface includes a visual block diagram of the unit's current configuration. The current status, input 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.

Unlike most other AJA PCIe cards and Thunderbolt devices, KONA HDMI is a capture-only card. As such, only the left side of the block diagram (showing inputs) is active and there will be no outputs shown on the right side of the block diagram. To add more inputs or outputs, add an additional AJA I/O device to your host CPU.

NOTE: AJA Control Panel can only capture one signal at a time from KONA HDMI. You can connect more than one source simultaneously (across ports 1-4), but you can select only one one of these sources for capture.

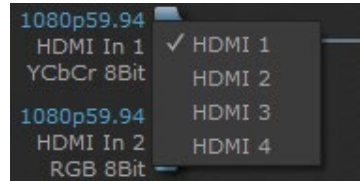*Figure 4. AJA Control Panel, Block Diagram and Controls*

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, reference source, and system status. Lines show a video path. Where there are no lines, there is no connection.

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 5. 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

HDMI Input Icons

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

Figure 6. HDMI Input 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.
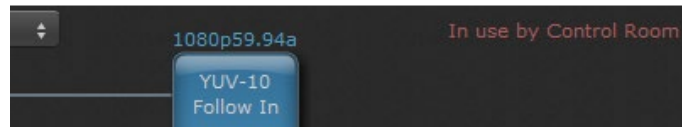
Primary Format

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 receive from the AJA hardware.

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.
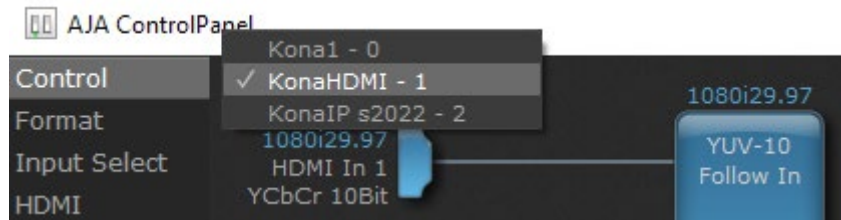
Figure 7. Control Panel In Use Message (in red)

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 8. 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.

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 29* 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/

Windows Preset Files Storage Location

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

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\<USER_NAME>\AppData\Local\aja\com.aja.devicesettings

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 copies or moves 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.*

Control Recommendations

We recommend you have AJA Control Panel running and visible at all times. When AJA 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 and what they are used for.
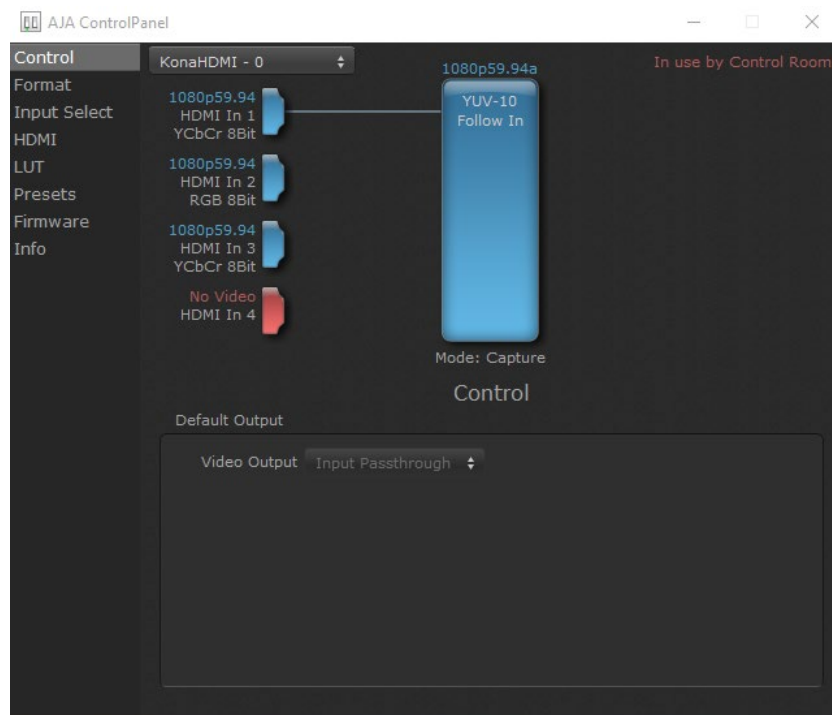
Table 1. KONA HDMI Function Screens

Screen	Functions
Control	Configure some basic KONA operation options.
Format	Select the framebuffer primary video format.
Input Select	View and edit input selections and audio mapping.

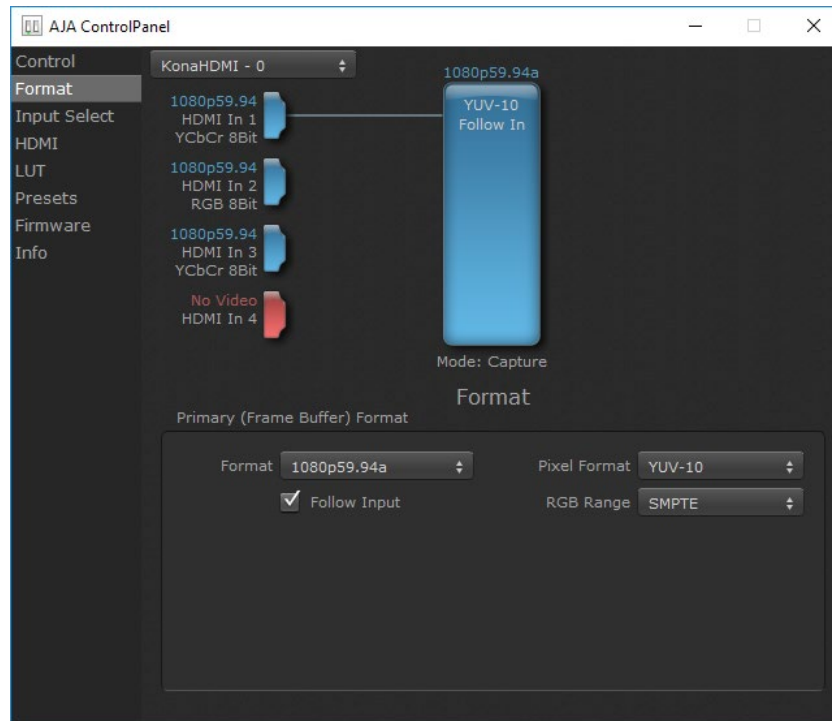| Screen	Functions
HDMI	Select the audio channels and RGB range of the HDMI inputs.
LUT	Configure Look Up Table values (RGB only).
Presets	Add or delete saved preset configurations (handy for quick and easy recall of different KONA HDMI settings for varied workflows).
Firmware	Install firmware from your 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 Control screen for KONA HDMI has no active controls, because this card has no outputs.

Format Screen

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

Primary (Frame Buffer) Format

Format

This pull-down menu shows the currently selected format.

If you select an alternate value in the Primary Format using the pull-down, it will change the format used by KONA HDMI's framebuffer.

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.
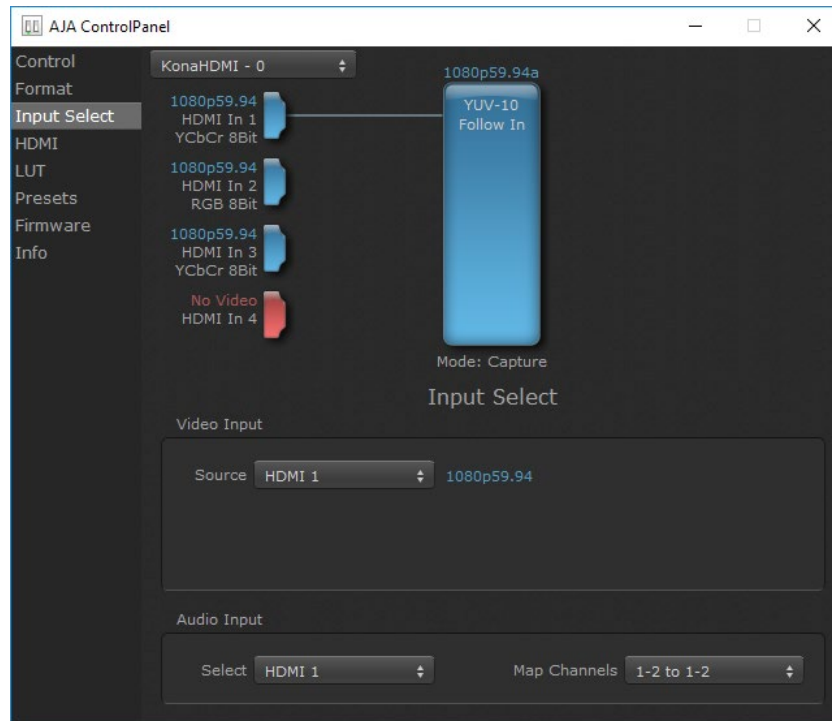
Pixel Format

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.

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.

Video Input

Source

This pulldown menu allows you to see and change the currently selected video source. Choose from:

- HDMI 1, HDMI 2, HDMI 3, or HDMI4
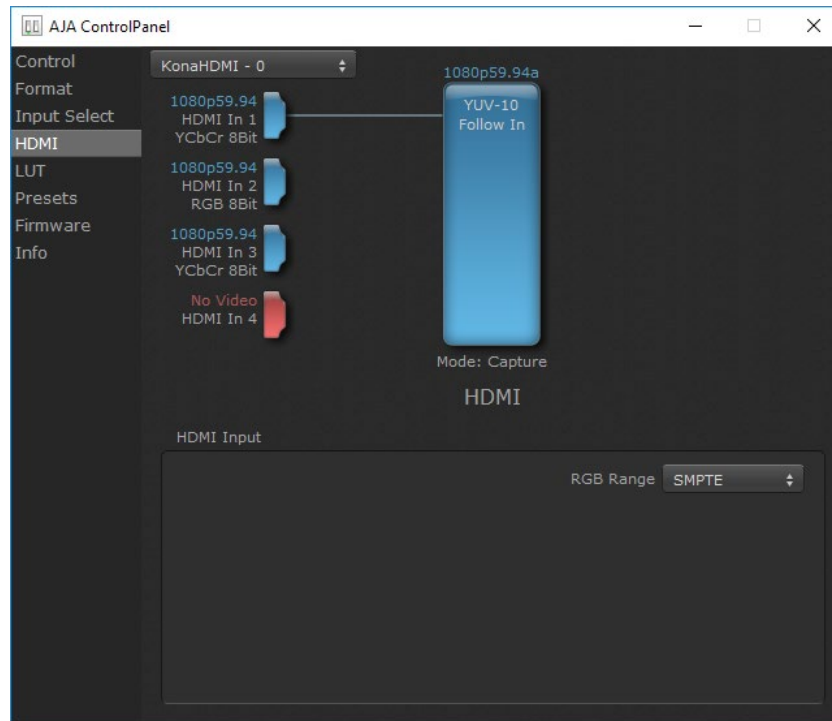
Audio Input

Select

This pulldown menu allows you to choose the currently selected audio source. Choose from:

- HDMI 1, HDMI 2, HDMI 3, or HDMI 4

Map Channels

This setting controls which two of the eight HDMI embedded audio channels will be used by an application configured for only two audio channels.

HDMI Screen

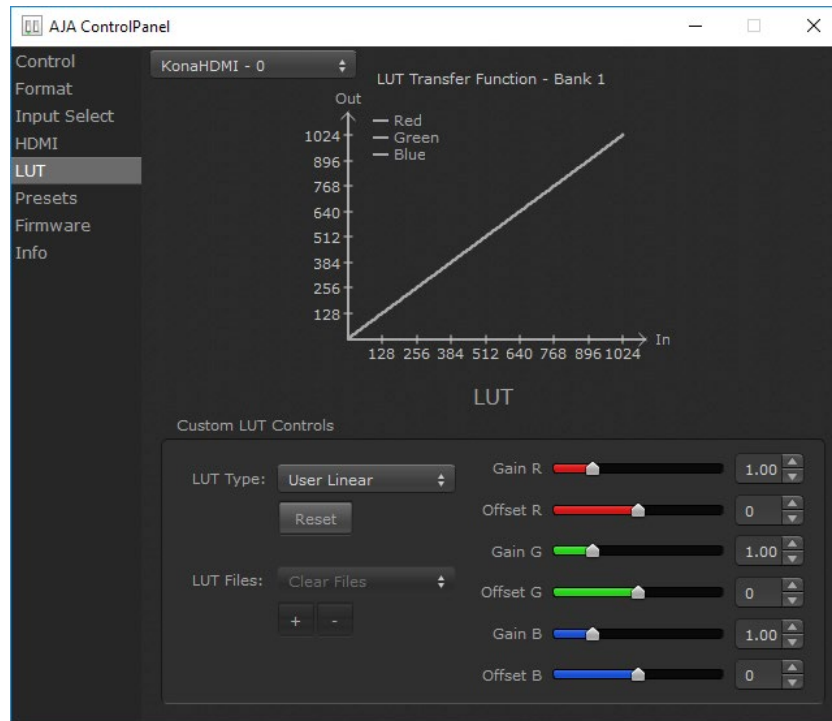The HDMI Screen lets you select the RGB Range.

HDMI Input

RGB Range

Choose from:

- SMPTE
- Full

LUT Screen

This screen lets you control RGB look up table (LUT) color conversion. You can let KONA HDMI automatically apply LUT conversion as appropriate, or you can load and adjust LUT data to meet your requirements. The frame buffer must be set to RGB (Format screen, Pixel Format) to enable, apply, and adjust LUT conversions.

NOTE: KONA HDMI also uses a hardware based color-space converter in conjunction with the LUT.

LUT Transfer Function

The upper right side of the LUT screen displays an approximate representation of the Red, Green, and Blue curves of the current transfer function.

NOTE: The LUT Transfer Function display may not always be an accurate representation of the color conversion being applied. For example, if other parameters are not set correctly, you may be able to change the curves on the screen but that conversion is not applied to the output until the parameters are adjusted correctly.

LUT Type

Select the type of LUT. Choose from

Auto (default)

When the Frame Buffer is set to **RGB** and LUT Type is set to **Auto** the type of LUT automatically loaded is determined by the video format and how the SDI video output(s) are configured.

- For SD format and YUV output the LUT is automatically loaded with a REC601 gamma.
- For HD format and YUV output: the LUT is automatically loaded with a REC709 Gamma.

- For HD format and RGB output (e.g. dual link RGB), the LUT is automatically loaded with linear since both the buffer and output are both RGB (1:1).
- For an RGB source and RGB output, and for a YUV source and YUV output the LUT will be linear because no conversion is taking place.
- For an RGB source and a YUV output (common if receiving files from an animator or motion graphics artist), and vice versa, then Auto will apply the proper curve to enable this (along with a color space conversion)

Linear

Forces a straight linear transfer function.

SMPTE->FullRange

Forces a SMPTE to Full Range transfer function.

FullRange->SMPTE

Forces a Full Range to SMPTE transfer function.

User Linear

On first use, sets a linear transfer function and activates the Gain and Offset sliders on the right, permitting individual Red, Green, and Blue color adjustments. These settings are retained if you select another LUT type and then return to this setting.

User Film Stream

Similar to User Linear, above but sets a film style transfer function that can be adjusted with the Gain and Offset sliders.

User LUT File

Activates the LUT Files controls, allowing the loading of a custom LUT .txt file. See *"User Defined LUTs" on page 27*.

Reset Button

Returns the settings of the currently selected LUT type to their default values.

Gain and Offset Sliders

When a User setting is selected, individual sliders for Gain and Offset for Red, Green, and Blue are activated.

User Defined LUTs

Users can 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. 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 (see *"LUT File Format Specification" on page 28*).

Uploading A 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 frame buffer format. Go to the Format screen and adjust the Pixel Format.

2. Open AJA Control Panel and select the "LUT" screen.

3. Click the "LUT Type" popup and choose "User LUT File". LUT Files options become enabled.

4. Click the "+" button and use the navigation dialog to choose a custom LUT file. The file is loaded and the LUT will be applied, if it is properly formatted.

LUT File Format Specification

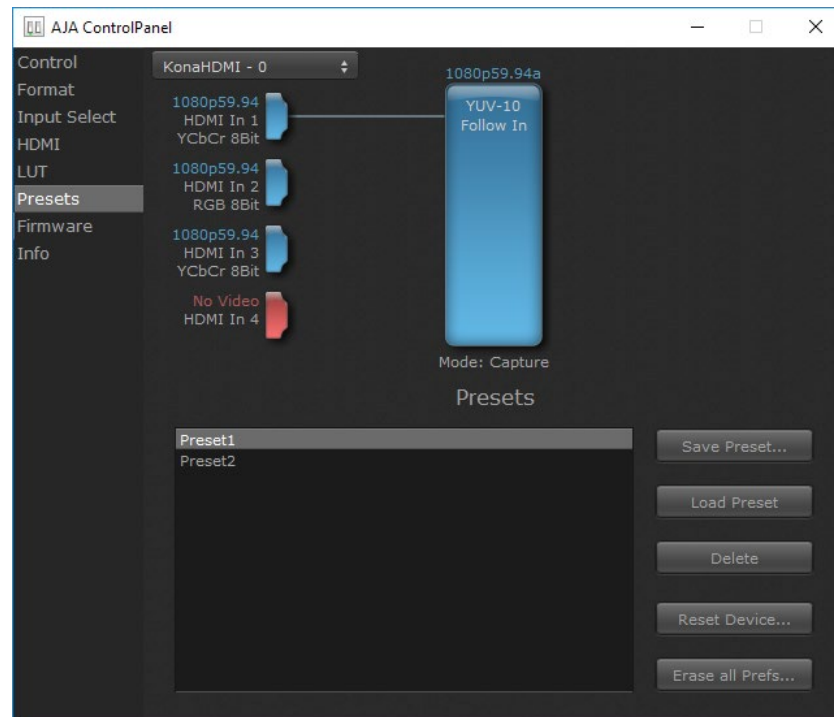LUT files are normal text files that contain 1025 lines (numbered 0 - 1024).

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 different 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.

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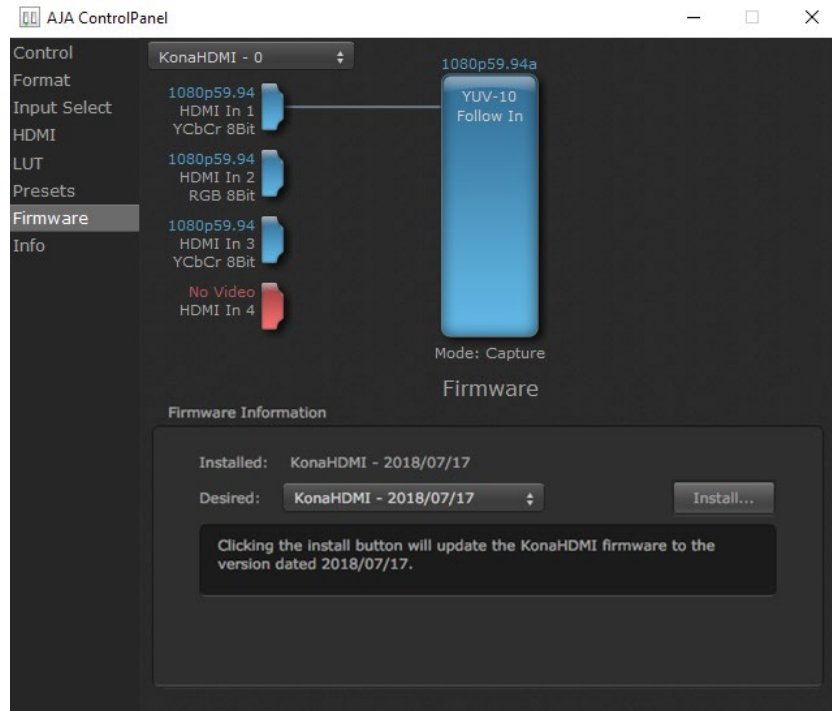
- If a Default Global Preference is found, it is loaded and the device is set to this state.
- If a Default Global Preference file is not found, "factory defaults" are loaded and the device is set to this state.

NOTE: See *"Default Preferences" on page 20* 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 Use Preference file with the changed settings.
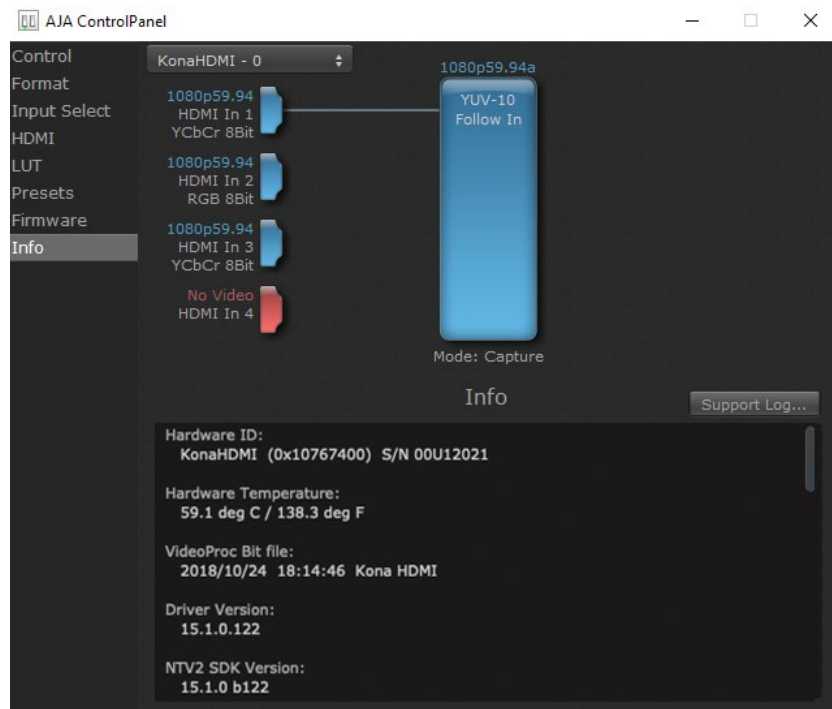
Firmware Screen

Use the Firmware screen to access the firmware install screen. Click install to erase current firmware and load the firmware version contained in your current driver installation.

You will be required to power-cycle your KONA HDMI and computer to finish the update.

See *"Firmware Update Procedure" on page 14* 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 HDMI Tech Specs

Video formats

- (4K) 4096 x 2160P 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (UltraHD) 3840 x 2160P 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (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

- Single stream 4K/UltraHD* with HFR support up to 60p, 4:2:2, 10-bit
  - HDMI 2.0, port 1 or 2
  - 30/36 bits/pixel, RGB or YUV, 6 Gbps per color component
- Quad, triple, dual or single stream 2K/HD/SD** with HFR support up to 60p, 4:2:2, 10-bit
  - 30/36-bits/pixel, RGB or YUV, 2.25 Gbps
- Dual stream 4K/UltraHD** with up to 1x 60p and 1x 30p, 4:2:2, 10-bit
  - HDMI 2.0, port 1 or 2 only
  - 30/36-bits/pixel, RGB or YUV, 6 Gbps per color component
- Mixed stream** supporting 1x 4K/UltraHD and 2x 2K/HD/SD with HFR support up to 60p, 4:2:2, 10-bit
  - 1x 4K/UltraHD via port 1 only
    - 30/36-bits/pixel, RGB or YUV, 6 Gbps per color component
  - 2x 2K/HD via any other ports
    - 30/36-bits/pixel, RGB or YUV, 2.25 Gbps

*Using AJA Control Room or appropriate third party switching/capture software

**Using appropriate third party switching/capture software

Audio Input Digital

- 8-Channel, 16 and 24-bit HDMI embedded audio, 48 kHz sample rate, synchronous per HDMI Input
- Single stream input supports up to 8-Channels
- Quad stream input supports up to 32-Channels

Electrical Interface

- 8-lane PCIe 2.0

Size (w x d x h)

- 0.75" x 6.5" x 5.0" (19.05 x 165.1 x 127.00 mm)

Weight

- 0.3 lb (0.2 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

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

CE 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 + AC: 2013, 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

B급 기기 (가정용 방송통신기자재)	이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.
Class B (Broadcasting Communication Equipment for Home Use)	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.

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 éclairsou 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 expiga 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 rimane 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 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 the Customer brings a valid claim under this limited warranty for a hardware product or storage module (hereafter, a "product") during the applicable warranty period, AJA Video will, at its sole option and as the Customer's sole remedy for breach of the above warranty, provide one of the following remedies:

- Repair or facilitate the repair the product within a reasonable period of time, free of charge for parts and labor.
- Replace the product with a direct replacement or with a product that performs substantially the same function as the original product.
- Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

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 https://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. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATIONS ON APPLICABLE STATUTORY RIGHTS OF A CONSUMER, SO SOME OR ALL OF THE TERMS OF THIS PARAGRAPH MAY NOT APPLY TO YOU.

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