

Hi5-3D Mini-Converter

3D HD-SDI Multiplexer



Installation and Operation Guide

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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

The Hi5-3D is a 3D video multiplexer that combines two HD-SDI Inputs into various multiplexed 3D formats for output on HDMI 1.4a and HD-SDI. Non-3D input (SD-SDI, HDSDI) at either input will be passed to the HDMI output.

The HDMI 1.4a output supports EDID transactions that allow automatic 2D/3D configuration per the HDMI monitor's capabilities. Input SDI 2 will be frame synchronized to input SDI 1 in 3D Modes.

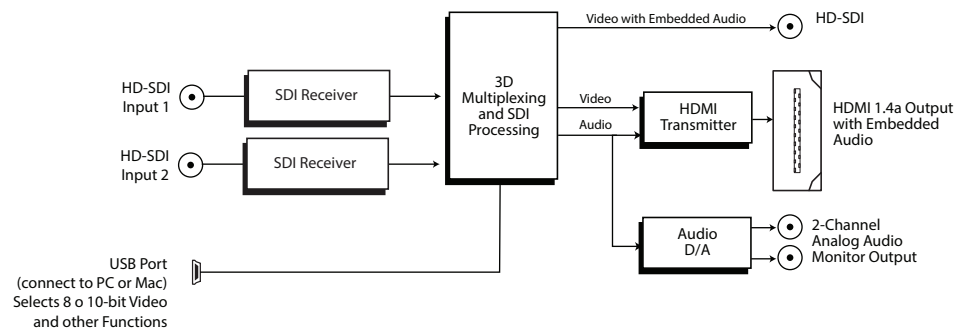
Embedded SDI input audio is embedded in both the HDMI and SDI outputs. 2 channel RCA audio output is also supported with user control of channel selection. The Hi5-3D supports AJA's Mini-Config application for user configuration and firmware download.

Features

- HD-SDI to HDMI 1.4a with additional SDI output
- Non-3D SD/HD-SDI passed to HDMI output
- 10-bit HDMI 1.4a support including 3D and embedded audio
- Frame-sync mode for HD formats: the right eye will be frame synchronized to the left eye.
- Anaglyph mode for calibrating 3D camera rigs (only luma data preserved)
- The left and right SDI inputs can be swapped using AJA's Mini-Config application and/or the Hi5-3D physical dipswitch controls.
- Additional 2-Channel RCA jack audio output
- Setup via DIP switch or PC/Mac using USB port and supplied USB cable (Mini-Config configuration software application available via download from AJA website)
- Uses universal input +5V power supply AJA model DWP-U-R1 (included)
- 5 year warranty

Block Diagram

Figure 1. Hi5-3D Converter, Simplified Block Diagram



3D Modes Supported

The Hi5-3D supports, depending on the video format, “side-by-side”, “top-bottom”, and “frame-packing” 3D modes. The “side-by-side” and “top-bottom” modes involve compressing, either horizontally or vertically, each input for combining into a single video stream at the same rate of the inputs.

The “frame-packing” mode stacks two full resolution inputs into a “tall” frame (at twice the clock and line rates). When selected, “frame-packing” works only with the following formats: 1080p23.98, and 1080p24. (Frame-packed mode does not support psf inputs at this time.) When operating in frame-packing mode, the SDI output will be black; the valid output is the HDMI connector.

Each input, in addition to 3D processing, can be flipped either horizontally, vertically, or both. This control is provided by 4 switches that can be engaged in any combination—or by use of the supplied AJA Mini Config software (Mac/PC).

NOTE: The Flip function is only active when in 3D mode and does not apply for pass-through of SDI inputs.

Format Support

The Hi5-3D works with both 2D and 3D inputs. When in the 2D mode, the input is simply passed to the output unmodified—or flipped (via dipswitch or Mini Config software selection). In the 3D mode, the Hi5-3D supports the required 3D modes as defined by the CEA for HDMI 1.4a televisions.

CEA Required 3D modes:

2xSDI	1.5Gb	720p50/59.94/60	T/B
2xSDI	1.5Gb	1080p23.98/24	T/B, FP
2xSDI	1.5Gb	1080psf23.98/24	T/B, FP
2xSDI	1.5Gb	1080i50/59.94	S/S

NOTE: “psf” inputs are converted to “p” for HDMI and SDI output.

The SDI output can support S/S and T/B formats only.

Future software versions may add other frame rates.

When a 525 or 625 source is on both inputs, the Hi5-3D will only output one of the sources, defaulting to Input 1. In the absence of Input 1, it will output Input 2. There are no 3D modes with SD sources; output is simply passed through.

I/O Connections

Figure 2. Hi5-3D Converter



NOTE: The LOCK LED indicates valid input video by color. Off is no signal, green is SD video, red is HD video.

Installation

Typically, Hi5-3D installation consists of the following steps:

1. Ensure the Hi5-3D is disconnected from power.
2. Connect video equipment to the converter BNCs and HDMI connector.
3. Connect audio equipment to RCA connectors (optional).
4. Apply power to the converter (AJA power supply included).
5. The Hi5-3D will now run using the default factory settings. If you wish to alter the factory settings, you'll need to install the AJA Mini Config software on a computer, attach the Hi5-3D via USB to the computer, and then make your changes. This process is detailed on the following pages.

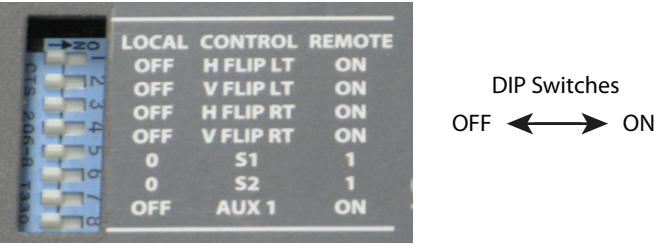
Chapter 2 – Operation

DIP Switch Settings

Eight DIP switches are located on the bottom of the unit. The default shipping position for these switches is Off (left). By default, DIP switch configuration is enabled, and Mini-Config control is disabled.

The DIP switch label identifies the functions of the switch positions.

Figure 3. Hi5-3D DIP Switches



Two Sets of DIP Switch Settings According to Firmware Version

There are two sets of DIP switch behaviors described below that correspond to firmware versions 3.2 and earlier, and 3.3. Please take note of which firmware version you have installed if you will be configuring the Hi5-3D using the DIP switches.

DIP Switches 1 - 5 for All Firmware Versions

The behavior for DIP switches 1 through 5, shown in the table below, is the same for all firmware versions.

Table 1. DIP switch setting descriptions for switches 1 through 5 for all firmware versions

FUNCTION	SWITCH	LABEL	POSITION	BEHAVIOR
Control	1	CONTROL	OFF	Selects Local (DIP), and blocks Mini-Config control
			ON	Selects Remote (Mini-Config), and disables DIP switches 2-8
Left eye channel horizontal flip	2	H FLIP LT	OFF	Does not flip left eye channel horizontally
			ON	Flips left eye channel horizontally
Left eye channel vertical flip	3	V FLIP LT	OFF	Does not flip left eye channel vertically
			ON	Flips left eye channel vertically

FUNCTION	SWITCH	LABEL	POSITION	BEHAVIOR
Right eye channel horizontal flip	4	H FLIP RT	OFF	Does not flip right eye channel horizontally
			ON	Flips right eye channel horizontally
Right eye channel vertical flip	5	V FLIP RT	OFF	Does not flip right eye channel vertically
			ON	Flips right eye channel vertically

DIP Switches 6, 7, 8 in Combination for Firmware Versions up to 3.2

Table 2. DIP switch setting descriptions for switches 6, 7 and 8 working in combination, firmware versions up to and including v3.2

FUNCTION	SWITCH	LABEL	POSITION	BEHAVIOR
Side by Side output	6	S1	OFF	Selects Side by Side output. Left and right eye channels are compressed and shown beside each other.
	7	S2	OFF	
	8	AUX 1	OFF	
Top Bottom output	6	S1	ON	Selects Top Bottom output. Left and right eye channels are compressed and shown one above the other.
	7	S2	OFF	
	8	AUX 1	OFF	
Frame Packed output	6	S1	ON	Selects Frame Packed output. Left and right eye channels are put into a single full resolution (but tall) frame, at twice the clock and line rates. Works only with 1080p 23.98 and 1080p 24 formats.
	7	S2	ON	
	8	AUX 1	OFF	

DIP Switch 8 for Firmware Versions up to 3.2

Table 3. DIP switch setting description for switch 8, firmware versions up to and including v3.2

FUNCTION	SWITCH	LABEL	POSITION	BEHAVIOR
Anaglyph	8	AUX 1	OFF	
			ON	Selects Anaglyph output. Both stereo images are overlaid as a single image for viewing with anaglyph glasses.

DIP Switches 6 and 7 in Combination for Firmware v3.3

Table 4. DIP switch setting descriptions for switches 6 and 7 working in combination, firmware v3.3

FUNCTION	SWITCH	LABEL	POSITION	BEHAVIOR
Side by side output	6	S1	OFF	Selects 3D Format Side by Side output. Left and right eye channels are compressed and shown beside each other.
	7	S2	OFF	
Top bottom output	6	S1	OFF	Selects 3D Format Top Bottom output. Left and right eye channels are compressed and shown one above the other.
	7	S2	ON	
Frame packed output	6	S1	ON	Selects 3D Format Frame Packed output. Left and right eye channels are put into a single full resolution (but tall) frame, at twice the clock and line rates. Works only with 1080p 23.98 and 1080p 24 formats.
	7	S2	OFF	
Anaglyph output	6	S1	ON	Selects 3D Format Anaglyph output. Both stereo images are overlaid as a single image for viewing with anaglyph glasses.
	7	S2	ON	

DIP Switch 8 for Firmware Version 3.3

Table 5. DIP switch setting descriptions for switch 8, firmware v3.3

FUNCTION	SWITCH	LABEL	POSITION	BEHAVIOR
Swap inputs	8	AUX 1	OFF	Does not swap left and right SDI inputs.
			ON	Swaps left and right SDI inputs.

USB Control and Setup—Using AJA Mini-Config

Your AJA Mini-Converter can be used right out of the box for some applications since it is designed to recognize inputs and perform standard actions automatically by default. However, to use its full capability, you must use AJA's Mini-Config software application for PCs and Macs. This same application can be used to update to new Mini-Converter software released by AJA.

NOTE: DIP switch 1 must be ON (Remote, Right) to permit AJA Mini-Config control of the unit.

Acquiring AJA Mini-Config

AJA's Mini-Config application is available for download from the AJA website.

To download the latest AJA Mini-Config package, which includes the AJA Mini-Config application, Mini-Converter firmware, and documentation, go to:

<https://www.aja.com/products/mini-config-software>

Select either the Windows or Mac icon to download the desired version.

Mini-Converter Documentation

Included with the AJA Mini-Config package is a complete set of documentation for all Mini-Converters supported by AJA Mini-Config. A .PDF of the *Installation and Operation Guide* for the currently connected Mini-Converter can be accessed from the AJA Mini-Config UI via the **Help/Manual** drop-down menu.

Documentation for all AJA Mini-Converters that use AJA Mini-Config can also be accessed directly in the AJA Mini-Config download package Documentation folder, and via the Documentation icon available on the Mac installer.

Documentation (and firmware) included with the AJA Mini-Config application are the versions available at the time of distribution. However, Mini-Converter software, firmware and documentation are updated regularly, so newer versions may exist.

To download the latest documentation for an individual Mini-Converter, go to:

<https://www.aja.com/family/mini-converters>

and navigate to the Support webpage of that Mini-Converter.

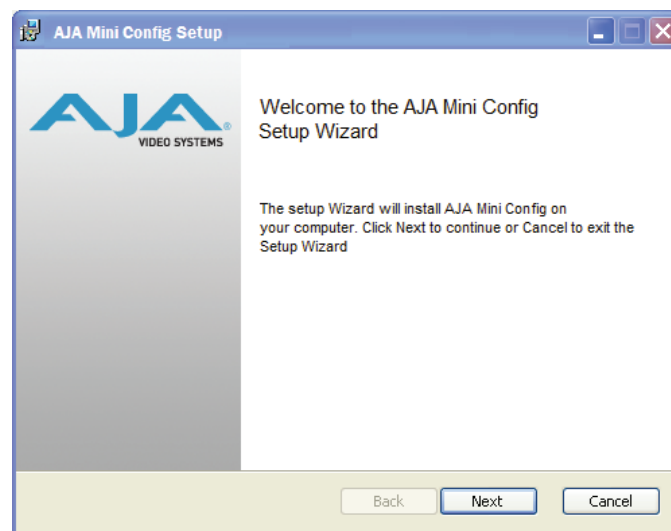
Installing AJA Mini-Config

PC Installation

To install AJA Mini-Config on a Windows PC:

1. Download the application from the AJA website (select the Windows icon on the AJA Mini-Config Support webpage).
2. Open the AJA_MiniConfig.zip file
3. Double-click on the MiniInstaller.msi file.
4. A Setup Wizard will guide you through the installation.

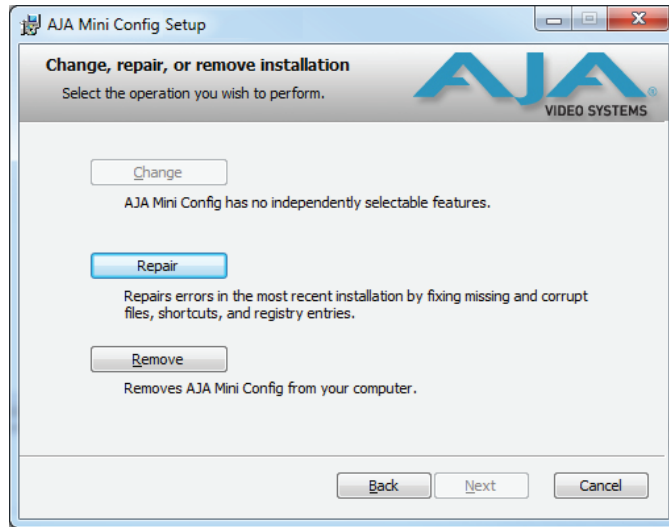
Figure 4. AJA Mini-Config PC Setup Wizard



5. Click Next to begin. Answer the questions in the subsequent dialogues. When finished, an AJA Mini-Config shortcut will be installed on the desktop, and you will be able to locate the AJA Mini-Config application in the AJA folder in the Programs listing.

NOTE: If the AJA Mini-Config application already exists on the PC, a different Setup Wizard appears.

Figure 5. AJA Mini-Config Setup Wizard, Reinstallation



With this screen you can **Repair** (reinstall) or **Remove** (uninstall) AJA Mini-Config on the PC.

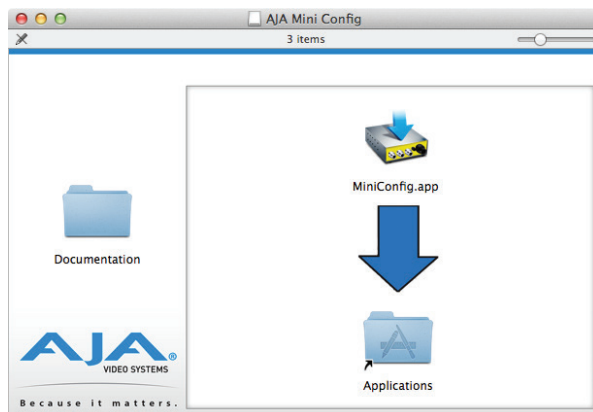
Mac Installation

To install the application on a Mac:

NOTE: Macintosh computers must be Intel-based (G5, G4 and earlier models will not work with AJA Mini-Config).

1. Download the application from the AJA website (select the Apple icon on the AJA Mini-Config Support webpage).
2. Open the AJA_MiniConfig folder.
3. Double-click on the AJAMiniConfig.dmg file.
4. Answer the prompt and a utility program will be launched.

Figure 6. AJA Mini-Config Mac Installer



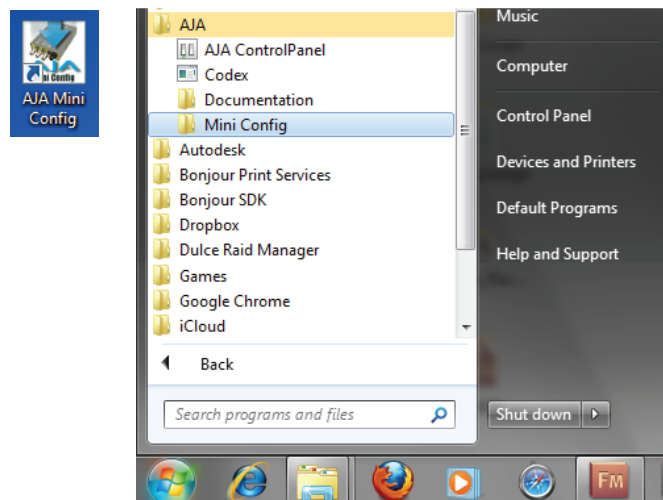
5. To complete the installation drag the "MiniConfig.app" icon to the Applications folder.

Running AJA Mini-Config

Connect the Mini-Converter to the PC or Mac via the supplied USB cable. Connect the external power supply (supplied) to the Mini-Converter.

PC Startup

To run AJA Mini-Config on a PC, double-click on the AJA Mini-Config icon on your desktop, or open the AJA folder in the program list and click on the AJA Mini-Config application located inside the AJA Mini-Config folder.

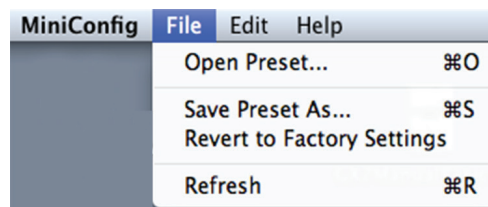


Mac Startup

To run AJA Mini-Config on a Mac, open the Applications folder and locate the AJA Mini-Config application. Double-click the application to launch it.

Saving Setups

A **File** drop down menu on the AJA Mini-Config application bar allows you to save the current state of the Mini-Converter to a preset file for later recall.



Using this feature you can set up the converter for different applications, storing each configuration (**Save Preset As...**) with a unique name for easy recall (**Open Preset...**).

A **Revert to Factory Settings** menu item similarly allows you to change the settings back to AJA's factory defaults.

Operating AJA Mini-Config

The AJA Mini-Config application provides a graphic interface for viewing settings and updating software. It consists of an information area at the top that shows the available Mini-Converters attached to the computer via USB, with a graphical rendering of the selected Mini-Converter showing all the connectors and their current state.

Colored text next to the connectors indicates the signal type and what the Mini-Converter is doing:

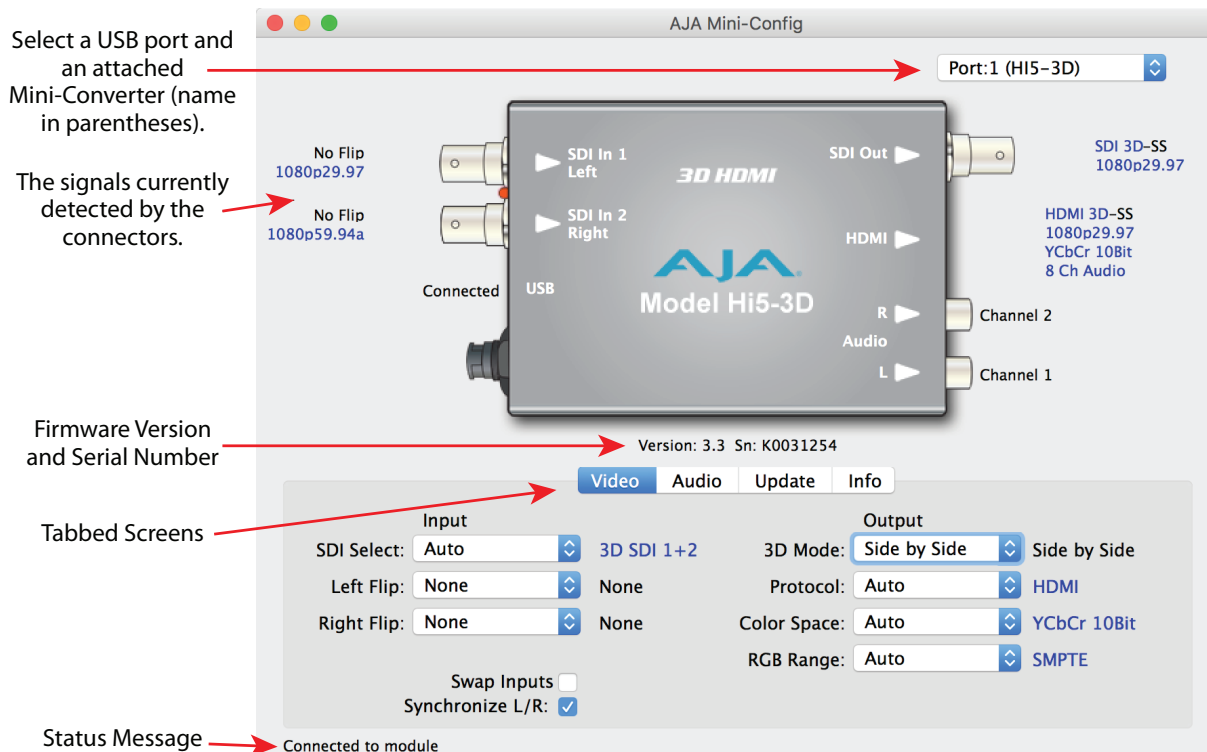
- Blue text indicates the values automatically selected
- Black text indicates values that you have manually selected
- Red text indicates the Mini-Converter is not detecting a signal, or cannot operate with the current user settings.

NOTE: Even if no output device is detected, the SDI connector text still shows the signal it is outputting.

NOTE: Configuration settings in red will change based on the attached output device as well as input signals. For improved accuracy and reliability, you should configure the Mini-Converter only when the target output device is attached and input signals are supplied at the inputs.

Screens are virtually the same on both PC and Mac, with subtle differences that reflect the general look of the platform environment.

Figure 7. Example AJA Mini-Config Screen



NOTE: The LOCK LED indicates valid input video by color. Off is no signal, green is SD video, red is HD video.

Selecting a Mini-Converter with the pulldown menu causes this application to connect to the selected converter. The graphic of Mini-Converter and text below it provides:

- Type of converter
- Firmware version
- Serial number of the unit

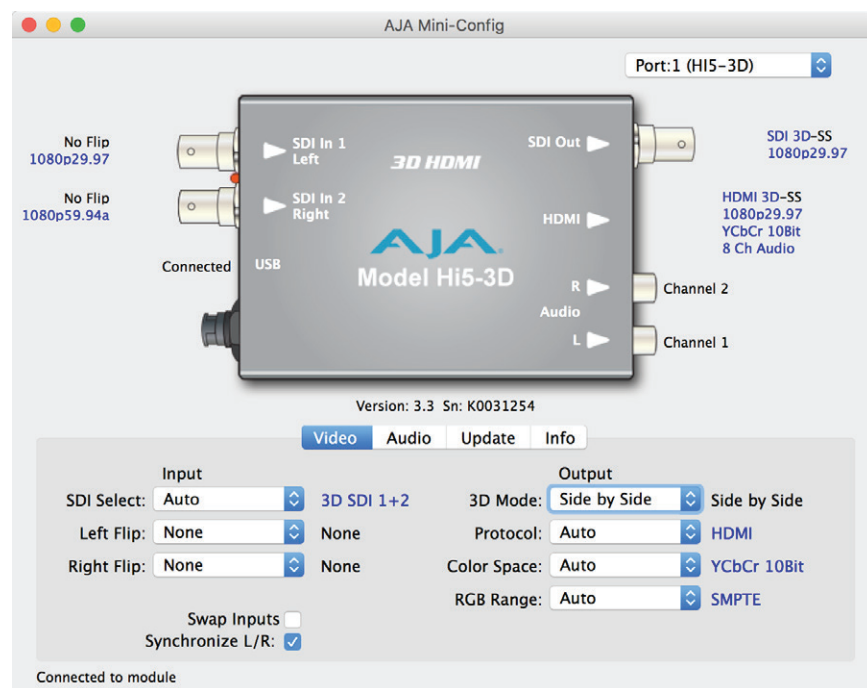
A status field at the bottom of the screen shows if your application is connected and communicating with the Mini-Converter.

When configuring the Mini-Converter, select it from the top pulldown, view the current settings and change any values. Making a change communicates that new value to the Mini-Converter's non-volatile memory.

Tabbed Screens

The Tabs delineate control screens with groups of controls for each type of task to be performed. The controls for the actual configuration parameters are specific to each Mini-Converter type. When you Click on any of the tab buttons, the pane below the tabs will change to match your tab selection. Any changes you make are immediately applied and will be saved, overwriting previous settings.

Video Tab Screen



Click on the Video tab to view and make changes to the converter's Video I/O settings.

Input Video Selections

SDI Select - Use to select a specific SDI input (1 and/or 2) or select automatic mode.

- Auto: directs the Hi5-3D to automatically select the input based on the signals detected at the two SDI Input BNCs.
- SDI 1: manually select the signal present at SDI Input 1.
- SDI 2: manually select the signal present at SDI Input 2.
- 3D SDI 1+2: manually select the signals present at SDI Inputs 1 and 2 as a 3D two input stream (right/left channels respectively).

Left Flip - Use to select how the left eye channel input will be flipped (if any).

- None: no flipping; the signal is unaltered.
- Horizontal: left eye channel is flipped horizontally.
- Vertical: left eye channel is flipped vertically.

- Horiz/Vert: left eye channel is flipped horizontally and vertically.

Right Flip - Use to select how the right eye channel input will be flipped (if any).

- None: no flipping; the signal is unaltered.
- Horizontal: right eye channel is flipped horizontally.
- Vertical: right eye channel is flipped vertically.
- Horiz/Vert: right eye channel is flipped horizontally and vertically.

Swap Inputs - Swaps the Left and Right SDI inputs.

Synchronize L/R - Activates Frame-Sync mode, in which the right eye channel will be frame synchronized to the left eye channel.

Output Video Selections

3D Mode - Use to select the type of CEA 3D mode:

- Auto: lets the Hi5-3D automatically select a 3D mode based on the HDMI 1.4a device it is connected and negotiating with (blue text shows what it chooses).
- Side by Side: select left/right eye channels are compressed and placed side by side.
- Top Bottom: select left/right eye channels are compressed and placed one on top of the other.
- Frame Packed: select left/right eye channels into a single full-resolution (but tall) frame, at twice the clock and line rates. When selected, "frame-packing" works only with the following formats: 1080p23.98, and 1080p24. Framepacked mode does not support psf inputs at this time.
- Anaglyph: used for calibrating camera rigs, this mode shows both stereo images overlaid as a single image for viewing using anaglyph glasses. In this implementation only the luma data is preserved.

NOTE: 525 and 625 inputs are passed through to the output without 3D processing.

Protocol - Use to select the signal protocol used for the HDMI output connector.

- Auto: lets the Hi5-3D automatically select a protocol based on the device it is connected and negotiating with at the HDMI connector (blue text shows what it chooses).
- HDMI: selects HDMI signal protocols.
- DVI: selects DVI signal protocols (note: an HDMI to DVI adapter should be used when connecting DVI devices).

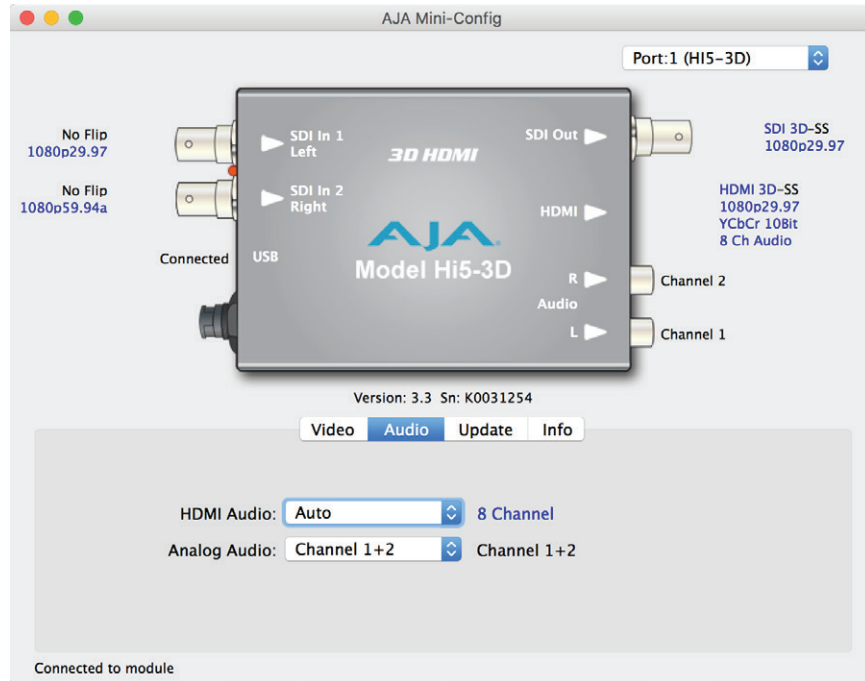
Color Space - Use to select type of RGB or YCbCr colorspace. The choices are:

- Auto: lets the Hi5-3D automatically select a protocol based on the device it is connected and negotiating with.
- RGB 8Bit
- RGB 10Bit
- YCbCr 10Bit

RGB Range - Use to select type of RGB color range, when RGB has been selected as the color space. Choices are:

- Auto: lets the Hi5-3D automatically select a protocol based on the device it is connected and negotiating with.
- SMPTE
- Full Range

Audio Tab Screen



The Audio Tab Screen is where you can configure Hi5-3D digital and analog audio settings.

HDMI Audio

Use to select how many SDI channels are passed to the HDMI connector and which channel pairs are selected. Choices are:

Auto - lets the Hi5-3D automatically select an HDMI audio output configuration based on it communicating with the attached HDMI device and determining its configuration.

2-Channel - output 2 channels from the SDI stream to two channels on the HDMI output connector. Which 2 channels are selected mirrors the Analog Audio setting (below).

8-Channel - output SDI channels 1 through 8 to the HDMI output connector.

Analog Audio

Use to select the channel pair that will be output to the Analog RCA connectors (L/R).

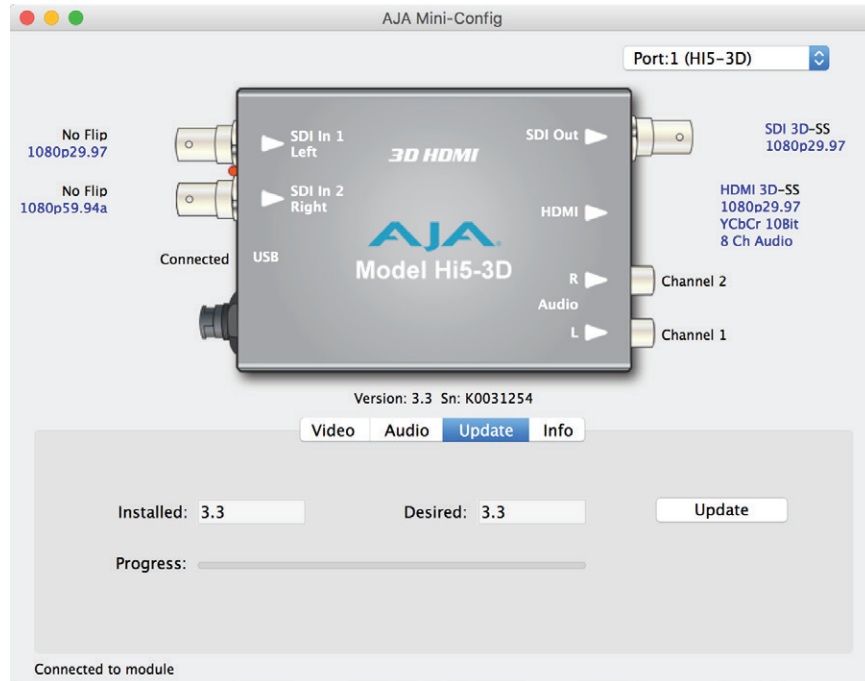
Channel 1+2 - output channels 1 & 2 from the SDI stream to the two Analog Audio RCA connectors (L/R).

Channel 3+4 - output channels 3 & 4 from the SDI stream to the two Analog Audio RCA connectors (L/R).

Channel 5+6 - output channels 5 & 6 from the SDI stream to the two Analog Audio RCA connectors (L/R).

Channel 7+8 - output channels 7 & 8 from the SDI stream to the two Analog Audio RCA connectors (L/R).

Update Tab Screen



Use this Update Tab Screen to view the software version currently installed on the converter or install new software.

NOTE: When discussing Mini-Converters, “Firmware” is software that will be stored in the Mini-Converter’s non-volatile memory and used when it is powered up. This is something different than the AJA Mini-Config application software. The version numbers shown in the Update screen refer only to the firmware.

Installed - This field shows the version of the firmware currently installed inside the Mini-Converter.

Desired - This field shows the version of firmware embedded in the AJA Mini-Config application which you can install into the Mini-Converter by clicking the Update button.

Update

This button initiates a software update operation loading the “Desired” version of firmware into the Mini-Converter’s non-volatile memory.

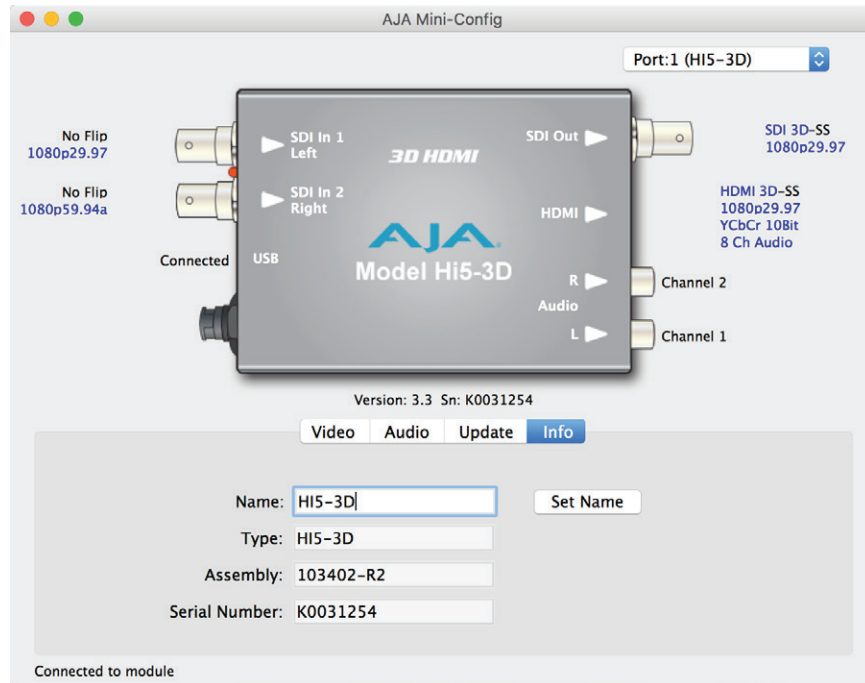
Progress - This indicator bar shows the progress of firmware installation.

Software Update Procedure

1. Check the AJA website for new AJA Mini-Config software for your Mini-Converter. If new software is found, download it and uncompress the file archive (zip). Here is the URL to use when checking:
<https://www.aja.com/products/mini-config-software>
2. Connect the Mini-Converter to a Mac or PC via a USB port on the computer and run the new AJA Mini-Config software just downloaded.
3. Click on the Update tab screen.
4. Check the Installed version level against the Desired version level. If the Desired is newer, then click the Update button to download the new

firmware to the Mini-Converter; progress will be shown via the “Progress” thermometer bar.

Info Tab Screen



The Info Tab Screen provides basic information about the Mini-Converter. This information is useful when calling AJA Support for service or technical support.

Name

This field allows you to give your Mini-Converter a name. This can be useful if you have several Mini-Converters attached to a Mac/PC via USB so you can distinguish between them easily (especially if they're the same model).

Type - This is the factory set model name of the Mini-Converter.

Assembly - This is the factory assembly number.

Serial Number - This is the factory set unique serial number of your Mini-Converter. If you ever call AJA Support for service, you may be asked for this number.

Appendix A – Specifications

Hi5-3D Tech Specs

Video Formats

- (HD) 1080i 50, 59.94, 60
- (HD) 1080p 23.98, 24, 25
- (HD) 720p 50, 59.94, 60

Video Inputs

- Dual HD-SDI (auto-selected), SMPTE-292, 296, 2 x BNC – 1 x SDI Left Eye Input and 1 x SDI Right Eye Input, 10-bit

Video Output

- 1 x HDMI v1.4a, 10-bit
- 1 x HD-SDI, 10-bit

NOTE: The Hi5-3D does not encode the HDMI output with HDCP encryption. By definition, SDI inputs to the Hi5-3D are unencrypted.

Audio Outputs

- HDMI embedded audio, 2 or 8-Channel
- 2 x RCA-style analog outputs at -10dBu (nominal), user assignable channels

Size (w x d x h)

- 5.8" x 3.1" x 1.0" (147mm x 79mm x 25mm)

Power

- +5 to 20V DC regulated, 6 watts max
- AJA external power supply model DWP-U-R1, included with purchase
- 100-240V, 50/60 Hz universal input

Environment

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

Appendix B – Safety and Compliance

Federal Communications Commission (FCC) Compliance Notices

Class A Interference Statement

This equipment has been tested and found to comply with the limits for a Class A 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 A 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 A 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 A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada. Cet appareil numérique de la Classe A 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 2004/108/EC.



This equipment meets the following conformance standards:

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.

Laser

EN 60825-1: 2007 and EN 60825-2: 2004 +A2: 2010,

CDRH Compliant Class 1 (TUV Cert No. 50135086)

Also Licensed for Standards: FDA 21 CFR 1040.10 and 1040.11



Warning! This is a Class A 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 A. 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 A. 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

A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
Class A (Broadcasting Communication Equipment for Office Use)	As an electromagnetic wave equipment for office use (Class A), this equipment is intended to use in other than home area. Sellers or users need to take note of this.

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 A product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438, Class A. 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A情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

This is a Class A product based on the standard of the VCCI Council (VCCI 32: 2016). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

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

Avertissement! Débranchez cet appareil pendant les orages avec éclaircies 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! 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 open the chassis. There are no user-serviceable parts inside. Opening the chassis will void the warranty unless performed by an AJA service center or licensed facility.

Avertissement! Ne pas ouvrir le châssis. Aucun élément à l'intérieur du châssis ne peut être réparé par l'utilisateur. La garantie sera annulée si le châssis est ouvert par toute autre personne qu'un technicien d'un centre de service ou d'un établissement agréé AJA.

Warnung! Öffnen Sie das Gehäuse nicht. Keine der Geräteteile können vom Benutzer gewartet werden. Durch das Öffnen des Gehäuses wird die Garantie hinfällig, es sei denn, solche Wartungsarbeiten werden in einem AJA-Service-Center oder einem lizenzierten Betrieb vorgenommen.

¡Advertencia! No abra el chasis. El interior no contiene piezas reparables por el usuario. El abrir el chasis anulará la garantía a menos que se lo haga en un centro de servicio AJA o en un local autorizado.

Advertência! Não abra o chassi. Não há internamente nenhuma peça que permita manutenção pelo usuário. Abrir o chassi anula a garantia, a menos que a abertura seja realizada por uma central de serviços da AJA ou por um local autorizado.

Avvertenza! Non aprire lo chassis. All'interno non ci sono parti riparabili dall'utente. L'apertura dello chassis invaliderà la garanzia se non viene effettuata da un centro ufficiale o autorizzato AJA.



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

Limited Warranty on Hardware.

AJA Video Systems, Inc. (AJA Video) warrants that the hardware product, not including software components, will be free from defects in materials and workmanship for a period of five years 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 (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.

Limitation of Liability

Under no circumstances shall AJA video BE LIABLE IN ANY WAY FOR ANY LOST, CORRUPTED OR DESTROYED DATA, FOOTAGE OR WORK, OR FOR ANY OTHER INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOST PROFITS, OR FOR ANY THIRD PARTY CLAIM, IN CONNECTION WITH THE PRODUCT, WHETHER RESULTING FROM DEFECTS IN THE PRODUCT, SOFTWARE OR HARDWARE FAILURE, OR ANY OTHER CAUSE WHATSOEVER, EVEN IF AJA VIDEO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. AJA VIDEO’S LIABILITY IN CONNECTION WITH THE PRODUCT SHALL UNDER NO CIRCUMSTANCES EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCT. The foregoing limitations apply even if any remedy set forth in this LIMITED WARRANTY fails of its essential purpose. SOME JURISDICTIONS DO NOT ALLOW THE LIMITATION OF LIABILITY FOR PERSONAL INJURY, OR OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO SOME OR ALL OF THE TERMS OF THIS PARAGRAPH MAY NOT APPLY TO YOU.

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.