

# HELO

## H.264 Streaming and Recording Encoder



## Installation and Operation Guide

Version 1.0  
Published February 8, 2017



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Telephone	+1.530.271.3190
FAX	+1.530.271.3140
Web	<a href="https://www.aja.com">https://www.aja.com</a>
Support Email	<a href="mailto:support@aja.com">support@aja.com</a>
Sales Email	<a href="mailto:sales@aja.com">sales@aja.com</a>

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# Chapter 1 – Introduction

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## Overview

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HELO is AJA's first hardware based H.264 solution. HELO can receive video output from a switcher, camera or other device and deliver the stream directly to a Content Delivery Network (CDN) via RTSP or RTMP. HELO can also simultaneously record the video to its built in SD slot, to a USB flash drive attached to its USB 2.0 port, or to a local shared network drive via its Ethernet port. This lets you configure your recording and streaming independently for maximum efficiency and flexibility.

HELO has both HDMI and SDI video interfaces for inputting either type of signal, as well as analog stereo audio in and out. Two hardware buttons are conveniently located on the front, one for stream and one for record.

HELO is configured by default for DHCP network communications, so installation can be as easy as just plugging in the Ethernet cable. A USB connection with AJA's eMini-Setup application also allows quick access directly to the HELO hardware for network configuration, if necessary.

HELO uses a web browser based UI, where all of HELO's controls are ready to use. The robust web browser UI allows you to setup and configure your CDN connection before you even arrive at your event. Once there, even an inexperienced operator can start and stop streaming and recording with simple button pushes. The web UI also provides complete control of HELO's operations from a remote location.

The diagram illustrates the AJA HELO H.264 Stream/Record interface and its various connectivity options. The central device is a black rectangular unit with the AJA logo and 'HELO H.264 STREAM/RECORD' printed on its front. It features a top panel with ports for POWER IN, LAN, HDMI OUT, HDMI IN, SDI OUT, SDI IN, AUDIO OUT, and AUDIO IN. The front panel also includes buttons for RECORD, STREAM, USB CONFIG, USB STORAGE, SD CARD, and POWER STATUS, along with status LEDs for STREAM, USB CONFIG, USB STORAGE, and SD CARD. Below the device, icons represent storage options: a hard drive, a USB drive, and an SD card.

Surrounding the device are several components and their connections:

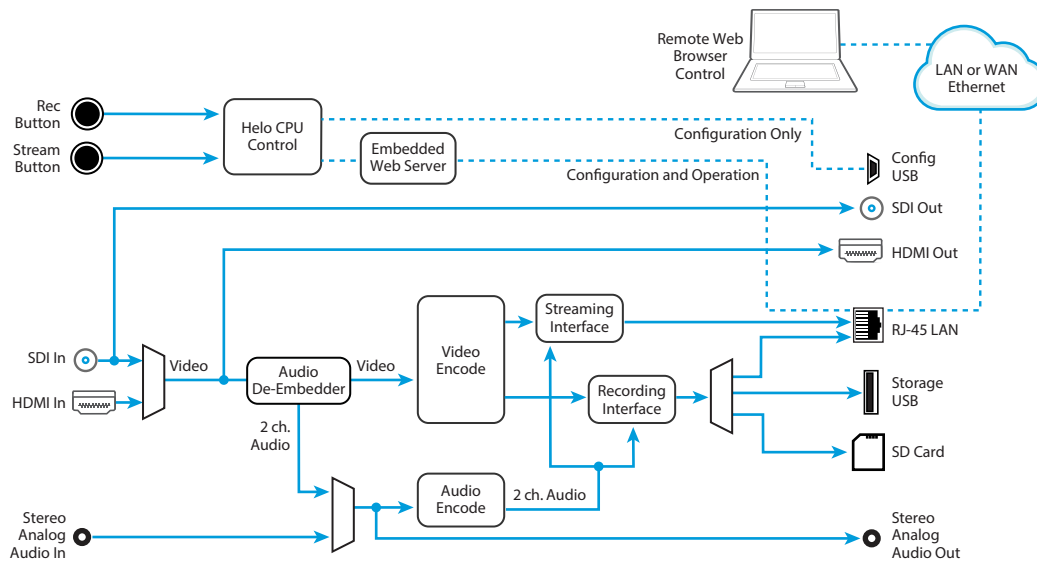
- Cloud:** A cloud icon connected to the LAN port via a dashed blue line labeled 'LAN'.
- Laptop and Smartphones:** A laptop and two smartphones are shown to the left, connected to the LAN port via a dashed blue line labeled 'LAN'.
- HDMI Monitor:** A monitor icon connected to the HDMI OUT port via a dashed blue line labeled '1 x HDMI Output'.
- SDI Monitor:** A monitor icon connected to the SDI OUT port via a dashed blue line labeled '1 x SDI Output'.
- Video Switcher:** A switcher icon connected to the SDI IN port via a dashed blue line labeled '1 x SDI Input'.
- Audio In:** A speaker icon connected to the AUDIO IN port via a solid green line labeled 'Audio In'.
- High Quality Audio:** A speaker icon connected to the AUDIO OUT port via a solid green line.

- Simultaneous independent streaming and recording of 3G/HD/SD video formats from a single input
- HDMI and SDI BNC inputs
- Optionally segmented recording to onboard USB or SD card storage or a network file store
- Single video source monitoring
- Support for two channels of HDMI or SDI embedded audio or two channels of consumer level analog audio I/O
- Audio sample rate conversion to 48 kHz for all audio channel inputs
- 32, 96, 128, 192, and 256 kbps output AAC-LC MPEG-4 audio bit rate
- De-interlacing
- Video geometry down scaling
- 2048x1080 center cut to 1920x1080 on SDI input
- Color space conversion, RGB 4:4:4 to Y'Cb'Cr' 4:2:0
- Alarm conditions
- Preservation of non-audio, video ANC data from SDI input to SDI output

- Hardware H.264 encoding, streaming and recording

- Built in web server for full remote control and configuration
- eMini-Setup can be used with a USB connection for initial HELO configuration

# Simplified Block Diagram



## What's In The Box?

When you unpack your product you will find the following components:

- HELO streaming/recording encoder
- USB cable
- Universal input +5V power supply AJA model DWP-U-R1

Please save all packaging for return shipping, should you wish to do so.

## System Requirements

Remote computer configuration and control is accomplished using HELO's internal web server. A Mac OSX or Windows computer with a web browser installed is all that is required. A USB port is also required for eMini-Setup configuration.

**NOTE:** Safari is the preferred web browser for control on the Mac, and additionally Chrome and Firefox on Windows. Other web browsers may work, but AJA cannot guarantee consistent operation for all web browsers or web browser versions.

## In This Manual

**Chapter 1** - Introduces the product, listing features and system requirements.

**Chapter 2** - Presents a product overview showing connections and controls.

**Chapter 3** - Explains installing and the initial configuration of the product.

**Chapter 4** - Describes remote web browser control of the product..

**Appendix A** - Provides specifications for the product.

**Appendix B** - Contains important safety and compliance statements.

**Warranty** - Contains warranty information.

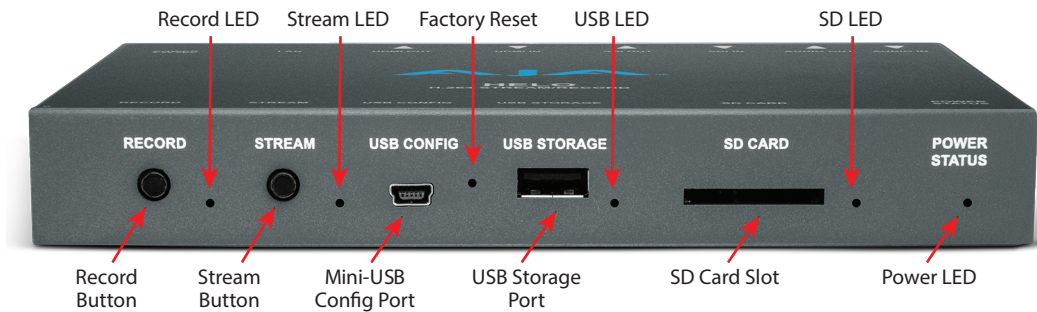
# Chapter 2 – Product at a Glance

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## Front Panel

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Figure 2. HELO Front Panel



## Buttons

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Once HELO is powered up, configured, and properly connected, the two buttons on the front panel are used to start and stop recording and streaming.

### Record Button

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Pressing the Record button initiates recording to the configured media type (SD card or USB) or record path (Network Share), or stops a recording in progress.

### Stream Button

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Pressing the Stream button initiates streaming output, or stops a stream in progress.

## Linking the Buttons

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Using the HELO web server screen these two buttons can be linked. When linked, pressing either button will start and stop both recording and streaming.

## Ports/Slots

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### Mini-USB Config Port

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USB connection for use with eMini-Setup for initial configuration and firmware update.

### USB 2.0 Storage Port

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USB port for connecting a flash drive for recording.



## SD Card Slot

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### Cards and Formatting

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- SDHC (FAT32)
- SDXC (exFAT)

## Network RJ-45

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- SMB
- NFS
- CIFS

## Front Panel Status LEDs

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### Record LED

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**Green** - Configured media is mounted and ready

**Flashing Green** - Recording in progress

**Amber** - Recording is not configured or no network connection for recording

**Flashing Amber** - Input signal loss

### Stream LED

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**Green** - Configured stream is ready

**Flashing Green** - Streaming in progress

**Amber** - Streaming is not configured, network error or no network connection

**Flashing Amber** - Input signal loss

### USB LED

---

**Green** - Media mounted and ready

**Flashing Green** - Recording in progress

### SD LED

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**Green** - Media mounted and ready

**Flashing Green** - Recording in progress

### Power LED

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**Green** - Power on and normal operation

**Amber** - Safeboot

**Flashing** - Identify feature on

## Factory Reset Button

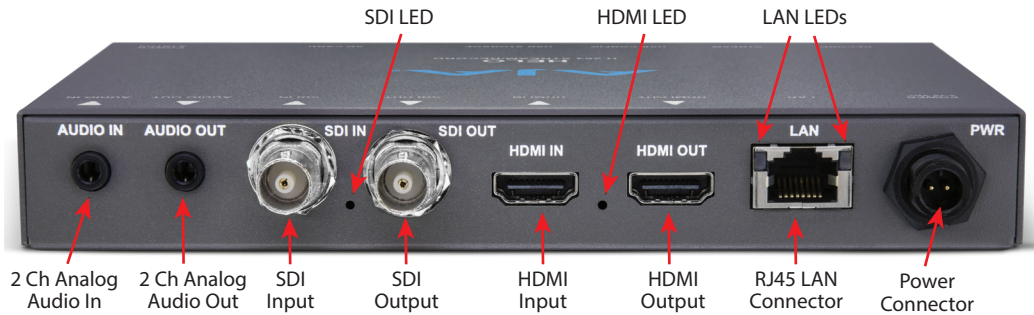
---

A recessed Factory Reset button is located between the USB ports. Using a paper clip, press and hold for five seconds to perform a factory reset.

A Factory Reset UI button is also available on the web browser UI (Presets screen).

# Rear Panel

Figure 3. HELO Rear Panel



## Connections

### Audio

- Audio Input (2 channel 1/8 inch TRS connector)
- Audio Output (2 channel 1/8 inch TRS connector)

**NOTE:** Embedded audio from SDI or HDMI is also supported.

### SDI Video

- 3G SDI Video Input (BNC connector)
- 3G SDI Video Loop Output (BNC connector)

### HDMI Video

- HDMI Video Input (HDMI 1.4a connector)
- HDMI Video Output (HDMI 1.4a connector)

**NOTE:** HELO can be configured to route the SDI input signal to the HDMI output, but cannot route the HDMI input to the SDI output.

### LAN

10/100/1000 Ethernet port (RJ-45 connector)

### Power

Uses universal input +5V power supply AJA model DWP-U-R1 (included)

## Rear Panel Status LEDs

### SDI In LED

This LED indicates the status of the SDI video input signal by color:

**Off** - No input or invalid input

**Green** - Lock to SD

**Red** - Lock to HD

**Amber** - Lock to 3G

## HDMI In LED

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This LED indicates the status of the HDMI video input signal by color:

**Off** - No input or invalid input

**Green** - Lock to SD

**Red** - Lock to HD

## LAN LEDs

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The LED on the right lights amber when there is an Ethernet link.

The LED on the left flashes green when data is being transferred.

# Chapter 3 – HELO Installation

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## Overview

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An initial HELO installation includes the following steps:

1. Apply power to HELO.
2. Connect HELO to your Ethernet network.
3. Determine HELO's IP address (DHCP), or configure HELO's network settings, using eMini-Setup and a USB connection.
4. Disconnect eMini-Setup and continue device configuration from the Web Interface.
5. Launch a web browser and **access** HELO using its IP address.
6. Connect the HELO inputs and outputs.
7. Configure HELO's basic operation.
8. Configure a HELO Recording Profile and a Streaming Profile.
9. When HELO is properly installed and configured, recording and/or streaming can be started and stopped simply by pressing the buttons on the front panel, or by using the web interface.

The current HELO configuration settings are retained, even when powered off, so subsequent installations for an identical recording and/or streaming session can be done with the following simple steps:

1. Apply power to HELO.
2. Connect HELO to your network and connect the HELO inputs and outputs.
3. Press the **Record** or **Stream** button to start and stop recording and/or streaming.

## Initial HELO Installation

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### Network Configuration

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HELO requires a network connection to stream to the internet or record to a network drive. HELO is shipped from the factory with DHCP enabled, so if your network has a DHCP server, by simply connecting HELO to your network with an Ethernet cable the DHCP server will assign HELO a compatible IP address. However, you will need to know that IP address before you will be able to access HELO's internal web server for initial configuration.

The eMini-Setup application, included with the HELO software and available as a free download from the AJA website, lets you identify the current HELO IP address, if configured, or to manually set the network configuration to work in your environment. Refer to ["Chapter 4 eMini-Setup" on page 15](#) for information about installing and using AJA's eMini-Setup application.

Once configured and connected to your network, HELO can be used for recording to locally inserted media (USB stick or SD card). For streaming or recording to a network drive additional HELO configuration is required. A properly configured HELO can stream and record simultaneously or perform each task individually.

## HELO Recording Quick Start

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HELO is shipped from the factory configured with the following basic recording settings:

- INPUT - (HDMI, Video Source on HELO web browser Config screen)
- AUDIO INPUT SOURCE - (HDMI Audio Source on Config screen)
- RECORDING Target- (SD on Recording Profiles screen)
- Recording default format is Selected Input Video Geometry Full Frame Rate 20Mb MOV

The easiest way to record is to simply apply power to HELO, connect HELO's HDMI port to a valid video/audio source, insert formatted SD media into HELO's SD slot, and then press the Record button on HELO's front panel. The Record button and SD LEDs will blink green while recording. Pressing the Record button again stops the recording.

To change HELO's configuration settings (other than IP address) requires a network connection to HELO and a computer running a web browser, as described above. You can then change the input source (SDI or HDMI), recording target (USB, SD card or network drive), and the recording format. Refer to "[Chapter 5 HELO Web Interface](#)" on page 22 for detailed information.

**NOTE:** On Mac systems, after deleting files from a USB thumb drive or SD card, you must also empty the trash to make that space available on the media.

## HELO Streaming Quick Start

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HELO is shipped from the factory configured with the following basic streaming settings:

- INPUT - (HDMI, Video Source on HELO web browser Config screen)
- AUDIO INPUT SOURCE? (HDMI Audio Source on Config screen)
- RTMP Stream Type (RTMP on Streaming Profiles Screen)
- Streaming default format is Selected Input Video Geometry Full Frame Rate 20Mb RTMP

Streaming requires a valid video/audio source, a network connection, and HELO configured with specific settings to match the Content Delivery Network (CDN) you will be using. Typically these CDN credentials for RTMP streaming include the following:

- RTMP Server URL
- RTMP Stream Name
- RTMP Stream Key

The Server URL, Stream Key and Stream Name combine to create the information needed for the RTMP server to understand the incoming stream.

You obtain this information directly from the CDN and, using a web browser, enter the data into HELO's Streaming Profiles configuration screen. This information is intended only for your streaming session(s).



**Caution!** Do not share your streaming credentials with anyone. That information allows anyone to access and stream to your channel without your knowledge or permission. CDNs will not ask for a stream key by email, so ignore any such requests. HELO stored presets contain streaming credentials. If you share an exported preset to someone, that person can extract the credentials. Before loaning the device to someone, or returning it as a rental, the factory reset button should be used to clear the device of sensitive information.

Your CDN or Video Server may also have other recommended settings for your streaming session. For best results you should follow those recommendations closely.

Refer to "[Chapter 5 HELO Web Interface](#)" on page 22 for detailed information about HELO streaming configuration.

After you have entered the CDN credentials into HELO and configured any other streaming settings, you can simply connect a valid video/audio source to HELO (either HDMI or SDI) and press the Stream button on HELO's front panel. Depending on the CDN/Video Server being used there may be a delay before the streamed signal is viewable on the output.

## HELO Firmware Update

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Visit the AJA website ([aja.com](http://aja.com)) to locate and download the latest firmware. The following page provides support information and will include links to locations where you can download updates:

<https://www.aja.com/products/helo#support>

# Chapter 4 – eMini-Setup

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## Overview

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This chapter describes using the eMini-Setup application to initially communicate with and configure an Ethernet capable AJA Mini-Converter (and some other selected AJA devices) over a direct USB connection. Once configured, that AJA device can be accessed via an Ethernet network using a web browser. Subsequently, that device can then be reconfigured over that network, using its IP address and built in web browser, or directly via USB.

**NOTE:** *The eMini-Setup application is only used to setup selected Ethernet capable AJA devices, and cannot be used to connect to or setup other AJA Mini-Converters.*

The general procedure is:

1. Acquire eMini-Setup from the AJA website and install the eMini-Setup application onto a computer.
2. Connect your AJA device to that computer's USB port.
3. Launch the eMini-Setup application.
4. Go to the **Network** tab, where the IP address settings are displayed. You can use the existing DHCP assigned IP address, or it can be changed manually.
5. You can also use eMini-Setup to load firmware to the device, although this can also be done quickly and easily using the web browser interface.

## Acquiring eMini-Setup

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AJA's eMini-Setup application is available for download from the AJA website.

To download the latest eMini-Setup package, which includes the eMini-Setup application and documentation, go to:

<https://www.aja.com/family/software#eminisetup>

Click the support button and select either the Windows or Mac icon to download the desired version.

## eMini-Setup Documentation

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Included with the eMini-Setup download is the AJA devices Installation and Operation Guide, which can be accessed from the eMini-Setup UI via the Help/Manual drop-down menu. This manual includes eMini-Setup information.

Documentation can also be accessed directly from the Mac eMini-Setup installer in the Documentation folder.

Documentation included with the eMini-Setup application is the version available at the time of distribution. However, AJA's documentation can be updated regularly, so newer versions may exist.

To download just the latest documentation, go to:

<https://www.aja.com/products/mini-converters/mini-connect#support>

Click the Support button and open the Manuals link.

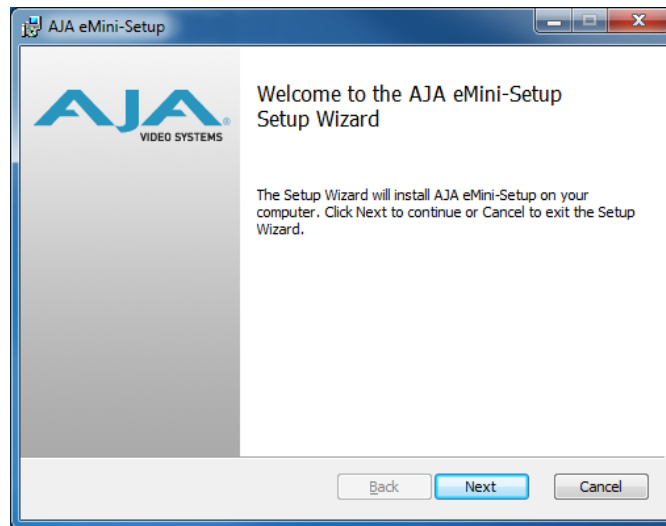
# Installing eMini-Setup

## PC Installation

To install eMini-Setup on a Windows PC:

1. Download the application from the AJA website (select the Windows icon on the AJA Support webpage).
2. Open the **AJA\_eMini-Setup\_win.zip** file.
3. Double-click on the **AJA\_eMini-Setup.msi** file.
4. The Setup Wizard will guide you through the installation.

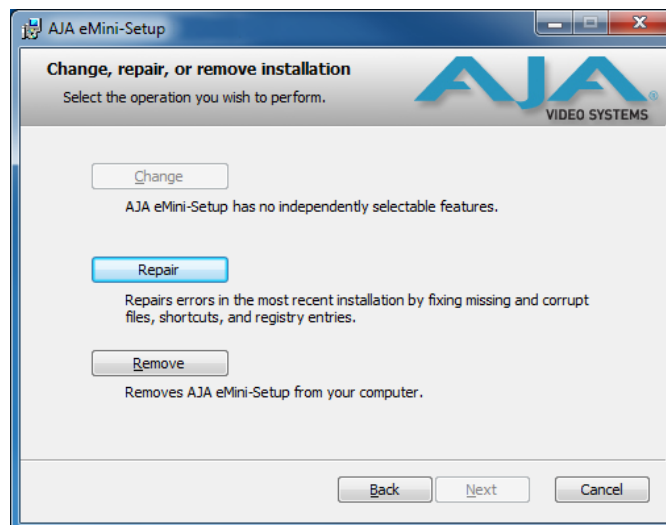
Figure 4. eMini-Setup PC Wizard



5. Click Next to begin. Answer the questions in the subsequent dialogs, including device software installation if displayed. When finished, an AJA eMini-Setup shortcut will be installed on the desktop, and you will be able to locate the eMini-Setup application in the AJA folder in the Programs listing.

*NOTE: If the eMini-Setup application already exists on the PC, a different Setup Wizard appears.*

Figure 5. eMini-Setup Wizard, Re-installation





With this screen you can Repair (reinstall) or Remove (uninstall) eMini-Setup on the PC.

## Mac Installation

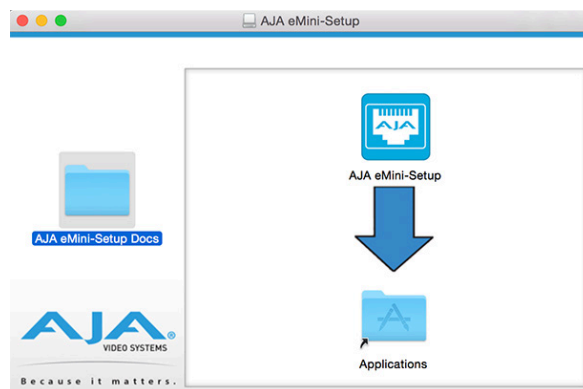
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To install the application on a Mac:

*NOTE: Mac computers must be Intel-based (G5, G4 and earlier models will not work with eMini-Setup).*

1. Download the application from the AJA website (select the Apple icon on the AJA Support webpage).
2. Unzip the file.
3. Double-click on the **AJA eMini-Setup.dmg** file.
4. Answer the prompt and a utility program will be launched.

*Figure 6. eMini-Setup Mac Installer*



5. To complete the installation drag the “AJA eMini-Setup” icon to the Applications folder.

## Running eMini-Setup

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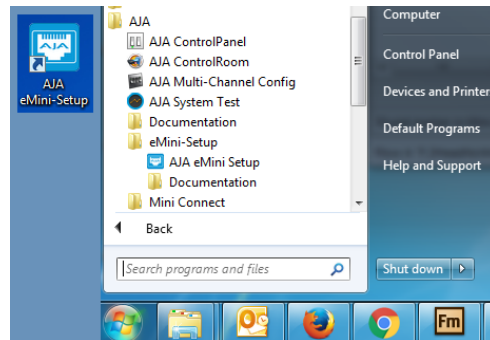
Connect your Ethernet capable AJA device to the PC or Mac via the supplied USB cable, and then connect the external power supply (supplied) to that AJA device.

### PC Startup

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

Figure 7. eMini-Setup Icon and Desktop Location



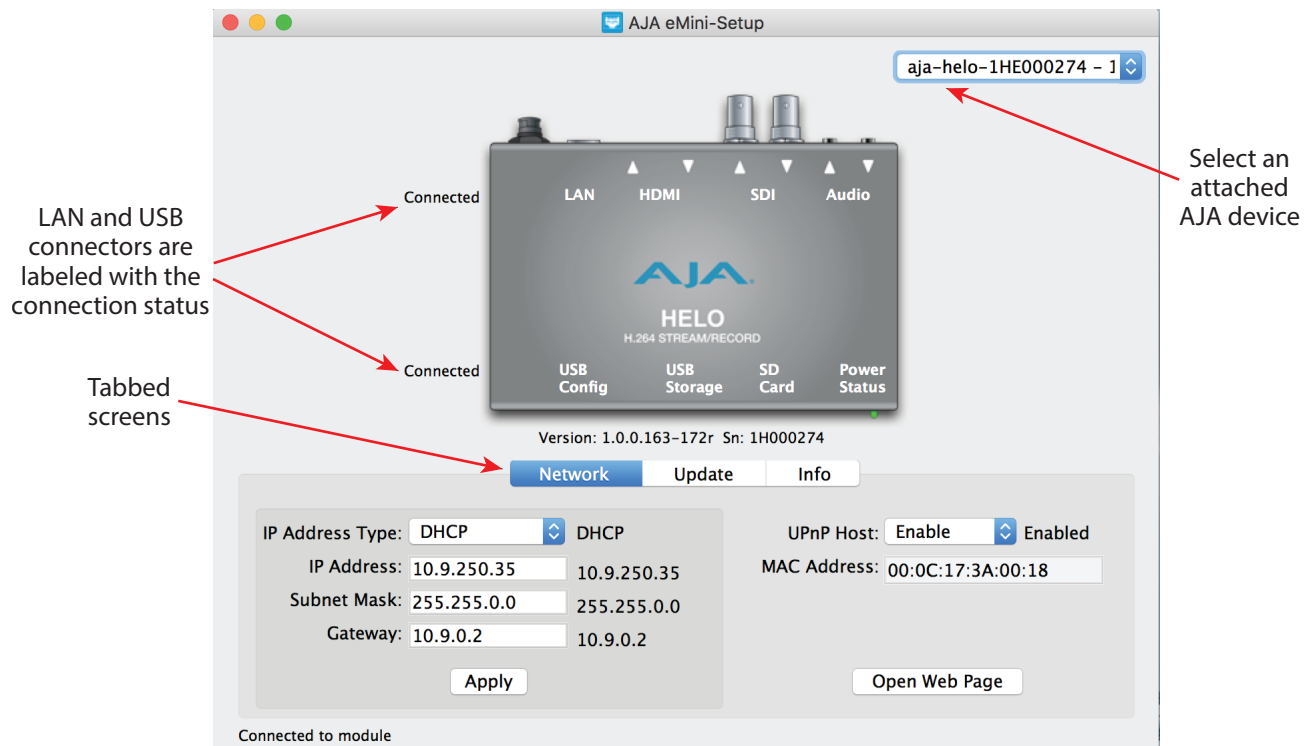
## Mac Startup

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

## Operating eMini-Setup

The eMini-Setup application provides a graphic interface for viewing settings and updating software.

Figure 8. Example eMini-Setup Screen



Selecting an AJA device with the pull down menu on the upper right causes eMini-Setup to connect to the selected AJA device.

## Mini-Converter Identification

- Version - The version of firmware installed in the AJA device is displayed below the graphic.
- Sn - This is the factory set unique serial number of your AJA device. If you ever call AJA Support for service, you may be asked for this number.

A status field at the bottom of the screen shows if the eMini-Setup application is connected and communicating with an AJA device.

## File Menu

The File drop-down menu on the eMini-Setup application bar has a Revert to Factory Settings menu item that allows you to change the settings back to the AJA device's factory defaults.

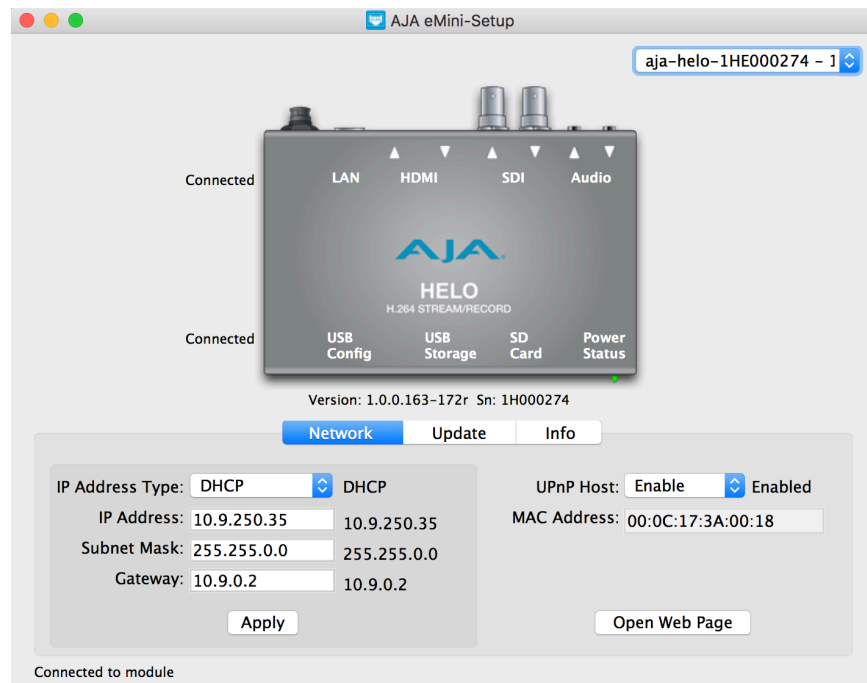
## Edit Menu

The Edit drop-down menu has standard Cut, Copy and Paste functions for editing text.

## Help Menu

The Help drop-down menu has a link to the AJA device's manual.

# Network Tab Screen

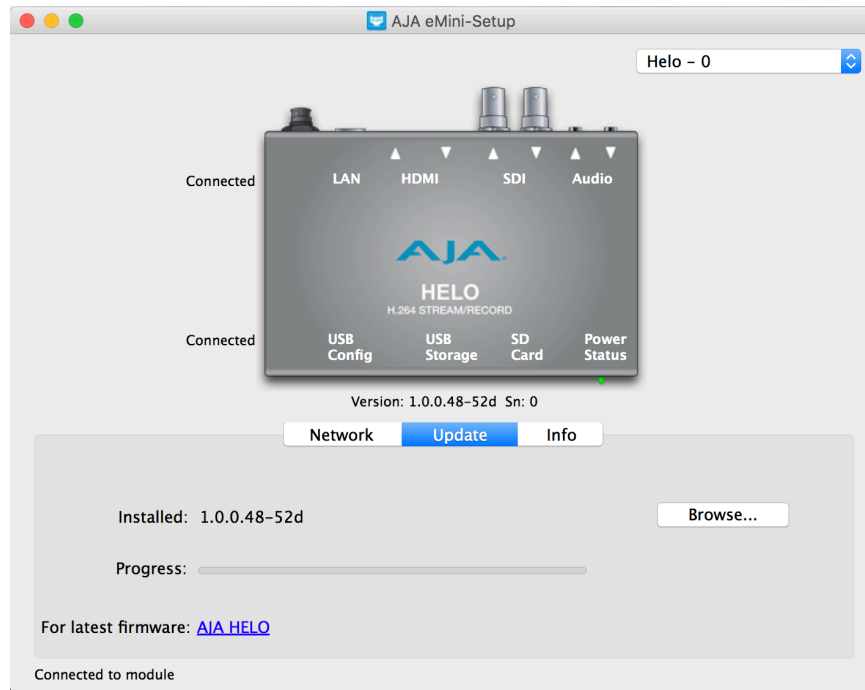


This tab lets you change the network setup on the connected AJA device. You must click the Apply button to initiate any IP address changes.

- IP Address Type - Choose from DHCP or Static IP Address.
- IP Address - The current IP address is displayed. A different IP address can be entered.
- Subnet Mask - The current Subnet Mask is displayed. A different netmask can be entered.

- Gateway - The current Gateway address is displayed. A different IP address can be entered.
- UPnP Host - Choose from Enable or Disable to control whether the AJA device makes itself visible for Windows network browsing.
- MAC Address - This is the permanent MAC address of the AJA device.
- Open Web Page - When connected to a HELO, clicking on this button opens its web page, allowing complete remote control.

## Update Tab Screen



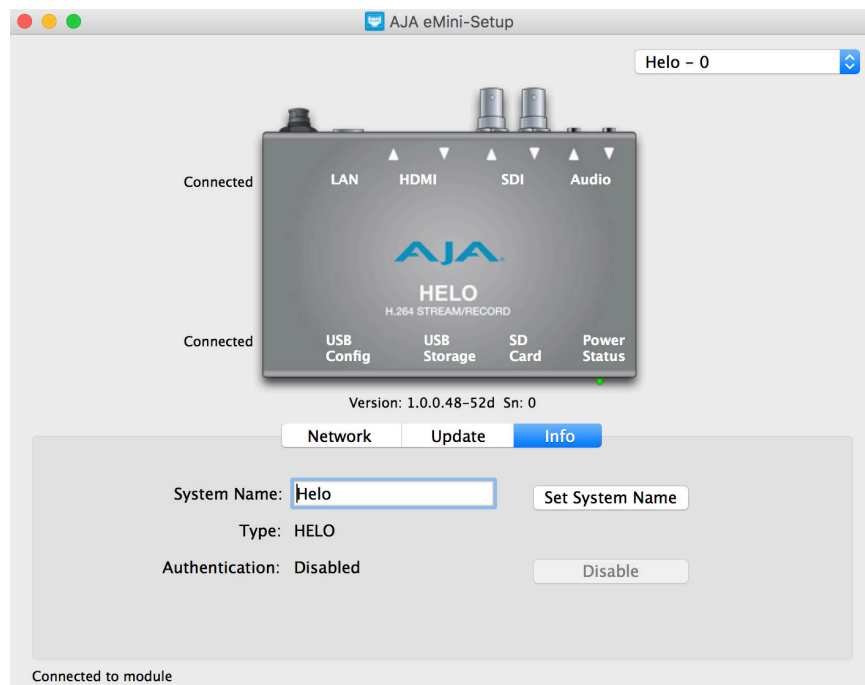
Use this Update tab to install new firmware.

- Installed - This field shows the version of the firmware currently installed.
- Browse - This button opens a navigation window, allowing you to select the firmware and load that version of firmware into the AJA device's non-volatile memory.
- Progress - This indicator bar shows the progress of firmware installation.

## Firmware Update Procedure

1. Check the AJA website for new firmware.
2. If new software is found, download it and uncompress the file archive (.zip).
3. Connect the device to a Mac or PC via a USB port on the computer.
4. Click on the **Update** tab, click on the **Browse** button, navigate to the firmware (.ajas extension), open it, and confirm the update. Progress will be shown via the "Progress" bar.
5. After the update, the AJA device must be rebooted by clicking on the Reboot button in the prompt window.

# Info Tab Screen



This tab provides basic information about the connected AJA device. This information is useful when calling AJA Support for service or technical support.

## System Name

This field allows you to give your AJA device a unique name. This can be useful if you have several attached to a Mac/PC via USB so you can distinguish between them easily. Enter the desired name, then click Set System Name.

## Type

This is the factory set model name of the AJA device.

## Authentication

If Authentication has been Enabled on the web browser Access tab, you can disable the security feature by clicking on the Disable button.

# Chapter 5 – HELO Web Interface

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## Overview

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Once installed and configured for operation, HELO can be controlled by simply pressing the front panel Record and Stream buttons. To change HELO's configuration settings and for remote control of HELO you use HELO's web interface.

## Remote Control Overview

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An optimized web server in HELO allows remote control and parameter setting adjustments via a web browser client running on a network wired computer. The network can be a closed local area network, a straight computer-to-HELO cable, or even exposed through a firewall to a broadband WAN.

The LAN connection HELO uses is a standard RJ45 connector, but internally it's intelligent and communicates via standard "straight-through" CAT 5 Ethernet cables or null-modem (cross-over) cables without any configuration or strapping required.

*NOTE: Safari is the preferred web browser for control on the Mac, and additionally Chrome and Firefox on Windows. Other web browsers may work, but AJA cannot guarantee consistent operation for all web browsers or web browser versions.*

To connect to HELO, simply attach HELO to your network and enter HELO's IP address into the web browser. If authentication has been configured, you may need to enter a password.

## Web Browser via Ethernet

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### General Screen Description

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All HELO web screens have certain areas and controls in common. Vertical and horizontal scroll bars appear when information extends past the border of a panel.

The round blue Up/Down arrow button on each panel and many status parameters opens and closes that pane or set of parameters.

#### Menu Panel

---

On the left of each screen is a Menu panel listing all the available screens. Click any of these links to jump to that screen.

#### Alarms Panel

---

Alarms are displayed in a panel on the left side of each screen. Clicking on the arrow opens or closes this panel to show or hide the alarms. Hovering the mouse over an alarm (red) or warning (yellow) may provide additional detail about the condition.

## Connections Panel

On the right side of every screen is a Connection panel listing information for the connected HELO.

## Network Panel

Also on the right is a Network pane that lists other HELOs on the network. The gear icon opens the Network Screen, same as selecting Network from the Menu Panel. Right clicking on the name of a HELO in this list allows you turn on the Identify feature, which will blink the power LED of that device.

## Record and Stream Panel

At the top of each screen is a panel labeled with the HELO system name that contains buttons and menus for recording and streaming.

## Independent Codecs Menu

A drop-down menu on the upper right lets you either choose Independent Codecs, or use the same Stream Codec for both streaming and recording.

## Parameters and Information

The rest of the screen displays all the parameter selections and information available for the selected HELO screen.

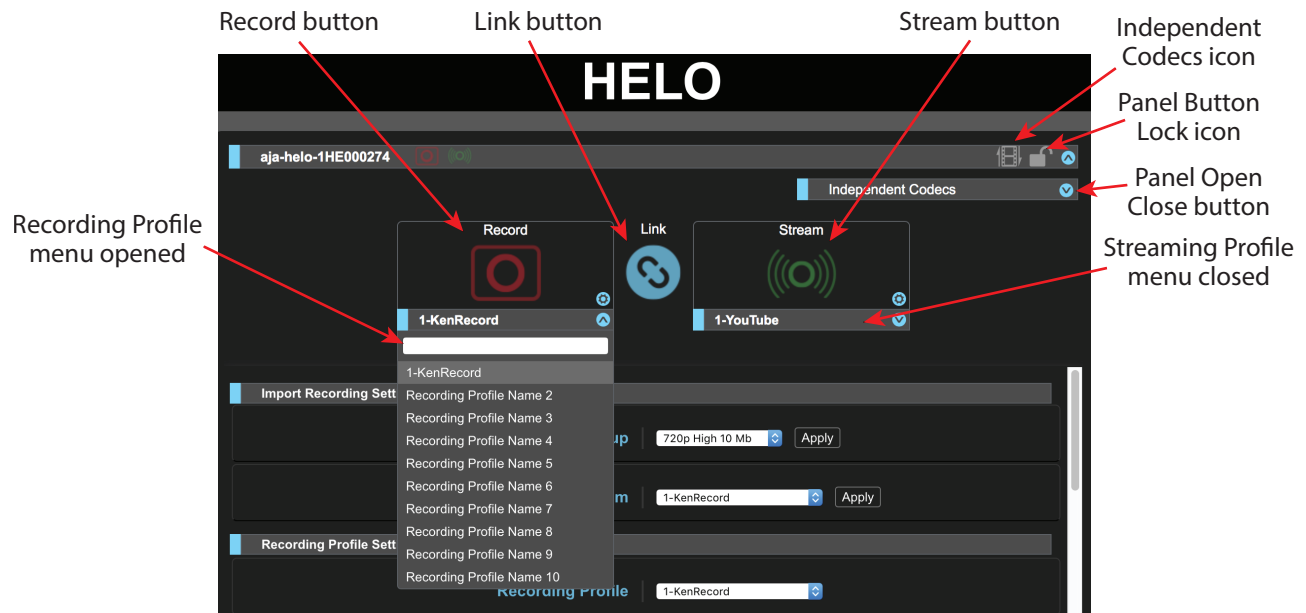
*Figure 9. HELO Web Browser Screen Areas*



## Dynamic Controls

- Hovering the mouse on a parameter name displays a brief description of its function.
- Right clicking on the parameter name resets just that parameter to its factory default.
- For values with sliders, fine control is achieved using the arrow keys on the keyboard to move the slider the minimum amount. The numeric value can also be clicked on to enter a specific value.

# Record and Stream Panel, Buttons and Profiles



## Record, Link and Stream Buttons

The Record and Stream buttons are used to toggle Recording and/or Streaming on or off. These controls can be linked together with the Link button. Error conditions may deactivate these buttons (e.g. No Video Input). Clicking on the down arrow button on the top bar closes the panel, useful to prevent accidentally starting or stopping recording or streaming.

## Independent Codecs Icon

This icon indicates the Independent Codecs status. When colored gray, Independent Codecs will be used. When colored blue, the Stream Codec will be used for recording.

## Lock Icon

The Lock icon indicates the status of the front panel buttons, set using the Front Panel Button Lock parameter in the Config menu. When lock is On (yellow closed lock icon), the front panel buttons will not control recording or streaming; if pressed, they will briefly flash red. When on, it cannot be turned off except via the web browser.

## Recording Profiles

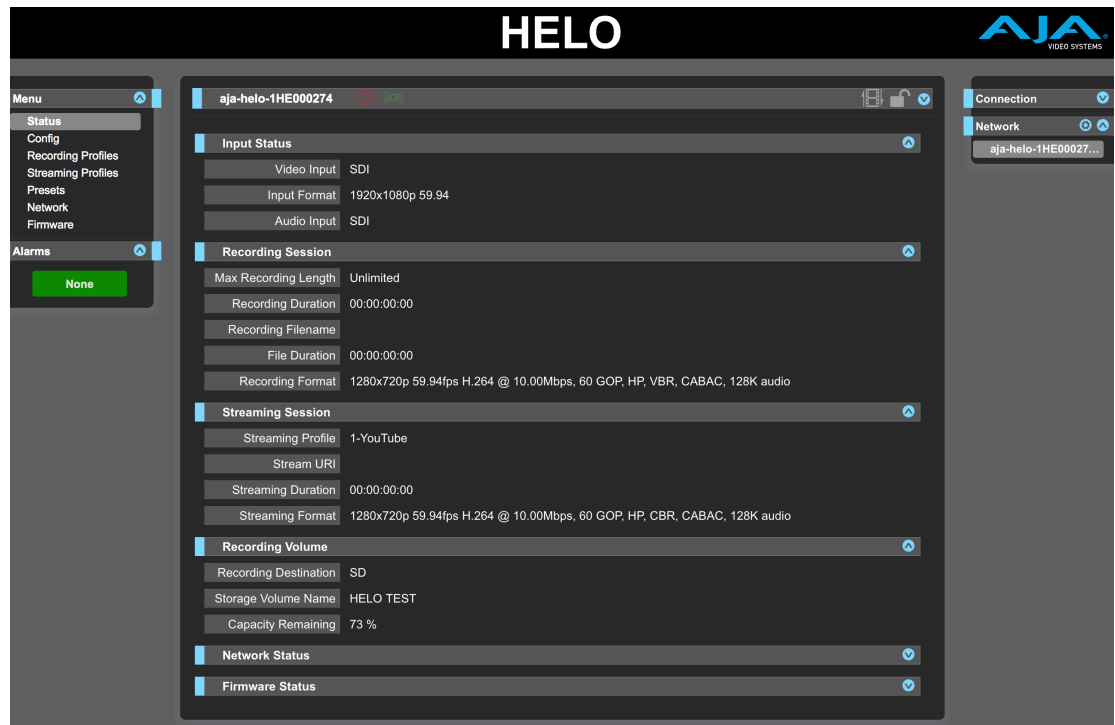
Below the Record button is a drop-down menu allowing you to select one of 10 different Recording Profiles that can contain different sets of recording configuration information. When selected, the parameters below change to match that profile. Each Recording Profile can be named. The blue gear is a shortcut to the current recording profile.

## Streaming Profiles

Below the Stream button is a drop-down menu for 10 different Streaming Profiles which behaves similarly to the Recording Profiles. The text-entry box is a search feature. Entering text lists only the profiles containing matching characters. The blue gear is a shortcut to the current streaming profile. Check with your streaming host for their suggested streaming settings.



# Status Screen



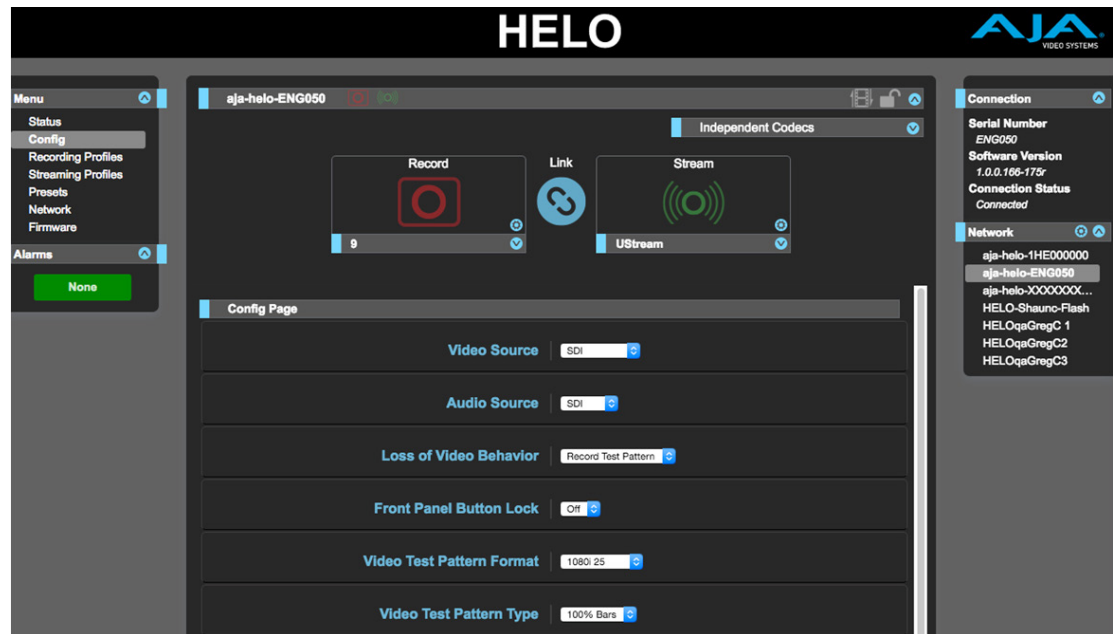
The Status screen reports the current status and settings for:

- Input Status
- Recording Session
- Streaming Session
- Recording Volume
- Network Status
- Firmware Status

Each group of parameters can be opened or closed.

Some of the parameters are editable using a right click. For example, right clicking on the Video Input selection will bring up a list of available inputs, allowing you to change it. Parameters cannot be changed when currently streaming or recording.

# Config Screen



The Config Screen has several parameters for HELO general operation.

## Video Source

**HDMI** - Use the HDMI input as the video source (factory default).

**SDI** - Use the SDI input as the video source.

**Test Pattern** - Use the internally generated test pattern as the video source.

## Audio Source

**HDMI** - Use HDMI embedded audio as the audio source (factory default).

**SDI** - Use SDI embedded audio as the audio source.

**Analog** - Use the analog stereo input as the audio source.

**Audio Signal Generator** - Use the internally generated signal generator as the audio source.

**None** - No audio will be recorded or streamed.

## Loss of Video Record Behavior

This controls what will happen to the recording if the input signal is lost.

**Stop** - Stops the recording.

**Record Test Pattern** - Record black or color bars (however the Video Test Pattern Type control is set) when there is no video input (factory default).

## Front Panel Button Lock

**Off** - The Record and Stream buttons on HELO's front panel are active (factory default).

**On** - Disables the Record and Stream buttons on HELO's front panel.

## Video Test Pattern Format

---

Sets the video format of HELO's internal test pattern generator. Choose from:

- 525i 29.97
- 625i 25
- 720p 50, 59.94, 60
- 1080i 25, 29.97, 30
- 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60

## Video Test Pattern Type

---

Choose from:

- 100% Bars
- Black

## System Name

---

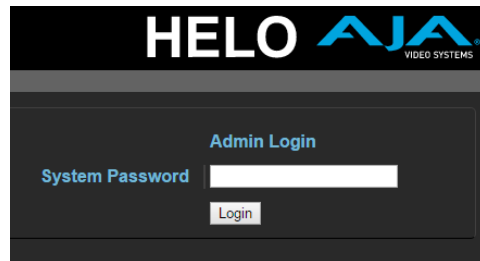
This field permits entering a name for the HELO unit. The name appears at the top of the screen, and also in the Network panes of the web screens of other HELO units on the LAN.

## User Authentication

---

For security reasons you may want require a password to login to HELO from the network. The factory default of this feature is Disabled.

To enable User Authentication, select **Login**. Parameters appear for you to Set Password and Confirm Password. After entering the password, select **Enable Authentication**, and then click **Confirm**. The HELO web browser will go to a login screen, where you can enter the password to reconnect.



You can disable User Authentication from the browser after logging in by choosing Disabled. If you forget the password, you can use eMini-Setup (Info Tab) while directly connected to HELO via USB to disable User Authentication.

## Time Source/Date Set

---

- Manual - When set to Manual (Factory default), the Date Set parameter appears below. You can enter the date and time in DD/MM/YYYY HR:MIN format, or you can use the calendar controls to set the date and time. Then click Apply to set HELO's date and time.

## Time Source/NTP Server

---

- Automatic - When set to Automatic the NTP Server parameter appears below. If your network has a Network Time Protocol Server running, you can enter the network name of the NTP server to synchronize HELO's internal clock with the network time. Synchronization of HELO's internal clock and calendar requires a correctly set up network configuration and an active network connection.

## Time Zone

---

This drop-down menu lets you choose your local time zone, by nearby city location.

## Daylight Savings

---

**ON** - HELO's internal clock will use Daylight Savings Time (factory default).

**OFF** - HELO's internal clock will use Standard Time.

## Identify LED

---

**OFF** - Factory default.

**ON** - When On is selected, the power LED on the connected HELO's front panel will blink. This can help you identify a particular HELO unit if more than one is connected.

## Enable HDMI Monitor

---

**ON** - HELO's HDMI output is active and displays the current recording or stream (factory default).

**OFF** - The HDMI output is disabled.

*NOTE: HELO's HDMI output is suitable for confidence monitoring only. The image quality and frame rates reflected on this output are not indicative of the encoded files or stream.*

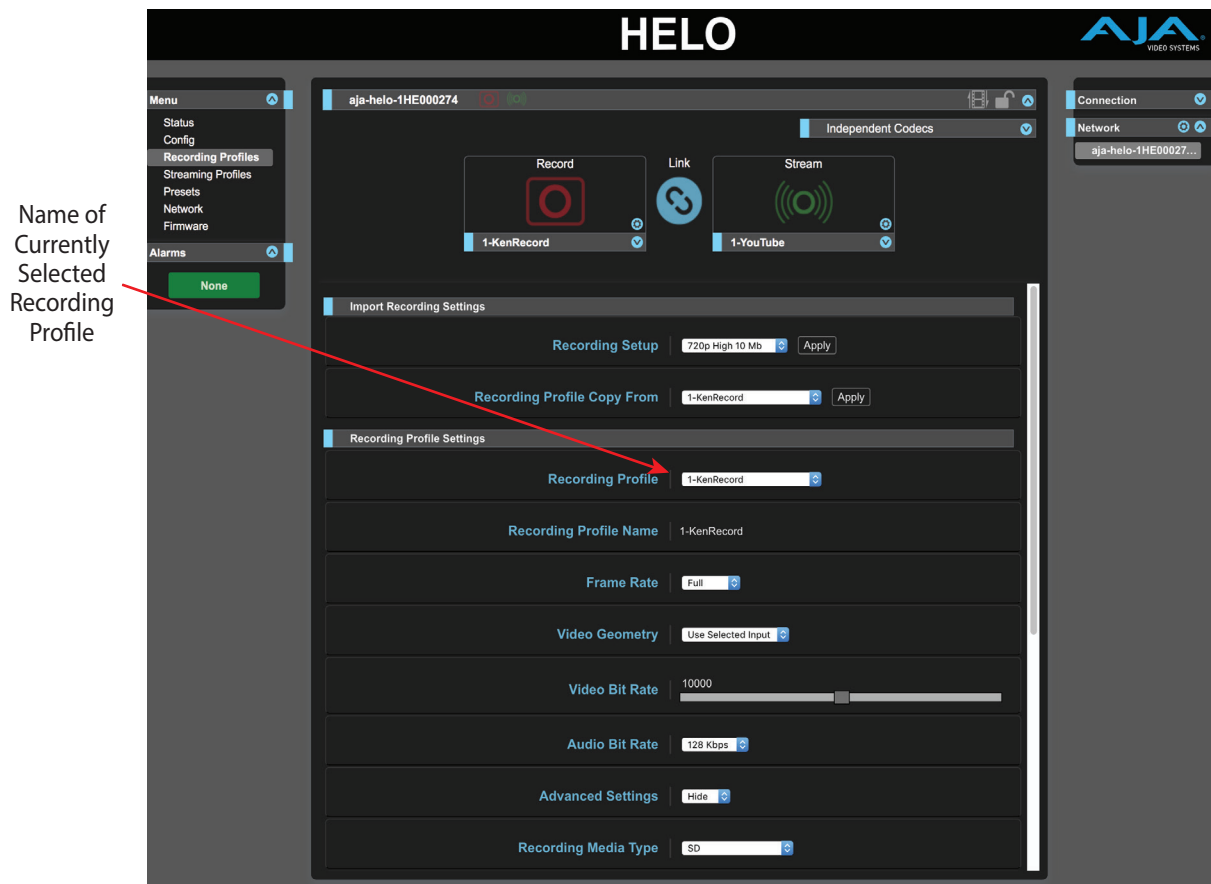
## UPnP Host

---

**Enable** - UPnP is enabled, allowing easier connection to HELO over the network via discovery through Bonjour or Windows network browsing (factory default).

**Disable** - UPnP is disabled. HELO will not advertise itself for discovery via Bonjour or Windows networking.

# Recording Profiles Screen



## Independent Codecs Menu

When the Record and Stream Buttons and Profiles Panel is open, you can use the drop-down menu on the upper right to choose Independent Codecs, or use the same Stream Codec values for both streaming and recording. When the Streaming Codec is shared, the following H.264 video encoding parameters are shared:

- Frame Rate
- Video Geometry (width and height)
- Video Bit Rate
- All Advanced Settings

Audio Bit Rate is not shared, nor are any other parameters.

**NOTE:** For high resolution, high frame rate simultaneous streaming and recording, such as dual 1080p60, this must be set to Use Stream Codec for Record.

## Import Recording Settings

The top area of the Recording Profiles screen lets you recall and save groups of settings to the currently selected Recording Profile. That profile is identified by name in the Recording Profile parameter below.

**NOTE:** Ensure you have the correct Recording Profile selected before changing any parameters. Parameter changes are immediately saved to the Recording Profile with no Undo.

## Recording Setup

---

Recording Setup has a drop-down menu listing common video formats. Each has an associated collection of recording parameter settings that are generally appropriate for that format. The formats include:

- 1080p High 20 Mb
- 1080p Low 5 Mb
- 720p High 10 Mb
- 720p Low 4 Mb
- 540p
- 360p
- 270p
- NTSC
- PAL
- VGA

You can use one of these presets as a starting point for building your specific recording profile. To save those settings to the currently selected profile:

1. Select the Recording Profile you want to change with the Recording Profile drop-down menu.
2. Select the desired preset.
3. Click on the Recording Setup **Apply** button.
4. Click **OK** in the dialog box.

*NOTE: Two different Apply buttons exist that are located close to each other. Be sure to use the correct button for your procedure. Using the wrong button will overwrite the current profile.*

## Recording Profile Copy From

---

You can copy all the settings from a different Recording Profile into the currently selected profile.

1. Select the Recording Profile you want to change with the Recording Profile drop-down menu.
2. Select the Recording Profile with the settings you want to save to the currently selected profile with the **Recording Profile Copy From** drop-down menu.
3. Click on the Recording Profile Copy From **Apply** button.
4. Click **OK** in the dialog box.

## Recording Profile Settings

---

### Recording Profile

---

Select the Recording Profile you want to use or edit from this drop-down menu.

### Recording Profile Name

---

You can rename the Recording Profile with this parameter by typing in a name and pressing Enter.

## Frame Rate

---

**Full** - The same frame rate as the incoming video will be recorded (factory default).

**Half** - Every other frame will be recorded.

**Quarter** - Every fourth frame will be recorded.

## Video Geometry

---

**Use Selected Input** - Apply the incoming video aspect ratio to the recording (factory default).

**Manual** - Allows adjustment of the size and aspect ratio of the recording. When Manual is On the Lock Aspect Ratio (On, Off) control and the Width and Height sliders become active.

## Lock Aspect Ratio

---

**On** - The Width and Height sliders are locked together. You can increase or decrease the size of the recorded image, maintaining the aspect ratio.

**Off** - The Width and Height sliders operate independently.

## Video Bit Rate

---

This slider adjusts the Video Bit Rate of the recording.

## Audio Bit Rate

---

This slider adjusts the Audio Bit Rate of the recording.

## Advanced Settings

---

These settings are intended for advanced users only. Generally they should only be changed if directed to by your CDN or Streaming Service Provider.

**Hide** - Hides the advanced settings parameters (factory default).

**Show** - Displays the following advanced parameters for adjustment.

- I-Frame [GOP] Every - Select the I-Frame interval in number of frames.
- P Interval - Select the cadence of Predictive (P) frames vs. Bidirectional (B) frames in the group of pictures. If set to one, all frames between I frames will be P frames; if two, every other frame between I frames will be a P frame; if 3, every third and so on. The remainder will be B frames. Higher values mean more efficient encoding and potentially better video quality, but more compute power to decode. Some decoders may not be able to decode video with too many, or any B frames.
- H.264 Encoding Profile - Select from: Constrained, Baseline, Main or High Profile
- Slices Per Frame: Options are 1, 2, 4 or 8. If Slices Per Frame is greater than one, video will be encoded in a way that allows parallelized decoding. If the decoder is sufficiently powerful it can decode 2, 4, or 8 sections of the frame simultaneously.
- Encoding Rate Mode - Select from VBR (Variable Bit Rate) or CBR (Constant Bit Rate)
- Entropy Coding - Select from: CAVLC (Context Adaptive Variable Length Coding), or CABAC (Context Based Adaptive Binary Arithmetic Coding). CAVLC is generally easier to decode, but can offer reduced image quality. CAVLC is always used when Constrained or Baseline H.264 Encoding Profiles are selected.
- Deinterlace Input - Select Auto (default), On, or Off. Auto will automatically detect and deinterlace input video sources.

## Recording Media Type

---

**SD** - Record to the media inserted into the SD Card slot (factory default).

**USB** - Record to the media connected to the standard size USB Storage port.

**CIFS** - Record to Windows shares (CIFS and SMB).

**NFS** - Record to Network File System for Unix-based systems such as Mac OS X and Linux.

## SD/USB Record Path

---

Creates the name of the directory for the recording location. Use forward slashes to create path subdirectories.

## Dropped Frames Record Behavior

---

**Continue** - Recording continues if dropped frames occur (factory default).

**Stop** - The recording stops if a frame is dropped.

## File Name Prefix

---

Sets the prefix of the file name, which will be appended with the Segment Numbers specified below ("clip" is the factory default).

## Recording Duration Extent

---

**Unlimited** - Once started, recording will continue until the media becomes full, it is stopped by the operator, or stopped by a dropped frame (factory default).

**Fixed** - The Recording Duration (hours) and Recording Duration (minutes) sliders become active, that can be used to set the length of the recording (unless it is stopped manually or for another reason).

## Starting Segment Number

---

This slider sets the number appended to the filename of the first recording. If a record duration is set, that number will be appended for each subsequent recording with that file name prefix.

## File Segment Record Duration (minutes)

---

This slider sets the maximum duration in minutes of each recording segment. At this time a new recording is initiated with the next segment number appended to the file name ("60" is the factory default).

## Recording File Type

---

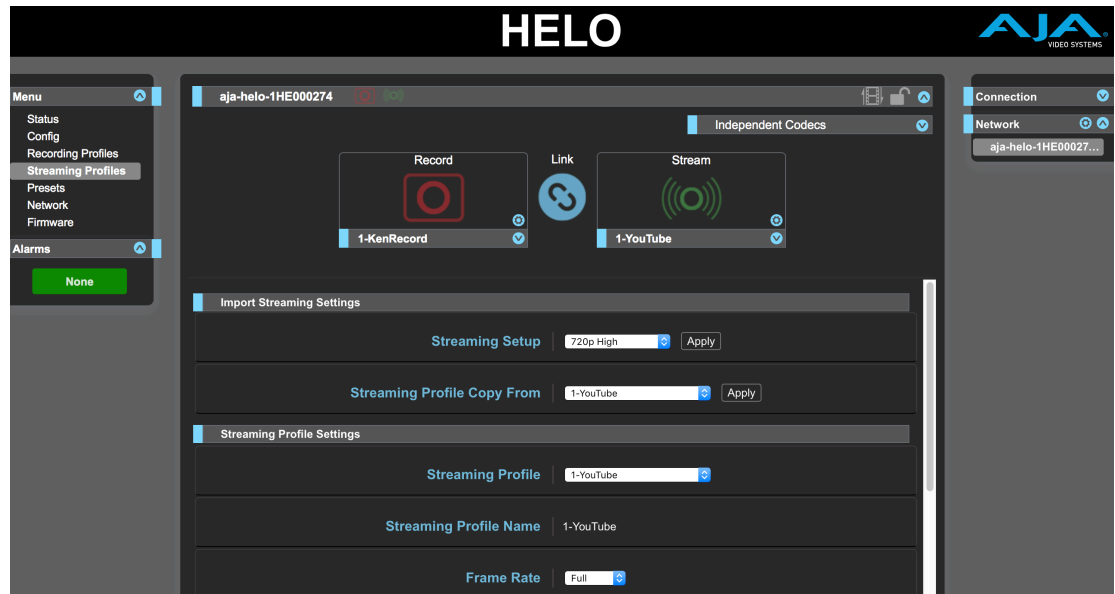
**MOV** - An H.264 file with a .mov QuickTime wrapper (factory default).

**TS** - An H.264 file with a .ts (Transport Stream) wrapper.

**MP4** - An H.264 file with an .mp4 (MPEG-4) wrapper.



# Streaming Profiles Screen



## Independent Codecs Menu

When the Record and Stream Buttons and Profiles Panel is open, you can use the drop-down menu on the upper right to choose Independent Codecs, or use the same Stream Codec values for both streaming and recording. See ["Independent Codecs Menu" on page 23](#), for more information about sharing Codecs.

## Import Streaming Settings

The top area of the Streaming Profiles screen lets you recall and save groups of settings to the currently selected Streaming Profile. That profile is identified by name in the Streaming Profile parameter below.

**NOTE:** Ensure you have the correct Streaming Profile selected before changing any parameters. Parameter changes are immediately saved to the Streaming Profile with no Undo.

Streaming Settings are imported the same as Recording Settings. See ["Import Recording Settings" on page 29](#).

## Streaming Profile Settings

Many of the Streaming Profile parameters are the same as the Recording Profile parameters described earlier, but they are applied to the streaming output instead of the recording. Only the parameters unique to a streaming profile are described here. See ["Streaming Profile Settings" on page 33](#) for information about the other settings.

**IMPORTANT:** For streaming, HELO must be configured to operate with a Content Delivery Network (CDN), using information provided for that specific network.

### Stream Type

This parameter selects which type of streaming will be used (RTMP or RTSP). It allows the values appropriate for each type to be entered.

RTMP is a "push" protocol and is usually used to deliver content to a CDN. In this case, HELO starts and stops the connection and delivery.

RTSP is a "pull" protocol and is usually used when a viewer on a computer is using an application like VLC to watch a stream. In this case HELO always has the content ready and available (if it is actively streaming), but the user is the one that initiates and ends the viewing session.

## RTMP

---

The following parameters are available when RTMP (factory default) is selected.

- RTMP Server URL
- RTMP Stream Name - If multiple streams are being sent to the same CDN at the same server URL (say, two HELOs streaming from two different cameras) these stream names must be unique.
- RTMP Username
- RTMP Password

*NOTE: If RTMP is selected but streaming won't be used for a session, an Invalid Selection warning message appears until RTMP has a correct configuration. To make the message go away, choose RTSP with default values, since RTSP doesn't require a receiver.*

## RTSP

---

- RTSP Stream Name - If a single device presents multiple streams on the name port number, each must have a unique stream name.
- RTSP Port - The TCP and UDP transport layer port number. Default is 554.
- RTSP Authentication - Select from **None** (no user name or password), **Basic** (username and password, but insecure unless used with SSL), or **Digest** (username and password, securely encrypted). If not set to None, the user must set a username and password. Viewers won't be able to access the RTSP stream without them.

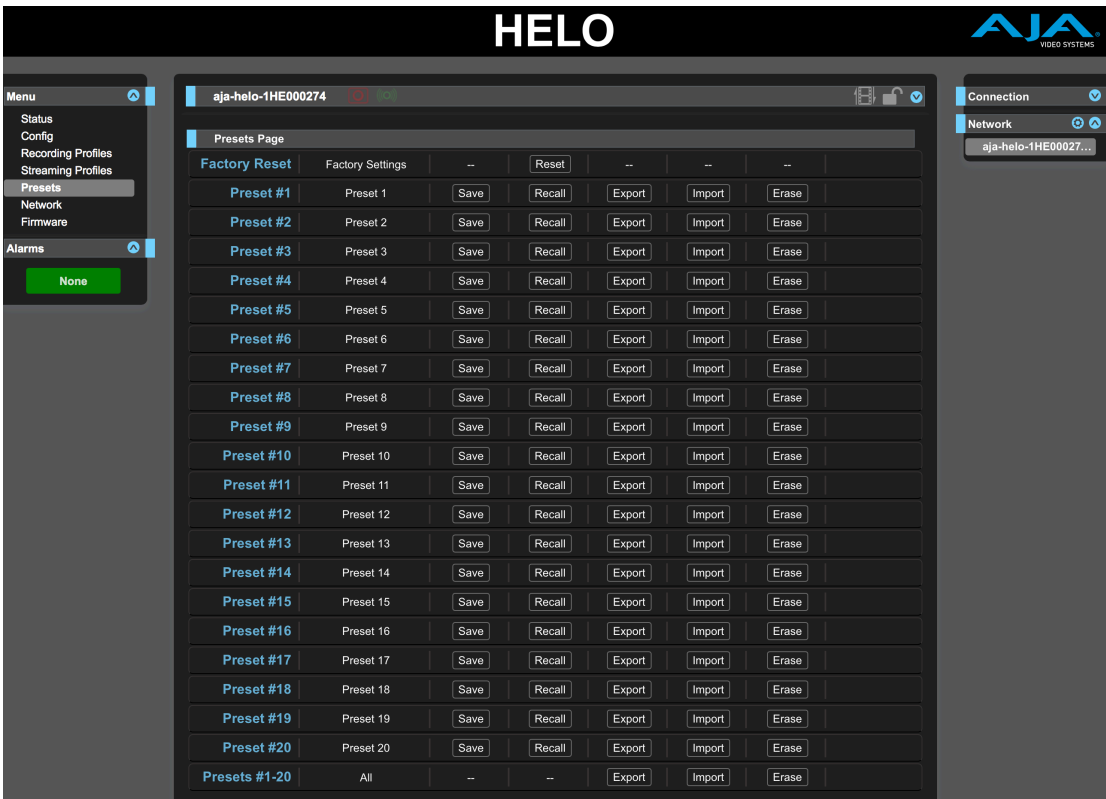
## Dropped Frames Stream Behavior

---

**Continue** - Streaming continues after dropped frames (factory default).

**Stop** - Streaming stops after dropped frames.

# Presets Screen



The Presets screen allows you to save HELO Preset Configurations into 20 separate memory registers and recall the presets whenever needed.

The Presets screen also includes Export and Import functions that allow exporting one or all presets to your computer as files and importing exported preset files from your computer. A displayed message indicates successful or failed saves, recalls, exports, and imports.

## Presets Screen Controls

### Factory Preset

Factory Preset recalls all editable parameters to their factory default settings. Individual presets and Network settings, such as the IP Address, are not affected. Recall Factory Preset changes the current settings for both Recording and Streaming Profiles.

A recessed hardware Factory Reset button is also available on HELO's front panel, between the USB ports.

### Recall

The Recall buttons recalls the saved preset configurations.



**Caution!** When you recall a Preset Configuration, the recalled preset immediately replaces the system's existing configuration. All previous settings are lost unless you have previously stored them in another preset configuration or an exported file.

## Store

---

The Store buttons let you save the current configuration into the preset register with the associated name and number. A preset is a set of all parameters as they were set at the time the preset was stored. Only editable parameters are saved in the presets. Non-editable parameters are not saved.

To change a preset name, click in the name's text field, type a new name, and press Enter to save the name. After entering text, you can click the mouse outside of the edit box to exit without changing the name.



**Caution!** HELO stored presets contain streaming credentials. If you share an exported preset to someone, that person can extract the credentials. Before loaning the device to someone, or returning it as a rental, the factory reset button should be used to clear the device of sensitive information.

## Export

---

The Export buttons save the associated preset contents to a file on your computer. The file gets exported to the default download location specified in your browser options. The file name is the same as the preset name with the suffix ".presets". If you export multiple files for the same preset, a number gets appended to ensure a unique file name. The file size is small, usually less than 100 kilobytes.

## Import

---

The Import buttons let you browse for and import a preset file on your computer into the preset register associated with the selected button. A dialog box warns you that the operation will overwrite the current preset contents with the file contents. You can only import presets from a HELO.

## Erase

---

The Erase buttons erase the data in that preset.

### Export Presets 1–20 (All)

---

Export All lets you save the contents of all presets to a file on your computer.

The file gets exported to the default download location specified in your browser options with the name "all.presets". If you export multiple files, a number gets appended to ensure a unique file name.

### Import Presets 1–20 (All)

---

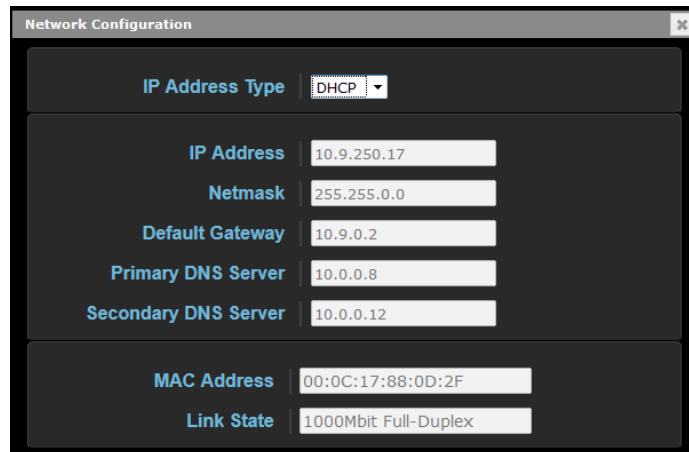
Import All lets you browse for and import a previously exported all.presets file from your computer. A dialog box warns you that the operation will overwrite all 20 current preset contents with the contents stored in the file.

### Erase Presets 1–20 (All)

---

Erase All erases all data from all the presets. A dialog box warns you that the operation will erase all 20 current presets.

# Network Screen



The screenshot shows a 'Network Configuration' window. At the top, 'IP Address Type' is set to 'DHCP'. Below this, several fields are displayed with grayed-out values, indicating they are automatically assigned: 'IP Address' (10.9.250.17), 'Netmask' (255.255.0.0), 'Default Gateway' (10.9.0.2), 'Primary DNS Server' (10.0.0.8), and 'Secondary DNS Server' (10.0.0.12). At the bottom, 'MAC Address' is 00:0C:17:88:0D:2F and 'Link State' is 1000Mbit Full-Duplex.

The Network screen allows you to view and change your HELO's network settings. Click Apply to activate any changes.

## IP Address Type

IP Address Type determines the type of TCP/IP network configuration to be used. DHCP enables connecting to the network DHCP server, which assigns the IP Address, Netmask, and Gateway automatically. Static lets you set these parameters manually.

**NOTE:** If the IP Address Type is DHCP, the IP Address, Netmask, and Default Gateway are gray, indicating they are set automatically and cannot be changed unless IP Address Type is first set to Static. Changes are saved and activated upon confirmation using the Apply button.

**DHCP (default)** - Selects automatic IP address assignment from the LAN DHCP server. If a DHCP server cannot be found, it fails over to the static IP address.

**Static** - Assigns a static IP address manually (using parameters 2.2, 2.3, and 2.4). The factory default static IP address: 192.168.0.1.

## IP Address

IP Address determines a static IP address to be used for TCP/IP networking. Consult your network administrator about how to set this value.

- If IP Address Type is set to DHCP, the IP address is set automatically by the network DHCP server and cannot be entered here.
- If IP Address Type is set to Static, enter an IP address compatible with your LAN here. Also enter a netmask and default gateway address in the following two parameters. Click Apply when you are ready to apply all three entries.
- If IP Address Type is set to DHCP and there is a DHCP failure, the IP address is set to the static IP address.

## Netmask

Netmask determines the subnet mask to be used for TCP/IP networking.

- Enter a subnet mask compatible with your LAN. This is only needed for Static IP configurations. The factory default Subnet Mask is 255.255.255.0.
- If IP Address Type is set to DHCP, the Subnet Mask is set by the DHCP server and cannot be changed by the user.

## Default Gateway

Default Gateway determines the gateway or router used on your LAN for TCP/IP networking.

Without a properly configured default gateway (whether you have a router/gateway or not), your HELO will be unable to see other HELOs on the network, although you may still be able to control this HELO via a web browser. Also, without a proper gateway defined, the discovery feature on the Network web page will not list other units on the network.

- Enter a default gateway or router address. This is only needed for Static IP configurations. The factory Default Gateway is 192.168.0.1.
- If IP Address Type is set to DHCP, the Default Gateway is set by the DHCP server and cannot be changed by the user.

## Primary and Secondary DNS Servers

In DHCP mode, reports the current DNS Server IP addresses. In Static mode, allows entry of DNS Server IP addresses.

*NOTE: If DNS servers are not present or have incorrectly entered IPs, then wherever HELO specifies machines by name (servers in recording destinations, URLs in streaming destinations, NTP servers), the names won't work, although numeric IP addresses will still work.*

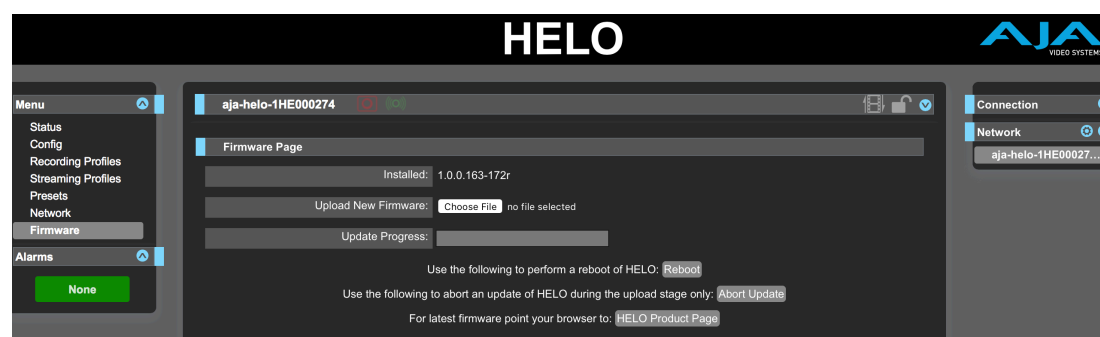
## MAC Address

Reports the connected HELO's Media Access Control Address.

## Link State

Reports the link speed of the Ethernet connection.

# Firmware Screen



The Firmware screen allows you to download and install a firmware update from AJA.

Visit the AJA website ([aja.com](http://aja.com)) to locate and download the latest firmware. The following page provides support information and will include links to locations where you can download updates:

<https://www.aja.com/products/helo#support>

After downloading the update to your local drive, use the Browse or Choose File button to locate the local copy. Follow the prompts to load the new firmware into your unit.

# Chapter 6 – Content Delivery Networks

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## Introduction

---

HELO must be configured to operate with a Content Delivery Network (CDN) when streaming via RTMP, using information provided for that specific network.



**Caution!** Do not share your streaming credentials with anyone. That information allows anyone to access and stream to your channel without your knowledge or permission. CDNs will not ask for a stream key by email, so ignore any such requests. HELO stored presets contain streaming credentials. If you share an exported preset to someone, that person can extract the credentials. Before loaning the device to someone, or returning it as a rental, the factory reset button should be used to clear the device of sensitive information.

*NOTE: HELO sends unencrypted credentials to CDNs.*

## YouTube Live

---

YouTube Live is a free streaming service available to YouTube users.

### YouTube Setup

---

Your YouTube channel must be verified, you need to enable live streaming, and your account cannot be restricted. See YouTube help for more information about setting up live streaming.

### Encoder Information

---

Sign in to YouTube, go to your YouTube channel, click on Upload, and click on Live Streaming.

- Server URL
- Stream name/key

### HELO Streaming Profile Required Settings

---

Stream Type	RTMP
RTMP Server URL	<Server URL>
RTMP Stream Name	<Stream name/key>

### Link to YouTube Recommended Settings

---

<https://support.google.com/youtube/answer/2853702?hl=en>

*NOTE: H.264 Main Profile is recommended, which is the HELO factory default (parameter located under Advanced Settings).*

# UStream

UStream is a commercial streaming service.

## Encoder Information

Log in to your UStream account, select the channel you want to broadcast to, select Broadcast Settings, and then click View on Encoder Settings:

- Server URL
- Stream name/key

## HELO Streaming Profile Required Settings

Stream Type	RTMP
RTMP Server URL	<Server URL>
RTMP Stream Name	<Stream name/key>

## Link to UStream Recommended Settings

<https://support.ustream.tv/hc/en-us/articles/207852117-Internet-connection-and-recommended-encoding-settings>

*NOTE: H.264 Main Profile is recommended, which is the HELO factory default (parameter located under Advanced Settings).*

# Twitch

Twitch is a social video platform and community for gamers.

## Encoder Information

To find your stream key, log into Twitch.TV, navigate to the Dashboard, and click the Stream Key tab.

- Server URL
- Stream name/key

## HELO Streaming Profile Required Settings

Stream Type	RTMP
RTMP Server URL	<Server URL> Use closest Ingest Point below.
RTMP Stream Name	<Stream name/key>

## Twitch Ingest Point

For the best performance with Twitch.Tv, select the Ingest Point that is geographically closest to you.

Name	RTMP address
South America: Argentina	rtmp://live-eze.twitch.tv/app/{stream_key}
South America: Chile	rtmp://live-scl.twitch.tv/app/{stream_key}
South America: Sao Paulo, Brazil	rtmp://live-gru.twitch.tv/app/{stream_key}
Asia: Hong Kong	rtmp://live-hkg.twitch.tv/app/{stream_key}
Asia: Seoul, South Korea	rtmp://live-sel.twitch.tv/app/{stream_key}



Name	RTMP address
Asia: Singapore	rtmp://live-sin.twitch.tv/app/{stream_key}
Asia: Taipei, Taiwan	rtmp://live-tpe.twitch.tv/app/{stream_key}
Asia: Tokyo, Japan	rtmp://live-tyo.twitch.tv/app/{stream_key}
Australia: Sydney	rtmp://live-syd.twitch.tv/app/{stream_key}
EU: Amsterdam, NL	rtmp://live-ams.twitch.tv/app/{stream_key}
EU: Stockholm, Sweden	rtmp://live-arn.twitch.tv/app/{stream_key}
EU: Paris, FR	rtmp://live-cdg.twitch.tv/app/{stream_key}
EU: Frankfurt, Germany	rtmp://live-fra.twitch.tv/app/{stream_key}
EU: London, UK	rtmp://live-lhr.twitch.tv/app/{stream_key}
EU: Prague, CZ	rtmp://live-prg.twitch.tv/app/{stream_key}
EU: Frankfurt, Germany	rtmp://live-fra.twitch.tv/app/{stream_key}
EU: Warsaw, Poland	rtmp://live-waw.twitch.tv/app/{stream_key}
US West: San Francisco, CA	rtmp://live.twitch.tv/app/{stream_key}
US West: Los Angeles, CA	rtmp://live-lax.twitch.tv/app/{stream_key}
US West: San Jose, CA	rtmp://live-sjc.twitch.tv/app/{stream_key}
US West: Seattle, WA	rtmp://live-sea.twitch.tv/app/{stream_key}
US Central: Dallas, TX	rtmp://live-dfw.twitch.tv/app/{stream_key}
US East: Ashburn, VA	rtmp://live-iad.twitch.tv/app/{stream_key}
US East: New York, NY	rtmp://live-jfk.twitch.tv/app/{stream_key}
US East: Miami, FL	rtmp://live-mia.twitch.tv/app/{stream_key}
US East: Chicago	rtmp://live-ord.twitch.tv/app/{stream_key}

Link to Twitch Recommended Settings

<http://help.twitch.tv/customer/en/portal/articles/1253460-broadcast-requirements>

*NOTE: H.264 Main Profile is recommended, which is the HELO factory default (parameter located under Advanced Settings).*

## Wowza

Wowza Media Systems offers a Streaming Server that can be run on either a local or cloud based server. For general information about Wowza Media Systems, see:

<https://www.wowza.com/>

For help with system configuration, contact Wowza Customer Support:

<https://www.wowza.com/forums/content.php?217-How-to-install-and-configure-Wowza-Streaming-Engine>

# Appendix A – Specifications

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## HELO Tech Specs

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### Video Formats

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

\* 2K inputs are center cut to 1080p and are only supported on SDI input

### Video Codec Support

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- H.264/MPEG-4 Encoder

### Video Encoding Parameters

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- 100 kbps to 20 Mbps streamed output
- 100 kbps to 20 Mbps recorded output
- Up to 1080p 60
- Supports Baseline, Main and High

### Audio Encoding Parameters

---

- 32 kbps to 256 kbps
- 32, 44.1 and 48 kHz 2-Channel stereo
- MPEG-4 AAC-LC

### Protocols

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- RTMP, RTSP/RTP, Unicast and Multi Unicast (3-10 Clients)

### Storage

---

- 1 x USB 2.0 slot, (exFAT or FAT32)
- 1 x SD Card slot, SD and SDHC cards (exFAT)
- Mounted Network Share

### Video Input Digital

---

- 1 x 3G-SDI, SMPTE-292/296/424, 10-bit
  - Single Link 4:2:2, 4:4:4 (1 x BNC)
- 1 x HDMI Standard Type A connector
  - HDMI v1.4a, RGB or YCbCr

### Video Output Digital

---

- 1 x 3G-SDI, SMPTE-292/296/424, 10-bit
  - Single Link 4:2:2 or 4:4:4 (1 x BNC)
- 1 x HDMI Standard Type A connector
  - HDMI v1.4a, RGB or YCbCr

### Audio Input Digital

---

- 2-Channel, 24-bit SDI embedded audio, 48 kHz sample rate, synchronous
- 2-Channel, 24-bit HDMI embedded audio, 48 kHz sample rate, synchronous

### Audio Input Analog

---

- 2-Channel, Analog (Line Level, Unbalanced stereo 1 x 3.5mm TRS connector)

### Audio Output Digital

---

- 2-Channel, 24-bit SDI embedded audio, 48 kHz sample rate, synchronous
- 2-Channel, 24-bit HDMI embedded audio, 48 kHz sample rate, synchronous

### Audio Output Analog

---

- 2-Channel, Analog (Line Level, Unbalanced stereo 1 x 3.5mm TRS connector)

### Network Interface

---

- 10/100/1000 Ethernet (RJ-45)
- Embedded web server for Configuration and Control

### User Interface

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- Stream Button
- Record Button
- Web UI
- Simple Web Configuration via AJA eMini-Setup (OSX and PC)

### Size (w x d x h)

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- 7.00" x 4.66" x 1.02" (177.8mm x 139.8mm x 25.8mm)

### Weight

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- 0.8 lb (0.4 kg)

### Power

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- 100-240V, 50/60 Hz Universal Input, +5-20V DC 13W Max

### Environment

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- 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

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## Federal Communications Commission (FCC) Compliance Notices

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### Class A Interference Statement

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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

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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

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### 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

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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, LICHTEINSTEIN, 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:

Safety:

EN 60065: 2002 + A1: 2006 + A11: 2008 + A2: 2010 + A12: 2011 (GS License)

IEC 60065: 2001 + A1: 2005 + A2: 2010 (CB Scheme Report/Certificate)

Additional licenses issued for specific countries available on request.

Emissions:

EN 55032: 2012, CISPR 22: 2008, 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 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.

## Japanese 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 V-3/2015.04). 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!** Unplug this device during lightning storms or when unused for long periods of time.

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

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

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

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

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



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

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

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

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

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

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





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

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

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

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

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

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



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

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

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

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

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

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



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

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

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

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

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

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



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

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

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

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

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

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



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

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

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

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

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

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

# Warranty and Liability Information

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## Limited Warranty

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AJA Video Systems, Inc. (AJA Video) warrants that the product, not including storage modules, 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, will be free from defects in materials and workmanship for a period of one year from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

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

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

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