

# HELO

## H.264 Streaming and Recording Encoder



## Installation and Operation Guide

Version 4.2r1  
Published April 3, 2020



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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, iPhone or other device and deliver the stream directly to a Content Delivery Network (CDN) via RTMP, RTMPS, RTMPE, RTSP (10 clients), HTTPS, RTP/UDP Unicast and Multi Unicast, or HLS (10 clients) (HTTP Live Streaming). 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.

Configured by default for DHCP network communications, installing HELO 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. A low frame rate video monitor displays the video signal to indicate its presence.

## Using Mobile Devices

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### Streaming from HELO to Mobile Devices

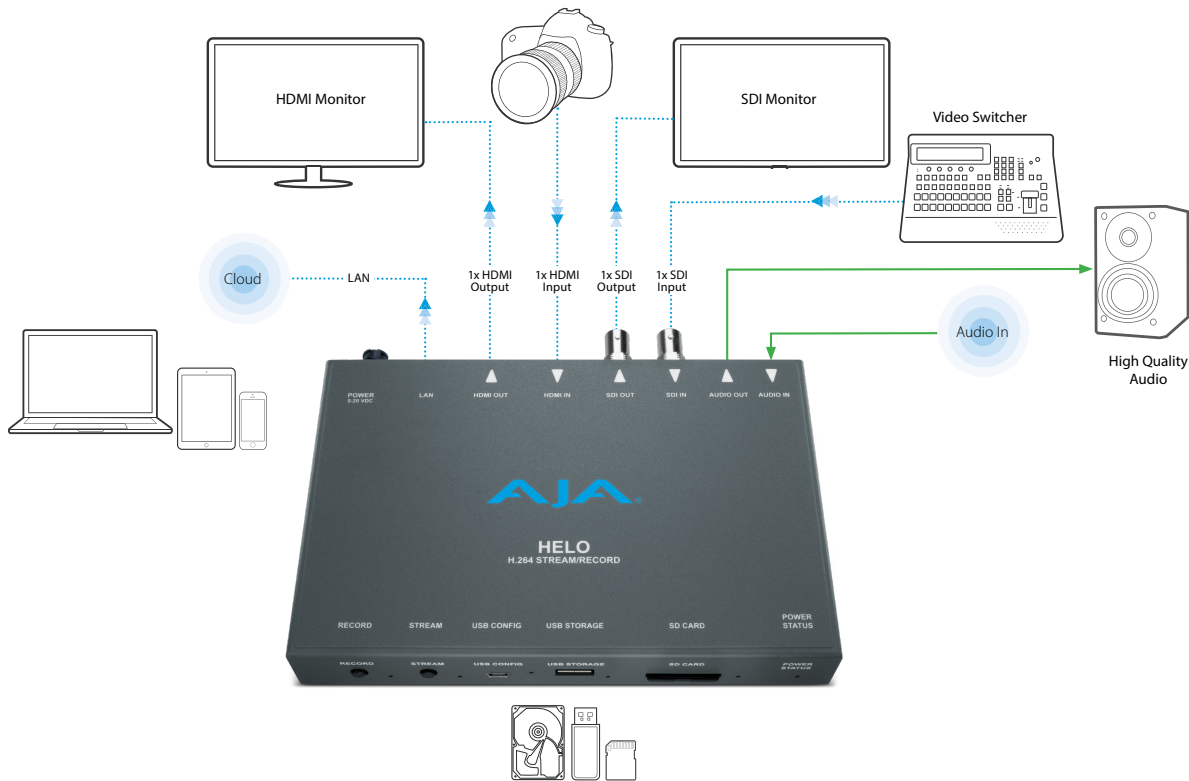
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When streaming from HELO to a mobile device, video is sent out through the LAN port and delivered to the mobile device wirelessly using the HLS protocol. The wireless delivery is done by a WiFi Access Point or by routing the stream through a mobile telecom network. HELO does not have WiFi built in, and does not support WiFi dongles in the USB port.

## Sending Video to HELO from Mobile Devices

When sending video from a mobile device to HELO for streaming, the mobile device, such as an iPhone, iPad, or Android device, must be physically connected to HELO's HDMI input using an appropriate adapter and an HDMI cable.

Figure 1. HELO Workflow Diagram



## Features

- Simultaneous independent streaming and recording of 3G/HD/SD video formats from a single input
- HLS streaming (HTTP Live Streaming) to reduce buffering and stuttering, allowing for consumer devices such as iPhones and iPads to connect directly to HELO for streaming
- Enhanced HTTPS security
- HDMI and SDI BNC inputs
- AV Mute with user graphics upload support for pre-live feeds
- Error logging for quick analysis of streaming issues
- Web UI regionalization for Chinese, Japanese and Korean
- Optionally segmented recording to onboard USB or SD card storage or a network file store
- Simultaneous dual recording to any destination plus onboard storage
- Closed captioning streaming from SDI input
- 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
- Integrated Calendar to schedule automatic streaming and/or recording of events
- Low frame-rate video confidence monitor in web UI
- Recordings directory in web UI to view, sort, download or delete recorded files

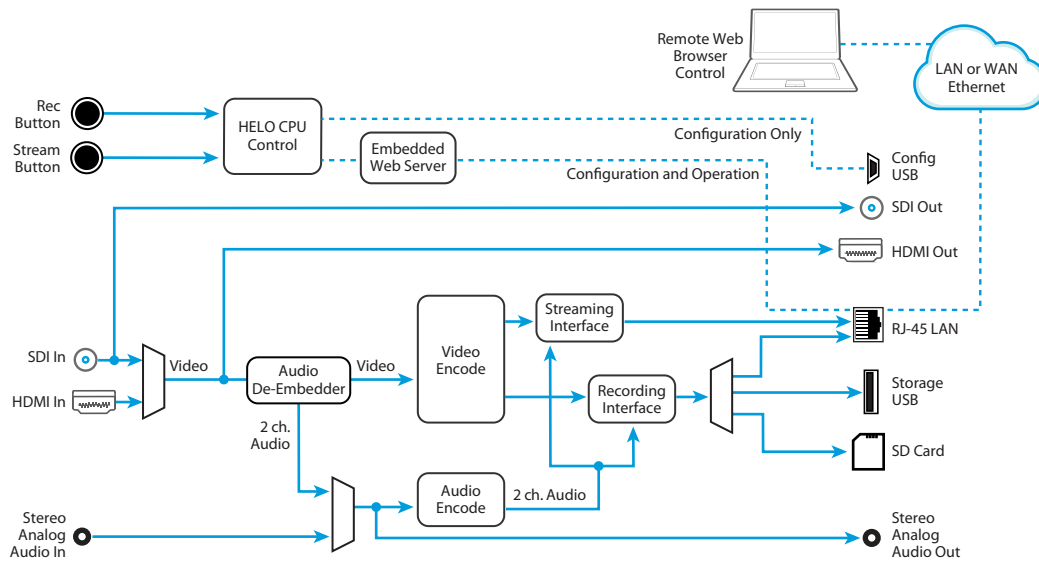
## Hardware

- Hardware H.264 encoding, streaming and recording

## Software

- 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

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Remote computer configuration and control is accomplished using HELO's internal web server. A macOS 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.*

## HELO REST API Documentation

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AJA's REST automation API provides a platform from which you can issue commands to an AJA device's internal web server, allowing remote systems the ability to control AJA embedded or networked devices. With this control framework, you can build integration and automation scripts, using any scripting language, allowing you to take full advantage of the device's functionality.

This documentation is available at the following link:

[https://gitlab.aja.com/pub/rest\\_api](https://gitlab.aja.com/pub/rest_api)

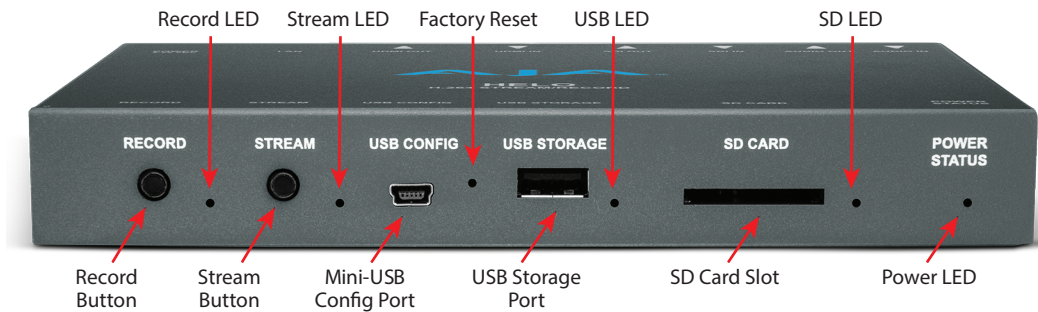
# Chapter 2 – Product at a Glance

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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

---

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

---

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

---

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

---

- SMB
- NFS

## Front Panel Status LEDs

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### Record LED

---

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

**Flashing Green** - Recording in progress

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

**Alternating Amber and Green** - Dual Record mode is selected, and one of the record destinations is ready but the other one is not

**Flashing Amber** - Input signal loss

### Stream LED

---

**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

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#### Storage Available Indicated by Color

---

**Solid (on or off)** - Safe to remove media

**Green** - Plenty of storage space available

**Yellow** - Storage space running low

**Red** - Storage media full. New recordings are not possible until more space is made available.

#### Activity Indicated by Blinking and On/Off Behavior

---

**Blinking On/Off** - Media in use, do not remove

**Solid off** - Media not selected or not present

**Solid on** - Media mounted and ready

**Slow flashing** - Recording in progress

**Medium flashing** - Media being scanned for recordings

**Fast flashing** - Other file access in progress (file download or delete)

**Green** - Media mounted and ready

**Flashing Green** - Recording in progress

## SD LED

---

### Storage Available Indicated by Color

---

**Solid (on or off)** - Safe to remove media

**Green** - Plenty of storage space available

**Yellow** - Storage space running low

**Red** - Storage media full. New recordings are not possible until more space is made available.

### Activity Indicated by Blinking and On/Off Behavior

---

**Blinking On/Off** - Media in use, do not remove

**Solid off** - Media not selected or not present

**Solid on** - Media mounted and ready

**Slow flashing** - Recording in progress

**Medium flashing** - Media being scanned for recordings

**Fast flashing** - Other file access in progress (file download or delete)

**Green** - Media mounted and ready

**Flashing Green** - Recording in progress

## Power LED

---

**Green** - Power on and normal operation

**Amber** - Safeboot

**Flashing** - Identify feature on

## Factory Reset Button (Hardware)

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

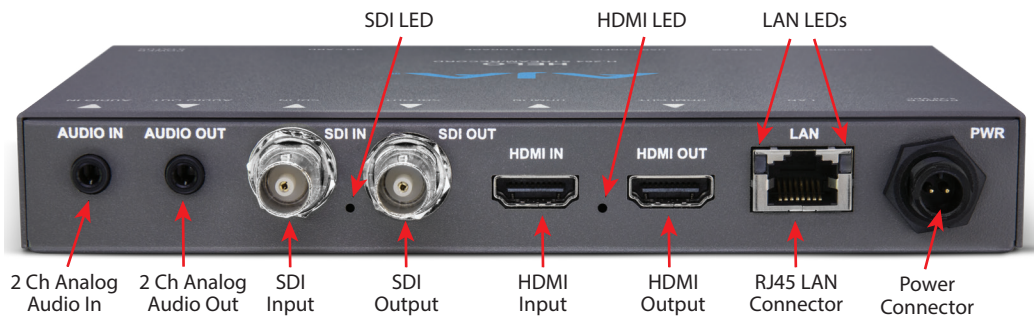
The hardware button does a hard reset, which resets everything, including network connection parameters, and will also erase all saved presets, profiles, and calendars. It is intended to be used in the factory to ensure a system is in a new state before shipment, and for use by equipment loan or rental houses that need to put HELOs into a new state, and also to ensure any saved passwords are erased.

*NOTE: A Factory Preset button is also available on the web browser UI (Presets Screen), but different parameters are reset from the web interface. See "[Factory Reset \(Web UI\)](#)" on [page 50](#) for more information.*

# Rear Panel

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Figure 3. HELO Rear Panel



## Connections

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### Audio

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- 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

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- 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

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### 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

---

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

---

**CAUTION:** Please use caution and take security into account when configuring your HELO unit on your network. It is recommended that you place your HELO behind a firewall so that it is not accessible on the open internet by unauthorized users. If you have questions or concerns about how to configure HELO in a way that is appropriate for your security needs, please consult with your IT staff or a qualified network security consultant.

## Network Configuration

---

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 18 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.

## Setting up HELO on a Static Network without eMini-Setup

---

If you choose not to use eMini-Setup to configure your HELO, this section describes the steps you can take to temporarily modify your controlling computer's IP address in order to connect to a HELO that has already had its IP address set to its default Static IP address.

Because HELO ships with DHCP enabled by default, in order to setup a Static IP address, you will first need to put HELO into Static IP mode via eMini-Setup or via the Web interface.

For example, let us assume that, through using eMini-Setup, the Static IP address of the HELO has previously been set to **192.168.101.1** with a subnet mask of **255.255.255.0**.

To enable your computer to connect to HELO without using eMini-Setup, we will walk through the network configuration steps needed for both MacOS and Windows to temporarily configure your computer to be set to the static IP address of **192.168.101.2**.

*IMPORTANT: BEFORE following the steps below to alter your Mac or Windows network configuration, record your existing TCP-IP settings so that you can return your computer to normal network operation after completing this procedure.*

### MacOS

---

1. Open up the MacOS **System Preferences** and select **Network**.
2. Input the address information shown below:
  - IP Address: **192.168.101.2**
  - Subnet Mask: **255.255.255.0**
3. Click **Apply**. This will put both your computer and your HELO within suitable address range for connection.
4. Ensure that the HELO device is connected to the Mac via Ethernet (directly or via LAN).
5. Start Safari (or another browser) and enter **192.168.101.1** as a web address.
6. Once connected to HELO's web interface, reconfigure HELO's network parameters as desired.
7. Restore your computer to its normal network TCP-IP settings.

### Windows

---

1. Use **Control Panel** to access your Local Area Network properties. In Windows 10 the path is **Control Panel > All Control Panel Items > Network and Sharing Center**.
2. Under **Connections**, click **Local Area Connection** for the PC's Ethernet port.
3. In the resulting General dialog screen, select **Properties**.
4. On the **Networking** tab, select **Internet Protocol Version 4** and click the **Properties** button below.

5. Click the **Use the following IP address:** radio button and enter the IP Address and Subnet Mask below:
  - IP Address: **192.168.101.2**
  - Subnet Mask: **255.255.255.0**
6. Click **OK** to store the changes.
7. Connect the Windows PC to HELO's RJ-45 port (either direct or through your LAN).
8. Point your web browser to **192.168.101.1**.
9. Once connected to HELO's web interface, reconfigure HELO's network parameters as desired.
10. Restore your computer to its normal network TCP-IP settings.

## HELO Recording Quick Start

---

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, Recording Media Type 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 25 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

---

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 Username
- RTMP Password

The Server URL 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 25* 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

Visit the AJA website (<https://www.aja.com>) to locate and download the latest firmware. The following page provides support information and includes links to locations where you can download updates:

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

# Chapter 4 – eMini-Setup

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## Overview

---

This chapter describes using the eMini-Setup application to initially communicate with and configure the HELO over a direct USB connection. Once configured, the HELO 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 server.

*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 the HELO to that computer's USB port.
3. Launch the eMini-Setup application.
4. Go to the Control Network tab and Media 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

---

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:

1. Go to:  
<https://www.aja.com/family/software#eminisetup>
2. Click the link corresponding to the version you want to download for Mac or Windows.

## AJA Documentation

---

Included with the eMini-Setup download is the AJA device's documentation, 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/support>

Click the product name and open the Manuals link.

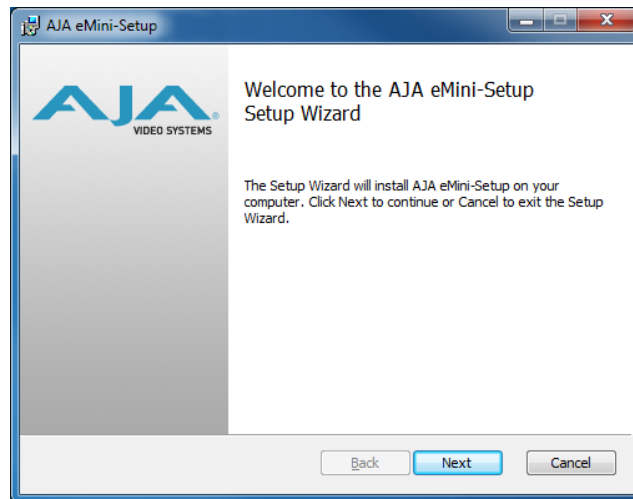
# Installing eMini-Setup

## PC Installation

To install eMini-Setup on a Windows PC:

1. Download the application from the AJA website. See ["Acquiring eMini-Setup" on page 18](#).
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.

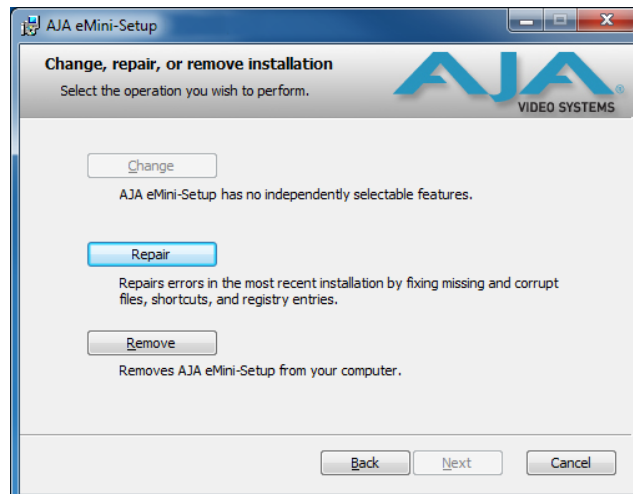
Figure 4. eMini-Setup PC Wizard



5. Click Next to begin. Answer the questions in the subsequent dialogues, 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. (In some instances, Windows may require uninstalling an earlier version of eMini-Setup before installing a new version.)

Figure 5. eMini-Setup Wizard, Re-installation



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

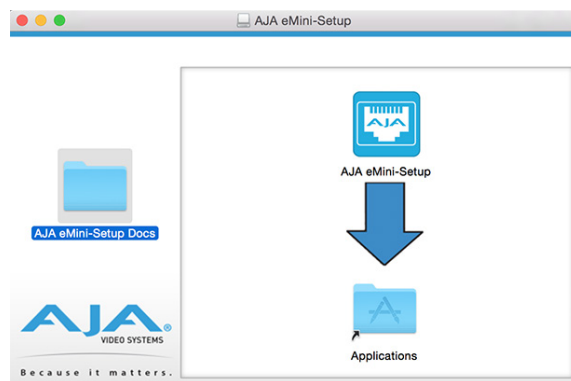
## Mac Installation

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. See ["Acquiring eMini-Setup" on page 18](#).
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*



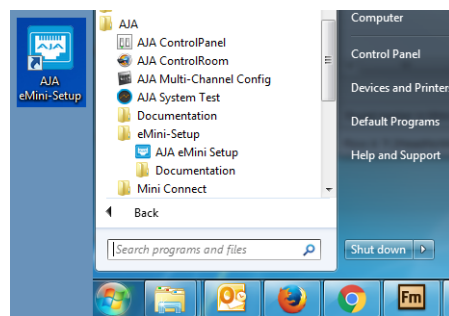
5. To complete the installation drag the "AJA eMini-Setup" icon to the Applications folder.

## Running eMini-Setup

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

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.



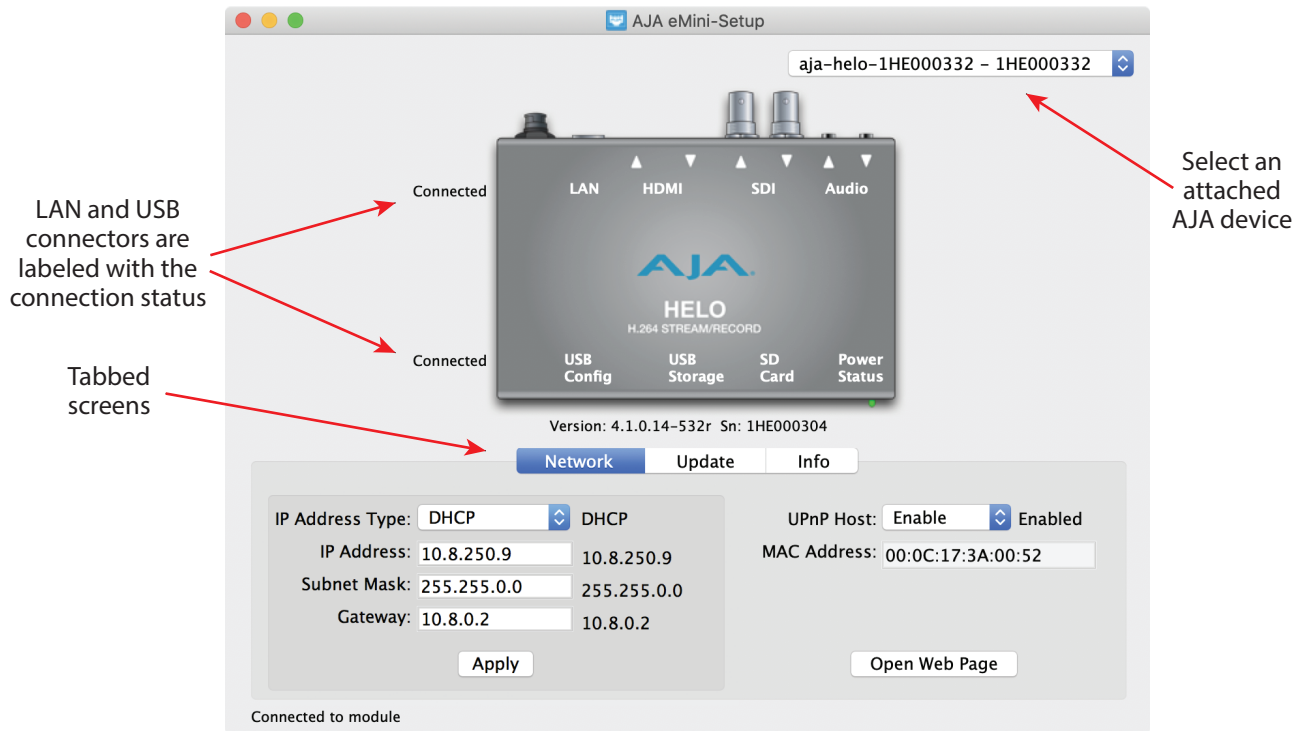
## Mac Startup

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 7. 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.

### eMini-Setup Device 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

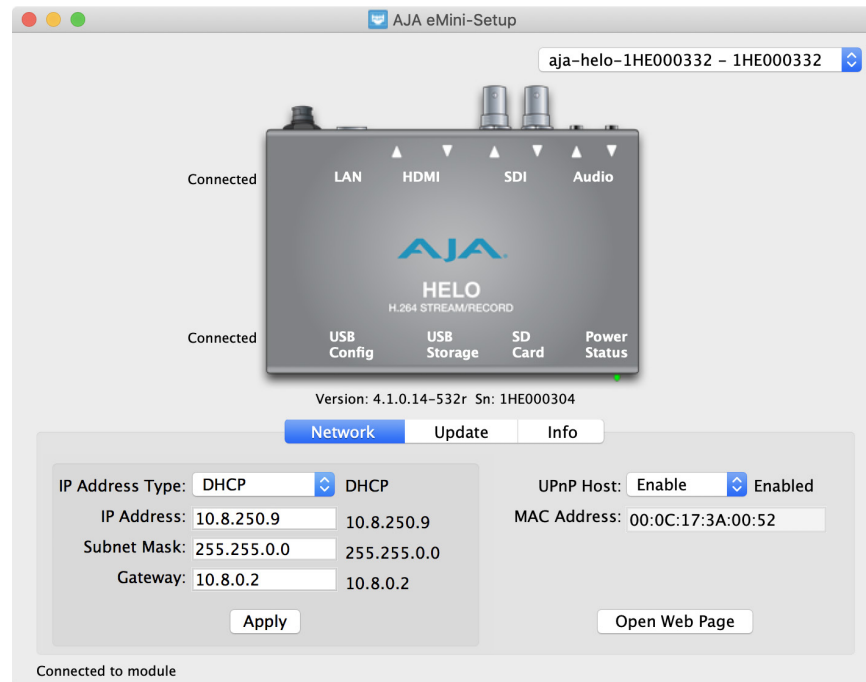
The File drop-down menu on the eMini-Setup application bar has a Revert to Factory Settings menu item that allows you to change the settings back to the AJA device's factory defaults.

### Edit Menu

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

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.

*NOTE: International characters are fully supported in the 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, 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.

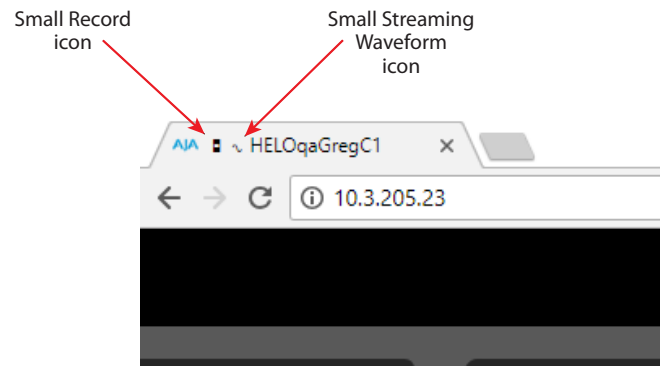
The round blue Up/Down arrow button on each panel and many status parameters opens and closes that pane or set of parameters.

#### Recording and Streaming Icons in Browser Tab

---

When HELO is recording, a small record icon appears in the browser tab. Similarly, when HELO is streaming, a small waveform icon, representing streaming, appears in the browser tab. This allows one to tell at a glance if HELO is recording and/or streaming while viewing a webpage in a different tab.

Figure 8. Recording and Streaming icons in web browser tab



## 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.

## Recordings Panel

The Recordings panel lists the Primary and Secondary recording destinations. Either destination can be selected to display and access the recordings residing on that destination. You can see a file directory from which you can view file attributes and select files for downloading or deleting.

## Languages Panel

From the Languages panel, you can select which language you prefer to be integrated with the web UI—English, Japanese, Korean or Chinese. After selecting your preferred language, HELO will pause for a few moments while it adjusts to your language selection.

## 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.

## Video Monitor

The Recording and Stream Panel contains a low frame rate video monitor used for signal confidence monitoring. You can use this to confirm the presence of the intended video signal.

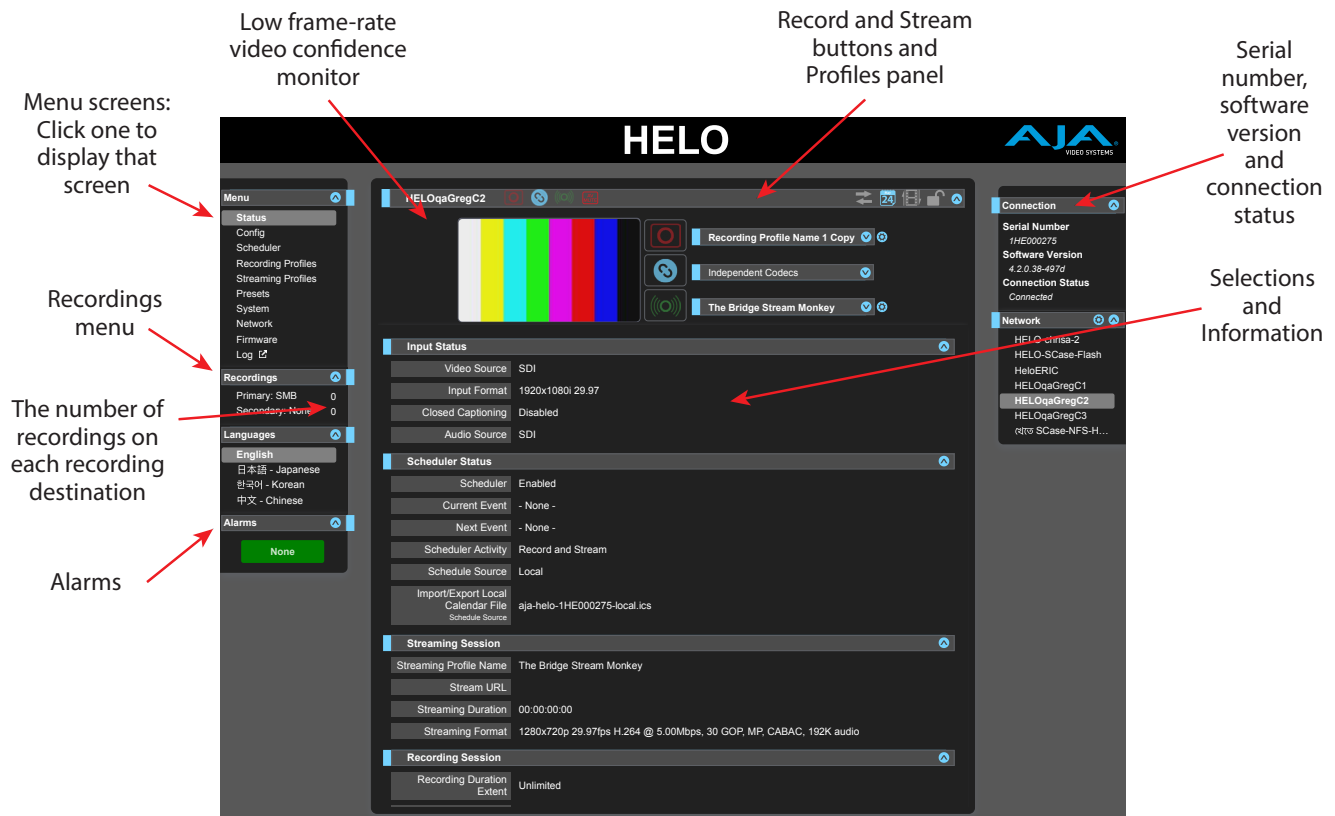
## Independent Codecs Menu

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.

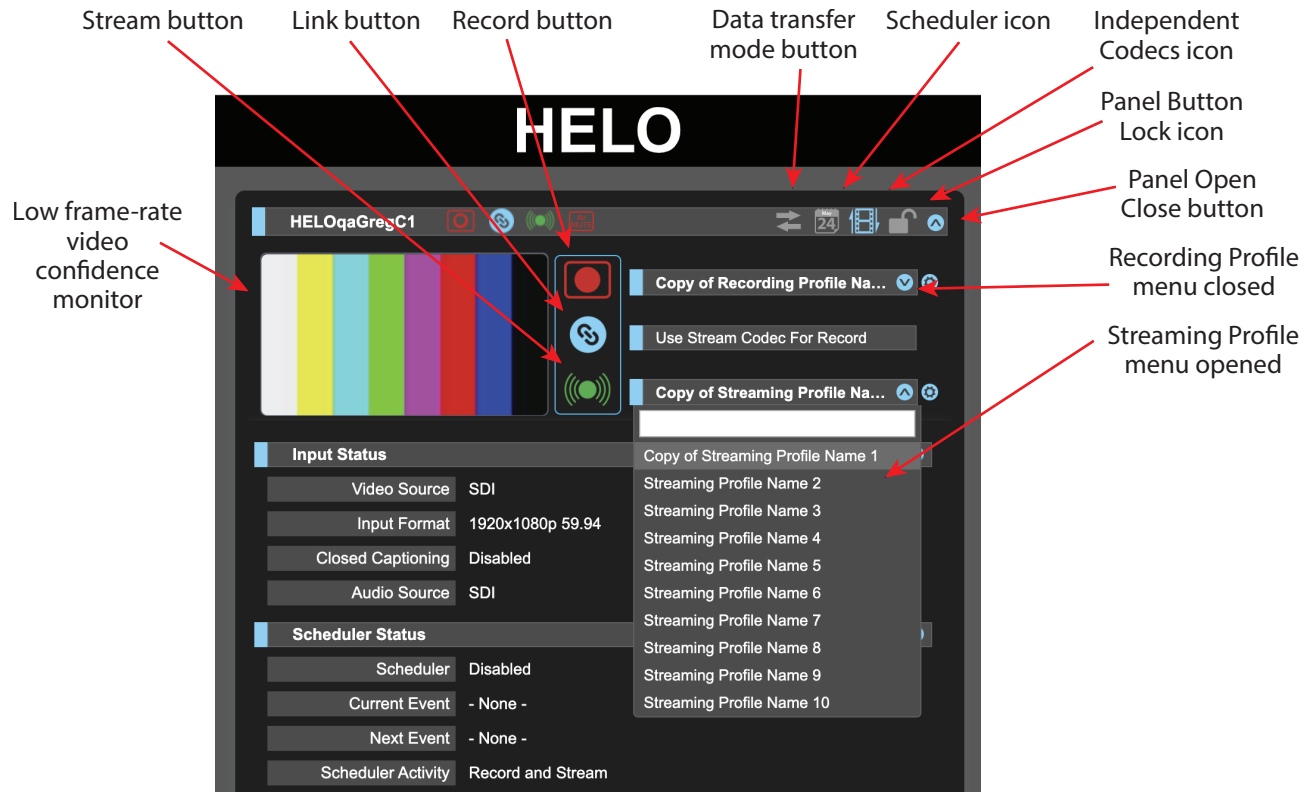
*Figure 9. HELO Web Browser Screen Areas*



## 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



## Video Monitor

The Recording and Stream Panel contains a low frame rate video monitor used for signal confidence monitoring. You can use this to confirm the presence of the intended video signal.

## 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. The Record, Stream, and Link buttons are disabled when in Data Transfer mode.

## Data Transfer Mode Button

The Data Transfer mode button toggles between off and on. When recording and/or streaming, Data Transfer mode must be turned off (gray arrows). Data Transfer mode must be turned on (yellow arrows) in order to download files from the Recordings panel.

## Scheduler Icon

The Scheduler icon indicates whether the Scheduler is enabled or not. When colored gray, the Scheduler is disabled. When colored blue, the Scheduler is enabled.

## 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

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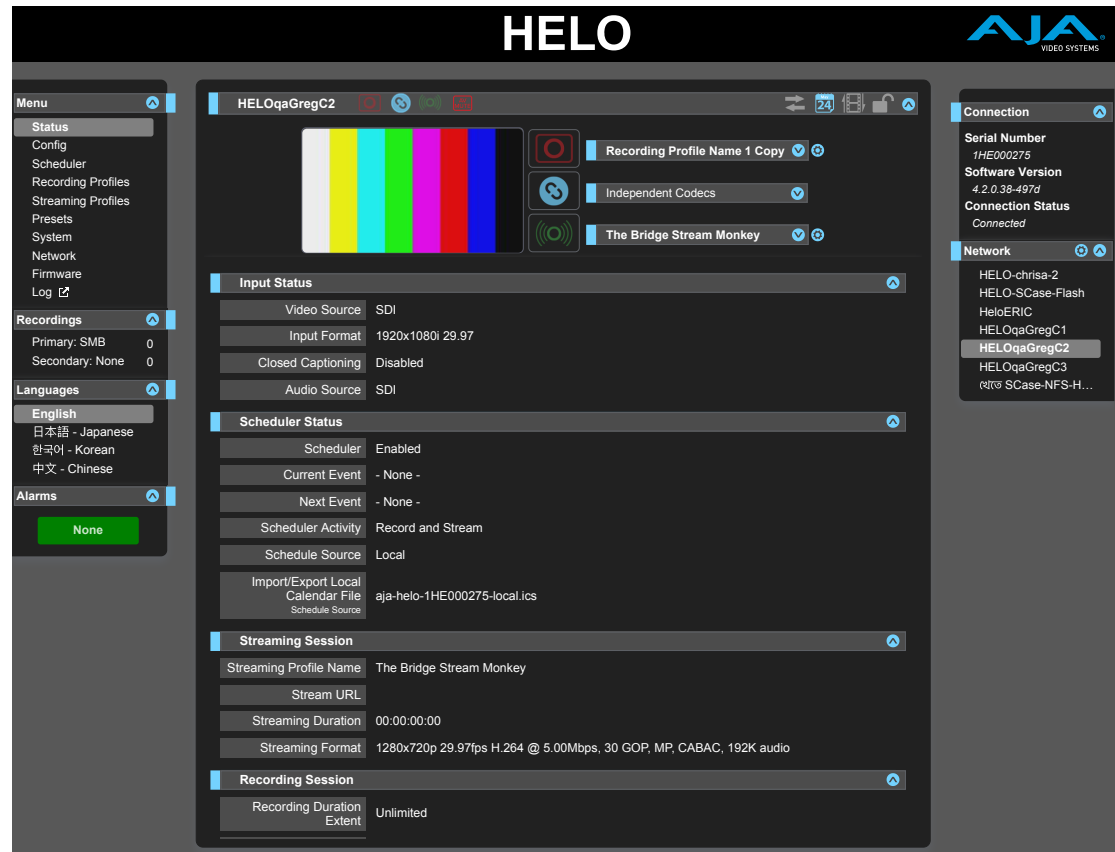
Below the Record button is a drop-down menu allowing you to select one of 10 different Recording Profiles that can contain different sets of recording configuration information. When selected, the parameters below change to match that profile. Each Recording Profile can be named. The blue gear is a shortcut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

Each group of parameters can be expanded or collapsed.

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

Selects a video input source from the available video input connections. This is the video that will be recorded and/or passed through.

**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

Selects an audio input source from the available audio input connections, including embedded SDI audio which requires an SDI video source and HDMI audio, which requires an HDMI video 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.

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

## Audio Delay

Delays audio on analog, HDMI, recordings, and streams by a fixed number of milliseconds relative to the input.

## Closed Captioning Source

---

Determines the source for closed captioning data. Closed captioning is available when the video source is an SDI signal. When the video source is HDMI or Test Pattern, the Closed Captioning Source control is not displayed on the Config Screen. Select from the following:

**None** - Select when you do not want to include closed captioning in the stream or when closed captioning is not present in the SDI signal (factory default).

**Auto** - Select when you want HELO to auto-detect the closed captioning source.

**Ancillary data** - Select when the closed captioning data has been encoded into the ancillary data of the signal.

**Line 21** - Select when the closed captioning data has been encoded into line 21 of the signal.

## AV Mute

---

Use AV Mute to mute both the video and audio while still maintaining a stream to the end viewer.

For example, you can personalize your pre-stream viewers' experience with your own program content instead of color bars or black, or replace the outgoing signal if technical difficulties occur in the studio while on air.

When AV Mute is on, HELO mutes the audio and video from the input signal and instead shows the selected Video Test Pattern Type along with silent audio.

When AV Mute is off, in instances when there is no input signal, HELO shows the selected Video Test Pattern Type along with silent audio.

### Uploading a Custom Video Test Pattern Image

---

To upload your own custom video test pattern image for HELO to display instead of color bars or black:

1. Select Custom from the Video Test Pattern Type control on the Config page. The Custom Test Pattern Image control displays.
2. Click the Choose File button. A navigation window opens.
3. Navigate to the image to upload, select it, then click Open. Your selection will display as the Custom Test Pattern Image and will be sent to the end viewer when AV Mute is on or when there is no input signal present.

### Custom Video Test Pattern File Requirements

---

Please observe these file requirements for custom video test pattern files:

- Must be in standard JPEG image file format.
- Cannot be larger than 4 MB in size.
- Image resolution must not be larger than HD (1920x1080).
- For best results, use an image that has the intended video capture resolution. (At any other resolution, the image will be anamorphically scaled to fit the capture size.)
- Images smaller than SD (720x480) are allowed but not recommended.

## 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).

## SDI 2K Input Processing

---

Determines how SDI 2K input is horizontally down-converted to 1080 pixels. To maintain aspect ratio when downscaling, manually select a height of 1008 pixels in the recording and streaming profiles.

**Center cut** - Trims frames.

**Downscale** - Squeezes frames.

## Auto-Recover Streaming

---

If there is a streaming disconnect, this control determines what will happen to the streaming function.

**Off** - After a streaming disconnect, the unit will *not* automatically attempt to reconnect and resume streaming.

**On** - After a streaming disconnect, the unit will automatically attempt to reconnect and resume streaming (factory default).

## Power Up State

---

Selects what HELO will do when powered on or reset. Select "Idle" for normal use and when the scheduler is enabled.

**Idle** - Upon powering up, the unit will be in an idle state (factory default).

**Record** - Upon powering up, the unit will automatically start encoding and recording.

**Stream** - Upon powering up, the unit will automatically start encoding and streaming.

**Record and Stream** - Upon powering up, the unit will automatically start encoding, recording and streaming.

## RTP/UDP Traffic Shaping

---

Allows control of traffic shaping for RTP or UDP stream output. Enabling this control will make the packet timing for RTP/UDP streams less "bursty" and may improve streamed video quality with some networks.

**Disable** - Disables RTP/UDP Traffic Shaping (factory default).

**Enable** - Enables RTP/UDP Traffic Shaping.

## Video Test Pattern Format

---

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

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

## Video Test Pattern Type

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

- 100% Bars (factory default)
- Black

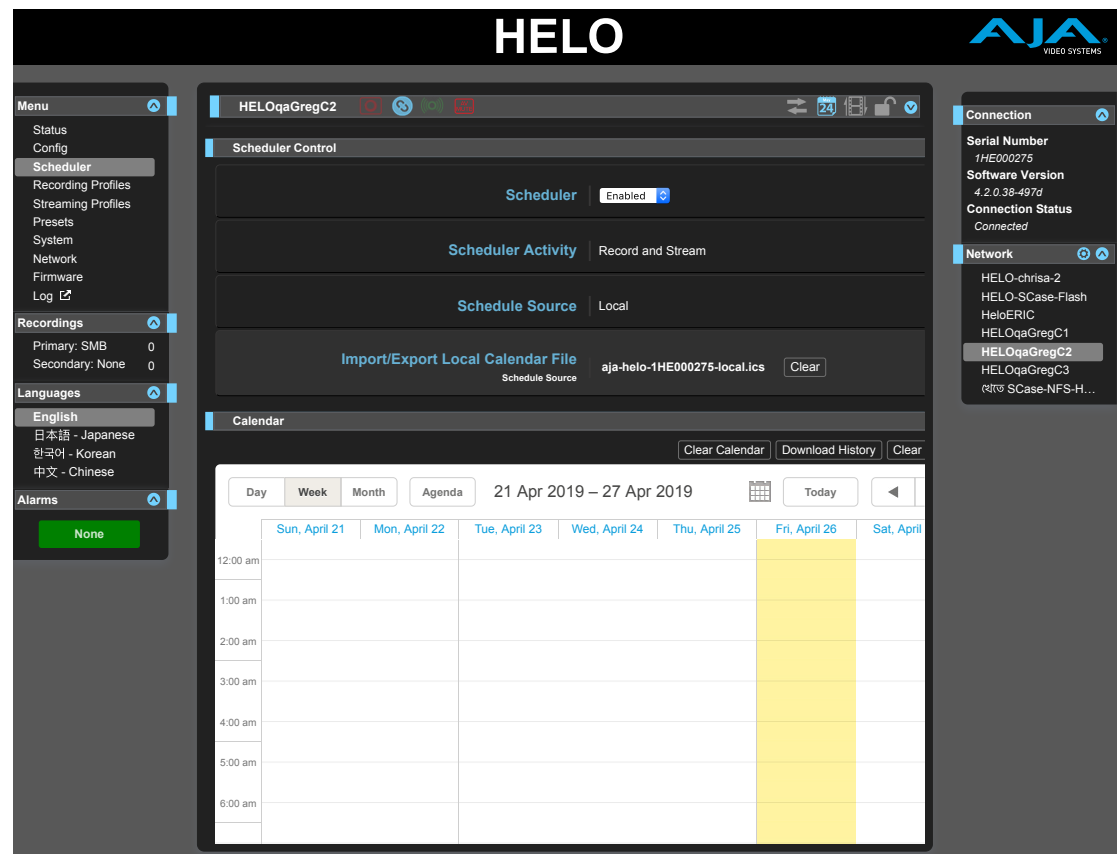
## Enable HDMI Monitor

**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.*

## Scheduler Screen



With the Scheduler, you can schedule one-time or recurring events for recording, streaming, or both. You can use local and remote calendars. You can also import and export calendar files, and export scheduler history logs.

### Scheduler

Enabling the scheduler sets up HELO for unattended operation. If the scheduler is enabled, HELO will automatically start and stop streaming and recording for each event on the calendar.

When using this option, ensure that any required network connectivity is configured and functioning correctly, and that adequate storage is available on both the primary and secondary recording destinations.

**Disabled** - When disabled, you can configure scheduler parameters such as Scheduler Activity, Schedule Source, and Import/Export Local Calendar file (factory default). When the scheduler is disabled, HELO will ignore events, although it will still display them on the calendar.

**Enabled** - When enabled, you cannot modify the Scheduler Activity, Schedule Source, and Import/Export Local Calendar File.

---

#### Scheduler Activity

**Record** - When Record is selected, the scheduled activity will record.

**Stream** - When Stream is selected, the scheduled activity will stream.

**Record and Stream** - When Record and Stream is selected, the scheduled activity will record and stream (factory default).

*NOTE: If this Scheduler Activity setting conflicts with the Power Up State setting on the Config page, this parameter takes priority, and a "Scheduler Takes Priority" warning will display in the alarms list.*

---

#### Schedule Source

To modify the Schedule Source, the Scheduler must be "Disabled." When disabled, a drop-down menu displays.

**Local** - (Factory default.) When Local is selected, the Import/Export Local Calendar File option displays.

**Remote** - When Remote is selected, the Remote Calendar URL option displays.

---

#### Import/Export Local Calendar File

This control provides a method for downloading and uploading calendar files.

If you have uploaded a local calendar, its filename will display. If you have not uploaded a local calendar, the default name will be based on the factory default system name, and will be something like "aja-helo-1HE000277-local.ics."

You can download the calendar file to your computer by clicking on its filename. It will contain any events you have created on HELO. This is true even if you have not first uploaded a calendar.

To upload a calendar, the Scheduler must be "Disabled." When disabled, a **Choose File** button displays directly beneath the calendar filename. Click the **Choose File** button to open a navigation window. Select the calendar file you want to upload, then click **Open**. The uploaded calendar filename now displays.

When importing and re-exporting local calendars, HELO discards some fields it doesn't use the first time you make an edit, including attachments.

---

#### Remote Calendar URL

When "Remote" is selected for Schedule Source, the Remote Calendar URL control displays. A URL needs to be entered into the Remote Calendar URL field. For example:

<https://calendar.google.com/calendar/ical/example@gmail.com/public/basics.ics>

HTTP and Webcal protocols are also supported. However, the URL must point to a file that is in ICAL format, and the file must be retrievable without authentication. "Private" Google calendar URLs (not publicized, but downloadable by anyone with the URL) will work, but anything that requires a login to retrieve will not.

## Creating, Editing or Deleting Events

---

You must be in "local" mode to create, edit, or delete events. In remote mode, the calendar is read-only.

If you want to edit a remote calendar, you will first need to export it from the remote source, such as Google, then upload it to HELO as a local calendar; this will allow edits.

To push any changes back, you will need to export the calendar from HELO and upload it back to the original source.

### To Create a New Event

1. Make sure you have selected "Enabled" from the Scheduler control.
2. Double-click on the calendar. A new event window pops up.
3. Enter a description in the Description field. Enter any details that would be useful to include in the Details field.
4. For a repeating event, click the **Disabled** button on the right side of the **Repeat event** section. **Repeat event** controls display.

*NOTE: Exceptions to repeating events, such as changes to or deletions of a single event in a series, are not supported in release 2.1.*

5. Use the Full day checkbox to indicate whether or not it is a full-day event.
6. Select the start date field to bring up a calendar. Click the date you want to use.
7. Select the start time field to bring up a clock. Select the hour, minute and AM/PM settings. (AM/PM is a choice if you are not in 24-hour clock mode.)
8. At the bottom of the clock display, select Done.
9. Repeat this same process to select the ending date and time for your event.
10. Select Save. Your new event will display on the calendar.

## Scheduler Status

---

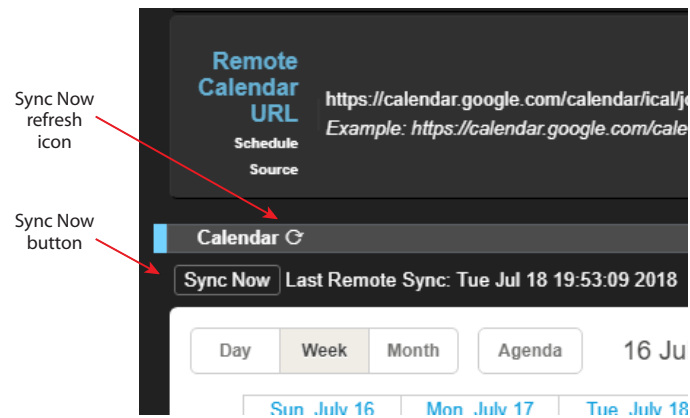
If a current event is active, it will display in the Scheduler Status portion of the Status page. The next scheduled event that isn't currently active will show up in the "Next Event" field right underneath it.

## Sync Now

---

When using a remote calendar, a Sync Now icon appears to the right of the Calendar heading. There is also a Sync Now button just below that. These both do the same thing. They retrieve the latest version of the remote calendar from the remote server hosting it. The date and time of the last sync is shown to the right of the Sync Now button. Additionally, synchronization occurs automatically every 15 minutes.

Figure 10. Remote Calendar Sync Now Refresh Icon and Button



## History Events

History events are created by HELO to show what scheduled events were attempted and what the result was for each one. This is useful for creating a log of recordings and streaming events that have occurred and what the outcome was for each one.

Each history event displays on the calendar using the following color scheme:

**Blue** - Scheduled (upcoming)

**Green** - Successful (completed)

**Red** - Failed (completed)

**Yellow** - Stopped by user (completed)

**Gray** - Discarded due to overlap (completed)

**Animated oscillation between Blue and Green** - Active (in progress)

**Animated oscillation between Blue and Red** - Trying (something is not working correctly but the unit is still attempting to perform the event)

The record of history events is maintained in a separate .ics file, called something like "myhelosystemname-scheduler-history.ics". If you download the history, you will get an .ics file with just the history events in it. History events are scheduled events from a local or remote calendar that HELO attempted to process automatically. If the Scheduler has never been enabled, it will be an empty calendar. The file will have the ICAL header but it will contain no events.

## Clear Calendar

Click the **Clear Calendar** button to clear the local calendar of all events. This clears the uploaded local events calendar file, or the one named after the default system name.

## Download History

Click the **Download History** button to download all past events that are on the local calendar.

## Clear History

Click the **Clear History** button to clear the result of automatically attempted events in the past.

## Local Calendar User Preferences

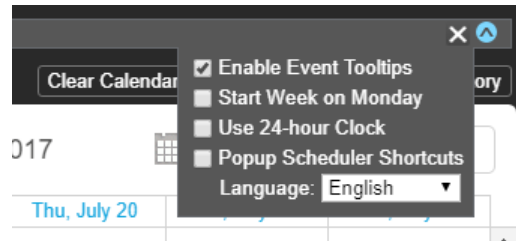
---

Click on the sandwich icon toward the right-hand side of the Calendar menu bar (next to the open/close icon) to access checkboxes for selecting local user preferences. These settings are saved by the browser in client-side local storage; they are not saved on HELO. If you switch browsers or computers, or use incognito mode, these preferences will need to be set again.

These local calendar user preferences include the following:

- Enable Event Tooltips
- Start Week on Monday (otherwise week starts on Sunday)
- Use 24-hour clock (otherwise clock will be 12-hour AM/PM)
- View a pop-up window that shows Scheduler Keyboard Shortcuts
- Select language for the calendar

*Figure 11. Local Calendar User Preferences*



## Calendar Views

---

View the calendar by day, week, or month. In week and month views, the light blue dates are links. Clicking on a date link takes you to its corresponding day view.

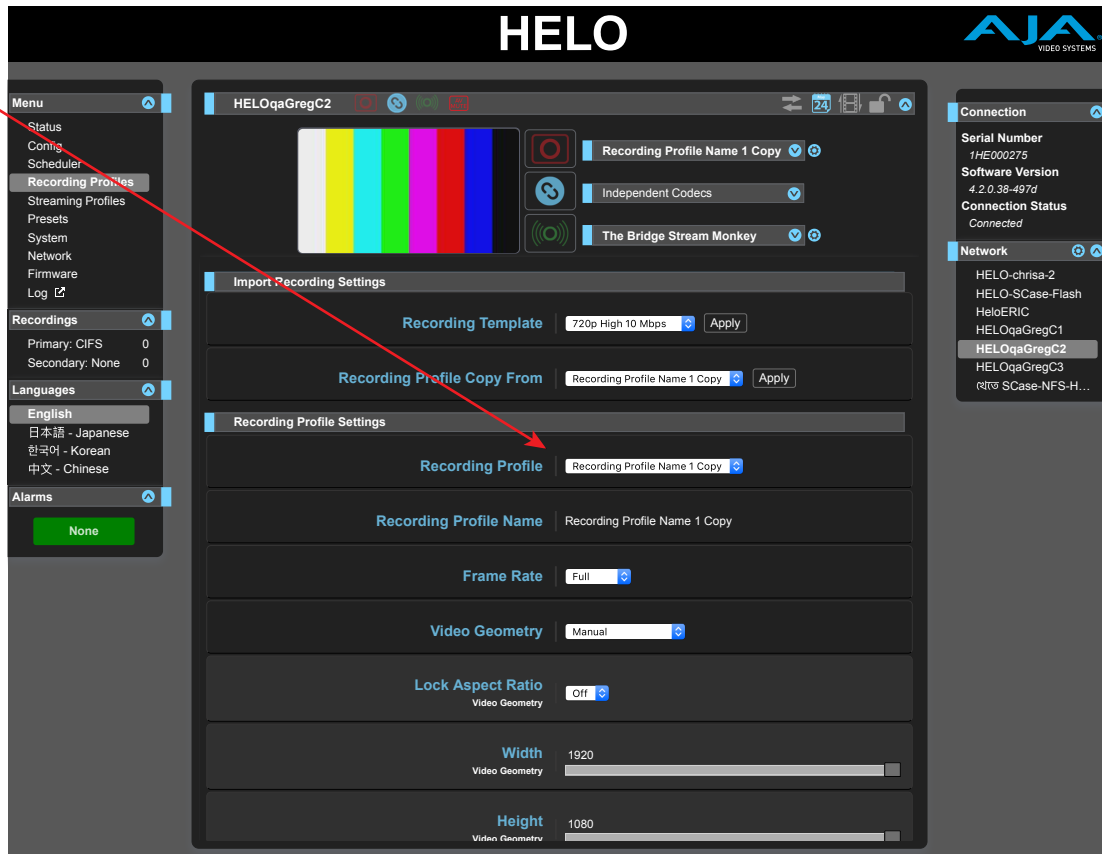
## Month-By-Month Mini Calendar Navigation

---

The small calendar icon next to the "Today" button is a navigational aid. Click on it to open a month-by-month mini calendar that facilitates rapid navigation to dates further away.

# Recording Profiles Screen

Name of  
Currently  
Selected  
Recording  
Profile



## 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 Template

Recording Template 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 Template you want to change with the Recording Template drop-down menu.
2. Select the desired template.
3. Click on the Recording Template **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

---

Selects the encode frame rate relative to the input 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

---

Selects whether the encoded video geometry is the same as the input or is set manually.

**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 selected, the Lock Aspect Ratio control (On, Off) and the Width and Height sliders become active.

## Lock Aspect Ratio

---

Selects whether the encoded video's aspect ratio is the same as the input video, or if the height and width can vary freely.

**Off** - The Width and Height sliders operate independently (factory default).

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

## Video Bit Rate

---

This slider adjusts the desired bit rate of the encoded video recording in Kbps (kilobits per second) from a minimum of 100 to a maximum of 20,000 (factory default). The slider control is color coded to indicate optimum settings. Staying within the green range is optimum.

## Audio Bit Rate

---

Use this drop-down menu to select the audio bit rate of the encoded recording. The available selections are:

- **32 Kbps**
- **64 Kbps**
- **96 Kbps**
- **128 Kbps** (factory default)
- **192 Kbps**
- **256 Kbps**

## Advanced Settings

---

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

**Reset Button** - Click to reset all of the advanced settings to factory default values.

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

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

### I-Frame [GOP] Every (Advanced Settings)

---

Selects how often I-frames are encoded (the Group-Of-Pictures (GOP) size). The default value is 120 frames.

**NOTE:** *It is important to choose a GOP size for streaming that corresponds to two seconds or larger. The number depends on the input frame rate and the value of the Streaming Profiles Frame Rate parameter.*

*For example:*

*Input frame rate is 30 frames per second.*

*Frame Rate parameter is set to "Half."*

*30 fps x .5 = 15 fps.*

*2 seconds x 15 frames per second equals 30 frames.*

*Therefore, for this example, the GOP size should be set to a minimum of "30."*

### P Interval (Advanced Settings)

---

Selects how often the GOP P frames appear after an I frame. This refers to the cadence of Predictive (P) frames vs. Bidirectional (B) frames in the group of pictures.

If set to one (factory default), 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 (Advanced Settings)

---

Selects the encoding profile from the H.264 standard to use for this stream. Available selections are:

- **Constrained**
- **Baseline**
- **Main** - (factory default)
- **High**

### Slices Per Frame (Advanced Settings)

---

Selects the number of encoding slices per frame. Options are:

- **1** - (factory default)
- **2**
- **4**
- **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.

### Entropy Coding (Advanced Settings)

---

Selects the algorithm used for entropy encoding.

**CABAC** - (Context Based Adaptive Binary Arithmetic Coding) (factory default)

**CAVLC** - (Context Adaptive Variable Length 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.

## Display Aspect Ratio (Advanced Settings)

---

Selects whether the input video should be coded for playback on a display device with a specific aspect ratio.

**Auto** - (factory default)

**4:3**

**16:9**

## Recording Media Type

---

Selects whether recordings go to SD Card, USB, or an SMB or NFS Network file share. SMB shares are commonly used on Windows servers. NFS shares are commonly used on Unix-style servers, such as Linux and macOS X.

**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.

**SMB Network Share** - Record to Windows shares. When SMB Network Share is selected, additional controls display so you can enter your network credentials.

*NOTE: To tell if the SMB server is writable, HELO writes a test file to the remote server, then deletes it. If the process works, HELO knows that the server is writable. However, it is possible to configure the server to allow HELO to be able to write files, but not delete them. If you are seeing numerous test files on your SMB server, check your server configuration to make sure that HELO has both write access and delete access.*

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

*NOTE: When using NFS Network Share, make sure that you take into account any file size limits on your file system. Configure your HELO so that it doesn't make file sizes that your storage system cannot handle. For example, you can restrict the maximum file size by adjusting the bit rate, frame rate, and setting limits of duration so that clips will not be bigger than 4GB or 2GB.*

## SMB and Record Paths

---

In all cases (SD/USB/SMB/NFS), if the recording directory is not present, HELO will create one. For SMB, this means HELO **must** have write permission at the "bottom" of the SMB Server Address. If the top-level share is Read-Only and the desired subdirectory is Read/Write, and if the subdirectory is entered as the SMB Network Record Path instead of as part of the SMB Server Address, recording will fail.

For example, in a scenario in which there is a top-level READ-ONLY SMB Share on the network of //ServerName/AVDepartment, and it contains a Read/Write folder called "MyProject" where clips are to go, the following will work successfully:

SMB Server Address: //ServerName/AVDepartment/MyProject

SMB Network Record Path: - Empty -

In contrast, the following will **not** work because the SMB server address is read-only:

SMB Server Address: //ServerName/AVDepartment

SMB Network Record Path: MyProject

HELO needs the SMB share mount point to be Read/Write so that it can create record paths if they do not exist already, since the user can change this parameter at any time.

## SMB Dialect

---

Use the SMB Dialect control to select a specific version of the Server Message Block (SMB) protocol to use with a remote SMB share. Start with Auto unless you experience long connection delays (two minutes or more), or if you must connect to a server that only supports SMB1 (also called CIFS or SMB with no version number), such as macOS X 10.8 Mountain Lion or earlier.

Auto (default) is recommended for most applications. When Auto is selected, HELO will start with the most secure setting (SMB 3.0), and work its way sequentially through the list until a compatible setting is found. Generally, the higher the number, the higher the security.

**WARNING:** *CIFS/SMB1 is not secure and should be avoided if at all possible. Use of CIFS/SMB1 may expose sensitive user credentials to anyone listening on your network.*

Select from the following options:

- Auto (default)
- SMB 3.0
- SMB 2.1
- SMB 2.0
- SMB 1.0

## SD Card/USB Record Path

---

Defines a path (or directory name) for the recording location on an SD card or USB stick. Recordings will always be placed inside an /AJA directory. Use forward slashes to create paths for subdirectories. For example, to create the path: "AJA/project\_name", enter the following into the SD Card/USB Record Path field:

/project\_name

## Secondary Recording Media Type

---

If creating a secondary recording, use this control to select whether secondary recordings go to SD Card or USB storage.

**None** - Select "None" when not creating a secondary recording.

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

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

## Secondary SD Card/USB Record Path

---

Defines a path (or directory name) for the secondary recording location on an SD card or USB stick. Recordings will always be placed inside an /AJA directory. Use forward slashes to create paths for subdirectories. For example, to create the path: "AJA/project\_name", enter the following into the SD Card/USB Record Path field:

/project\_name

## Dropped Frames Record Behavior

---

Selects the behavior when a recording destination is not fast enough to keep up with the encoded video.

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

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

---

## Filename Prefix

Sets the prefix of the file name, which will be appended with the Segment Numbers specified below ("clip" is the factory default). UTF-8 (international) characters are supported.

---

## Recording Duration Extent

Selects whether the recording will continue indefinitely, stop automatically after a fixed amount of time, or record as a long single segment.

**Unlimited** - Once started, recording will continue until the media becomes full, or until 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. They can be used to set the length of the recording (unless it is stopped manually or for another reason).

**Long Single Segment** - In this mode, you can record a long single clip up to a maximum of 720 minutes (12 hours). When the maximum duration has been reached, the unit will end the recording. Because a long single segment needs more information written to its header, the startup time will be delayed. When the recording has completed, you can initiate another recording manually.

*NOTE: Long Single Segment recordings must use the EXFAT format. Use a computer to format your media in EXFAT. FAT32 file systems cannot be used for Long Single Segment recordings because of file length limitations.*

*IMPORTANT: The limits and behavior for various kinds of storage devices may vary. "Full" may mean different things depending on whether storage is local or on a network. "Full" may also mean different things depending on whether the HELO is recording or is in idle. Some media may start dropping frames before they are full.*

*IMPORTANT: Consider the quality of your storage media if you are needing to push the limits of its storage capacity. When storage is near 90% full and you are recording at 20Mb/s in TS format, your media may hit its limit quickly starting at 11% free space, whereas recording at 10Mb/s may allow your media to fill more completely.*

### Media Limits When Not Recording

- Local warning limit at 15% storage remaining
- Network warning limit at 7% storage remaining
- Local full limit at 10% storage remaining
- Network full limit at 5% storage remaining

### Media Limits When Recording

- Local warning limit at 15% storage remaining
- Network warning limit at 7% storage remaining
- Local full limit at 1% storage remaining
- Network full limit at 1% storage remaining

---

## 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 ("001" is the factory default).

---

## File Segment Record Duration (minutes)

This slider sets the maximum duration in minutes of each recording segment. The slider control is color coded to indicate optimum settings. Staying within the green range is optimum.

After one segment is finished, a new recording segment is initiated with the next segment number appended to the file name ("60" is the factory default).

For all file formats, the maximum segment length supported is 360 minutes. Longer duration files need higher performance media. For more detailed information, please navigate to the [Support section of the AJA HELO web page](#). From there, select the Documents section to access the HELO Media Recommendations document.

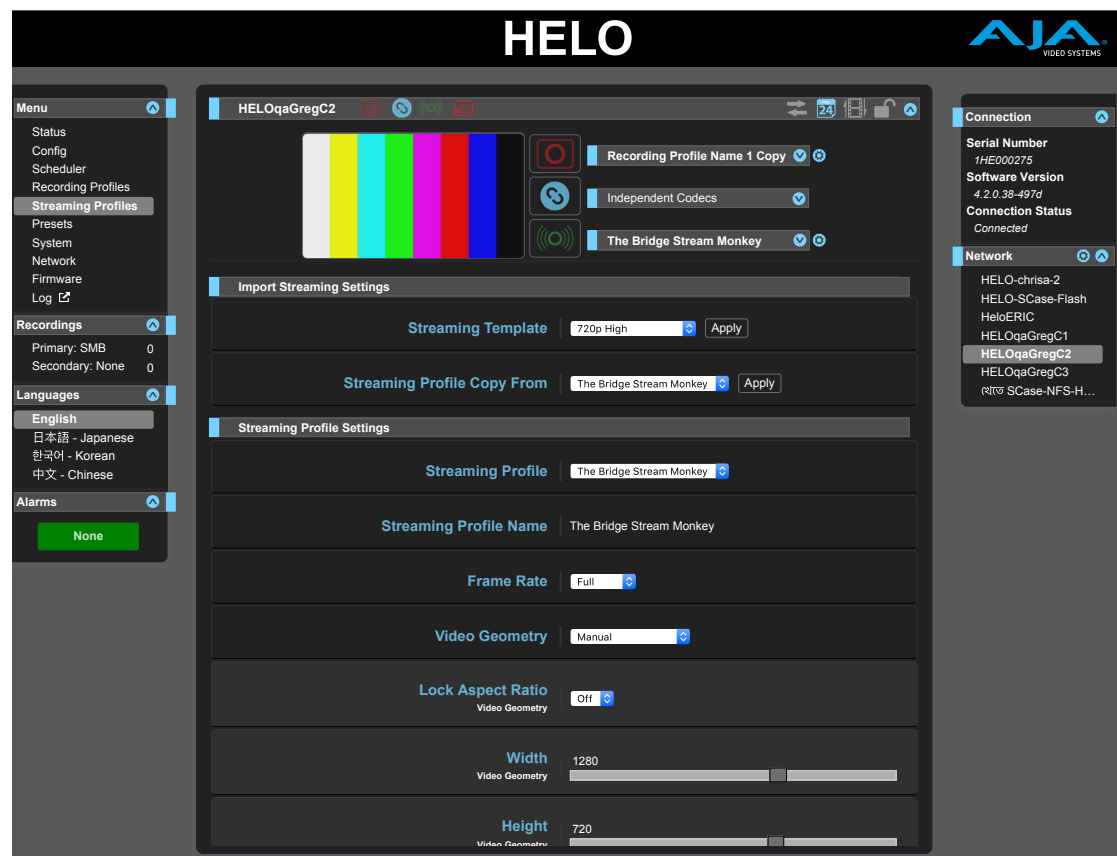
### Recording File Type

**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 27](#), 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 39](#).

## Ports Required for Streaming Protocols

---

### Outgoing Ports

---

#### RTMP

---

By default, outgoing connections are made on port TCP 1935 for RTMP streaming. A different port number may be specified in the RTMP URL. To specify port number 1935, the URL would follow this format:

`rtmp://127.0.0.1:1935/live`

#### RTP

---

The RTP protocol uses outgoing UDP ports for streaming. The port number must be specified in the streaming URL. For example, to specify port number 5234, the URL would follow this format:

`udp://10.0.0.1:5234`

### Incoming Ports

---

#### RTSP

---

RTSP streaming is performed over incoming TCP connections to HELO. Specify the port on which the incoming connection should be made by using the RTSP Port sliding control. The default port number used is 554.

*NOTE: For RTSP, to avoid failure, the selected incoming port must **not** be port 80 or 443 because they conflict with HELO's web interface http and https services.*

#### HLS

---

HLS streaming works over incoming HTTP/HTTPS connections to HELO. When HTTP is in use, this is over incoming TCP port 80. When HTTPS is enabled, incoming TCP port 443 is also used.

## 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 ["Recording Profile Settings" on page 40](#) for information about the other settings.

*IMPORTANT: For RTMP streaming, HELO must be configured to operate with a Content Delivery Network (CDN), using information provided for that specific network. Please refer to "Chapter 6 – CDNs and Clients" on page 62 for more information.*

## Encoding Rate Mode (Advanced Settings)

---

For RTP/UDP streams only. Selects whether video shall be encoded using a variable or constant bit rate.

**Variable** - Provides constant video quality.

**Constant** - Provides constant bit rate. This selection is supported only for UDP (RTP or TS) streaming.

## Stream Type

---

This parameter selects the network streaming protocol that will be used (RTMP, RTSP, RTP/UDP-TS, or HLS). It allows the values appropriate for each type to be entered.

**RTMP** - RTMP (factory default) is a "push" protocol usually used to deliver content to a CDN. In this case, HELO starts and stops the connection and delivery. When RTMP is selected, the following parameters are available:

- RTMP Server URL
- RTMP Stream Key/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 key/names must be unique.
- RTMP Username
- RTMP Password
- RTMP Handshake Mode is designed to automatically try different ways of applying your RTMP stream name, URL, port, and key/name information in order to make a connection. RTMP Handshake Mode Defaults to Auto. If it has a hard time connecting, it will try each successive mode (Mode 1, Mode 2, Mode 3, Mode 4). In the event that Auto mode does not succeed with your CDN, try the different modes by selecting them manually to see which one works.

**NOTE:** *If the stream connects to the CDN and seems to be working, but the video is blank or missing, try using a different forced RTMP mode to correct it.*

**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.*

**RTMP Port Requirements** - By default, outgoing connections are made on port TCP 1935 for RTMP streaming. A different port number may be specified in the RTMP URL. To specify port number 1935, the URL would follow this format:

`rtmp://127.0.0.1:1935/live`

**RTSP** - 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. RTSP is limited to 10 streams. The following parameters are available when RTSP is selected:

- RTSP Stream Name - If a single device presents multiple streams on the name port number, each must have a unique stream name.
- RTSP Port - RTSP streaming is performed over incoming TCP connections to HELO. Specify the port on which the incoming connection should be made by using the RTSP Port sliding control. The default port number used is 554.

*NOTE: For RTSP, to avoid failure, the selected incoming port must **not** be port 80 or 443 because they conflict with HELO's web interface http and https services.*

- 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.

**RTP/UDP-TS:** RTP and UDP-TS are both push protocols, typically used for multicast applications. They do not require a CDN. RTP (Real-time Transport Protocol) and UDP-TS (User Datagram Protocol Transport Stream) require a numeric IP address and port number. UDP-TS is a raw MPEG transport stream sent out through UDP packets. Recipients of the stream have to know where the stream is coming from and use a video player like VLC. From an end user's point of view, RTP and UDP-TS are basically identical, except for video player compatibilities. When RTP/UDP-TS is selected, the following parameter is available:

- RTP/UDP-TS Destination URL - Defines the RTP/UDP-TS destination URL using a numeric IP address and port number.

**RTP Port Requirements** - The RTP protocol uses outgoing UDP ports for streaming. The port number must be specified in the streaming URL. For example, to specify port number 5234, the URL would follow this format:

udp://10.0.0.1:5234

**HLS** - HLS (HTTP Live Streaming) is a media streaming protocol that reduces buffering, stuttering and other problems by chopping MP4 video content into short, 10-second pieces. This allows the stream to be compatible with a wide range of devices, such as iPhones and iPads. When HLS is selected, it does not require parameters to be configured.

**HLS Port Requirements** - HLS streaming works over incoming HTTP/HTTPS connections to HELO. When HTTP is in use, this is over incoming TCP port 80. When HTTPS is enabled, incoming TCP port 443 is also used.

## Dropped Frames Stream Behavior

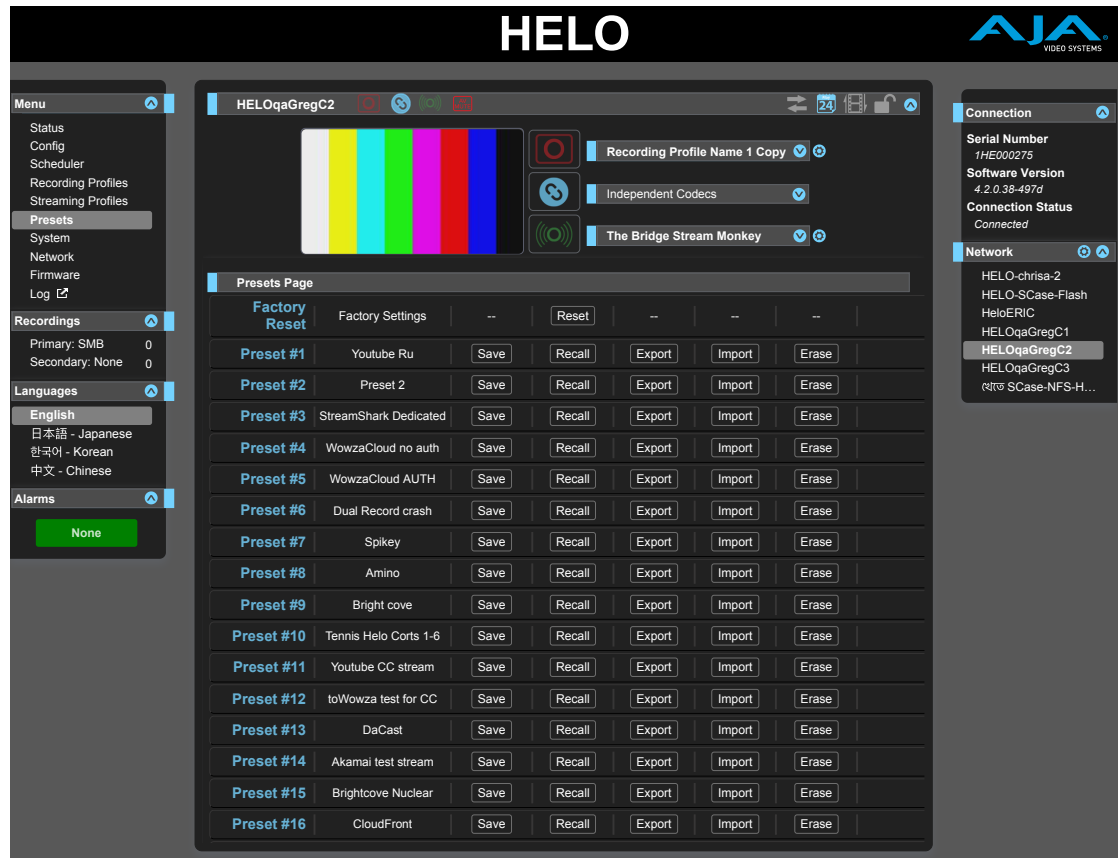
---

Selects the behavior when a streaming destination is not fast enough to keep up with the encoded video.

**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 Reset (Web UI)

The Factory Reset button does a soft reset, which resets most functional (A and V) parameters, but leaves basic system configuration, like the network setup, intact. This allows the user to get HELO into a known good state without losing the web connection settings or their saved profiles.

**NOTE:** A soft reset will erase saved profiles and calendars; be sure to export them before doing a reset if you want to save their contents.

**NOTE:** A recessed hardware Factory Reset button is also available on HELO's front panel, between the USB ports, but different parameters are reset using the hardware button. See "[Factory Reset Button \(Hardware\)](#)" on page 11 for more information.

### 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)

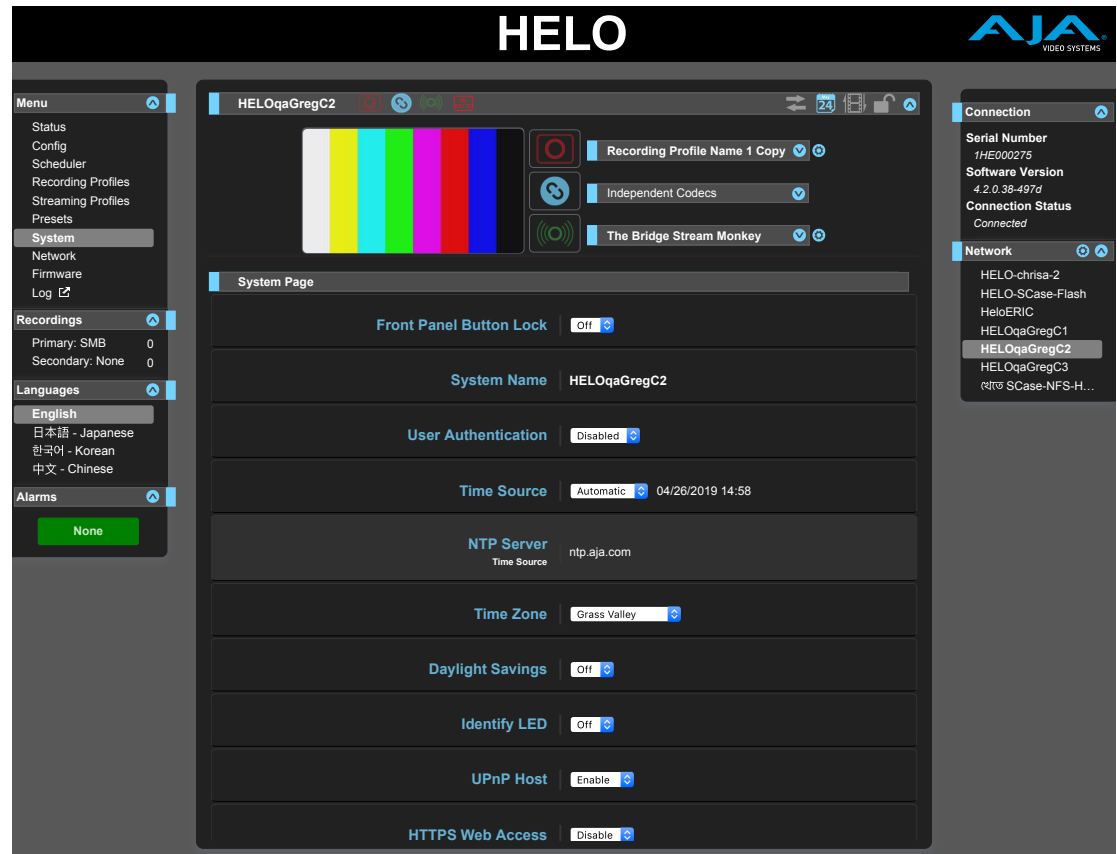
Import All lets you browse for and import a previously exported all.presets file from your computer. A dialog box warns you that the operation will overwrite all 20 current preset contents with the contents stored in the file.

---

### 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.

# System Screen



## Front Panel Button Lock

Determines whether the physical buttons on the front panel are ignored. When a front panel button is pressed while the front panel lock is "On," the LED next to the button will flash red briefly to indicate that the button press is being ignored.

**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.

## System Name

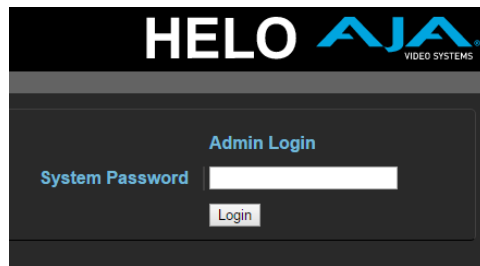
This field defines a name for the HELO unit and gives it a unique identifier. The name appears at the top of the screen, and also in the Network panes of the web screens of other HELO units on the LAN.

*NOTE: International characters are fully supported in the system name.*

## User Authentication

For security, you may require a password to login to HELO from the network. The factory default setting 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.

---

### Logging Out

When authentication is enabled and you are logged into HELO in a browser session, you must quit the browser application in order to log out. Please note that merely closing the browser tab or window will not log you out.

---

### Time Source/Date Set

**Manual** - When set to Manual (factory default), the Date Set parameter displays below. You can enter the date and time in DD/MM/YYYY HH:MM format (24-hour clock format). Or click in the Date Set field to display a pop-up calendar. Use the calendar controls to set the date and time, or click the **Now** button to set HELO to your computer's time. Then click **Apply** to set HELO's date and time to your selected settings.

---

### Time Source/NTP Server

**Automatic** - When set to Automatic, the NTP Server parameter displays below. The factory default is ntp.aja.com, a public timeserver offered for free by AJA Video Systems, Inc. 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 based on nearest city location. The factory default setting is "Grass Valley."

---

### Daylight Savings

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

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

***WARNING:*** *If using the Scheduler, you must correctly configure the time, date, timezone and daylight savings settings in order for scheduled events to occur at the correct 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.

## 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.

## HTTPS Web Access

---

For greater security, use HTTPS if you require the communications between your HELO unit and client web browsers to be encrypted. If you are not sure whether you need secure, encrypted sessions, consult with your system administrator.

**Disable** - HTTPS Web Access is disabled (default).

**Enable** - When HTTPS Web Access is enabled, an Upload Certificate control displays. Use the Choose File button to upload a certificate.

### Prerequisites

---

For HELO and the HTTPS protocol to work together, a few prerequisites need to be in place:

- A fully qualified domain name
- A digital certificate and key from a Certificate Authority
- Digital certificate and key uploaded to your HELO

### Fully Qualified Domain Name

---

A fully qualified domain name has both a host name and a domain name. For example:

helo-st.aja.com

In this case, "helo-st" is the host name, followed by "aja.com" which is the domain name.

The Domain Name System (DNS) maps the domain name to the specific IP address of a HELO unit's internal web server. The domain name and the digital certificate must match.

*NOTE: When accessing a secure internal HELO web server from a web browser, always use its domain name rather than its IP address. Accessing it through its IP address will result in a web browser certificate error.*

### Acquiring a Digital Certificate

---

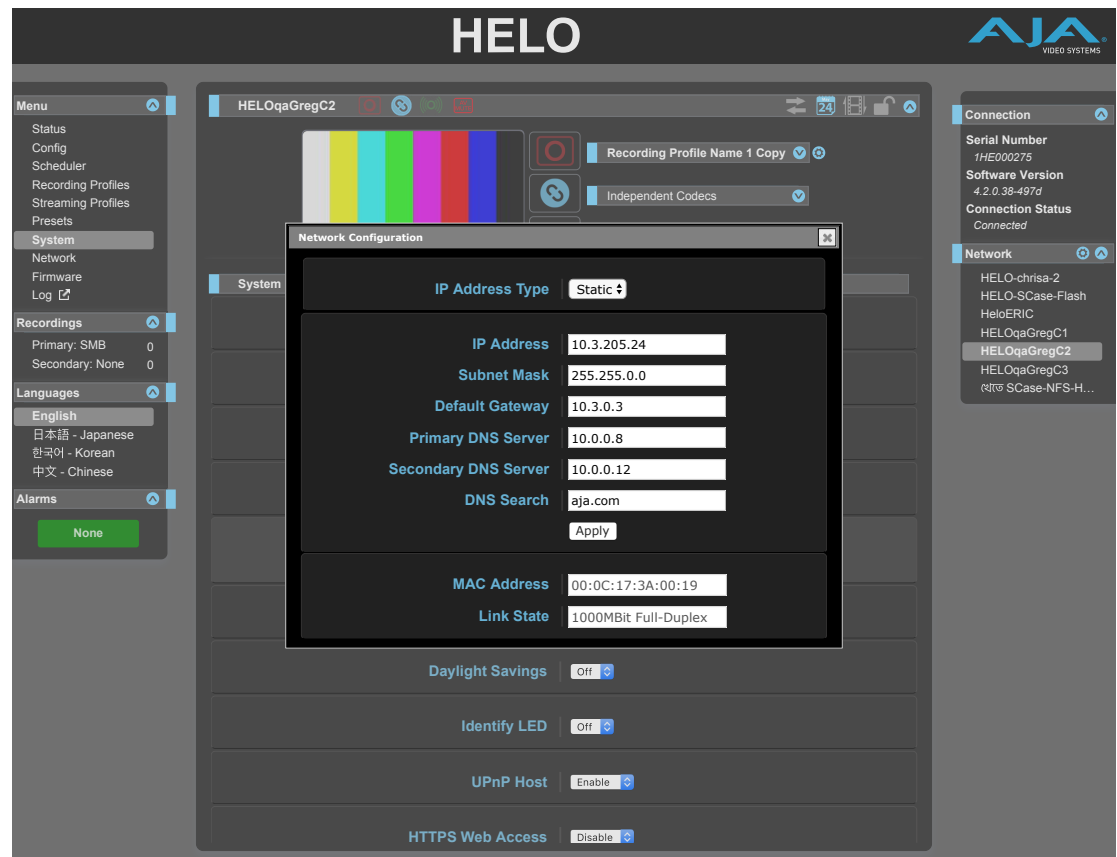
You can acquire a digital certificate, such as an SSL (secure socket layer) certificate, from a trusted Certificate Authority. A Certificate Authority assigns a digital certificate to a fully qualified domain name and provides both the certificate and its key as a digital download.

## Uploading Certificate and Key to HELO

Once you have acquired your digital certificate and key, upload them in PEM format to your HELO unit. Contact your Certificate Authority if you need more information about the PEM format.

The certificate and key residing on HELO provides verification of your organization's identity to web browser clients. The presence of a valid digital certificate activates the padlock and the HTTPS protocol, creating a secure and encrypted connection between HELO's internal web server and the client web browser.

## Network Screen



The Network screen allows you to view and change your HELO's network settings. When using a static address, 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. 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.

## Subnet Mask

---

Subnet Mask 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.

## DNS Search Path

---

Defines the Domain Name System search path for the HELO.

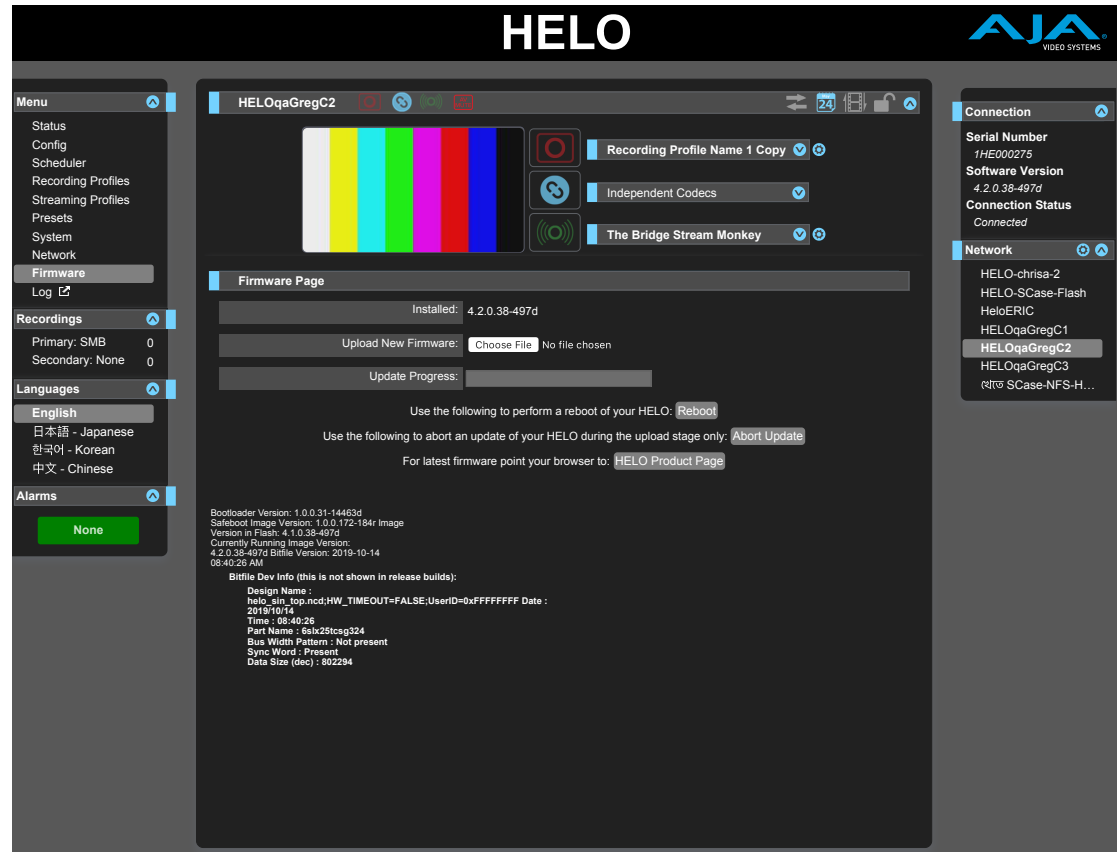
MAC Address

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.

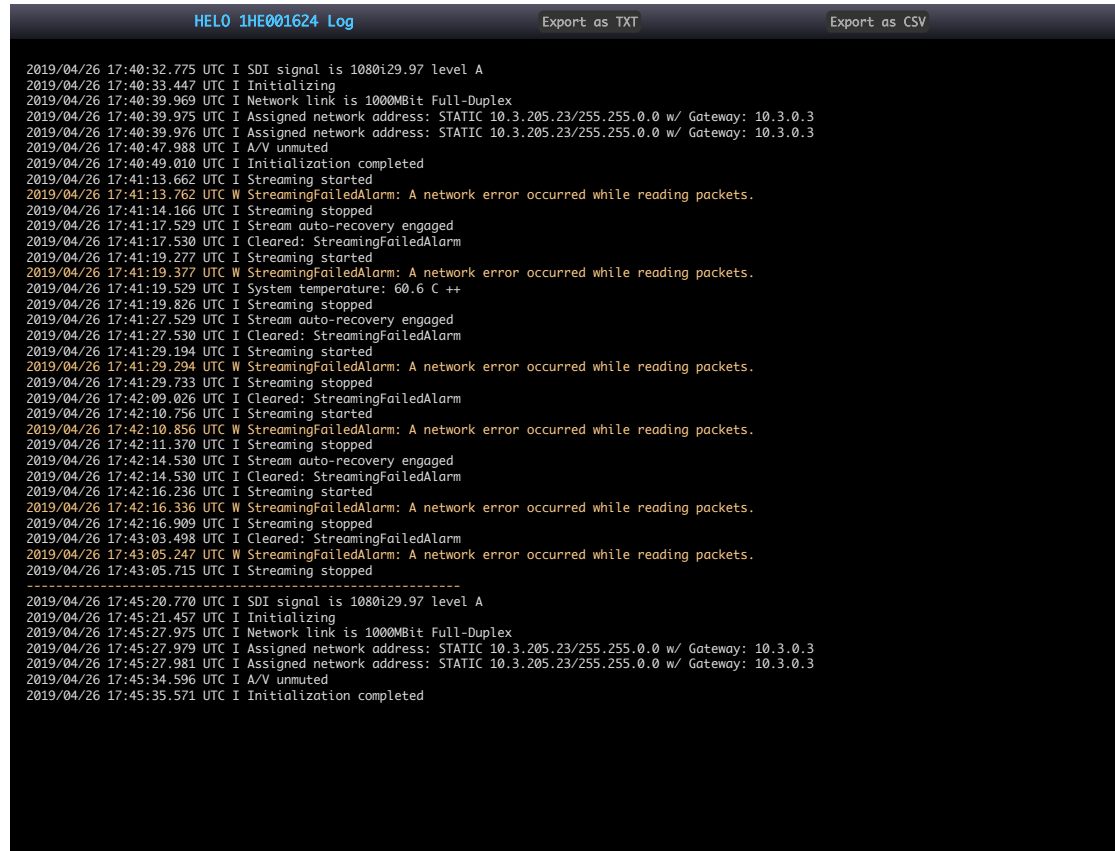
## Log Screen

Selecting the Log menu in the left navigation panel opens a new browser tab in the web user interface that displays a technical event log.

## Technical Event Log

The technical event log lists activity that has taken place on your HELO unit. This information can be useful for analyzing and diagnosing any potential service issues that may be otherwise challenging to pinpoint for fault analysis.

You can view the log directly from the newly opened browser tab, or export it as a .TXT file or .CSV file.



```
HELO 1HE001624 Log      Export as TXT      Export as CSV

2019/04/26 17:40:32.775 UTC I SDI signal is 1080i29.97 level A
2019/04/26 17:40:33.447 UTC I Initializing
2019/04/26 17:40:39.969 UTC I Network link is 1000MBit Full-Duplex
2019/04/26 17:40:39.975 UTC I Assigned network address: STATIC 10.3.205.23/255.255.0.0 w/ Gateway: 10.3.0.3
2019/04/26 17:40:39.976 UTC I Assigned network address: STATIC 10.3.205.23/255.255.0.0 w/ Gateway: 10.3.0.3
2019/04/26 17:40:47.988 UTC I A/V unmuted
2019/04/26 17:40:49.010 UTC I Initialization completed
2019/04/26 17:41:13.662 UTC I Streaming started
2019/04/26 17:41:13.762 UTC W StreamingFailedAlarm: A network error occurred while reading packets.
2019/04/26 17:41:14.166 UTC I Streaming stopped
2019/04/26 17:41:17.529 UTC I Stream auto-recovery engaged
2019/04/26 17:41:17.530 UTC I Cleared: StreamingFailedAlarm
2019/04/26 17:41:19.277 UTC I Streaming started
2019/04/26 17:41:19.377 UTC W StreamingFailedAlarm: A network error occurred while reading packets.
2019/04/26 17:41:19.529 UTC I System temperature: 60.6 C ++
2019/04/26 17:41:19.826 UTC I Streaming stopped
2019/04/26 17:41:27.529 UTC I Stream auto-recovery engaged
2019/04/26 17:41:27.530 UTC I Cleared: StreamingFailedAlarm
2019/04/26 17:41:29.194 UTC I Streaming started
2019/04/26 17:41:29.294 UTC W StreamingFailedAlarm: A network error occurred while reading packets.
2019/04/26 17:41:29.733 UTC I Streaming stopped
2019/04/26 17:42:09.026 UTC I Cleared: StreamingFailedAlarm
2019/04/26 17:42:10.756 UTC I Streaming started
2019/04/26 17:42:10.856 UTC W StreamingFailedAlarm: A network error occurred while reading packets.
2019/04/26 17:42:11.370 UTC I Streaming stopped
2019/04/26 17:42:14.530 UTC I Stream auto-recovery engaged
2019/04/26 17:42:14.530 UTC I Cleared: StreamingFailedAlarm
2019/04/26 17:42:16.236 UTC I Streaming started
2019/04/26 17:42:16.336 UTC W StreamingFailedAlarm: A network error occurred while reading packets.
2019/04/26 17:42:16.909 UTC I Streaming stopped
2019/04/26 17:43:03.498 UTC I Cleared: StreamingFailedAlarm
2019/04/26 17:43:05.247 UTC W StreamingFailedAlarm: A network error occurred while reading packets.
2019/04/26 17:43:05.715 UTC I Streaming stopped
-----
2019/04/26 17:45:20.770 UTC I SDI signal is 1080i29.97 level A
2019/04/26 17:45:21.457 UTC I Initializing
2019/04/26 17:45:27.975 UTC I Network link is 1000MBit Full-Duplex
2019/04/26 17:45:27.979 UTC I Assigned network address: STATIC 10.3.205.23/255.255.0.0 w/ Gateway: 10.3.0.3
2019/04/26 17:45:27.981 UTC I Assigned network address: STATIC 10.3.205.23/255.255.0.0 w/ Gateway: 10.3.0.3
2019/04/26 17:45:34.596 UTC I A/V unmuted
2019/04/26 17:45:35.571 UTC I Initialization completed
```

**NOTE:** The technical event log in HELO is a tool intended to help you troubleshoot basic configuration issues. Exporting this file as a .TXT or .CSV file may be helpful when contacting AJA support.

## Recordings Panel

Using the Recordings panel, you can access recordings that have been made to the Primary and/or Secondary recording media destinations. Select the Primary or Secondary menu to view the corresponding directory of files that have been recorded to that media destination.

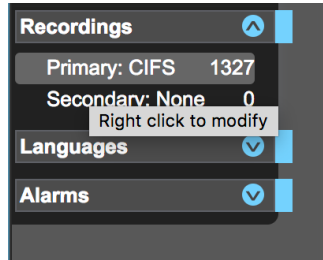
When local media is being scanned for recordings, the associated front panel LED will blink at moderate speed. This happens upon insertion of media, when it is first selected as a record destination, and when it is checked after a recording completes.

Do not eject media when the storage LEDs are flashing.

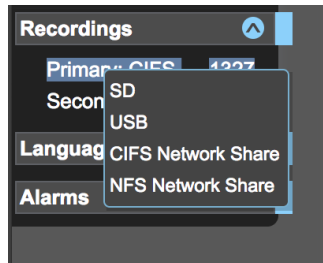
## Changing the Recording Destination

To change the recording destination, right-click directly on the Primary or Secondary menu in the left column under the Recordings panel, then select one of the options from the pop-up menu.

*Figure 12. Right-click on Primary recording destination to display pop-up menu*



*Figure 13. Pop-up menu displaying for Primary recording destination*



Primary destinations can be SD, USB, CIFS Network Share, or NFS Network Share. Secondary destinations can be None, SD, or USB.

## Viewing Recorded Files

Select the Primary or Secondary recording destination to see the files that have been recorded on each destination.

For each recorded file, you can view these characteristics:

- File Name
- Video Format
- Number of Audio Channels
- Duration
- File Size
- Date (YYYY-MM-DD HH:MM:SS AM/PM)
- Encode Type

Not all characteristics are available in the case of .m3u and .ts files.

The video file types displayed are .ts, .mov and mp4. m3u (play list) files are also shown. For example, if you have recorded one hour's worth of 5-minute segments, you will see 12 video files (for a total of one hour of video) and one m3u playlist file. m3u files are text files that contain a list of all the segmented clips that go together.

When a recording starts, the clip name and m3u will appear in the listing. The clip will show initial information, which will remain unchanged until recording is complete. Once finished, it will be updated with the final file size and duration of the complete recording.

If HELO detects an issue with a file, it will be listed in orange italic text. Hovering over the file with the mouse will show a popup that gives more details about the

issue. One common issue is a clip that contains zero frames. This applies to audio-only files not created by HELO, so warnings for such files can be safely ignored.

If a clip displays in orange italic text, you can check its validity using a computer.

## Sorting Columns

You can sort the files by clicking any of the column headings.

Click a column heading to toggle sorting of the table by ascending or descending order by that column. For example, repeatedly clicking the File Size column header will alternately sort the table from largest file to smallest, then smallest to largest.

Sorting can be slow if there are a large number of files in a folder. To improve responsiveness, delete unwanted files and keep the number of files in a directory to a few screenfuls.

## Filtering Field

Filter your view of the files by entering filter criteria in the Filter field in the upper right area of the Recordings file directory.

The filter works on all the fields for each file, not just the name. For example, filtering on ".mp4" will show only mp4 files, and filtering on "2017-10-01" will show all files recorded on October 1st, 2017.

## Downloading Files

Any of the files shown in the directory can be downloaded.

## Data Transfer Mode

Click on the Data Transfer Mode button to turn on Data Transfer Mode. The Download button appears. HELO cannot record or stream when transferring data. When on, the Data Transfer button turns yellow, and the Record, Stream, and Link buttons turn gray.

*Figure 14. Recordings directory headings components with Data Transfer Mode turned off*

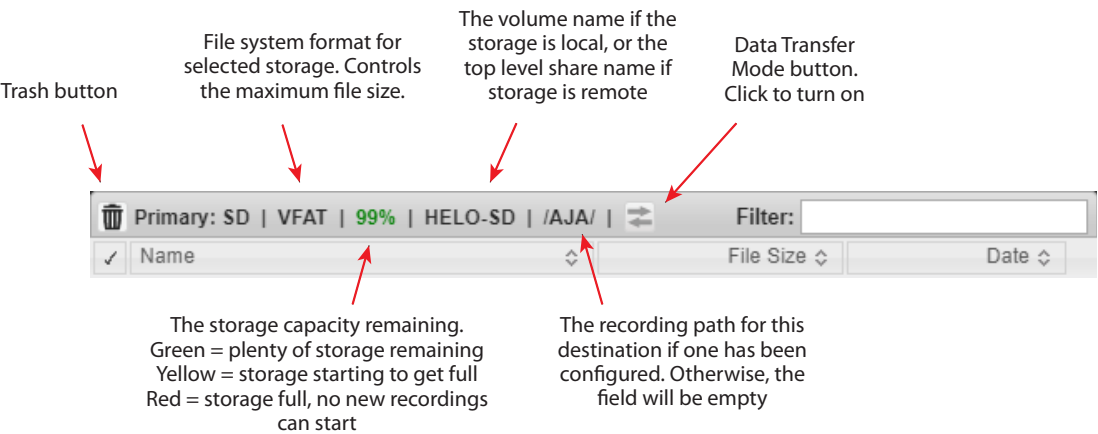


Figure 15. When Data Transfer Mode is turned on, the Data Transfer Mode button arrows are yellow and the Download button displays

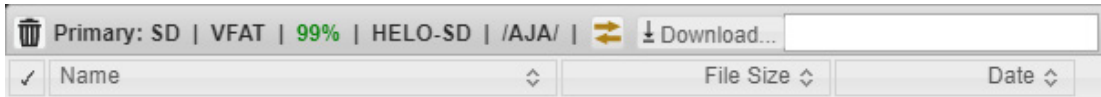
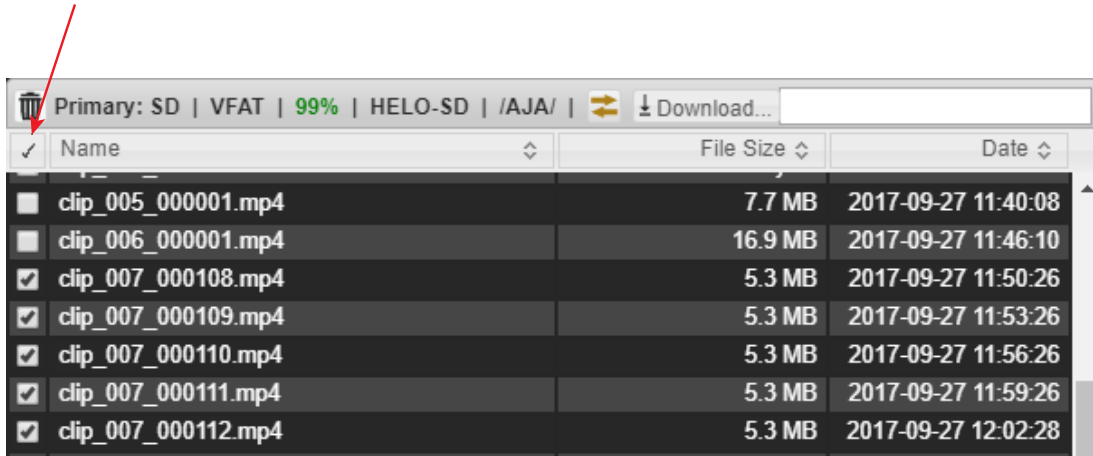


Figure 16. Files with checkboxes selected

Clicking the checkbox will toggle selection of all files



Select the check boxes corresponding to the files you want to download. Once checked, select the Download button. The selected files will download to your computer immediately.

Click the Data Transfer Mode button again when all downloads are complete to return to normal operation and re-enable recording and streaming.

Do not click the Data Transfer Mode button before downloads complete, or any that are in progress will be aborted.

## Deleting Files

Similarly, if you want to delete files, select them with the check boxes, then select the Trash Can button. The selected files will be deleted.

Files can be deleted at any time. Entering Data Transfer mode is not required.

You cannot delete the file currently being recorded.

Be careful before confirming the deletion of files, especially if using the checkmark to select all files. Double-check to ensure the selection is correct, including files that may require scrolling down to see. Deleted files cannot be recovered.

When files are being downloaded or deleted, the media LED corresponding to that storage, if there is one—there is no LED for network shares—will flash rapidly, indicating the storage is in use and should not be removed.

In the case of small numbers of small files, the operation may complete before the flashing becomes apparent.

# Chapter 6 – CDNs and Clients

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## Introduction

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



**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.*

## Akamai

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### Akamai Configuration Summary

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1. From the Akamai web site (<https://www.akamai.com/>), sign in to your Akamai account with your username and password.
2. From the Configure tab, select Media Services Live.
3. On the Media Services Live page, the information entered for Primary Entrypoint must match the information entered on your HELO unit for the RTMP Server URL.
4. On your HELO unit, enter the RTMP Stream Name. This is a combination of the stream name, camera angle, stream number. See Akamai documentation for details.
5. On your HELO unit, enter your RTMP Username and RTMP Password that correspond to your Akamai account.

## Amino Set-Top Boxes

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### Unicast

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1. Decide which UDP port you would like to use. In this example, we will use port 11000.
2. Set the set-top box to play video from URL `udp://0.0.0.0:11000`.
3. In the HELO streaming profile, select Stream Type = RTP/UDP-TS.
4. Set RTP / UDP-TS Destination URL to `udp://stb-ip-address:11000`. For example, if the IP address of the set-top box is 192.168.0.200, set this to: `udp://192.168.0.200:11000`.

### Multicast

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1. Decide which UDP port and multicast address you would like to use. In this example, we will use port 12000 with multicast address 239.0.0.1.

2. Set the set-top box to play video from URL `igmp://239.0.0.1:12000`.
3. In the HELO streaming profile, select Stream Type = RTP/UDP-TS.
4. Set RTP / UDP-TS Destination URL to `udp://239.0.0.1:12000`.

## Elemental Encoder Appliances and Elemental Cloud

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Website

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

## Facebook Live

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Facebook Live lets you stream live, and lets your followers receive notifications when you go live so they know to tune in to your broadcasts.

Facebook Configuration Summary:

1. Create a Facebook page in your Facebook account.
2. Navigate to <https://www.facebook.com/live/create>
3. Click **Create Live Stream**. The page **Connect Your Live Stream to the Live API** displays.
4. Review the instructions on the page.
5. Make the configuration selections that best match your requirements with respect to secure connection (SSL) and persistent stream key.
6. Copy the Server URL and paste it into the HELO RTMP Server URL field on the HELO Streaming Profiles page.
7. Copy the Stream Key and paste it into the HELO RTMP Stream Name field on the HELO Streaming Profiles page.
8. Press the Stream button on HELO's front panel or web interface.
9. Click **Go Live** in the bottom right corner of the **Connect Your Live Stream to the Live API** Facebook page.

Facebook directions, recommended settings and troubleshooting methods are available at: <https://www.facebook.com/facebookmedia/get-started/live>

## Instagram via Third Party Application Yellow Duck

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1. Download and install Yellow Duck from the Yellow Duck website: (<https://yellowduck.tv/>).
2. Launch the Yellow Duck application. The **Login to Instagram** page displays.
3. Enter your Instagram username and password, then click **Login**. Yellow Duck displays a page showing the **RTMP URL** and **Stream key** fields.
4. From Yellow Duck, copy the **Stream URL (RTMP URL)**.
5. From the HELO web UI Streaming Profiles page, paste the **Stream URL (RTMP URL)** into the HELO **RTMP Server URL** field.
6. From Yellow Duck, copy the **Stream key**.
7. From the HELO web UI Streaming Profiles page, paste the **Stream key** into the HELO **RTMP Stream Name** field.

8. Enter your Instagram username into the HELO **RTMP Username** field.
9. Enter your Instagram password into the HELO **RTMP Password** field.
10. From the HELO web UI, click the Stream button to start streaming.

*NOTE: You are not able to watch your stream from your account directly. However, you can use other accounts or create a new account to monitor your stream.*

Your video will be adjusted to fit into Instagram's aspect ratio.

## Kaltura

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Website

<https://corp.kaltura.com/>

## OBS (Open Broadcaster Software)

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OBS is a free and open source software application for video recording and live streaming.

OBS can accept an RTSP stream from HELO, provided that the following two conditions are met:

1. The computer that is running OBS must reside on the same network as HELO.
2. HELO is streaming with the RTSP protocol.

To configure your HELO to stream with the RTSP protocol, from the Streaming Profiles Screen, under Streaming Profile Settings, select RTSP under the Stream Type control.

Website

<https://obsproject.com/>

OBS Configuration Summary

1. From OBS Studio, under Sources, click "+" to add a source.
2. Select Media Source.
3. Select Create New.
4. Enter a name for it, then click OK.
5. Uncheck Local File. An Input window becomes available.
6. From your HELO unit, copy the Stream URL and paste it into the Input Window of OBS Studio, then click OK.
7. By default, OBS will automatically include any available audio source.

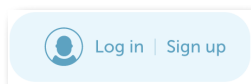
## Periscope.tv

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Website

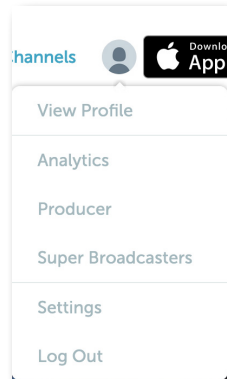
<https://www.periscope.tv/>

1. From the periscope.tv website, log in by selecting the **Login in | Sign up** icon along the top bar.



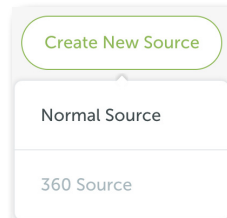
**NOTE:** After logging in, the **Log in | Sign up** icon is replaced by any image you may have uploaded as your user profile image.

2. Select your user profile image from the top bar. A drop-down menu displays.

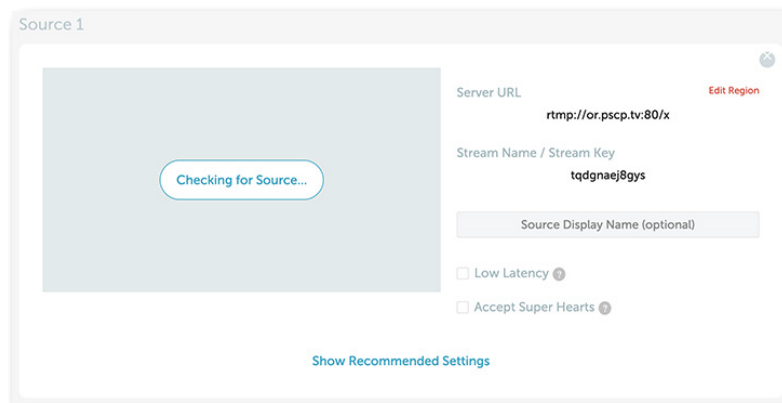


3. From the drop-down menu, select **Producer**. A new page displays with a **Create New Source** button.

4. Select **Create New Source**. A drop-down menu displays.



5. From the drop-down menu, select **Normal Source**. A new **Source 1** section displays.



6. Click the link under the **Server URL** heading. The link is automatically copied to your clipboard.
7. On your HELO Streaming Profiles page, paste the link into the **RTMP Server URL** field.
8. From Periscope, click the link under the **Stream Name/Stream Key** heading. The link is automatically copied to your clipboard.
9. On your HELO Streaming Profiles page, paste the link into the **RTMP Stream Name** field.

10. From Periscope, click **Preview Broadcast**. After a few moments, once your preview image displays, click **Go LIVE**.

*NOTE: If you are having any problems, click Show Recommended Settings in the lower part of the Source 1 section to view additional settings that may be helpful to implement in your HELO Streaming Profiles settings.*

## StreamShark.io

Website

<https://streamshark.io/>

## 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. When streaming to Twitch, find your Stream Key via the web dashboard. Add the Stream Key text to the end of the RTMP address you are using.

| Name                             | RTMP address (add Stream Key text) |
|----------------------------------|------------------------------------|
| South America: Argentina         | rtmp://live-eze.twitch.tv/app/     |
| South America: Chile             | rtmp://live-scl.twitch.tv/app/     |
| South America: Sao Paulo, Brazil | rtmp://live-gru.twitch.tv/app/     |
| Asia: Hong Kong                  | rtmp://live-hkg.twitch.tv/app/     |
| Asia: Seoul, South Korea         | rtmp://live-sel.twitch.tv/app/     |
| Asia: Singapore                  | rtmp://live-sin.twitch.tv/app/     |
| Asia: Taipei, Taiwan             | rtmp://live-tpe.twitch.tv/app/     |
| Asia: Tokyo, Japan               | rtmp://live-tyo.twitch.tv/app/     |
| Australia: Sydney                | rtmp://live-syd.twitch.tv/app/     |
| EU: Amsterdam, NL                | rtmp://live-ams.twitch.tv/app/     |
| EU: Stockholm, Sweden            | rtmp://live-arn.twitch.tv/app/     |
| EU: Paris, FR                    | rtmp://live-cdg.twitch.tv/app/     |

| Name                       | RTMP address (add Stream Key text) |
|----------------------------|------------------------------------|
| EU: Frankfurt, Germany     | rtmp://live-fra.twitch.tv/app/     |
| EU: London, UK             | rtmp://live-lhr.twitch.tv/app/     |
| EU: Prague, CZ             | rtmp://live-prg.twitch.tv/app/     |
| EU: Frankfurt, Germany     | rtmp://live-fra.twitch.tv/app/     |
| EU: Warsaw, Poland         | rtmp://live-waw.twitch.tv/app/     |
| US West: San Francisco, CA | rtmp://live.twitch.tv/app/         |
| US West: Los Angeles, CA   | rtmp://live-lax.twitch.tv/app/     |
| US West: San Jose, CA      | rtmp://live-sjc.twitch.tv/app/     |
| US West: Seattle, WA       | rtmp://live-sea.twitch.tv/app/     |
| US Central: Dallas, TX     | rtmp://live-dfw.twitch.tv/app/     |
| US East: Ashburn, VA       | rtmp://live-iad.twitch.tv/app/     |
| US East: New York, NY      | rtmp://live-jfk.twitch.tv/app/     |
| US East: Miami, FL         | rtmp://live-mia.twitch.tv/app/     |
| US East: Chicago           | rtmp://live-ord.twitch.tv/app/     |

Link to Twitch Recommended Settings

<https://help.twitch.tv/s/article/broadcast-requirements>

**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).

## vMIX

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vMix is a Software Video Mixer and Switcher that also functions as live streaming software that allows you to publish live productions directly to the Internet. HELO can be used as an input source via RTSP stream.

### vMix Configuration Summary

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1. Add Input
2. Choose Stream
3. Select Stream Type RTSP over UDP
4. Enter URI rtsp://(IP Address/Stream Name)
5. Click OK

Additional information is available at <https://www.vmix.com>

## Wirecast

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TeleStreams' Wirecast application lets you capture, produce, and stream to integrated streaming services & CDNs. HELO can be used as an input source via RTSP stream.

### Wirecast Configuration Summary

---

1. Add web stream
2. Change protocol to RTSP
3. Stream options: RTSP over UDP
4. Format Options: Auto Detect
5. Check Live Stream
6. Enter URI of the HELO
7. Click Connect

*NOTE: Wirecast may take a few seconds to initialize the incoming stream and show video in the Wirecast UI.*

Additional information is available at <https://www.telestream.net/wirecast/overview.htm>

## Wowza

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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/>

## Using the Local Wowza Streaming Engine

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*NOTE: This section assumes that you have already installed and configured the local Wowza Streaming Engine media server. For instructions on installation and configuration, see the following:*

<https://www.wowza.com/docs/how-to-install-and-configure-wowza-streaming-engine>

## Gather Wowza Application Connection Settings

---

Once you have installed and configured your local Wowza Streaming Engine media server, follow these steps to gather your Wowza Application Connection Settings, then enter them into your HELO's Streaming Profile Configuration.

1. Launch a web browser, then navigate to your local server installation of the Wowza Streaming Engine Manager.
2. In the left column, under the "Selected Application" heading, select the application you want to use.
3. From the selected application sub-menu, select "Sources (Live)". The Sources (Live) page displays.
4. From the far right column of the Sources (Live) page, under the heading "Application Connection Settings," note the following:
  - Host Server IP Address
  - Host Port Number
  - Application Name

## Enter Settings into HELO Streaming Profile Configuration

---

1. From your HELO web user interface, select the Streaming Profiles menu. The Streaming Profile Settings page displays.
2. In the Stream Type field, select RTMP.
3. In the RTMP Server URL field, enter the IP address (or URL) of the server followed by a slash, then the engine name. For example:  
`rtmp://10.3.0.75/livestream1`  
-or-  
`rtmp://wowza.aja.com/livestream1`

It is not necessary to enter the port number if you are using the default port number (1935). For example, when using the default port number, these two addresses would be equivalent:

`rtmp://wowza.aja.com/livestream1`  
`rtmp://wowza.aja.com:1935/livestream1`

However, if you are not using the default port number, it will be necessary to enter it explicitly.

4. In the RTMP Stream Name field, enter the name of the stream. You can name the stream anything you like, for example, "myStream".

## Initiate HELO Streaming Output

---

To initiate the HELO streaming output, press the Stream button from your HELO unit's front panel, or click the Stream button from the HELO web user interface.

## 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>

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

# Appendix A – Specifications

---

## HELO Tech Specs

---

### Video Formats

---

- (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 50, 59.94, 60
- (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

---

- 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

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

### Protocols

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- RTMP, RTSP (10 clients), RTMPE, RTMPS, HTTPS and RTP/UDP Unicast and Multi Unicast

### Storage

---

- 1x USB Slot (USB 2.0 and USB 3.0 media, exFAT or FAT32)
- 1x SD card slot, SD, SDHC, SDXC cards (exFAT)
- Mounted Network Share (CIFS or NFS)

### Video Input Digital

---

- 1x 3G-SDI, SMPTE-259/292/296/424, 10-bit
  - Single Link 4:2:2, 4:4:4 (1x BNC)
- 1x HDMI Standard Type A connector
  - HDMI v1.4a, RGB or YCbCr

### Video Output Digital

---

- 1x 3G-SDI, SMPTE-292/296/424, 10-bit
  - Single Link 4:2:2 or 4:4:4 (1x BNC)
- 1x 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 1x 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 1x 3.5mm TRS connector)

## Network Interface

---

- 10/100/1000 Ethernet (RJ-45)
- Embedded web server for Configuration and Control
- Regionalized interface support - Simplified Chinese

## User Interface

---

- Stream Button
- Record Button
- Web UI
- Simple Web Configuration via AJA eMini-Setup (macOS and Windows)
- Integrated calendar

## Control and Automation

---

- Integrated calendar scheduler
- Support remote ICS calendars
- Scriptable REST control API
- Closed Captioning supported

## Size (w x d x h)

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- 7.00" x 4.66" x 1.02" (177.8 x 118.37 x 25.91 mm)

## Weight

---

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

# Appendix B – Safety and Compliance

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## Federal Communications Commission (FCC) Compliance Notices

---

### 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

---

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 2014/30/EU.



This equipment meets the following conformance standards:

Safety:

EN 60065: 2014 (T-Mark License)

IEC 60065: 2014 (CB Scheme Report/Certificate)

Additional licenses issued for specific countries available on request.

Emissions:

EN 55032: 2012, CISPR 32: 2015, EN 61000-3-2: 2014, EN 61000-3-3: 2013

Immunity:

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

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

EN 61000-4-11:2004

Environments: E2, E3 and E4

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



**Warning!** This is a Class 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<br>(업무용 방송통신기자재)                                           | 이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.                                                                                       |
| Class A<br>(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 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.

## Chinese Compliance Statement

This product has been tested to the following Chinese standards:

GB13837-2003, GB8898-2001, and GB17625.1-2003

This product meets the requirements of implementation rules for compulsory certification (REF NO. CNCA-01C-17:2010) under certificate number 2017010805953353.

## 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 on Hardware

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

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

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

To obtain service under this warranty, the Customer must notify AJA Video of the defect before expiration of the warranty period and make suitable arrangements for the performance of service by contacting AJA Video support through the channels set forth on the support contacts web page at <https://www.aja.com/support>.

Except as stated, the Customer shall bear all shipping, packing, insurance and other costs, excluding parts and labor, to effectuate repair. Customer shall pack and ship the defective product to a service center designated by AJA Video, with shipping charges prepaid. AJA Video shall pay to return the product to Customer, but only if to a location within the country in which the AJA Video service center is located. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATIONS ON APPLICABLE STATUTORY RIGHTS OF A CONSUMER, SO SOME OR ALL OF THE TERMS OF THIS PARAGRAPH MAY NOT APPLY TO YOU.

## Limitation of Liability

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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

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This limited warranty is the only warranty provided by AJA Video on the hardware product. It supersedes all prior or contemporaneous understandings regarding such subject matter. No amendment to or modification of this warranty will be binding unless in writing and signed by AJA Video. The laws of the State of California, USA will govern this warranty and any dispute arising from it. Any translation of this

Agreement is intended for convenience and to meet local requirements and in the event of a dispute between the English and any non-English versions, the English version of this warranty will govern. This limited warranty gives you specific legal rights and you may have other rights that vary from jurisdiction to jurisdiction, some of which are noted above.

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