

OmniStream™ Wallplate Networked AV Encoder



Version Information

Version	Release Date	Notes
10	Nov 2023	- Updated wiring diagram on pages 50 and 54; replaced AT-OMNI-111-WP with AT-OMNI-111 (Encoder #2).

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Operating Notes



IMPORTANT: Visit <http://www.atlona.com/product/AT-OMNI-111-WP> for the latest firmware updates and User Manual.

Warranty



To view the product warranty, use the following link or QR code:

<https://atlona.com/warranty/>.

Safety and Certification



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT OPEN ENCLOSURE OR EXPOSE TO RAIN OR MOISTURE. NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.



The information bubble is intended to alert the user to helpful or optional operational instructions in the literature accompanying the product.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this product near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of a 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.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the product.
11. Only use attachments/accessories specified by Atlona.
12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
13. Unplug this product during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the product 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 product, the product has been exposed to rain or moisture, does not operate normally, or has been dropped.



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Introduction

The Atlona **AT-OMNI-111-WP** is a networked AV encoder for HDMI sources up to 4K/UHD and HDR (High Dynamic Range), plus embedded audio. It features a US two-gang, wallplate form factor, and includes interchangeable black and white wallplates and faceplates. **OmniStream** is designed for high performance, flexible distribution of AV over standard, off-the-shelf Gigabit Ethernet switches in commercial audiovisual applications. The OMNI-111-WP encoder features the advanced VCx™ codec which delivers 4K/UHD, with artifact-free presentation of computer-generated content and fast-motion video, and ultra-low latency less than one frame. With its wallplate form factor, the OMNI-111-WP enables convenient installation wherever an aesthetically appealing or discreet AV source connection is required.

Features

- Best-in-class AV over IP performance and reliability over Gigabit Ethernet.
- US two-gang enclosure for wallplate openings – interchangeable black or white trim kits.
- AV encoder for HDMI up to 4K/UHD, plus embedded audio and RS-232 or IR control pass-through.
- Supports 4K/UHD plus HDR formats.
- Advanced VCx codec.
- High-efficiency coding.
- Integrated high-quality scaler.
- HDCP Compliance.
- Ultra-fast switching between 4K/60 video streams.
- Encoder grouping.
- Integrated Ethernet link testing.
- Thumbnail preview of encoded video streams.
- Networked AV redundancy.
- Network error resilience with FEC (forward error correction).
- Simplify integration with plug-and-play network switch compatibility.
- Remote PoE (Power over Ethernet) powering.
- Secure content distribution with AES-128 encryption.
- Supports industry-standard, network security features and protocols.
- AES67-compatible.
- Simultaneous OmniStream and AES67 audio streaming.
- Enhance AV presentations with visual enhancements.
- EDID management.
- Audio processing and pass-through.
- System management.

Package Contents

- 1 x AT-OMNI-111-WP
- 1 x Black faceplate
- 1 x White Decora® wallplate
- 1 x Black Decora® wallplate
- 1 x 3.5 mm-to-DE-9 (M-F) cable
- 4 x Spare screws

Introduction to OmniStream

OmniStream 101

OmniStream products are similar in principle to matrix switch endpoints: A/V signals are sent from one point (transmitter) to another point (receiver) over category cable. However, OmniStream stands apart from matrix switchers, in that it is an *IP-based solution*, allowing this data to be sent over a standard IP network. In addition, these endpoints are referred to as *encoders* and *decoders*. Encoders act as “transmitters” and decoders act as “receivers”.



DEFINITIONS

Encoder – Compresses source signals before sending them out over a network environment.

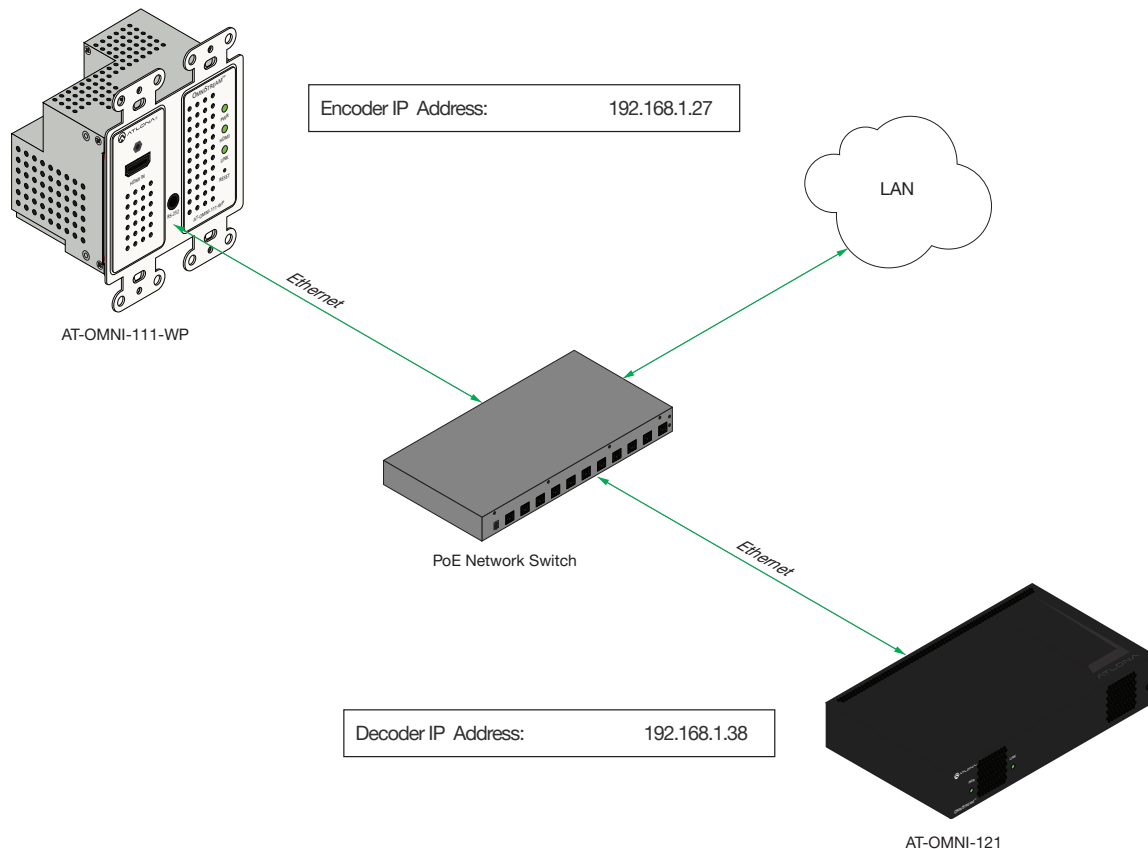
Decoder – Receives and decompresses signals from an encoder and sends them to an output device, such as a display or other sink device.

IP Address – A unique numerical label that is assigned to each device connected to a network.

IP Address Assignment

Figure 1.1 below, shows an encoder and a decoder, connected through a network switch. As with all network devices, both the encoder and decoder must have unique IP addresses. OmniStream encoders and decoders are DHCP-enabled, by default. This means that when the encoder/decoder is connected to the network, and a DHCP server is available, the encoder/decoder will automatically be assigned an IP address. If no DHCP server is available, then the unit will use a self-assigned IP address within the range of 169.254.xxx.xxx/16. OmniStream devices can also be assigned a static IP address, if necessary. Static IP addressing will be covered in a later section.

Figure 1.1 - An encoder and decoder on a network, with assigned IP addresses.



Network Bandwidth and OmniStream Compression

When sending video and audio over a network, the available bandwidth needs to be managed. Gigabit Ethernet switches are very common and can take advantage of installed Category 5e cable. 10-Gigabit Ethernet switches are available, but are more expensive per port and require Category 6A cable or better. The chart below shows uncompressed data rates for common resolutions. These data rates exceed the available bandwidth of Gigabit Ethernet, but using the compression technology in OmniStream, this video can be streamed over cost-effective Gigabit networks.

Resolution	Data Rate*
1920 x 1080p 30 Hz	2.2 Gbps
1920 x 1080p 60 Hz	4.5 Gbps
3840 x 2160p 30 Hz	8.9 Gbps
3840 x 2160p 60 Hz	17.8 Gbps

* Data rate is shown without compression.

OmniStream compresses the source data at the encoder, before it is sent out over the network. This process is known as *encoding*. OmniStream uses VCx and VC-2 compression, which are intermediate compression schemes and offer lower latency and higher video fidelity than an interframe compression scheme, such as H.264 or H.265. Interframe codecs are typically used by cable or internet providers and use very aggressive bit rates (low bandwidth) with high latency (delay), which results in lag. VCx and VC-2 provide both high quality (high bit rates) and very low-latency for a much more desirable viewing experience.

Streams

The term *stream* is used throughout this manual, to describe the different types of signals that are transmitted over a network. For example, if a blu-ray player is connected to an encoder, both video and audio are sent to the encoder over an HDMI cable. The term *video stream* is used to identify the video portion of a signal and *audio stream* identifies the audio portion of the signal.

Sessions

A *session* is a way of organizing audio and video streams. The session identifies each stream with a unique *multicast IP address* and *UDP port* assignment. This provides an address to determine where the package of audio and video should be sent. [Table 1.1](#) illustrates how a session encapsulates a video and audio stream.



NOTE: Sessions are not limited to only video and audio streams. Control data, such as RS-232, as well as AES67 audio, can also be contained within a session. These topics will be covered in a later chapter.

Table 1.1 - Video and audio streams contained within a session.

Session		
Video Stream	Multicast IP Address	UDP Port
Audio Stream	Multicast IP Address	UDP Port

Introduction to OmniStream

Subscribing to a Stream

To receive information from an encoder, the decoder must *subscribe* to the multicast IP address and UDP port of the stream(s). Note that the decoder does not subscribe to the session, but to the stream(s) within the session. The process of subscribing is similar to changing the channel on a Set-Top Box. For example, in order to view the content on channel 213, the Set-Top Box must be set to channel 213. Similarly, for a decoder to subscribe to an encoder stream, *the multicast IP address and UDP port settings on the decoder must be set to the same values as the encoder to which it is subscribed*. Note that the management IP address of a unit is different than its multicast IP address.

Figure 1.2 - Diagram of a video and audio stream, transmitted over an Ethernet cable, to the subscribing decoder.

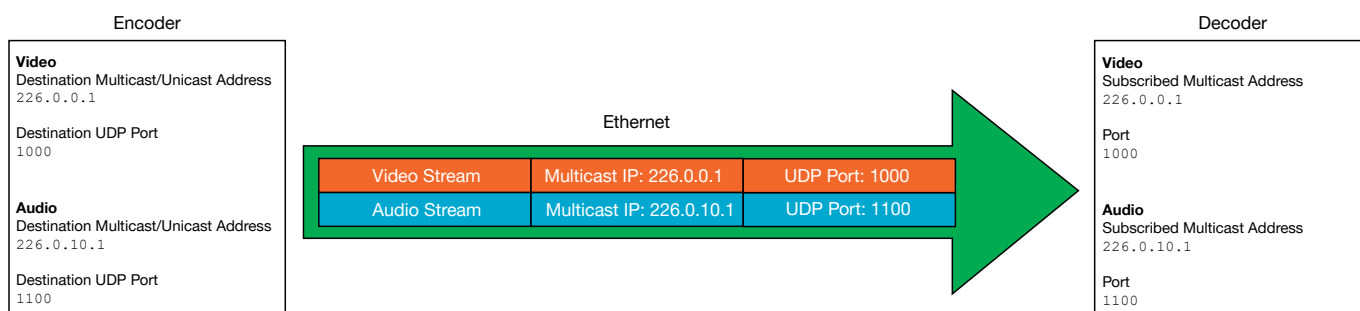
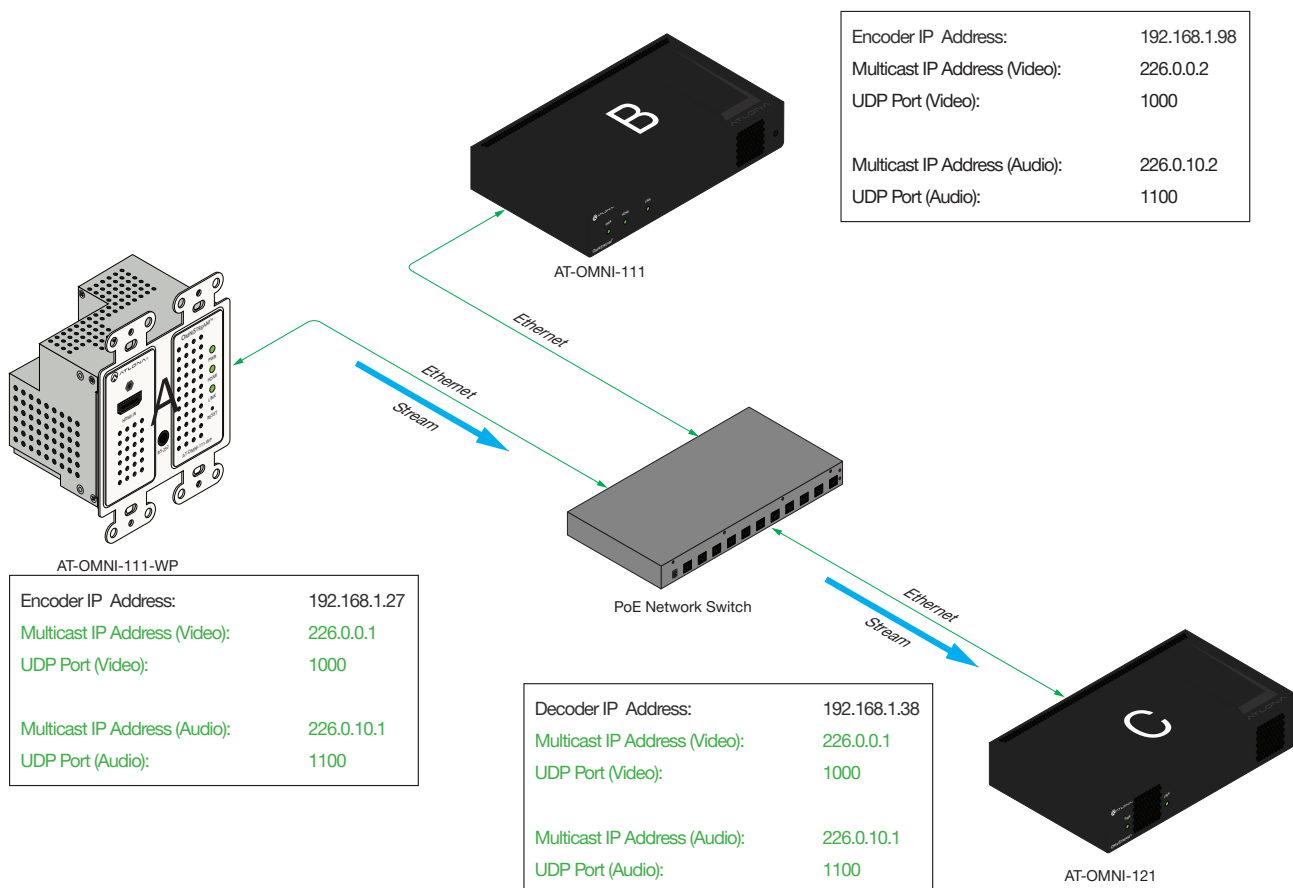


Figure 1.3 shows two encoders and a single decoder connected to a network switch. Decoder “C” is subscribed to encoder “A”, since the multicast IP addresses and UDP port numbers for both video and audio are set to the same values as encoder “A”.

Figure 1.3 - Decoder “C” subscribed to encoder “A”.





DEFINITIONS

Stream – Describes the video, audio, or any data that is transmitted from an encoder over the network.

Multicast IP Address – A class-D IP address assigned to a stream.

UDP Port – User Datagram Protocol (UDP) port. Part of the network addressing scheme to send and receive data to the proper destination on a network.

Subscribing – The process of selecting the multicast IP address to “listen to”, in order to receive one or more encoder streams at the decoder endpoint.

Encoder Naming Schema

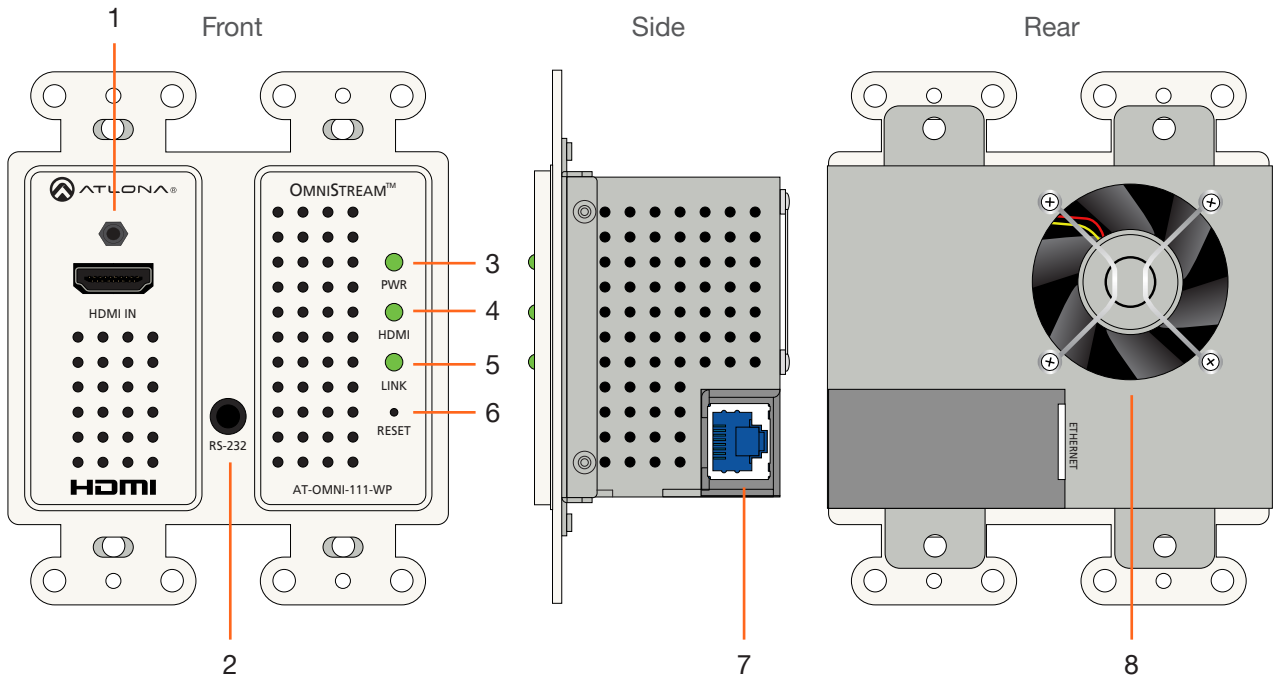
Two different models of OmniStream encoders are available. Each model has a different set of inputs and outputs and, depending upon the number of inputs and outputs, will support a defined number of sessions.

Model	Description
AT-OMNI-111 AT-OMNI-111-WP	<ul style="list-style-type: none"> • One HDMI input • One Ethernet output • Supports up to six sessions
AT-OMNI-112	<ul style="list-style-type: none"> • Two HDMI inputs • Two Ethernet outputs • Supports up to six sessions

The last three numbers of the OmniStream SKU, describe the model version, model type, and number of outputs. Note that the number of Ethernet outputs is the same as the number of HDMI inputs.

- **AT-OMNI-111** **1** = OmniStream Pro (“R-Type” models begin with the number “5”)
AT-OMNI-111-WP **1** = Indicates that the device is an *encoder* (*decoders* are identified with the number “2”)
1 = One Ethernet Output / One HDMI Input
- **AT-OMNI-112** **1** = OmniStream Pro
1 = Indicates that the device is an *encoder* (*decoders* are identified with the number “2”)
2 = Two Ethernet Outputs / Two HDMI Inputs

Panel Description



- 1 HDMI IN**
Connect an HDMI cable from this port to a UHD/ HD source.
- 2 RS-232**
This is a service port used for future management purposes.
- 3 PWR**
This LED indicator is green when the unit is powered.
- 4 HDMI**
This LED indicator is green when the link between source and encoder is good.
- 5 LINK**
This LED indicator is green when the link integrity between the AT-OMNI-111-WP and the switch is good.
- 6 RESET**
Press and release this button to reboot the AT-OMNI-111-WP. Note that this operation *does not* reset the unit to factory-default settings.
- 7 ETHERNET**
Connect an Ethernet cable from this port to the Local Area Network (LAN).
- 8 Fan**
This fan provides internal cooling by forcing hot air from the wallplate chassis. Make sure adequate ventilation is provided when installing the AT-OMNI-111-WP.

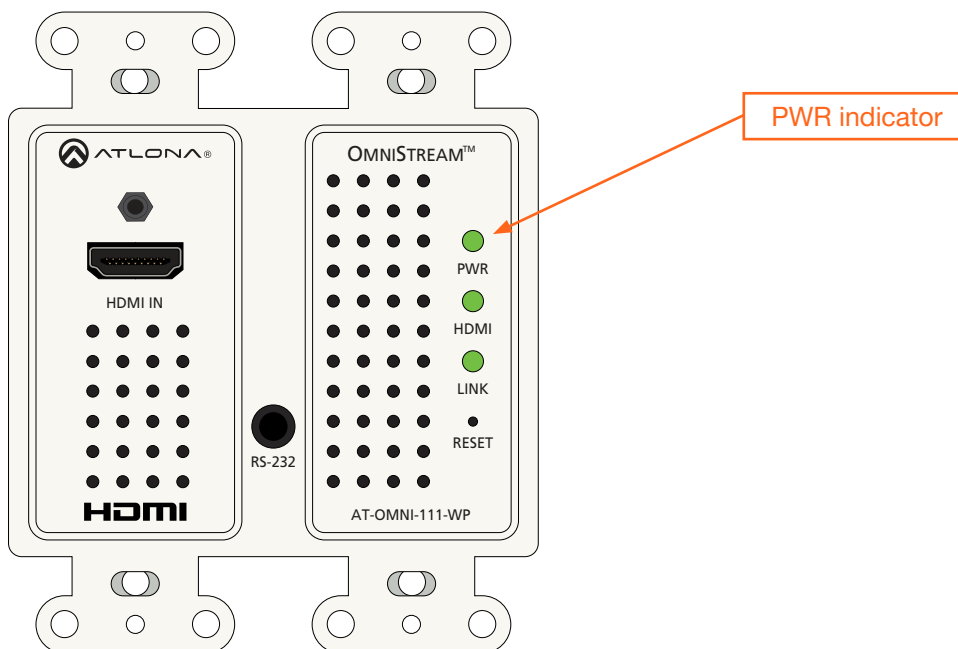
Installation

Connection Instructions



IMPORTANT: The venting holes, surrounding the enclosure, along with the fan assembly on the back of the unit, provides cooling by expelling warm air from the enclosure. To prevent overheating, make sure these holes and the fan assembly are not blocked.

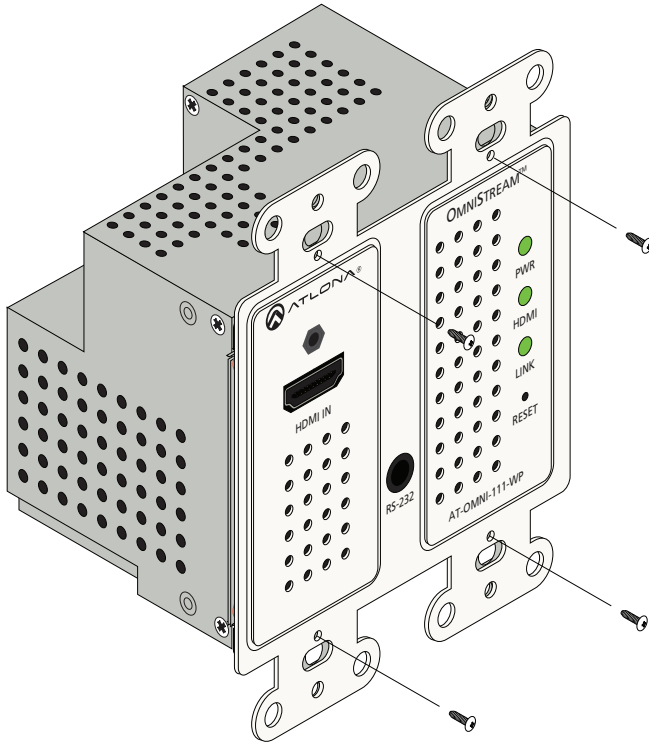
1. Connect an Ethernet cable from the **ETHERNET** port on the AT-OMNI-111-WP to a PoE-capable switch on the Local Area Network (LAN).
2. Install the AT-OMNI-111-WP into a 2-gang electrical box or mud ring.
3. Attach the included Decora® wallplate to secure the AT-OMNI-111-WP to the wall/surface.
4. Connect an HDMI cable from a HD/UHD source to the **HDMI IN** port on the AT-OMNI-111-WP.
5. The **PWR** indicator, on the front panel, displays the power status. When the AT-OMNI-111-WP is powered, the **PWR** LED initially turns red. After a few moments it will turn amber, and finally green.
6. The AT-OMNI-111-WP is now ready for operation.



Faceplate Removal and Assembly

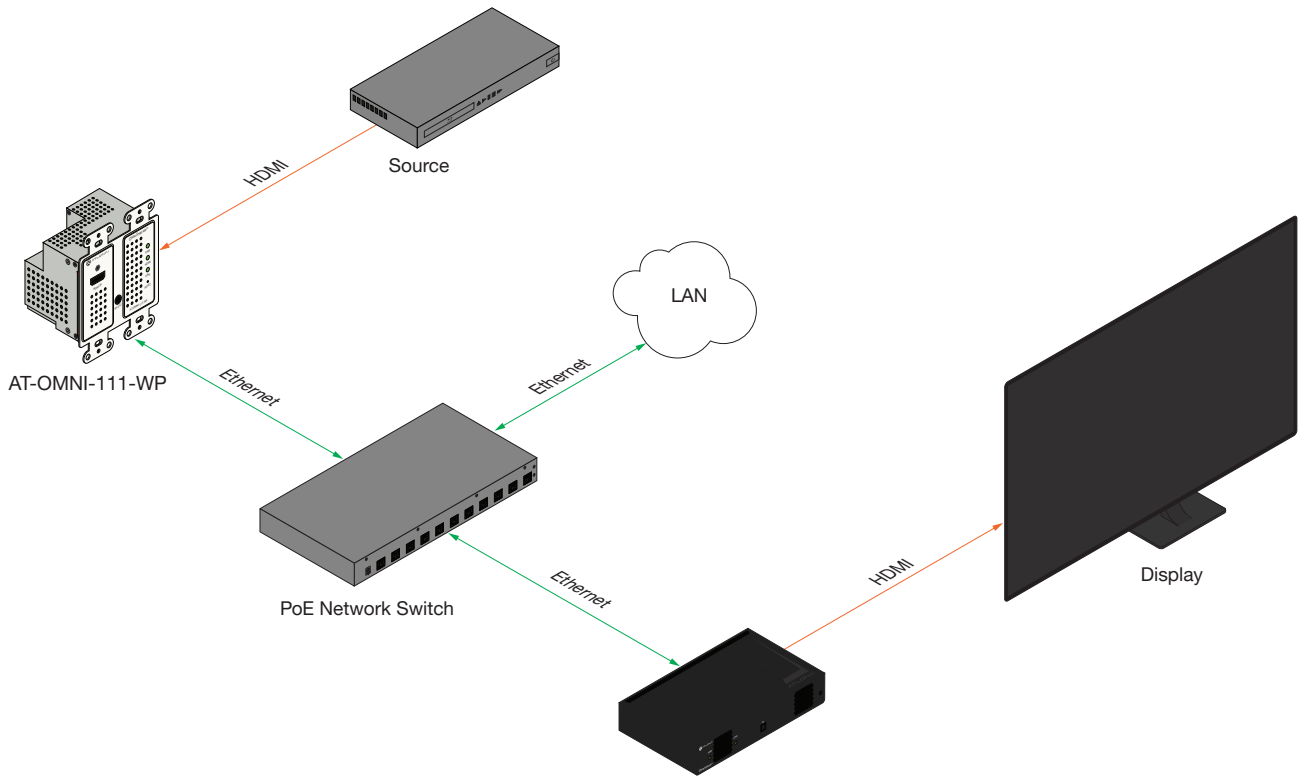
Removal of the faceplate requires that the AT-OMNI-111-WP be disassembled from the electrical box or mud ring. A small Phillips-head screwdriver is required to remove the faceplate.

1. Unscrew the four Phillips-head screws from the sides of the faceplate, as shown:



2. Gently remove the faceplate by pulling it toward you.
3. Attach the new faceplate, then secure it using the four Phillips-head screws. Do not over-tighten or apply high-torque devices to the screws. Doing so may damage the faceplate and/or the screws.
4. Install the AT-OMNI-111-WP to the electrical box or mud ring.

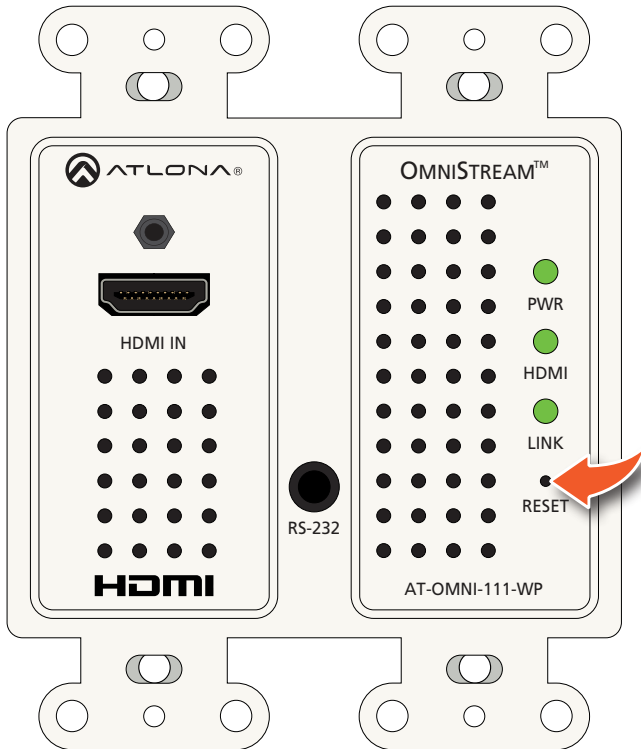
Connection Diagram



Getting Started

Rebooting OmniStream

To reboot the OmniStream encoder, press and release the recessed button, on the far-right side of the unit, using a small, pointed object. Rebooting the encoder does not reset the encoder to factory-default settings.



LED Indicators

The following table provides a listing of front-panel LED indicators and their status:

LED			Description
PWR	Off	○	<ul style="list-style-type: none"> If using a PoE switch, make sure that the port on the switch that is connected to the encoder, has PoE enabled. When the encoder is powered using PoE, the PWR indicator will be green. Check the Ethernet cable for possible damage or loose connections.
	Red	●	<ul style="list-style-type: none"> The encoder is booting.
	Amber	●	<ul style="list-style-type: none"> The encoder is booting and/or attempting to locate a DHCP server.
	Green	●	<ul style="list-style-type: none"> The encoder is ready.
HDMI	Red	●	<ul style="list-style-type: none"> No source is connected to the input. Check the HDMI cable for possible damage or loose connections.
	Green	●	<ul style="list-style-type: none"> The link integrity between the source and the encoder is good.
LINK	Red	●	<ul style="list-style-type: none"> No Ethernet cables are connected between the switch and the ETHERNET port(s). Check the Ethernet cable for possible damage or loose connections.
	Amber	●	<ul style="list-style-type: none"> The encoder is booting.
	Green	●	<ul style="list-style-type: none"> Link integrity is good between the encoder and the network.

Accessing the Web Server

In order to access the web server of the desired encoder/decoder, the IP address of the encoder must be known. This can be accomplished by using any of the following methods: 1) Running IP scanner software or 2) accessing the encoder using the domain name. When running an IP scanner, both the computer and the OmniStream encoders/decoders must be connected to the same network.

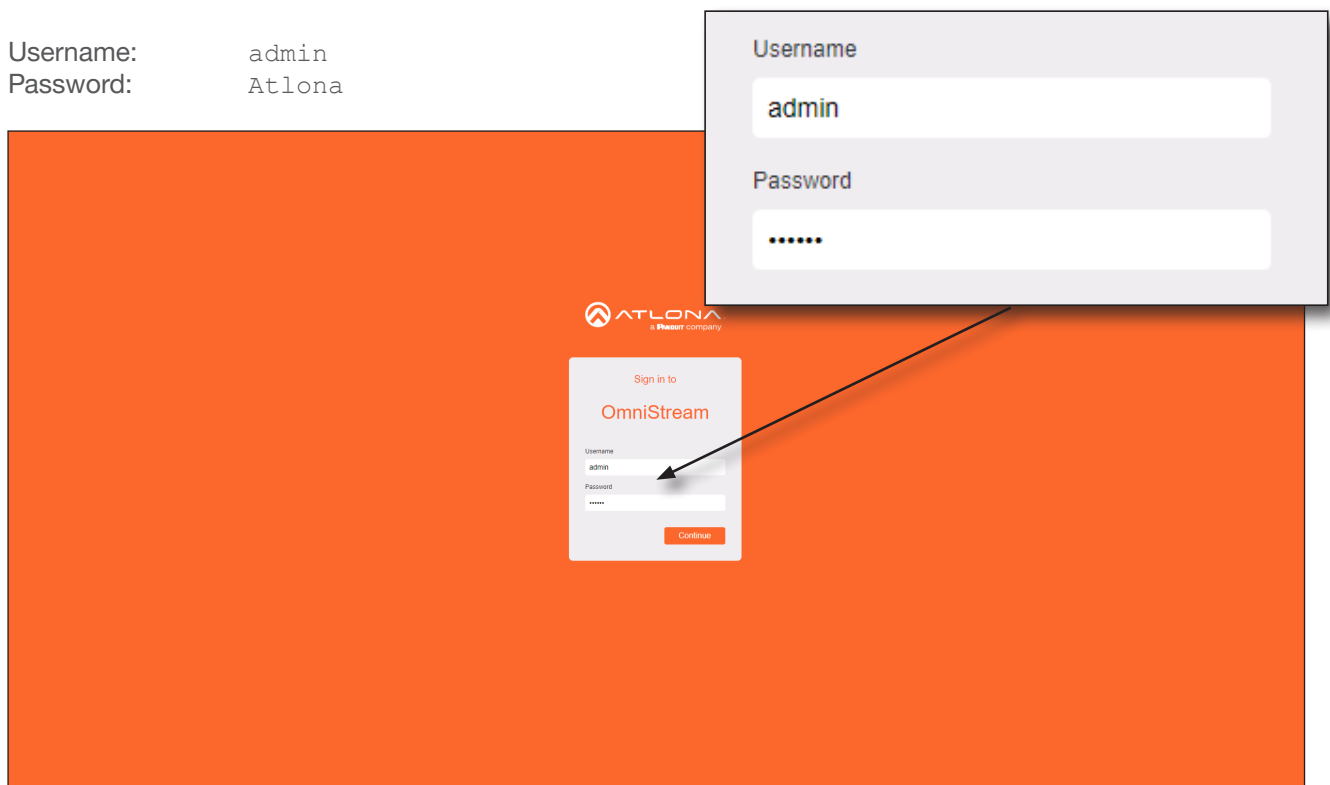


TIP: Atlona recommends downloading and using the Network Assignment Planner, when setting up OmniStream products on the network. Recording this information in this document will provide a “snapshot” of the current OmniStream network configuration. The Network Assignment Planner is available for download on the OmniStream product pages, under the Resources tab.

Logging In

1. Launch the desired web browser and enter the IP address or domain name of the encoder in the address bar.
2. Enter the username and password. Note that the password field will always be masked. The default credentials are:

Username: admin
Password: Atlona

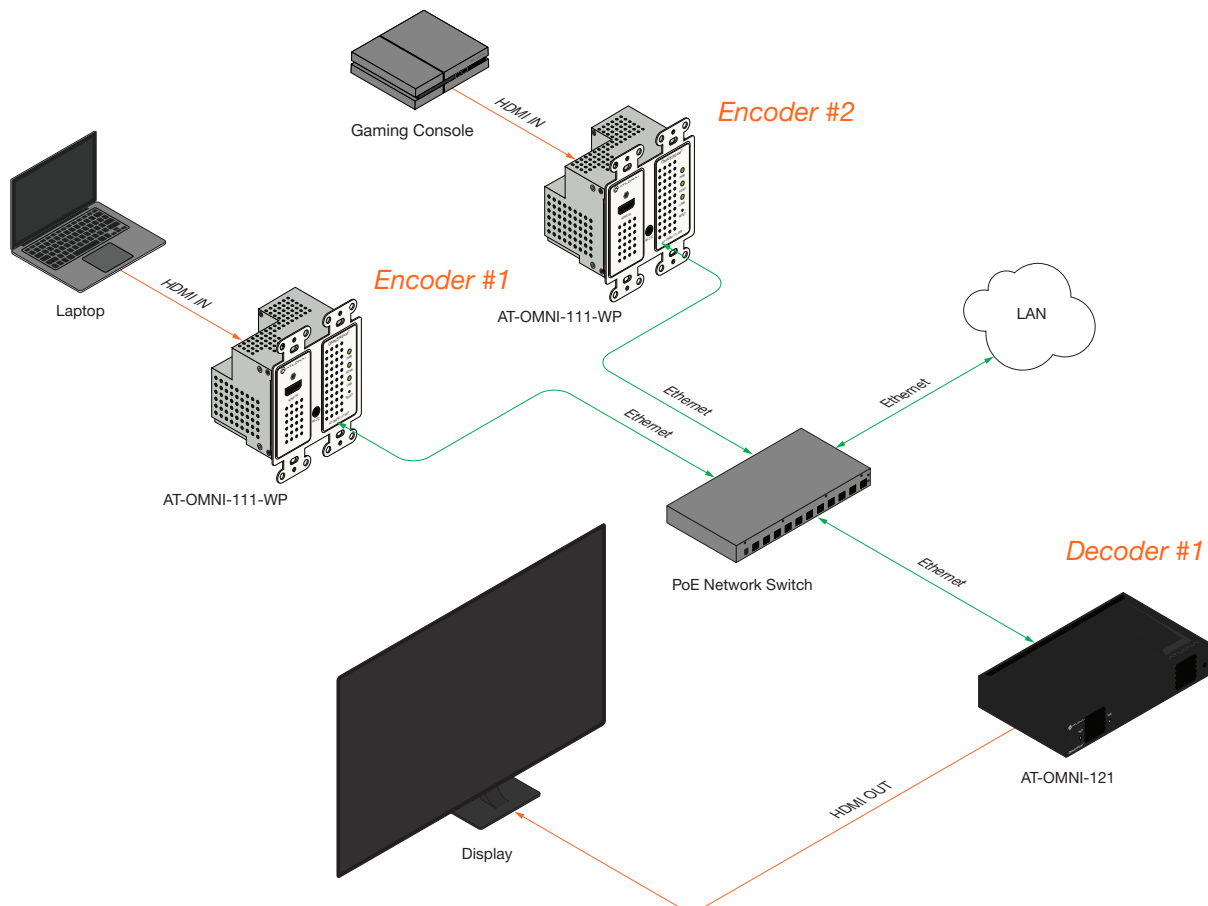


3. The **System Information** page will be displayed.

Basic Configuration Tutorial

This section provides a tutorial on configuring two AT-OMNI-111-WP single-channel encoders and one AT-OMNI-121 single-channel decoder. Make sure the encoder is connected to a source device and that the decoder is connected to a display. Both the encoder and decoder should be connected to the same local network. Refer to [Connection Instructions](#) (page 13) for more information.

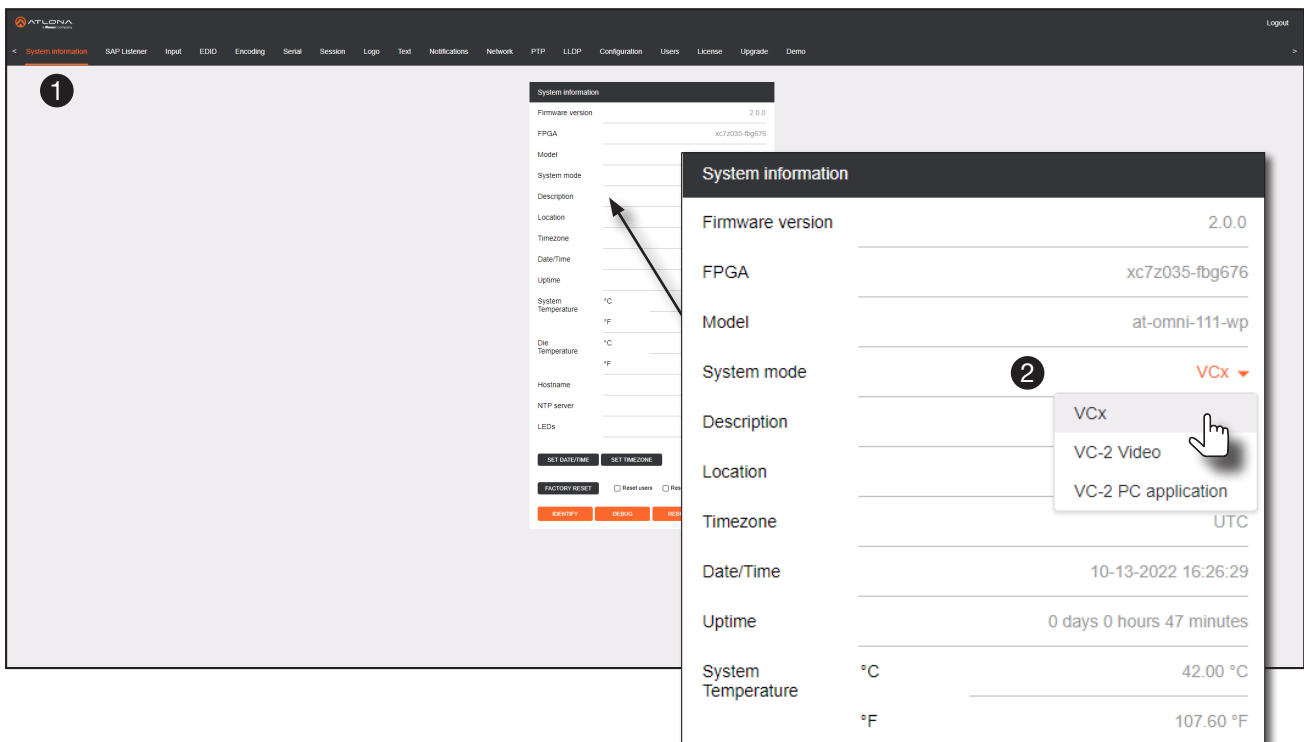
Physical Connections



Setting the System Mode

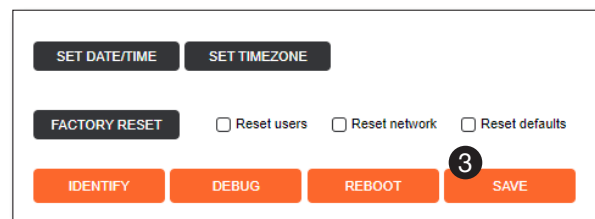
OmniStream offers three system modes. These modes will determine the codec and settings available in OmniStream.

1. Login to each encoder and click **System Information** in the menu bar.
2. Click the **System mode** drop-down list and select **VCx**. This mode will provide access to all of OmniStream 2.0 features.



Mode	Description
VCx	This is the default mode and represents the latest codec technology from Atlona, with outstanding support for computer graphics and motion video. VCx includes support for 4K60 4:4:4 fast switching, dual streaming from AT-OMNI-111 encoders, and multiview on the decoders.
VC-2 Video	Legacy OmniStream codec that provides the best viewing experience when streaming motion graphics and/or video.
VC-2 PC application	Legacy OmniStream codec that optimizes the image when viewing static images, such as spreadsheets or similar content.

3. Click **SAVE** at the bottom of the page to commit changes.
4. Go to the decoder interface and repeat this process. Refer to the *OmniStream Single-Channel / Dual Channel A/V Decoder User Manual*, if necessary.



Configuring Inputs

The **Input** page is used to verify that the encoder recognizes the source device. This page is also used to set the EDID, HDCP version, and provides detailed information about the source signal. The following procedure should be performed on both AT-OMNI-111-WP encoders.

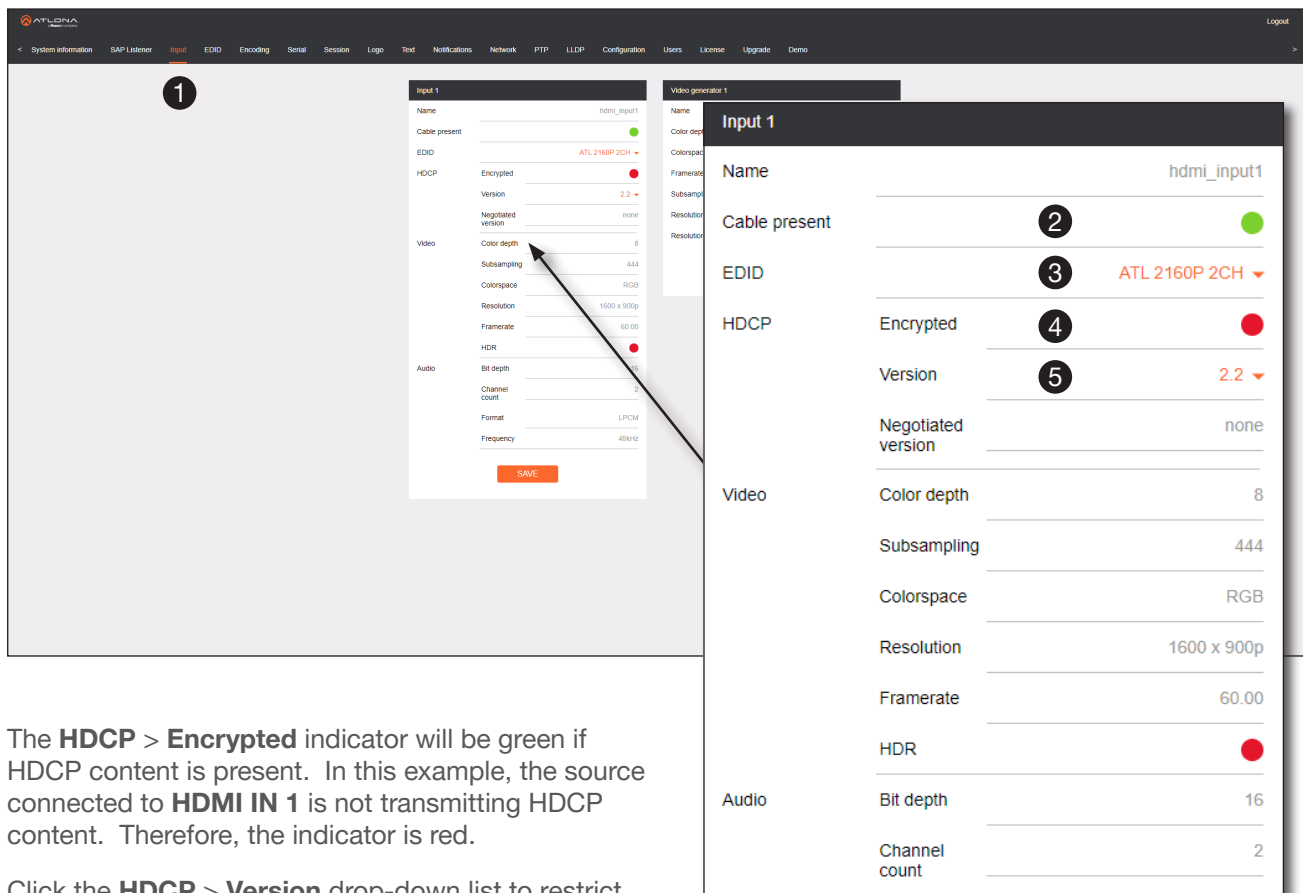
1. Click the **Input** menu.
2. Since a source has been connected to the **HDMI IN** port, the **Cable present** indicator within the **Input 1** window group is green, as shown below. This indicates that an active source is connected to the HDMI port.

If these indicators are red, check that each source is connected to an **HDMI IN** port. A red indicator may also describe faulty HDMI cables. If the sources are connected, then try different HDMI cables. If the HDMI cable integrity has been verified, then make sure that the output resolution of the source is at least 720p.



TIP: If no signal is being received on the encoder, then it's always a good practice to check the **Input** screen on the encoder when performing additional troubleshooting.

3. Click the **EDID** drop-down list to select an EDID. For now, leave this setting at **ATL 2160P 2CH**. This EDID provides general compatibility with most displays.



4. The **HDCP > Encrypted** indicator will be green if HDCP content is present. In this example, the source connected to **HDMI IN 1** is not transmitting HDCP content. Therefore, the indicator is red.
5. Click the **HDCP > Version** drop-down list to restrict HDCP to a particular version. By default, this is set to 2.2 and this setting should be used for most applications.

Basic Configuration Tutorial

6. The **Video** section provides information about the input signal: color depth, subsampling, color space, resolution, frame rate, and HDR (High Dynamic Range). If the HDR indicator is green, this will indicate that HDR content is being transmitted from the source device. Refer to the [Input page \(page 78\)](#) for more information.
7. The **Audio** section displays audio information (if present) from the source device: bit depth, the number of audio channels, the audio format, and the frequency. Refer to the [Input page \(page 78\)](#) for more information.
8. Click **SAVE** to commit all changes.

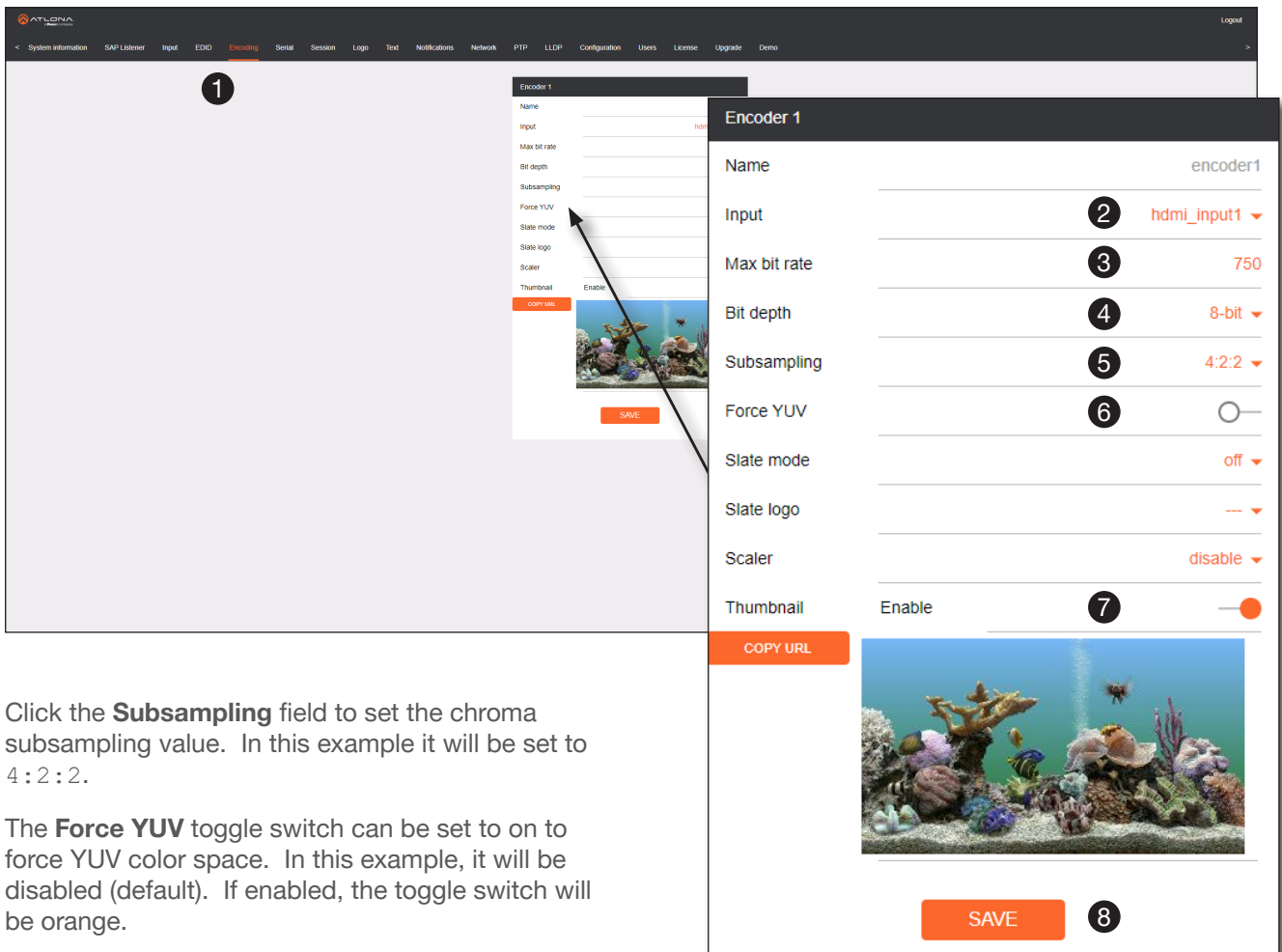
Input 1

Name	hdmi_input1	
Cable present		●
EDID		ATL 2160P 2CH ▾
HDCP	Encrypted	●
	Version	2.2 ▾
	Negotiated version	none
Video 6	Color depth	8
	Subsampling	444
	Colorspace	RGB
	Resolution	1600 x 900p
	Framerate	60.00
	HDR	●
Audio 7	Bit depth	16
	Channel count	2
	Format	LPCM
	Frequency	48kHz
8		SAVE

Encoder Settings

The **Encoding** page is used to assign an input to an encoder. In addition, this page allows video settings, such as the maximum bit rate, bit depth, and chroma subsampling to be set. Video thumbnails of the source device can also be displayed on this page. *The following procedure should be performed on both AT-OMNI-111-WP encoders.*

1. Click **Encoding** in the menu bar.
2. Under the **Encoder 1** window group, click the **Input** drop-down list and select `hdmi_input1`.
3. Enter `750` in the **Max bit rate** field. This means 750 Mbps.
4. Click the **Bit depth** drop-down list to change the bit depth. In this example, it will be set to `8-bit`.

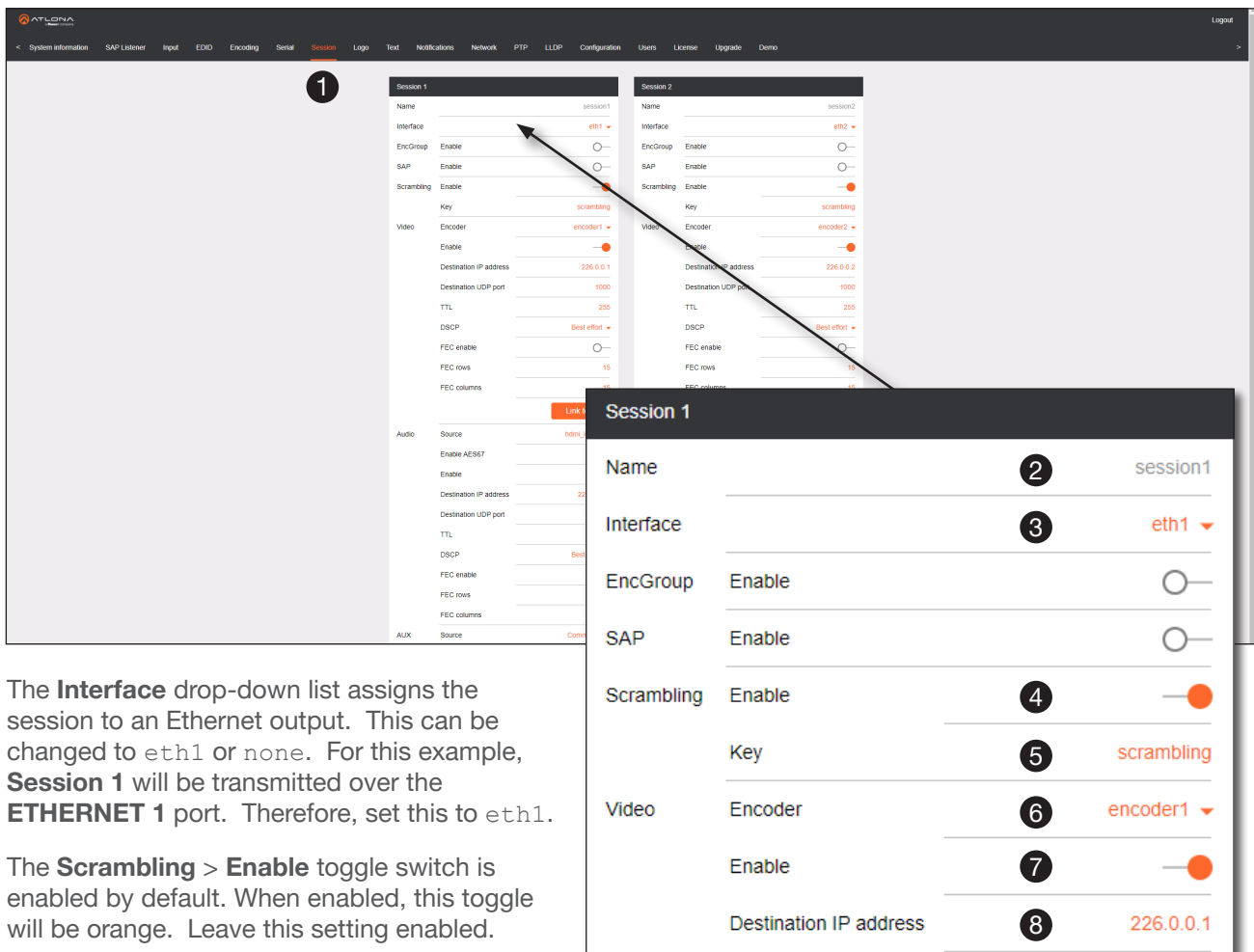


5. Click the **Subsampling** field to set the chroma subsampling value. In this example it will be set to `4:2:2`.
6. The **Force YUV** toggle switch can be set to on to force YUV color space. In this example, it will be disabled (default). If enabled, the toggle switch will be orange.
7. Click the **Thumbnail > Enable** toggle switch to enable it and display a thumbnail of the source. When enabled, the toggle switch is orange and a thumbnail of the source will be displayed. If no thumbnail is displayed when this feature is enabled, verify that the source is connected, powered, and is configured correctly under the **Input** menu.
8. Click **SAVE** to commit all changes.

Creating a Session

Before the video and audio (if any) can be sent out over the network, a session must be created on the encoder. The session assigns each stream to a unique multicast IP address and UDP port assignment. Sessions are always created on encoders. Refer to the [Session page \(page 86\)](#) for a detailed description of all settings. *The following procedure should be performed on both AT-OMNI-111-WP encoders, except where noted.*

1. Click **Session** in the menu bar.
2. Under **Session 1**, the **Name** field indicates the session name. This value is set to `session1` and cannot be changed.



The screenshot shows the ATLONA web interface with the 'Session' menu item highlighted. A callout box titled 'Session 1' provides a detailed view of the configuration for Session 1. The configuration includes:

- Name:** session1
- Interface:** eth1
- EncGroup:** Enable
- SAP:** Enable
- Scrambling:** Enable
- Key:** scrambling
- Video:** Encoder (encoder1), Enable
- Destination IP address:** 226.0.0.1
- Destination UDP port:** 1000
- TTL:** 255
- DSCP:** Best effort
- FEC enable:** Disabled
- FEC rows:** 15
- FEC columns:** 15

3. The **Interface** drop-down list assigns the session to an Ethernet output. This can be changed to `eth1` or `none`. For this example, **Session 1** will be transmitted over the **ETHERNET 1** port. Therefore, set this to `eth1`.
4. The **Scrambling > Enable** toggle switch is enabled by default. When enabled, this toggle will be orange. Leave this setting enabled.
5. The **Scrambling > Key** field is set to `scrambling` by default. Scrambling keys can be any combination of alphanumeric characters and it is good practice to use them. For this tutorial, use the default key.
6. Select the encoder for the session. The AT-OMNI-111-WP has one encoder. Therefore, set the **Video > Encoder** field to `encoder1` for **Session 1**.
7. Click the **Video > Enable** toggle switch and make sure it is enabled for both **Session 1**. When enabled, the toggle switch will be orange. If set to disabled, then the encoder video stream will be disabled.
8. Enter the multicast IP address for the video stream in the **Destination IP address** field. Atlona recommends using multicast IP addresses as shown in [Table 2.1](#), on the next page. Enter `226.0.0.1` in the **Destination IP address** field for **Session 1** on **Encoder #1**. For **Encoder #2**, enter `226.0.0.2` in the **Destination IP address** field for **Session 1**.

Basic Configuration Tutorial

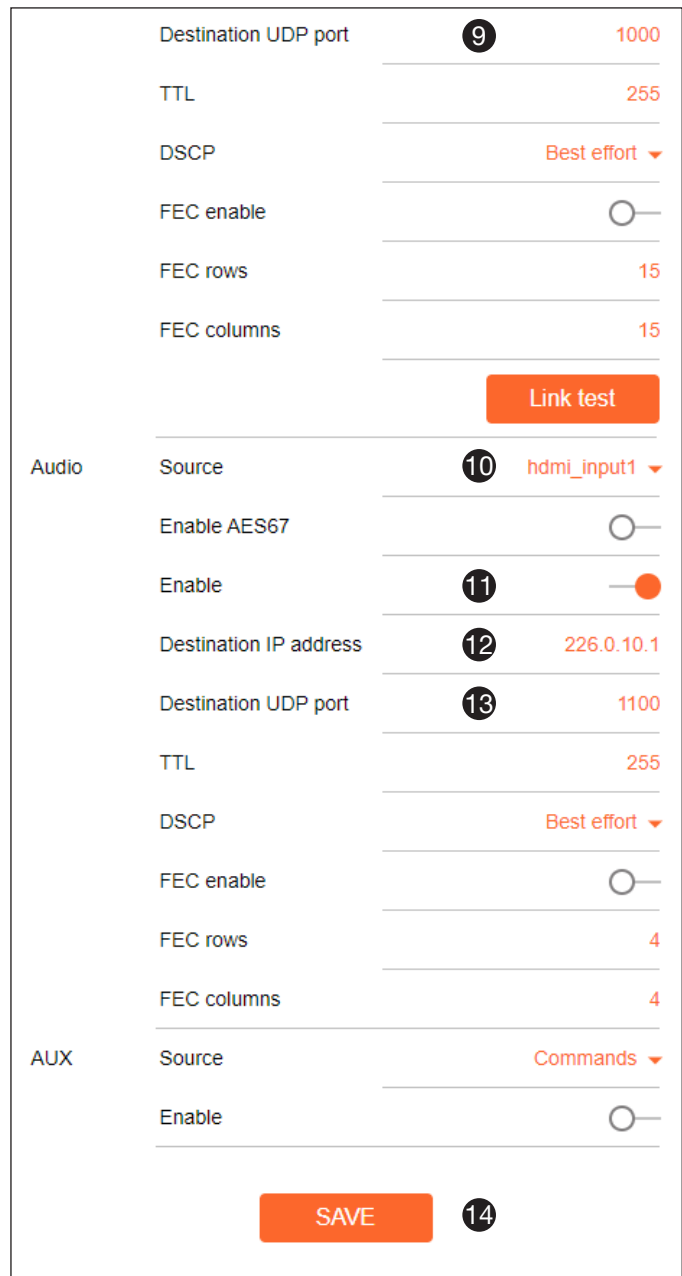
Table 2.1 - Recommended multicast IP address for video, audio, and data streams.

Stream	Video	Audio	Data (Control)
First source	226.0.0.1	226.0.10.1	226.0.20.1
Second source	226.0.0.2	226.0.10.2	226.0.20.2
nth source	226.0.0.n	226.0.10.n	226.0.20.n

Table 2.2 - Recommended UDP ports for video, audio, and data streams.

Stream	Video	Audio	Data (Control)
UDP Port	1000	1100	1200

9. Enter the UDP port in the **Destination UDP port** field. Although any valid UDP port can be used, Atlona suggests using the UDP port numbers in [Table 2.2](#), shown above. Since this is a video stream, enter 1000 in the **Destination UDP port** field for **Session 1**.
10. Click the **Audio > Source** drop-down list and select the HDMI audio input for the session. The source is connected to **HDMI IN**. Therefore, set this to `hdmi_input1` for **Session 1**.
11. Click the **Audio > Enable** toggle switch and make sure it is enabled. When enabled, it will be orange. If disabled, no audio will be streamed from the encoder.
12. Enter the multicast IP address for the audio stream in the **Destination IP address** field. Refer to [Table 2.1](#), above. In this example, enter 226.0.10.1 for **Session 1** on *Encoder #1* and 226.0.10.2 for **Session 1** on *Encoder #2*.
13. Enter the audio stream UDP port in the **Destination UDP port** field for **Session 1**. Refer to [Table 2.2](#), above. Since this is an audio stream, use UDP port 1100.
14. Click the **SAVE** button to commit all changes to **Session 1**.



The screenshot shows a configuration interface with three main sections: Video, Audio, and AUX. Each section has several settings:

- Video Section:**
 - Destination UDP port: 1000 (circled 9)
 - TTL: 255
 - DSCP: Best effort (dropdown)
 - FEC enable: Unchecked (toggle)
 - FEC rows: 15
 - FEC columns: 15
 - Link test button (orange)
- Audio Section:**
 - Source: hdmi_input1 (dropdown, circled 10)
 - Enable AES67: Unchecked (toggle)
 - Enable: Checked (toggle, circled 11)
 - Destination IP address: 226.0.10.1 (circled 12)
 - Destination UDP port: 1100 (circled 13)
 - TTL: 255
 - DSCP: Best effort (dropdown)
 - FEC enable: Unchecked (toggle)
 - FEC rows: 4
 - FEC columns: 4
- AUX Section:**
 - Source: Commands (dropdown)
 - Enable: Unchecked (toggle)

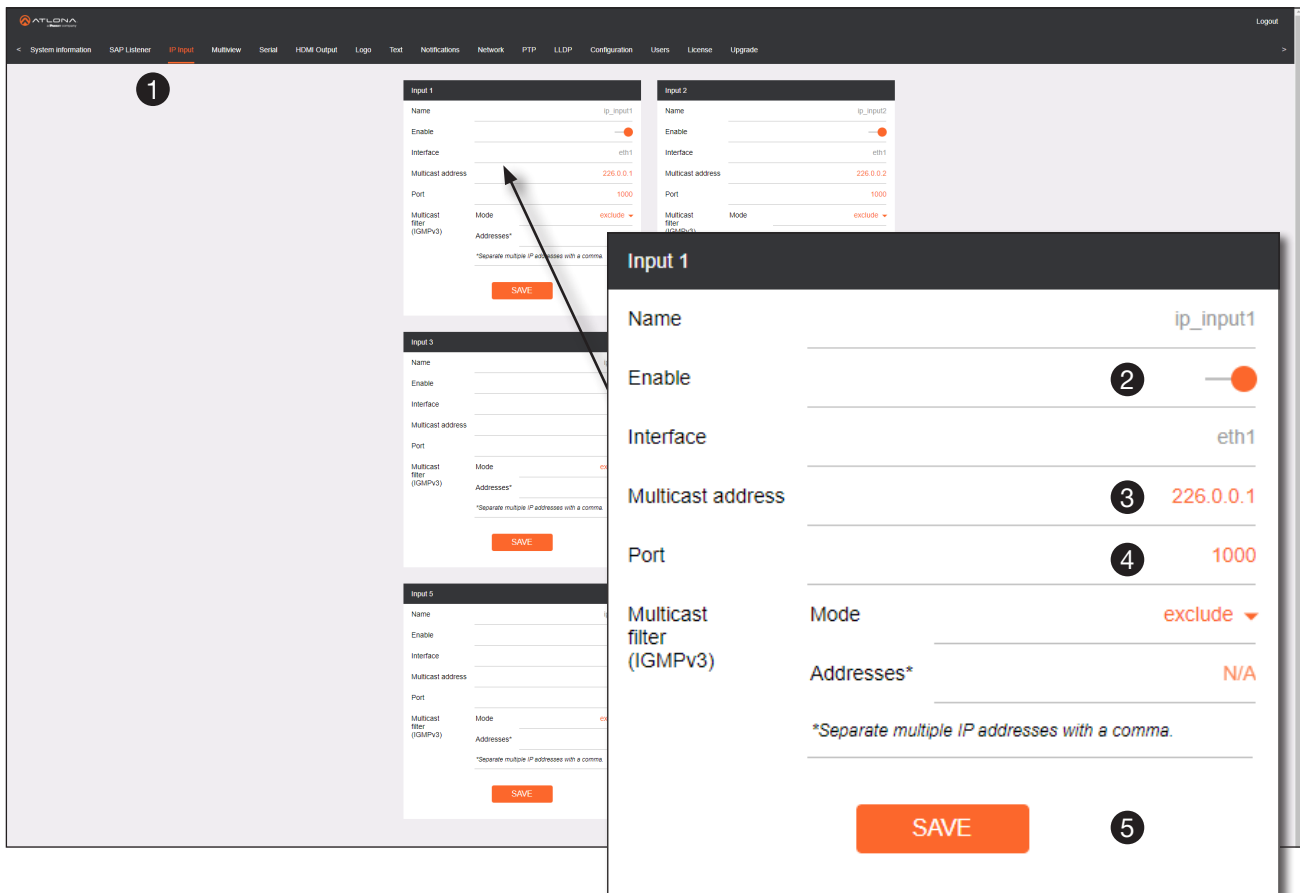
At the bottom of the interface is a **SAVE** button (circled 14).

Subscribing to an Encoder

The next step is to configure the decoder so that it is able to receive video, audio, and/or data (control) streams from the encoder. This process is referred to as “subscribing to the encoder”.

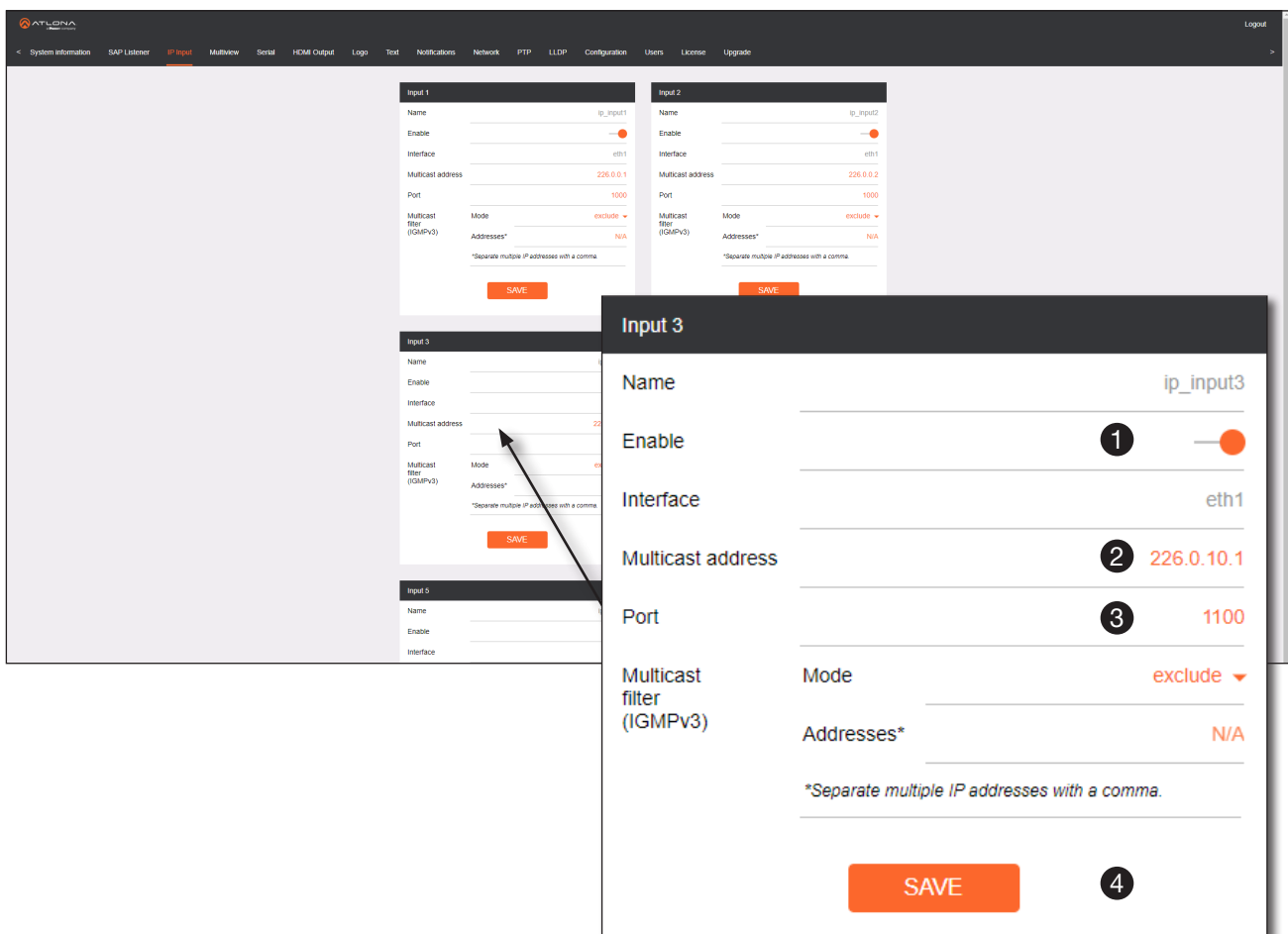
Video Configuration

1. Go to the decoder and click **IP Input** in the menu bar.
2. Locate the **Input 1** window group and verify that the **Enable** toggle switch is enabled. When enabled, the toggle switch will be orange. Perform the same procedure for the **Input 2** window group.
3. Under the **Input 1** window group, enter **226.0.0.1** in the **Multicast address** field. Under the **Input 2** window group, enter **226.0.0.2** in this field. These multicast IP address are the same addresses that were specified under the **Video > Destination IP address** field for the encoders.
4. In the **Port** field, enter **1000** under both **Input 1** and **Input 2** window groups. These are the same port settings that were entered under the **Video > UDP Port** section of the encoder.
5. Click the **SAVE** button, under the **Input 1** and **Input 2** window groups, to commit changes.



Audio Configuration

1. Locate the **Input 3** window group and verify that the **Enable** toggle switch is enabled. When enabled, the toggle switch will be orange. Perform the same procedure for the **Input 4** window group.
2. Under the **Input 3** window group, enter 226.0.10.1 in the **Multicast address** field. Under the **Input 4** window group, enter 226.0.10.2 in this field. These multicast IP address are the same addresses that were specified under the **Audio > Destination IP address** field for the encoders.
3. In the **Port** field, enter 1100 under both **Input 3** and **Input 4** window groups. These are the same port settings that were entered under the **Audio > UDP Port** section of the encoder.
4. Click the **SAVE** button, under the **Input 3** and **Input 4** window groups to commit changes.



Input Configuration Notes

Although there is no hard and fast rule for which **Input** window groups should be used for video, audio, and/or control, it can be helpful to visualize the **Input** window groups as columns and rows to better organize the IP data. Here, each column of **Input** window groups represents an encoder.

Table 2.3 - Video and Audio information for each encoder.

Encoder #1

Input	Multicast Address / Port
Input 1	Video (226.0.0.1:1000)
Input 3	Audio (226.0.10.1:1100)

Encoder #2

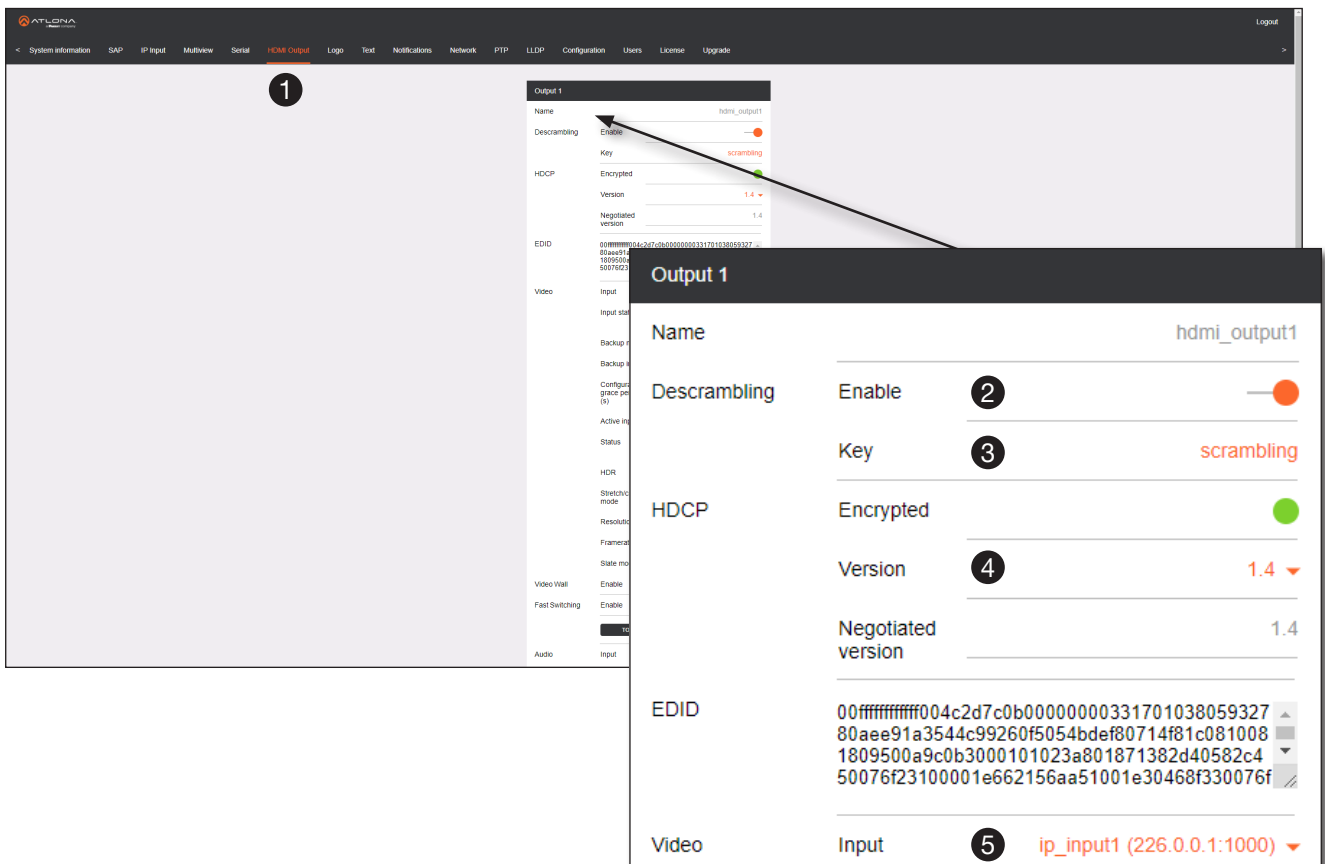
Input	Multicast Address / Port
Input 2	Video (226.0.0.2:1000)
Input 4	Audio (226.0.10.2:1100)

Configuring the HDMI Output Stream

1. Click **HDMI Output** in the menu bar.
2. The **Descrambling** > **Enable** toggle switch is enabled by default. When enabled, this toggle will be orange. For this example, leave the setting enabled.
3. The **Descrambling** > **Key** field is set to `scrambling` by default. This is the same key that is being used under the **Scrambling** > **Key** field on the encoder, and will allow the decoder to descramble the signal and send it out over the HDMI output to the display. Leave this key at its default setting.
4. Click the **HDCP** > **Version** drop-down list and select the HDCP version. `2.2` will work with most sources. However, in this case, an older sink/monitor which doesn't support HDCP 2.2 is being used. Therefore, the value is set to `1.4`.
5. Click the **Video** > **Input** drop-down list and select the video source. Based on what has been configured, the following options are available:

Video > Input	
ip_input1	(226.0.0.1:1000)
ip_input2	(226.0.0.2:1000)
ip_input3	(226.0.10.1:1100)
ip_input4	(226.0.10.2:1100)

Since this is the **Video** field, a video source should be selected. Referring to [Table 2.3](#), on the previous page, `ip_input1 (226.0.0.1:1000)` and `ip_input2 (226.0.0.2:1000)` are video data, from two different encoders. For this example, this field will be set to `ip_input1 (226.0.0.1:1000)`.



The screenshot shows the ATLONA configuration interface. The main page is titled "Output 1" and has a navigation bar at the top with options like "System information", "SAP", "IP Input", "Multiview", "Serial", "HDMI Output", "Logo", "Text", "Notifications", "Network", "PTP", "LLDP", "Configuration", "Users", "License", and "Upgrade". A callout box highlights the "Output 1" configuration details, which are as follows:

Output 1	
Name	hdmi_output1
Descrambling	Enable 2 <input checked="" type="checkbox"/>
Key	3 scrambling
HDCP	Encrypted <input checked="" type="checkbox"/>
Version	4 1.4 <input type="button" value="v"/>
Negotiated version	1.4
EDID	00ffffffff004c2d7c0b0000000331701038059327 80aee91a3544c99260f5054bdef80714f81c081008 1809500a9c0b3000101023a801871382d40582c4 50076f23100001e662156aa51001e30468f330076f
Video	5 Input ip_input1 (226.0.0.1:1000) <input type="button" value="v"/>

Basic Configuration Tutorial

6. Scroll down to the **Audio > Input** field and select the desired audio stream. Referring to [Table 2.3](#) (shown below), the audio stream that is associated with encoder 1 is **Input 3**. Therefore, `ip_input3 (226.0.10.1:1100)` is selected.

Table 2.3 - Video and Audio information for each encoder.

Encoder #1

Input	Multicast Address / Port
Input 1	Video (226.0.0.1:1000)
Input 3	Audio (226.0.10.1:1100)

Encoder #2

Input	Multicast Address / Port
Input 2	Video (226.0.0.2:1000)
Input 4	Audio (226.0.10.2:1100)

7. Click the **SAVE** button to commit changes.

Audio Input **6** `ip_input3 (226.0.10.1:1100)` ▼

Backup mode Off ▼

Backup input Not used ▼

Standby Auto on

? Projector 0

 cooldown (s) 0

 Timeout (s) 0

 Type DispSW AVon ▼

SAVE **7**

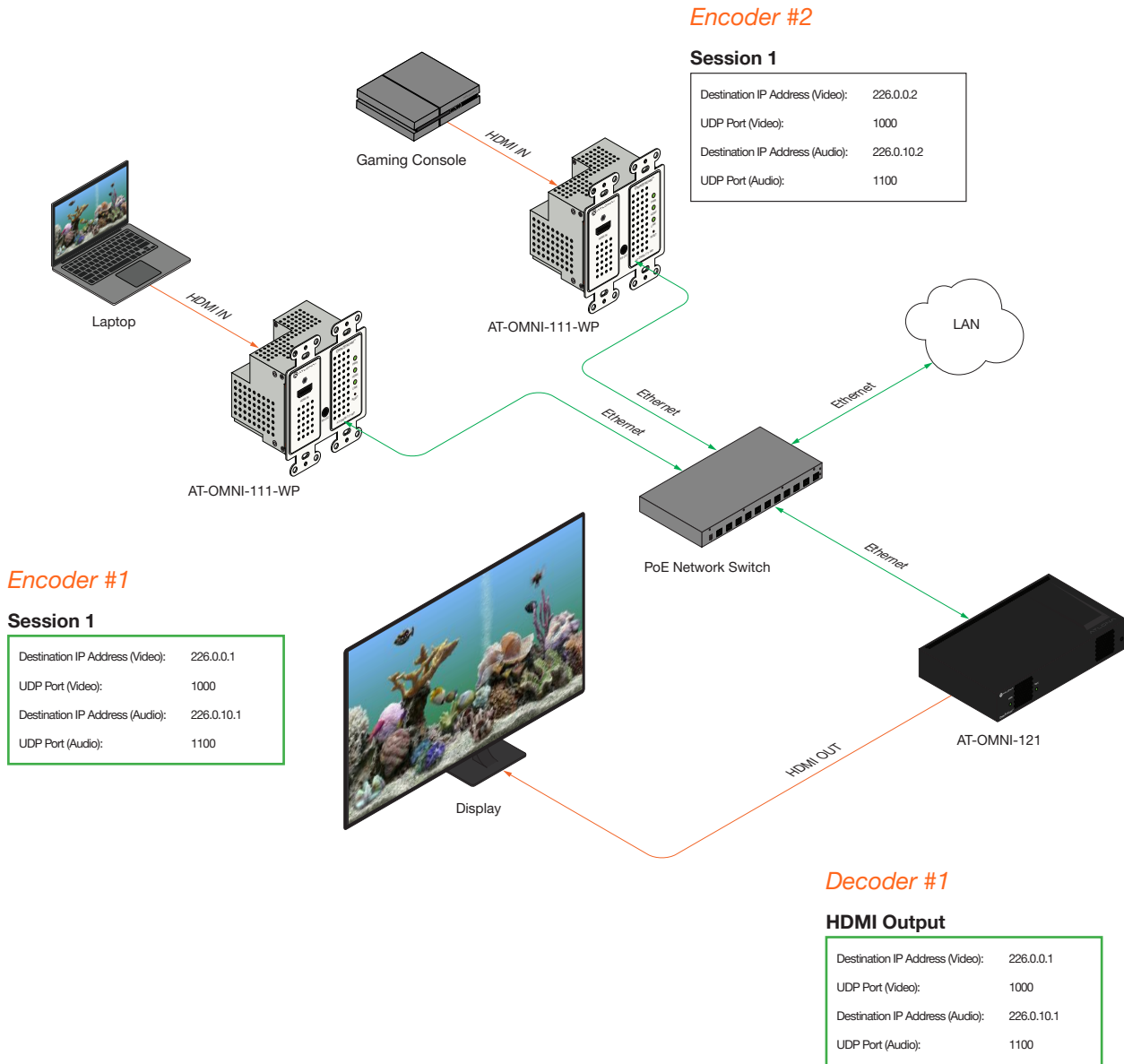
The decoder should now display the content of the source device connected to **HDMI IN** on the encoder. [Figure 3.1](#), on the next page, shows the completed configuration.

To switch between video sources, click the **Video > Input** drop-down list and select the desired stream. To switch between audio streams, click the **Audio > Input** drop-down list to select the desired stream.

Note that separating video and audio data into different streams, allows the flexibility of combining different video and audio sources together.

Basic Configuration Tutorial

Figure 3.1 - Basic OmniStream setup with *Decoder #1* subscribed to *Encoder #1*.



Troubleshooting

If no video and/or audio is present on the display, check the following for both *Encoder #1* and *Encoder #2*, unless otherwise noted.

Encoder Checklist

- Verify that all encoders and decoders are set to the same system mode. In this tutorial, both encoders and the decoder should be set to `VCx`. Refer to [Setting the System Mode \(page 20\)](#).
- Go to the **Input** menu and make sure that the **Cable present** indicator, under the **Input 1** window group, is green. Refer to [Configuring Inputs \(page 21\)](#) for more information.
- Go to the **Encoding** menu and verify the following under the **Encoder 1** window group. Refer to [Encoder Settings \(page 23\)](#) for more information.
 - » Make sure the **Input** drop-down list is assigned to an input. In this tutorial, the **Input** field for both encoder 1 and encoder 2 are set to `hdmi_input1`.
 - » Verify that the **Max bit rate** field is set to at least 450.
 - » Verify that a **Thumbnail > Enable** toggle switch is enabled and a thumbnail of the source is displayed.
- Go to the **Session** menu and verify the following under the **Session** window groups. Refer to [Creating a Session \(page 24\)](#) for more information.
 - » Make sure the **Interface** field for both encoders is set to `eth1`.
 - » Check that the **Scrambling > Enable** toggle switch is enabled. Also check that the **Scrambling > Key** field, for this example, is set to `scrambling` for both encoders.
 - » Verify that the **Video > Enable** toggle switch is set to enabled for both encoders.
 - » Check the **Video > Destination IP address** field is set to the correct multicast IP address. In the example, `226.0.0.1` is used on *Encoder #1* and `226.0.0.2` is used on *Encoder #2*.
 - » Check that the **Video > Destination UDP port** field is set to the proper port. In this example, `1000` should be used on both encoders.
 - » Make sure the **Audio > Source** is set to `hdmi_input1` on both encoders.
 - » Verify that the **Audio > Enable** toggle switch is enabled on both encoders.
 - » Check the **Audio > Destination IP address** field is set to the correct multicast IP address. In this example, `226.0.10.1` is used on *Encoder #1* and `226.0.10.2` is used on *Encoder #2*.
 - » Check that the **Audio > Destination UDP port** field is set to the proper port. In this example, `1100` is used for both encoders.

Decoder Checklist

- Verify that all encoders and decoders are set to the same system mode. In this tutorial, both encoders and the decoder should be set to VCx. Refer to [Setting the System Mode \(page 20\)](#).
- Go to the **IP Input** menu and verify the following. Refer to [Subscribing to an Encoder \(page 26\)](#) for more information.
 - » Under both the **Input 1** and **Input 2** window groups, verify that the **Enable** toggle switch is enabled.
 - » Check that the **Multicast address** field is set to the correct multicast IP address. In this example, 226.0.0.1 for **Input 1** and 226.0.0.2 for **Input 2**.
 - » Check that the **Port** field is set to the proper port. In this example, 1000 for both **Input 1** and **Input 2**.
 - » Under both the **Input 3** and **Input 4** windows groups, verify that the **Enable** toggle switch is enabled.
 - » Check that the **Multicast address** field is set to the correct multicast IP address. In this example, 226.0.10.1 for **Input 3** and 226.0.10.2 for **Input 4**.
 - » Check that the **Port** field is set to the proper port. In this example, 1100 for both **Input 3** and **Input 4**.
- Go to the **HDMI Output** menu and verify the following. Refer to [Subscribing to an Encoder \(page 26\)](#) for more information.
 - » Make sure that the **Descrambling > Enable** toggle switch is enabled.
 - » Check the **HDCP > Version** field to make sure the correct version is selected. Also note the color of the **HDCP > Encrypted** indicator. If it is red, then a picture may not be displayed and result in a “blue screen” on the display. Change the **HDCP > Version** field, if necessary.



IMPORTANT: The scrambling key on a decoder must be *identical* to the scrambling key on the encoder which is being subscribed. Scrambling keys are case-sensitive.

- » Verify that the **Descrambling > Key** field is set to `scrambling`.
- » Make sure that the **Video > Input** drop-down list is set to one of the configured inputs: either `ip_input1` or `ip_input2`.
- » Make sure that the **Audio > Input** drop-down list is set to one of the configured inputs: either `ip_input3` or `ip_input4`.

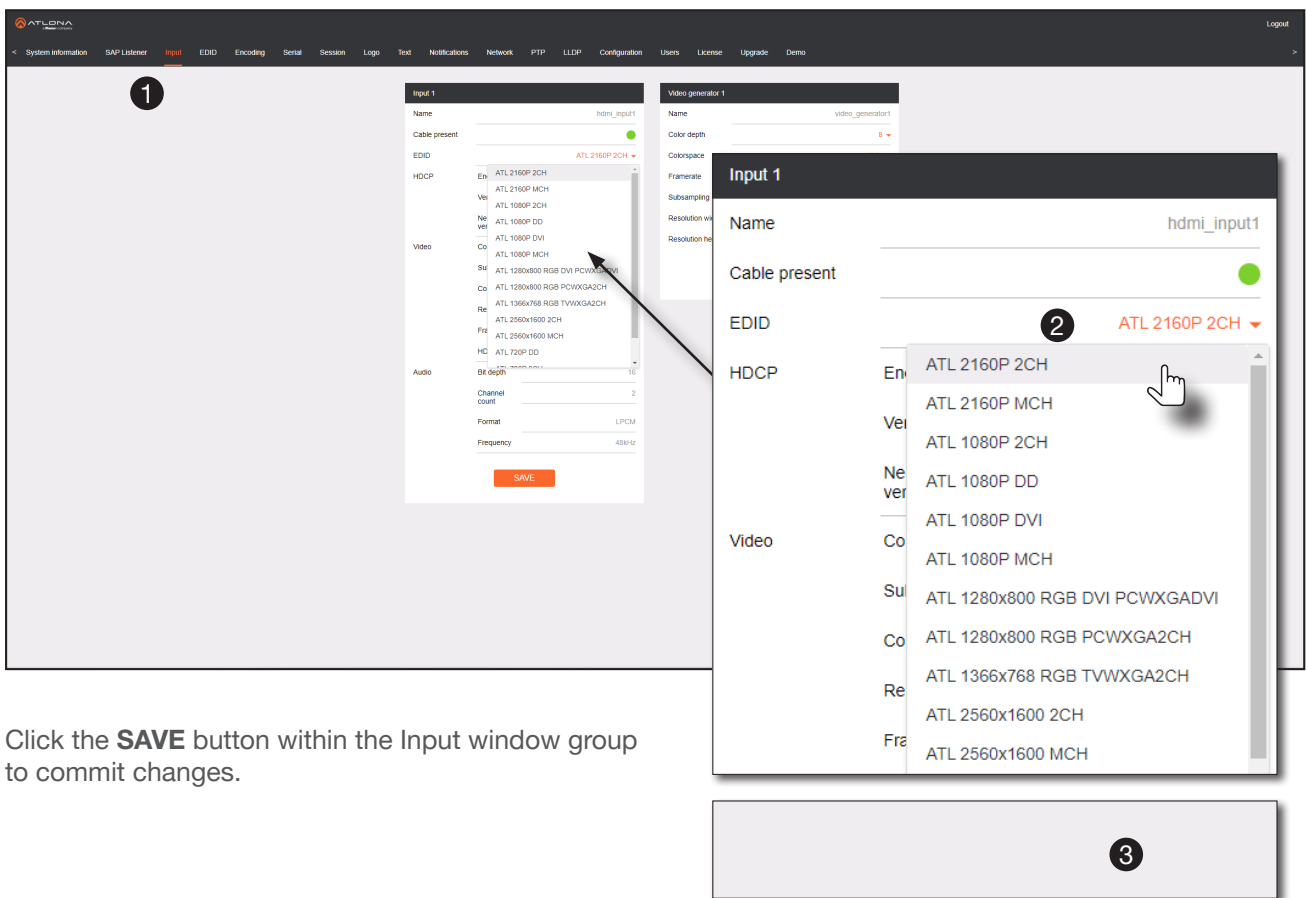
Device Operation

EDID Management

OmniStream encoders provide EDID management for each input. The encoder can be assigned one of several included EDID presets or can be assigned a custom EDID. Raw EDID data can be copied from displays or other sink devices, that are connected to OmniStream decoders.

Selecting an EDID Preset


1. Login to the encoder and click the **Input** menu.
2. Click the **EDID** drop-down list, within the desired **Input** window group, and select the EDID.

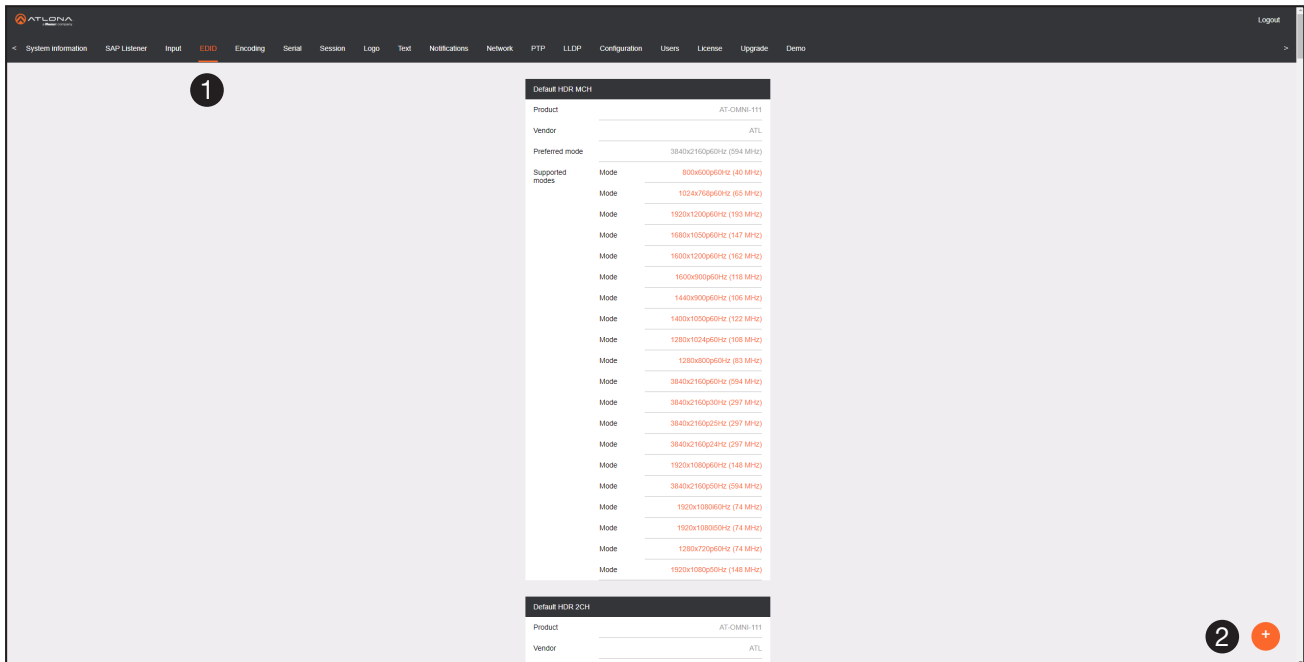


4. Click the **SAVE** button within the Input window group to commit changes.

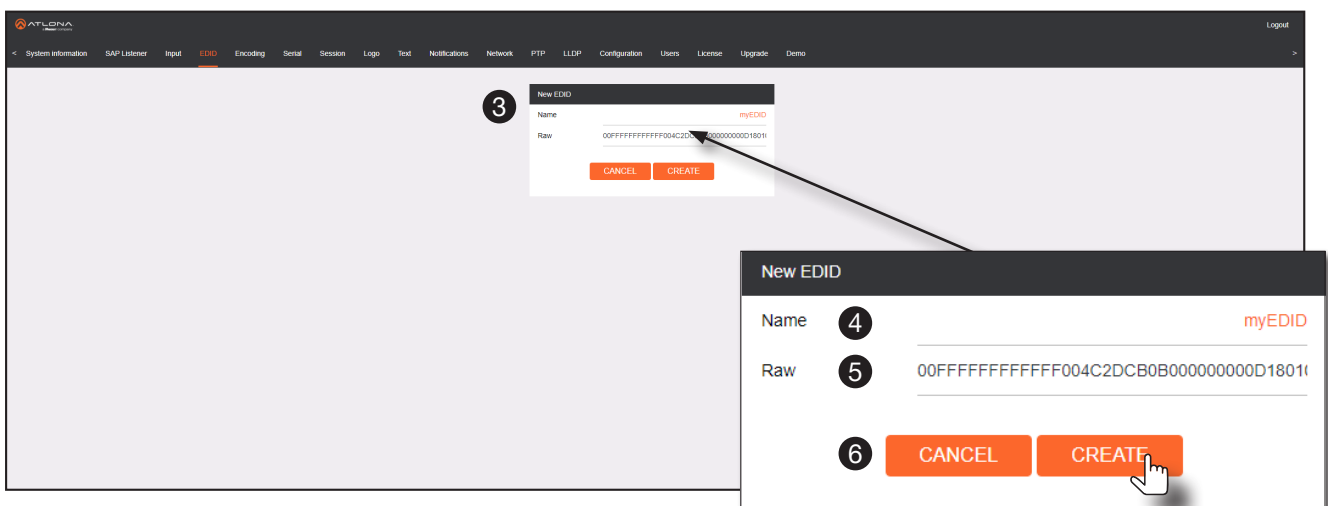
Adding a Custom EDID

Encoders can be loaded with a custom EDID. The raw EDID data must be in hexadecimal format. Commas or spaces are *not* permitted.

1. Login to the encoder and click the **EDID** menu.
2. Click the  icon in the lower-right corner of the screen.



3. The **New EDID** window group will be displayed.
4. Enter the name of the EDID in the **Name** field.
5. Enter the EDID data in the **Raw EDID** field. EDID data can be copy and pasted from an EDID editor and must be in hexadecimal format. Commas or spaces must *not* be included.
6. Click the **CREATE** button to commit changes or click **CANCEL** to abort the addition of a custom EDID. Once a custom EDID is loaded, it will be added to the drop-down list and can be selected without re-entering the information.

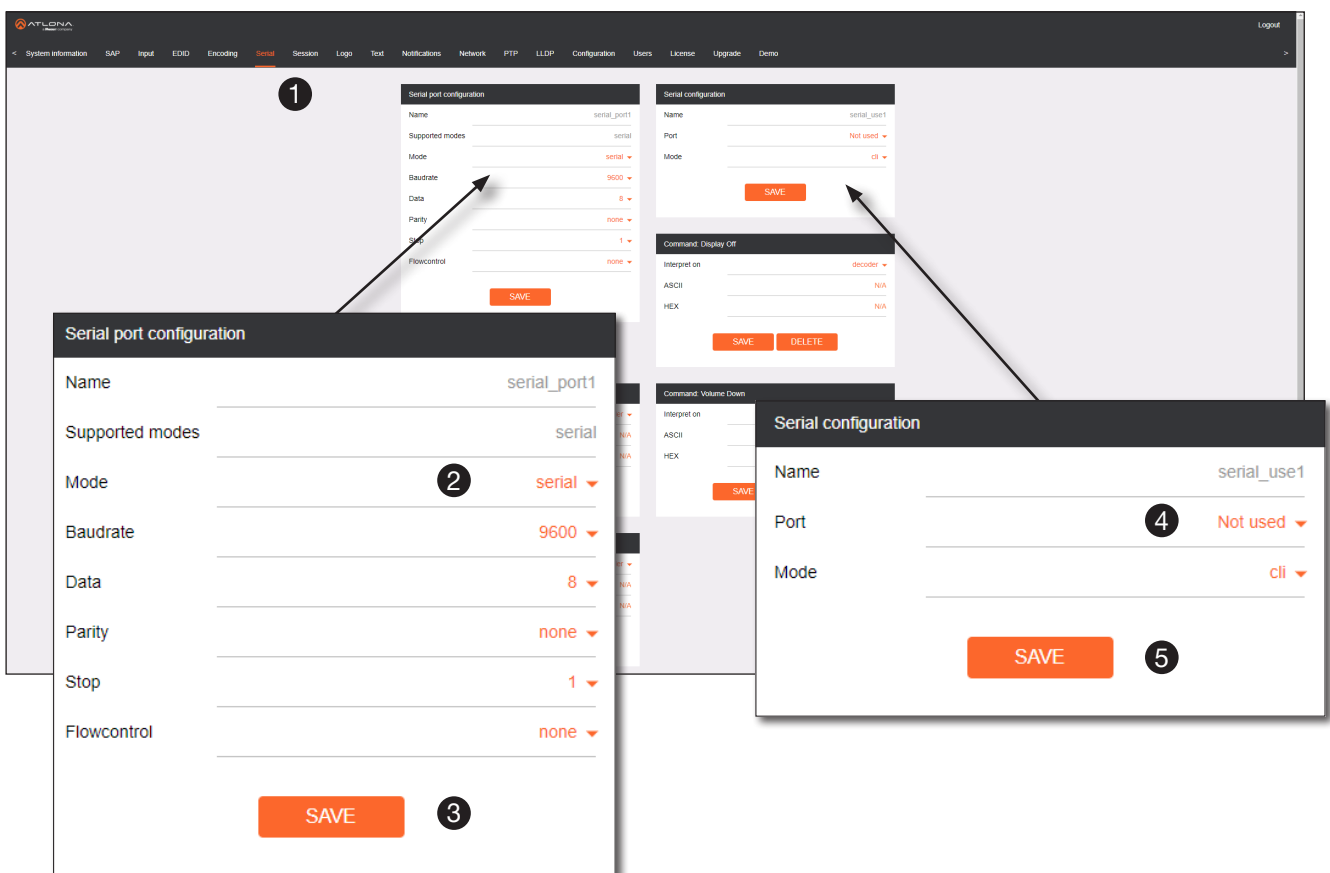


Device Control

Downstream Control using RS-232

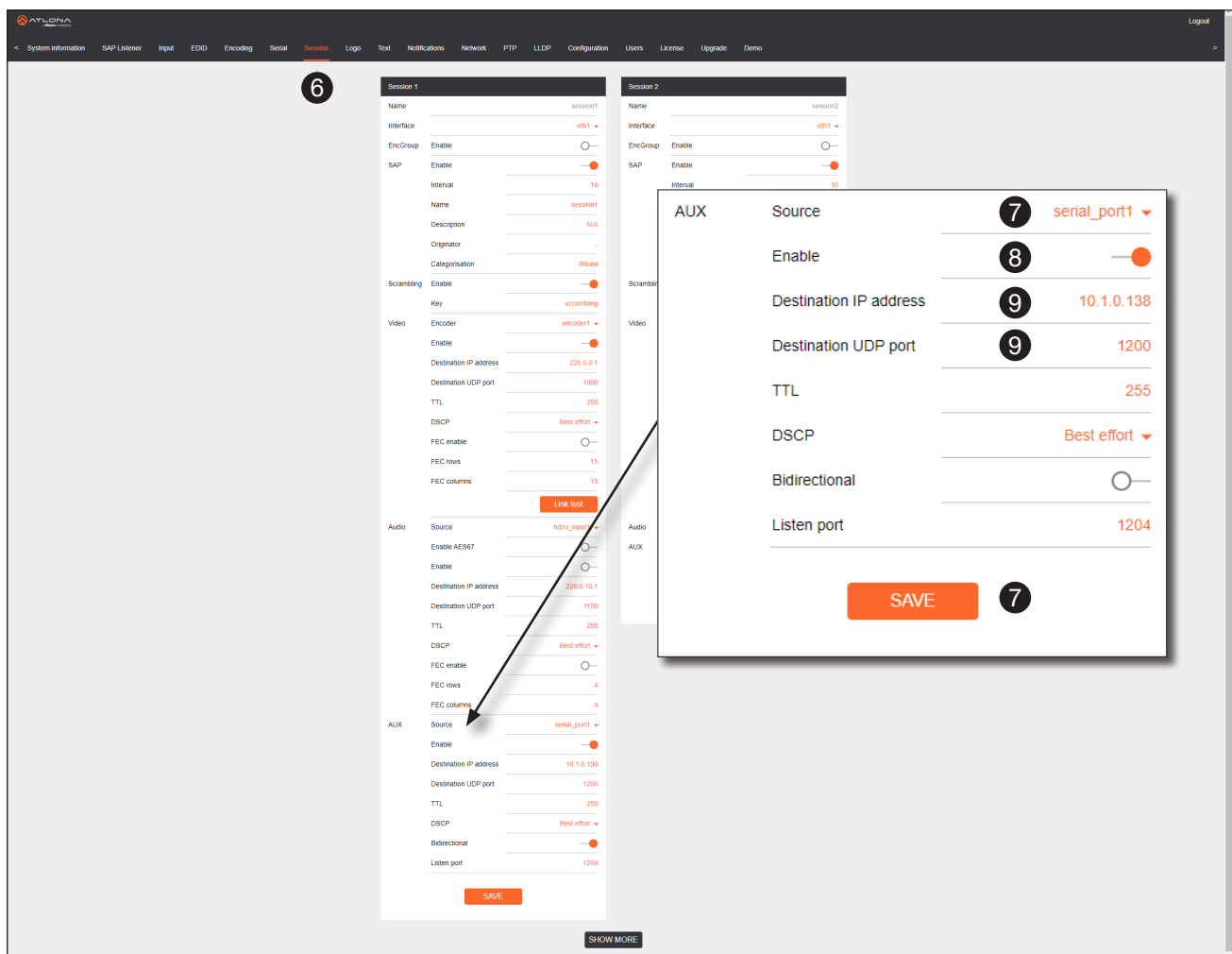
Control using RS-232 is converted and transmitted over IP by the encoder. Destination devices can either be the IP address of a display or a decoder.

1. Login to the encoder and click the **Serial** menu.
2. Under the **Serial Port Configuration** window group, click the **Mode** drop-down list and select **Serial**.
3. Click the **SAVE** button.



4. Under the **Serial configuration** window group, click the **Port** drop-down list and select **Not Used**.
5. Click the **SAVE** button.

6. Click the **Session** menu.
7. Under the desired Session, locate the **AUX** section and click the **Source** drop-down list to select the desired serial port.
8. Click the **Enable** toggle switch to display the additional fields.
9. Enter the destination IP address and UDP port in the **Destination IP address** and **Destination UDP port** fields, respectively.



The screenshot displays the ATLONA web interface for configuring sessions. The 'Session' menu is selected, showing two sessions: Session 1 and Session 2. The 'AUX' section for Session 1 is expanded, and a modal window is open for its configuration. The modal window contains the following fields and values:

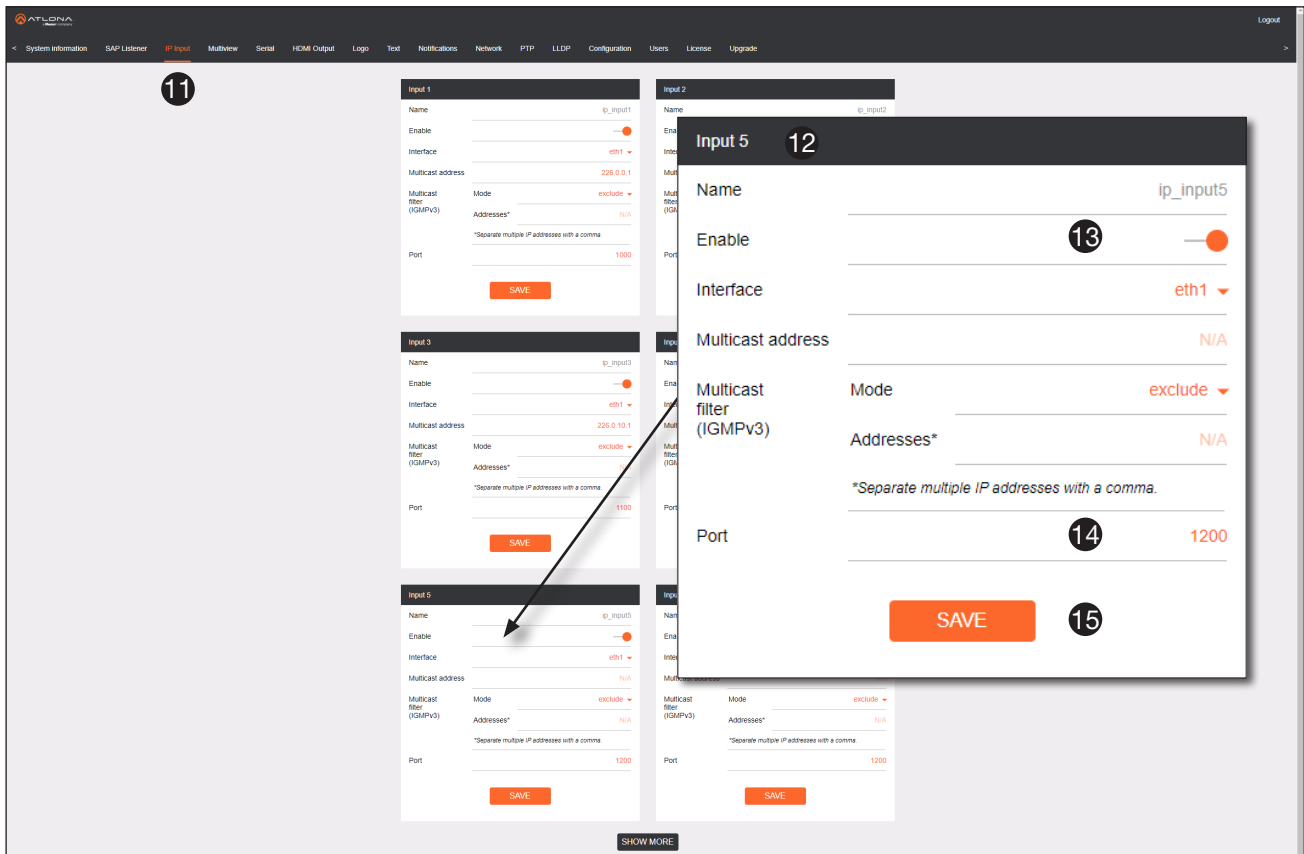
- Source:** serial_port1 (indicated by a circled 7)
- Enable:** Enabled (indicated by a circled 8)
- Destination IP address:** 10.1.0.138 (indicated by a circled 9)
- Destination UDP port:** 1200 (indicated by a circled 9)
- TTL:** 255
- DSCP:** Best effort
- Bidirectional:** Disabled
- Listen port:** 1204

A 'SAVE' button is located at the bottom of the modal window (indicated by a circled 7). A 'SHOW MORE' button is located at the bottom of the main configuration panel. A circled 6 is also present in the top left of the main configuration panel, indicating the 'Session' menu selection.

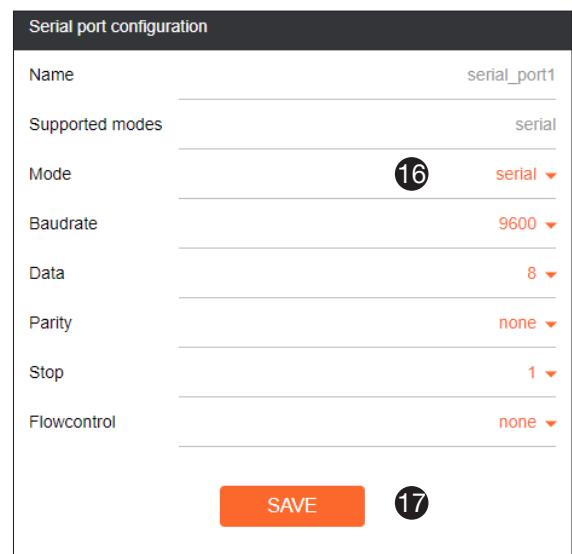
10. Click the **SAVE** button.

If the destination IP address and UDP port is for a decoder, follow Steps 11 through 20, beginning on the next page:

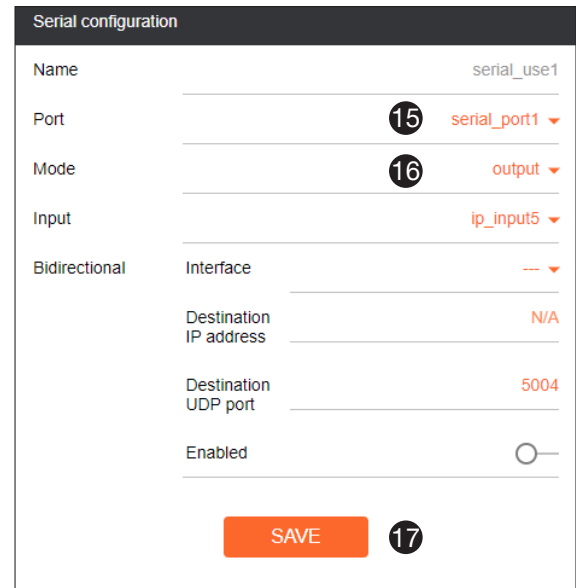
11. Login to the decoder and click the **IP Input** menu.
12. Locate an Input that does *not* contain a defined Multicast address field. In this example, **Input 5** will be used. Note that if a multicast address was used in Step 9, then that multicast address must be entered in the **Multicast address** field under **Input 5**.
13. Click the **Enable** toggle switch to enable the Input. When an Input is enabled, the toggle switch will be orange.
14. Enter the UDP port, from Step 9, in the **Port** field.



15. Click the **SAVE** button.
16. On the decoder, click the **Serial** menu, and under **Serial port configuration**, click the **Mode** drop-down list and select **serial**.
17. Click the **SAVE** button.



18. Under the **Serial configuration** window group, click the **Port** drop-down list and select the desired port.
19. Click the **Mode** drop-down list and select `output`.
20. Click **SAVE**.



Serial configuration

Name: serial_use1

Port: **15** serial_port1

Mode: **16** output

Input: ip_input5

Bidirectional: Interface: --

Destination IP address: N/A

Destination UDP port: 5004

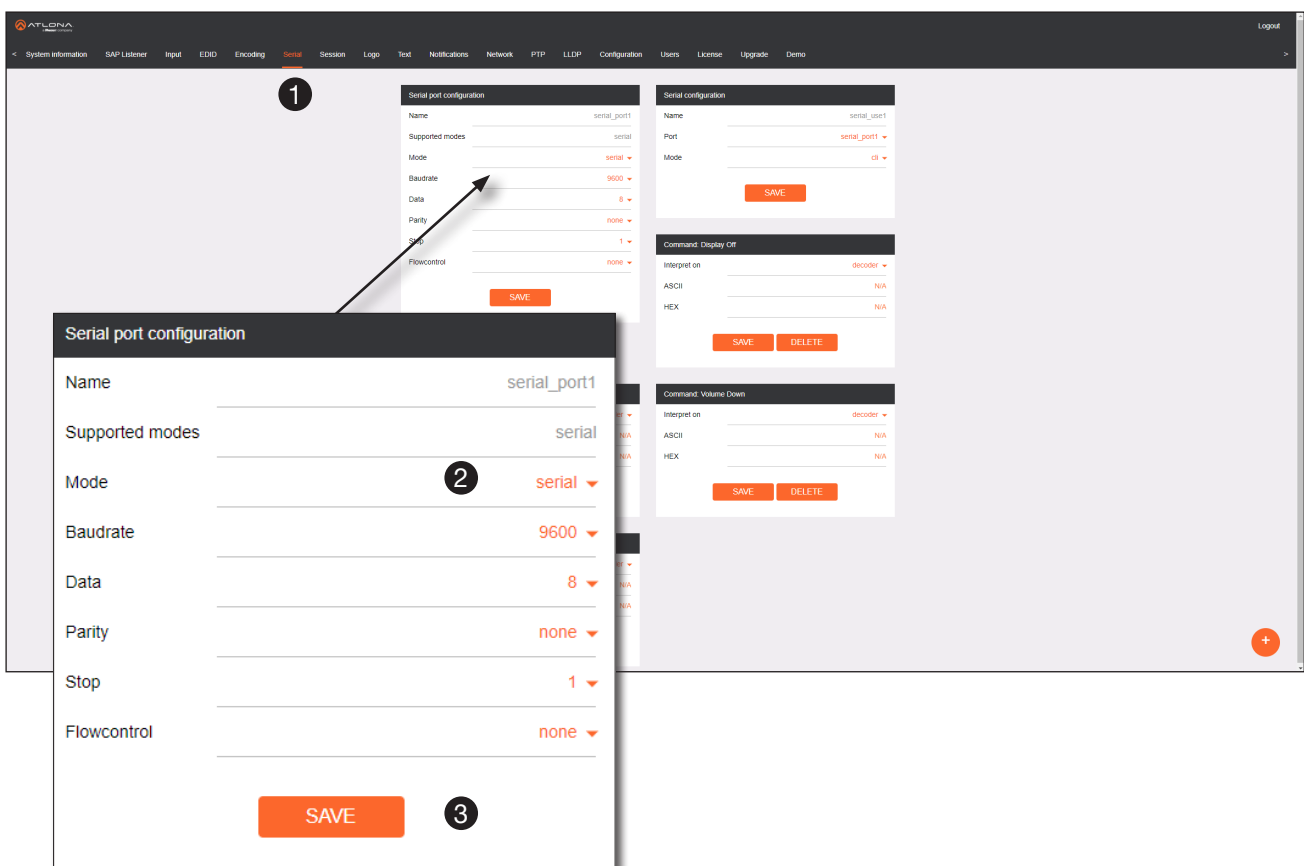
Enabled:

SAVE **17**

Control using TCP Proxy

TCP/IP traffic received by an encoder or decoder, on the defined IP:Port socket, are translated to RS-232, allowing both control of source or display. Control is achieved using a control system, where all control commands are stored.

1. Login to the encoder or decoder and click the **Serial** menu.
2. Under the **Serial Port Configuration** window group, for the desired serial port, click the **Mode** drop-down list and select `Serial`.
3. Click the **SAVE** button.



1

Serial port configuration

Name: serial_port1

Supported modes: serial

Mode: **2** serial

Baudrate: 9600

Data: 8

Parity: none

Stop: 1

Flowcontrol: none

SAVE **3**

Serial configuration

Name: serial_use1

Port: serial_port1

Mode: ct

SAVE

Command Display Off

Interpret on: decoder

ASCII: N/A

HEX: N/A

SAVE **DELETE**

Command Volume Down

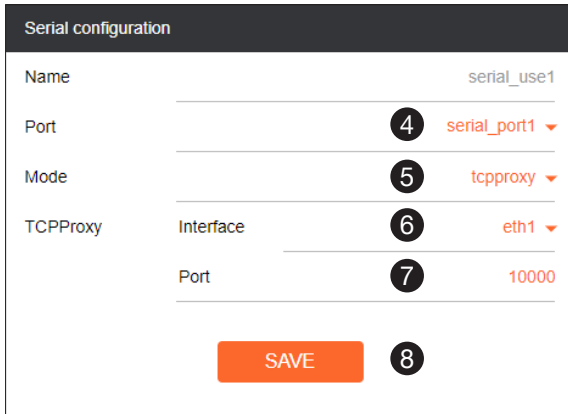
Interpret on: decoder

ASCII: N/A

HEX: N/A

SAVE **DELETE**

4. Under the **Serial Configuration** window group, click the **Port** drop-down list and select the desired serial port.
5. Click the **Mode** drop-down list and select `tcpproxy`.
6. Click the **TCPPProxy > Interface** drop-down list and select the desired Ethernet interface.
7. Enter the listening port in the **TCPPProxy > Port** field.
8. Click the **SAVE** button.



Serial configuration

Name	serial_use1
Port	4 serial_port1 ▾
Mode	5 tcpproxy ▾
TCPPProxy	6 Interface eth1 ▾
	7 Port 10000

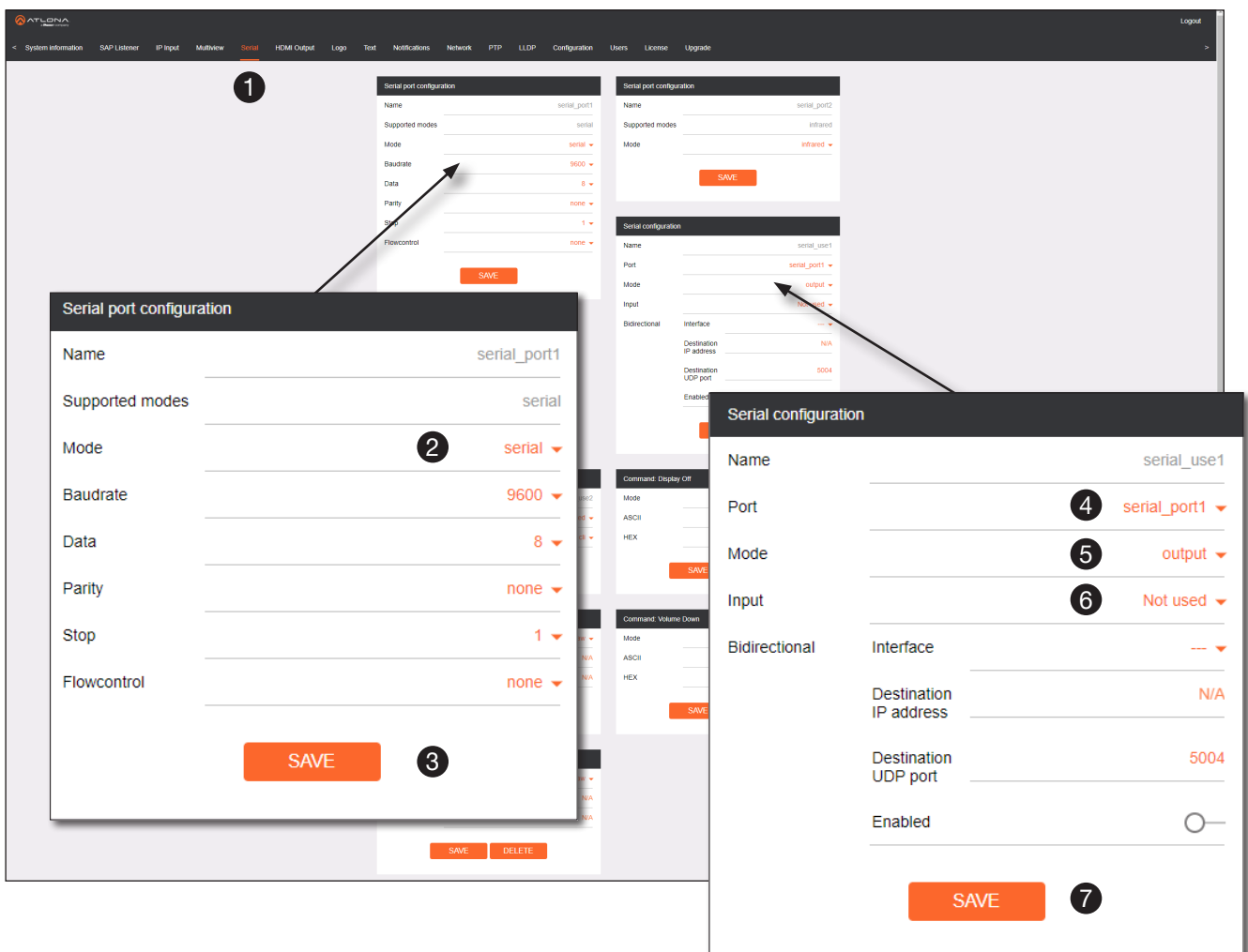
8 SAVE

Downstream Control using Triggering

TCP/IP traffic received by an encoder or decoder, on the defined IP:Port socket, are translated to RS-232, allowing both control of source or display. Control is achieved using a control system, where all control commands are stored.

Option 1: Defining Commands on the Decoder

1. Login to the decoder and click the **Serial** menu.
2. Under the **Serial Port Configuration** window group, for the desired serial port, click the **Mode** drop-down list and select **Serial**.
3. Click the **SAVE** button.

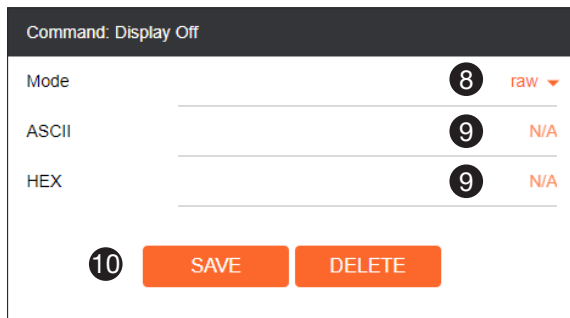


4. Under the **Serial Configuration** window group, click the **Port** drop-down list and select the desired serial port.
5. Click the **Mode** drop-down list and select **output**.
6. Click the **Input** drop-down list and select **not used**.
7. Click the **SAVE** button.

- For each of the available commands, click the **Mode** drop-down list and select `raw`.

The available commands are: **Display On**, **Display Off**, **Volume Up**, and **Volume Down**.

- Enter the command data in either ASCII or hexadecimal format using the **ASCII** or **HEX** fields.
- Click the **SAVE** button.



The screenshot shows a configuration window titled "Command: Display Off". It contains three input fields: "Mode", "ASCII", and "HEX". The "Mode" field has a dropdown menu with "raw" selected. The "ASCII" and "HEX" fields are empty. Below the fields are two buttons: "SAVE" and "DELETE".

Field	Value
Mode	8 raw
ASCII	9 N/A
HEX	9 N/A

- Open a Telnet/SSH session with the decoder and trigger display control using the following command:

```
TrigRS232X Y
```

where X is the number of the serial port: 1, 2
where Y is the command: `on`, `off`, `vol+`, or `vol-`.

Option 2: Defining Commands on the Encoder

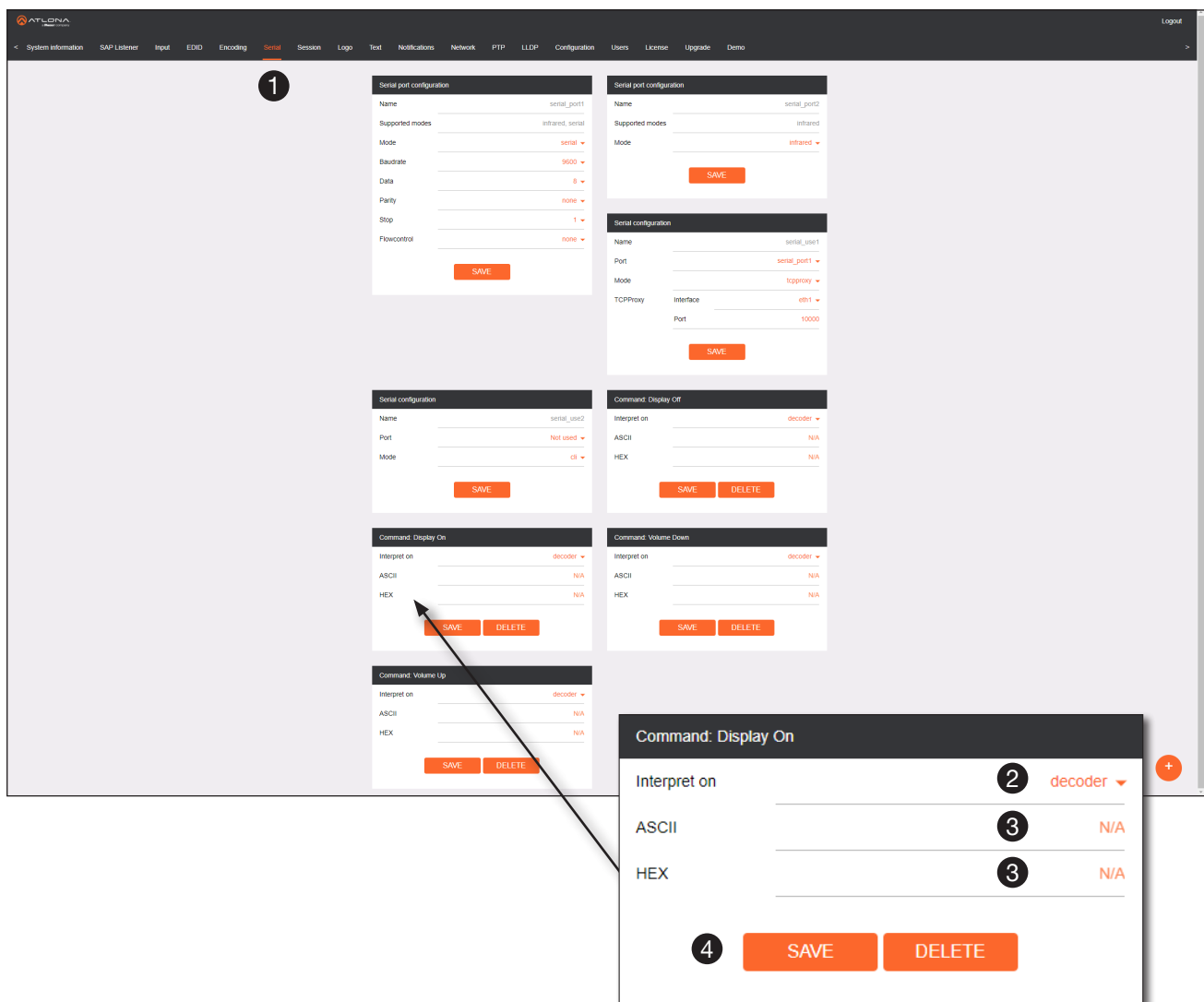
1. Login to the encoder and click the **Serial** menu.
2. For each of the available commands, click the **Interpret on** drop-down list and select `decoder`.

The available commands are: **Display On**, **Display Off**, **Volume Up**, and **Volume Down**.



NOTE: Setting the **Interpret on** drop-down list to `encoder` implies that commands are defined/stored on the encoder. If set to `decoder`, commands are defined/stored on the decoder.

3. Enter the command data in either ASCII or hexadecimal format using the **ASCII** or **HEX** fields.
4. Click the **SAVE** button.



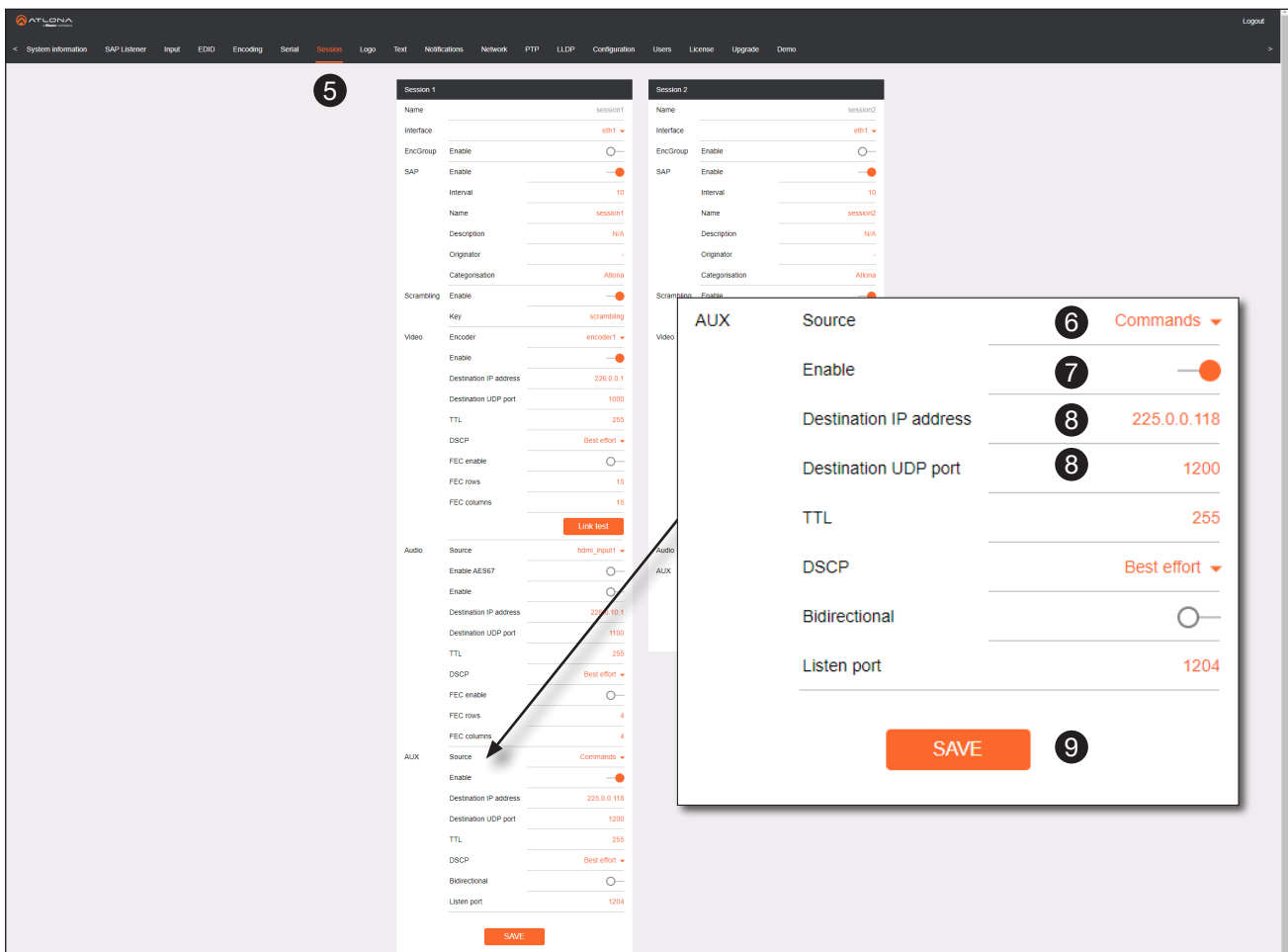
The screenshot displays the ATLONA web interface with the 'Serial' menu selected. A circled '1' points to the 'Serial' menu item in the top navigation bar. The main content area shows several configuration panels:

- Serial port configuration:** Two panels for 'serial_port1' and 'serial_port2'. 'serial_port1' is fully configured with fields for Name, Supported modes, Mode, Baudrate, Data, Parity, Stop, and Flowcontrol. 'serial_port2' is partially configured with Name and Supported modes.
- Serial configuration:** Two panels for 'serial_user1' and 'serial_user2'. 'serial_user1' is fully configured with Name, Port, Mode, and TCPProxy. 'serial_user2' is partially configured with Name and Port.
- Command: Display Off:** A panel with 'Interpret on' set to 'decoder', and empty ASCII and HEX fields.
- Command: Volume Down:** A panel with 'Interpret on' set to 'decoder', and empty ASCII and HEX fields.
- Command: Volume Up:** A panel with 'Interpret on' set to 'decoder', and empty ASCII and HEX fields.

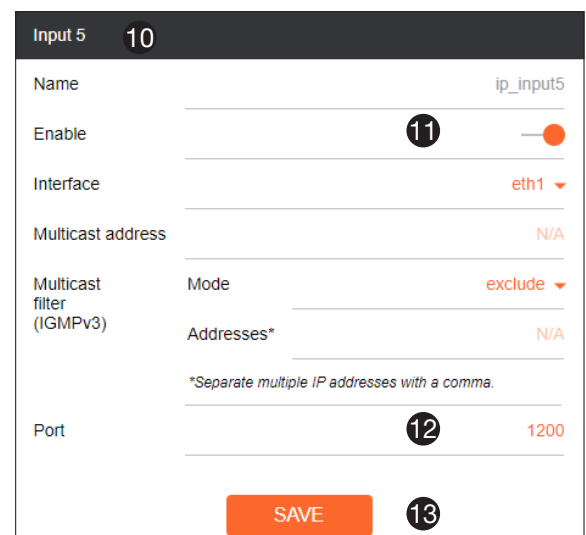
A callout window titled 'Command: Display On' is shown in the bottom right, with a circled '4' pointing to it. It contains the following fields:

- Interpret on:** A dropdown menu set to 'decoder' (circled '2').
- ASCII:** An empty text field (circled '3').
- HEX:** An empty text field (circled '3').
- Buttons:** 'SAVE' and 'DELETE' buttons (circled '4').

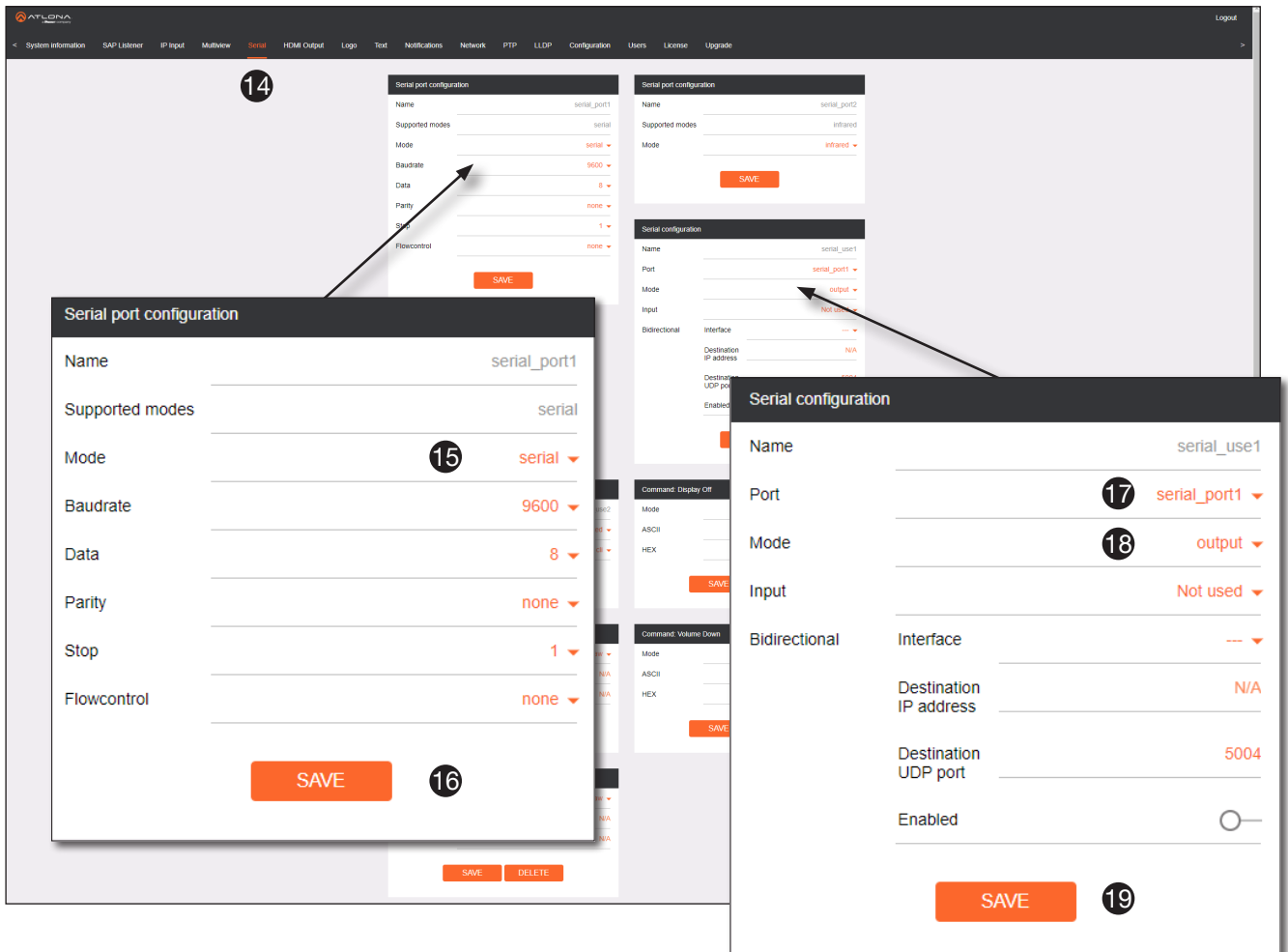
5. Click the **Session** menu.
6. Under the desired Session, locate the **AUX** section, click the **Source** drop-down list, and select **Commands**.
7. Click the **Enable** toggle switch to display the additional fields.
8. Enter the destination IP address and UDP port, of the decoder, in the **Destination IP address** and **Destination UDP port** fields, respectively. A multicast address can also be entered in the **Destination IP address** field.
9. Click the **SAVE** button.



10. Login to the decoder, click the **IP Input** menu, then locate an Input that does *not* contain a defined Multicast address field. In this example, **Input 5** will be used. Note that if a multicast address was used in Step 8, then that multicast address must be entered in the **Multicast address** field under **Input 5**.
11. Click the **Enable** toggle switch to enable the Input. When an Input is enabled, the toggle switch will be orange.
12. Enter the UDP port, from Step 8, in the **Port** field.
13. Click the **SAVE** button.



14. Click the **Serial** menu.
15. Under **Serial port configuration**, set the **Mode** drop-down list to `serial`.
16. Click the **SAVE** button.
17. Under **Serial configuration**, select the desired port.
18. Click the **Mode** drop-down list and select `output`.



19. Click the **SAVE** button.
20. Open a Telnet/SSH session with the encoder and trigger display control using any of the following commands:
`InputBtn X`

where *X* is the number of the input: 1, 2, or `tog`.

`DisplayBtnX Y`

where *X* is the number of the HDMI input: 1, 2.
where *Y* is the command: `on`, `off`, or `toggle`.

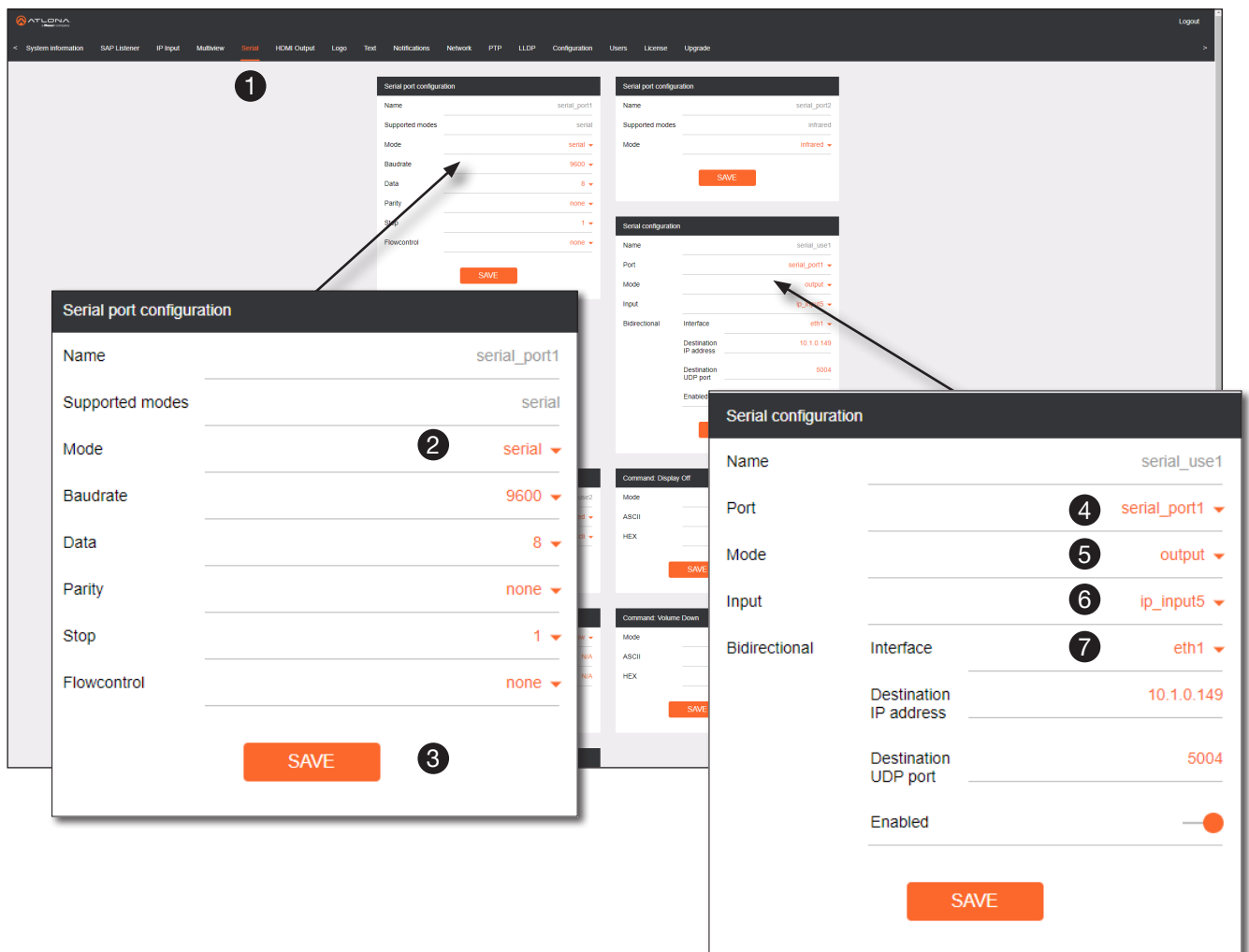
`VolumeBtn X`

where *X* is the volume-up or volume-down command.

Upstream Control using RS-232

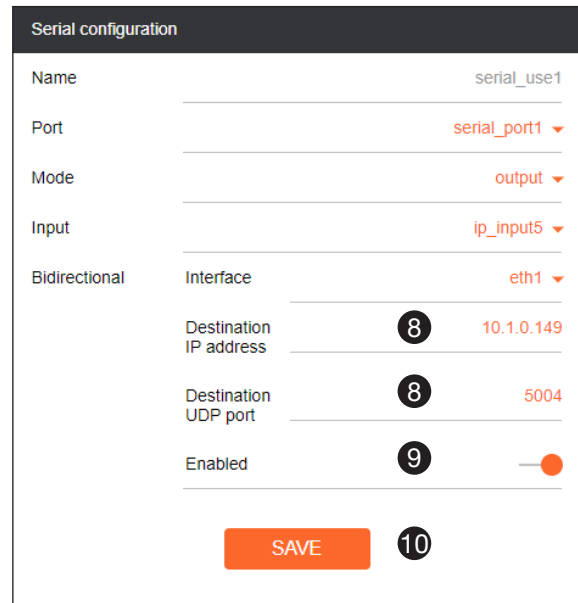
The serial interface provides RS-232 control of both downstream and upstream devices. Source control is provided by enabling bidirectional communication.

1. Login to the decoder and click the **Serial** menu.
2. Under the **Serial Port Configuration** window group, click the **Mode** drop-down list and select *Serial*.
3. Click the **SAVE** button.



4. Under the **Serial configuration** window group, click the **Port** drop-down list and select the desired serial port.
5. Click the **Mode** drop-down list and select *output*.
6. Click the **Input** drop-down list and select the input.
7. Click the **Bidirectional > Interface** drop-down list and select the interface.

8. Enter the destination IP address (the IP address of the encoder) and UDP port in the **Bidirectional > Destination IP address** and **Bidirectional > Destination UDP port** field, respectively.
9. Click the **Bidirectional > Enabled** toggle switch to the enabled position. When enabled, the toggle switch will be orange.
10. Click the **SAVE** button.
11. Login to the encoder and click the **Serial** menu.
12. Under the **Serial Port Configuration** window group, click the **Mode** drop-down list and select **Serial**.
13. Click the **SAVE** button.
14. Under the **Serial configuration** window group, click the **Port** drop-down list and select **not used**.



Serial configuration

Name: serial_use1

Port: serial_port1

Mode: output

Input: ip_input5

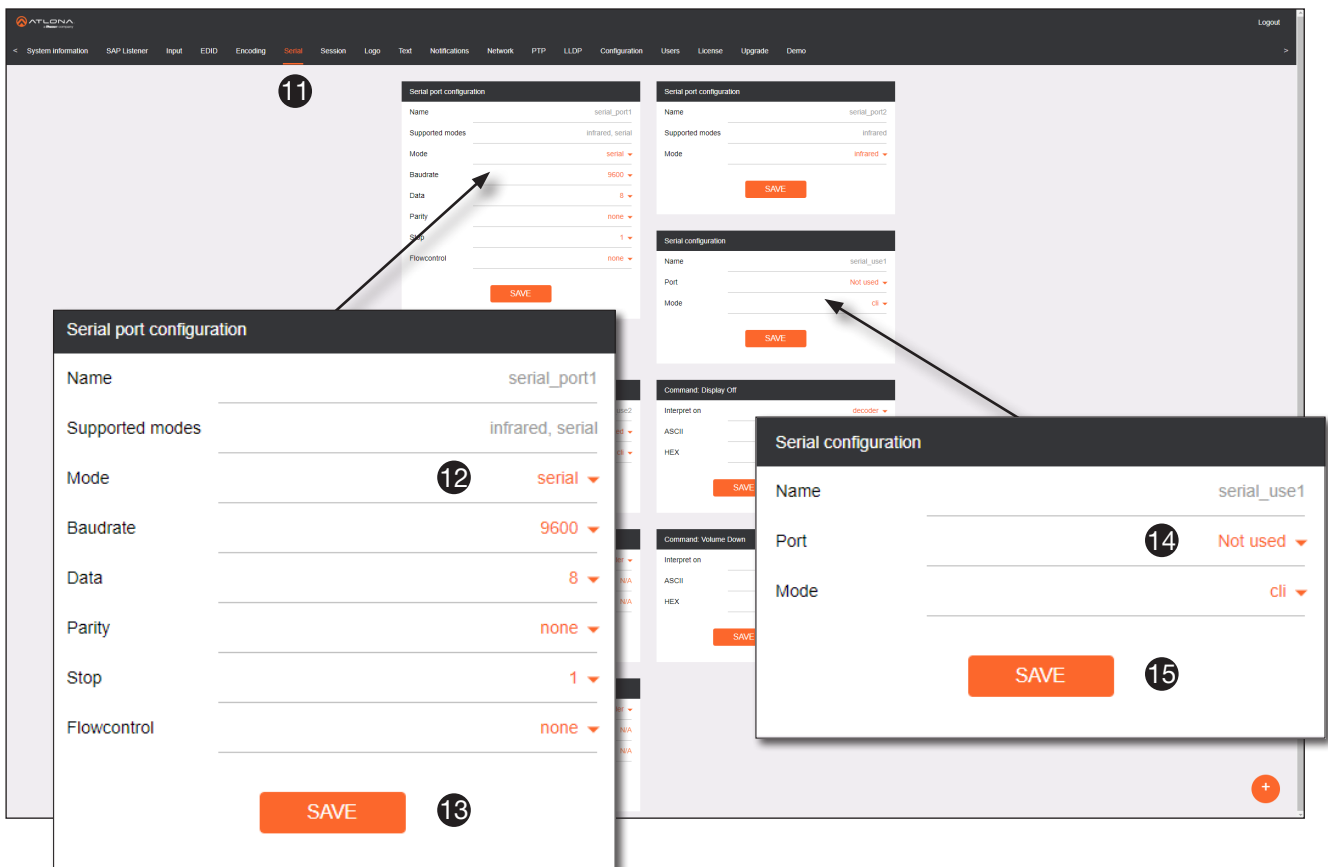
Bidirectional Interface: eth1

Destination IP address: 8 10.1.0.149

Destination UDP port: 8 5004

Enabled: 9

SAVE 10



Serial port configuration

11

Name: serial_port1

Supported modes: infrared, serial

Mode: 12 serial

Baudrate: 9600

Data: 8

Parity: none

Stop: 1

Flowcontrol: none

SAVE 13

Serial configuration

14

Name: serial_use1

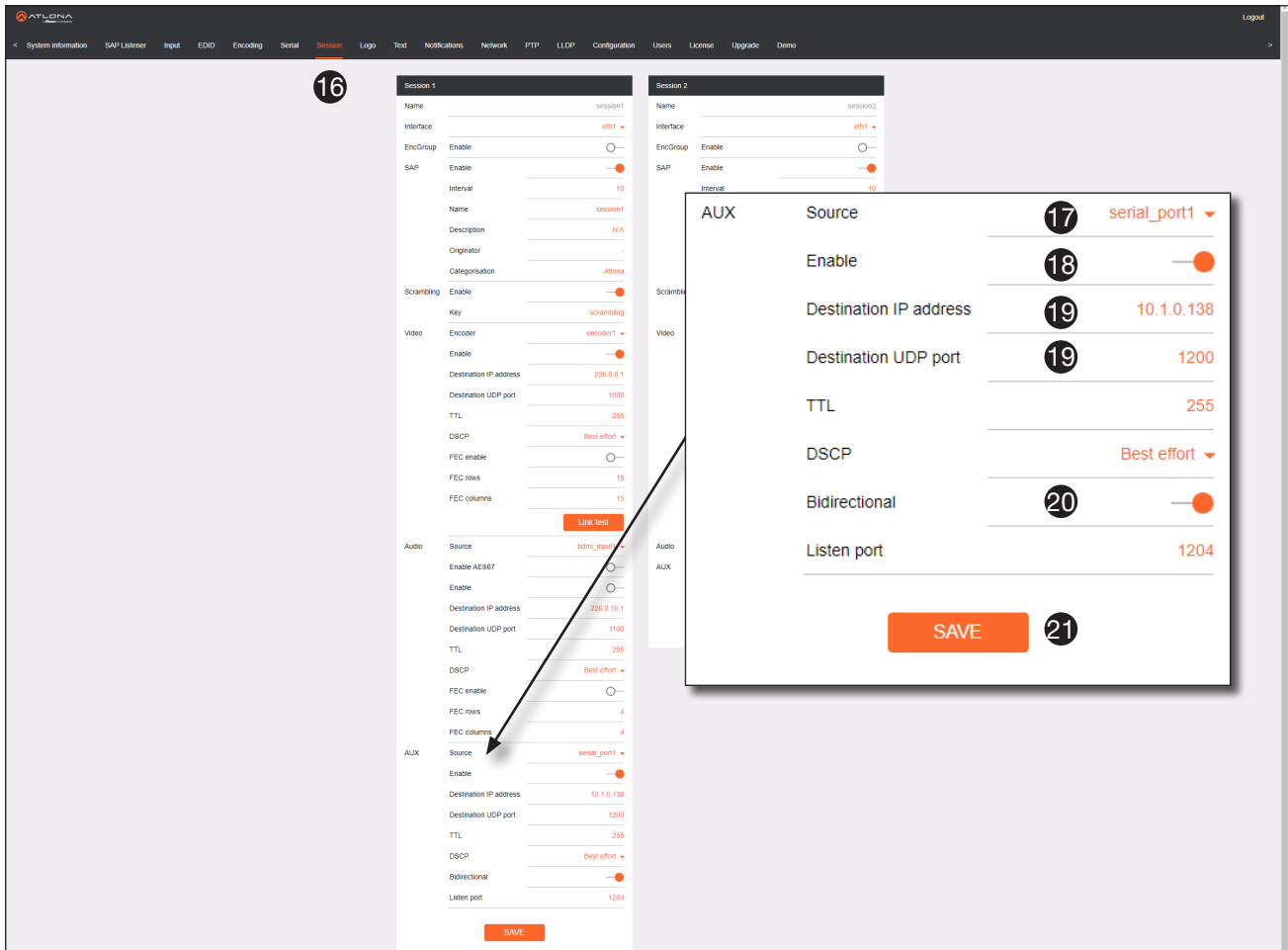
Port: 14 Not used

Mode: cli

SAVE 15

15. Click the **SAVE** button.
16. Click the **Session** menu.
17. Under the desired Session, locate the **AUX** section and click the **Source** drop-down list to select the desired serial port.
18. Click the **Enable** toggle switch to display the additional fields.

19. Enter the destination IP address and UDP port in the **Destination IP address** and **Destination UDP port** fields, respectively.
20. Click the **SAVE** button.



The screenshot displays the ATLONA web interface with the 'Sessions' tab selected. Two session configuration panels are visible: 'Session 1' and 'Session 2'. A modal window for 'Session 1' AUX configuration is open, showing the following fields and values:

- Source:** serial_port1 (17)
- Enable:** (18) [Checked]
- Destination IP address:** 10.1.0.138 (19)
- Destination UDP port:** 1200 (19)
- TTL:** 255
- DSCP:** Best effort
- Bidirectional:** (20) [Checked]
- Listen port:** 1204
- SAVE button:** (21)

Callout 16 points to the 'Sessions' tab in the top navigation bar. Callout 17 points to the 'Source' dropdown menu. Callout 18 points to the 'Enable' toggle. Callout 19 points to the 'Destination IP address' and 'Destination UDP port' input fields. Callout 20 points to the 'Bidirectional' toggle. Callout 21 points to the 'SAVE' button at the bottom of the modal.

Multiview Nomenclature

General Overview

A *multiview* is comprised of a canvas (display area) containing at least two, but no more than four subframes, where each subframe has the following parameters:



NOTE: Multiview cannot be used in conjunction with fast switching and/or with video walls.



DEFINITIONS:

Subframe - The stream multicast IP address for the video.

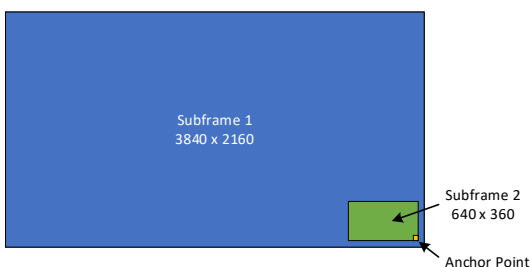
Anchor point - A fixed point on a subframe. The anchor point can be set to top-left, top-right, bottom-left, bottom-right, or center. Each anchor point is defined by an x and y coordinate.

Z-order - Determines whether a frame appears in-front-of or behind another subframe. Subframes with a larger z-order value will appear in front of a subframe with a smaller z-order value.

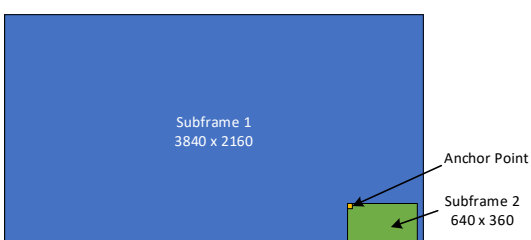
The images below shows the different anchor point options on a particular subframe. For any given subframe, only one of these will be selected as the anchor point.

If the incoming stream changes resolution, the size of the subframe will change on the screen if scaling is not configured on the encoder. While the decoder HDMI output can be scaled, there is no per-subframe scaling. This is because the incoming stream is not scaled in the decoder. To illustrate this, consider the following examples.

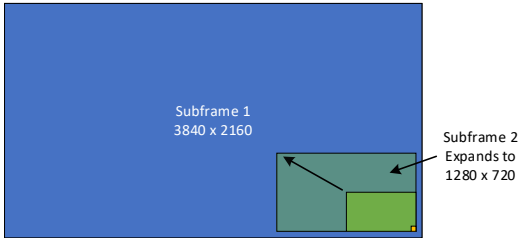
In this first example, the multiview is configured as a P-i-P view, where the P-i-P subframe has its anchor point configured as bottom right. The incoming stream is 640 x 360.



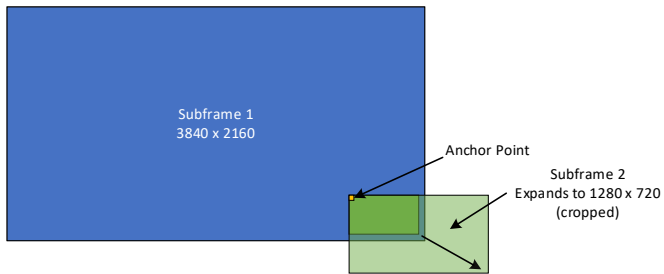
By contrast, consider the same multiview layout, but with the P-i-P subframe having a top left anchor point.



If the incoming stream changes resolution to 1280x720, then the subframe will grow in size, but it will still fit on-screen, because its bottom right Anchor point has not changed position.



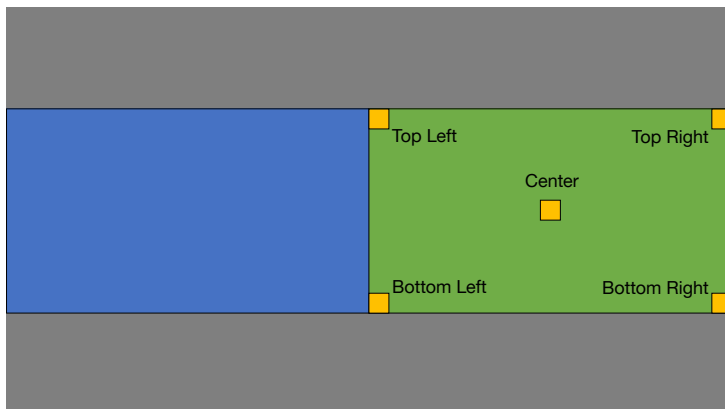
In this case, when the stream changes to 1280 x 720, the subframe will grow in size and be cropped by the display, because the top left anchor point has not change position



Anchor Points

Anchor points will be placed on the canvas at the x and y coordinates of that canvas. If the decoder output is not scaled, then this will correspond to the actual coordinates on the display. If the decoder output is scaled, then the Anchor point will be rendered on the canvas at the specified coordinates, and then the entire output image will be scaled.

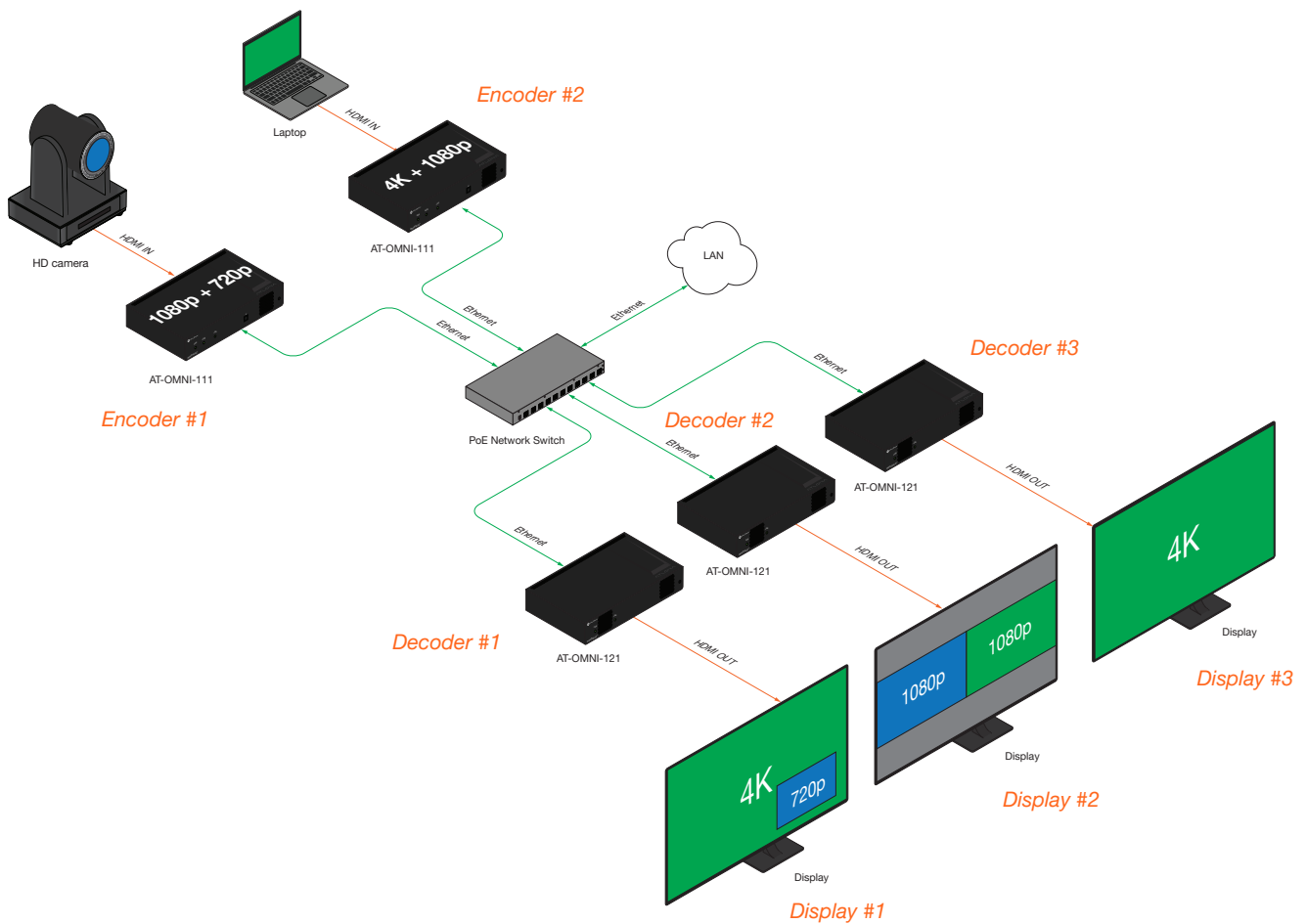
Because of the way the VCx codec works, anchor points must be placed on coordinates where the x value is divisible by 32 and the y value is divisible by 8. If a coordinate is entered that does not meet this requirement, then the decoder will automatically snap the coordinates and notify the user of the change.



Multiview and Dual-Streaming Tutorial

This section provides a tutorial on configuring a multiview setup. In addition, the concept of dual-streaming will be introduced. Review the diagram and the table below for a summary of how this setup will function. All encoders and the decoders should be connected to the same local network.

Physical Connections



OmniStream Device	Description (decoders only subscribe to streams that are shown)
<i>Encoder #1</i> (AT-OMNI-111)	<ul style="list-style-type: none"> Dual-streaming configuration. Transmits both 1080p and 720p streams.
<i>Encoder #2</i> (AT-OMNI-111)	<ul style="list-style-type: none"> Dual-streaming configuration. Transmits both 4K and 1080p streams.
<i>Decoder #1</i> (AT-OMNI-121)	<ul style="list-style-type: none"> Multiview configuration (picture-in-picture). Subscribes to the 4K and 720p streams in multiview.
<i>Decoder #2</i> (AT-OMNI-121)	<ul style="list-style-type: none"> Multiview configuration (side-by-side). Subscribes to two 1080p streams in multiview.
<i>Decoder #3</i> (AT-OMNI-121)	<ul style="list-style-type: none"> Subscribes to a single 4K stream.

Dual-Streaming Encoder Configuration

Encoder #1

This encoder is used with the HD camera and will be configured to dual-stream 1080p and 720p.

1. Go to the **System information** page, click the **System mode** drop-down list and select **VCx**. Click the **SAVE** button to commit changes.



IMPORTANT: **VCx** must be enabled in order to use the Multiview feature.

2. Click the **Input** menu and select `Default HDR MCH` from the **EDID** drop-down list.
3. Click the **HDCP > Version** drop-down list and select `2.2`. Click the **SAVE** button to commit changes.
4. Click the **Encoding** menu.
5. Under the **Encoder 1** window group, select `hdmi_input1` from the **Input** drop-down list.
6. Set the **Max bit rate** field to `450`.
7. Click the **Scaler** drop-down list and select `1920x1080`.
8. Click the **Enable** toggle switch in the **Thumbnail** field to enable thumbnails of the source. This will verify that the input source is configured correctly and will provide a visual reference for the encoder stream. Thumbnails are updated every 2 seconds.



NOTE: Thumbnails can also be accessed at: `http://<encoder-ip-address>/thumbnail/thumbnail1.jpg`. For dual-channel encoders, the secondary thumbnail can be accessed at: `http://<encoder-ip-address>/thumbnail/thumbnail2.jpg`.

9. Click the **SAVE** button, under the **Encoder 1** window group, to commit changes.
10. Under the **Encoder 2** window group, select `hdmi_input1` from the **Input** drop-down list.
11. Set the **Max bit rate** field to `150`.
12. Click the **Scaler** drop-down list and select `1280x720`.
13. Click the **SAVE** button, under the **Encoder 2** window group, to commit changes.
14. Click the **Session** menu and configure each video session, using the information in the table bellow. Audio streams will not be configured for this tutorial.

Session	Interface	Encoder	Destination IP Address	Destination UDP Port
Session 1	eth1	encoder1	226.0.0.1	1000
Session 2	eth1	encoder2	226.0.0.2	1000

15. Click the **SAVE** button, under both **Session 1** and **Session 2** window groups, to commit changes.

Encoder #2

This encoder is used with a 4K source and will be configured to dual-stream 4K and 1080p.

1. Go to the **System information** page, click the **System mode** drop-down list, and select `VCx`. Click the **SAVE** button to commit changes.
2. Click the **Input** menu and select `Default HDR MCH` from the **EDID** drop-down list. Click the **SAVE** button to commit changes.
3. Click the **Encoding** menu.
4. Under the **Encoder 1** window group, select `hdmi_input1` from the **Input** drop-down list.
5. Set the **Max bit rate** field to `750`.
6. Click the **Scaler** drop-down list and select `3840x2160`.



IMPORTANT: When configuring streams above 1920x1080p, **Encoder 1** must be used.

7. Click the **Enable** toggle switch in the **Thumbnail** field to enable thumbnails of the source. This will verify that the input source is configured correctly and will provide a visual reference for the encoder stream. Thumbnails are updated every 2 seconds.
8. Click the **SAVE** button, under the **Encoder 1** window group, to commit changes.
9. Under the **Encoder 2** window group, select `hdmi_input1` from the **Input** drop-down list.
10. Set the **Max bit rate** field to `150`.
11. Click the **Scaler** drop-down list and select `1920x1080`.
12. Click the **SAVE** button, under the **Encoder 2** window group, to commit changes.
13. Click the **Session** menu and configure each video session, using the information in the table below. Audio streams will not be configured for this tutorial.

Session	Interface	Encoder	Destination IP Address	Destination UDP Port
Session 1	eth1	encoder1	226.0.0.3	1000
Session 2	eth1	encoder2	226.0.0.4	1000

14. Click the **SAVE** button, under both **Session 1** and **Session 2** window groups, to commit changes.

Decoder Configuration

Dual-streaming has been successfully configured on both encoders. This provides a total of four streams which are listed in the tables, below, for reference.

Encoder #1 (source: HD camera)

Stream	Encoder	Resolution	Session	Multicast IP Address	Port
1	Encoder 1	1920x1080	Session 1	226.0.0.1	1000
2	Encoder 2	1280x720	Session 2	226.0.0.2	1000

Encoder #2 (source: Laptop)

Stream	Encoder	Resolution	Session	Multicast IP Address	Port
3	Encoder 1	3840x2160	Session 1	226.0.0.3	1000
4	Encoder 2	1920x1080	Session 2	226.0.0.4	1000

The next step is to configure each decoder to subscribe to these streams. Although, in the tutorial diagram, each decoder is subscribed to no more than two streams, we will configure all three decoders to access all four streams. This will allow us to change the output on the displays, if desired.

Decoder #1, Decoder #2, and Decoder #3

1. Login to the decoder and click the **IP Input** menu.
2. Configure the following fields, under each **Input** window group, as follows:

Input	Multicast Address	Port
Input 1	226.0.0.1	1000
Input 2	226.0.0.2	1000
Input 3	226.0.0.3	1000
Input 4	226.0.0.4	1000

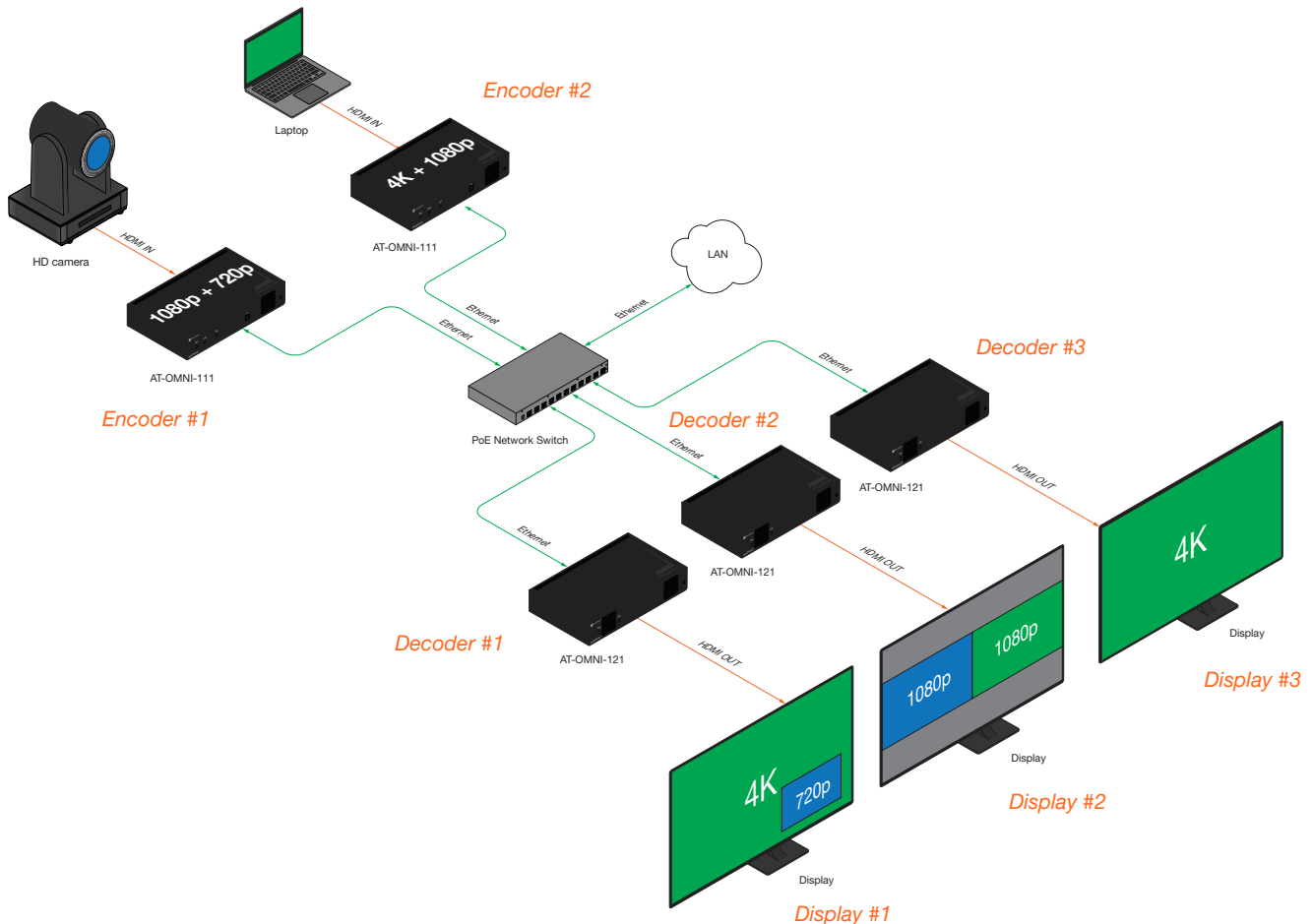
3. Click the **Enable** toggle switch for each **Input** window group. When enabled, the toggle switch will be orange.
4. Click **SAVE**, under each **Input** window group, to commit changes.
5. Click on the **HDMI Output** menu.
6. Verify that each source can be displayed, independently. To do this, locate the **Video** section and click the **Input** drop-down list. Alternate between the following selections to display each source.

```
ip_input1 (226.0.0.1:1000)
ip_input2 (226.0.0.2:1000)
ip_input3 (226.0.0.3:1000)
ip_input4 (226.0.0.4:1000)
```

If any of these sources are not displayed, return to the encoder **IP Input**, **Session**, and **Encoding** menus to verify that the configuration is correct.

Multiview Configuration

The final step is to configure the decoders to display the proper stream(s), as outlined in the tutorial diagram (shown below).



Decoder #1

1. Click **Multiview** in the menu bar.
2. Click the **ADD MULTIVIEW** button.
3. The **New Multiview** dialog box will be displayed.
4. Enter a name for the multiview configuration in the **Name** field. Since this decoder will be a picture-in-picture layout, use the name `pip`.



NOTE: Multiple multiview configurations can be created and saved. To display a different multiview, go to the **HDMI Output** menu, locate the **Video** section and click the **Input** drop-down list to select the desired multiview configuration.

5. Click the **Resolution** drop-down list and select `3840x2160`.
6. Click the **Layout** drop-down list to view the available layouts, and select `pip-bottom-right`.
7. Click the **1 main (3840x2160)** drop-down list and select `ip_input3 (226.0.0.3:1000)`.
8. Click the **2 bottom_right (1280x720)** drop-down list and select `ip_input2 (226.0.0.2:1000)`.

1. Click the **SAVE** button.
2. Click **HDMI Output** in the menu bar.
3. Locate the **Video** section, click the **Input** drop-down list, and select `Multiview pip`. This is the name of the multiview that was created in Step 4. The name `Multiview` will always be used as a prefix, indicating that the selection is a multiview.
4. Click the **SAVE** button at the bottom of the **Output 1** window group.

Decoder #2

1. Click **Multiview** in the menu bar.
2. Click the **ADD MULTIVIEW** button.
3. The **New Multiview** dialog box will be displayed.
4. Enter a name for the multiview configuration in the **Name** field. Since this decoder will be a side-by-side layout, use the name `sbs`, or similar.
5. Click the **Resolution** drop-down list and select `3840x2160`.
6. Click the **Layout** drop-down list to view the available layouts, and select `side-by-side`.
7. Click the **1 left (1920x1080)** drop-down list and select `ip_input1(226.0.0.1:1000)`.
8. Click the **2 right (1920x1080)** drop-down list and select `ip_input4(226.0.0.4:1000)`.
9. Click the **SAVE** button.
10. Click **HDMI Output** in the menu bar.
11. Locate the **Video** section, click the **Input** drop-down list, and select the name of the side-by-side multiview configuration that was created.
12. Click the **SAVE** button at the bottom of the **Output 1** window group.

Decoder #3

1. Since no multiview is used on this decoder, click **HDMI Output** in the menu bar.
2. Locate the **Video** section, click the **Input** drop-down list, and select `ip_input3(226.0.0.3:1000)`.
3. Click the **SAVE** button at the bottom of the **Output 1** window group.

This completes the dual-streaming and multiview tutorial. Additional multiview features are documented in the following pages.

Positioning Subframes

Each subframe in a multiview can be repositioned on the screen based on its anchor point. For example, in the picture-in-picture example that was created on Decoder #1, the settings for each subframe are as follows:

Input	Anchor	x	y
ip_input2 (226.0.0.2:1000)	bottom right	3808	2128
ip_input3 (226.0.0.3:1000)	top left	0	0

To move ip_input2 (camera source) to the left, decrease the x value.

1. Click the **Multiview** menu.
2. Locate the **Subframe** sections and adjust the x and y values as desired, based on the anchor point.

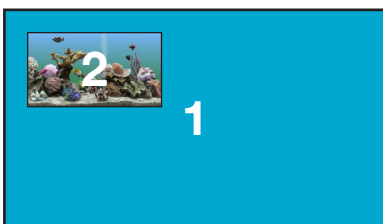


IMPORTANT: X-values must be specified in increments of 32. Y-values must be specified in increments of 8. If these increments are not used, then the decoder will automatically be assigned the closest “correct” coordinate value and display a message of the change.

3. Click the **SAVE** button to commit changes.

Changing the Background Color

The background color can be seen if any portion of the canvas is not covered by a subframe. Refer to the illustration below. For example, in this PiP configuration, subframe 1 contains no image. Instead of a blank background, the background color is displayed. The default background color is black: (RGB) 0,0,0.



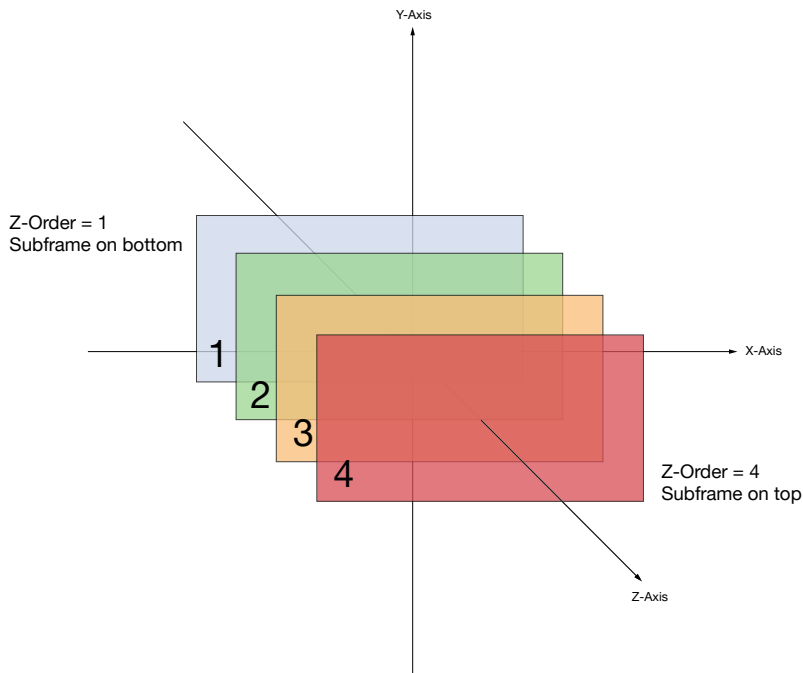
1. Click the **Multiview** menu, then under the **Multiviews** window group, click the name of the Multiview background color to be changed.
2. Locate the **Background color** section and click the **Choose color** button.
3. Click and drag the mouse across the palette to select the desired color. Alternatively, RGB values can be entered direction in the **red**, **green**, and **blue** fields.
4. Click the **SAVE** button to commit changes.



Changing the Z-Order

The ordering of overlapping subframes in two-dimensional space is referred to as the *z-order*. In the illustration below, the red window is set to priority 4 and will be displayed on top of all other subframes. Assigning a subframe to z-order 1 (the blue window) will move the subframe behind the other subframes. The larger the z-order value, the higher the subframe priority will be. Subframes cannot share the same z-order value.

Note that subframes do not support transparency. This is only used in the diagram to illustrate how overlapping subframes can be placed behind or in front of one another.



1. Click **Multiview** in the menu.
2. Locate the **Subframe** sections and enter z-order value in the **z-order** field.
3. Click the **SAVE** button to commit changes.

Adding Subframes

Multiview supports a maximum of 4 subframes. As long as the maximum number of subframes is not exceeded, additional subframes can be added. This provides for customization of existing layouts.

1. Click the **Multiview** menu.
2. Under the **Multiviews** window group, click the name of the Multiview to be changed.
3. Click the **ADD SUBFRAME** button.
4. The **New Subframe** dialog will be displayed.
5. Enter the title of the new subframe in the **Name** field.
6. Click the **Input** drop-down list to select the desired input. Only a list of currently configured IP inputs will be available from this list. If a new IP input is desired, it will need to be configured.
7. Click the **Anchor** drop-down list and select the desired anchor point.
8. Enter the desired values in the **X** and **Y** fields, relative to the anchor point.
9. Enter the z-order value in the **z-order** field.
10. Click the **SAVE** button to commit changes.

Deleting a Subframe

1. Click the **Multiview** menu.
2. Under the **Multiviews** window group, click the name of the Multiview to be changed.
3. Under the name of the multiview configuration, click the **DELETE** button. The subframe will be immediately removed from the multiview.

Deleting a Multiview



IMPORTANT: In order to delete a Multiview, the Multiview to be deleted must not be in use by the decoder. Click the **HDMI Output** menu, then click the **Video > Input** drop-down list to select another IP input or a different Multiview.

1. Click the **Multiview** menu.
2. Locate the **Multiview** window group to be deleted.
3. Click the **DELETE** button, next to the **ADD SUBFRAME** button.

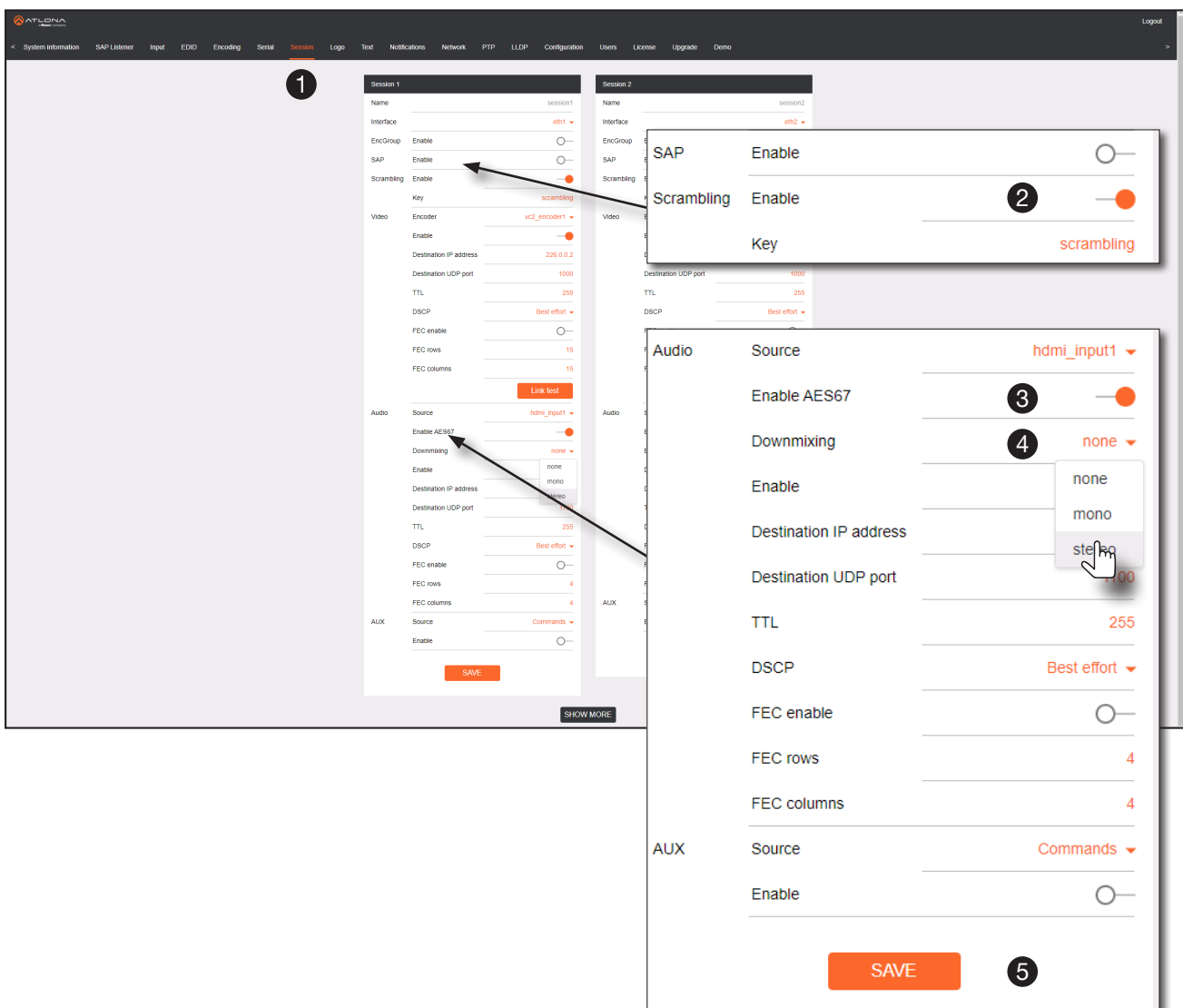
Using Audio in Multiview

When using multiview, a decoder can only subscribe to a single audio stream. To use an audio stream in multiview, simply configure the audio as part of the session (**Audio > Source > hdmi_input1**, for example). Refer to [Creating a Session \(page 24\)](#) for more information.

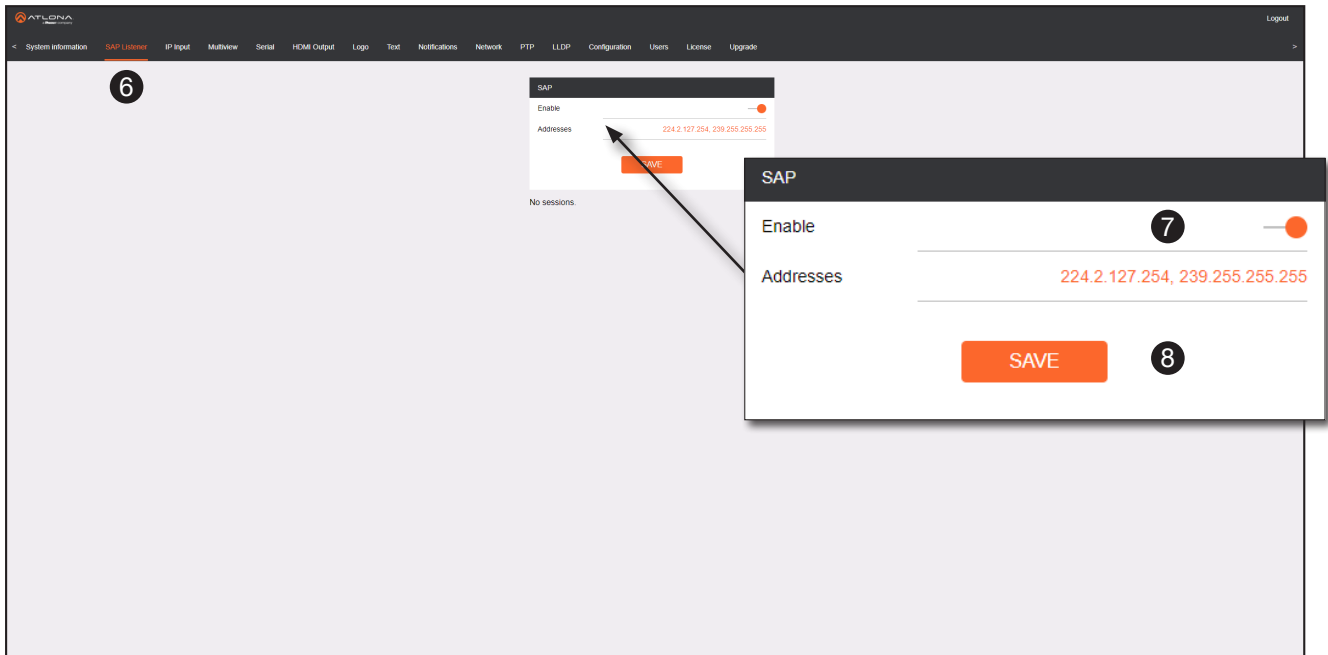
AES67 Audio

AES67 audio is a standard for high-performance audio streaming over IP, providing several features such as synchronization, media clock identification, and connection management. AES67 does not support bitstream/compressed audio formats, such as Dolby® Digital, and others. Source audio must be transmitted as LPCM up to eight channels at 192 kHz / 24-bit.

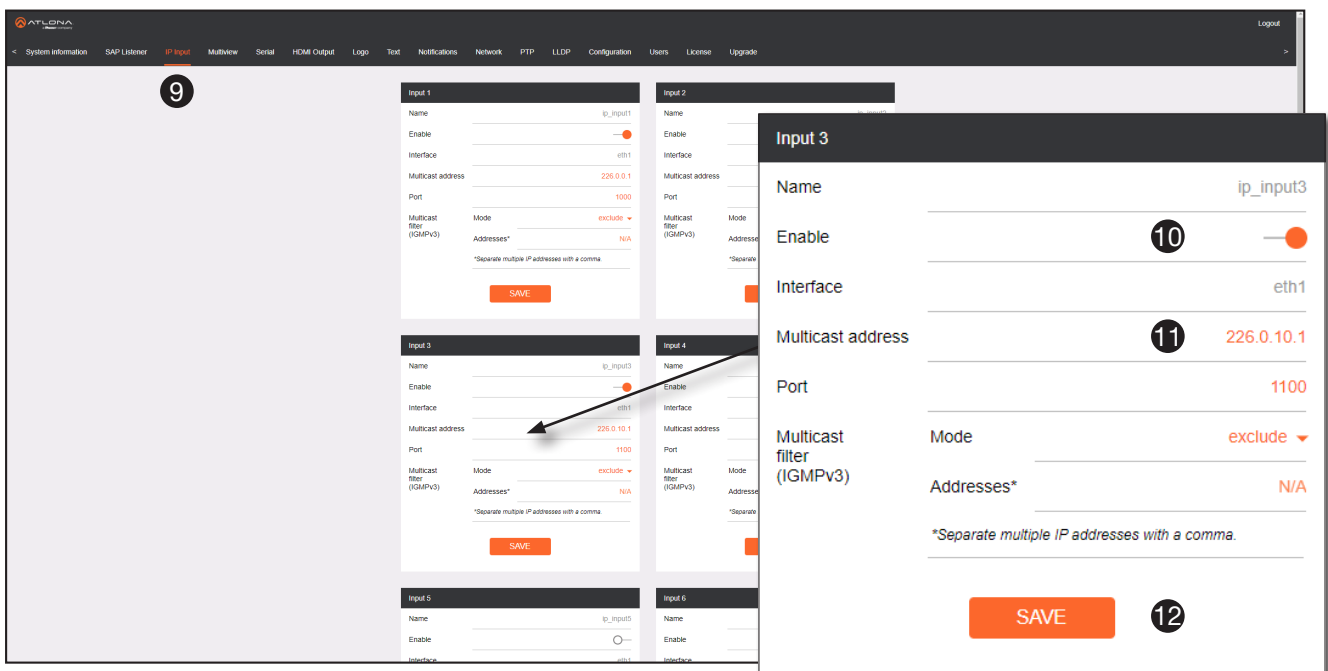
1. Login to the encoder and click **Session** in the menu bar.
2. Click the **SAP > Enable** toggle switch to enable SAP. When enabled, the toggle switch will be orange.
3. Locate the **Audio** section and click the **Enable AES67** toggle switch to enable this feature. When enabled, the toggle switch will be orange.
4. Select the type of downmixing from the **Downmixing** drop-down list, if desired. Available options are: *None*, *Mono*, or *Stereo*.
5. Click the **SAVE** button to commit changes.



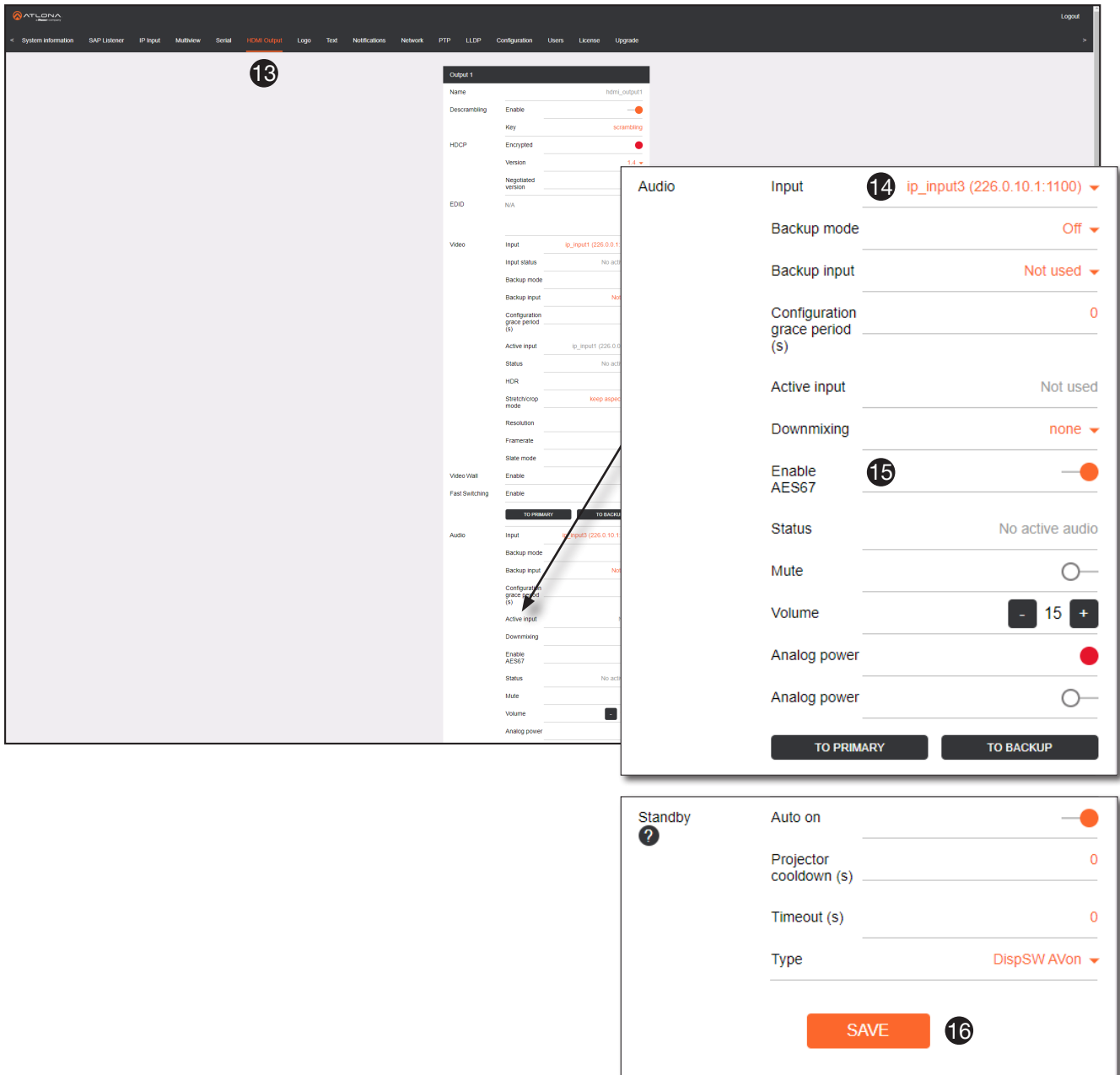
6. Go to the decoder and click the **SAP Listener** menu.
7. Click the **Enable** toggle switch to enable the SAP listener. When enabled, the toggle switch will be orange.
8. Click the **SAVE** button.



9. Click the **IP Input** menu.
10. Select the desired IP input for AES67 audio and click the **Enable** toggle switch. When enabled, the toggle switch will be orange. In the example below, **Input 3** is used.
11. Enter the address in the **Multicast address** field.
12. Click the **SAVE** button.



13. Click the **HDMI Output** menu.
14. Locate the **Audio** section, click the **Audio > Input** drop-down list, and select the input that was configured in Steps 10 and 11.
15. Click the **Enable AES67** toggle switch to enable it. When enabled, the toggle switch will be orange.
16. Click the **SAVE** button.



The screenshot displays the AT-LONA web interface with the following configuration steps highlighted:

- Step 13:** The **HDMI Output** menu is selected in the top navigation bar.
- Step 14:** The **Audio** section is expanded, and the **Input** dropdown menu is set to **ip_input3 (226.0.10.1:1100)**.
- Step 15:** The **Enable AES67** toggle switch is turned on, indicated by an orange circle.
- Step 16:** The **SAVE** button is highlighted in orange.

Additional configuration details visible in the interface include:

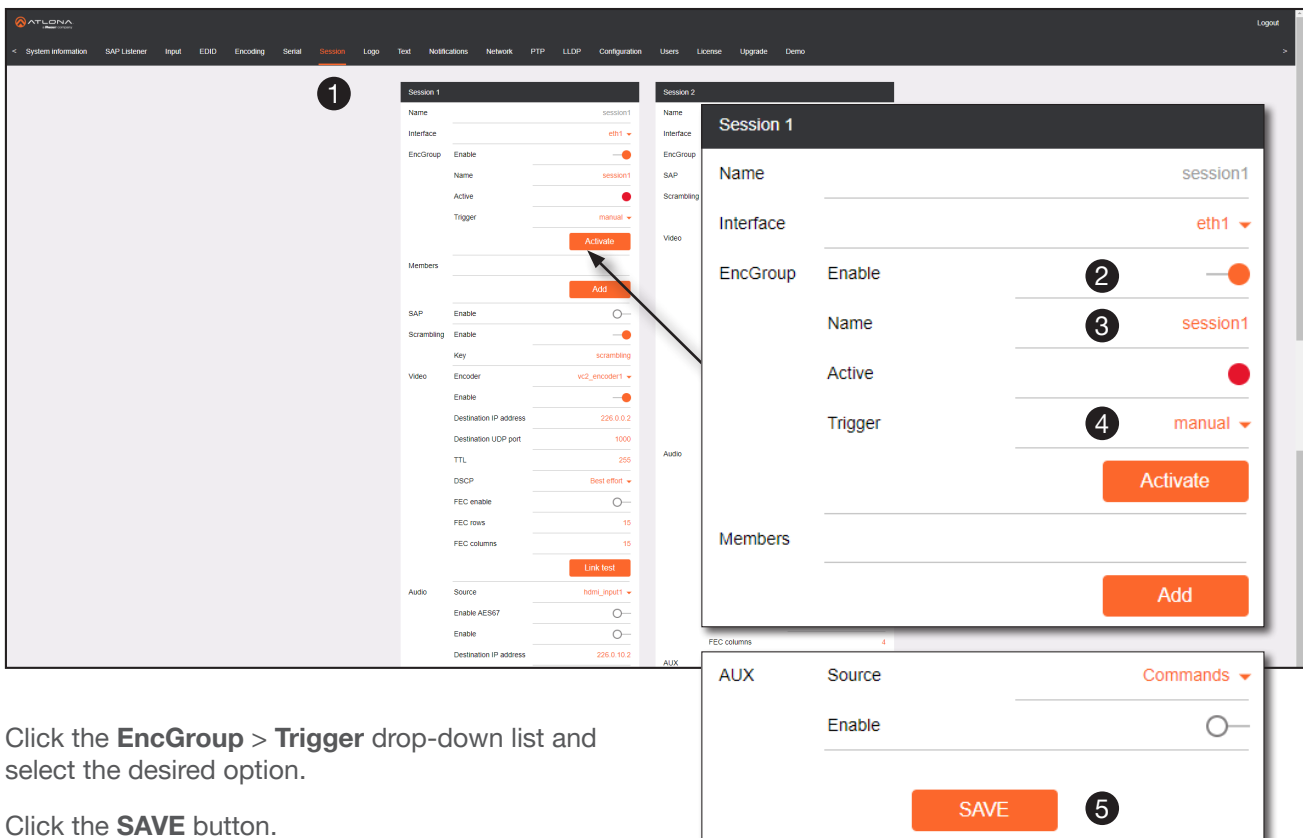
- Output 1:** Name: hdmi_output1, Descrambling: Enable, Key: scrambling, HDCP: Encrypted, Version: 1.4, Negotiated version: , EDD: N/A, Video: Input: ip_input1 (226.0.0.1), Input status: No act, Backup mode: , Backup input: Not used, Configuration grace period (s): , Active input: ip_input1 (226.0.0.1), Status: No act, HDR: , Stretch/crop mode: keep aspect, Resolution: , Framerate: , State mode: , Video Wall: Enable, Fast Switching: Enable, Audio: Input: ip_input3 (226.0.10.1), Backup mode: , Backup input: Not used, Configuration grace period (s): , Active input: , Downmixing: , Enable AES67: No act, Status: No act, Mute: , Volume: , Analog power: , TO PRIMARY, TO BACKUP.
- Audio Section:** Input: ip_input3 (226.0.10.1:1100), Backup mode: Off, Backup input: Not used, Configuration grace period (s): 0, Active input: Not used, Downmixing: none, Enable AES67: (orange toggle), Status: No active audio, Mute: (off), Volume: 15, Analog power: (on), TO PRIMARY, TO BACKUP.
- Standby Section:** Auto on: (orange toggle), Projector cooldown (s): 0, Timeout (s): 0, Type: DispSW AVon, SAVE button.

Encoder Grouping

Encoder grouping allows the creation of a “virtual matrix” by grouping several physical encoders into a single logical encoder. Only a single session can be active at any one time. *The following procedure must be performed on all encoders that will be part of the encoder group.*

Encoder Configuration

1. Login to the encoder and click the **Session** menu.
2. Locate the **EncGroup** section and click the **Enable** toggle switch. When enabled, the toggle switch will be orange.
3. Enter a name for the group in the **Group Name** field. This same name must assigned to all encoders in the encoder group. For this example, the name `group1` name will be assigned. However, it is recommended that a more descriptive name be used.



The screenshot shows the ATLONA web interface with the following configuration steps highlighted:

1. The **Session** menu is selected in the top navigation bar.
2. In the **EncGroup** section, the **Enable** toggle switch is turned on (orange).
3. The **Name** field is set to `session1`.
4. The **Trigger** dropdown menu is set to `manual`.
5. The **Activate** button is clicked.

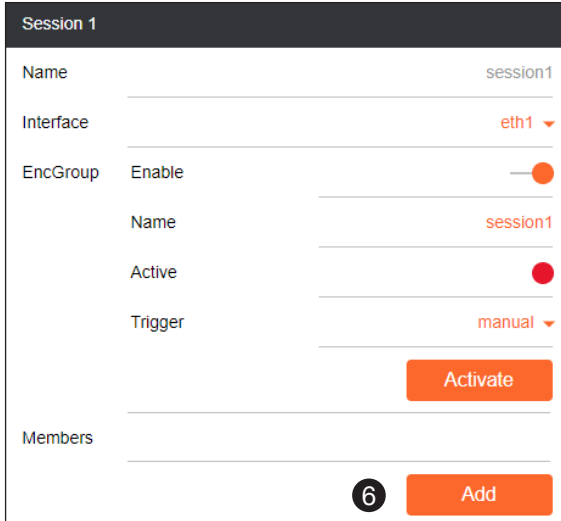
4. Click the **EncGroup > Trigger** drop-down list and select the desired option.
5. Click the **SAVE** button.

Mode	Description
manual	Use this setting to manually enable the input. When set to <code>manual</code> , click the Activate button to perform the input switching.
input connected	Use this setting to allow the encoder group to use automatic input detection using the TMDS / 5V pin on the HDMI port. Once a new source is connected, that source automatically becomes the active source.



NOTE: Setting **Trigger** to `input connected` should not be used when **Slate Mode** is set to `Auto`. Doing so will cause the slate to be displayed when switching inputs. If encoder auto-switching is being used, set the **Slate Mode** to `Auto`, on the decoder. Refer to [Slate / Logo Insertion \(page 68\)](#) for more information.

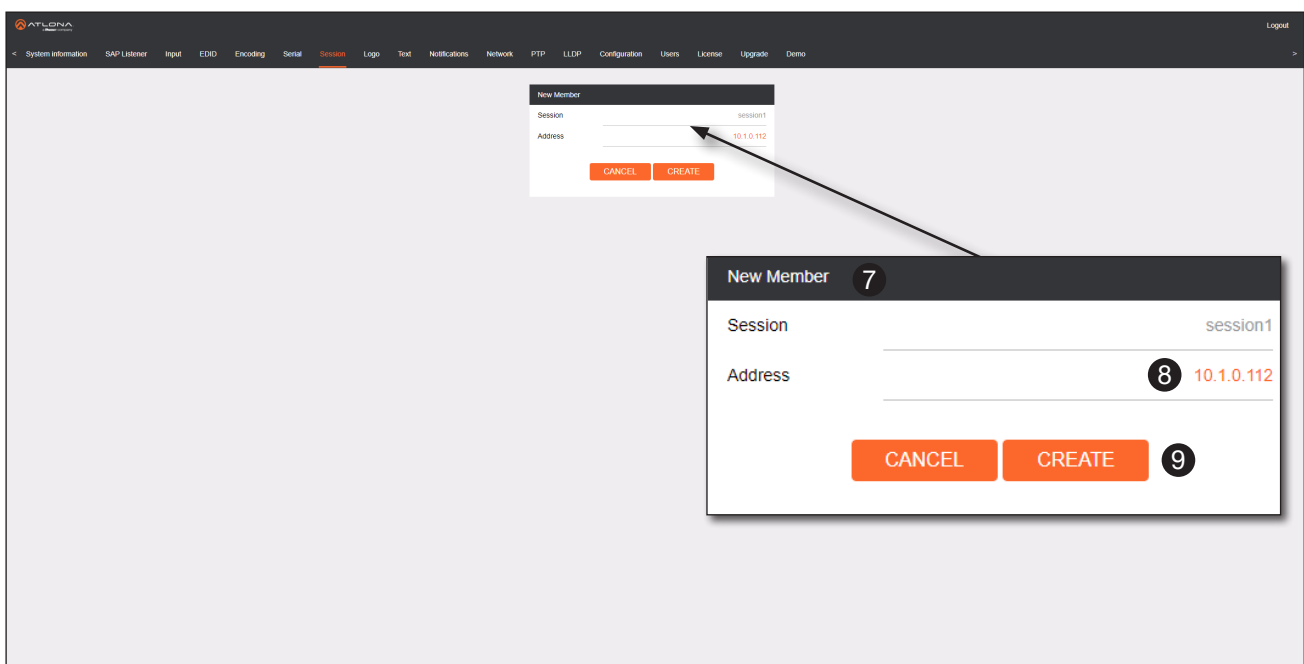
- Click the **Add** button to add members to the encoder group. A *member* refers to the IP address of a physical encoder.



- The **New Member** dialog will be displayed.
- Enter the IP address of the encoder in the **Address** field.
- Click the **CREATE** button. To return to the **Session** screen, without adding a new member, click the **CANCEL** button.



IMPORTANT: The IP address for each encoder must be added to the group. This *includes* the IP address of the encoder that is being used to create the group.



10. The new member will be added to the group. Continue adding members as needed, following Steps 9 and 10.
11. Click the **SAVE** button.

Session 1

Name

Interface

EncGroup Enable

Name

Active

Trigger

15

Members

Address	Interface	Status
10 <input type="text" value="10.1.0.112"/>	<input type="text" value="eth1"/>	<input type="text" value="inactive"/>

AUX Source

Enable

11

Video

Encoder

Enable

Destination IP address **12**

Destination UDP port **12**

TTL

DSCP

FEC enable

FEC rows

FEC columns

Audio

Source

Enable AES67

Enable

Destination IP address **12**

Destination UDP port **12**

TTL

DSCP

FEC enable

FEC rows

FEC columns

12. Under the **Video** and **Audio** sections, enter the IP address and UDP port information, in the **Destination IP address** and **Destination UDP port** fields, respectively. *The information on both of these fields must be identical for each encoder, within the encoder group.*
13. Optional: Click the **Scrambling > Enable** toggle switch to enable scrambling. When enabled, the toggle switch will be orange. In addition, enter the scrambling key in the **Scrambling > Key** field. *This step is required if the source content is HDCP protected.*
14. Click the **SAVE** button to commit changes.
15. If using manual triggering, then click the **Activate** button. Otherwise, connect an active HDMI source to an encoder within the group.

Scrambling Enable **13**

Key **13**

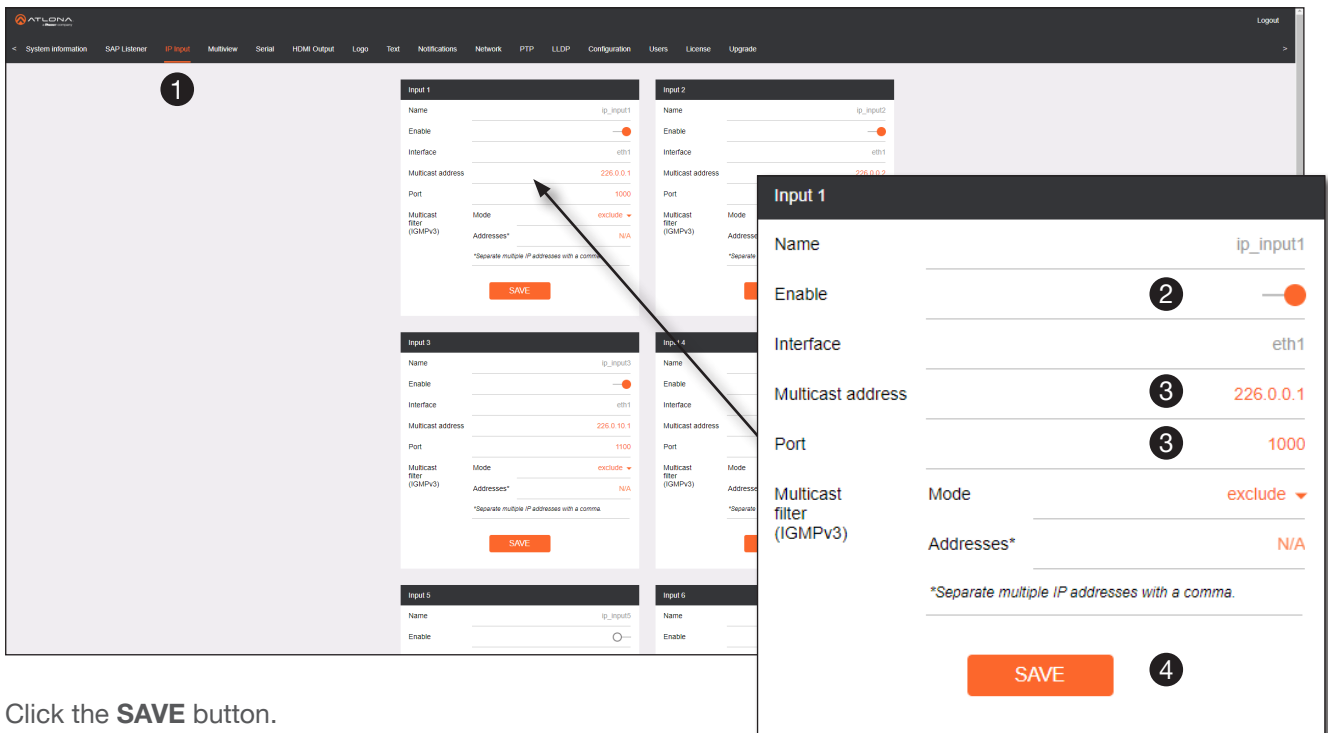
AUX Source

Enable

14

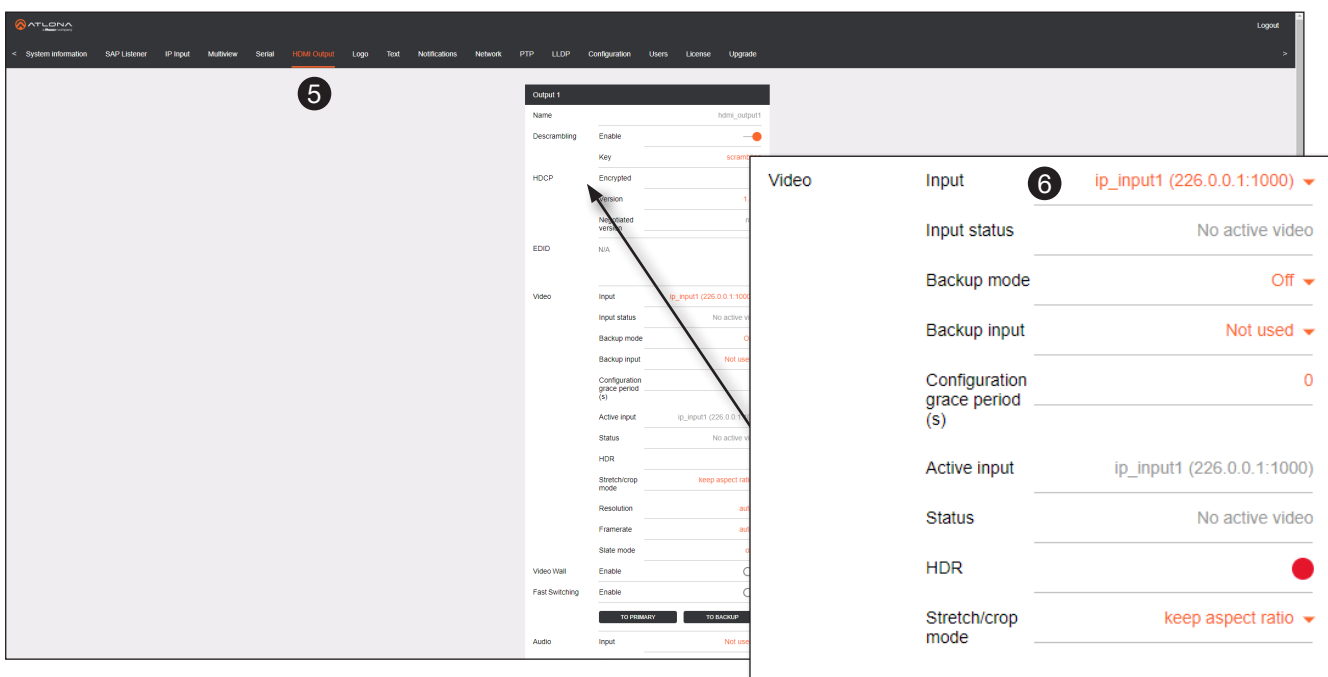
Decoder Configuration

1. Login to the decoder and click the **IP Input** menu.
2. Click the Enable toggle switch to enable the input. When enabled, the toggle switch will be orange.
3. Enter the multicast address and port information in the Multicast address and Port fields. *The information on both of these fields must be identical to the Session information, entered in the previous section.*



The screenshot displays the 'IP Input' configuration page in the ATLONA web interface. A grid of configuration cards for 'Input 1' through 'Input 6' is visible. A callout box for 'Input 1' provides a detailed view of the configuration fields: Name (ip_input1), Enable (orange toggle switch), Interface (eth1), Multicast address (226.0.0.1), Port (1000), and Mode (exclude). A 'SAVE' button is located at the bottom of the callout box.

4. Click the **SAVE** button.
5. Click the **HDMI Output** menu.
6. Click the **Video > Input** drop-down list and select the IP Input used for video, audio, and control.



The screenshot displays the 'HDMI Output' configuration page. The 'Video' configuration card is highlighted, showing the 'Input' dropdown menu set to 'ip_input1 (226.0.0.1:1000)'. A callout box for 'Video' provides a detailed view of the video settings: Input (ip_input1 (226.0.0.1:1000)), Input status (No active video), Backup mode (Off), Backup input (Not used), Configuration grace period (s) (0), Active input (ip_input1 (226.0.0.1:1000)), Status (No active video), HDR (No active video), and Stretch/crop mode (keep aspect ratio).

Device Operation

7. Optional: Click the **Descrambling > Enable** toggle switch to enable scrambling. When enabled, the toggle switch will be orange. In addition, enter the scrambling key in the **Scrambling > Key** field. The descrambling key should always match the scrambling key on the encoder.
8. Click the **SAVE** button to commit changes.

Output 1

Name	hdmi_output1		
Descrambling	Enable	7	<input checked="" type="checkbox"/>
	Key	7	scrambling
HDCP	Encrypted		<input checked="" type="checkbox"/>
	Version		1.4 ▼
	Negotiated version		none

Standby ?

Auto on	<input checked="" type="checkbox"/>
Projector cooldown (s)	0
Timeout (s)	0
Type	DispSW AVon ▼

SAVE
8

Scrambling

OmniStream supports 128-bit Advanced Encryption Standard (AES) scrambling and is required for HDCP-encrypted video streams. Scrambling can be enabled or disabled through the web server, and can be applied to individual sessions. In order for scrambling to function properly, it must be enabled on both the encoder session and all decoders subscribed to a stream that is a part of a scrambled session. The scrambling key on both encoder and subscribed decoder(s) must be identical. When enabled, the default scrambling key is “scrambling”.

1. Login to the encoder.
2. Click **Session** in the menu bar.
3. Locate the **Scrambling** section under the desired **Session** window group.
4. Click the **Enable** toggle switch to enable scrambling. Once enabled, the toggle switch will be orange.
5. Enter the desired scrambling key in the **Key** field.
6. Click the **SAVE** button at the bottom of the **Session** window group to commit the changes.



IMPORTANT: If a user-defined key is specified, then it must be a minimum of eight alphanumeric characters. Special characters and spaces are not permitted. Also note that if a key is generated, the same generated key (on the encoder) must also be used on the decoder, in order to de-scramble the signal.

Slate / Logo Insertion

The difference between a “slate” and “logo” is in the size of the image and how it is used: Logos are classified as smaller, low-resolution images that can be positioned at specified locations on the screen. Slates occupy the entire screen. Note that while logos may be used as slates, the image quality will be degraded, as the image will be scaled to fill the screen.

Slate / logo insertion can be performed on both the encoder and decoder. When configured on the encoder, the image that is displayed on the output (decoder) will be from the encoder IP address(es) to which each decoder is subscribed. When configured on the decoder, the image is unique to the specified HDMI output. Refer to the *OmniStream Single-Channel / Dual Channel A/V Decoder User Manual*, for information on managing slate / logo insertion on decoder units.

Adding Slates / Logos

1. Login to the encoder.
2. Click **Logo** in the menu bar.
3. Under the **New logo** window group, enter the name of the logo in the **Name** field.
4. Click the **Choose File** button and select the desired image. Only .png files are valid selections.
5. Click the **UPLOAD** button to upload the file.
6. A new window group will be created with the name of the logo that was provided in Step 3.
7. Perform one of the following:
 - If the selected image will be used as a *logo*, then proceed with Steps 8 through 13.
 - If the image will be used as a *slate*, skip to Step 14 on the next page.
8. Under the **Logo Insertion** window group, click the **Select Logo** drop-down list and select the desired logo. To prevent the image from being displayed, select the **Not used** option.
9. Click the **Aspect Ratio** drop-down list to set the aspect ratio of the image. Selecting **Keep** will maintain the aspect ratio. Select **Stretch** to scale the image to the defined size.
10. Enter the horizontal and vertical position of the logo, based on the resolution of the video stream, in the **Horizontal** and **Vertical** fields, respectively.
11. Enter the width and height of the logo, based on the resolution of the video stream, in the **Width** and **Height** fields, respectively.
12. Click the **Enable** toggle switch to activate the logo/slate feature. When enabled, this toggle switch will be orange.
13. Click the **SAVE** button to commit changes.

14. Click **Encoding** in the menu bar.
15. Click the **Slate mode** drop-down list, and select *Off*, *Manual*, or *Auto*.

Slate mode	Description
Off	Disables the image from being displayed.
Manual	The image will always be displayed, superimposed on the source signal, and will remain even if the source signal is lost.
Auto	The image will only be displayed when the source signal is lost. For example, this mode is useful in conference room applications for displaying system instructions when no sources are connected.

16. Click the **Slate logo** drop-down list and select the desired image. If **Slate Mode** is set to *Off*, then this field will not be visible.
17. Click the **SAVE** button to apply all changes.

Deleting Slates

1. Click **Encoding** in the menu bar.
2. Under the **Encoder** window group(s), click the Slate mode drop-down list and select *Off*.
3. Click the **SAVE** button at the bottom of the window group to commit changes.
4. Click **Logo** in the menu bar.
5. Click the **DELETE** button for the logo to be removed.

Deleting Logos

1. Click **Logo** in the menu bar.
2. Under the **Logo Insertion** window group(s), click Enable button (if enabled) to disable the feature.
3. Click the **SAVE** button at the bottom of the window group to commit changes.
4. Click the **DELETE** button for the logo to be removed.

Text Insertion

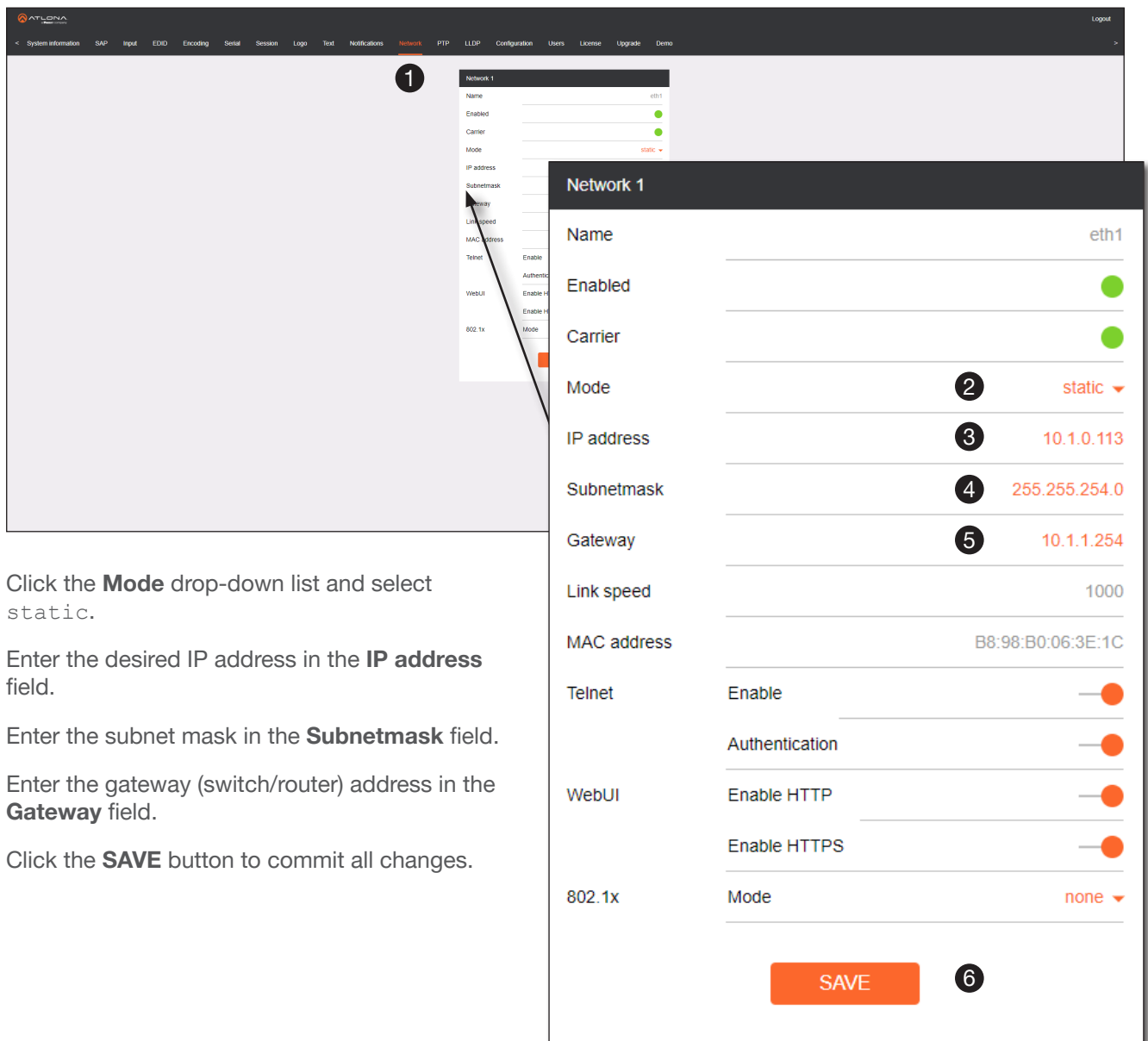
Text can be inserted and scrolled across the screen, making it useful for messages and notifications. Several options are available when using text: Scroll speed adjustment (forward, reverse, or static), number of iterations, text color, vertical / horizontal position, as well as transparency.

1. Login to the encoder.
2. Click **Text** in the menu bar.
3. Under the **Text Insertion** window group, click the **Enable** toggle switch. When enabled, this toggle switch will be orange.
4. In the **Text** field, enter the desired text.
5. Specify the speed of the scrolling text in the **Scroll Speed** field. Integer values from -255 to 255 are valid. Negative numbers will scroll the text from left to right. Positive numbers will scroll text from right to left. A value of 0 will not scroll.
6. Enter the number of iterations in the **Iteration** field. Set this field to 0 (zero) to set the number of iterations to infinity.
7. Click the **Color** drop-down list to select the color of the text. The **Red**, **Green**, and **Blue** fields can be changed to further modify the color of the text. Adjust the **Alpha** field to control the transparency of the text. A value of 255 is opaque and a value of 0 is transparent. Numbers from 0 to 255 are valid for each of these fields.
8. Specify the location of the text in the **Horizontal (%)** and **Vertical (%)** fields. Each of these values is based on the horizontal and vertical resolution of the video stream.
9. Specify the size of the text in the **Width (%)** and **Height (%)** fields. Each of these values is based on the horizontal and vertical resolution of the video stream.
10. Click the **SAVE** button to commit all changes.

Configuring a Static IP Address

There will be situations where it is desirable for the encoder to be assigned a static IP address. Some IT environments prefer this method, as opposed to having a DHCP server dynamically assign IP addresses. If the encoder is unable to detect a DHCP server within 15 seconds, then Automatic Private IP Addressing (APIPA) will be used to assign the encoder an address within the IPv4 address block 169.254.xxx.xxx/16. If this occurs, connect an Ethernet cable directly from the **ETHERNET** port of the encoder to the LAN port of a computer, then follow the instructions below.

1. Login to the web server and click **Network** in the menu bar.



The screenshot shows the web interface for configuring Network 1. The configuration details are as follows:

Field	Value
Name	eth1
Enabled	<input checked="" type="checkbox"/>
Carrier	<input checked="" type="checkbox"/>
Mode	static
IP address	10.1.0.113
Subnetmask	255.255.254.0
Gateway	10.1.1.254
Link speed	1000
MAC address	B8:98:B0:06:3E:1C
Telnet	<input checked="" type="checkbox"/>
Authentication	<input checked="" type="checkbox"/>
WebUI	<input checked="" type="checkbox"/> Enable HTTP, <input checked="" type="checkbox"/> Enable HTTPS
802.1x	Mode: none

At the bottom right of the configuration form, there is a **SAVE** button and a callout number 6.

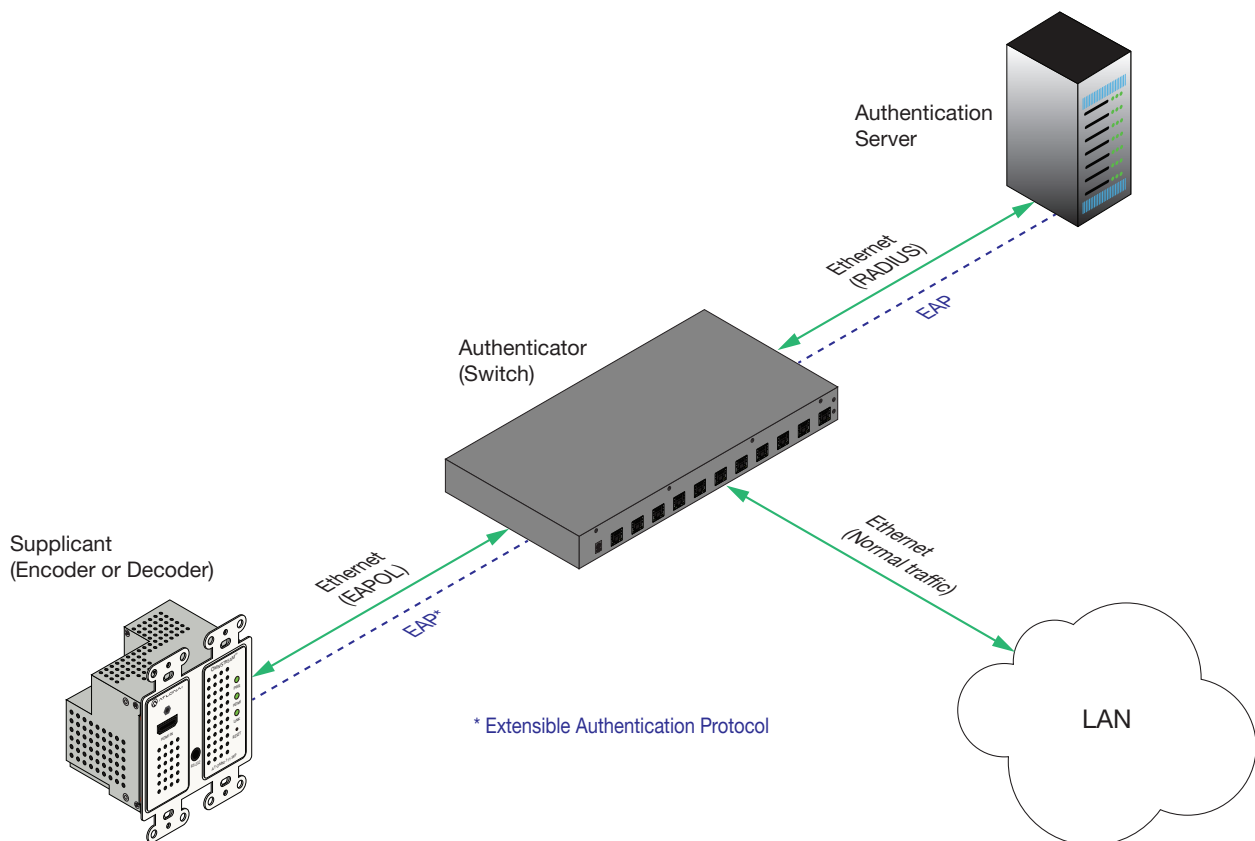
2. Click the **Mode** drop-down list and select **static**.
3. Enter the desired IP address in the **IP address** field.
4. Enter the subnet mask in the **Subnetmask** field.
5. Enter the gateway (switch/router) address in the **Gateway** field.
6. Click the **SAVE** button to commit all changes.

802.1X Authentication

802.1X is a server-based port authentication which restricts unauthorized (rogue) clients from connecting to a Local Area Network. In its simplest form, 802.1X usually involves three parties: supplicant (client device), authenticator (Ethernet switch or WAP), and an authentication server. Before the device is permitted on the network, port communication is restricted to Extensible Authentication Protocol over LAN (EAPOL) traffic. If the device passes the authentication process, the authentication server notifies the switch, allowing the client to access the LAN. The illustration below shows the basic architecture.



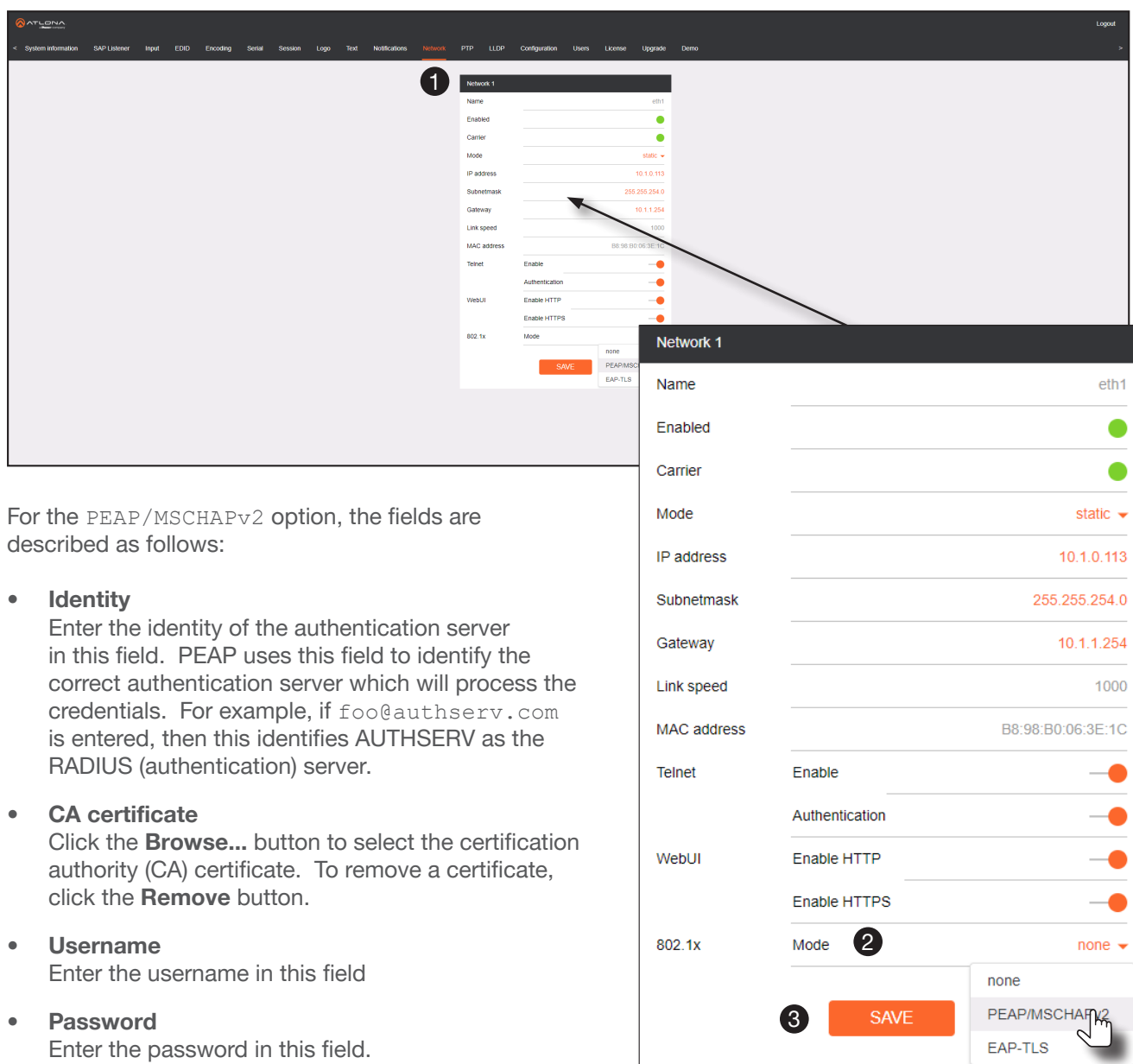
IMPORTANT: Connecting an 802.1X-enabled encoder to a network without an active or operational authentication server, will result in an encoder that does not function until the expected message is returned from a RADIUS server. If it is unclear as to whether the network uses 802.1X authentication, consult the IT administrator for assistance.



Three options are available on both the OmniStream encoder and decoder.

Protocol	Description
none	802.1X protocol disabled
PEAP/MSCHAPv2	Protected EAP; requires basic credentials in addition to a CA (certificate authority) certificate.
EAP-TLS	EAP Transport Layer Security; requires a client certificate, client private key, and CA (certificate authority) certificate.

1. Login to the encoder and click the **NETWORK** menu.
2. Click the **802.1x > Mode** drop-down list, at the bottom of the Network window group and select the desired authentication method. In the example below, **PEAP/MSCHAPv2** is selected. Once a method is selected, the required fields for that method will be displayed. Enter the required information in each field.
3. Click **SAVE** to commit changes.



For the **PEAP/MSCHAPv2** option, the fields are described as follows:

- Identity**
 Enter the identity of the authentication server in this field. PEAP uses this field to identify the correct authentication server which will process the credentials. For example, if `foo@authserv.com` is entered, then this identifies AUTHSERV as the RADIUS (authentication) server.
- CA certificate**
 Click the **Browse...** button to select the certification authority (CA) certificate. To remove a certificate, click the **Remove** button.
- Username**
 Enter the username in this field
- Password**
 Enter the password in this field.

Refer to the table below for a list of available authentication methods. An orange dot indicates that this field will be displayed as part of the method.

Authentication Method	Identity	Password	CA Certificate	CA Certificate	Client Private Certificate
PEAP/MSCHAPv2	●	●	●		
EAP-TLS			●	●	●

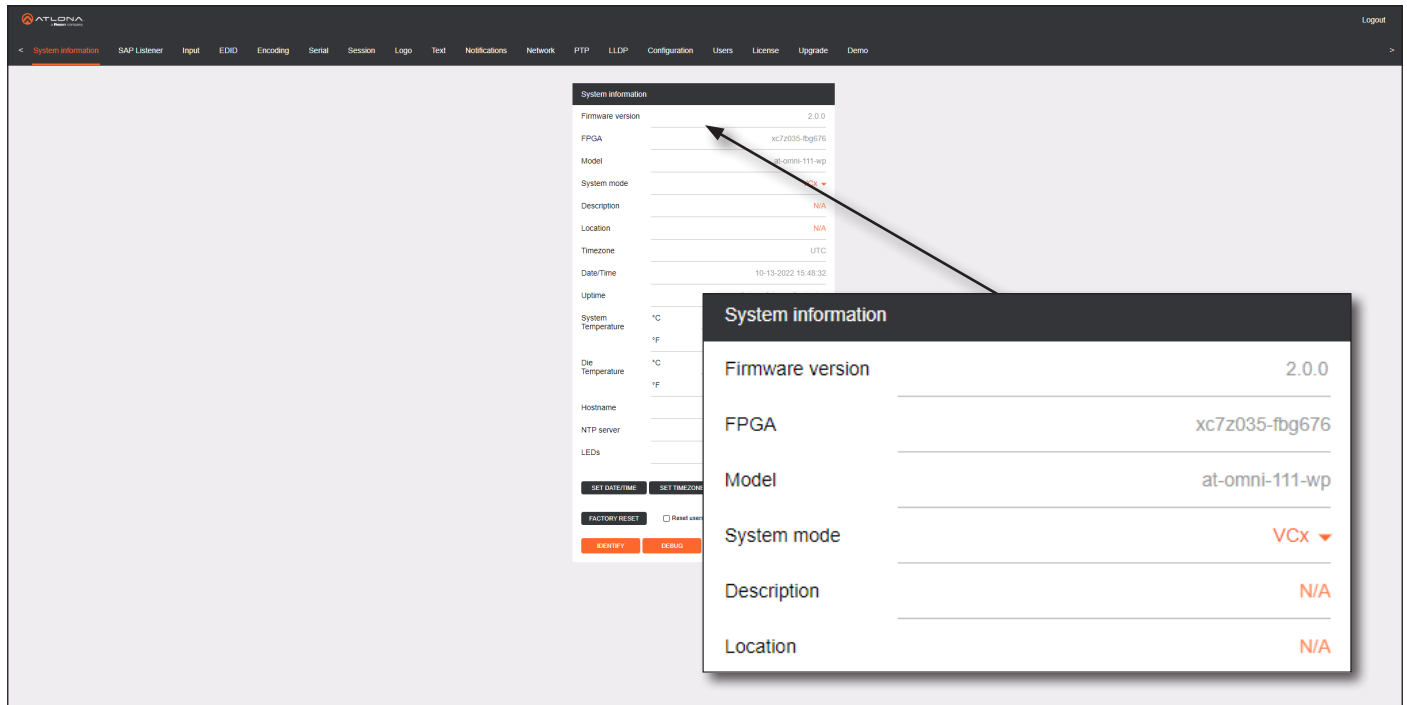
Configuration and Management Interfaces

Web Server



NOTE: This section assumes that the **System mode** is set to VCx. If VC-2 Video or VC-2 PC Application is used, some features on these pages will not be available.

System information page



Firmware version

The version of firmware that the encoder is running. Always make sure the latest version of firmware is installed.

FPGA

Displays the FPGA model number and the size.

Model

The model number of the unit.

System mode

Click this drop-down list to select the system mode. The default setting is VCx.

Mode	Description
VCx	This is the default mode and represents the latest codec technology from Atlona, with outstanding support for computer graphics and motion video. VCx includes support for 4K60 4:4:4 fast switching, dual streaming from AT-OMNI-111 encoders, and multiview on the decoders.
VC-2 Video	Legacy OmniStream codec that provides the best viewing experience when streaming motion graphics and/or video.
VC-2 PC application	Legacy OmniStream codec that optimizes the image when viewing static images, such as spreadsheets or similar content.

Configuration and Management Interfaces

Description

Provides the option of assigning descriptive name to the unit.

Location

Provides the option of assigning a description of where the unit is located.

Timezone

Displays the time zone format. Click the **SET TIMEZONE** button, to assign the time zone.

Date/Time

Displays the current date and time. Click the **SET DATE/TIME** button to set these values.

Uptime

Displays the elapsed time since the unit was powered-on or rebooted.

System Temperature

Displays the ambient enclosure temperature.

Die Temperature

Displays the value returned from the die temperature sensor (DTS) on the chip of the PCB.

Hostname

Displays the hostname of the encoder. If using a custom hostname, it must meet the hostname standards defined here: <https://tools.ietf.org/html/rfc1123>.

NTP Server

Displays the NTP server. This field is set to `pool.ntp.org` by default. Click this field to enter the desired NTP server address.

LEDs

Click this toggle switch to enable or disable all front-panel LED indicators and button backlight indicators.

SET DATE/TIME

Click this button to set the current date and time.

SET TIMEZONE

Click this button to set the desired time zone.

Timezone	UTC
Date/Time	10-13-2022 15:48:32
Uptime	0 days 0 hours 9 minutes
System Temperature	°C 36.50 °C
	°F 97.70 °F
Die Temperature	°C 47.62 °C
	°F 117.71 °F
Hostname	at-omni-111-wp-00084
NTP server	pool.ntp.org
LEDs	<input checked="" type="checkbox"/>
<div style="display: flex; justify-content: space-around;"> SET DATE/TIME SET TIMEZONE </div>	
<div style="display: flex; justify-content: space-around;"> FACTORY RESET <input type="checkbox"/> Reset users <input type="checkbox"/> Reset network <input type="checkbox"/> Reset defaults </div>	
<div style="display: flex; justify-content: space-around;"> IDENTIFY DEBUG REBOOT SAVE </div>	

Configuration and Management Interfaces

FACTORY RESET

Click this button to reset the encoder to factory-default settings. When performing a factory reset, the following options can be selected, by clicking the check box. If no options are selected, then the encoder is reset with no factory-default settings.

Option	Description
None Checked	Resets the encoder with no factory-default settings.
Reset User	Resets the encoder to factory-default settings and resets custom user information.
Reset Network	Resets the encoder to factory-default settings and resets network information.
Reset Defaults	Resets the encoder to factory-default settings. In addition, static multicast addresses are configured. This option can be used to configure a single encoder to transmit to any number of decoders.



IMPORTANT: The **Reset Defaults** option will not work for multiple encoders on the same network.

IDENTIFY

Click this button to physically identify a unit on the network. Clicking this button will cause all front-panel LED indicators to flash for 10 seconds.

DEBUG

Click this button to instruct the unit to create a debug file. This file is used by Atlona Technical Support Engineers to diagnose internal issues with the unit.

REBOOT

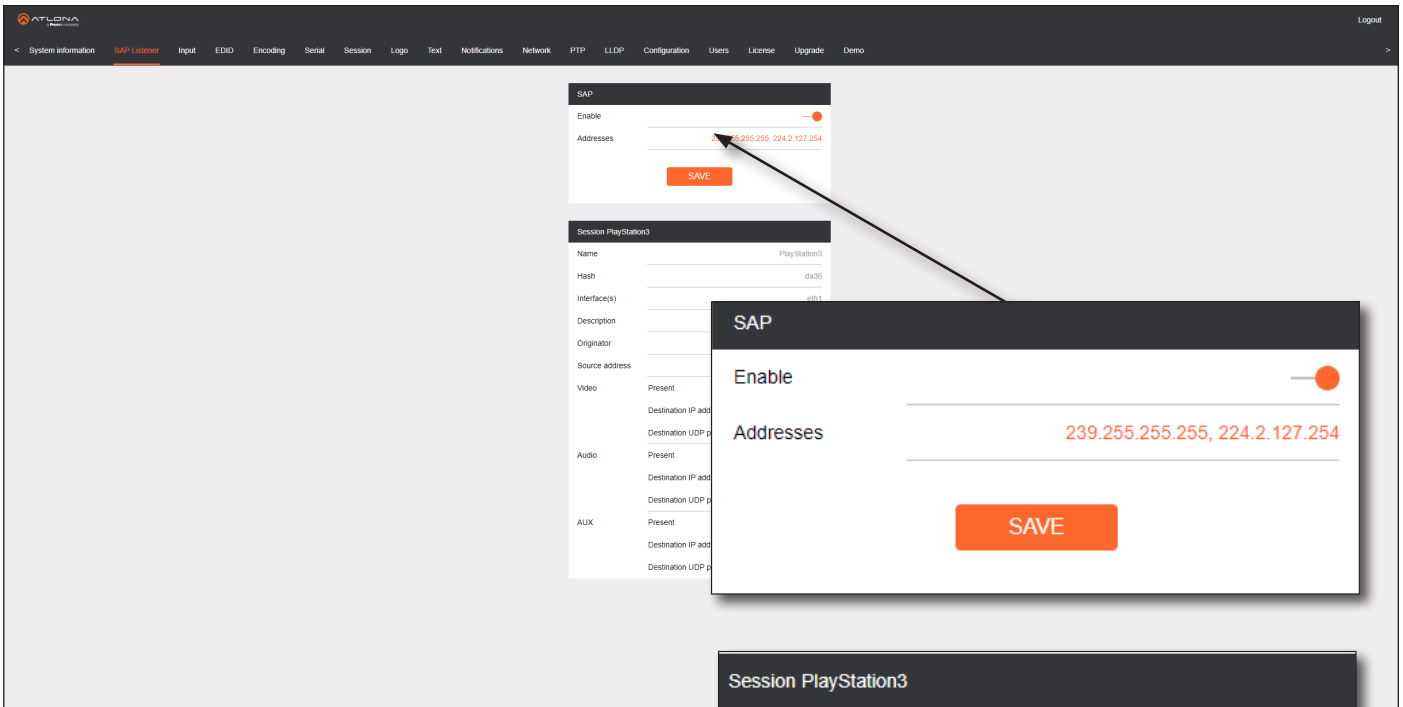
Click this button to perform a soft reboot of the encoder.

SAVE

Click this button to commit changes to the settings on this page.

Configuration and Management Interfaces

SAP Listener page



Enable

Click this toggle to enable or disable SAP. This feature is enabled when the toggle switch is orange. This is the default setting. If an SAP announcement is picked up, it will be displayed below the **SAP** window group (as shown here).

Addresses

Encoders currently send SAP announcements on two multicast addresses: 224.2.127.254 and 239.255.255.255. These IP addresses are added by default.

SAVE

Click this button to save all changes.

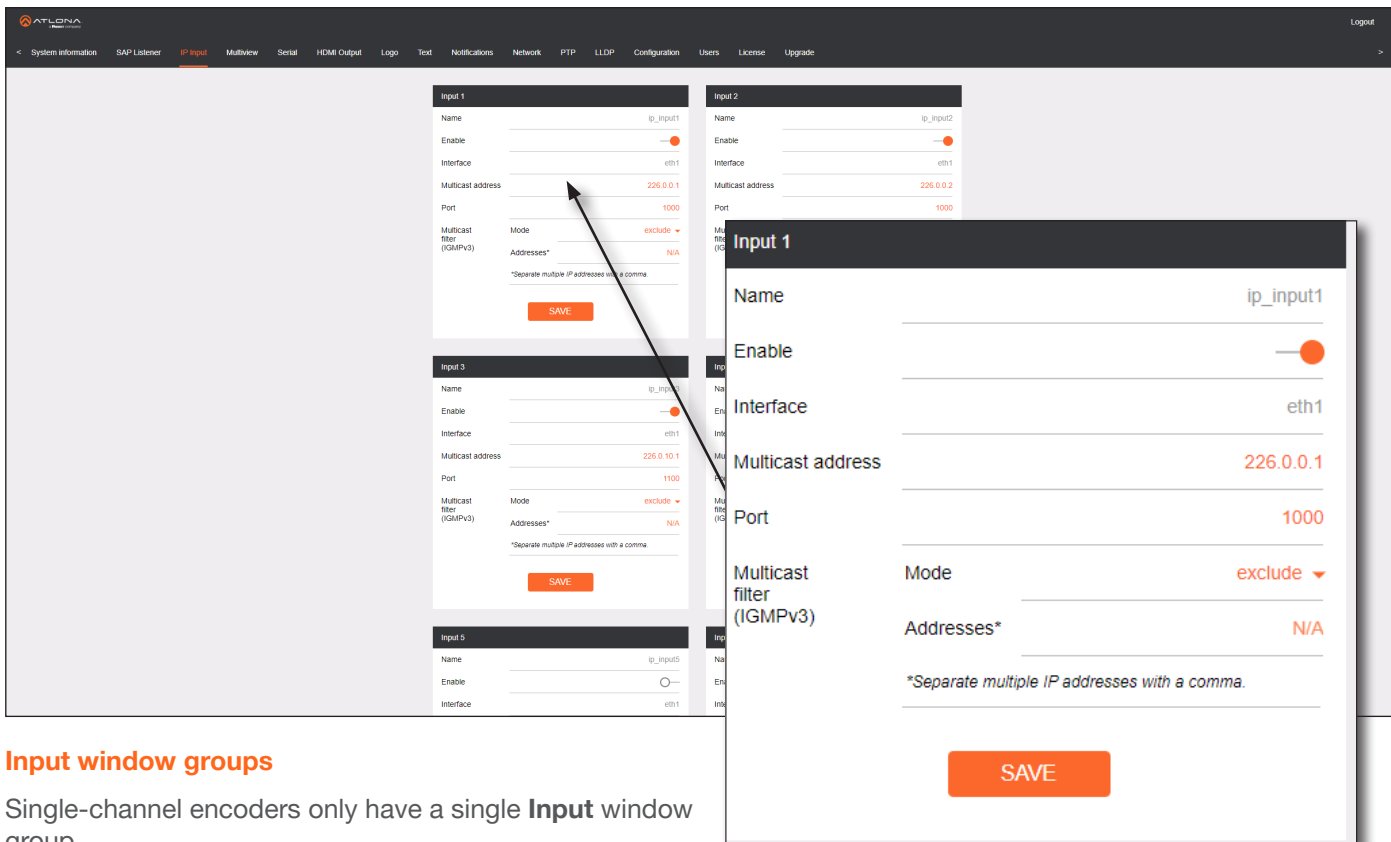
Session PlayStation3	
Name	PlayStation3
Hash	da36
Interface(s)	eth1
Description	N/A
Originator	-
Source address	10.1.0.12
Video	Present ●
Destination IP address	226.0.0.1
Destination UDP port	1000
Audio	Present ●
Destination IP address	226.0.10.1
Destination UDP port	1100
AUX	Present ●
Destination IP address	N/A
Destination UDP port	N/A



IMPORTANT: If the **Addresses** field is changed, then the same changes must be applied to all devices, in order for all devices to see the SAP multicast.

Configuration and Management Interfaces

Input page



Input window groups

Single-channel encoders only have a single **Input** window group.

Name

The name of the input. This field cannot be changed.

Cable present

This indicator will be red if the encoder is unable to detect the source signal. This may indicate a damaged HDMI cable. If this indicator is green (shown), then the cable integrity is good, and additional fields for both the Video and Audio sections will be displayed.

EDID

Click this drop-down list to select the desired EDID. The default EDID is selected as a default setting.

EDID	Description
ATL 2160P 2CH	3840x2160p30 with two-channel PCM audio
ATL 2160P MCH	3840x2160p30 with multichannel PCM audio
ATL 1080P 2CH	1920x1080p60 with two-channel PCM audio
ATL 1080P DD	1920x1080p60 with Dolby Digital
ATL 1080P DVI	1920x1080p60 formatted as DVI
ATL 1080P MCH	1920x1080p60 with Multichannel PCM audio
ATL 1080P 2CH	1920x1080p60 with two-channel PCM audio
ATL 1280x800 RGB DVI PCWXGADVI	1280x800 formatted as DVI
ATL 1280x800 RGB DVI PCWXGA2CH	1280x800p60 PC format with two-channel PCM audio

Configuration and Management Interfaces

EDID	Description
ATL 1366x768 RGB DVI TVWXGA2CH	1280x800p60 TV format with two-channel PCM audio
ATL 2560x1600 2CH	2560x1600p60 with two-channel PCM audio
ATL 2560x1600 MCH	2560x1600p60 with multichannel PCM audio
ATL 720P DD	1280x720p60 with Dolby Digital audio
ATL 720P 2CH	1280x720p60 with Dolby Digital two-channel audio
ATL VR (2160x1200)	2160x1200p90 (Compatible with HTC VIVE® VR system)

HDCP

Encrypted

Indicates if the content being transmitted from the source is HDCP-encrypted. If using HDCP-encrypted content is being used, then this indicator will be green.

Version

Click this drop-down list to select the version of HDCP to be supported: 2.2, 1.4, or None.

Negotiated Version

This field displays the HDCP version that has been negotiated with the source.

Video

The following fields will only be displayed if the **Cable present** indicator is green.

Color Depth

Displays the color depth of the source content.

Subsampling

Displays the chroma subsampling value of the source content.

Colorspace

Displays the color space of the source content.

Resolution

Displays the resolution of the source content.

Framerate

Displays the frame rate of the source content.

HDR

This indicator displays the presence of HDR source content. If the indicator is green, then the source is outputting HDR content. If the indicator is red, then no HDR content is detected.

Audio

The following fields will only be displayed if the **Cable present** indicator is green.

Bit Depth

Displays the bit depth of the source audio.

Format

Displays the audio format of the source content.

Channel count

Displays the number of audio channels that are present in the source audio.

Frequency

Displays the audio frequency of the source content.

Configuration and Management Interfaces

Input 2

Name	ip_input2	
Enable		<input checked="" type="checkbox"/>
Interface	eth1	
Multicast address	226.0.0.2	
Port	1000	
Multicast filter (IGMPv3)	Mode	exclude ▼
	Addresses*	N/A

*Separate multiple IP addresses with a comma.

SAVE

Video generator window group

This signal can be used to test the video capability of the network.

Name

The name of the input. This field cannot be changed.

Color Depth

Click this drop-down list to select the color depth. Available values are 8, 10, and 12.

Colorspace

Click this drop-down list to select the color space. Available values are YUV and RGB.

Framerate

Click in this field to change the frame rate of the video generator signal. The default value is 60 Hz.

Subsampling

Click this drop-down list to select the chroma subsampling value. Available values are 444, 442, and 420.

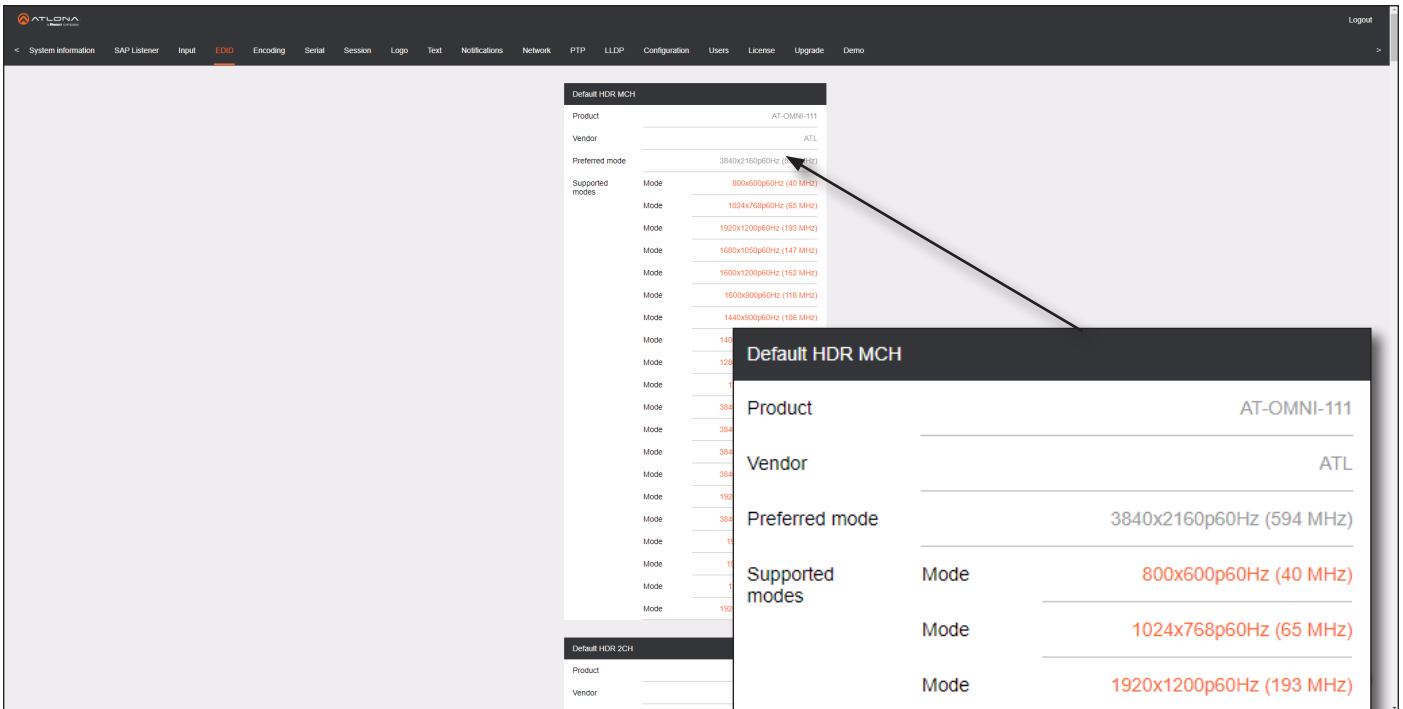
Resolution width

Click in this field to change the horizontal resolution of the signal.

Vertical width

Click in this field to change the vertical resolution of the signal.

EDID page



Product

Displays the SKU of the OmniStream encoder or the Product and Vendor for any EDID captured using a decoder. This field cannot be changed.

Vendor

Displays the vendor name. This field cannot be changed.

Preferred mode

Displays the preferred timing and resolution of the EDID. This field cannot be changed.

Supported modes

Mode

In addition to the preferred timing and resolution, each EDID structure contains a listing of supported timings/resolutions. The number of available supported timings/resolutions depends on the EDID.

Add EDID

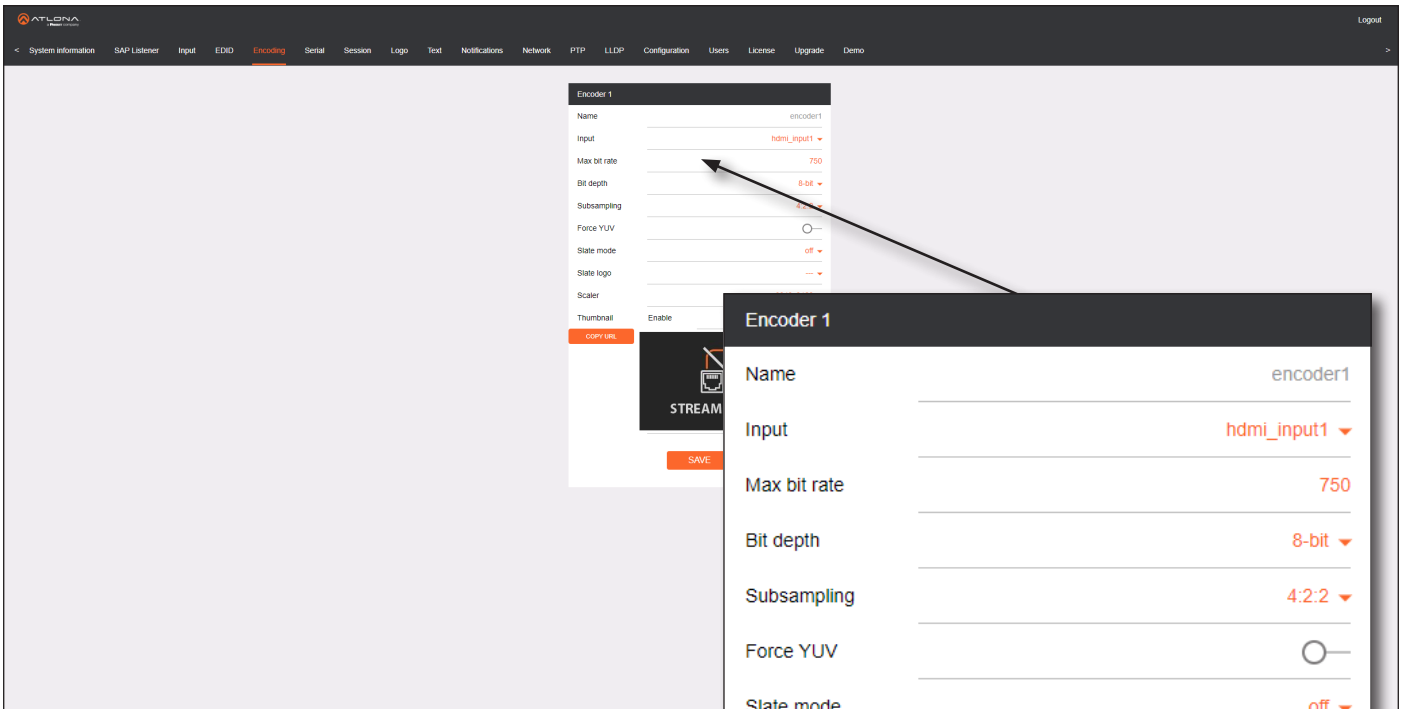
Click this button, located at the bottom-right of the page, to add a new EDID.



Default HDR MCH	
Product	AT-OMNI-111
Vendor	ATL
Preferred mode	3840x2160p60Hz (594 MHz)
Supported modes	Mode 800x600p60Hz (40 MHz)
	Mode 1024x768p60Hz (65 MHz)
	Mode 1920x1200p60Hz (193 MHz)
	Mode 1680x1050p60Hz (147 MHz)
	Mode 1600x1200p60Hz (162 MHz)
	Mode 1600x900p60Hz (118 MHz)
	Mode 1440x900p60Hz (106 MHz)
	Mode 1400x1050p60Hz (122 MHz)
	Mode 1280x1024p60Hz (108 MHz)
	Mode 1280x800p60Hz (83 MHz)
	Mode 3840x2160p60Hz (594 MHz)
	Mode 3840x2160p30Hz (297 MHz)
	Mode 3840x2160p25Hz (297 MHz)
	Mode 3840x2160p24Hz (297 MHz)
	Mode 1920x1080p60Hz (148 MHz)
	Mode 3840x2160p50Hz (594 MHz)
Mode 1920x1080i60Hz (74 MHz)	
Mode 1920x1080i50Hz (74 MHz)	
Mode 1280x720p60Hz (74 MHz)	
Mode 1920x1080p50Hz (148 MHz)	

Configuration and Management Interfaces

Encoding page



Encoder window groups

Name

The name of the encoder. This field cannot be changed.

Input

Click this drop-down list to select the input. Available options are: not used, `hdmi_input1`, and `video_generator1`.

Max bit rate

Click this field to enter the maximum bit rate. The default setting is 750 Mbps. 4K60 4:4:4 streams should be at least 700 Mb/s, 4K30 4:4:4 streams should be at least 350 Mb/s, and 1080p streams should be at least 150 Mb/s. Setting this field below these recommended values will result in lower-quality video.

Bit depth

Click in this drop-down list to select the desired bit depth. Available values are: 8-bit, 10-bit, and 12-bit.

Subsampling

Click this drop-down list to select the chroma subsampling value. Available values are: 4:4:4, 4:4:2, and 4:2:0.

Force YUV

When this toggle switch is enabled (orange), the encoder will stream YUV content over the network, regardless of which color space is used by the HDMI source. When the decoder receives the YUV stream, it will output YUV on the HDMI output. However, if the decoder is connected to a display that requires RGB, as determined by the EDID of the display, then the decoder will convert the video signal to RGB on the HDMI output. In order for the chroma scaling to work on RGB inputs, this option must be enabled.

Configuration and Management Interfaces

Slate mode

Click this drop-down list to enable or disable slate mode. Available values are: `off`, `manual`, and `auto`.

Slate mode	Description
Off	Disables the image from being displayed.
Manual	The image will always be displayed, superimposed on the source signal, and will remain even if the source signal is lost.
Auto	The image will only be displayed when the source signal is lost. For example, this mode is useful in conference room applications for displaying system instructions when no sources are connected.

Slate logo

Click this drop-down list to select the desired slate logo.

Scaler

Click this drop-down list to select the desired output resolution. This option is set to `disabled` by default.

Setting	
disable	1440x816
3840x2160	1280x736
2880x1524	1280x720
2592x1440	960x544
2560x1440	960x528
1920x1104	864x480
1920x1080	640x368
1920x1072	640x360
1792x960	480x272
1728x960	

Thumbnail Enable

Click this toggle switch to enable to disable a thumbnail of the input stream. When enabled, this toggle switch will be orange and an image of the input stream will be displayed. <http://<encoder-ip-address>/thumbnail/thumbnail1.jpg>.



NOTE: Thumbnails can also be accessed at: <http://<encoder-ip-address>/thumbnail/thumbnail1.jpg>. For dual-channel encoders, the secondary thumbnail can be accessed at: <http://<encoder-ip-address>/thumbnail/thumbnail2.jpg>.

COPY URL

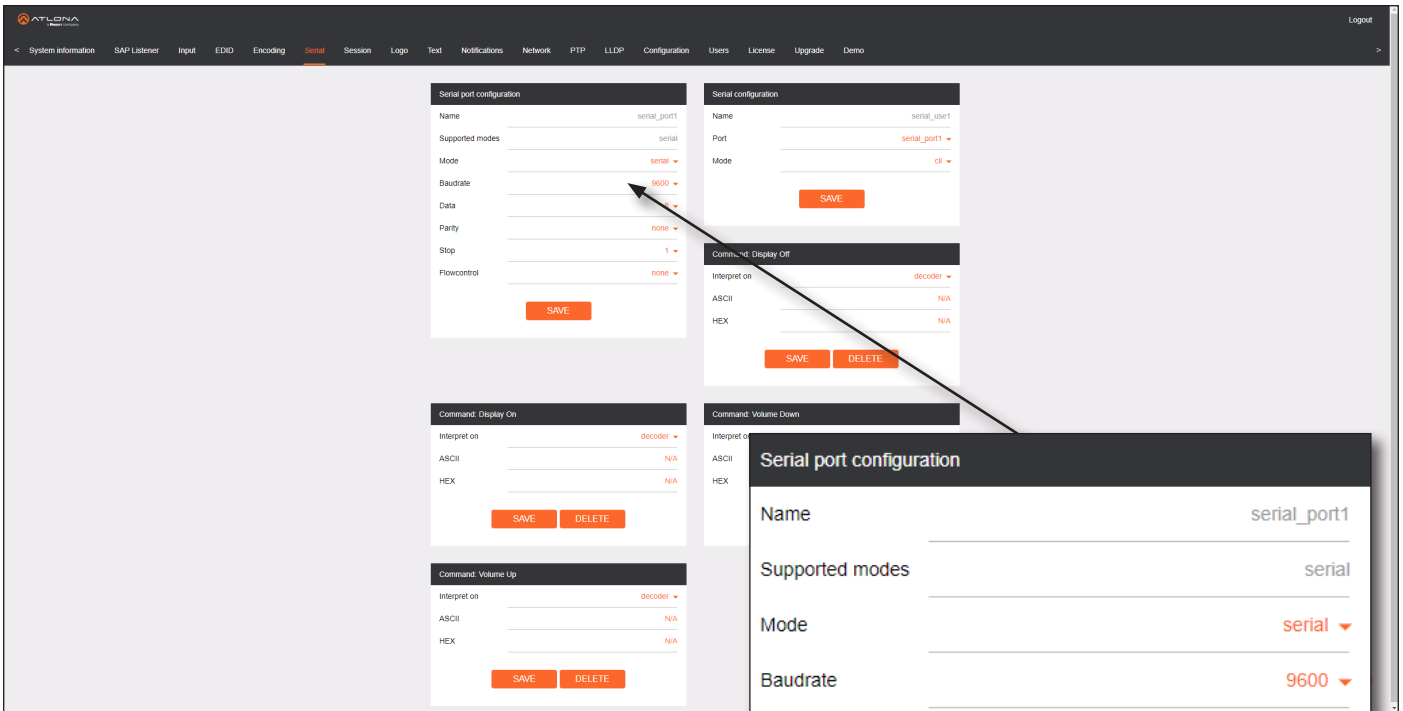
Click this button to copy the URL of the thumbnail to the clipboard.

SAVE

Click this button to save all changes.

Configuration and Management Interfaces

Serial page



Serial port configuration window groups

Name

The name of the serial port. This field cannot be changed.

Supported Modes

Displays the supported protocols for the serial port. This field cannot be changed.

Mode

Click this drop-down list to select the desired serial mode. Available values will be reflected in the **Supported Modes** field.

Baudrate

Click this drop-down list to select the desired baud rate: 115200, 57600, 38400, 19200, or 9600.

Data

Click this drop-down list to select the number of data bits: 6, 7, or 8.

Parity

Click this drop-down list to select the parity bit: None, Odd, Even, Mark, or Space.

Stop

Click this drop-down list to select the stop bit: 1, 1.5, or 2.

Configuration and Management Interfaces

Flow Control

Click this drop-down list to select the type of flow control: `none`, `xonxoff`, or `hw`.

SAVE

Click this button to commit all changes within the **Serial port configuration** window group.

Serial configuration window groups

Name

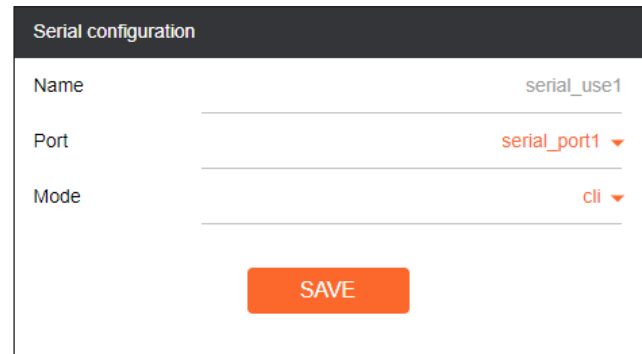
The name of the port. This field cannot be changed.

Port

Click this drop-down list to select the desired serial port.

Mode

Click this drop-down list to select the desired control mode. Available values are: `cli` and `tcpproxy`. Select `tcpproxy` to translate received IP control traffic to RS-232 output. Selecting the `cli` option will force the serial port to function as a Command-Line Interface (CLI) for control of the encoder. Refer to [Device Control \(page 35\)](#) for more information.



SAVE

Click this button to commit all changes within the **Serial configuration** window group.

Command window groups

By default, window groups for the following commands are created: `Display Off`, `Display On`, `Volume Down`, and `Volume Up`.

Interpret on

Click this drop-down list to select the endpoint where the command will be processed: `encoder` or `decoder`.

ASCII

Enter the ASCII representation of the command string in this field.

HEX

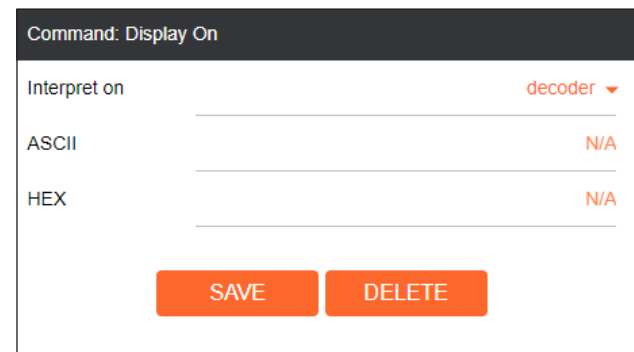
Enter the hexadecimal representation of the command in this field.

SAVE

Click this button to commit all changes within the **Command** window group.

DELETE

Click this button to delete the command window group and all parameters.




NOTE: When entering the command string, it is not required to enter the string under both the ASCII and HEX fields. The encoder requires that one field be completed.

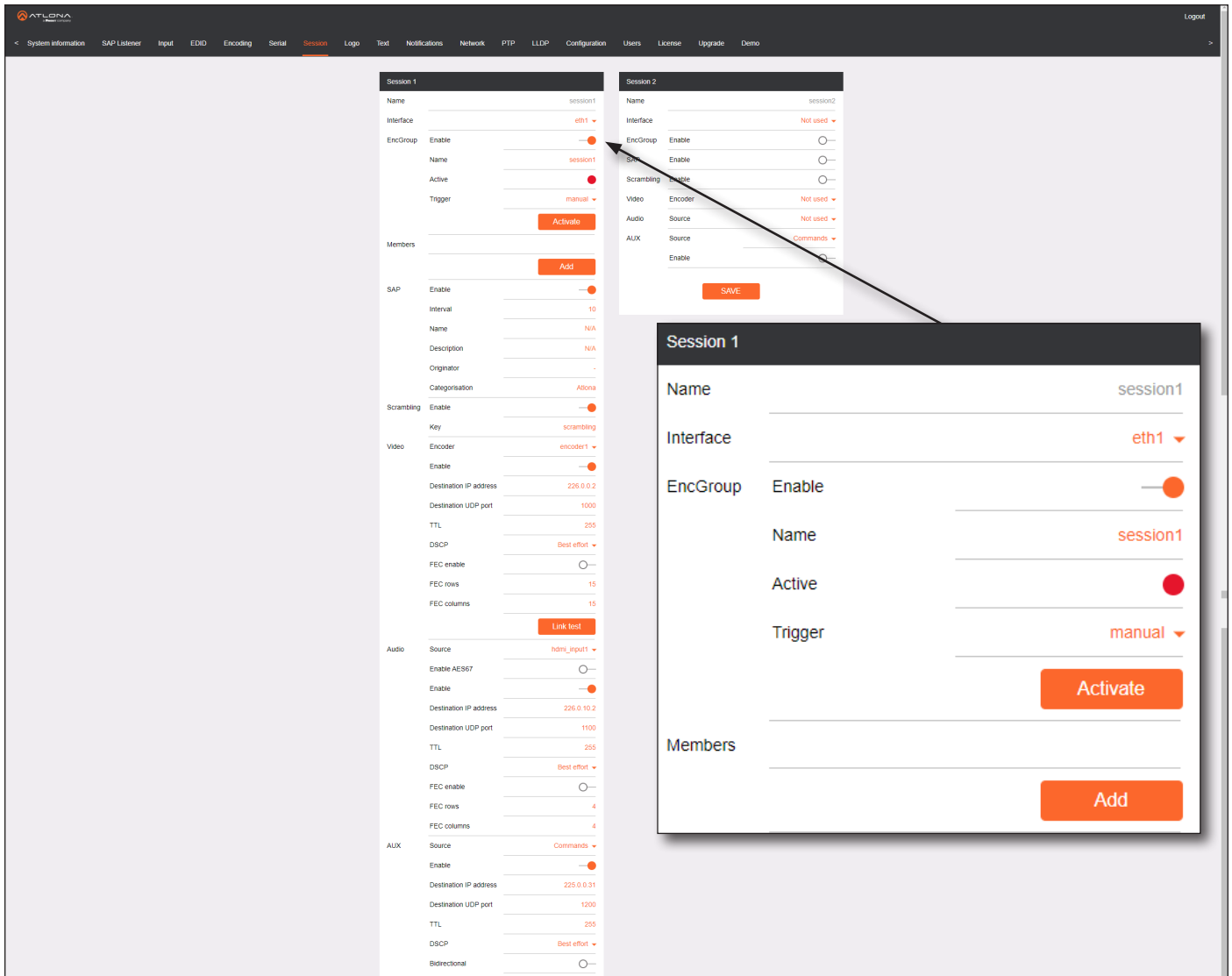


New Command

Click this button to create a new command window group. Provide a name for the command in the displayed dialog box, then click the **Create** button. Complete each of the fields, as described above.

Configuration and Management Interfaces

Session page



Session window groups

The following fields apply to all **Session** window groups. The AT-OMNI-111-WP supports up to six sessions.

Name

The name of the session. This field cannot be changed.

Interface

Click this drop-down list to select the desired interface.

Interface	Description
eth1	ETHERNET 1 port
not used	No Ethernet port selected

Configuration and Management Interfaces

EncGroup

Enable

Click this toggle switch to enable (orange) or disable encoder grouping.

Name

Enter the name of the encoder in this field. Only available if encoder grouping is enabled.

Active

Indicates if the encoder group is active. If active, then this indicator will be green. Only available if encoder grouping is enabled.

Trigger

Click this drop-down list to select the trigger type: `manual` or `input connected`. Only available if encoder grouping is enabled.

EncGroup	Enable	<input checked="" type="checkbox"/>
	Name	session1
	Active	<input checked="" type="checkbox"/>
	Trigger	manual ▾

Mode	Description
manual	Use this setting to manually enable the input. When set to manual, click the Activate button to perform the input switching.
input connected	Use this setting to allow the encoder group to use automatic input detection. Once a new source is connected, that source becomes the active source.

Activate

Click this button to make the encoder video stream the *active* stream for the encoder group.

Members

This field lists all members (encoder IP addresses) that have been added to the group. Use the **Add** button to add members to the group.

Add

Click this button to add the IP address of an encoder to the group. Note that when adding encoders to the group, the IP address of the encoder, which is being used to create the group, must be included.

SAP

SAP

Click this switch to enable or disable the Session Announcement Protocol (SAP) announcements. When enabled, the toggle switch will be orange.

Interval

Sets the announcement interval.

Name

The name of the SAP session. By default, this is the same as the session name.

Description

The SAP description.

		<input checked="" type="checkbox"/>	Activate
Members			
			Add
SAP	Enable	<input checked="" type="checkbox"/>	
	Interval		10
	Name		N/A
	Description		N/A
	Originator		-
	Categorisation		Atlona

Originator

The ID of the SAP message originator.

Categorisation

The SAP category. This field can be changed, if desired.

Configuration and Management Interfaces

Scrambling

Enable

Click this toggle switch to enable or disable scrambling on the encoder. Atlona recommends enabling scrambling for security purposes. When enabled, the toggle switch will be orange.



Scrambling Enable

Key

Key
This field is only displayed if the **Scrambling** toggle switch is enabled (orange). Enter the scrambling key in this field. The scrambling key must be ASCII and must contain a minimum of eight characters. Special characters and spaces are not permitted.

Video

Encoder

Click this drop-down list to select the encoder input. Available values are: `Not used`, and `encoder1`.

Enable

Click this toggle switch to enable or disable the video signal. When enabled (orange), video will pass from the encoder to the decoder.

Destination IP address

Enter the multicast IP address that will be used to stream the content.

Destination UDP port

Enter the destination UDP port in this field.

TTL

Set the TTL (Time-To-Live) duration, from 1 to 255 seconds, in this field. The default value is 255 seconds.

DSCP

Click this drop-down list to select the DSCP value. Refer to [Differentiated Services Code Point \(page 110\)](#) for more information on this topic.

FEC enable

Click this toggle switch to enable (orange) or disable Forward Error Correction (FEC). This feature can be used when transporting streams over a network that is suspected to be unreliable, due to noise or other factors. By default, this feature is disabled. Refer to [FEC Details \(page 108\)](#) for more information.

FEC rows

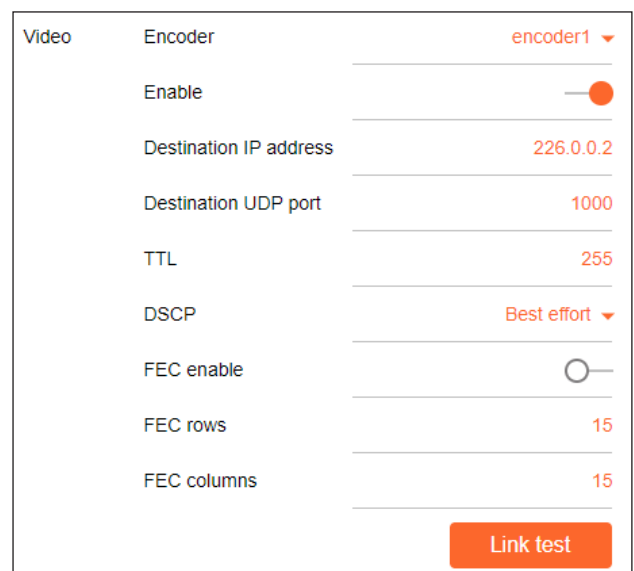
Specify the number of FEC rows in this field. Refer to [FEC Details \(page 108\)](#) for more information.

FEC Columns

Specify the number of FEC columns in this field. Refer to [FEC Details \(page 108\)](#) for more information.

Link Test

Click this button to perform a link integrity test. This feature validates the quality of the link between the encoder and decoder. Link tests are initiated at an encoder, and any decoders that are configured to join that encoder's video multicast address will return packet loss statistics to the encoder, which displays the combined results under the **Notifications** tab. Refer to [Performing a Link Test \(page 105\)](#) for more information.



Video Encoder

Enable

Destination IP address

Destination UDP port

TTL

DSCP

FEC enable

FEC rows

FEC columns

Configuration and Management Interfaces

Audio

Source

Click this drop-down list to select the desired input. Available values are: `Not used`, `audio_generator1`, and `hdmi_input1`.

Enable AES67

Click this toggle switch to enable AES67. When this feature is enabled, the toggle switch will be orange.

Downmixing

This field will only be available when AES67 is enabled. Available values are: `none`, `mono`, and `stereo`.

Enable

Click this toggle switch to enable or disable the audio signal. When enabled (orange), audio will pass from the encoder to the decoder.

Destination IP address

Enter the multicast IP address that will be used to stream the content.

Destination UDP port

Enter the destination UDP port in this field.

TTL

Set the TTL (Time-To-Live) duration, from 1 to 255 seconds, in this field. The default value is 255 seconds.

DSCP

Click this drop-down list to select the DSCP value. Refer to [Differentiated Services Code Point \(page 110\)](#) for more information on this topic.

FEC enable

Click this toggle switch to enable (orange) or disable Forward Error Correction (FEC). This feature can be used when transporting streams over a network that is suspected to be unreliable, due to noise or other factors. By default, this feature is disabled. Refer to [FEC Details \(page 108\)](#) for more information.

FEC rows

Specify the number of FEC rows in this field. Refer to [FEC Details \(page 108\)](#) for more information.

FEC Columns

Specify the number of FEC columns in this field. Refer to [FEC Details \(page 108\)](#) for more information.

Audio	Source	hdmi_input1 ▾
	Enable AES67	<input type="checkbox"/>
	Enable	<input checked="" type="checkbox"/>
	Destination IP address	226.0.10.2
	Destination UDP port	1100
	TTL	255
	DSCP	Best effort ▾
	FEC enable	<input type="checkbox"/>
	FEC rows	4
	FEC columns	4

Configuration and Management Interfaces

AUX

Source

Click this drop-down list to select the method of how commands are transmitted.

Source	Description
Not Used	Serial control is disabled
Commands	Stored commands in the encoder are sent to the decoder serial port. Refer to Downstream Control using Triggering (page 40) for more information.
Serial Port 1	Commands are transmitted using Serial Port 1

Enable

Click this toggle switch to enable or disable the AUX signals. When enabled (orange), control signals will pass from the encoder to the decoder.

Destination IP address

Enter the IP address of the decoder that will be receiving the control signals.

Destination UDP port

Enter the destination UDP port in this field.

TTL

Set the TTL (Time-To-Live) duration, from 1 to 255 seconds, in this field. The default value is 255 seconds.

DSCP

Click this drop-down list to select the DSCP value. Refer to [Differentiated Services Code Point \(page 110\)](#) for more information on this topic.

Bidirectional

Click this toggle switch to enable or disable bidirectional control. When enabled (orange), control signals will be able to pass from encoder to decoder, or from decoder to encoder.

Listen port

Enter the listening port in this field.

SAVE

Click this button to commit all changes within the **Session** window group.

AUX

Source Commands ▾

Enable

Destination IP address 225.0.0.31

Destination UDP port 1200

TTL 255

DSCP Best effort ▾

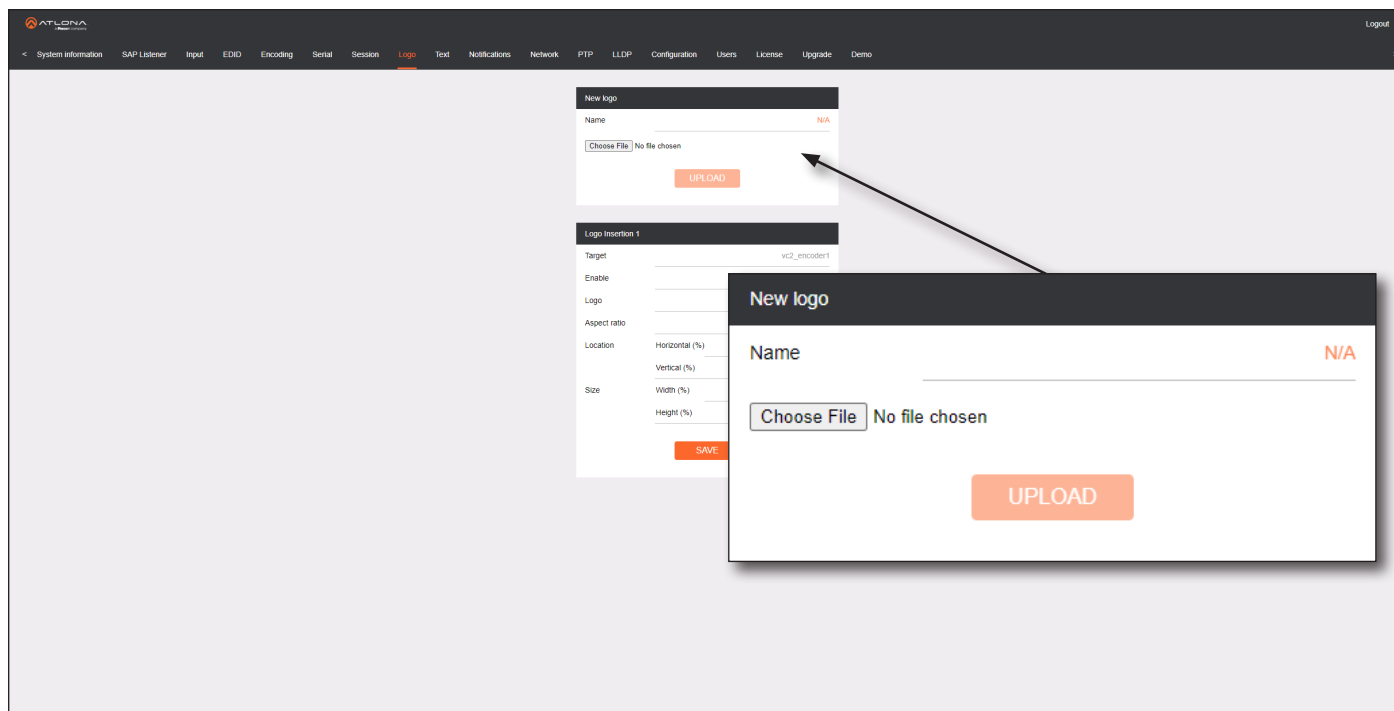
Bidirectional

Listen port 1204

SAVE

Configuration and Management Interfaces

Logo page



New logo window group

Name

Enter a name for the logo in this field.

Choose File

Click this button to select the logo file to be uploaded. Files must be in `.png` or `.svg` format and must not exceed 5 MB (5120000 bytes) in size. When an image file is uploaded, it will appear in the **Logo** drop-down list.

UPLOAD

Click this button to upload the logo file to the encoder.

Logo Insertion window group

Target

Displays the name of the encoder. This field cannot be changed.

Enabled

Click the toggle switch to enable or disable the logo. If the toggle switch is orange, then the logo will be enabled.

Logo

Click this drop-down list to select the desired logo. To disable the use of a logo, set to **Not Used**.

Aspect Ratio

Click this drop-down list to select the type of aspect ratio to be applied to the logo.

Logo Insertion 1	
Target	vc2_encoder1
Enable	<input type="checkbox"/>
Logo	Not used ▼

Configuration and Management Interfaces

Location

Horizontal (%)

Enter the horizontal position of the logo based on the resolution of the video stream.

Vertical (%)

Enter the vertical position of the logo based on the resolution of the video stream.

Size

Width (%)

Enter the width of the logo. This value is based on the horizontal resolution of the video stream.

Height (%)

Enter the height of the logo. This value is based on the vertical resolution of the video stream.

SAVE

Click this button to commit all changes within the **Logo Insertion** window group.

Aspect ratio	stretch ▼	
Location	Horizontal (%)	0
	Vertical (%)	0
Size	Width (%)	10
	Height (%)	10

SAVE

Configuration and Management Interfaces

Text page



Text insertion window group

Enabled

Click this toggle switch to enable or disable the text. When the toggle switch is orange, the text will be enabled.

Text

Enter the desired text in this field.

Scroll Speed

Enter the scrolling speed in this field. Integer values from -255 to 255 are valid. Negative numbers will scroll the text from left to right. Positive numbers will scroll text from right to left.

Iterations

Enter the number of iterations in the **Iteration** field. Set this field to 0 (zero) to set the number of iterations to infinity.

Color

Click this drop-down list to select a solid color preset: red, green, black, white, yellow, or blue.

Red, Green, Blue, Alpha

Click these fields to fine tune the color of the text. Integer values from 0 to 255 are valid for all fields. Adjust the **Alpha** field to control the transparency of the text. An alpha value of 255 is opaque and a value of 0 is transparent.

Configuration and Management Interfaces

Horizontal

Enter the horizontal position of the text, based on the resolution of the video stream.

Vertical

Enter the vertical position of the text, based on the resolution of the video stream.

Width

Enter the width of the text. This value is based on the horizontal resolution of the video stream.

Height

Enter the height of the text. This value is based on the vertical resolution of the video stream.

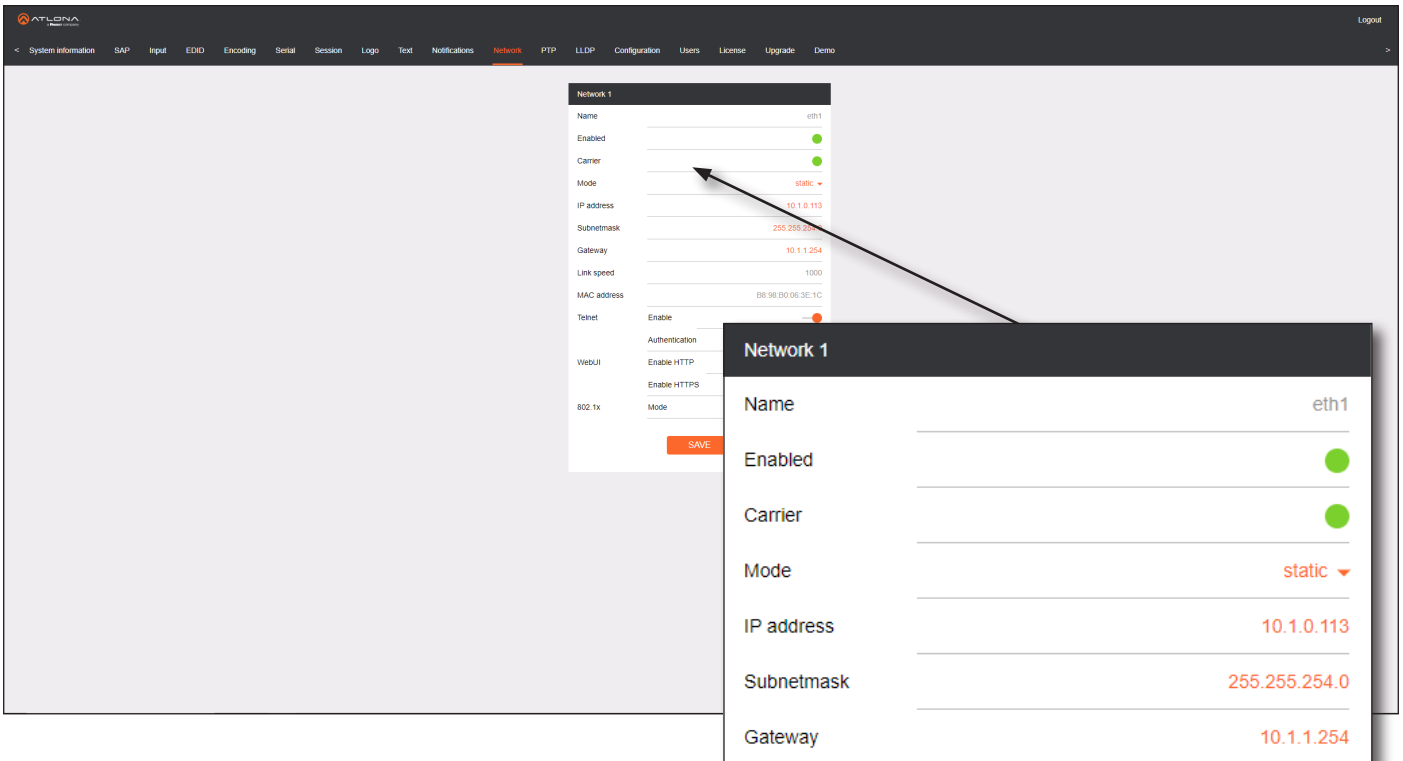
SAVE

Click this button to commit all changes within the **Text insertion** window group.

Location	Horizontal	<input type="text" value="0"/>
	Vertical	<input type="text" value="0"/>
Size	Width	<input type="text" value="10"/>
	Height	<input type="text" value="10"/>

Configuration and Management Interfaces

Network page



Network window groups

The AT-OMNI-111-WP has only one **Network** window group.

Name

Displays the name of the Ethernet interface. This field cannot be changed.

Enabled

This indicator displays the state of the Network Interface Card (NIC). If the indicator is green, then the NIC is in the up/up state.

Carrier

If this indicator is green, then an active link exists. Otherwise, if no link exists, this indicator will be red.

Mode

Click this drop-down list to select the desired IP mode. Select `DHCP` to let the DHCP server (if present) assign the encoder the IP settings. When `static` is selected, the information for the **IP Address**, **Subnetmask**, and **Gateway** fields must be entered.

IP Address

Displays the IP address used by the channel. This field can only be changed if **Mode** is set to `static`.

Subnetmask

Displays the subnet mask for the channel. This field can only be changed if **Mode** is set to `static`.

Gateway

Displays the gateway (router) address for the channel. This field can only be changed if **Mode** is set to `static`.

Configuration and Management Interfaces

Link speed

Displays the Ethernet interface link speed in Mbps. This field cannot be modified.

MAC address

Displays the MAC address of the Ethernet interface.

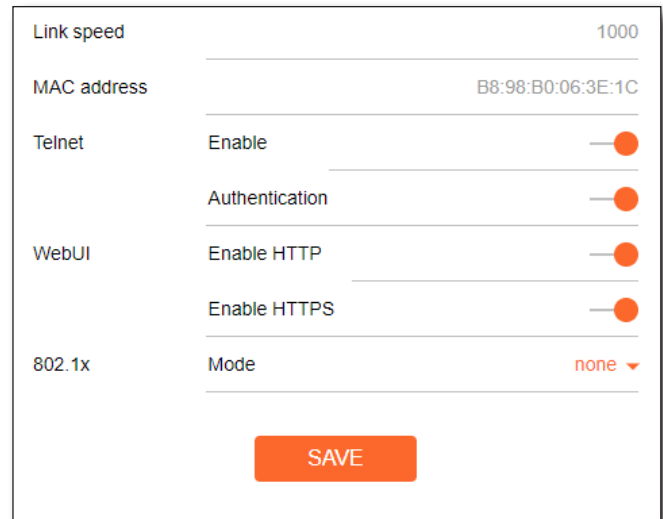
Telnet Enable

Click this toggle switch to enable or disable Telnet. If disabled, then Telnet sessions to the encoder cannot be established.

Telnet Authenticator

Click this toggle switch to enable or disable Telnet authentication. If enabled, then the toggle switch will be orange. Once enabled, connecting to the encoder using Telnet will require login credentials. The default credentials are:

Username: admin
Password: Atlona



Link speed	1000
MAC address	B8:98:B0:06:3E:1C
Telnet	Enable <input checked="" type="checkbox"/>
	Authentication <input checked="" type="checkbox"/>
WebUI	Enable HTTP <input checked="" type="checkbox"/>
	Enable HTTPS <input checked="" type="checkbox"/>
802.1x	Mode none ▼

SAVE

WebUI Enable HTTP

Click this toggle switch to enable or disable HTTP. If disabled, traffic on port 80 is forbidden.

WebUI Enable HTTPS

Click this toggle switch to enable or disable HTTPS. If disabled, traffic on port 443 is forbidden.

802.1x Mode

Click this drop-down list to select the desired authentication mode.

Protocol	Description
none	802.1X protocol disabled
PEAP/MSCHAPv2	Protected EAP; requires basic credentials in addition to a CA (certificate authority) certificate.
EAP-TLS	EAP Transport Layer Security; requires a client certificate, client private key, and CA (certificate authority) certificate.

SAVE

Click this button to commit all changes within the **Network** window group.

Configuration and Management Interfaces

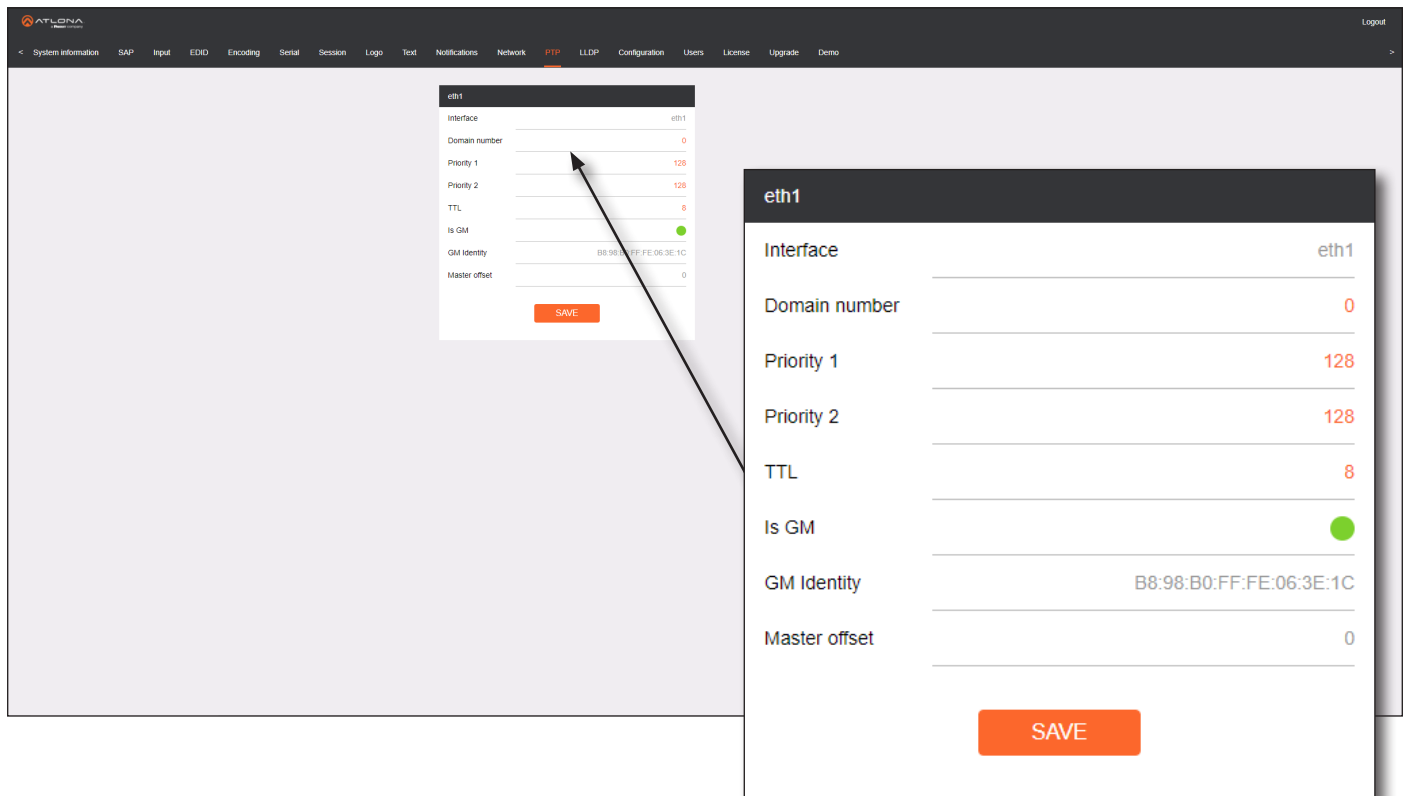
PTP page

The **PTP** page provides options for adjust Precision Time Protocol (PTP) for AES67 audio streams. PTP is used by AES67 to keep all audio streams synchronized.

For a system utilizing PTP, all devices undergo an automatic self-election process to choose the device to be used as the PTP grandmaster (GM) clock, based on the accuracy of the device's clock and the device's configured priority. A lower priority number means the device is more likely to get selected as the GM. OmniStream runs 1 PTP daemon per Ethernet interface.



IMPORTANT: If a new device is added to the network and the GM changes, a brief outage will be experienced while all connected devices synchronize with the new clock. Because of this, Atlona recommends that one unit gets manually defined as the GM and have both **Priority 1** and **Priority 2** fields be set to 1.



The screenshot shows the Atlona web interface with the PTP configuration page for interface eth1. The configuration window displays the following settings:

Field	Value
Interface	eth1
Domain number	0
Priority 1	128
Priority 2	128
TTL	8
Is GM	<input checked="" type="checkbox"/>
GM Identity	B8:98:B0:FF:FE:06:3E:1C
Master offset	0

eth1 window group

Interface

Displays the Ethernet interface associated with the PTP settings.

Domain Number

Enter the domain number in this field. Valid entries are 0 through 127.

Priority 1

Enter the priority number in this field.

Priority 2

Enter the priority number in this field.

Configuration and Management Interfaces

TTL

Displays the TTL value. The default IPV4 TTL value used for PTP is 8.

Is GM

If the indicator is green, then this interface is the PTP GM.

GM Identity

The grandmaster clock identity.

Master Offset

Displays the grandmaster clock offset.

SAVE

Click this button to commit all changes.

eth1

Interface	eth1
Domain number	0
Priority 1	128
Priority 2	128
TTL	8
Is GM	●
GM Identity	B8:98:B0:FF:FE:06:3E:1C
Master offset	0

SAVE

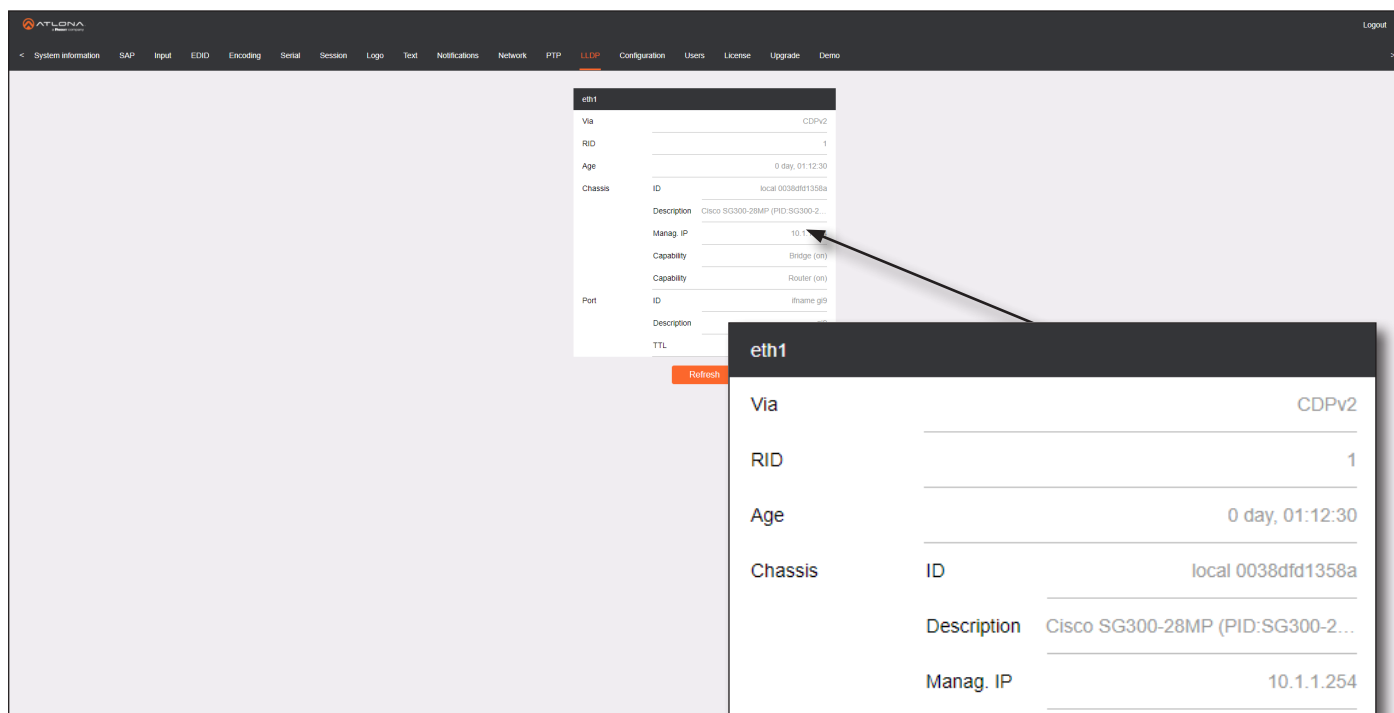
Configuration and Management Interfaces

LLDP page

The Link Layer Discovery Protocol (LLDP) page returns information about the switch that the encoder is connected to. If both interfaces from a dual-channel encoder are connected to the switch, then two **eth** window groups will be displayed.



NOTE: LLDP must be enabled on the switch that the encoders are connected to, in order for the switch information to be displayed.



Via

The discovery protocol being used.

RID

The router ID.

Age

Up-time of the interface.

Chassis ID

The MAC address of the interface.

Chassis Capability

Indicates the device function, such as bridge (switch), router, etc.

Port ID

The port ID.

Port Description

The type of port, such as gigabit Ethernet, fast Ethernet, etc.

TTL

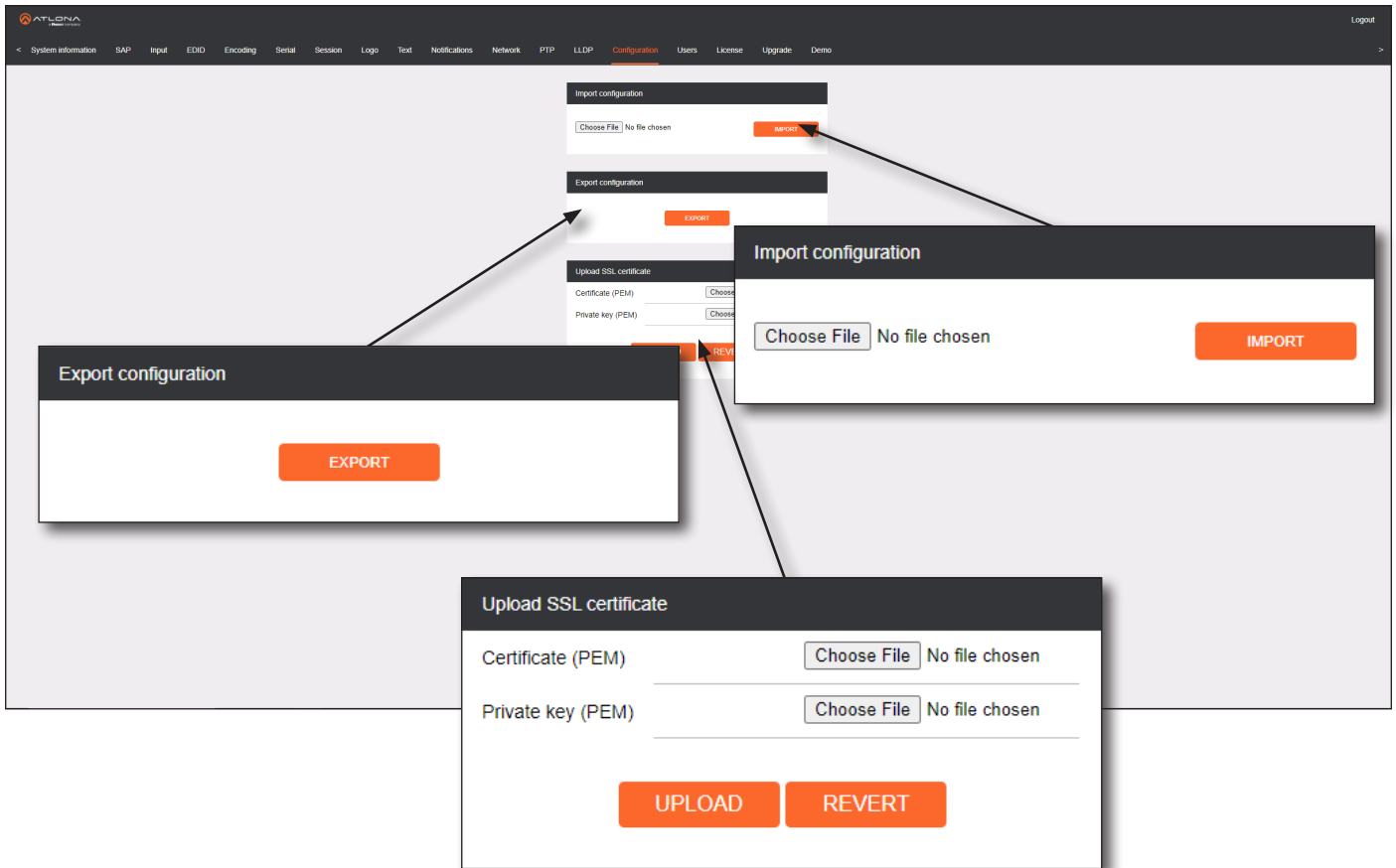
The Time-To-Live value.

Refresh

Click this button to refresh the page after a port change.

Configuration and Management Interfaces

Configuration page



Import configuration

Choose File

Click this button to select the desired configuration file to be uploaded.

IMPORT

Click this button to upload the selected configuration file to the encoder. The hostname, specific to the configuration filename, will be ignored.

Export configuration

EXPORT

Click this button to export the current encoder system configuration to a .json file.

Upload SSL certificate

Choose File

Click these buttons to select the desired certificate or private key.

UPLOAD

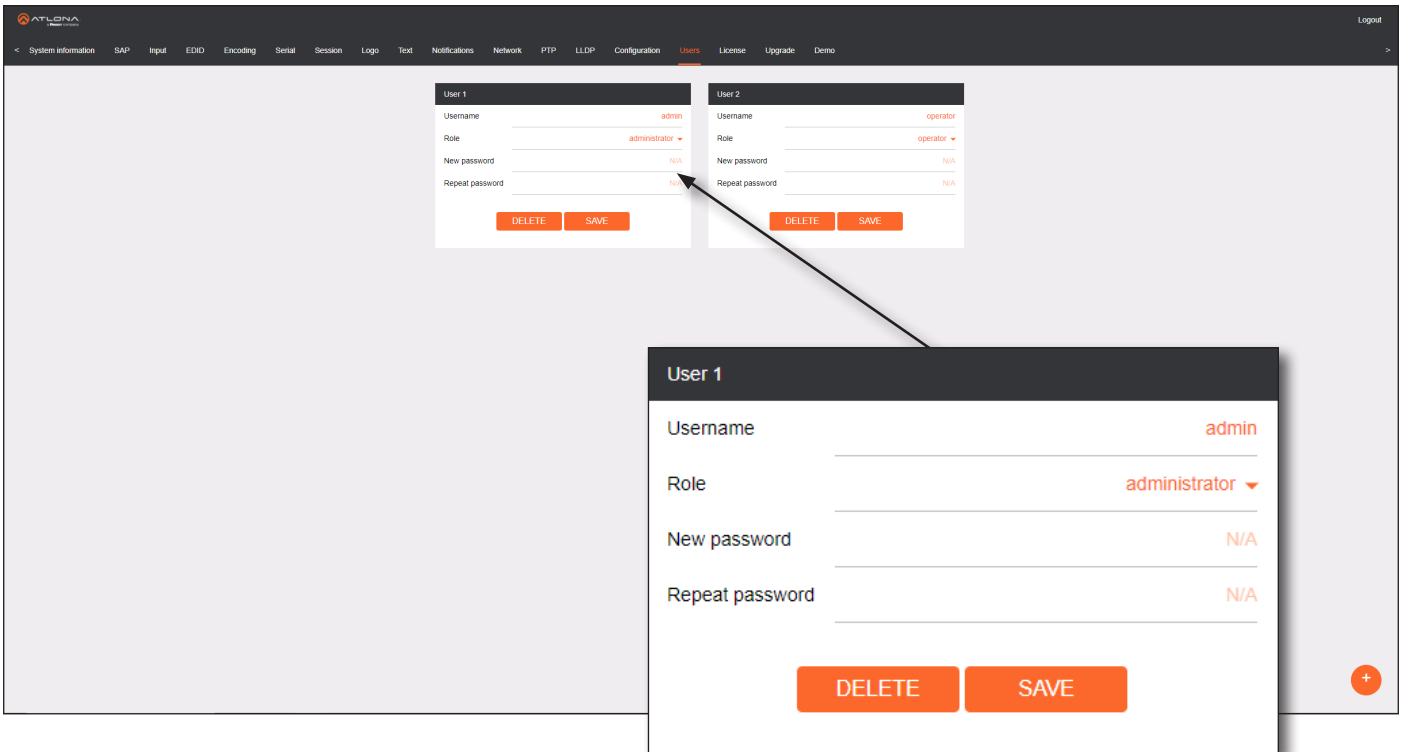
Click this button to upload the certificate/private key to the encoder.

REVERT

Click this button to restore the previous configuration.

Configuration and Management Interfaces

Users page



User window groups

The following fields apply to all **User** window groups. Encoders have two usernames, by default: **admin** and **operator**.

Username

Enter the desired username in this field.

Role

Click this drop-down list to select the desired role of the user.

New password

Enter the desired password for the username in this field.

Repeat password

Confirm the new password by entering it in this field.

DELETE

Click this button to delete the user in the current window group. Note that there must be at least one admin role at all times. Therefore, if one **admin** role and one **operator** role exist, then the **admin** user cannot be deleted.

SAVE

Click this button to commit all changes within the current user window group.



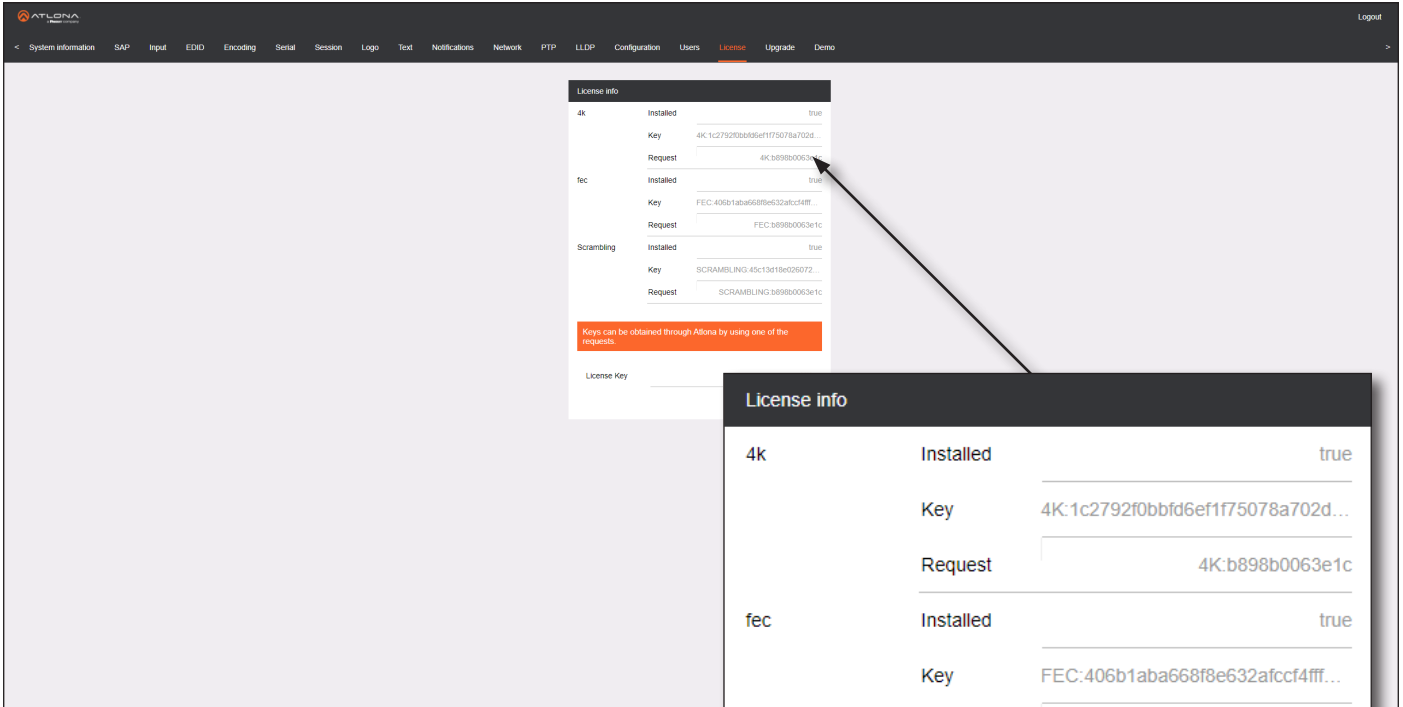
New user

Click this button to create a new user. Provide the role and password, as described in the fields above.

Configuration and Management Interfaces

License page

This page displays all installed licenses and allows additional licenses to be installed.

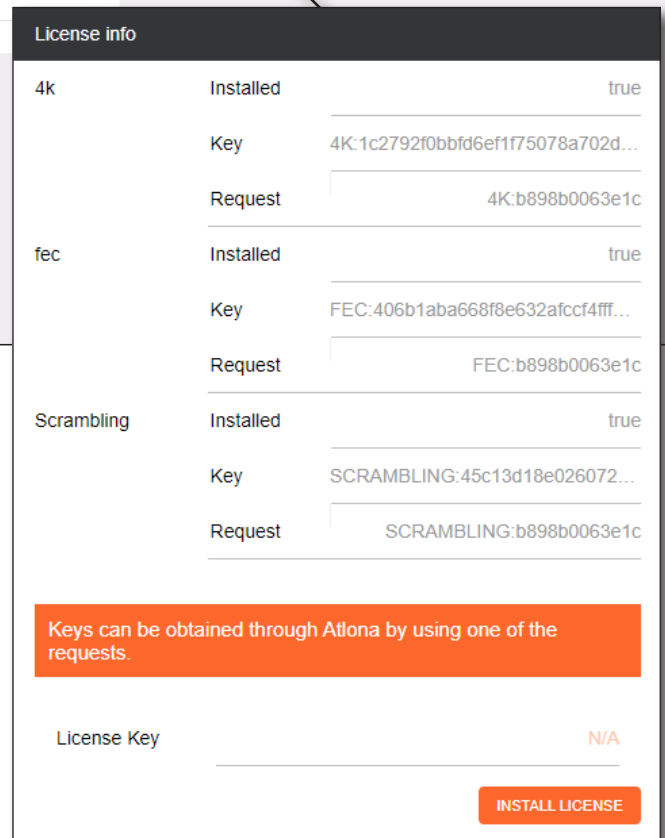


License Key

Enter the license key in this field.

INSTALL LICENSE

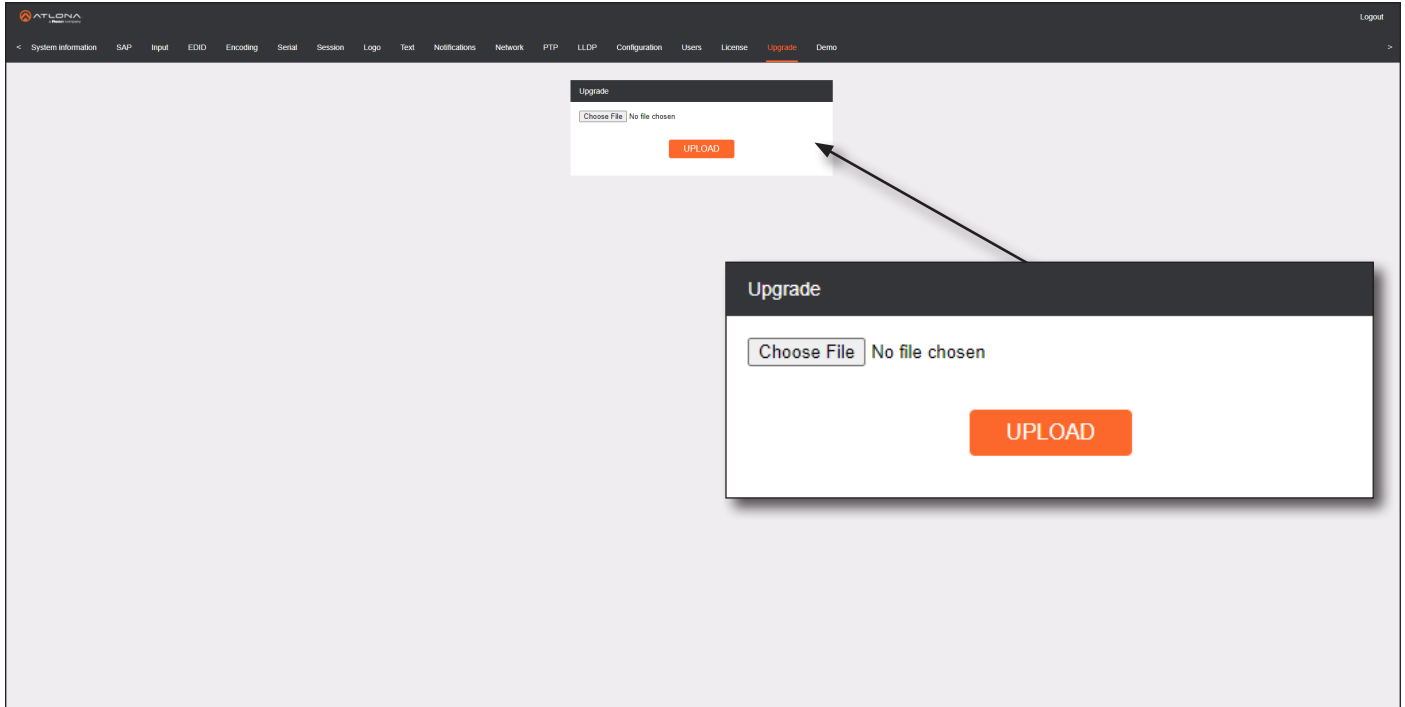
Click this button to validate and install the license.



Configuration and Management Interfaces

Upgrade page

This page is used to update the firmware on the encoder.



Choose File

Click this button to select the firmware file to be uploaded.

UPLOAD

Click this button to upload the selected firmware file.

Appendix

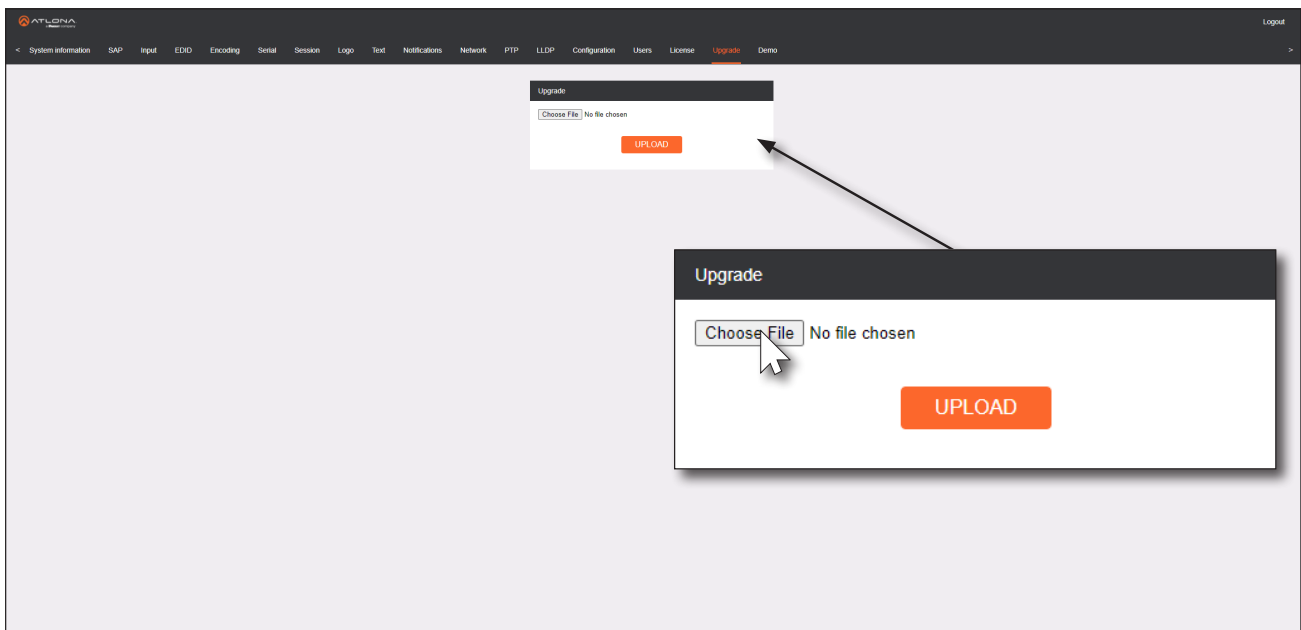
Updating the Firmware

Follow the procedure below to update OmniStream units using the built-in web server.

1. Launch the desired web browser and enter the IP address of the encoder/decoder in the address bar.
2. Enter the username and password. Note that the password field will always be masked. The default credentials are:

Username: admin
 Password: Atlona

3. The **System Information** page will be displayed.
4. Click **Upgrade** in the menu bar to display the **Upgrade** page.
5. Click the **Choose File** button.



6. In the **Open** dialog box, select the correct firmware file. Refer to the table below.

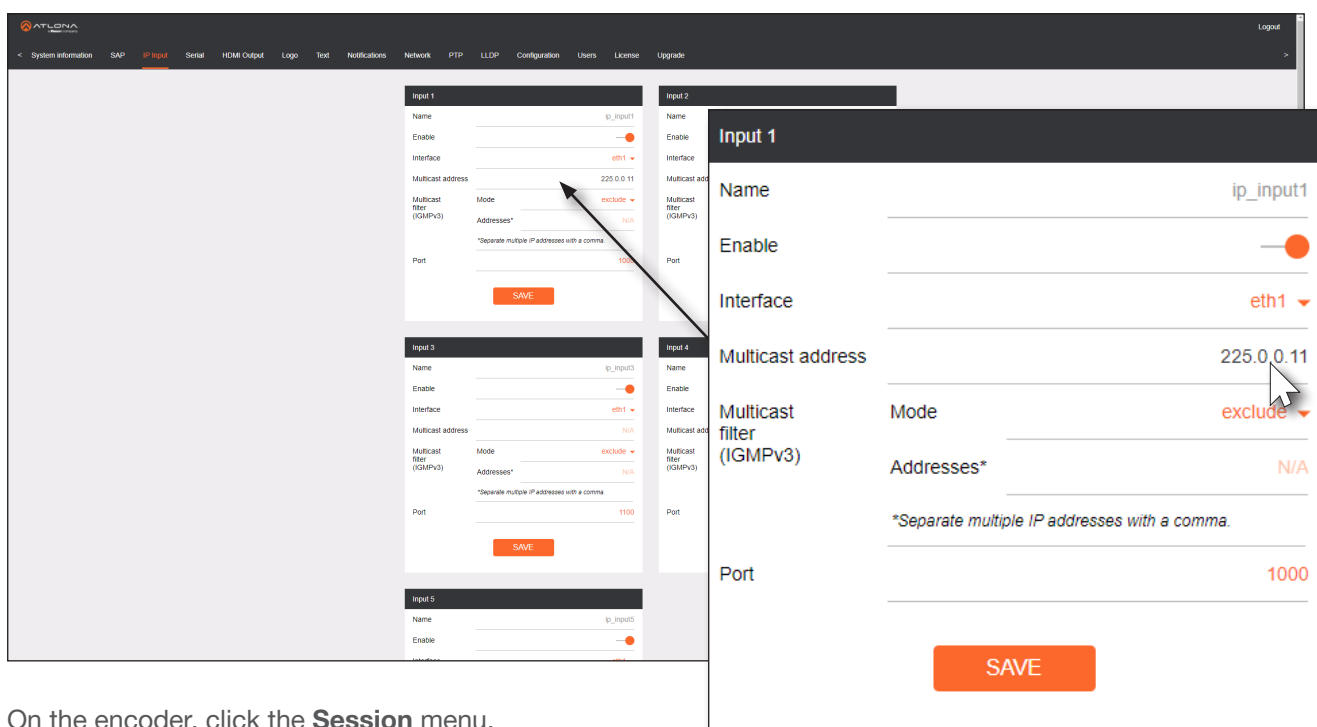
Firmware file	OmniStream SKU
at-omni-single-upgrd-os-[version].vpup2	AT-OMNI-111 AT-OMNI-121 AT-OMNI-111-WP
at-omni-dual-upgrd-os-[version].vpup2	AT-OMNI-112 AT-OMNI-122
at-omni-residential-upgrd-os-[version].vpup2	AT-OMNI-512 AT-OMNI-521

7. Click the **UPLOAD** button.
8. A progress bar will be displayed, indicating the current upgrade status of the unit. When firmware update process has completed, the **Upgrade** page will be displayed.
9. The upgrade process is complete.

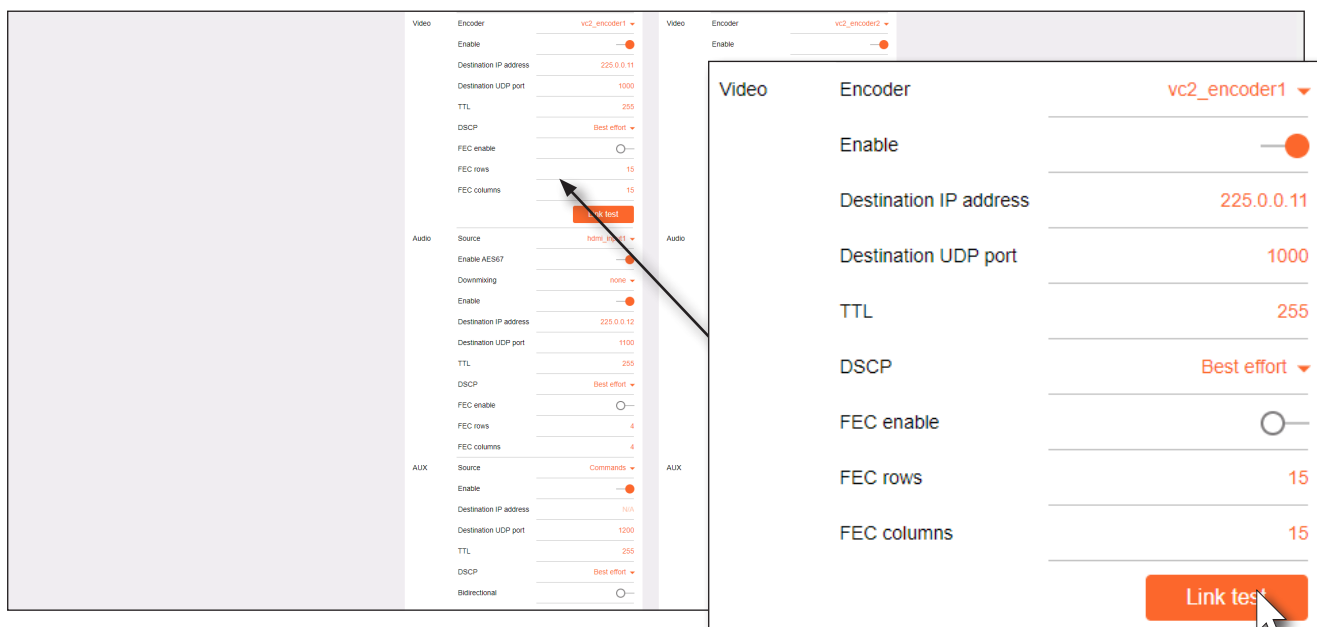
Performing a Link Test

Follow the procedure below to perform a link integrity test between an encoder and decoder(s).

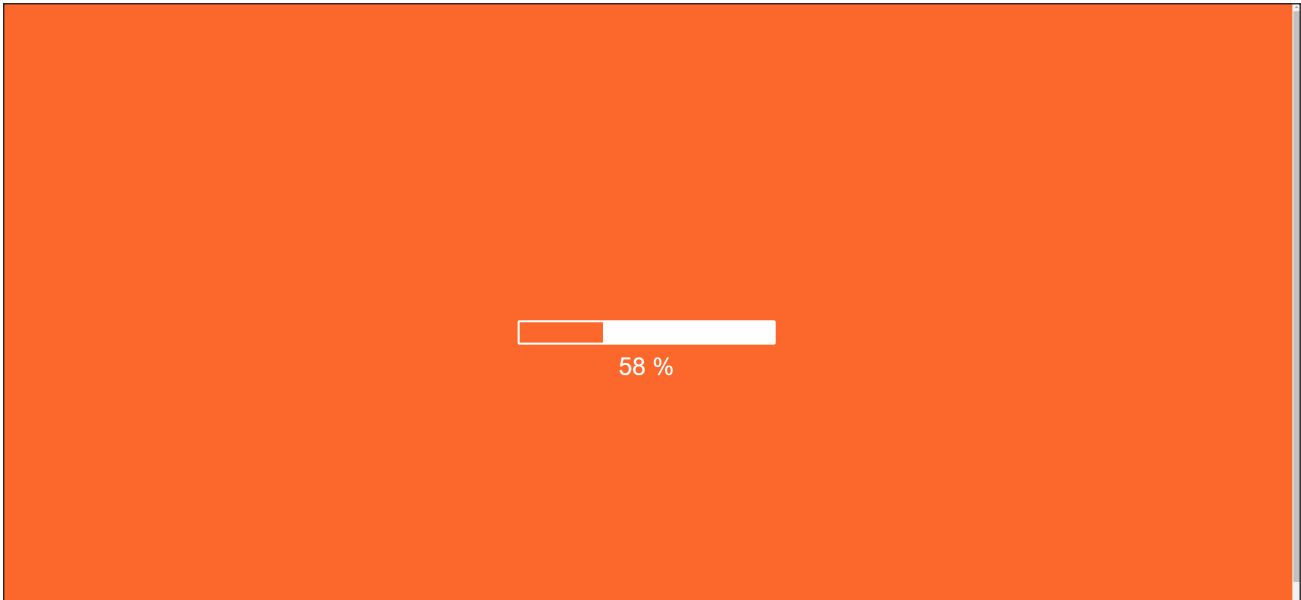
1. Launch a web browser and enter the IP address of the encoder in the address bar.
2. Open another tab in the browser and enter the IP address of the subscribing decoder in the address bar.
3. Verify that all desired decoders are subscribed to the encoder's multicast address and port number. In the decoder example below, the **IP Input > Input 1 > Multicast address** field is set to 225.0.0.11. This is the same IP address that is assigned to the **Session > Session 1 > Destination IP address** field on the encoder.



4. On the encoder, click the **Session** menu.
5. Under the **Video** section, click the **Link test** button.

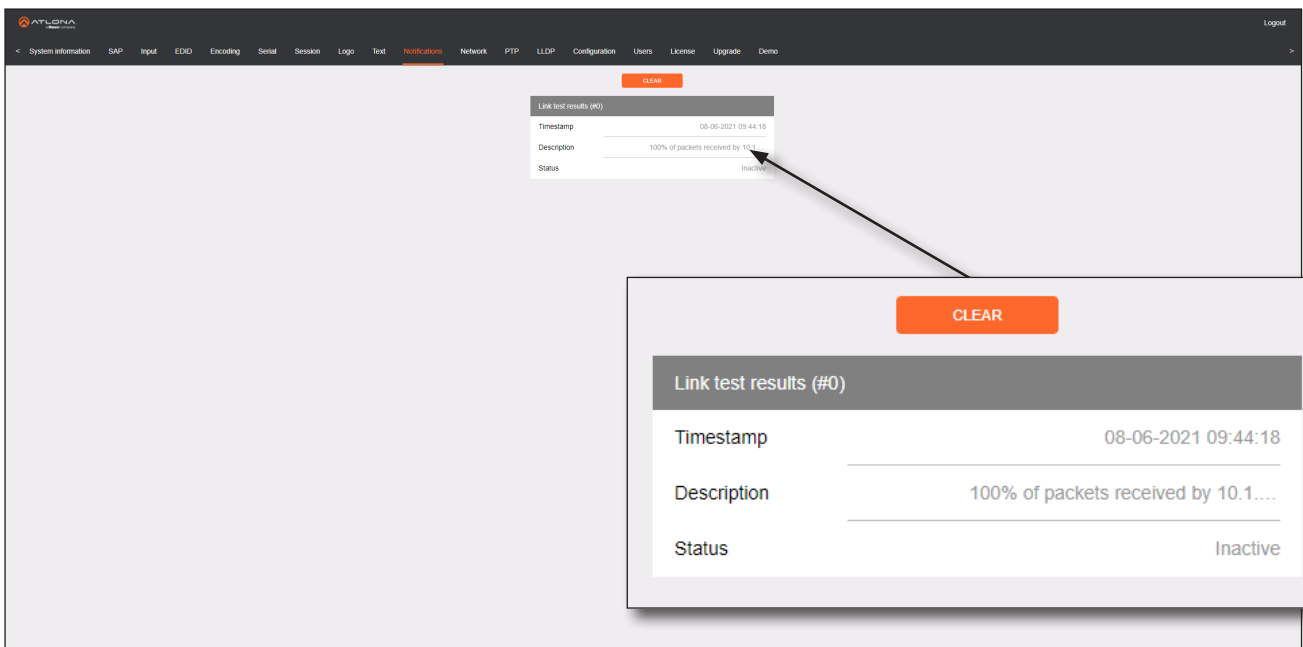


- An orange screen with a progress bar will be displayed during the testing procedure.

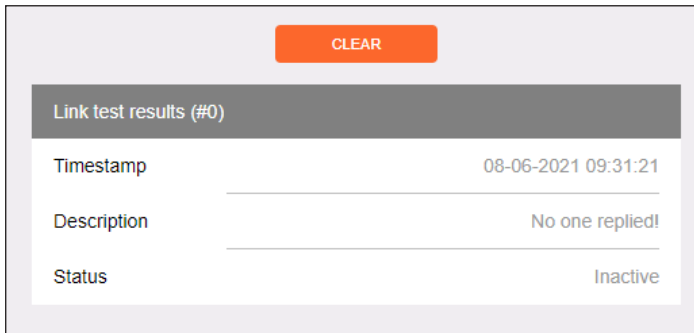


- After the test, the encoder web page will automatically redirect to the **Notifications** tab where the user can see the results.

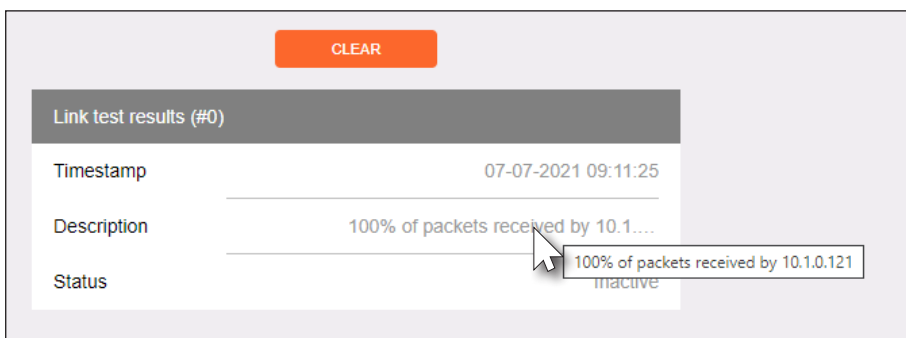
If the test passed, information similar to the following will be displayed. Note the information in the **Description** field: "100% of packets received by ..." indicates no packets were dropped / zero loss.



If the test fails, it could be that less than 100% of packets are received, indicating connectivity, but with some amount of packet loss. If it shows “No one replied!” or if the target decoder is not shown in results, it could indicate that there is a connectivity issue or that the decoder is not subscribed to the correct video multicast address.



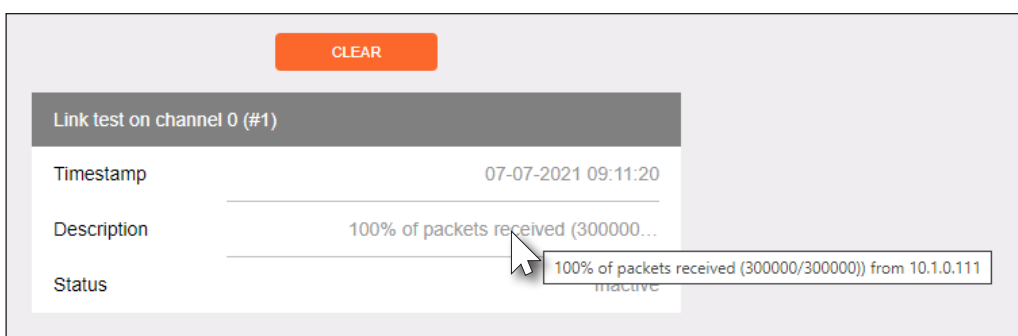
Hovering the mouse over the **Description** field will provide the full IP address of each decoder which received the test, as shown below. If multiple decoders were tested, additional IP addresses will be displayed.



- Go to the **Notifications** menu on the decoder.

If the test passed, information similar to the following will be displayed. Note the information in the **Description** field: “100% of packets received ...” indicates no packets were dropped / zero loss.

Hovering the mouse over the **Description** field will display the full IP address of the encoder from where the packets originated.



- Click the **CLEAR** button to remove the test results from the **Notification** page.

FEC Details

Matrix Size, Overhead, and Latency

- FEC can only work if a single packet from each row/column is missing. Multiple packets missing from each row/column will cause FEC to fail.
- Due to the above, a smaller matrix is more robust, as there is a better chance of errors not occurring in the same row/column.
- FEC has a bitrate overhead that is inversely proportional to the matrix size: the bigger the matrix, the less bitrate overhead is generated.
- FEC has a latency overhead that is directly proportional to the matrix size: the bigger the matrix, the more latency is introduced.
 - » As of v1.0.0, OmniStream does not explicitly synchronize audio and video. Therefore, FEC configuration can have a noticeable impact on lip sync. The tables below should be used to keep the audio/video lip sync as tight as possible.
- FEC latency overhead is also inversely proportional to bitrate: the higher the bitrate, the less FEC latency is introduced.
 - » For applications where lip sync is very critical, using a higher audio sampling rate, and thus a higher audio bitrate, can result in more accurate lip sync.

FEC and Video Bitrate

- The bitrate configured on the video encoder includes FEC overhead and will automatically adjust itself depending on the bitrate needed for FEC.
- FEC overhead can be calculated using the following formulas:

$$Video\ rate = \frac{Configured\ bit\ rate}{1 + \left(\frac{Rows + Columns}{Rows \times Columns} \right)} \qquad FEC\ rate = Configured\ bit\ rate - Video\ rate$$

- The following table provides a few examples of how this works.

FEC / matrix usage	Configured bit rate	Used for video	Used for FEC
FEC disabled	900 Mbps	900 Mbps	0 Mbps
FEC enabled, 4x4	900 Mbps	600 Mbps	300 Mbps
FEC enabled, 10x10	900 Mbps	750 Mbps	150 Mbps
FEC enabled, 20x20	900 Mbps	818 Mbps	82 Mbps
FEC enabled, 4x4	450 Mbps	300 Mbps	150 Mbps
FEC enabled, 10x10	450 Mbps	375 Mbps	75 Mbps
FEC enabled, 20x20	450 Mbps	409 Mbps	41 Mbps

FEC, Latency, and Lip Sync

- In order for FEC to work, the matrix must be filled in order to calculate the FEC packets. This introduces some additional latency. Due to high bitrates, this is not noticeable for video, but can be very significant for audio. Therefore, Atlona recommends either leaving FEC disabled for audio or using a very small matrix.
- Latency calculations are complex. The tables below provide some common working benchmarks. In order to minimize lip sync issues, try to match the additional latencies for video and audio as closely as possible.
 - » Video - additional video latency for enabling FEC using various matrix sizes.

Configured bit rate	4x4	10x10	20x20
900 Mbps	0.64 ms	3.20 ms	11.74 ms
450 Mbps	1.28 ms	6.40 ms	23.47 ms

- » Audio - additional audio latency for enabling FEC using various matrix sizes.

Format	1x4	2x4	4x4	10x10
2 channel PCM, 44.1 kHz	34.01 ms	68.03 ms	136.10 ms	850.30 ms
2 channel PCM, 48 kHz	31.25 ms	62.50 ms	125.00 ms	781.30 ms
2 channel PCM, 96 kHz	15.63 ms	31.25 ms	62.50 ms	390.60 ms
2 channel PCM, 192 kHz	7.81 ms	15.63 ms	31.25 ms	195.30 ms

- It is recommended to keep lip sync within ± 1 frame of video to prevent any noticeable syncing issues.
- Examples of good choices to minimize lip sync issues are:
 - » Video configured for 450 Mbps, FEC 10x10; Audio is 2 channel PCM, 192 kHz, FEC 1x4: 6.40 ms – 7.81 ms = -1.41 ms
 - » Video configured for 900 Mbps, FEC 10x10; Audio is 2 channel PCM, 48 kHz, FEC disabled: 6.40 ms – 0 ms = 6.40 ms

Differentiated Services Code Point

Differentiated Services Code Point (DSCP) is a method of managing network traffic, in addition to providing *Quality of Service* (QoS) within the Layer-3 (Network Layer) of the OSI network model. DSCP uses the 6-bit Differentiated Services (DS) field in the IP header in order to determine packet classification/priority. Normally, all routers and switches will forward network traffic to the proper destination with the same priority, no matter what type of data it is. This methodology is what is known as *Best Effort*.

The *Best Effort* setting will provide normal priority for data packets, while other settings will raise the priority on data packets. However, it should be noted that a higher priority setting on one type of data type may also result in data packet loss for other data types, depending upon network traffic.

When QoS or differentiated services policy is used, all network devices such as routers, networks switches, and end-devices must be configured properly in accordance with QoS policies on the network. There are two main methodologies for tagging traffic: *Assured Forwarding (AF)* and *Class Selectors (CS)*.

The tables below provide a list of the available selections and their description.



IMPORTANT: Consult the IT administrator as to what methods to use and the required settings for each encoder on the network.

Table 1 - Assured Forwarding

Selection	Queue Classification	Drop Probability
AF11	Class 1	Low
AF21	Class 2	Low
AF31	Class 3	Low
AF41	Class 4	Low

Table 2 - Class Selectors

Selection	Class Selector Name
CS0 / Best Effort	Routine
CS1	Priority
CS2	Immediate
CS3	Flash
CS4	Flash Override
CS5	Critical
CS6	Interwork Control
CS7	Network Control
EF	Expedited Forwarding

Specifications

Video		
Signal	HDMI	
Copy Protection	HDCP 2.2	
UHD/HD/SD	4096x2160 (DCI) @ 30/24 Hz 3840x2160 (UHD) ⁽²⁾ @ 60/50/24/25/30 Hz 1920x1080p @ 23.98/24/25/29.97/30/50/59.94/60 Hz 1920x1080i ⁽¹⁾ @ 25/29.97/30 Hz	1280x720p @ 30/50/59.94/60 Hz 720x576p @ 50 Hz 720x576i @ 25 Hz 720x480p @ 59.94/60 Hz 720x480i @ 29.97/30 Hz
VESA ⁽³⁾	2560x1600 1920x1200 1680x1050 1600x1200 1600x900 1440x900 1400x1050	1366x768 1360x768 1280x1024 1280x800 1280x768 1152x768 1024x768
Virtual Reality	2160x1200 @ 90 ⁽⁴⁾ Hz (HTC [®] Vive)	
Color Space	YUV, RGB	

Encoding				
Density	Single encoding engine			
Compression Format	VCx and VC-2 (SMPTE-2042)			
Video Quality Optimization	User-selectable: PC Application or Video mode (VC-2 codec only)			
Chroma Subsampling	Chroma	VCx	VC-2 Video	VC-2 PC Application
	4:4:4	Yes	No	Yes
	4:2:2	Yes	No	Yes
	4:2:0	Yes	Yes	No
Color Depth	8-bit, 10-bit, 12-bit			
HDR	HDR10, HLG, Dolby [®] Vision™			
Bit Rate	Configurable up to 900 Mbps			
Scaler ⁽⁵⁾	Encoder 1			
	Up and down, 3840x2160 max.			
Latency	0.5 frame (e.g. 1080p @ 60 Hz latency is < 8 ms between encoder and decoder). 1.5 frames in Fast Switching mode (e.g. 1080p @ 60 Hz latency is < 24 ms between encoder and decoder). Note: Unusual network configurations may increase overall latency.			
Thumbnails	Number of thumbnails: 1 per HDMI input Resolution: 320x180px File format: JPG Update frequency: 2 seconds			

Audio			
Pass-through	LPCM 2.0	Dolby [®] Digital	Dolby Atmos [®]
	LPCM 5.1	Dolby Digital Plus	DTS [®]
	LPCM 7.1	Dolby TrueHD	DTS-HD Master Audio™
Down-mixing	Multichannel LPCM to two-channel LPCM		
Sample Rate	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz		
Bit Depth	Up to 24-bit		

Protocols	
Video Streaming	RTP
Audio Streaming	RTP, up to 7.1 channels AES67, up to LPCM 7.1 channels
Addressing	DHCP, static
Encryption	AES-128
QoS Tagging	RFC 2475
Discovery	Multicast DNS, LLDP, SAP
Management	HTTPS, SSH, Telnet, and WebSockets with TLS
Authentication	IEEE 802.1x: PEAP/MSCHAPv2 or EAP-TLS
IP Multicast	IGMPv2 and IGMPv3 support

Graphics Features	
Text Insertion	Adjustable height/width, scrolling (speed, direction, or static), iterations (up to infinite), positioning, and adjustable color and alpha (transparency) channels.
Slate / Logo Insertion	PNG file format, adjustable aspect ratio (keep or stretch), horizontal/vertical size, screen position; slate mode can be set to off, manual (image always displayed, superimposed on the source signal, and will remain if source signal is lost), auto (image will only be displayed when source signal is lost).

Connectors	
HDMI IN	1 - Type A, 19-pin, female, locking
ETHERNET ⁽⁶⁾	1 - RJ45, 10/100/1000 Mbps

Indicators and Controls	
PWR	1 - LED, tricolor (red, amber, green)
HDMI	1 - LED, bicolor (red, green)
LINK	1 - LED, bicolor (red, green)
RESET	1 - Momentary, tact-type

Power	
PoE	IEEE 802.3af
Consumption	Up to 12 W
BTU/h	40.9

Environmental	
Cooling System	Front-to-rear airflow, temperature-controlled fans
Operating Temperature	+14 to +104 °F (+14 to +95 °F when used with a 4K source) -10 to +40 °C (-10 to +35 °C when used with a 4K source)
Storage Temperature	+14 to +140 °F -10 to +60 °C
Operating Humidity (RH)	20% to 95%, non-condensing

Chassis	
Dimensions (H x W x D)	4.19 in x 3.46 in x 1.72 in 106.50 mm x 88 mm x 43.65 mm
Weight	0.46 lbs 0.21 kg

Certification	
Device	CE, FCC, CB, RoHS
Compliance	
NDAA-889	Yes
TAA	Yes
Warranty	
Device	10 years

Footnotes

- (1) Interlaced sources are passed-through without modification, and do not support scaling, video wall, logo insertion, text insertion, or fast switching.
- (2) Due to thermal constraints, 4K50 and 4K60 resolutions are only supported when the input resolution has 4:2:0 chroma subsampling.
- (3) All VESA resolutions are 60 Hz.
- (4) Only supported when System Mode is set to VC-2 Video mode.
- (5) Scaler is limited to a fixed list of resolutions. Refer to documentation for more information.
- (6) Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.

