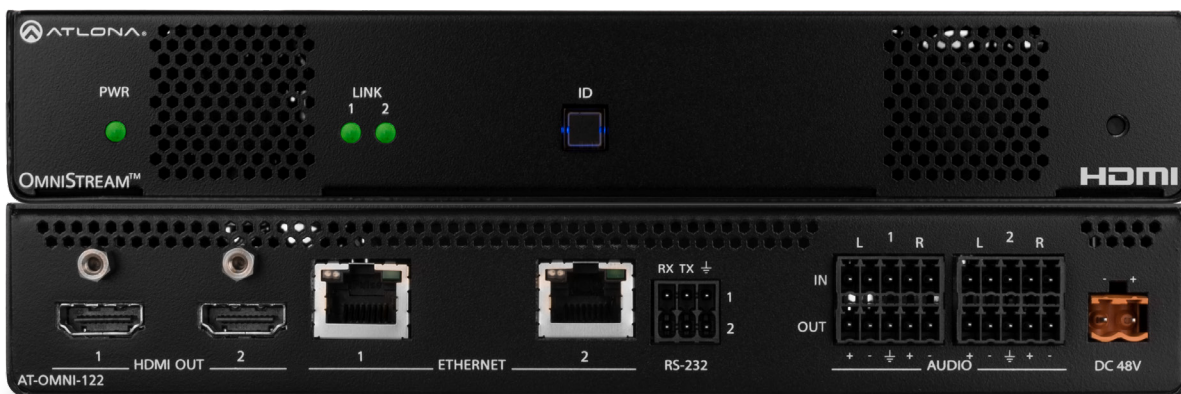


# OmniStream™ Single-Channel / Dual-Channel Networked AV Decoder



## Version Information

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Version	Release Date	Notes
15	May 2023	<ul style="list-style-type: none"><li>- Various documentation improvements.</li><li>- Updated to include features for firmware version 2.0.</li></ul> <i>For a complete list of features, bug fixes and known issues, refer to the AT-OMNI-1XX / AT-OMNI-5XX Release Notes.</i>

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---

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## Operating Notes

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**IMPORTANT:** The AT-OMNI-122 does *not* support VCx mode. Installations that use the AT-OMNI-122 should make sure that all devices in the system are on the same VC-2 mode. Refer to [System information page \(page 89\)](#) for more information.



**IMPORTANT:** Visit <http://www.atlona.com/product/AT-OMNI-121> for the latest firmware updates and User Manual.

## Warranty

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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.



## FCC Compliance

FCC Compliance and Advisory Statement: This hardware device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed or used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: 1) reorient or relocate the receiving antenna; 2) increase the separation between the equipment and the receiver; 3) connect the equipment to an outlet on a circuit different from that to which the receiver is connected; 4) consult the dealer or an experienced radio/TV technician for help. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Where shielded interface cables have been provided with the product or specified additional components or accessories elsewhere defined to be used with the installation of the product, they must be used in order to ensure compliance with FCC regulations.

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## Introduction

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The Atlona **AT-OMNI-121** is a networked AV decoder for HDMI / HDCP 2.2 output supporting resolutions up to 4K/60 4:4:4 and HDR (High Dynamic Range), plus audio embedding and de-embedding, and RS-232 or IR control pass-through. **OmniStream** is designed for high performance, flexible distribution of AV over standard, off-the-shelf Gigabit Ethernet switches in commercial audiovisual applications. The OMNI-121 decoder features the advanced VCx™ codec which delivers 4K/60 4:4:4 video from encode to decode, with artifact-free presentation of computer-generated content and fast-motion video, and ultra-low latency less than one frame. Additionally, the OMNI-121 features multiview window processing, with the ability to ingest up to four streams from AT-OMNI-111 encoders and display them simultaneously on a single screen. This decoder is housed in a half-width rack enclosure with front-to-back air flow, and is ideal for high-density, compact installation in distributed, multi-display installations.

## Features

---

- Best-in-class AV over IP performance and reliability over Gigabit Ethernet
- AV encoder for HDMI up to 4K/UHD, plus embedded audio and RS-232 or IR control pass-through
- Supports 4K/60 4:4:4 plus HDR formats
- Advanced VCx codec
- High-efficiency coding
- Integrated high-quality scaler
- HDCP compliance
- Ultra-fast switching between 4K/60 video streams(1)
- Encoder grouping
- Multiview window processing (with AT-OMNI-111 encoder)
- 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
- Local or PoE (Power over Ethernet) powering
- Secure content distribution with AES-128 encryption
- Supports industry-standard, network security features and protocols
- AES67-compatible
- Audio embedding and de-embedding(2)
- Video wall processing
- Enhance AV presentations with visual enhancements
- EDID management
- Audio processing and pass-through
- Display control
- System management
- Compact enclosure

## Package Contents

---

### OmniStream Single-Channel Decoder

1 x AT-OMNI-121  
1 x Captive screw connector, 3-pin  
1 x Captive screw connector, 5-pin  
1 x Push spring connector, 6-pin  
2 x Push spring connectors, 5-pin  
2 x Wall/table mounting brackets

### OmniStream Dual-Channel Decoder

1 x AT-OMNI-122  
1 x Push spring connector, 6-pin  
1 x Captive screw connector, 3-pin  
2 x Captive screw connectors, 5-pin  
4 x Push spring connectors, 5-pin  
2 x Wall/table mounting brackets  
4 x Rubber feet



# 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.

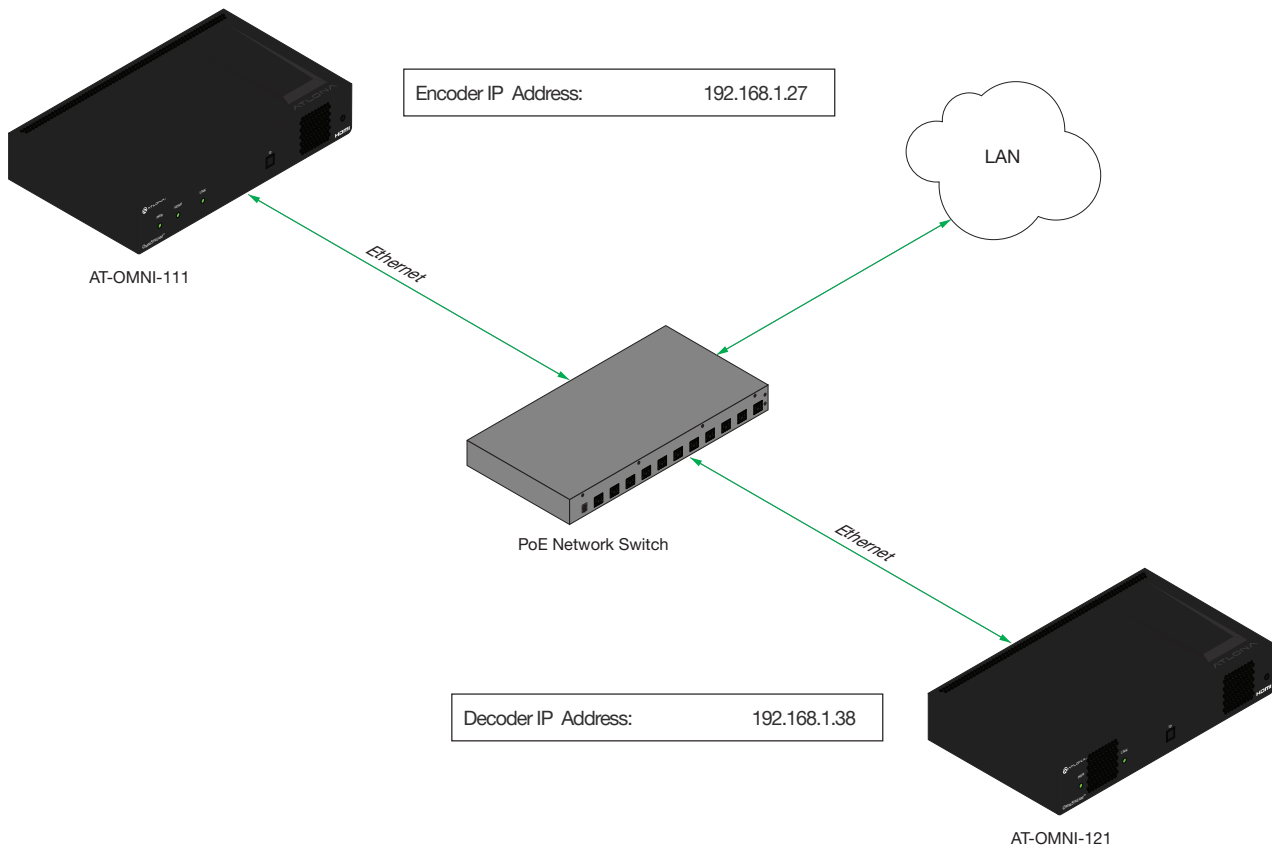
*Decoder* – Receives and decompresses signals from an encoder and sends them to an output device, such as a display or other sink device.

*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.*



## Introduction to OmniStream

### 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 is much more desirable than using 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 IR and 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.

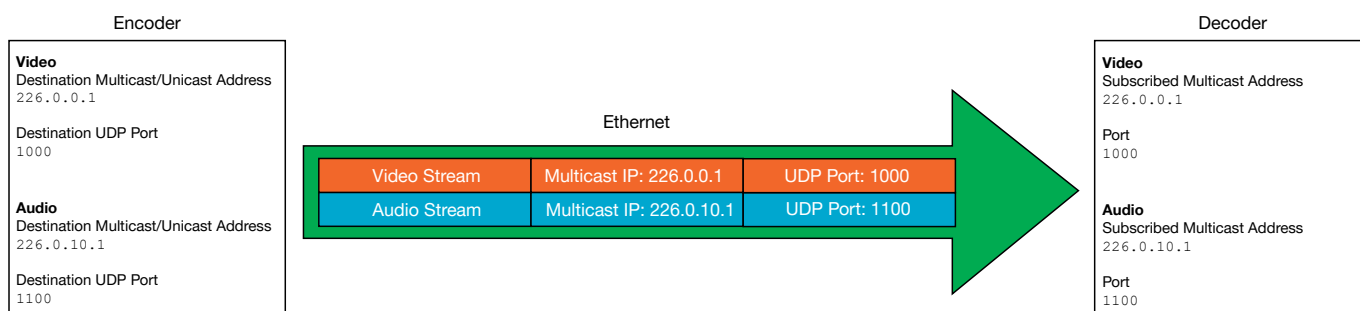
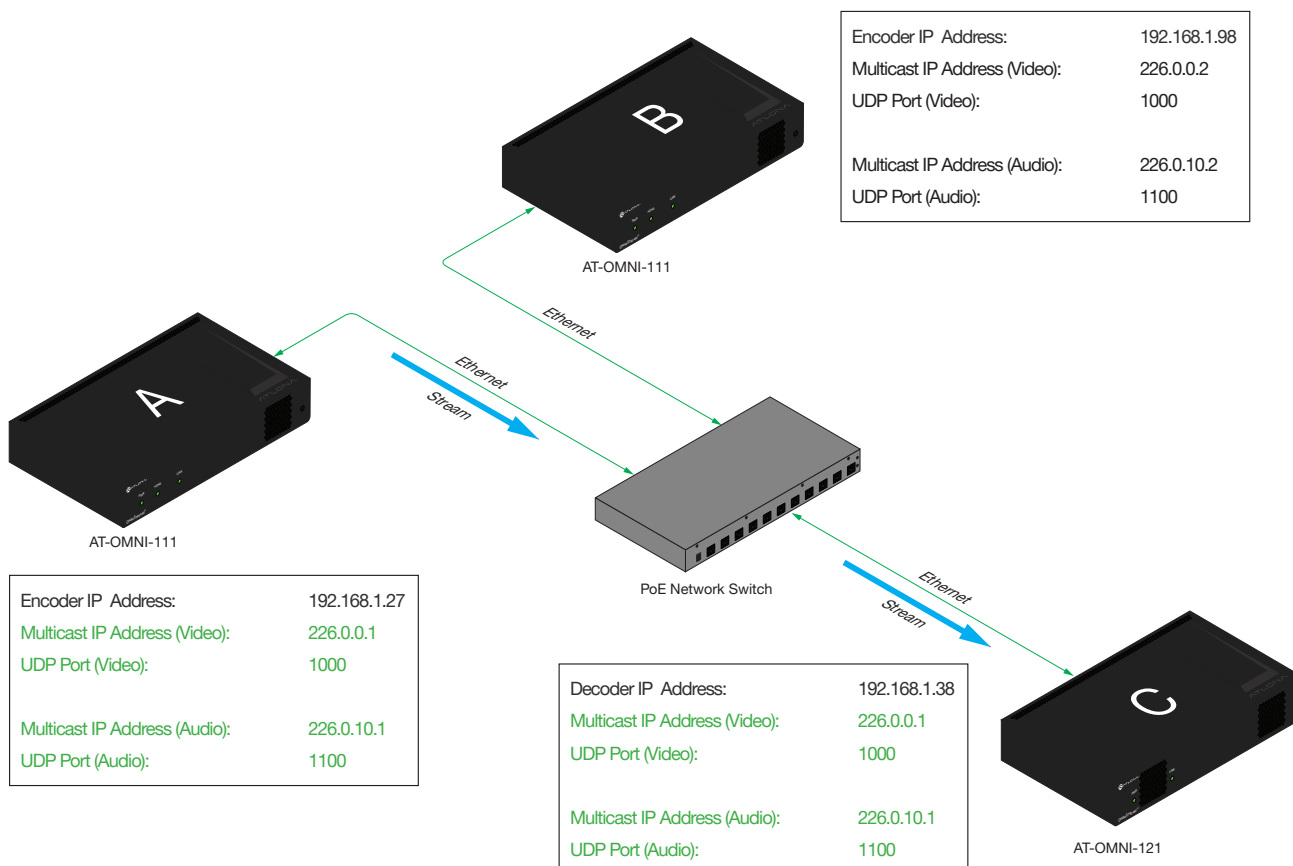


Figure 1.3 shows two encoders and a single decoder connected to a network switch. Decoder “C” is subscribed to encoder “A”, since the multicast IP addresses and UDP port numbers for both video and audio are set to the same values as encoder “A”.

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.

### OmniStream Naming Schema

Each OmniStream model has a different set of inputs and outputs and, depending upon the number of inputs and outputs. The number of supported session will depend upon the encoder model.

Encoders	Description
AT-OMNI-111 AT-OMNI-111-WP	<ul style="list-style-type: none"> <li>• One HDMI input</li> <li>• One Ethernet output</li> <li>• Supports up to six sessions</li> </ul>
AT-OMNI-112	<ul style="list-style-type: none"> <li>• Two HDMI inputs</li> <li>• Two Ethernet outputs</li> <li>• Supports up to six sessions</li> </ul>
AT-OMNI-512	<ul style="list-style-type: none"> <li>• One HDMI input</li> <li>• One Ethernet output</li> <li>• Supports up to four sessions</li> </ul>

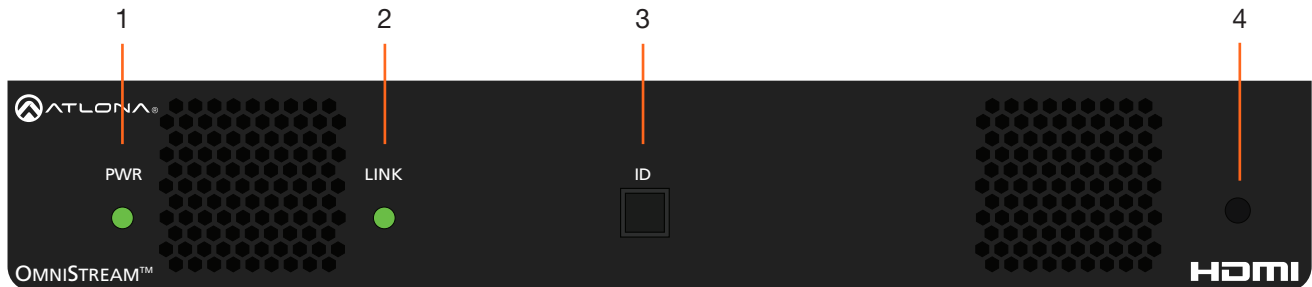
Decoders	Description
AT-OMNI-121	<ul style="list-style-type: none"> <li>• One HDMI output</li> <li>• One Ethernet output</li> </ul>
AT-OMNI-122	<ul style="list-style-type: none"> <li>• Two HDMI inputs</li> <li>• Two Ethernet outputs</li> </ul>

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.

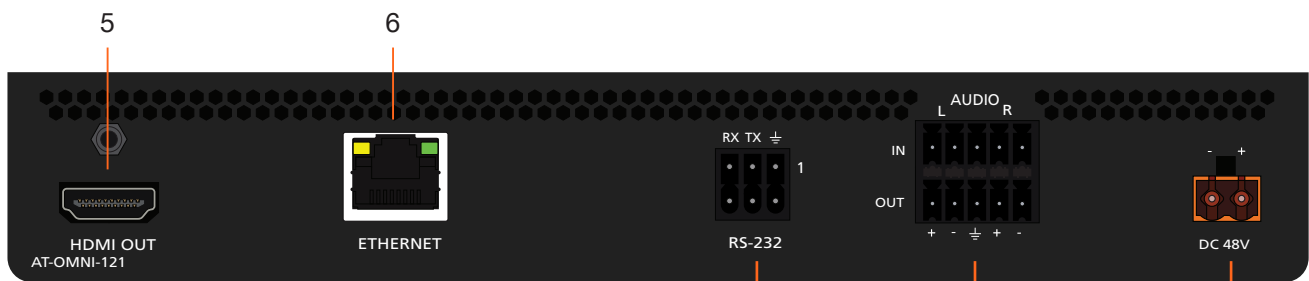
- **AT-OMNI-112**
  - 1**= OmniStream Pro (“R-Type” models begin with the number “5”).
  - 1** = Indicates that the device is an *encoder* (*decoders* are identified with the number “2”).
  - 2** = The number of Ethernet outputs.

# Panel Description

## AT-OMNI-121



Front



Rear

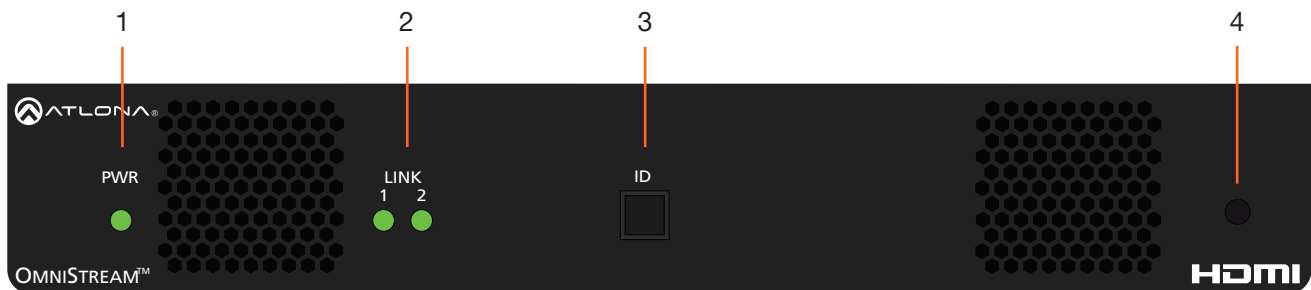
- |  |   |
|--|---|
| <p><b>1 PWR</b><br/>This LED indicator is green when the unit is powered and booted.</p> <p><b>2 LINK</b><br/>This LED indicator is green when the link integrity between the decoder and the network switch is good.</p> <p><b>3 ID</b><br/>This button provides two functions:<br/>(1) Press and release this button to send a broadcast network notification to any devices that may be listening (AMS).<br/>(2) Press and hold this button for 30 seconds to perform a factory-reset of the unit. Refer to <a href="#">ID Button (page 22)</a> for more information.</p> | <p><b>5 HDMI OUT</b><br/>Connect an HDMI cable from this port to a UHD/ HD display.</p> <p><b>6 ETHERNET</b><br/>Connect an Ethernet cable from this port to the Local Area Network (LAN).</p> <p><b>7 RS-232</b><br/>Use the included Phoenix terminal block to connect an RS-232 device to this port. The bottom three pins support IR pass-through. Refer to <a href="#">IR Connections (page 17)</a> for more information.</p> <p><b>8 AUDIO</b><br/>Connect the included Phoenix terminal blocks to embed audio on the output stream and/or connect to an audio output device.</p> <p><b>9 DC 48V</b><br/>Connect the optional 48V DC power supply to this power receptacle. This power supply is available, separately.</p> |
|--|---|



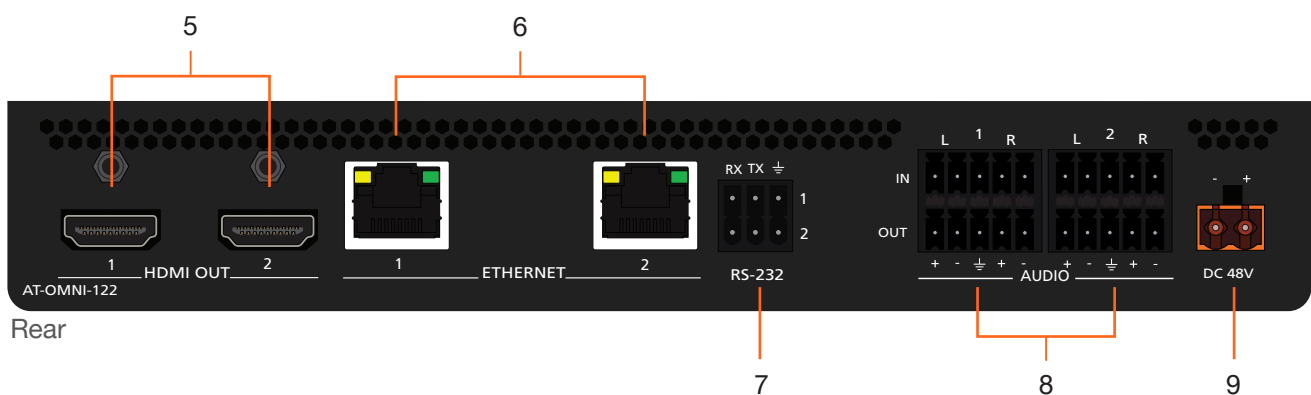
**NOTE:** Some older hardware revisions do not have an ID button.

- 4 REBOOT**  
Use a pointed object to press this recessed button and reboot the unit.

### AT-OMNI-122



Front



Rear

- 1 PWR**  
 This LED indicator is green when the unit is powered and booted.
- 2 LINK 1 / LINK 2**  
 These LED indicators will be green when the link integrity between the decoder and the network switch is good.
- ID**  
 This button provides two functions:  
 (1) Press and release this button to send a broadcast network notification to any devices that may be listening (AMS).  
 (2) Press and hold this button for 30 seconds to perform a factory-reset of the unit. Refer to [ID Button \(page 22\)](#) for more information.
- 3 REBOOT**  
 Use a pointed object to press this recessed button and reboot the unit.
- 4 HDMI OUT 1 / HDMI OUT 2**  
 Connect HDMI cables from these ports to a UHD/HD display.
- 5 ETHERNET 1 / ETHERNET 2**  
 Connect Ethernet cables from these ports to the Local Area Network (LAN).
- 6 RS-232**  
 Use the included Euroblock push-spring connector to connect up to two RS-232 devices to this port. The RS-232 2 port also supports IR pass-through. Refer to [IR Connections \(page 17\)](#) for more information.
- 7 AUDIO 1 / AUDIO 2**  
 Connect the included Euroblock push-spring connectors to embed audio on the output stream and/or connect to an audio output device.
- 8 DC 48V**  
 Connect the optional 48V DC power supply to this power receptacle. This power supply is available, separately, and is required when connecting the decoder to non-PoE compatible switch or when embedding and de-embedding of analog audio.



**NOTE:** Some older hardware revisions do not have an **ID** button.

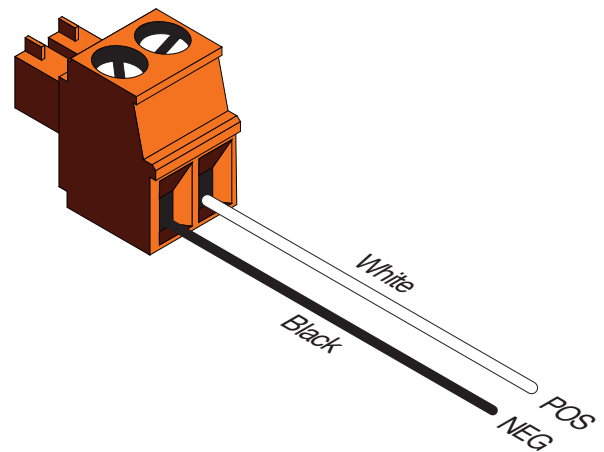
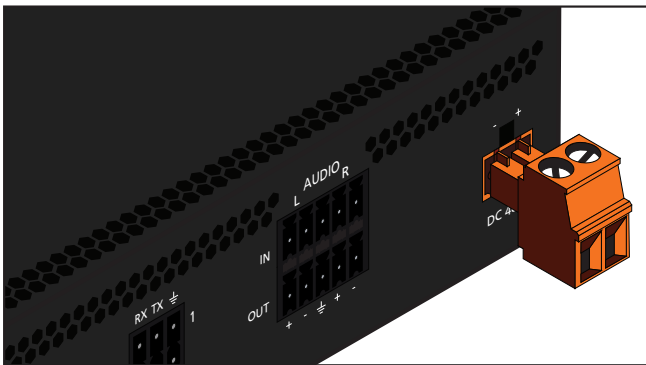
## Installation

### External Power (Optional)

OmniStream decoders are powered by PoE (Power over Ethernet), when connected to a PoE-capable switch. If a PoE-switch is not used, then the optional 48 V power supply (Atlona part no. AT-PS-48083-C) can be purchased, separately. Insert the positive and negative leads, from the power supply, into the terminals of the 2-pin captive screw connector block, as shown. The orange 2-pin captive screw connector block is included with the OmniStream power supply package.



**IMPORTANT:** The external power supply must be connected to the decoder when embedding and de-embedding audio using the **AUDIO IN** and/or **AUDIO OUT** ports.

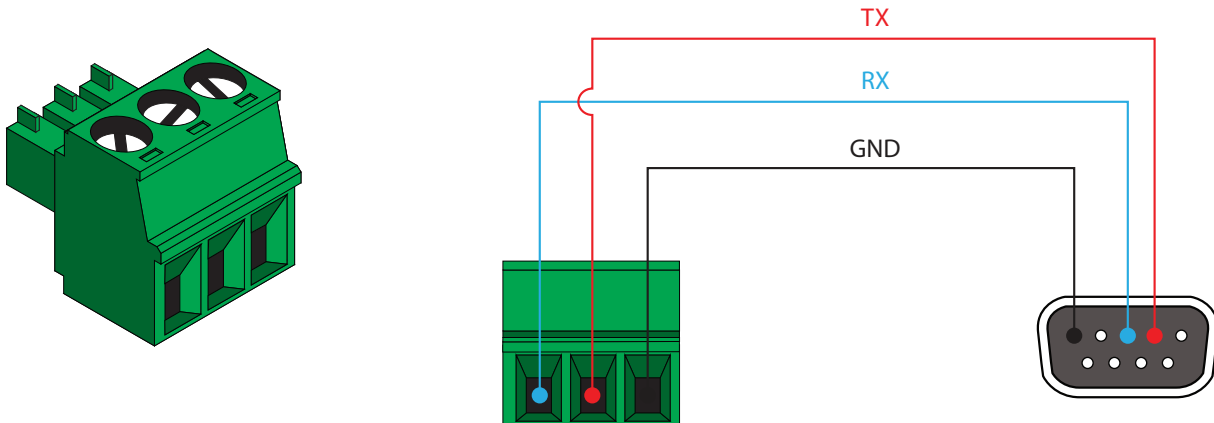


## RS-232 Connections

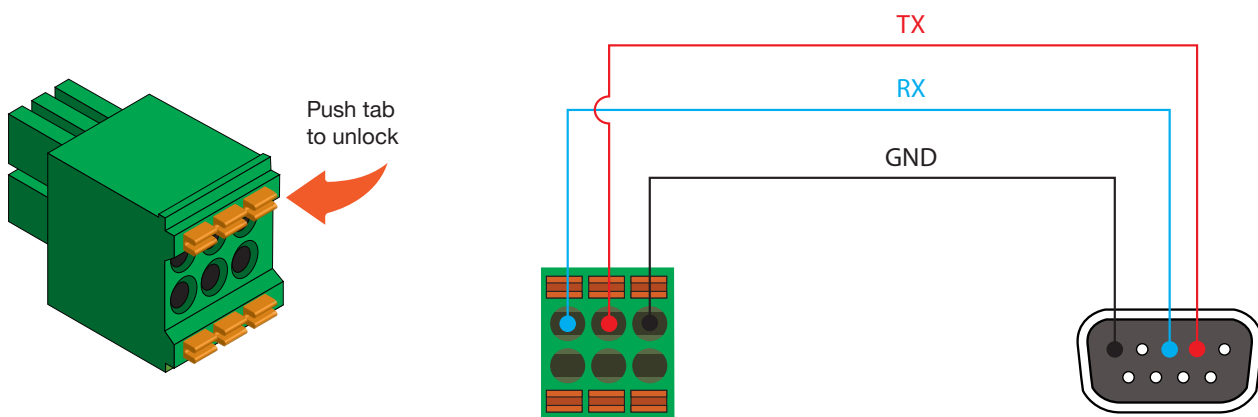
Both the AT-OMNI-121 and AT-OMNI-122 provide RS-232 over IP, allowing communication between an automation system and an RS-232 device. This step is optional. Only port 1 can be used for serial data.

1. Use wire strippers to remove a portion of the cable jacket.
2. Remove at least 3/16" (5 mm) from the insulation of the RX, TX, and GND wires.
3. Insert the TX, RX, and GND wires into correct terminal on the included Phoenix block. If using non-tinned stranded wire, press the orange tab, above the terminal, while inserting the exposed wire. Repeat this step for the TX, RX, and GND connections.

### AT-OMNI-121



### AT-OMNI-122

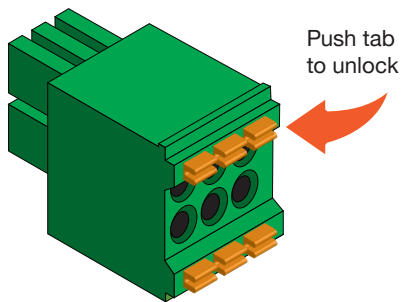


**NOTE:** Typical DB9 connectors use pin 2 for TX, pin 3 for RX, and pin 5 for ground. On some devices, pins 2 and 3 are reversed.

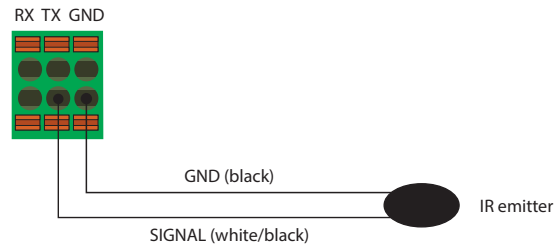


## IR Connections

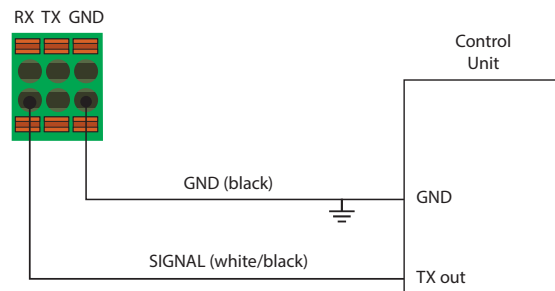
The same port that provides RS-232 connections also supports bidirectional IR pass-through, allowing a device to be controlled from either the headend or the decoder endpoint. This step is optional. Refer to [Device Control \(page 40\)](#) for more information.



### IR emitter configuration



### IR extender configuration



## Audio Connectors

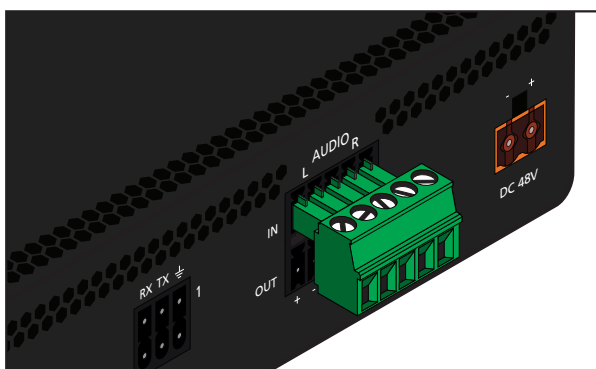
In addition to passing audio directly from the encoder to the decoder, both the AT-OMNI-121 and AT-OMNI-122 provide two additional audio options. Either option can be used or they can be used simultaneously.

- HDMI audio can be de-embedded and output to two-channel analog audio.
- Two-channel analog audio can be embedded and output over HDMI.

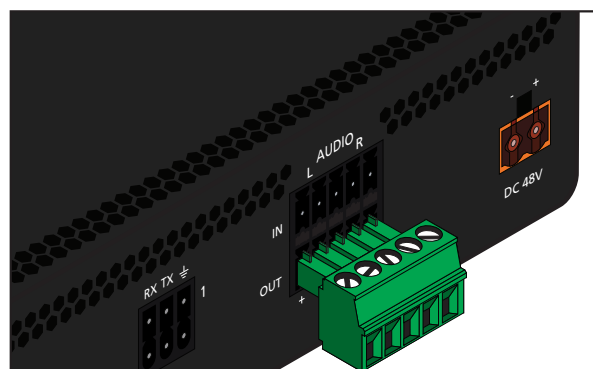
Use the included dual five-pin Phoenix blocks. Note that each product comes with different connector blocks. This step is optional. Refer to [Configuring Audio Output \(page 66\)](#) for more information.

### AT-OMNI-121

- If either the **AUDIO IN** or **AUDIO OUT** port will be used, then connect the included 5-pin “captive screw” Phoenix blocks, as shown below.

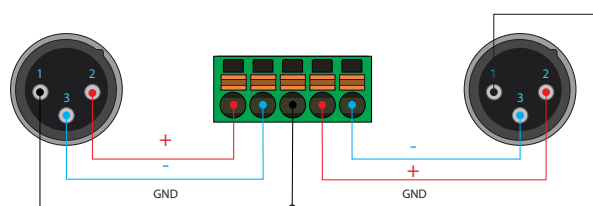
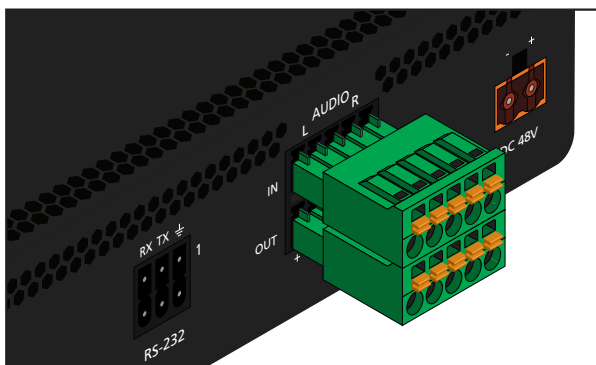


2-channel analog audio input (top)

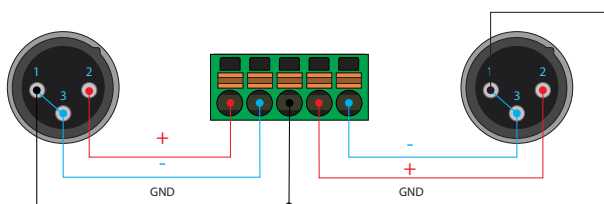


2-channel analog audio output (bottom)

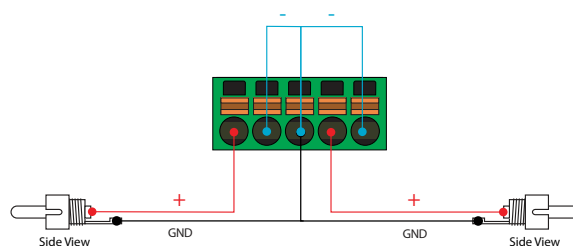
- If *both* **AUDIO IN** and **AUDIO OUT** terminals will be used, then connect the included 5-pin “push spring” Phoenix blocks, as shown below.



Balanced XLR audio



Unbalanced XLR audio



Unbalanced RCA audio

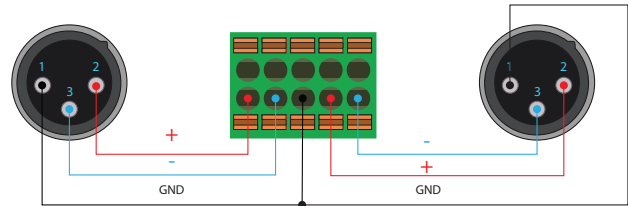
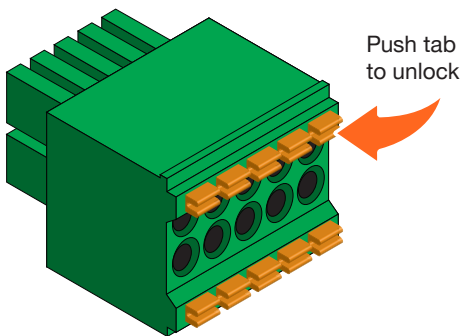


**NOTE:** Unbalanced XLR audio pins require Pin 1 and Pin 3 to be connected.

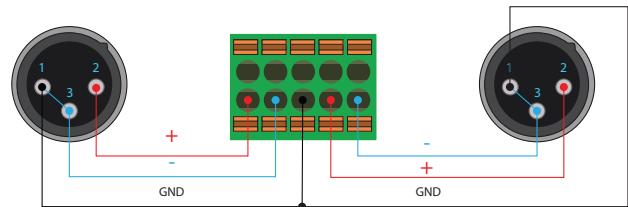
### AT-OMNI-122

Use the top 5 pins to connect audio input sources. Use the bottom five pins to connect to audio output devices.

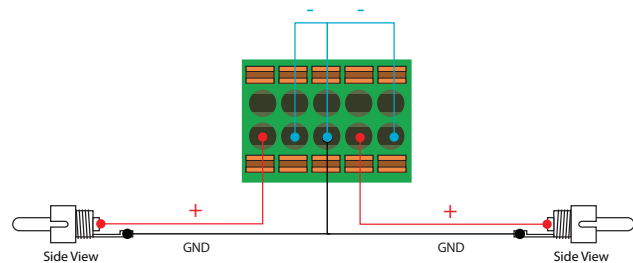
1. Use wire strippers to remove a portion of the cable jacket.
2. Locate the included Phoenix block connectors. Press the orange tab, above the terminal, while inserting the exposed wire. Release the orange tab to lock the wire in place. Balanced or unbalanced audio can be used.



Balanced XLR audio



Unbalanced XLR audio



Unbalanced RCA audio



**NOTE:** Unbalanced XLR audio pins require Pin 1 and Pin 3 to be connected.



**IMPORTANT:** When using analog audio inputs on the OmniStream decoder, the decoder must be powered using the 48V power supply (AT-PS-48083-C). This power supply is sold separately and can be purchased from Atlona.

### Connection Instructions

1. Connect an Ethernet cable from the **ETHERNET** port on the decoder to a PoE-capable switch on the Local Area Network (LAN). If using the dual-channel decoder, connect a separate Ethernet cables to **ETHERNET 1** and **ETHERNET 2** ports.



**IMPORTANT:** If a PoE-capable switch is not available, then the 48V DC power supply (sold separately) must be connected to the decoder.

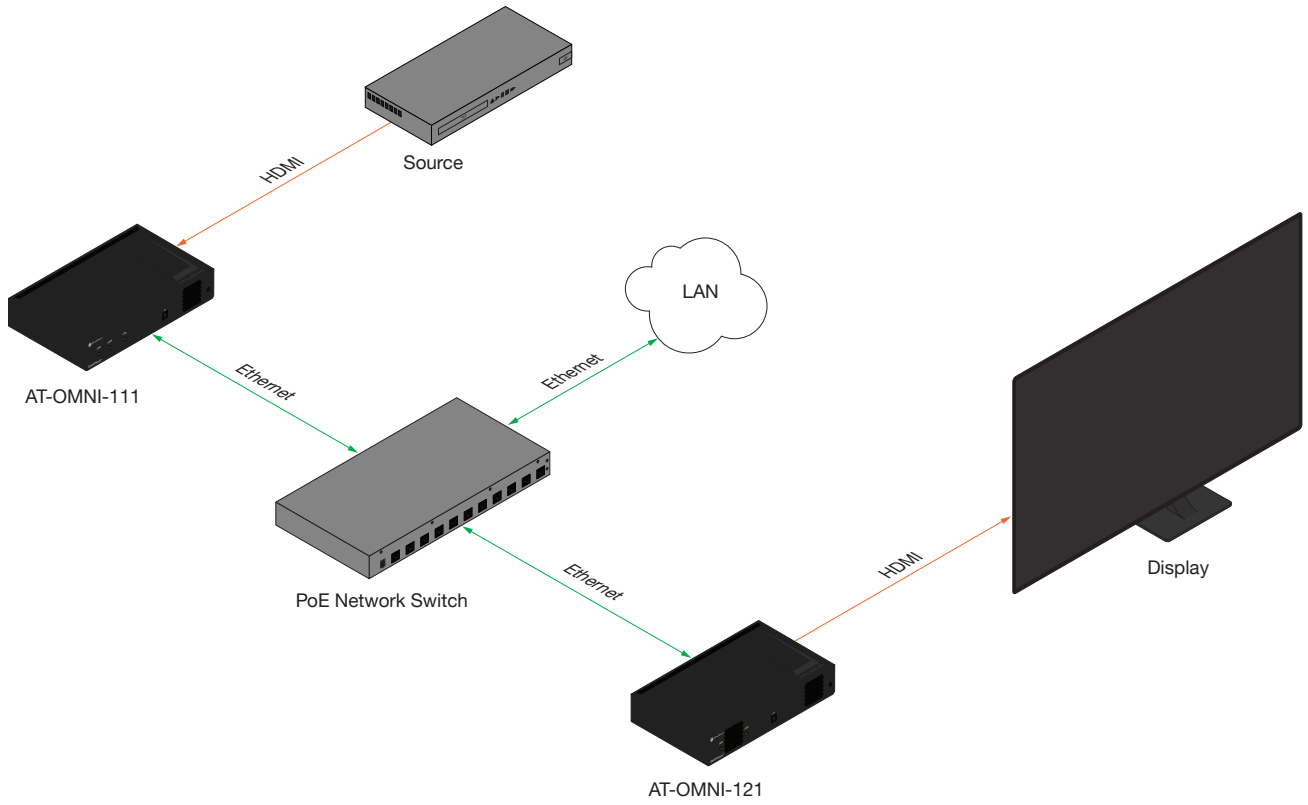
2. Connect an HDMI cable from the **HDMI OUT** port on the decoder to a display. If using the dual-channel decoder, connect an HDMI cable from each **HDMI OUT** port to a display.
3. RS-232 (optional)
  - Connect the RS-232 device to the **RS-232** port on the decoder.
4. External Audio (optional)
  - Connect the audio inputs to the decoder, as required.
  - Connect the audio outputs to the decoder, as required.



**IMPORTANT:** When using analog audio inputs on the OmniStream decoder, the decoder must be powered using the 48V power supply (AT-PS-48083-C). This power supply is sold separately and can be purchased from Atlona.

5. IR (optional)
  - **IR emitter**  
Connect the IR emitter to the **TX** and **GND** pins of the **RS-232 2** port. The IR emitter must be placed no more than one inch from the IR sensor on the device, in order to function properly.
  - **IR extender**  
Connect the IR extender from the **RX** and **GND** pins of the **RS-232 2** port to the associated pins on the control system.
6. Once power is applied, the **PWR** indicator, on the front panel, will turn red, then amber, then green.

Connection Diagram



## Getting Started

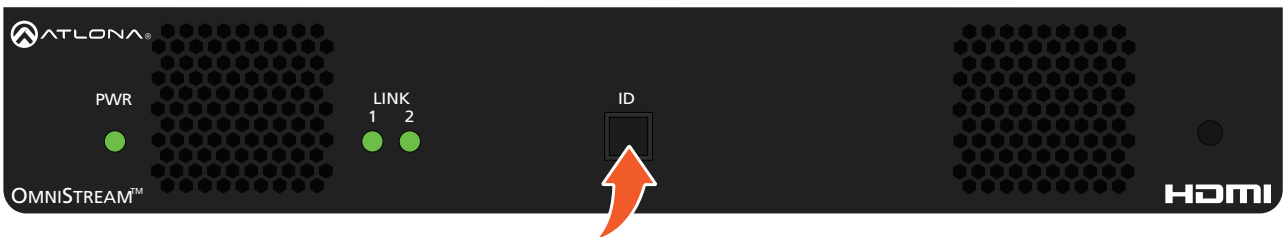
### ID Button

The **ID** button serves two functions:

1. Sends a broadcast message, over the network, to any devices that may be listening.
2. Resets the decoder to factory-default settings.



**NOTE:** Some older hardware revisions do not have an **ID** button.

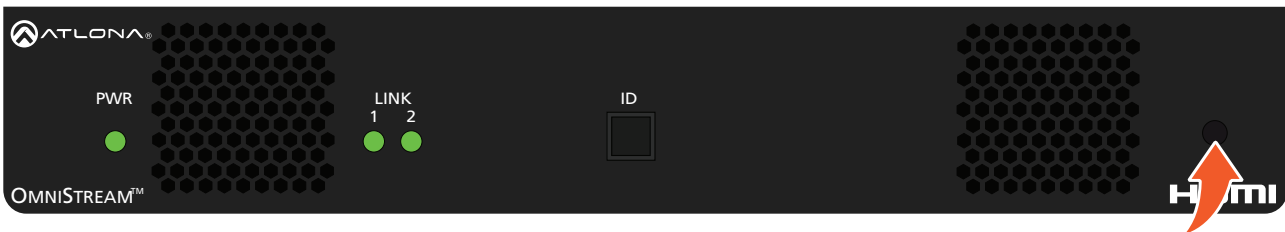


### Broadcast Messaging

Press and release the **ID** button to send a broadcast notification over the network to any devices that may be listening.

### Rebooting OmniStream

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



### Resetting to Factory-Defaults



**WARNING:** Performing a factory-default reset will erase all user-programmed settings from the decoder. IP settings are not preserved.

#### Using the ID button

1. Press and hold the **ID** button for approximately 30 seconds.
2. The LED indicators on the front panel will flash, then turn “off.”
3. The decoder is now reset and will need to be reconfigured.

#### Using the Mclear command

1. Connect a PC to serial port 1 using a USB to serial cable.
2. Set the PC console port to the following settings: 9600 baud, 8 data bits, 1 stop bit, no parity.
3. Once connected to the CLI, execute the `Mclear` command.

#### Using the Web Server

1. Log in to the decoder using the built-in web server. Refer to [Accessing the Web Server \(page 25\)](#) for more information.
2. Click the **FACTORY RESET** button.
3. The decoder is now reset and will need to be reconfigured.

### 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"> <li>If using a PoE switch, make sure that the port on the switch that is connected to the decoder, has PoE enabled. When the decoder is powered using PoE, the <b>PWR</b> indicator will be green.</li> <li>Check the Ethernet cable for possible damage or loose connections.</li> <li>Connect the optional 48V DC power supply (available from atlona.com) to the encoder. When using an external power supply, the <b>PWR</b> indicator will be green.</li> </ul>
	Red	●	<ul style="list-style-type: none"> <li>The decoder is booting.</li> </ul>
	Amber	●	<ul style="list-style-type: none"> <li>The decoder is booting and/or attempting to locate a DHCP server.</li> </ul>
	Green	●	<ul style="list-style-type: none"> <li>The decoder is ready.</li> </ul>
LINK 1 / 2	Red	●	<ul style="list-style-type: none"> <li>The optional 48V DC power supply is connected, but no Ethernet cables are connected between the switch and the <b>ETHERNET</b> port(s).</li> <li>Check the Ethernet cable for possible damage or loose connections.</li> </ul>
	Amber	●	<ul style="list-style-type: none"> <li>The decoder is booting.</li> </ul>
	Green	●	<ul style="list-style-type: none"> <li>Link integrity is good between the decoder and the network.</li> </ul>



### Accessing the Web Server

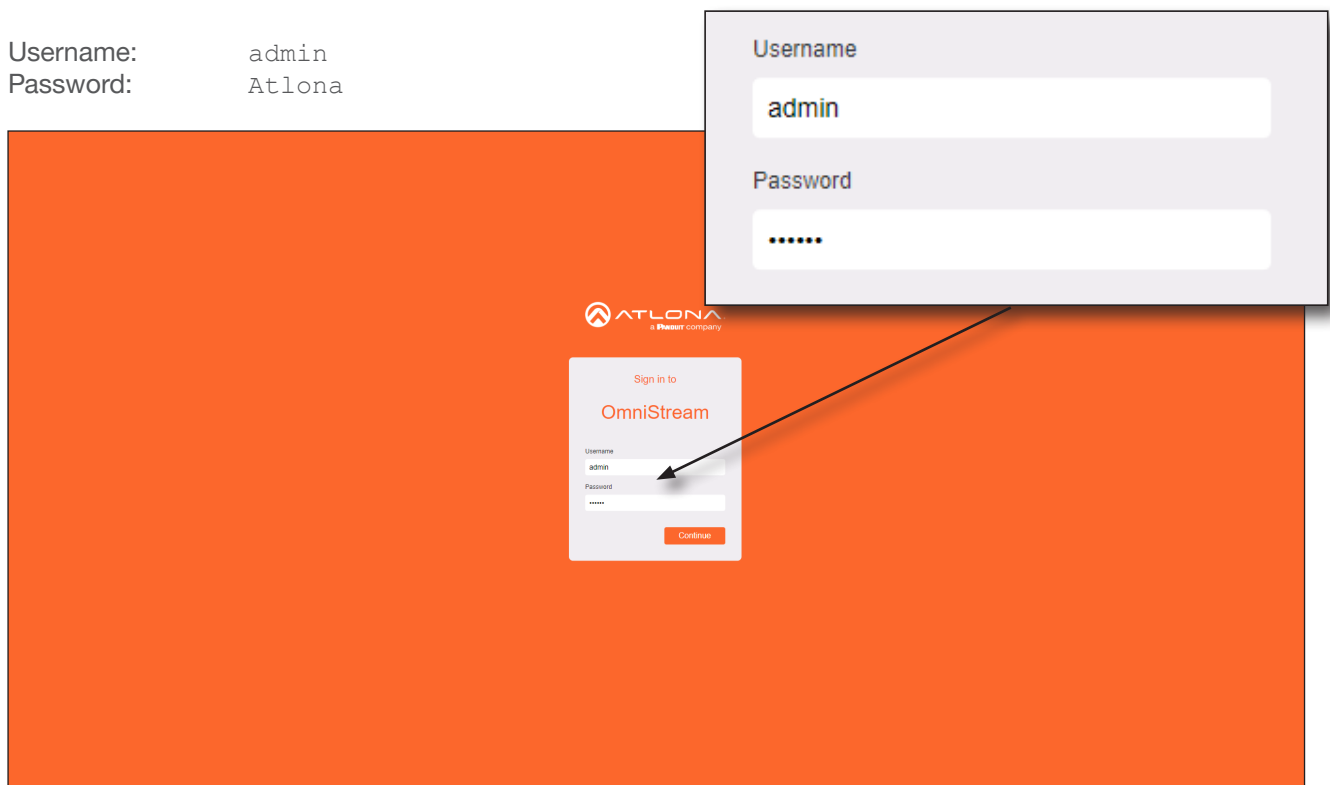
In order to access the web server of the desired encoder/decoder, the IP address of the encoder must be known. This can be accomplished by using any of the following methods: 1) Running IP scanner software or 2) accessing the encoder using the domain name. When running an IP scanner, both the computer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

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

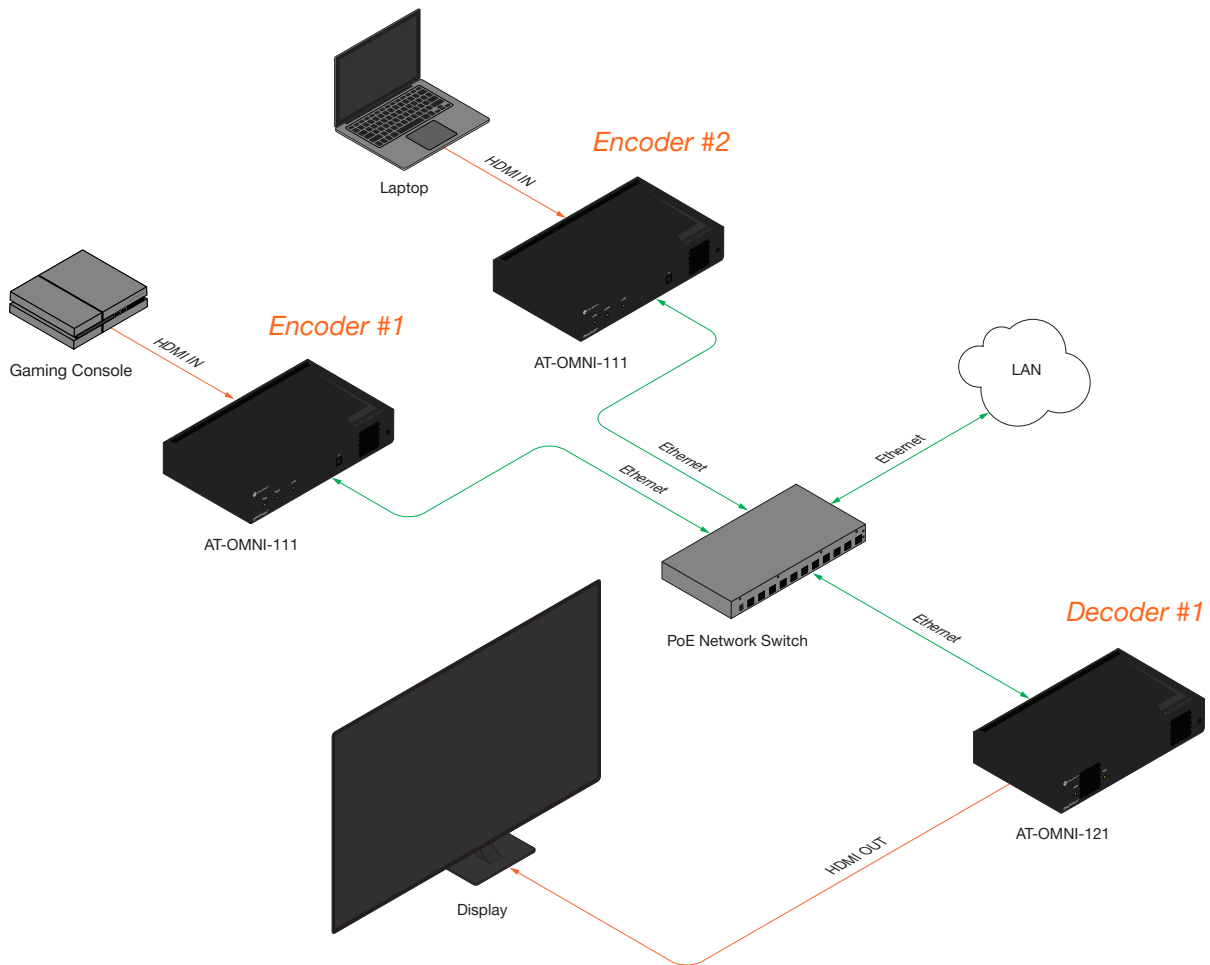


3. The **System Information** page will be displayed.

## Basic Configuration Tutorial

This section provides a tutorial on configuring two AT-OMNI-111 single-channel encoders and one AT-OMNI-121 single-channel decoder. Make sure the encoders are connected to a source device and that the decoder is connected to a display. Both encoders and the decoder should be connected to the same local network. Refer to [Connection Instructions](#) (page 20) for more information.

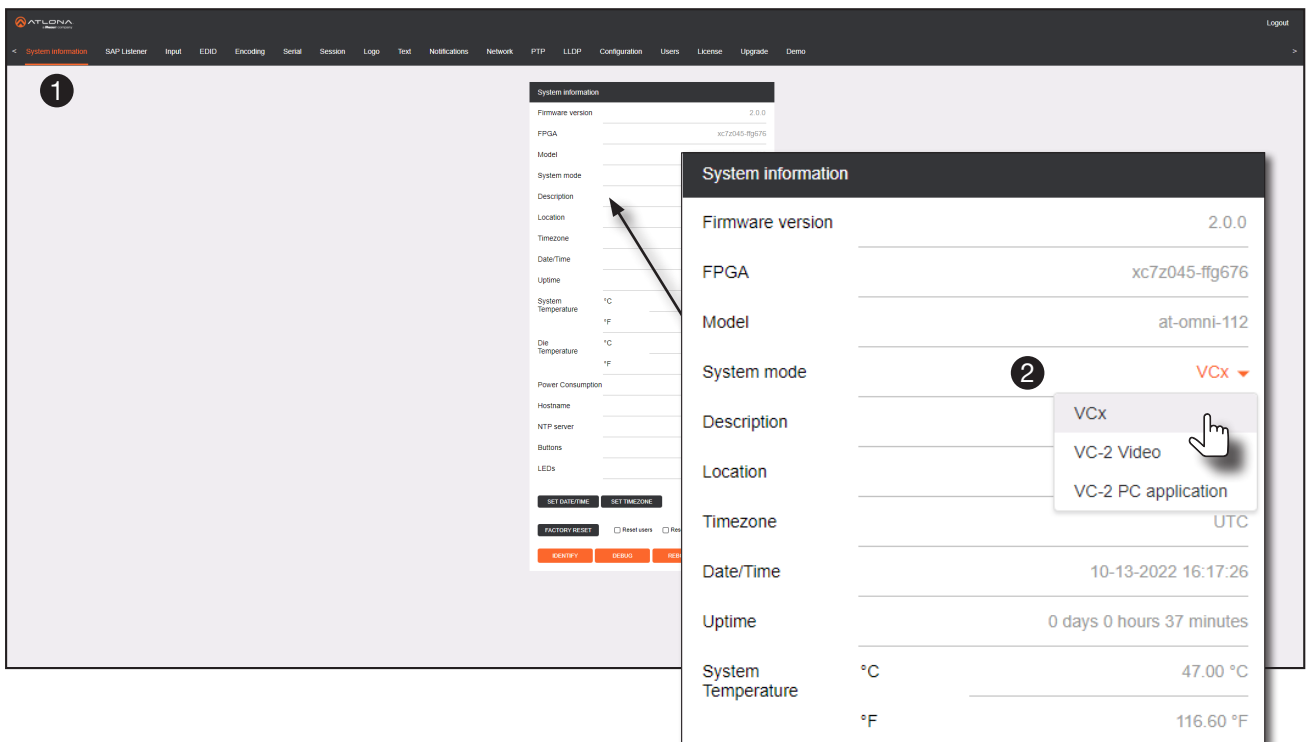
### Physical Connections



## Setting the System Mode

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

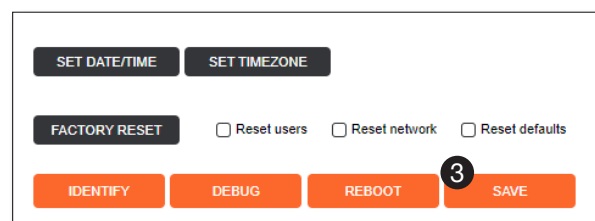
1. Login to each encoder and click **System Information** in the menu bar.
2. Click the **System mode** drop-down list and select **VCx**. This mode will provide access to all of OmniStream 2.0 features.



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.

Login to the decoder interface and repeat this process.



### 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 encoders.

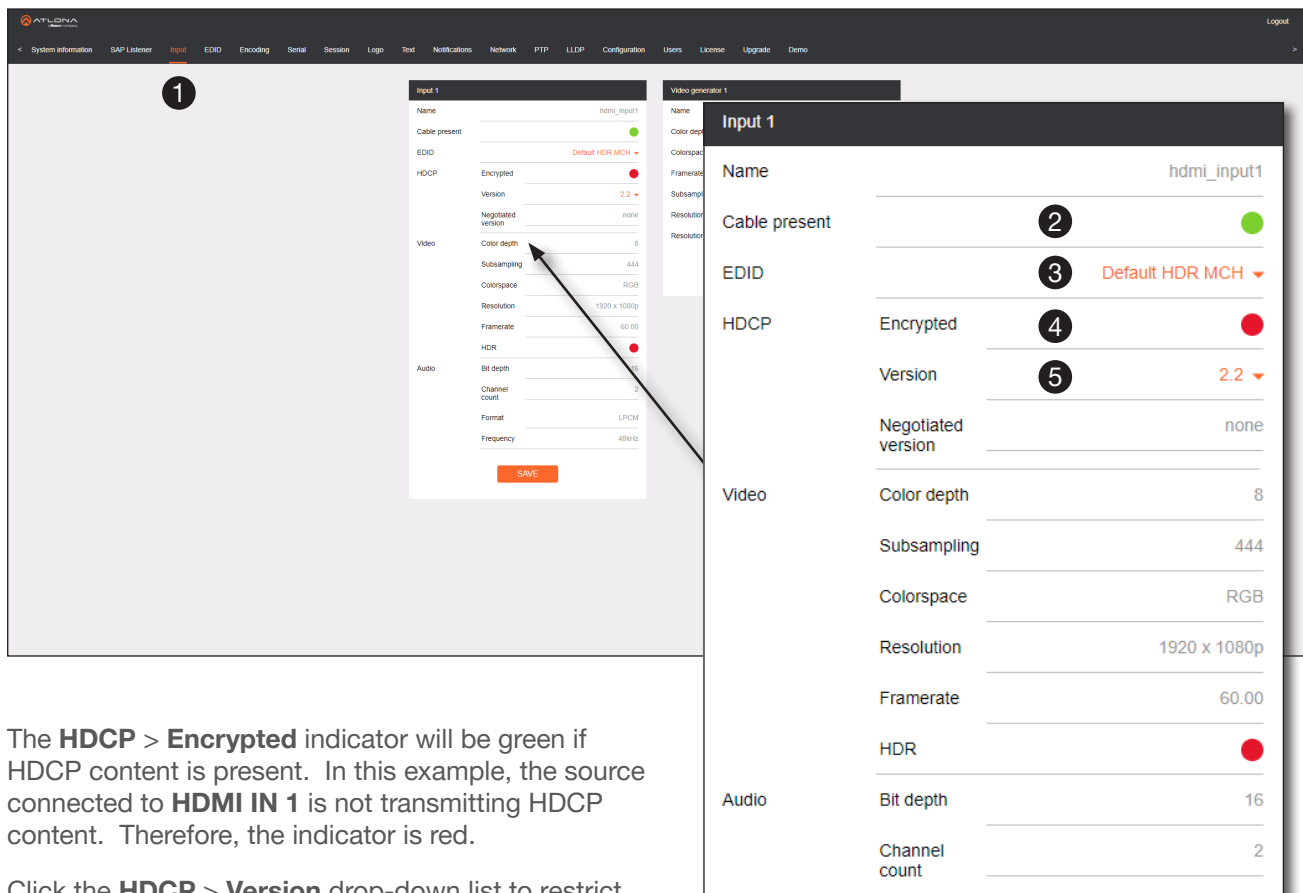
1. Click the **Input** menu.
2. Since a source has been connected to the **HDMI IN** port, the **Cable present** indicator within the **Input 1** window group is green, as shown below. This indicates that an active source is connected to the HDMI port.

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 `Default HDR MCH`. This EDID provides general compatibility with most displays.



The screenshot shows the 'Input 1' configuration page in the ATLONA web interface. The page is divided into two main sections: a left sidebar with a 'SAVE' button and a right main area with configuration fields. The 'Cable present' indicator is green (2), 'EDID' is set to 'Default HDR MCH' (3), 'HDCP Encrypted' is red (4), and 'HDCP Version' is set to '2.2' (5). The video and audio settings are also visible.

Category	Field	Value	Indicator
General	Name	hdmi_input1	
	Cable present		Green (2)
EDID	EDID	Default HDR MCH	Red (3)
	HDCP	Encrypted	Red (4)
HDCP	Version	2.2	Red (5)
	Negotiated version	none	
Video	Color depth	8	
	Subsampling	444	
	Colorspace	RGB	
	Resolution	1920 x 1080p	
	Framerate	60.00	
Audio	HDR		Red
	Bit depth	16	
	Channel count	2	

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 [IP Input page \(page 93\)](#) 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 [IP Input page \(page 93\)](#) for more information.
8. Click **SAVE** to commit all changes.

**Input 1**

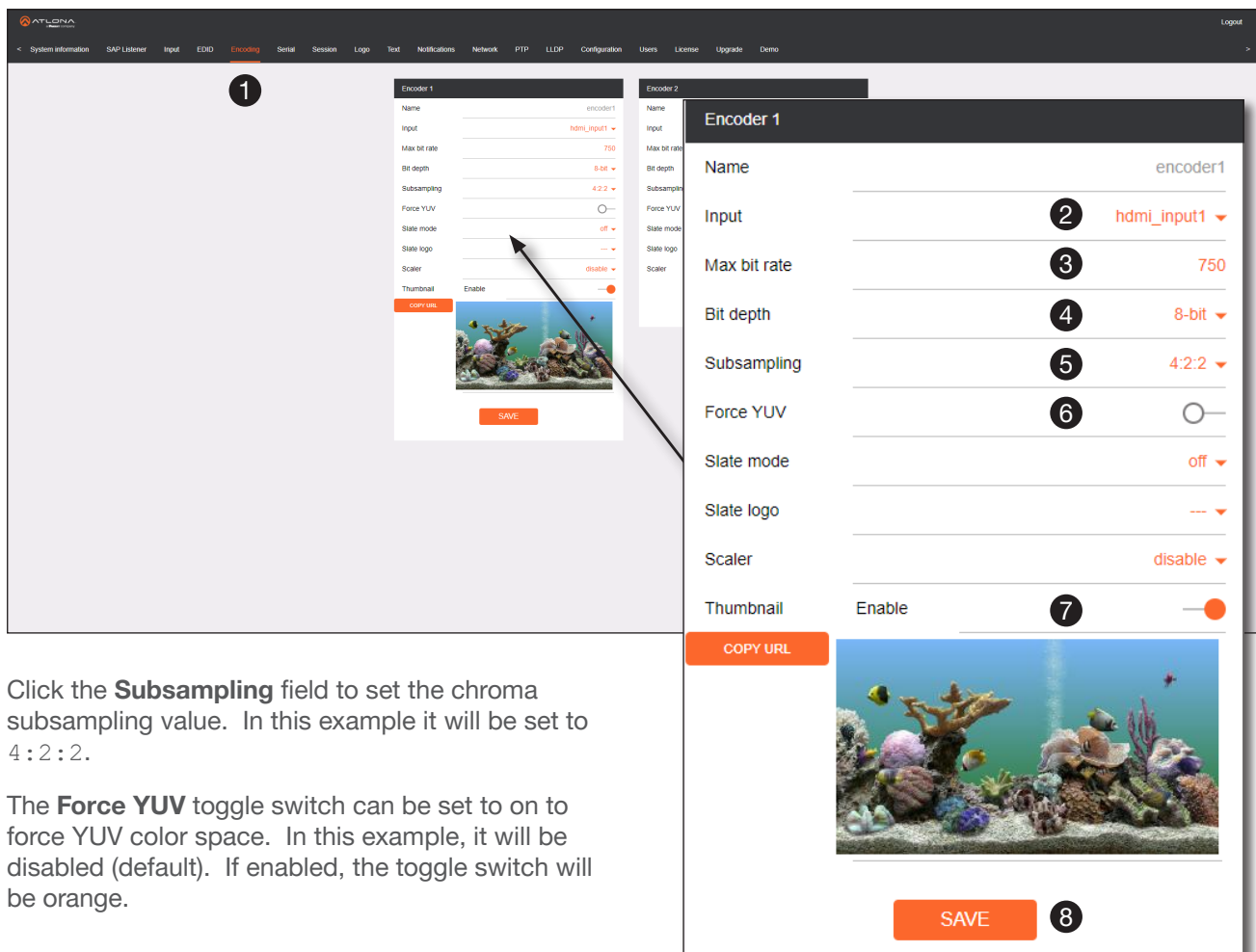
Name	hdmi_input1	
Cable present		<span style="color: green;">●</span>
EDID		Default HDR MCH ▾
HDCP	Encrypted	<span style="color: red;">●</span>
	Version	2.2 ▾
	Negotiated version	none
Video <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">6</span>	Color depth	8
	Subsampling	444
	Colorspace	RGB
	Resolution	1920 x 1080p
	Framerate	60.00
	HDR	<span style="color: red;">●</span>
Audio <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">7</span>	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 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. Bandwidth per port is calculated as 900 Mbps, and on a dual-channel encoder, the combined bandwidth of both ports should not exceed 900 Mbps. So, if two sources were connected to a AT-OMNI-112 encoder, then the **Max bit rate** field for both **Encoder 1** and **Encoder 2** should not exceed a value of 450.
4. Click the **Bit depth** drop-down list to change the bit depth. In this example, it will be set to `8-bit`.

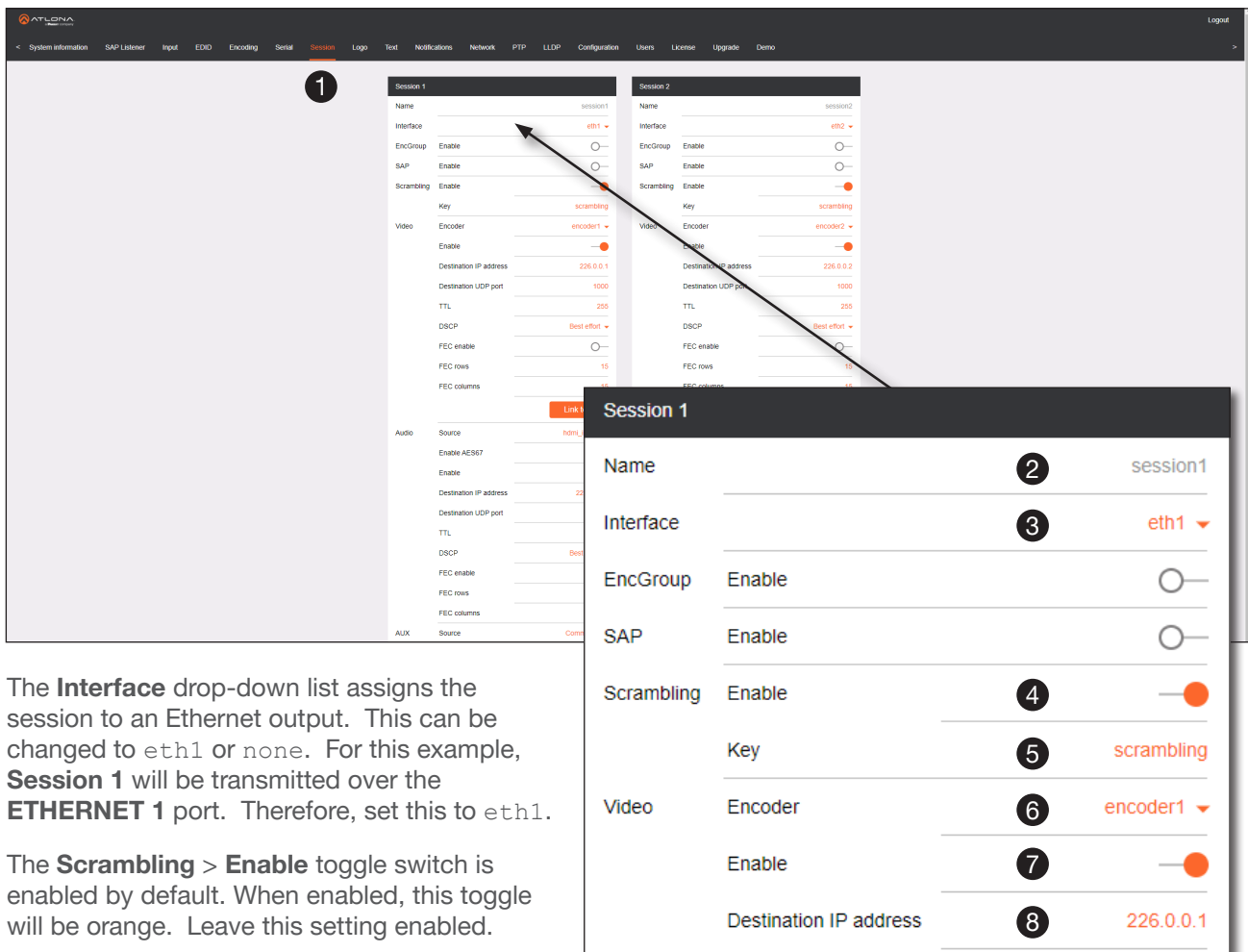


5. Click the **Subsampling** field to set the chroma subsampling value. In this example it will be set to `4:2:2`.
6. The **Force YUV** toggle switch can be set to on to force YUV color space. In this example, it will be disabled (default). If enabled, the toggle switch will be orange.
7. Click the **Thumbnail > 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. *The following procedure should be performed on both AT-OMNI-111 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 'Sessions' menu selected. A callout box titled 'Session 1' provides a detailed view of the configuration for the first session. The configuration includes:

- Name:** session1
- Interface:** eth1
- EncGroup:** Enable
- SAP:** Enable
- Scrambling:** Enable
- Key:** scrambling
- Video:** Encoder: encoder1, Enable: Enabled
- 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. In this example, `hdmi_input1` is assigned to **Encoder 1** (refer to Step 2 on previous page). 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 **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

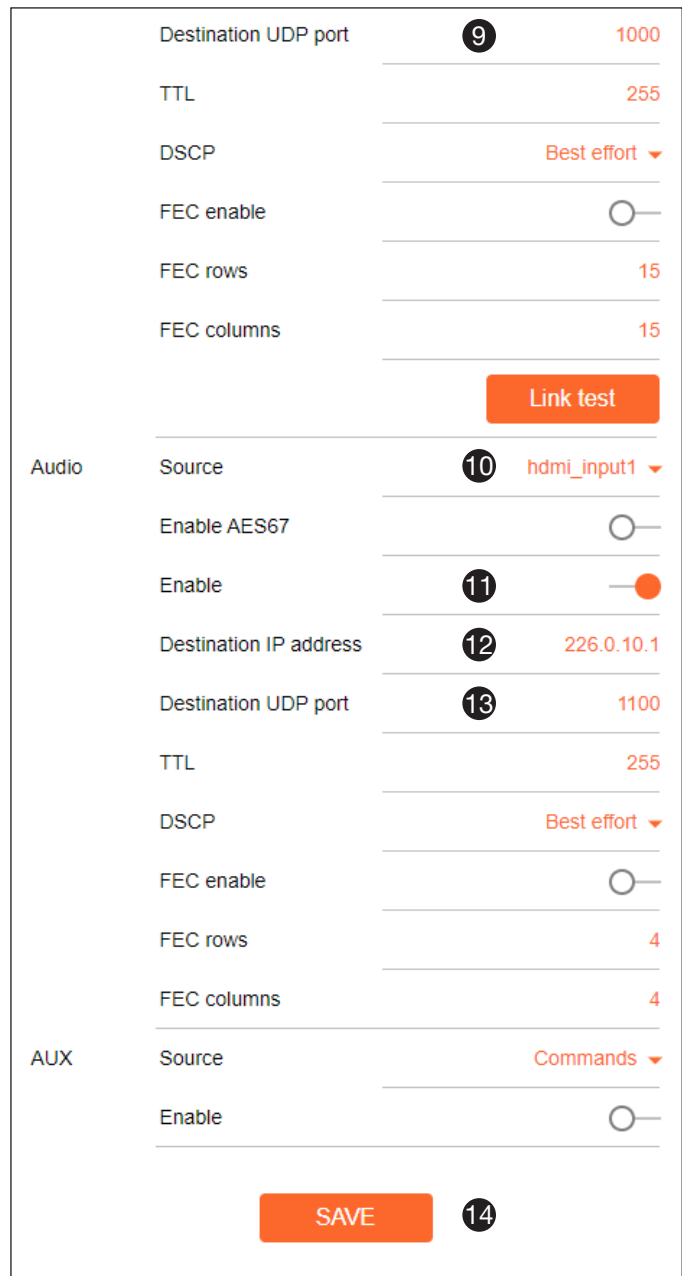
*Table 2.1 - Recommended multicast IP address for video, audio, and data streams.*

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**.



Destination UDP port **9** 1000

TTL 255

DSCP Best effort ▼

FEC enable

FEC rows 15

FEC columns 15

**Link test**

**Audio**

Source **10** hdmi\_input1 ▼

Enable AES67

Enable **11**

Destination IP address **12** 226.0.10.1

Destination UDP port **13** 1100

TTL 255

DSCP Best effort ▼

FEC enable

FEC rows 4

FEC columns 4

**AUX**

Source Commands ▼

Enable

**SAVE** **14**

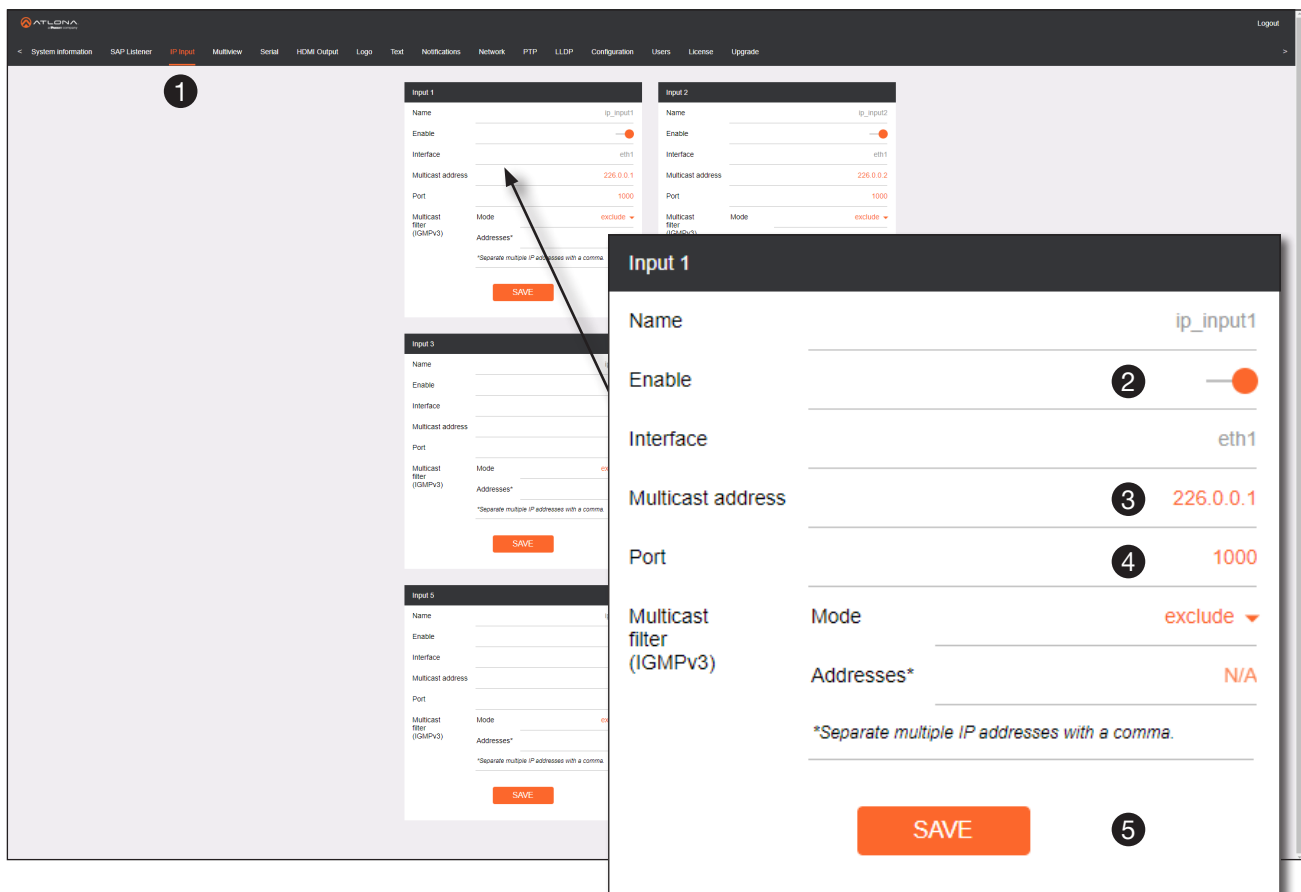


### Subscribing to an Encoder

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.



The screenshot displays the ATLONA web interface for configuring IP inputs. The main interface shows three input groups: Input 1, Input 2, and Input 3. A callout window for 'Input 1' is overlaid, showing the following configuration details:

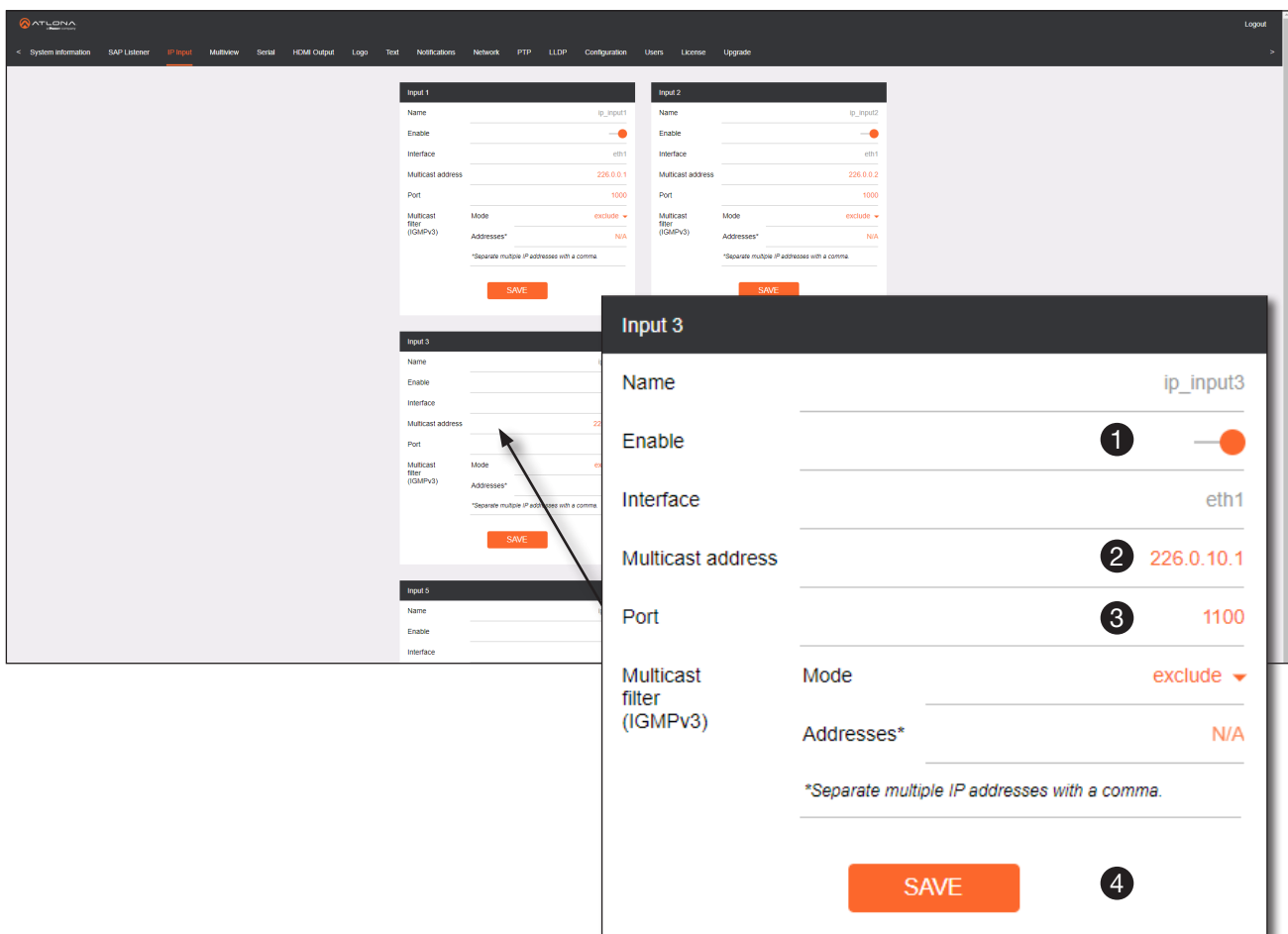
- Name:** ip\_input1
- Enable:** Enabled (indicated by an orange toggle switch)
- Interface:** eth1
- Multicast address:** 226.0.0.1
- Port:** 1000
- Multicast filter (IGMPv3):** Mode: exclude, Addresses\*: N/A

Numbered callouts in the image correspond to the steps in the tutorial:

1. Points to the 'IP Input' menu item in the top navigation bar.
2. Points to the 'Enable' toggle switch for Input 1.
3. Points to the 'Multicast address' field for Input 1.
4. Points to the 'Port' field for Input 1.
5. Points to the 'SAVE' button for Input 1.

### 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
Input 1	Video (226.0.0.1:1000)
Input 3	Audio (226.0.10.1:1100)

#### Encoder #2

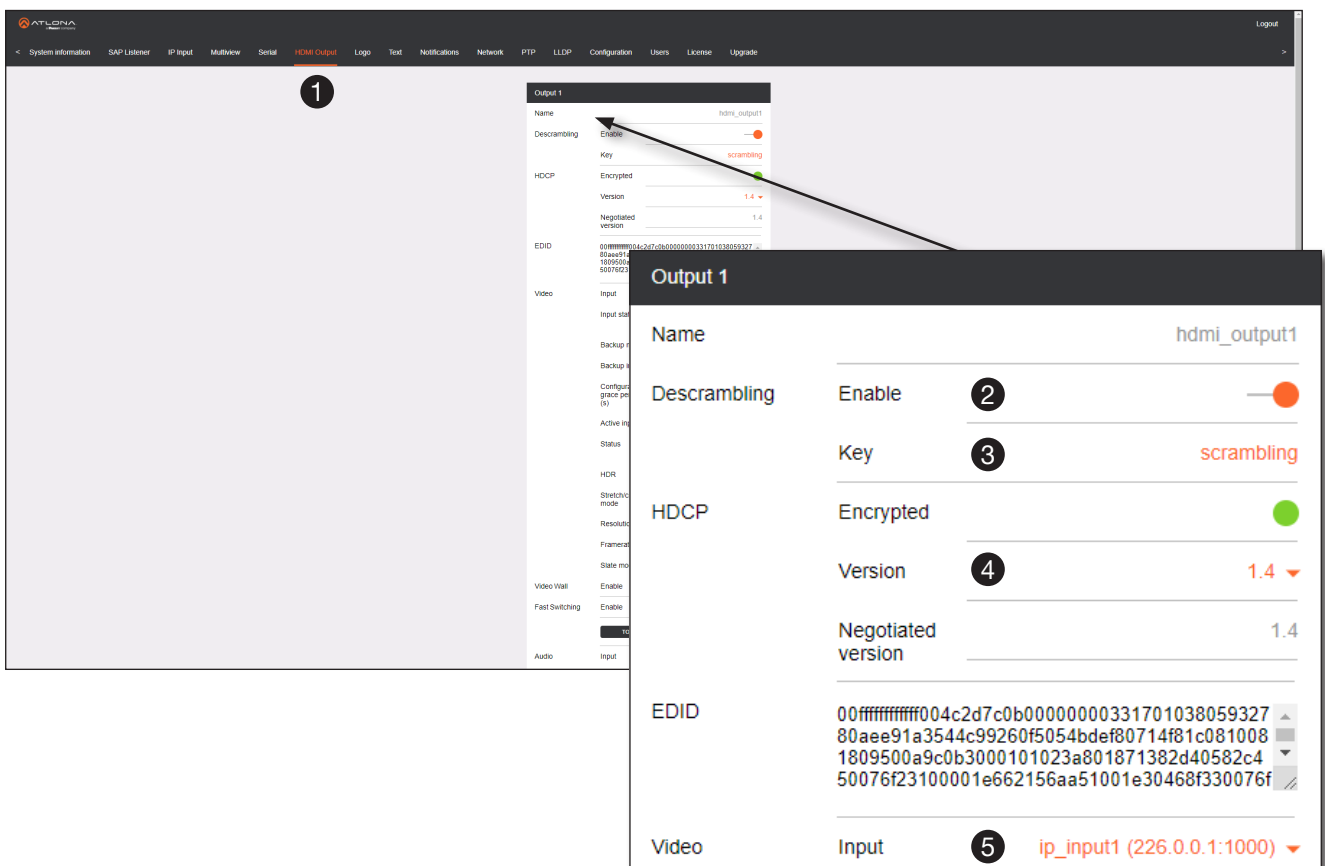
Input	Multicast Address
Input 2	Video (226.0.0.2:1000)
Input 4	Audio (226.0.10.2:1100)

### 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 example, 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 displays the ATLONA web interface for configuring the HDMI output stream. The navigation menu at the top includes options like System Information, SAP Listener, IP Input, Multiview, Serial, **HDMI Output**, Logs, Text, Notifications, Network, PTP, LLDP, Configuration, Users, License, and Upgrade. The sidebar on the left lists various system settings such as System Information, SAP Listener, IP Input, Multiview, Serial, Logs, Text, Notifications, Network, PTP, LLDP, Configuration, Users, License, Upgrade, Active Input, Status, HDR, Stretch mode, Resolution, Frame rate, State machine, Video Wall, Fast Switching, and Audio. The main content area shows the configuration for 'Output 1' (name: hdmi\_output1). A callout box highlights the 'Video' section with five numbered annotations: 1 points to the 'Output 1' title, 2 points to the 'Descrambling Enable' toggle, 3 points to the 'Key' field set to 'scrambling', 4 points to the 'HDCP Version' dropdown set to '1.4', and 5 points to the 'Video Input' dropdown set to 'ip\_input1 (226.0.0.1:1000)'. The EDID field is also visible, showing a hexadecimal string.

## Basic Configuration Tutorial

- 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)

- 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 cooldown (s) 0

Timeout (s) 0

Type DispSW AVon ▼

SAVE 7

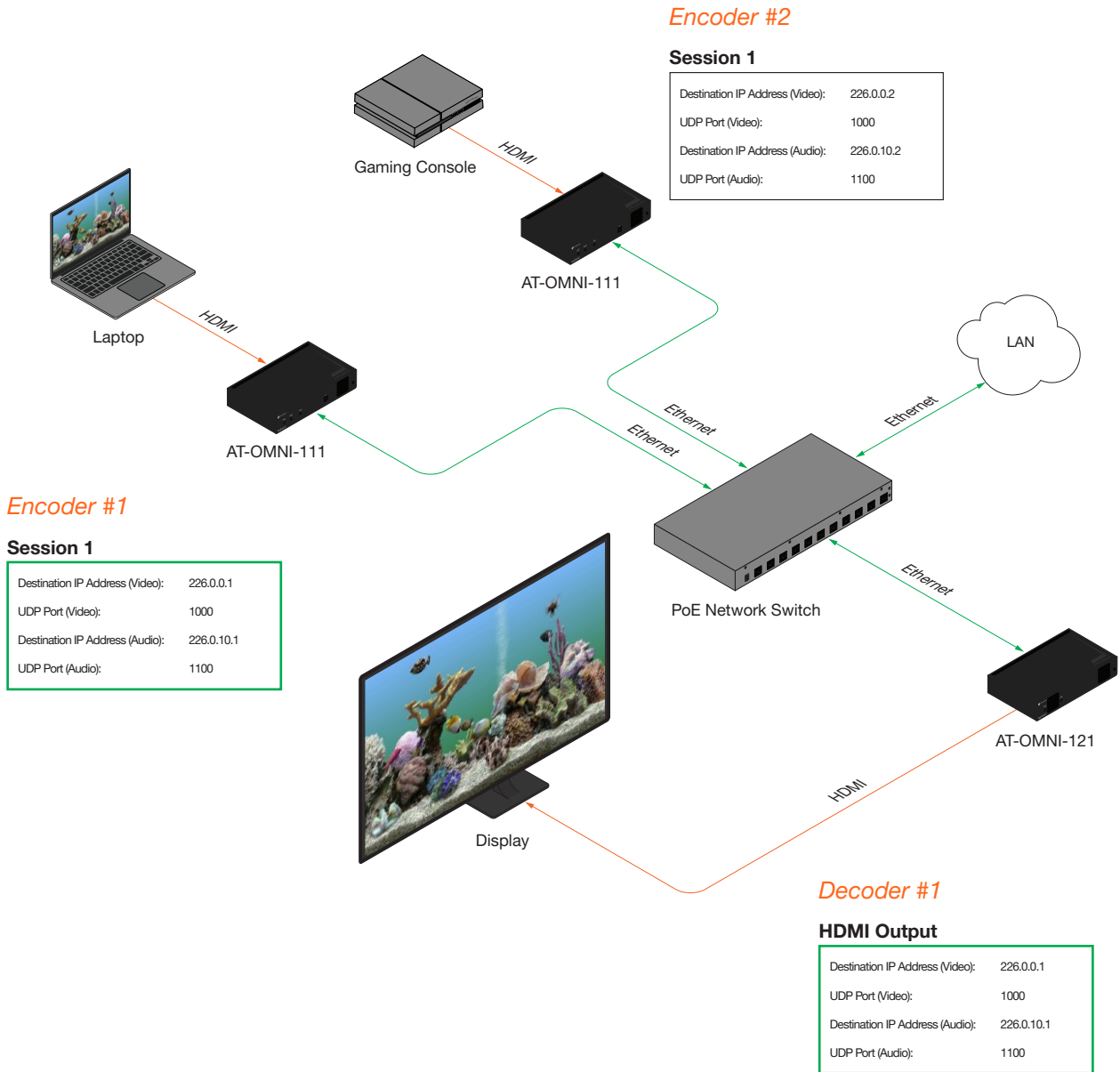
The decoder should now display the content of the source device connected to **HDMI IN** on the encoder. [Figure 3.1](#), on the next page, shows the completed configuration.

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 \(page 27\)](#).
- Go to the **Input** menu and make sure that the **Cable present** indicator, under the **Input 1** window group, is green. If it is not green, replace the HDMI cable or the encoder EDID. Refer to [Configuring Inputs \(page 28\)](#) for more information.
- Go to the **Encoding** menu and verify the following under the **Encoder 1** window group. Refer to [Encoder Settings \(page 30\)](#) for more information.
  - » Make sure the **Input** drop-down list is assigned to an input. In this tutorial, the **Input** field, under the **Encoder 1** window group, is 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 \(page 31\)](#) 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`.
  - » Verify that the **Video > Enable** toggle switch is set to enabled.
  - » 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 1000.
  - » Make sure the **Audio > Source** is set to `hdmi_input1`.
  - » Verify that the **Audio > Enable** toggle switch is enabled.
  - » 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 1100.

### 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 \(page 27\)](#).
- Go to the **IP Input** menu and verify the following. Refer to [Subscribing to an Encoder \(page 33\)](#) 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 1100 for both **Input 3** and **Input 4**.
- Go to the **HDMI Output** menu and verify the following. Refer to [Subscribing to an Encoder \(page 33\)](#) 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`.

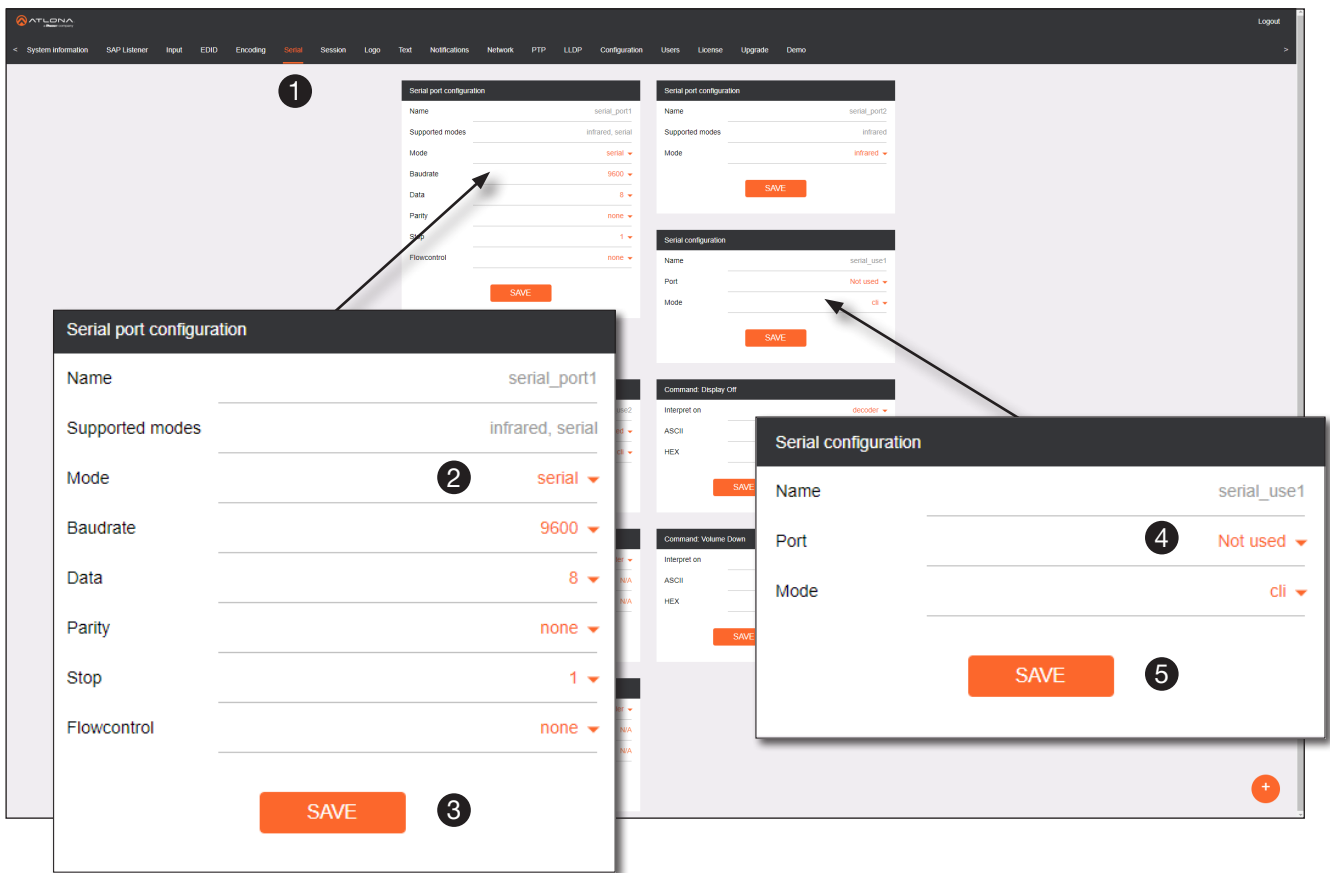
# Device Operation

## 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.

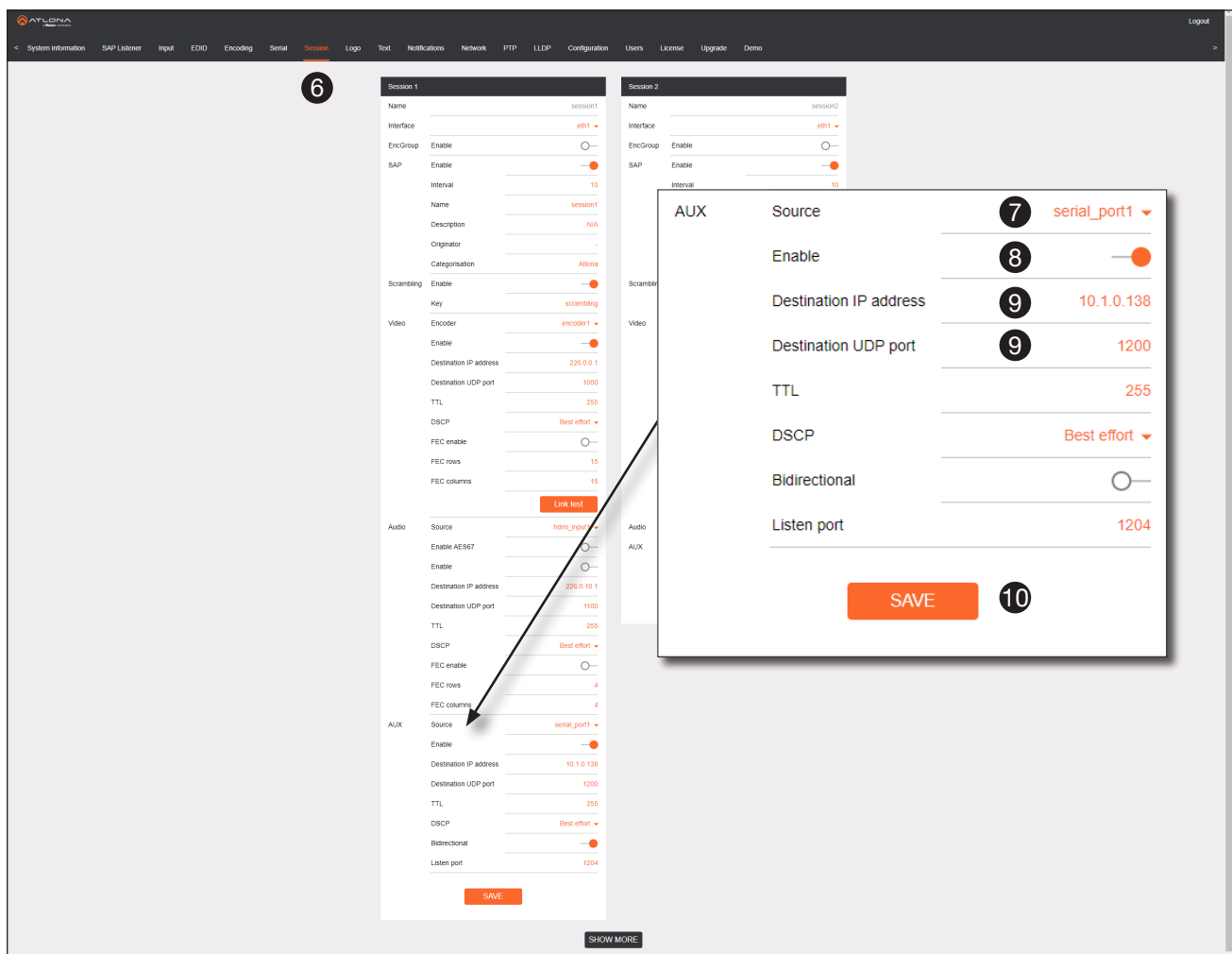
1. Login to the encoder and click the **Serial** menu.
2. Under the **Serial Port Configuration** window group, click the **Mode** drop-down list and select **Serial**.
3. Click the **SAVE** button.



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



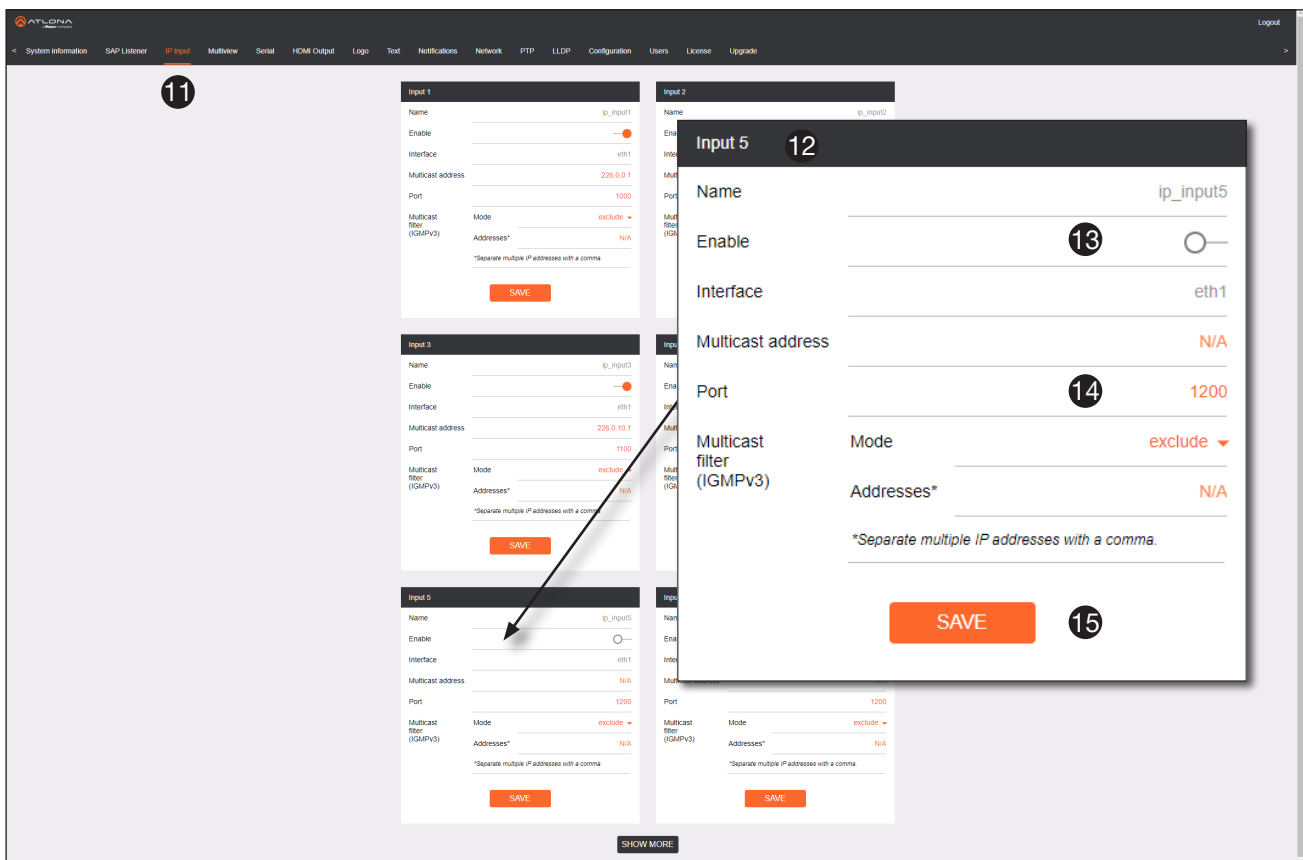
6. Click the **Session** menu.
7. Under the desired Session, locate the **AUX** section and click the **Source** drop-down list to select the desired serial port.
8. Click the **Enable** toggle switch to display the additional fields.
9. Enter the destination IP address and UDP port in the **Destination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



10. Click the **SAVE** button.

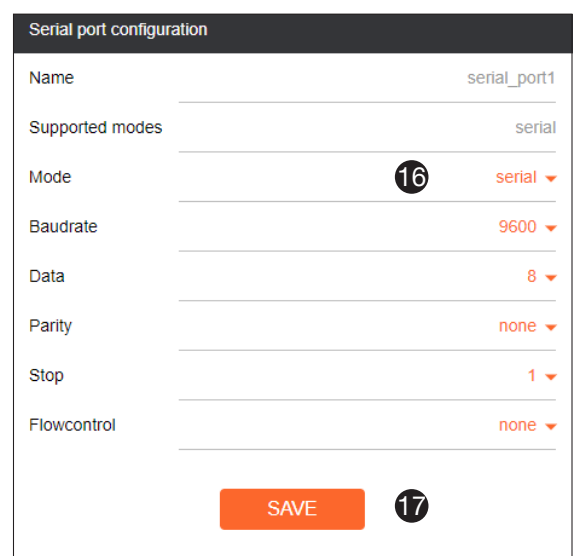
*If the destination IP address and UDP port is for a decoder, follow Steps 11 through 20, beginning on the next page:*

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.

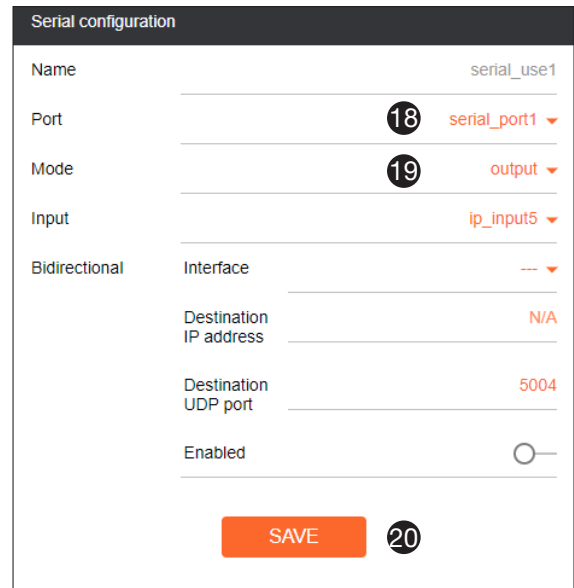


16. On the decoder, click the **Serial** menu, and under **Serial port configuration**, click the **Mode** drop-down list and select **serial**.

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: **18** serial\_port1

Mode: **19** output

Input: ip\_input5

Bidirectional: Interface: --

Destination IP address: N/A

Destination UDP port: 5004

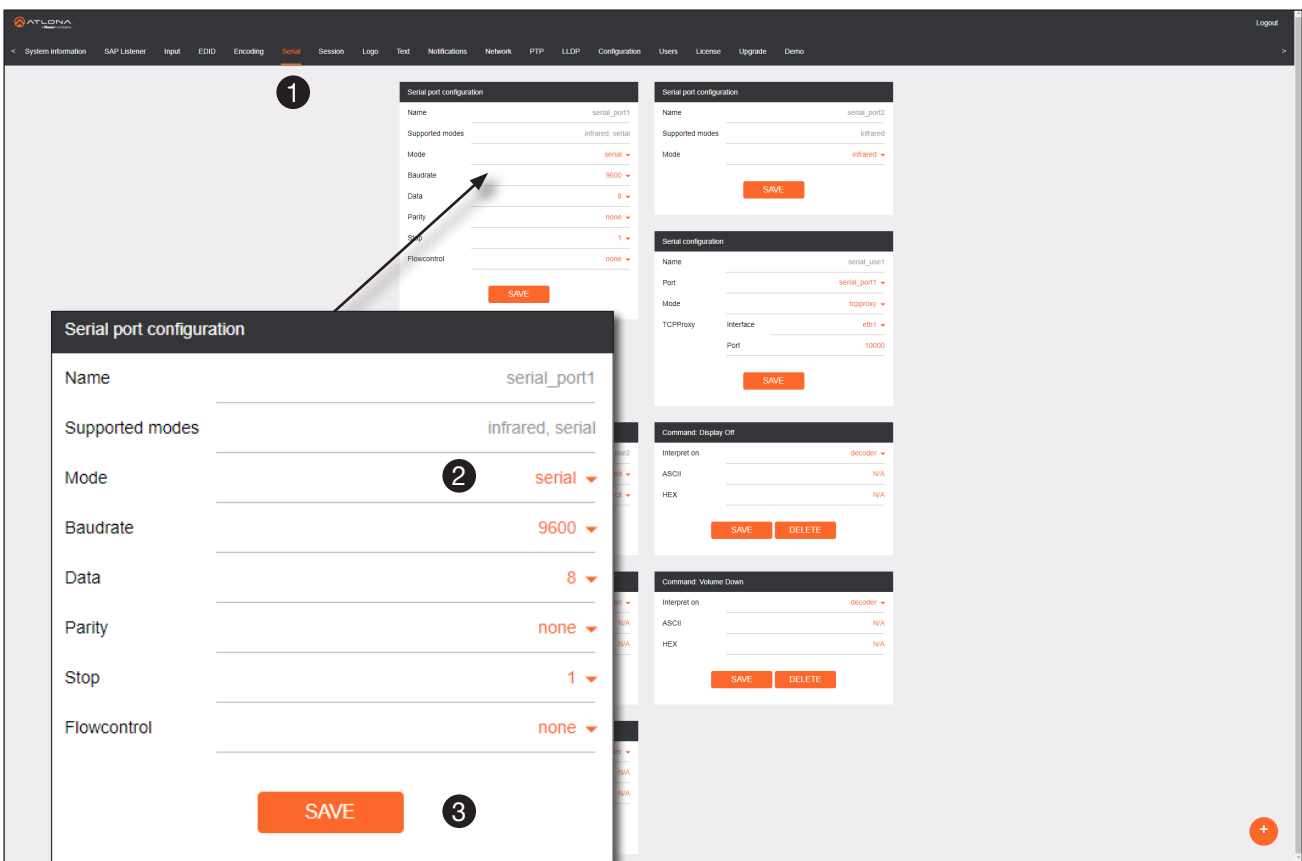
Enabled:

**SAVE** **20**

### 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: infrared, serial

Mode: **2** serial

Baudrate: 9600

Data: 8

Parity: none

Stop: 1

Flowcontrol: none

**SAVE** **3**

**Serial port configuration**

Name: serial\_port2

Supported modes: infrared

Mode: infrared

**SAVE**

**Serial configuration**

Name: serial\_use1

Port: serial\_port1

Mode: tcpproxy

TCPProxy: Interface: eth1, Port: 10000

**SAVE**

**Command: Display Off**

Interpret on: decoder

ASCII: N/A

HEX: N/A

**SAVE** **DELETE**

**Command: Volume Down**

Interpret on: decoder

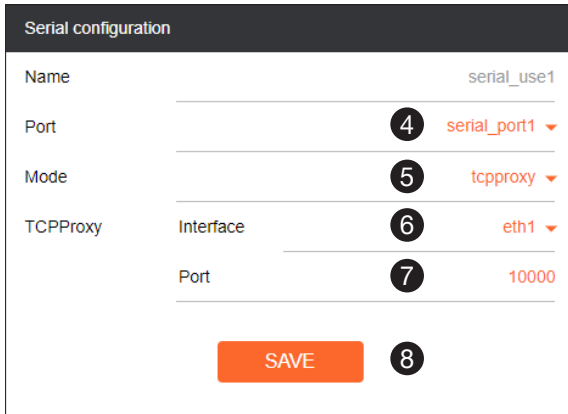
ASCII: N/A

HEX: N/A

**SAVE** **DELETE**

## Device Operation

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

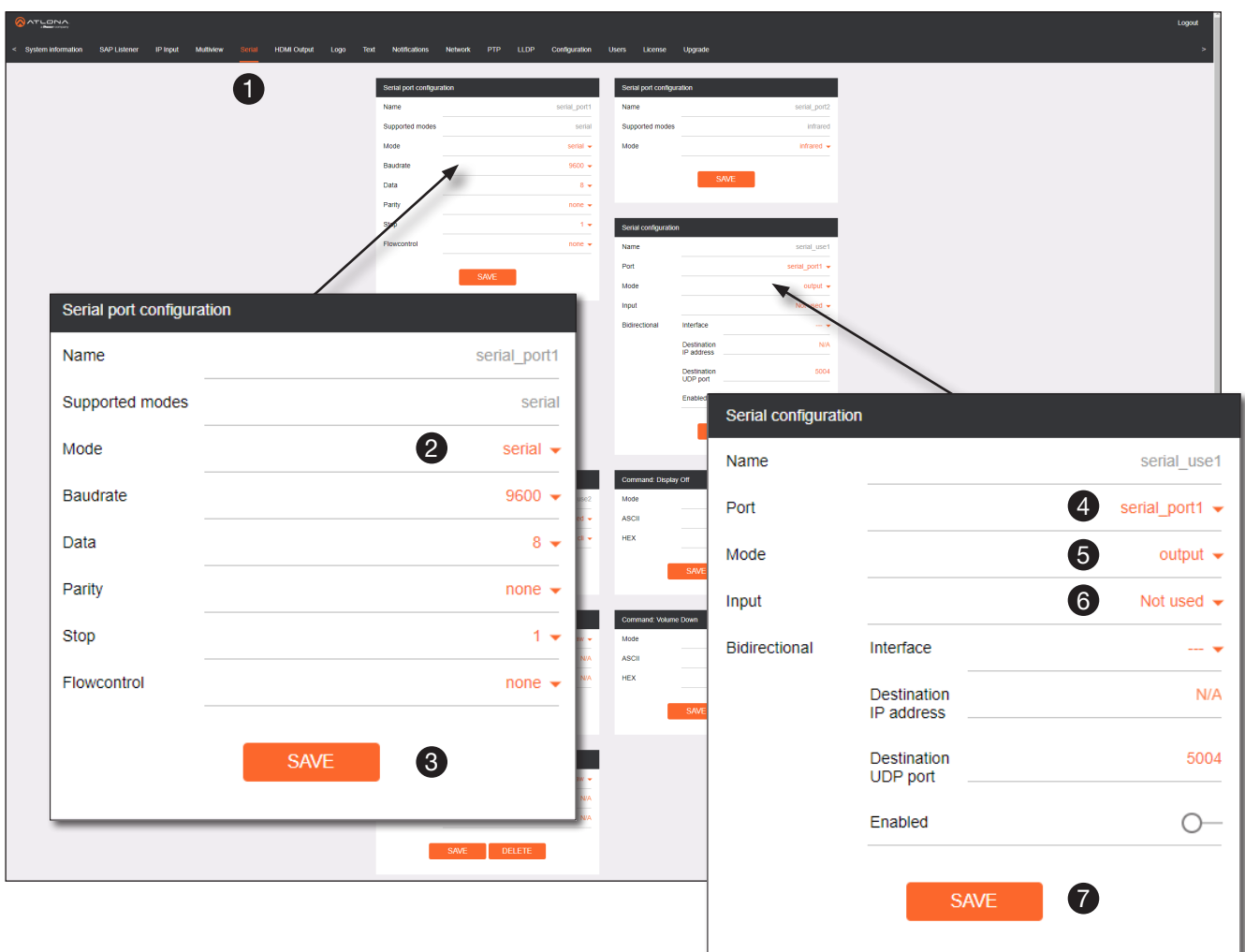
SAVE 8

### 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.



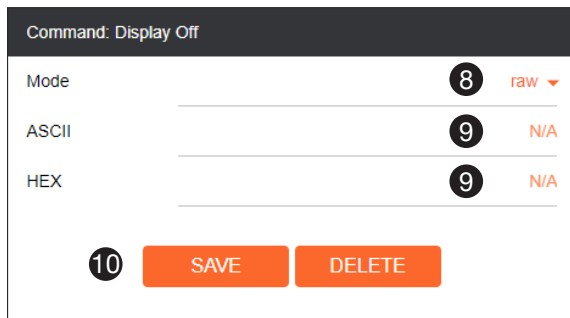
The screenshot displays the ATLONA web interface with several configuration windows. A navigation bar at the top includes 'System Information', 'SAP Listener', 'IP Input', 'Multiview', 'Serial', 'HDMI Output', 'Logo', 'Text', 'Notifications', 'Network', 'PTP', 'LLDP', 'Configuration', 'Users', 'License', and 'Upgrade'. The 'Serial' menu is highlighted with a circled '1'. Below it, the 'Serial port configuration' window for 'serial\_port1' shows 'Mode' set to 'serial' (circled '2') and a 'SAVE' button (circled '3'). Another 'Serial port configuration' window for 'serial\_port2' shows 'Mode' set to 'infrared'. A 'Serial configuration' window for 'serial\_use1' shows 'Port' set to 'serial\_port1' (circled '4'), 'Mode' set to 'output' (circled '5'), 'Input' set to 'Not used' (circled '6'), and a 'SAVE' button (circled '7').

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" with a dropdown menu set to "raw" (indicated by a circled 8), "ASCII" with a circled 9, and "HEX" with a circled 9. At the bottom, there are two orange buttons: "SAVE" (indicated by a circled 10) and "DELETE".

- 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

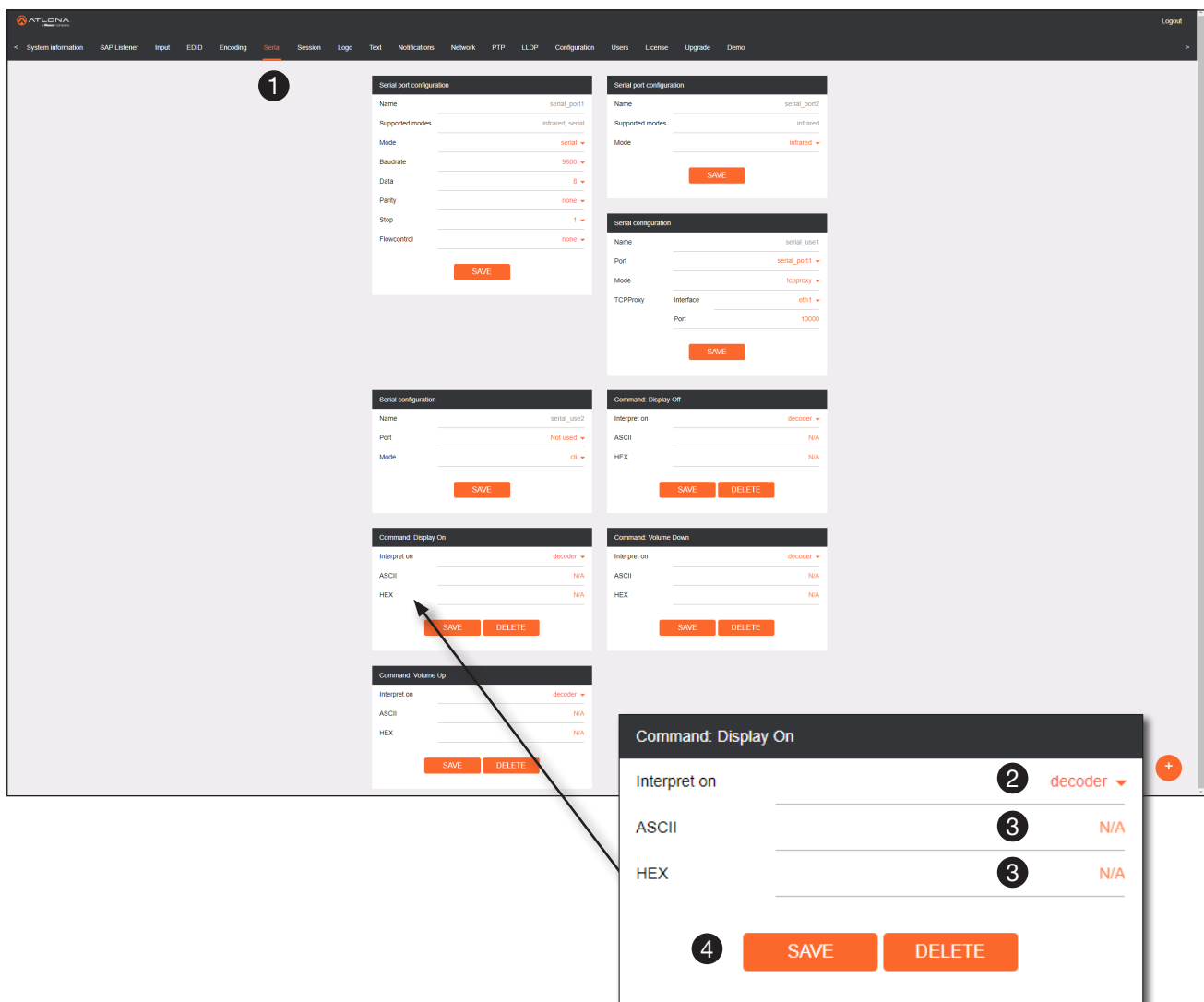
1. Login to the encoder and click the **Serial** menu.
2. For each of the available commands, click the **Interpret on** drop-down list and select `decoder`.

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.



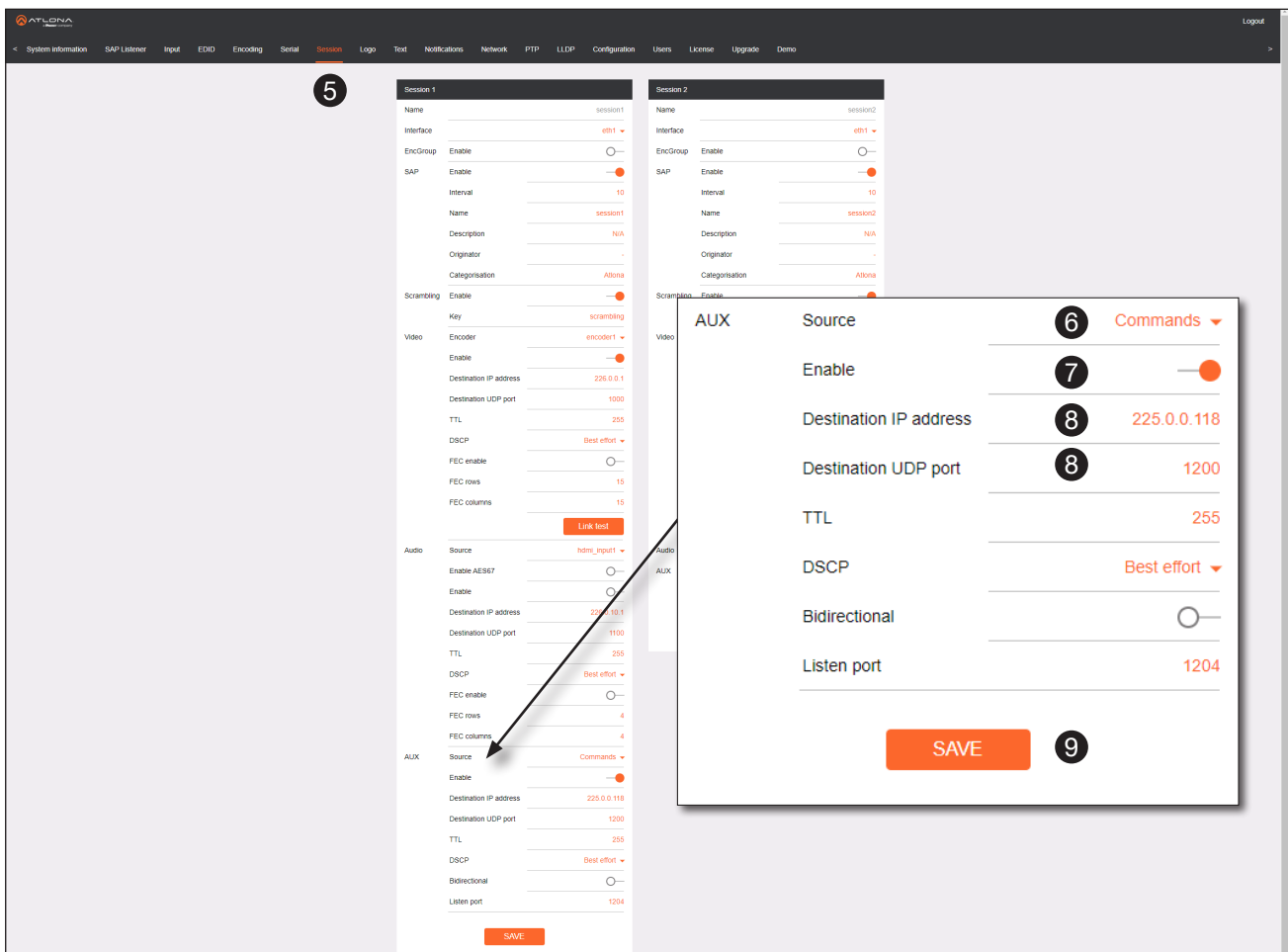
The screenshot displays the ATLONA web interface for configuring serial ports and commands. A red circle with the number '1' highlights the 'Serial' menu in the top navigation bar. Below, several configuration panels are visible:

- Serial port configuration:** Two panels for 'serial\_port1' and 'serial\_port2' with fields for Name, Supported modes, Mode, Baudrate, Data, Parity, Stop, and Flowcontrol. A 'SAVE' button is at the bottom of each.
- Serial configuration:** A panel for 'serial\_user1' with fields for Name, Port, Mode, and TCPProxy. A 'SAVE' button is at the bottom.
- Command: Display Off:** A panel with an 'Interpret on' dropdown set to 'decoder', and ASCII and HEX input fields. 'SAVE' and 'DELETE' buttons are at the bottom.
- Command: Volume Down:** A panel with an 'Interpret on' dropdown set to 'decoder', and ASCII and HEX input fields. 'SAVE' and 'DELETE' buttons are at the bottom.
- Command: Volume Up:** A panel with an 'Interpret on' dropdown set to 'decoder', and ASCII and HEX input fields. 'SAVE' and 'DELETE' buttons are at the bottom.

A callout window titled 'Command: Display On' is shown in the bottom right, with numbered steps:

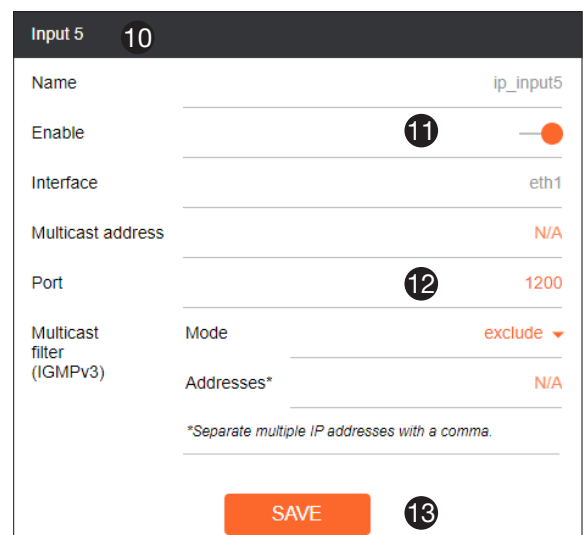
2. The 'Interpret on' dropdown menu is open, showing 'decoder' selected.
3. The 'ASCII' and 'HEX' input fields are visible.
3. The 'SAVE' and 'DELETE' buttons are visible.
4. The 'SAVE' button is highlighted.

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.



The screenshot shows the ATLONA web interface with the 'Session' menu selected. A callout box highlights the configuration for Session 1, specifically the AUX section. The 'Source' is set to 'Commands', the 'Enable' toggle is turned on, and the 'Destination IP address' is set to '225.0.0.118' and the 'Destination UDP port' is set to '1200'. A 'SAVE' button is visible at the bottom of the callout box.

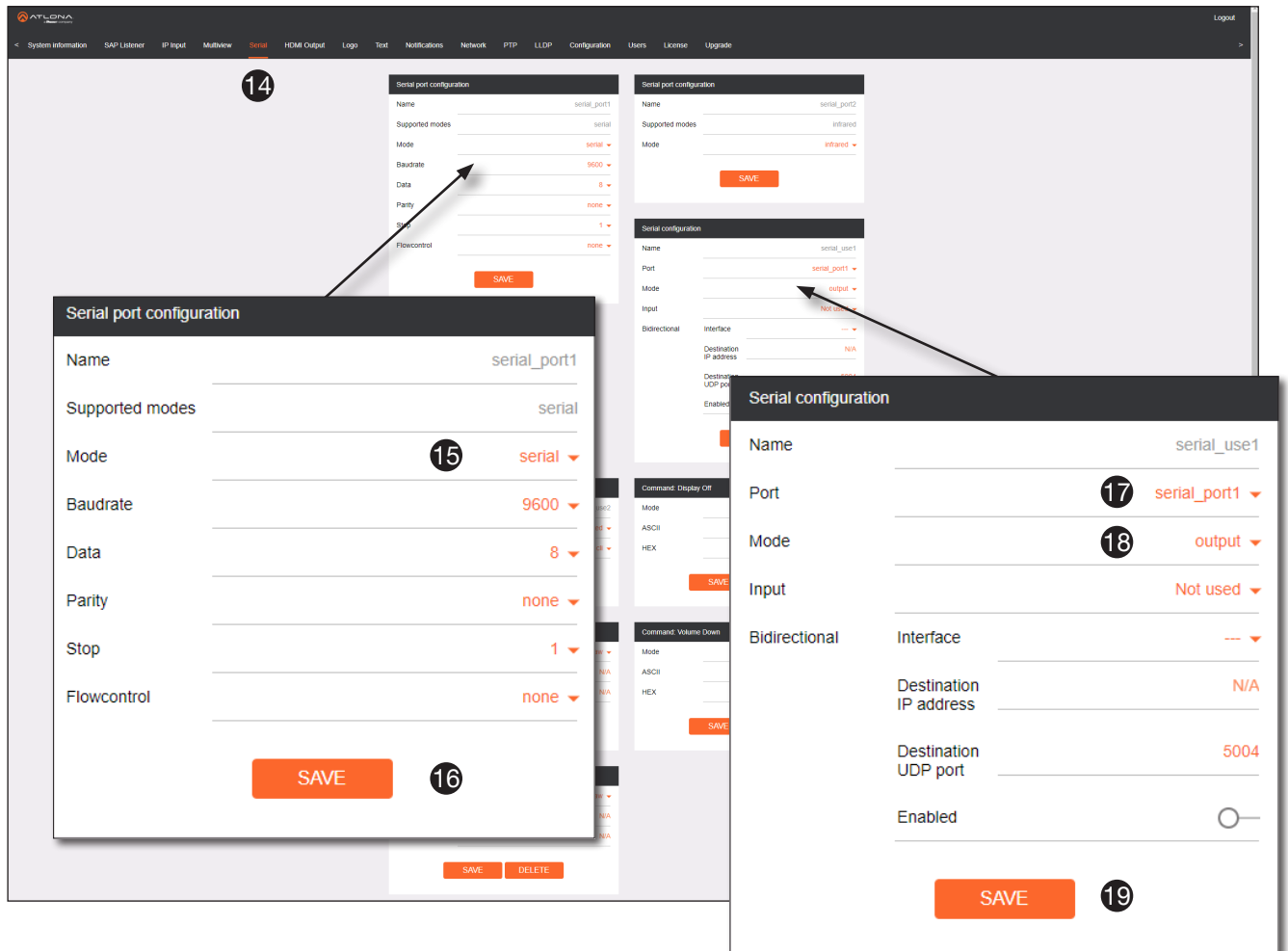
10. Login to the decoder, click the **IP Input** menu, then locate an Input that does *not* contain a defined Multicast address field. In this example, **Input 5** will be used. Note that if a multicast address was used in Step 8, then that multicast address must be entered in the **Multicast address** 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.



The screenshot shows the ATLONA web interface with the 'Input 5' configuration page. The 'Enable' toggle is turned on, and the 'Port' field is set to '1200'. A 'SAVE' button is visible at the bottom of the configuration page.



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`.



The screenshot displays the AT-OMNI-121/122 web interface. The 'Serial' menu is highlighted in the top navigation bar (14). The 'Serial port configuration' section shows 'serial\_port1' with 'Mode' set to 'serial' (15). A 'SAVE' button is visible (16). The 'Serial configuration' section shows 'serial\_use1' with 'Port' set to 'serial\_port1' (17) and 'Mode' set to 'output' (18). A 'SAVE' button is visible (19).

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`.

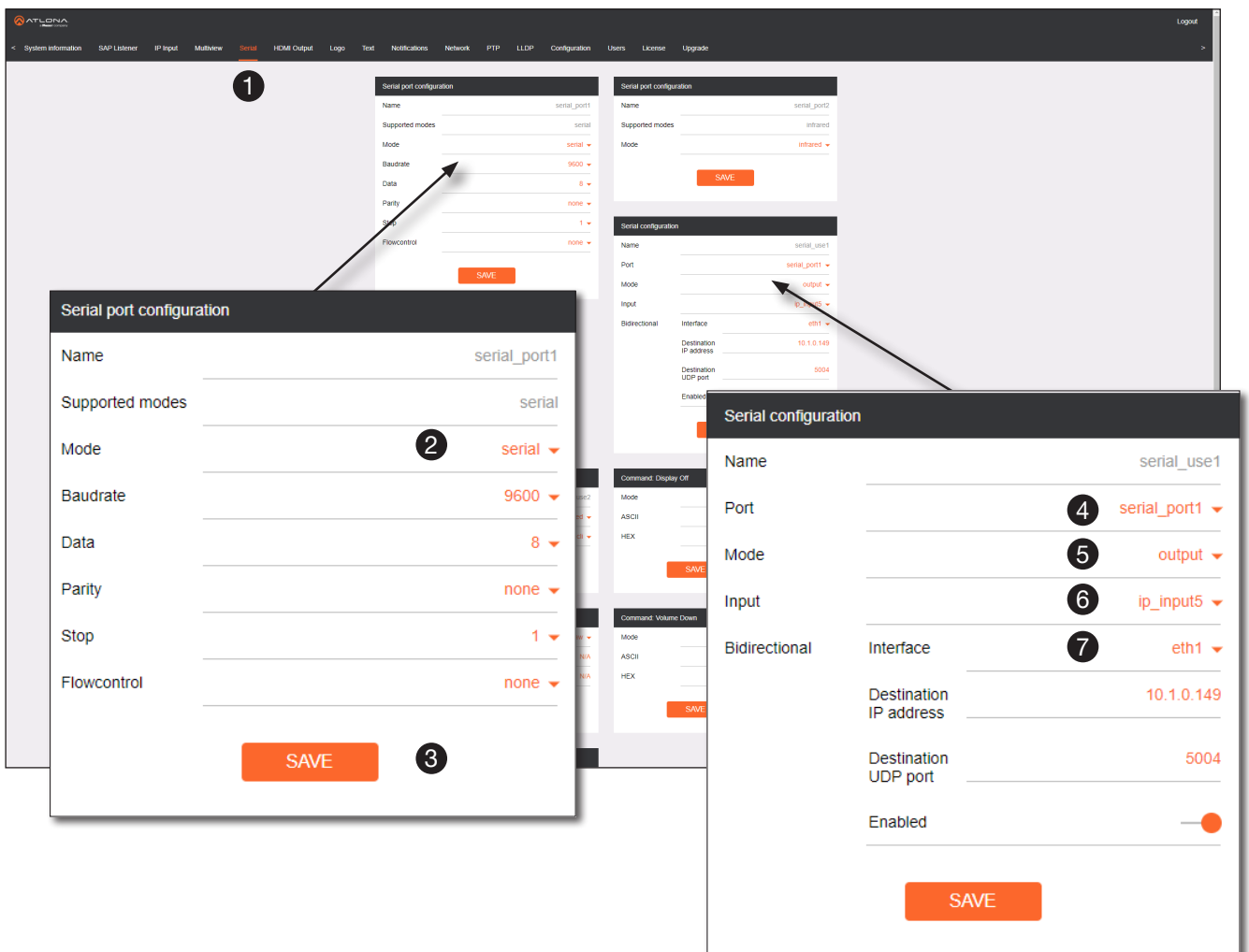
`VolumeBtn X`

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

### Upstream Control using RS-232

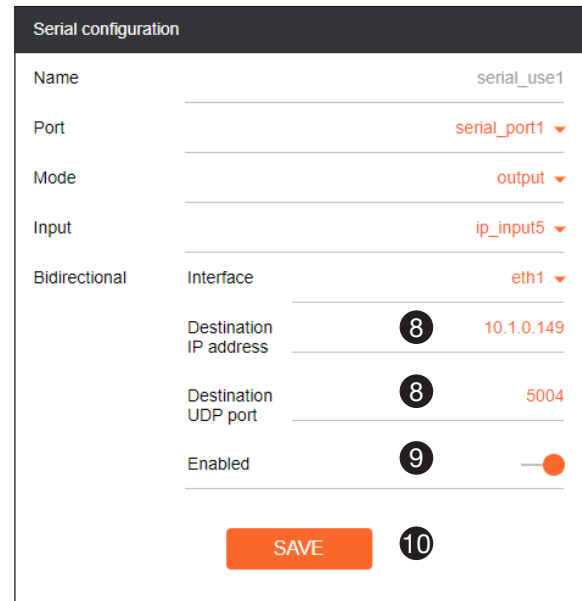
The serial interface provides RS-232 control of both downstream and upstream devices. Source control is provided by enabling bidirectional communication.

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**.
15. Click the **SAVE** button.



**Serial configuration**

Name: serial\_use1

Port: serial\_port1

Mode: output

Input: ip\_input5

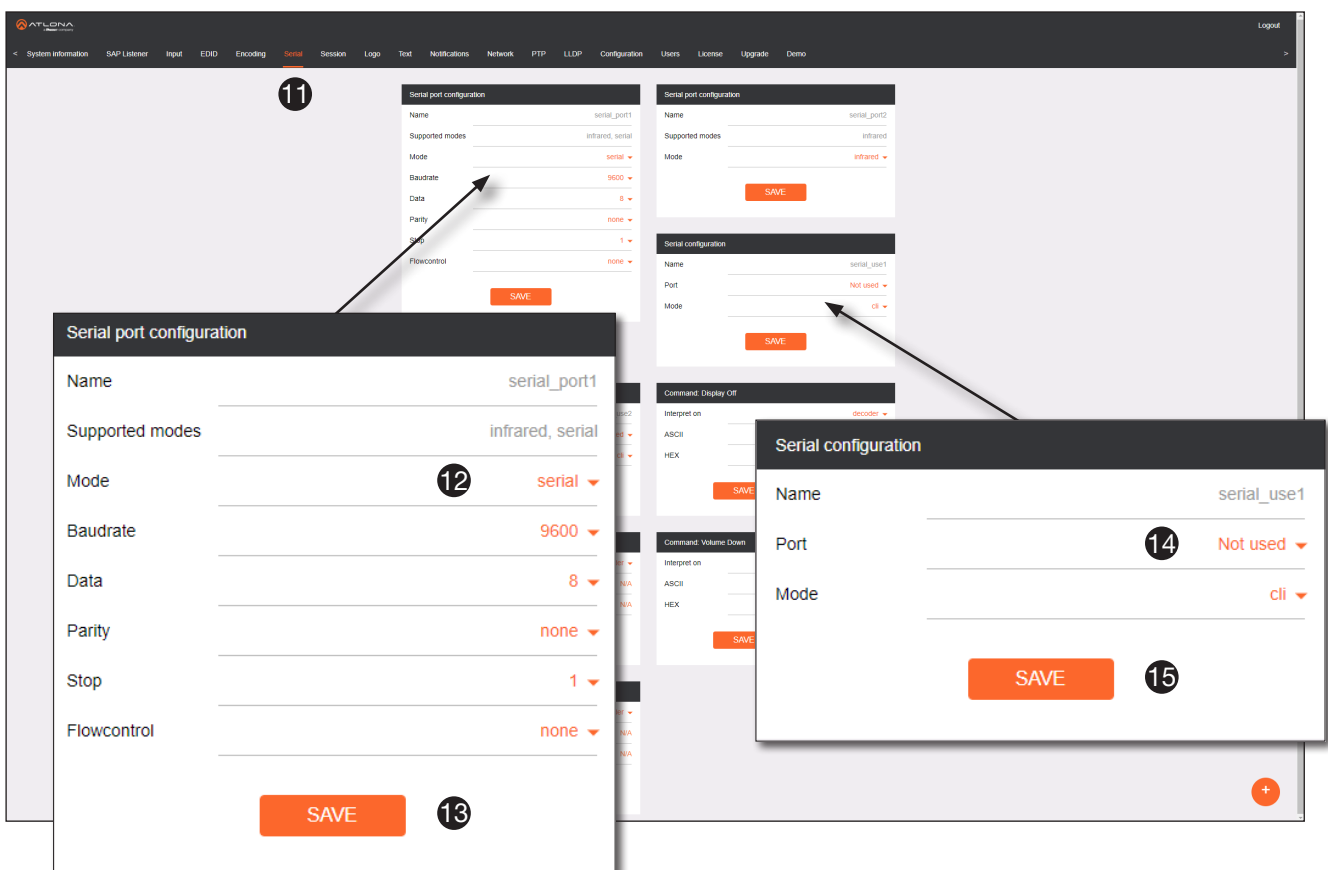
Bidirectional Interface: eth1

Destination IP address: 10.1.0.149

Destination UDP port: 5004

Enabled:

**SAVE**



**Serial port configuration**

Name: serial\_port1

Supported modes: infrared, serial

Mode: serial

Baudrate: 9600

Data: 8

Parity: none

Stop: 1

Flowcontrol: none

**SAVE**

**Serial configuration**

Name: serial\_use1

Port: Not used

Mode: cli

**SAVE**

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 **AUX > Bidirectional** toggle switch to enable it. When enabled, the toggle switch will be orange.
21. Click the **SAVE** button.

### Upstream Control using IR

To control of headend source from downstream, refer to the [Upstream Control using RS-232 \(page 50\)](#) instructions. Once configured, make sure that the serial port is configured for infrared, as shown.



**IMPORTANT:** Depending on the hardware, IR *may* also be supported on **RS-232** port 1. Verify the OmniStream hardware version to determine its capabilities. For decoders, IR is only supported on **RS-232** port 2.

**Serial port configuration**

Name:

Supported modes:

Mode:

**SAVE**

infrared

### Fast Switching

The VCx codec provides fast switching at resolutions up to 4K YUV 4:4:4 @ 60 Hz. This is an improvement over the VC-2 codecs that limited fast switching up to 1920x1200. When the decoder resolution and frame rate are set to `Auto`, VCx fast switching operates at the preferred resolution and frame rate of the display. In some cases, this preferred resolution and frame rate might not be the maximum supported by the display. If fast-switching is desired at a supported resolution and/or frame rate other than the preferred resolution and frame rate, the decoder can be manually configured for those resolutions.

The fast switching time depends primarily on three things, when switching between streams: resolution, frame rate, and bitrate. For example, a 4K60 stream operating at 750 Mb/s requires ~250 ms to switch. On the other hand, a 1080p stream operating at 750 Mb/s requires less than 50 ms to switch. The time it takes to switch is determined by the amount of time it takes for all the data for a complete frame to be received by the decoder. To improve the fast switching time, decrease the resolution, lower the frame rate, or increase the bitrate.



**IMPORTANT:** If Fast Switching is enabled, latency increases from 0.5 frames to 1.5 frames.

1. Login to the decoder and click **HDMI Output** in the menu.
2. Locate the **Fast Switching** section and click the **Enable** toggle switch to enable this feature. When enabled, the toggle switch will be orange.
3. Enter the timeout interval, in seconds, in the **Timeout(s)** field. If fast switching is enabled and the decoder is switched to a different stream, but the stream is not present, then the decoder will hold the last image on the screen. This image will continue to be displayed until either a new stream appears or the decoder is switched to a different stream. Once the timeout interval has expired, the screen will go black. Setting the timeout interval to 0 disables this feature and the last image will be displayed indefinitely.



**NOTE:** The following table is only applicable when using the VC-2 codec.

Input Resolution (from Encoder)	Output Resolution (AT-OMNI-121)	Output Resolution (AT-OMNI-122)
1280 x 720p	1280 x 720p	1280 x 720p
1920 x 1080p @ 60 Hz	1920 x 1080p @ 60 Hz	1920 x 1080p @ 30 Hz
> 1920 x 1080p (up to UHD)	1920 x 1080p @ 60 Hz	1920 x 1080p @ 30 Hz

### Fast Switching FAQs

**Question:** Does fast switching work between streams of different resolutions?

**Answer:** Yes. Fast switching can be used between streams with different resolutions and frame rates.

**Question:** Does fast switching work between HDR and SDR streams?

**Answer:** Yes, fast switching can be used between HDR and SDR streams; however, it's important to note that some color artifacts may appear during the switch.

**Question:** Does fast switching work between single streams and multiviews or between multiviews?

**Answer:** No. Due to the way multiviews work, fast switching is not supported. However, it is not necessary to change the fast switching setting – the decoder will switch as fast as possible between multiviews and return to fast switching when single streams are used.

**Question:** Does fast switching work on video walls?

**Answer:** No. Fast switching is not supported when using video walls.

### 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.

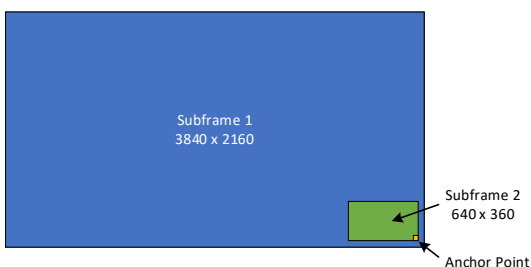
*Anchor point* - A fixed point on a subframe. The anchor point can be set to top-left, top-right, bottom-left, bottom-right, or center. Each anchor point is defined by an x and y coordinate.

*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.

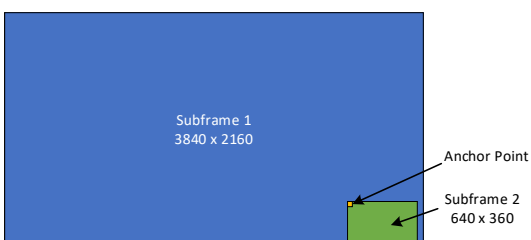
The images below shows the different anchor point options on a particular subframe. For any given subframe, only one of these will be selected as the anchor point.

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.

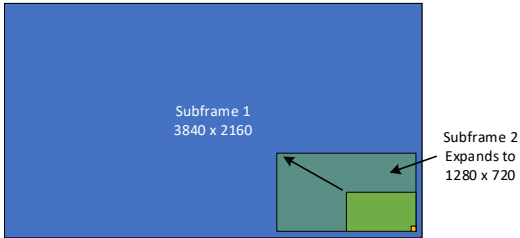
In this first example, the multiview is configured as a P-i-P view, where the P-i-P subframe has its anchor point configured as bottom right. The incoming stream is 640 x 360.



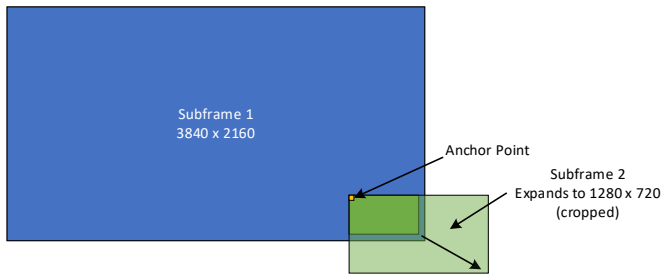
By contrast, consider the same multiview layout, but with the P-i-P subframe having a top left anchor point.



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.



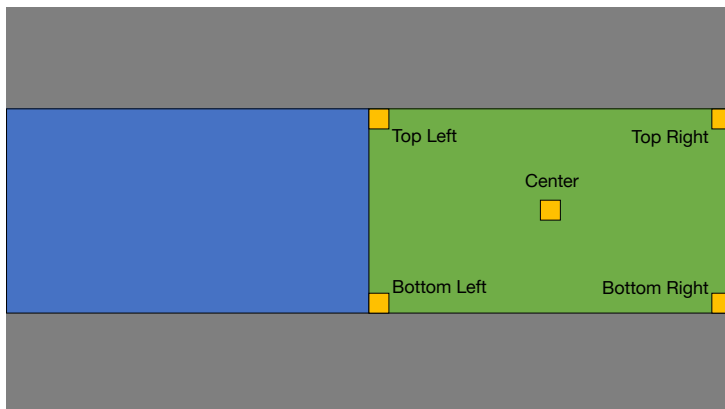
In this case, when the stream changes to 1280 x 720, the subframe will grow in size and be cropped by the display, because the top left anchor point has not change position



### 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.

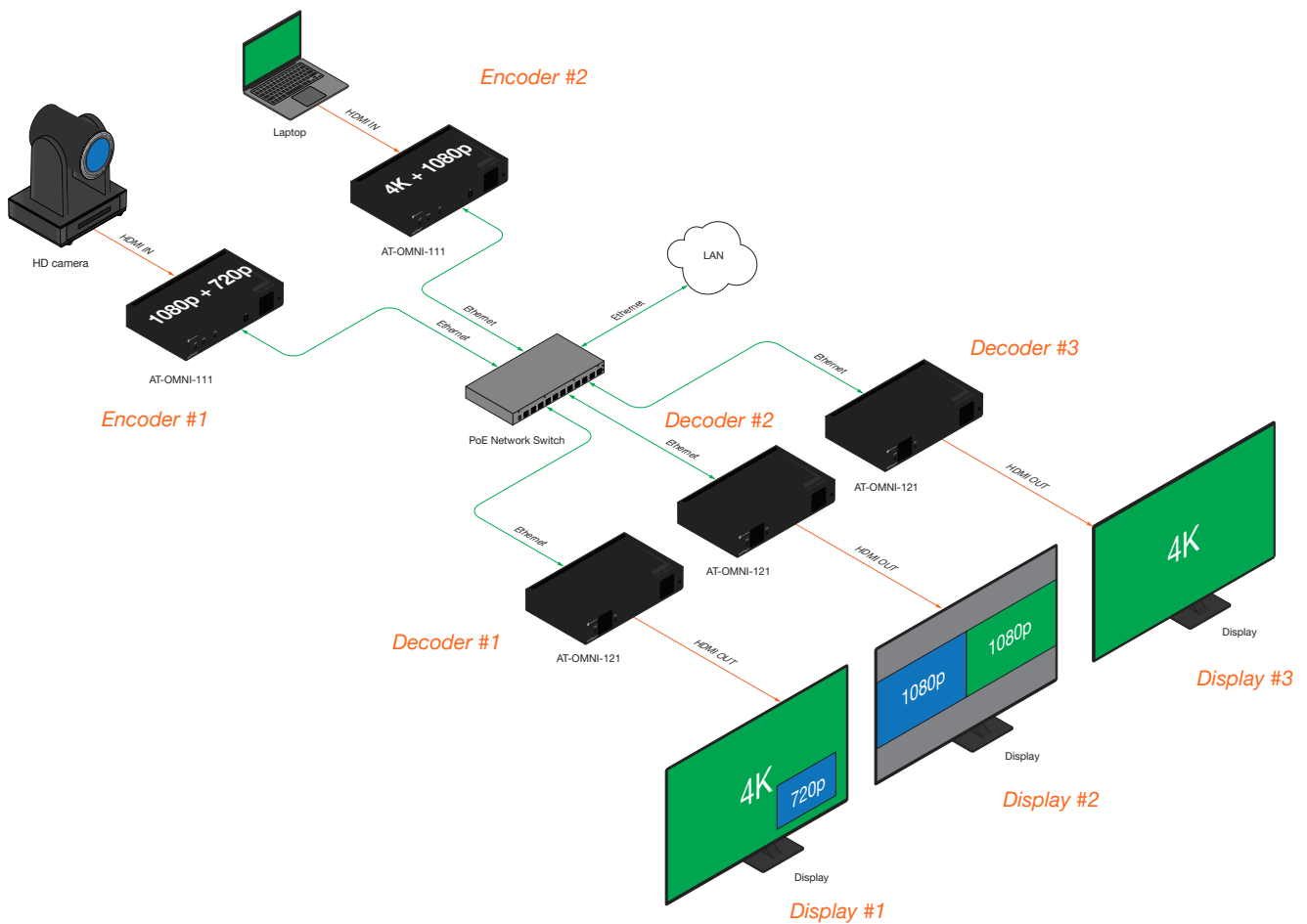




## Multiview and Dual-Streaming Tutorial

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

### 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

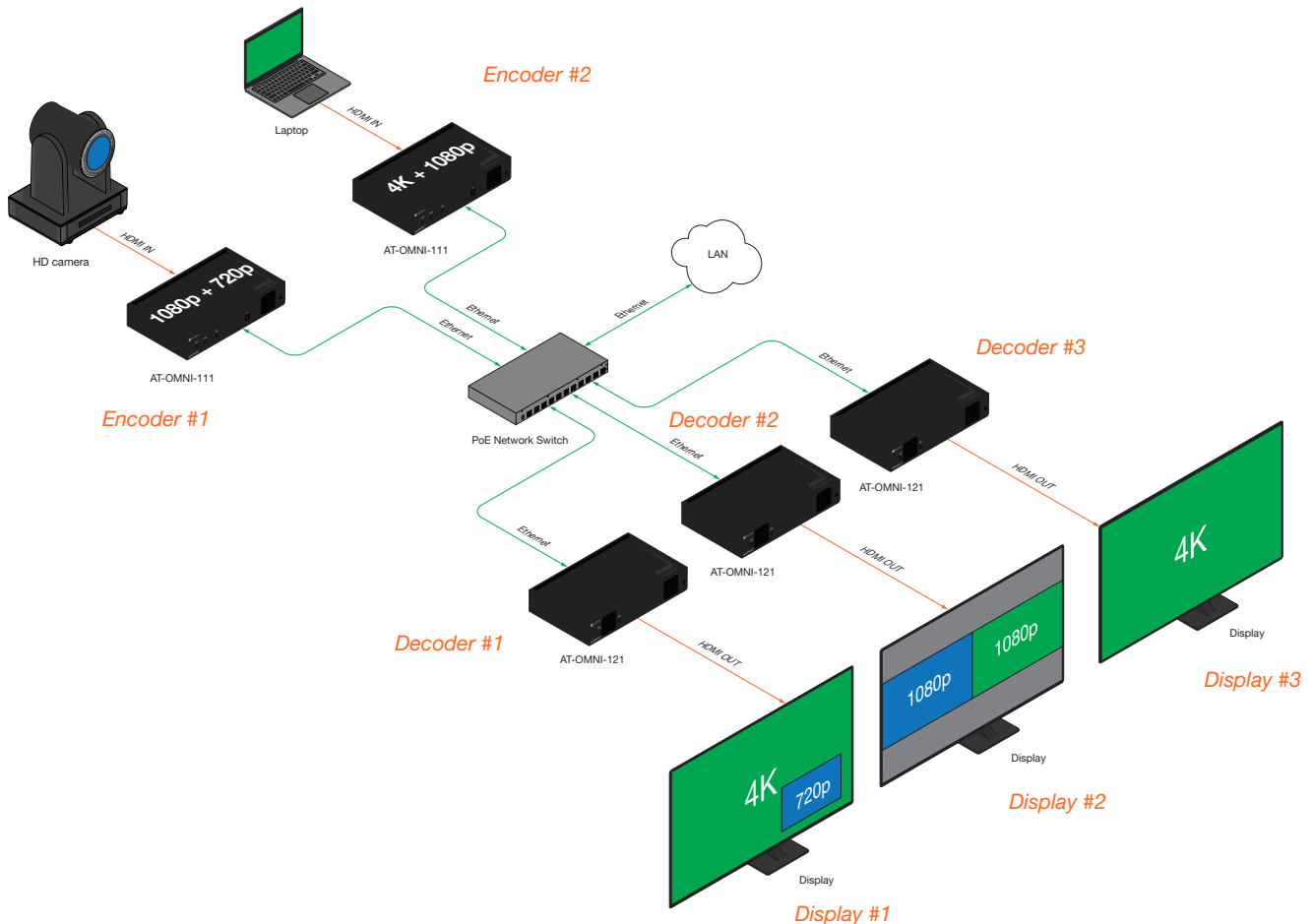
3. Click the **Enable** toggle switch for each **Input** window group. When enabled, the toggle switch will be orange.
4. Click **SAVE**, under each **Input** window group, to commit changes.
5. Click on the **HDMI Output** menu.
6. Verify that each source can be displayed, independently. To do this, 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)`.

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 `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.
12. 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. The anchor point (0, 0) represents the top left corner of the multiview canvas. 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.

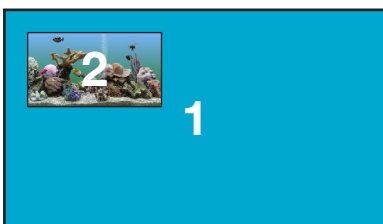


**IMPORTANT:** X-values must be specified in increments of 32. Y-values must be specified in increments of 8. If these increments are not used, then the decoder will automatically be assigned the closest “correct” coordinate value and display a message of the change.

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.



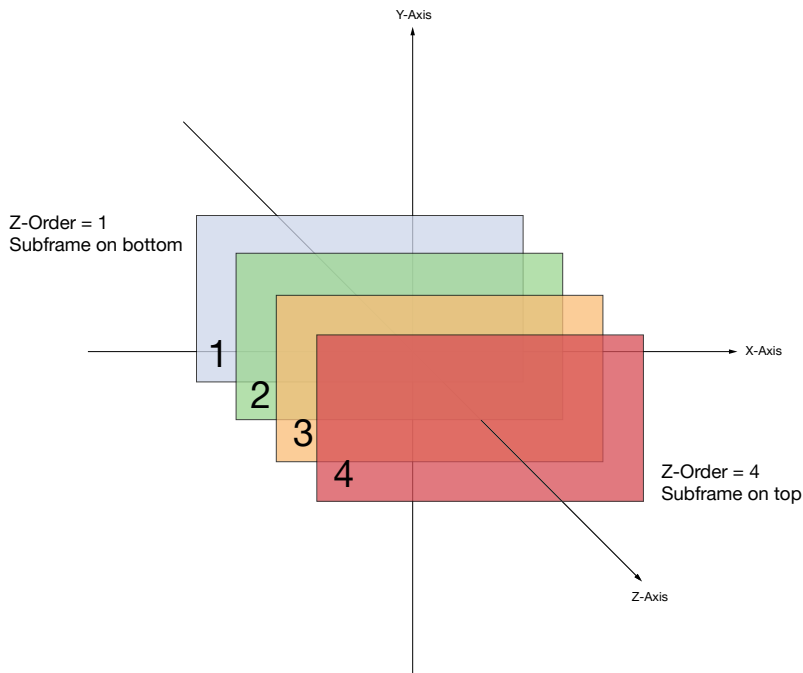
1. Click the **Multiview** menu, then under the **Multiviews** window group, click the name of the Multiview background color to be changed.
2. Locate the **Background color** section and click the **Choose color** button.
3. Click and drag the mouse across the palette to select the desired color. Alternatively,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

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.



**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.

### 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 \(page 31\)](#) for more information.

### Configuring Audio Output



**IMPORTANT:** When using analog audio inputs on the OmniStream decoder, the decoder must be powered using the 48V power supply (AT-PS-48083-C). This power supply is sold separately and can be purchased from Atlona.

In addition to passing audio directly from the encoder to the decoder, both the AT-OMNI-121 and AT-OMNI-122 provide two additional audio options

- HDMI audio can be de-embedded and output to two-channel analog audio.
- Two-channel analog audio can be embedded and output over HDMI.

This section covers both methods. If using a single-channel decoder, only a single **AUDIO IN** and **AUDIO OUT** port will be available.

#### De-embedding Audio

De-embedding audio will extract the HDMI LPCM audio and automatically downmix to two-channel analog audio, using the included captive-screw connectors.

1. Connect the power supply to the DC 48V connector on the decoder.
2. Connect the included 5-pin captive screw connectors to the **AUDIO OUT** ports. Refer to [Audio Connectors \(page 18\)](#) for wiring information.
3. Login to the decoder and click **HDMI Output** in the menu.
4. Scroll down to the **Audio** section and click the **Analog Power** toggle switch to enable it. When enabled, the toggle switch will be orange. The **Analog Power Status** indicator, above the toggle switch, will be green. This indicates that the external power supply is connected to the decoder.

Audio from the source will now be heard on the **ANALOG OUT** port of the decoder. Note that when audio is de-embedded, it will not longer be audible using the HDMI OUT ports on the decoder.

#### Embedding Audio

Embedding audio will replace the existing HDMI audio source, normally heard on the output of the decoder. The analog audio will be heard on the **HDMI OUT** port of the decoder.

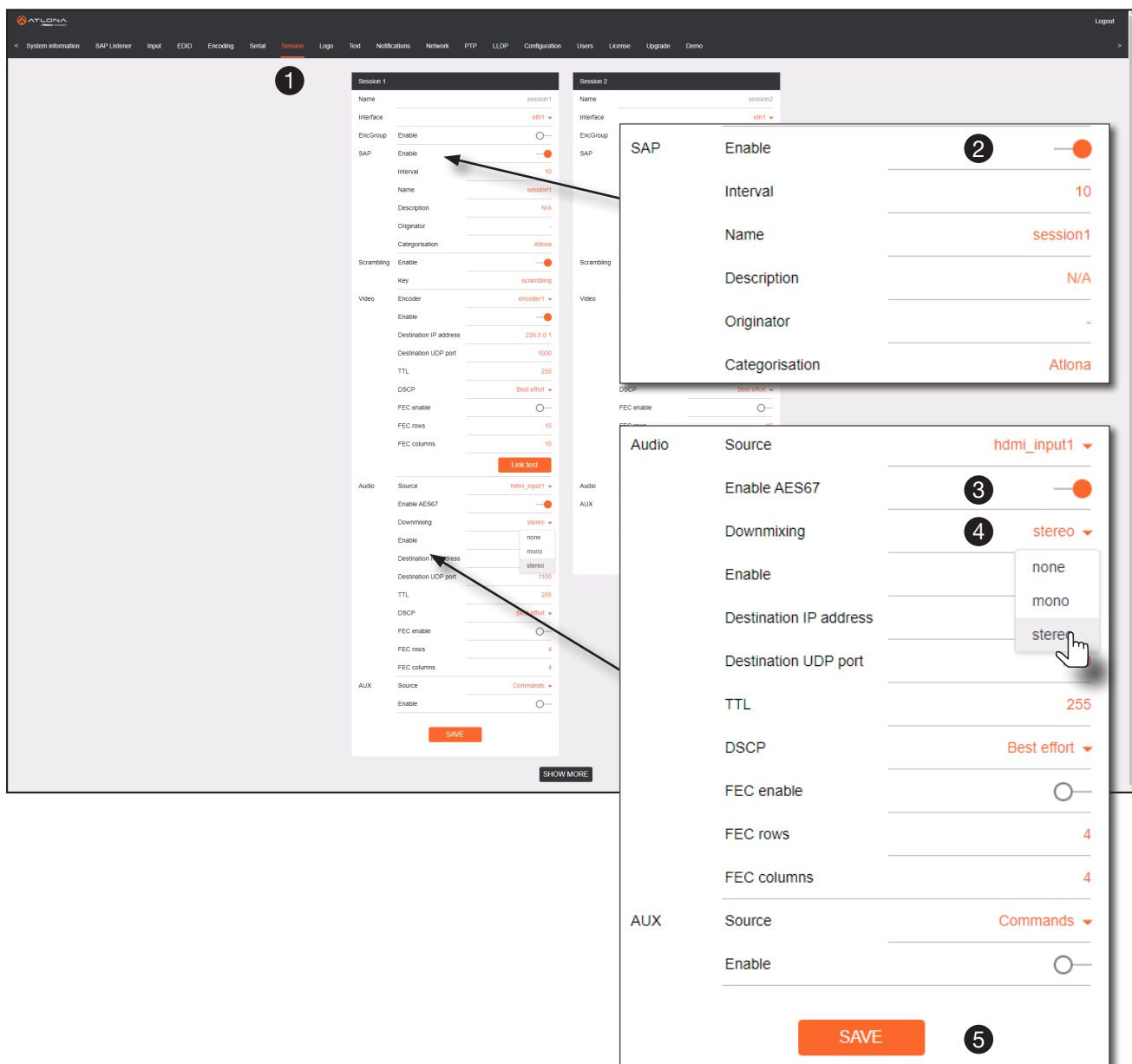
1. Connect the power supply to the DC 48V connector on the decoder.
2. Connect the audio source to the **AUDIO IN** ports, using the included 5-pin captive screw connectors. Refer to [Audio Connectors \(page 18\)](#) for wiring information.
3. Login to the decoder.
4. Click **HDMI Output** in the menu bar.
5. Scroll down to the **Audio** section and click the **Analog Power** toggle switch to enable it. When enabled, the toggle switch will be orange. The **Analog Power Status** indicator, above the toggle switch, will be green. This indicates that the external power supply is connected to the decoder.

Audio from the source will now be heard on the **HDMI OUT** ports on the decoder.

## 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.

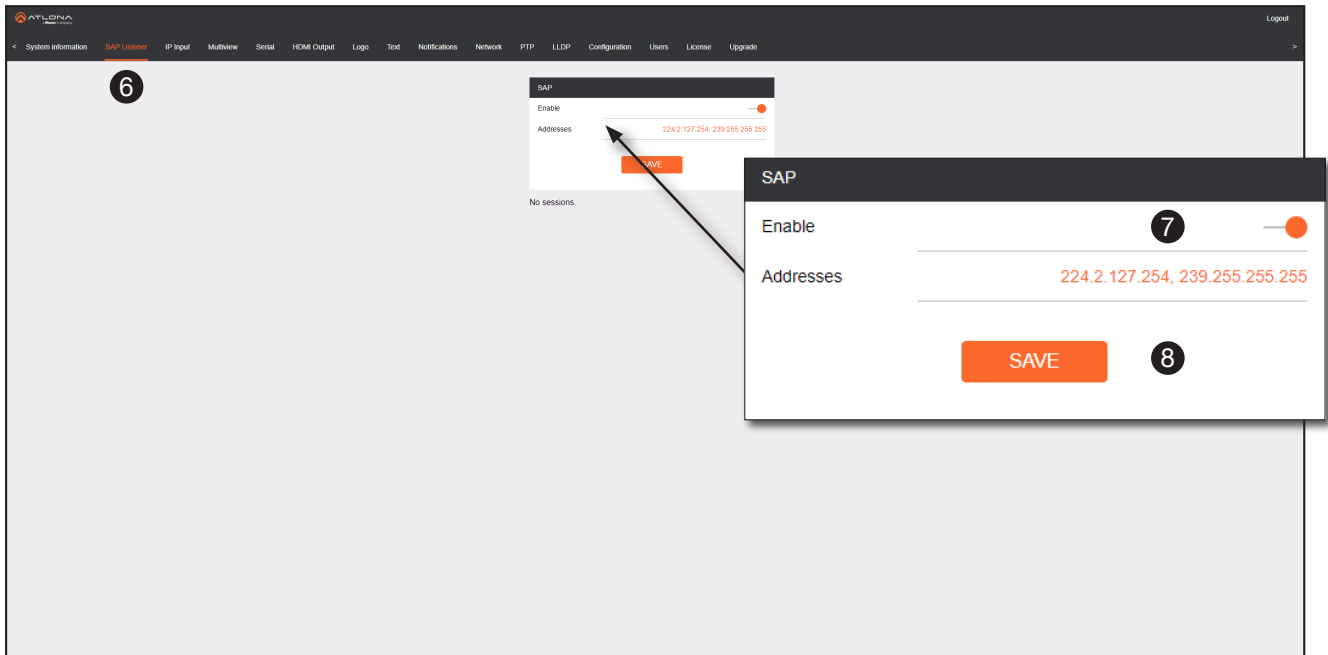
1. Login to the encoder and click **Session** in the menu bar.
2. Click the **SAP > Enable** toggle switch to enable SAP. When enabled, the toggle switch will be orange.
3. Locate the **Audio** section and click the **Enable AES67** toggle switch to enable this feature. When enabled, the toggle switch 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.



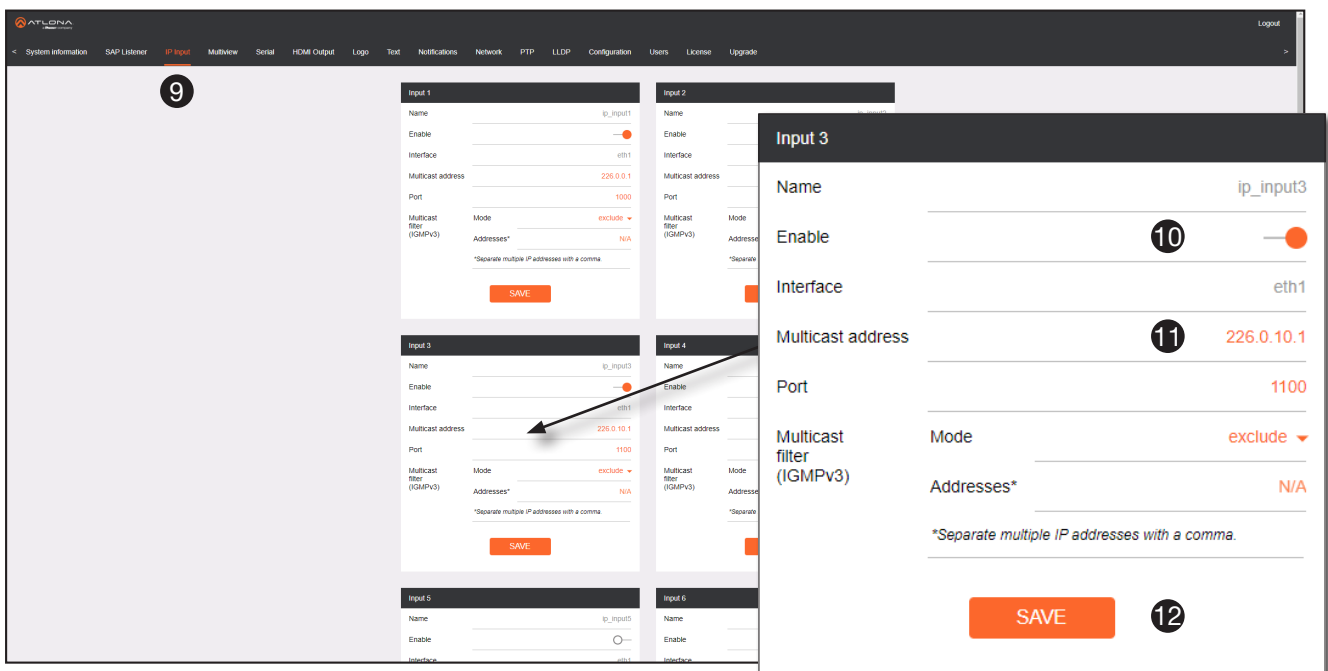
The screenshot displays the ATLONA web interface with the following configuration details:

- Session 1:**
  - Name: session1
  - Interface: eth1
  - Enable AES67:
  - Downmixing: stereo
  - Destination IP address: 226.0.0.1
  - Destination UDP port: 1000
  - TTL: 255
  - DSCP: Best effort
  - FEC enable:
  - FEC rows: 15
  - FEC columns: 15
  - Audio Source: hdmi\_input1
  - Enable AES67:
  - Downmixing: stereo
  - Destination IP address: 226.0.0.1
  - Destination UDP port: 1100
  - TTL: 255
  - DSCP: Best effort
  - FEC enable:
  - FEC rows: 4
  - FEC columns: 4
  - AUX Source: Commands
  - Enable:
- Session 2:**
  - Name: session2
  - Interface: eth1
  - Enable AES67:
  - Downmixing: stereo
  - Destination IP address: 226.0.0.1
  - Destination UDP port: 1000
  - TTL: 255
  - DSCP: Best effort
  - FEC enable:
  - FEC rows: 15
  - FEC columns: 15
  - Audio Source: hdmi\_input1
  - Enable AES67:
  - Downmixing: stereo
  - Destination IP address: 226.0.0.1
  - Destination UDP port: 1100
  - TTL: 255
  - DSCP: Best effort
  - FEC enable:
  - FEC rows: 4
  - FEC columns: 4
  - AUX Source: Commands
  - Enable:

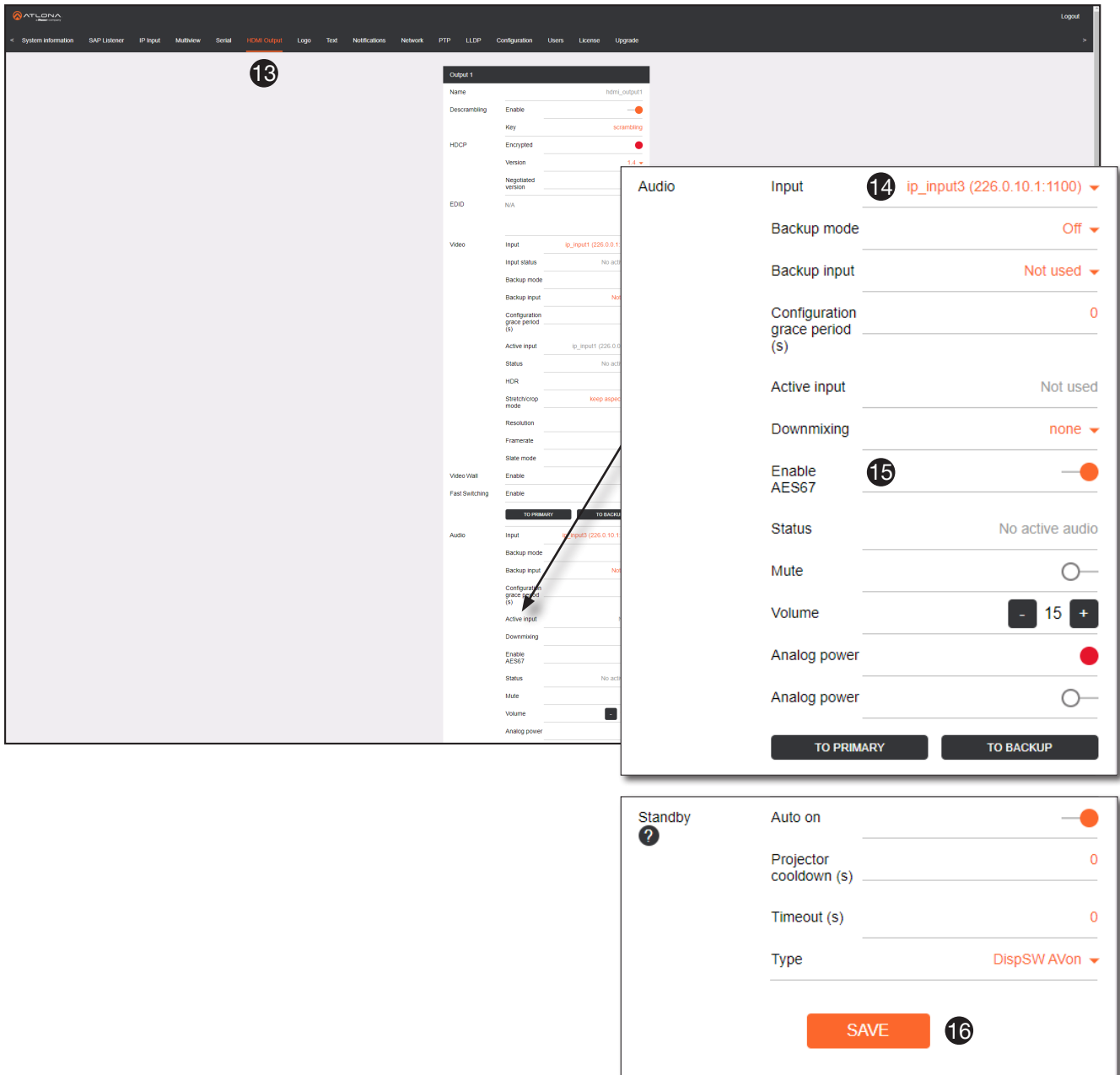
6. Go to the decoder and click the **SAP Listener** menu.
7. Click the **Enable** toggle switch to enable the SAP listener. When enabled, the toggle switch will be orange.
8. Click the **SAVE** button.



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:** In the **Audio** section, the **Input** dropdown menu is open, and **ip\_input3 (226.0.10.1:1100)** is selected.
- Step 15:** The **Enable AES67** toggle switch is turned on (orange).
- Step 16:** The **SAVE** button is highlighted in orange.

The interface also shows other configuration options for the Audio section, including Backup mode (Off), Backup input (Not used), Configuration grace period (0s), Active input (Not used), Downmixing (none), Mute (Off), Volume (15), and Analog power (Off).

## Descrambling

OmniStream supports 128-bit Advanced Encryption Standard (AES) scrambling and is required for HDCP-encrypted video streams. Scrambling can be enabled or disabled and is applied to individual sessions. In order to function properly, *scrambling* must be enabled on the *encoder* and *descrambling* must be enabled on the *decoder*. The scrambling and descrambling key on both the decoder and all subscribed encoders must be identical. The default scrambling/descrambling key is `scrambling`.

1. Login to the decoder.
2. Click **HDMI Output** in the menu bar.
3. Locate the **Descrambling** section and click the **Descrambling** > **Enable** toggle to enable descrambling. Once enabled, the toggle switch will be orange.
4. Enter the descrambling key in the **Key** field. This key must match the key specified on the subscribed encoder, under the **Scrambling** section.
5. Click the **SAVE** button at the bottom of the **HDMI Output** 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 entered on the decoder, in order to descramble 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.

#### 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` or `.svg` 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 the **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

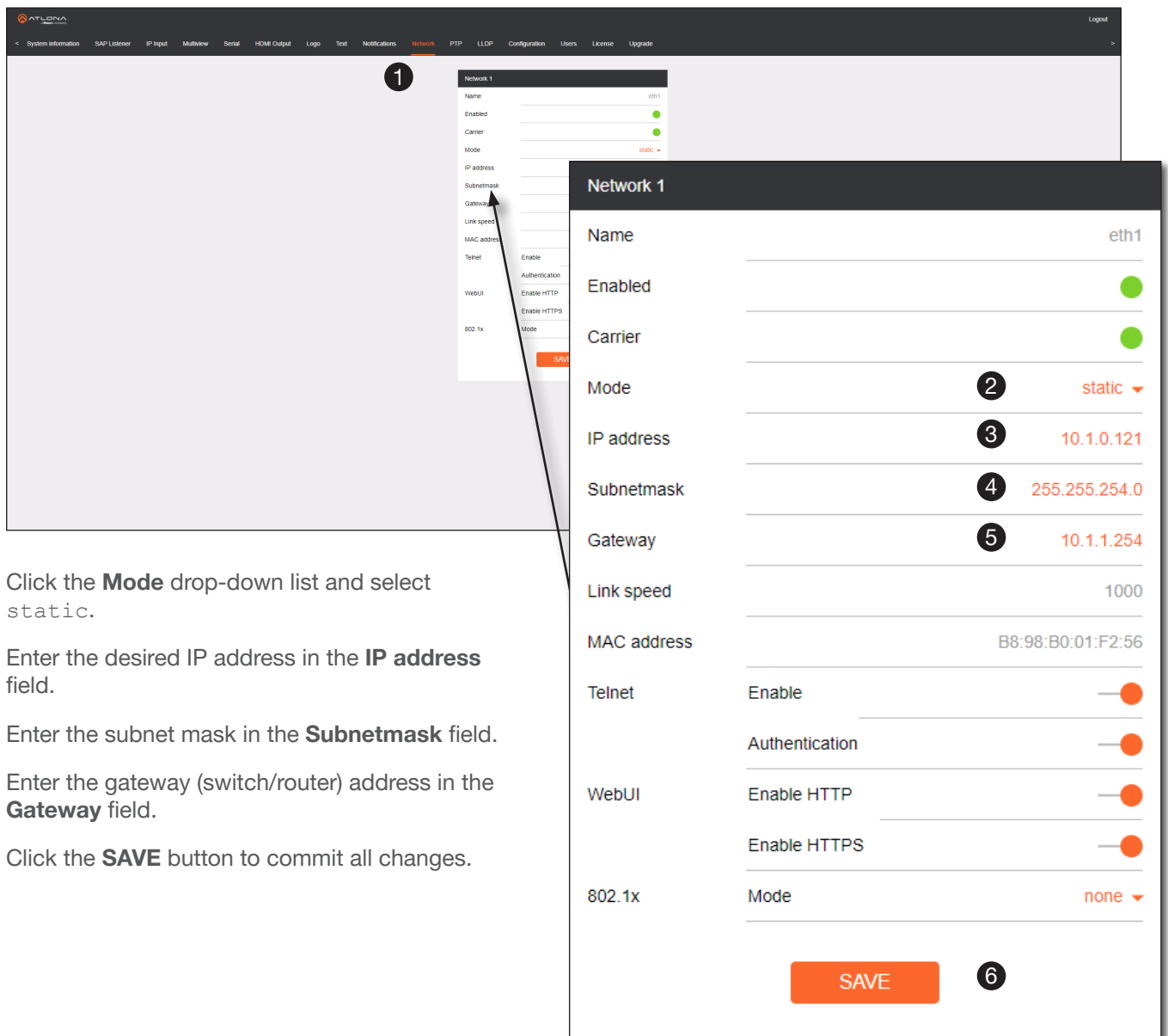
Text can be inserted and scrolled across the screen, making it useful for messages and notifications. Several options are available when using text: Scroll speed adjustment (forward, reverse, or static), number of iterations, text color, vertical / horizontal position, as well as transparency.

1. Login to the decoder.
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 decoder 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	10.1.0.121
Subnetmask	255.255.254.0
Gateway	10.1.1.254
Link speed	1000
MAC address	B8:98:B0:01:F2:56
Telnet	<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

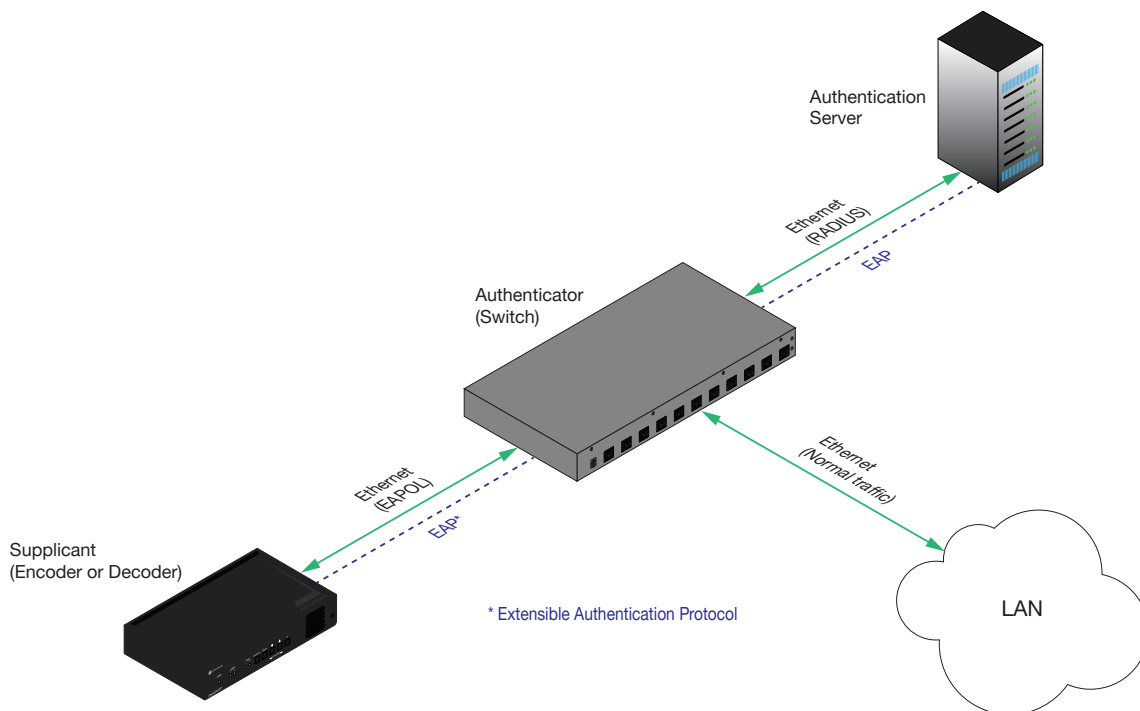
2. Click the **Mode** drop-down list and select **static**.
3. Enter the desired IP address in the **IP address** field.
4. Enter the subnet mask in the **Subnetmask** field.
5. Enter the gateway (switch/router) address in the **Gateway** field.
6. Click the **SAVE** button to commit all changes.

### 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.



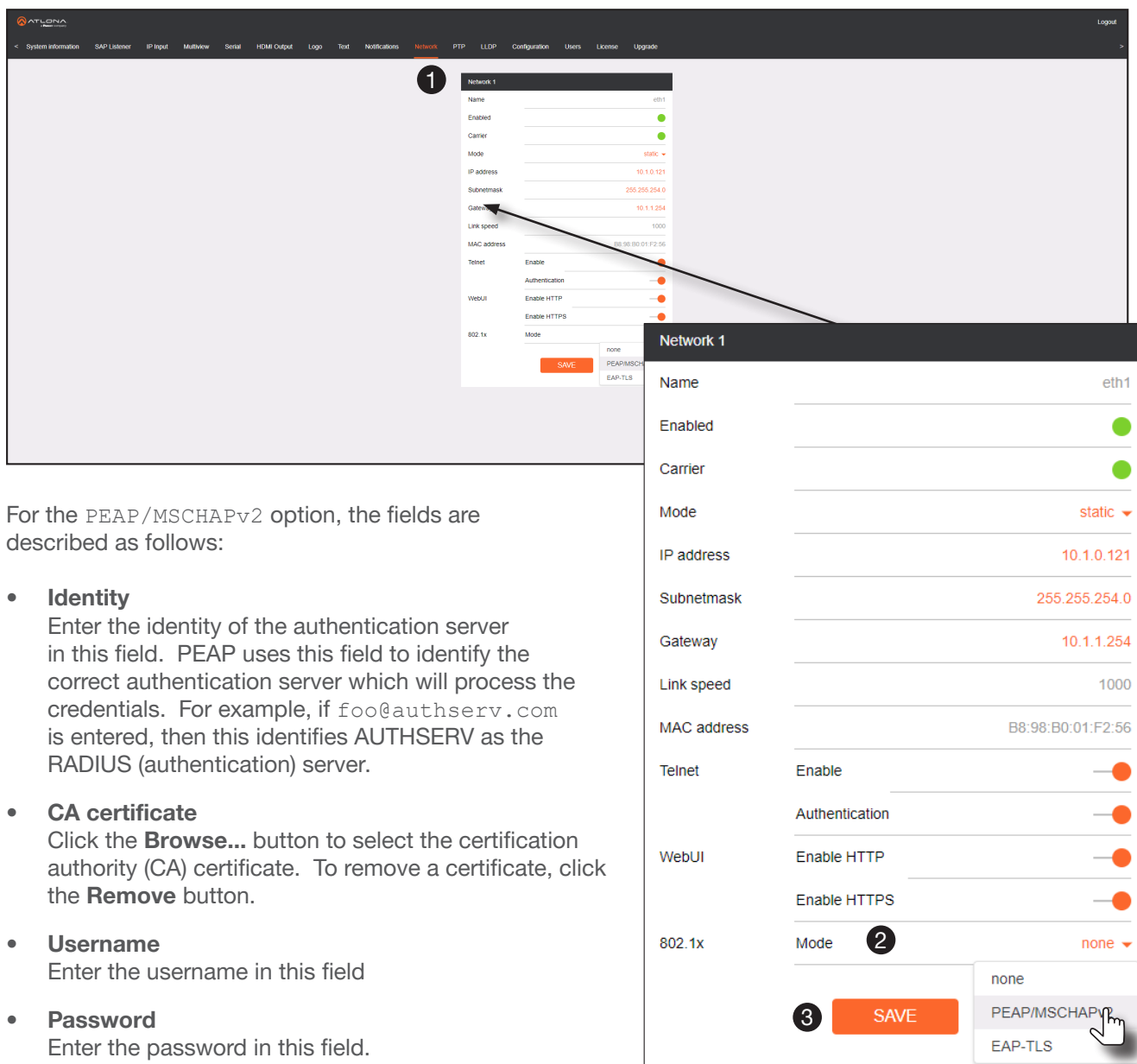
**WARNING:** Connecting an 802.1X-enabled decoder to a network without an active or operational authentication server, will result in an decoder that does not function until the expected message is returned from a RADIUS server. If it is unclear as to whether the network uses 802.1X authentication, consult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

### Creating Video Walls

#### Introduction

Before proceeding with creating video walls, review the tables below. These tables provide information on video wall size, maximum timing, color space, and bit depth.



**NOTE:** OmniStream video walls do not support interlaced sources.

The following table lists the maximum video wall size, based on the resolution of the source.

Resolution	Maximum Video Wall Size
4Kp60	2 x 2
4Kp30	16 x 16
1080p60	n x n (no limit)

The following table provides maximum timing, color space, and bit-depth specifications when video walls are enabled.

Number of Channels	Resolution	Refresh Rate	Color Space	Bit Depth
1	1920 x 1080p	60 Hz	4:4:4	12-bit
2	1920 x 1080p	30 Hz	4:4:4	12-bit



**NOTE:** When video walls are enabled, the output resolution at the decoder endpoint is dependent on both the number of channels on the decoder and the input resolution received from the encoder. Refer to the table below for details.

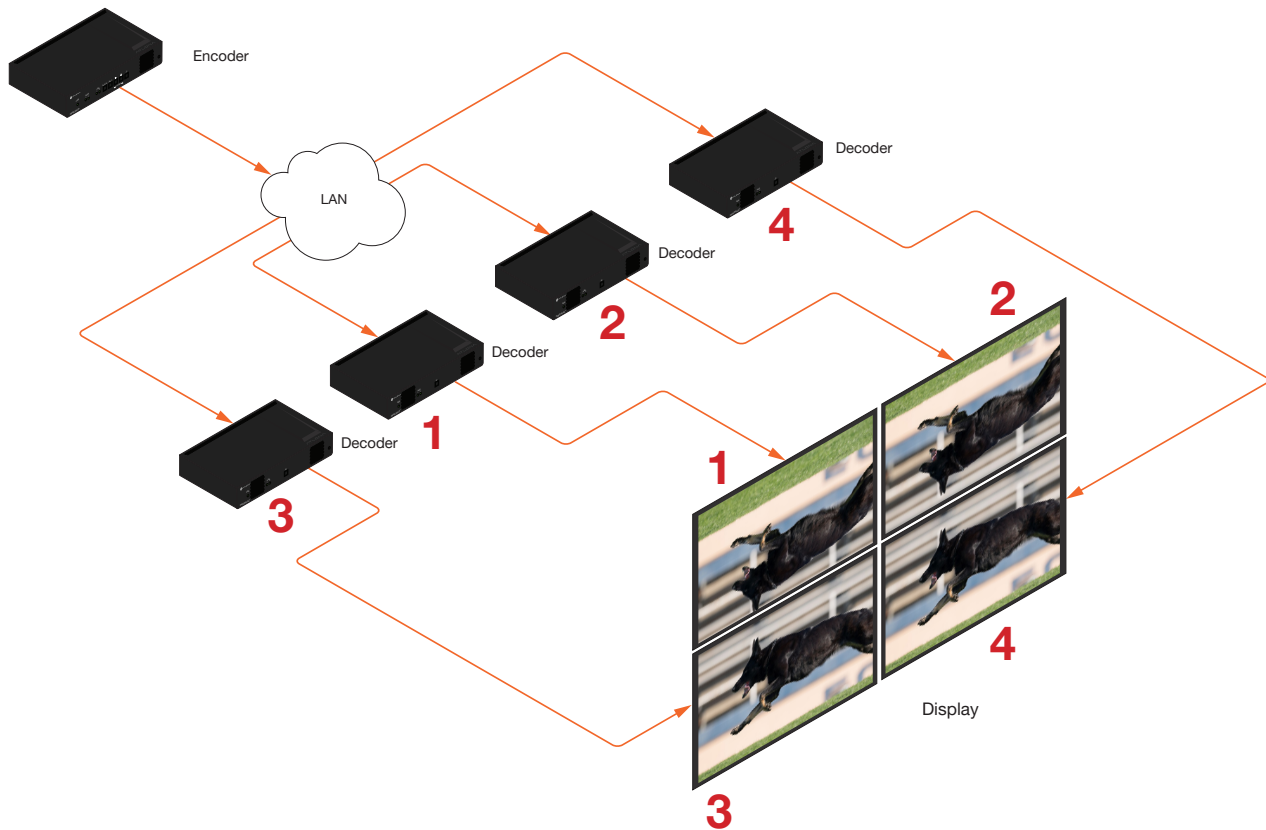
Input Resolution (from Encoder)	Output Resolution (AT-OMNI-121)	Output Resolution (AT-OMNI-122)
1280 x 720p	1280 x 720p	1280 x 720p
1920 x 1080p @ 60 Hz	1920 x 1080p @ 60 Hz	1920 x 1080p @ 30 Hz
> 1920 x 1080p (up to UHD)	1920 x 1080p @ 60 Hz	1920 x 1080p @ 30 Hz

### Landscape Mode

The following diagram will be used to illustrate how to configure a 2 x 2 video wall. The details of this diagram are listed below:

- Four decoders are subscribed to a single encoder. Each decoder is connected to a display.
- The encoder is transmitting a 3840 x 2160 video signal.
- The top two displays have been accidentally mounted upside down.

Figure 1.1: Landscape-mode 2x2 video wall requiring adjustment.

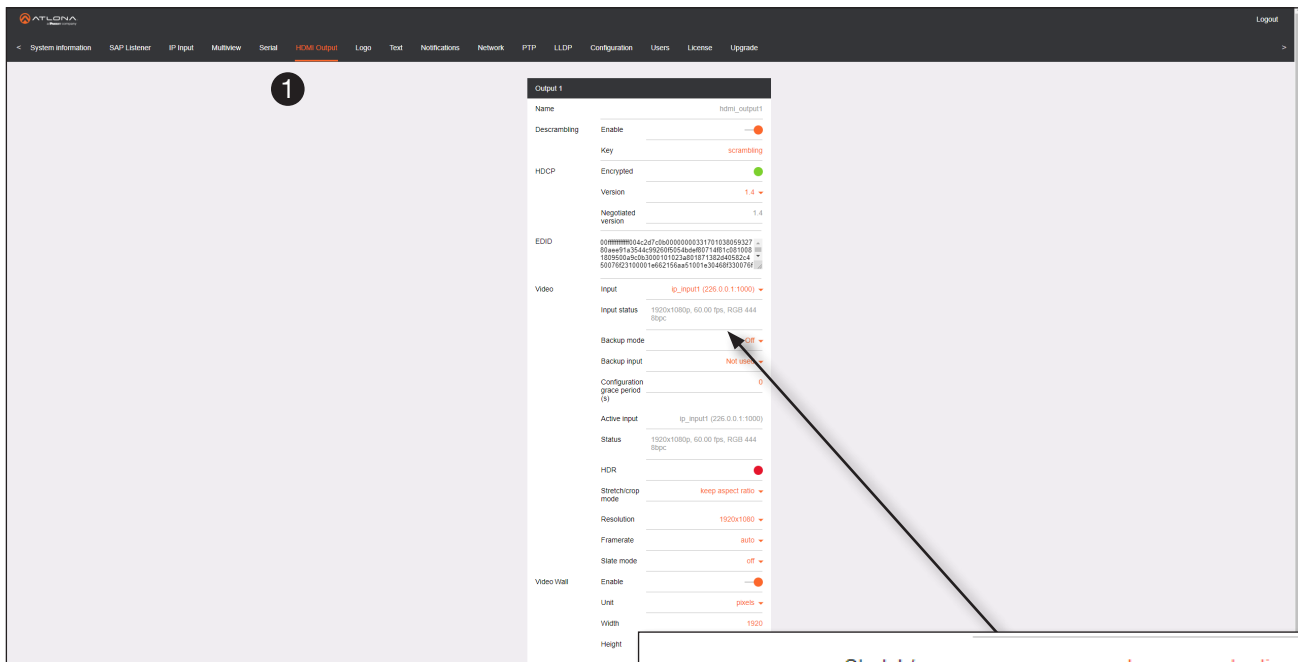


This diagram presents some challenges that need to be met:

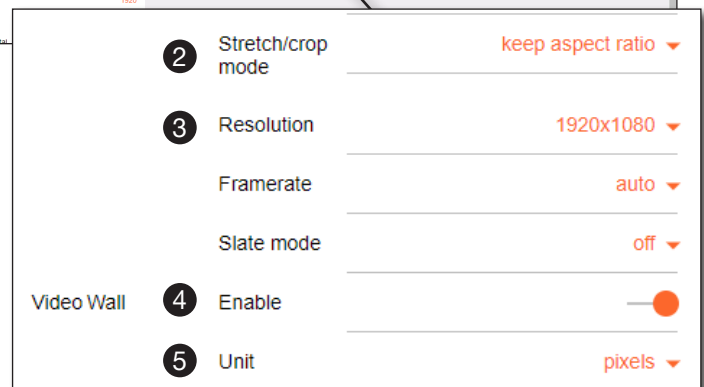
- Since there are four displays, the image from each decoder will need to be scaled to one-fourth of the total resolution. The crop-and-scale feature will be used to provide the correct output.
- The top two displays have been mounted upside-down. To meet this challenge, the rotate feature will be applied to these two displays.

Note that the order in which each image is cropped, scaled, and/or rotated is arbitrary. In this example, the configuration process will begin with Display 1, in the top left.

1. Login to the decoder and click the **HDMI Output** menu.
2. Under the **Video** section, click the **Stretch/Crop Mode** drop-down list and select **Full Screen**. This guarantees that the image will fill the screen.



3. Click the **Resolution** drop-down list and select **1920x1080**. This will scale the output resolution to 1920x1080.
4. Under the **Video Wall** section, click the **Enable** toggle switch to activate the **Video wall** option. Once enabled, the **Video wall** section will be expanded and display all available options.
5. Click the **Unit** drop-down list to select the unit of measure. In this example, **Pixels** (the default value) will be used.



**IMPORTANT:** When using Millimeters or Inches, two additional fields will be available: **Total display width** and **Total display height**. When entering these values, the following requirement must be observed: **Total display width** must be greater than or equal to the display width. **Total display height** must be greater than or equal to the display height.

6. Enter the horizontal and vertical resolution of the portion of the source stream that will be displayed on this decoder in the **Width** and **Height** fields. The table on the next page, lists width and height examples for a 2x2 video wall, with the specified source resolution.

6	Width	1920
6	Height	1080

7. Enter the starting coordinates of the portion of the source stream that will be displayed on this decoder in the **Horizontal** and **Vertical** fields.. These values are the pixel start position (upper left most pixel). The table below lists left and right coordinates for a 2x2 video wall, with the specified source resolution.

7	Horizontal	0
7	Vertical	0
8	Rotation (°)	0 ▼

Table listing width and height examples for 2x2 video wall.

Source resolution	Width (pixels)	Height (pixels)
3840 x 2160 (UHD)	1920	1080
1920 x 1080 (1080p)	960	540

Table listing left and right coordinates for a 2x2 video wall.

Source resolution	Upper Left	Upper Right	Lower Left	Lower Right
3840 x 2160 (UHD)	0, 0	1920, 0	0, 1080	1920, 1080
1920 x 1080 (1080p)	0, 0	960, 0	0, 540	960, 540

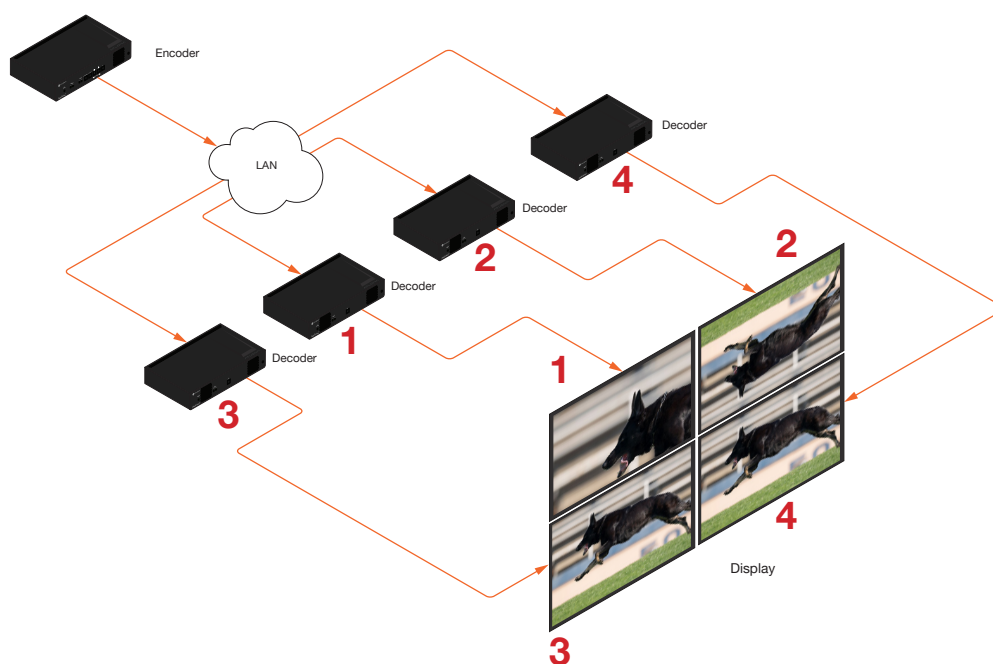
8. Click the **Rotation** drop-down list to select the rotation angle of the image. In this example, select 180 from the drop-down list. The image will be flipped, vertically. This step is only applied when configuring the two top displays.



**NOTE:** 0 and 180 used for landscape mode video walls and 90 and 270 for portrait mode. Refer to [Portrait Mode \(page 82\)](#) for more information.

The image on Display 1 in the upper-left corner, as illustrated below, has been cropped and rotated and is now displayed correctly. At this point, one-fourth of the video wall has been configured.

Figure 1.2: Landscape-mode 2x2 video wall requiring adjustment.





9. Click the **SAVE** button at the bottom of the screen to commit changes.
10. Repeat steps 3 through 9 for decoders 2, 3, and 4. Note that in the example below, decoders 3 and 4 will not require any rotation. Therefore, make sure the **Rotation** option is set to 0 for decoders 3 and 4.

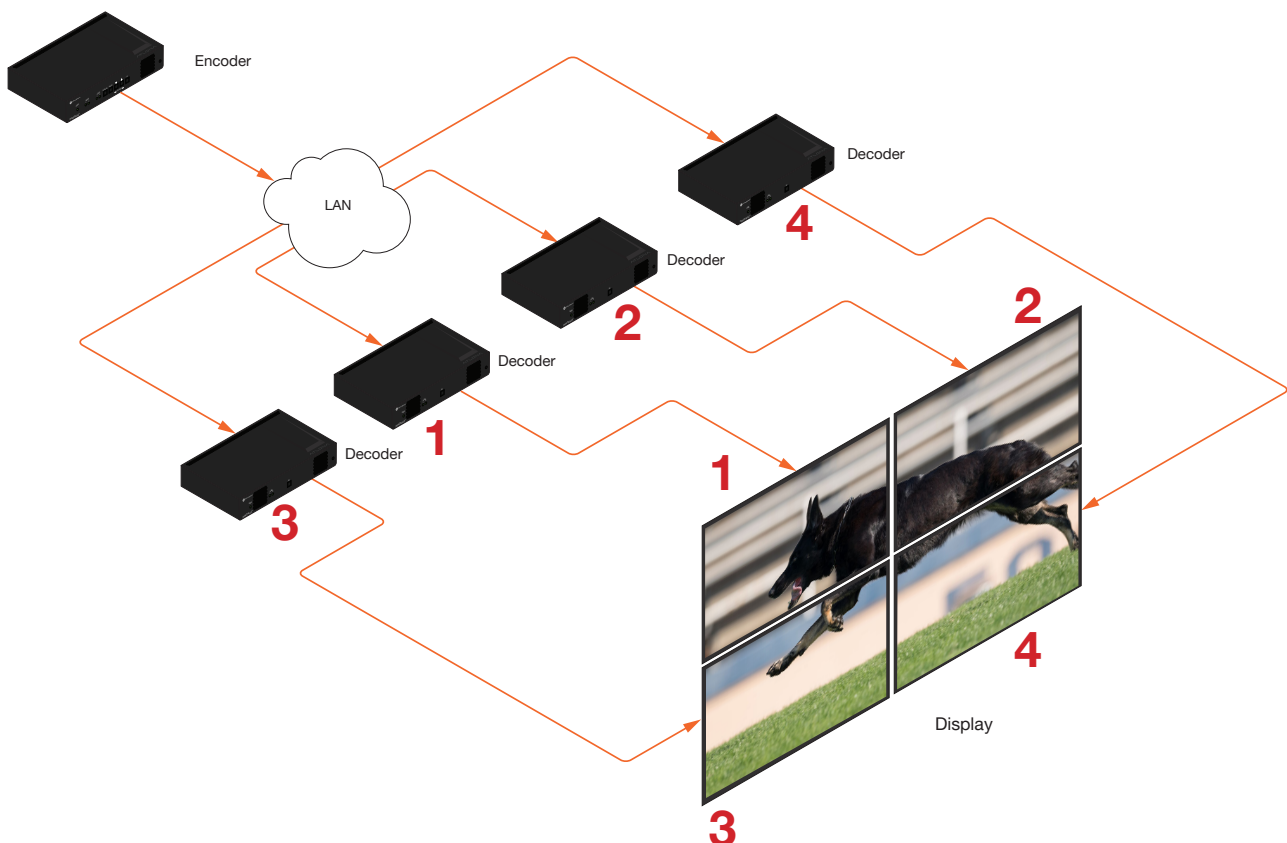


**IMPORTANT:** When using dual-channel decoders, the **Rotation** feature can only be used when a single HDMI channel is active. Image rotation is not supported on dual-channel decoders when both HDMI channels are active. Single-channel decoders do not have this restriction.

Once all four decoders have been properly configured, the image will be correctly displayed across all four displays. Refer to the illustration on the next page.

11. Check the image, on each display, and make sure they are aligned correctly with the other images on the video wall. Use the **Edge Compensation** drop-down list to adjust bevel compensation, if necessary. Refer to [Bezel Compensation \(page 87\)](#) for more information.

Figure 1.3: Landscape-mode 2 x 2 video wall displayed correctly.



### Portrait Mode



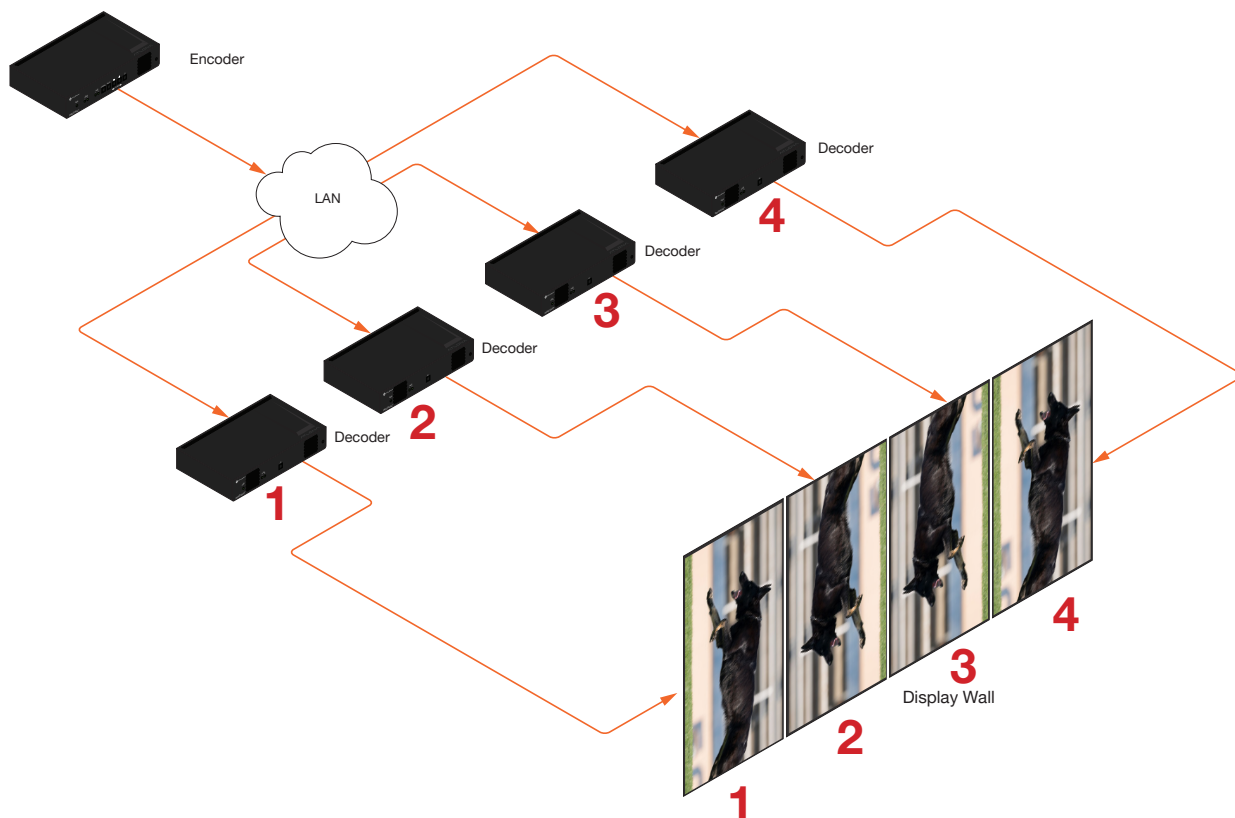
**IMPORTANT:** Portrait Mode is only supported on single-channel decoders.

Images can be rotated 90° or 270° to create portrait-oriented video walls. The steps to configure portrait-oriented video walls is very similar to creating landscape video walls.

A similar scenario to the landscape video wall challenge will be used to illustrate how to configure a 1 x 4 portrait-oriented video wall. The details of this diagram are listed below:

- Four decoders are subscribed to a single encoder. Each decoder is connected to a display.
- The encoder is transmitting a 3840 x 2160 video signal.
- Display 2 and 3 have been mounted upside-down.

Figure 2.1: Portrait-mode video wall requiring adjustment.

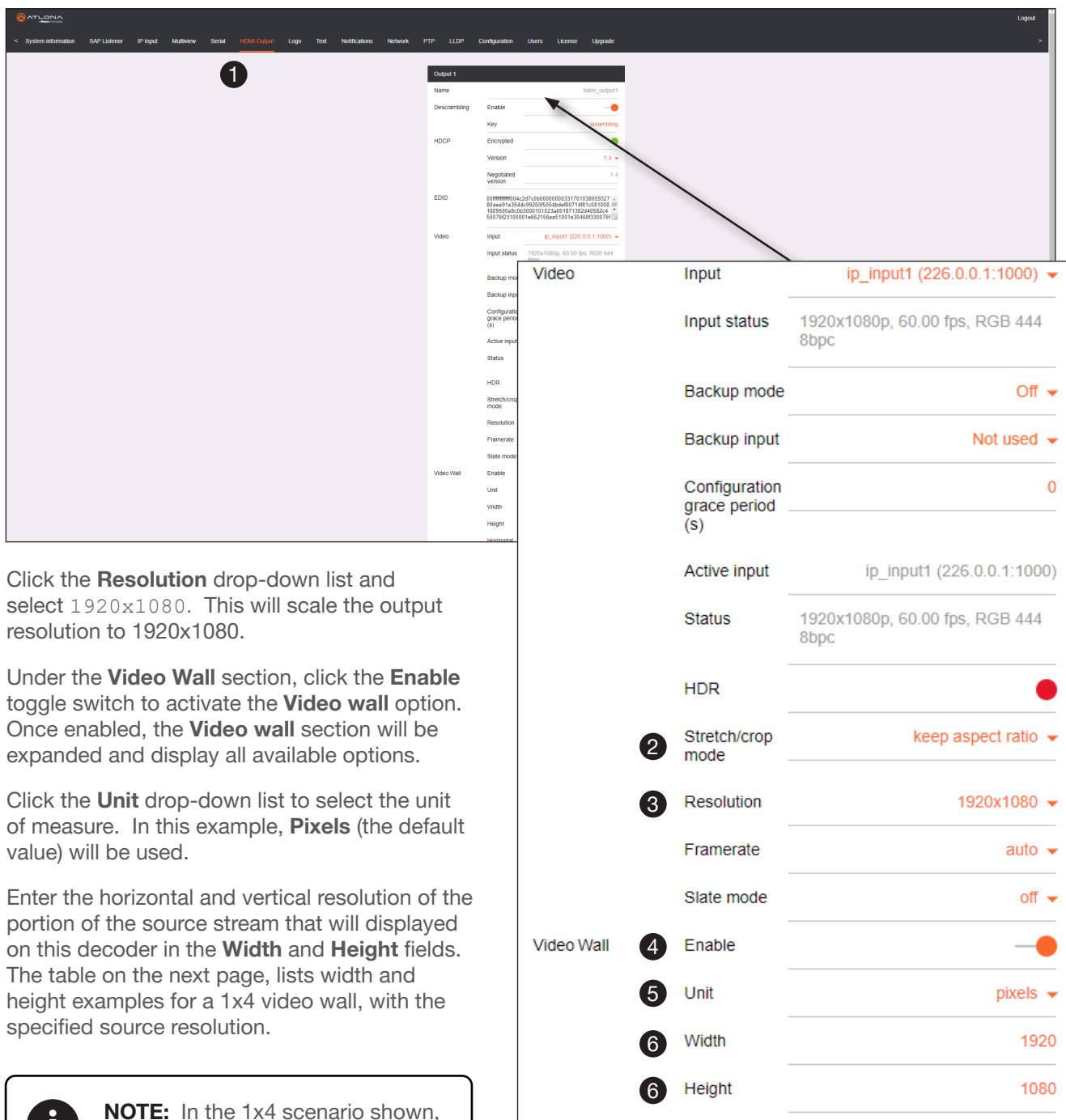


As with the landscape video wall, this diagram presents some challenges that need to be met:

- Since there are four displays, the image from each decoder will need to be scaled to one-fourth of the total resolution. The crop-and-scale feature will be used to provide the correct output.
- Display 2 and 3 have been mounted upside-down. To meet this challenge, the images must be flipped horizontally and rotated 90°, which gives a total rotation angle of 270°. Display 1 and 4 only need to be rotated 90°.

Note that the order in which each image is cropped, scaled, and/or rotated is arbitrary. In this example, the configuration process will begin with Display 1.

1. Login to the decoder and click **HDMI Output** in the menu.
2. Under the **Video** section, click the **Stretch/Crop Mode** drop-down list and select **Full Screen**. This guarantees that the image will fill the screen.



The screenshot shows the ATLONA web interface with the 'HDMI Output' configuration page. A red circle '1' is placed over the 'HDMI Output' menu item in the top navigation bar. A red circle '2' is placed over the 'Stretch/crop mode' dropdown menu in the 'Video' section. The 'Video' section is expanded, showing various settings including Input, Backup mode, Backup input, Configuration grace period (s), Active input, Status, HDR, Stretch/crop mode, Resolution, Framerate, Slate mode, Video Wall Enable, Unit, Width, and Height.

Section	Parameter	Value
Video	Input	ip_input1 (226.0.0.1:1000)
	Input status	1920x1080p, 60.00 fps, RGB 444 8bpc
	Backup mode	Off
	Backup input	Not used
	Configuration grace period (s)	0
	Active input	ip_input1 (226.0.0.1:1000)
	Status	1920x1080p, 60.00 fps, RGB 444 8bpc
	HDR	Off
	Stretch/crop mode	keep aspect ratio
	Resolution	1920x1080
Video Wall	Enable	On
	Unit	pixels
	Width	1920
	Height	1080
	Framerate	auto

3. Click the **Resolution** drop-down list and select **1920x1080**. This will scale the output resolution to 1920x1080.
4. Under the **Video Wall** section, click the **Enable** toggle switch to activate the **Video wall** option. Once enabled, the **Video wall** section will be expanded and display all available options.
5. Click the **Unit** drop-down list to select the unit of measure. In this example, **Pixels** (the default value) will be used.
6. Enter the horizontal and vertical resolution of the portion of the source stream that will be displayed on this decoder in the **Width** and **Height** fields. The table on the next page, lists width and height examples for a 1x4 video wall, with the specified source resolution.



**NOTE:** In the 1x4 scenario shown, the height will need to match the height of a 4K image, so the width needs to be set to 1080 and the height needs to be set to 2160.

7. Enter the starting coordinates of the portion of the source stream that will be displayed on this decoder in the **Horizontal** and **Vertical** fields. These values are the pixel start position (upper left most pixel). The table on the next page lists left and right coordinates for a 1x4 video wall, with the specified source resolution.
8. Click the **Rotation** drop-down list to select the rotation angle of the image. In this example, select **90** from the drop-down list to rotate the image as portrait. The image on Display 1 is now cropped and rotated and is displayed correctly. At this point, one-fourth of the video wall has been configured.
9. Click the **SAVE** button at the bottom of the screen to commit changes.

Video Wall	Enable	<input checked="" type="checkbox"/>
	Unit	pixels ▼
	Width	1920
	Height	1080
7	Horizontal	0
7	Vertical	0
8	Rotation (°)	0 ▼

Type	DispSW AVon ▼
9	<input type="button" value="SAVE"/>



**NOTE:** 0 and 180 used for landscape mode video walls and 90 and 270 for portrait mode. Refer to [Portrait Mode \(page 82\)](#) for more information.

Table listing width and height examples for 1x4 video wall.

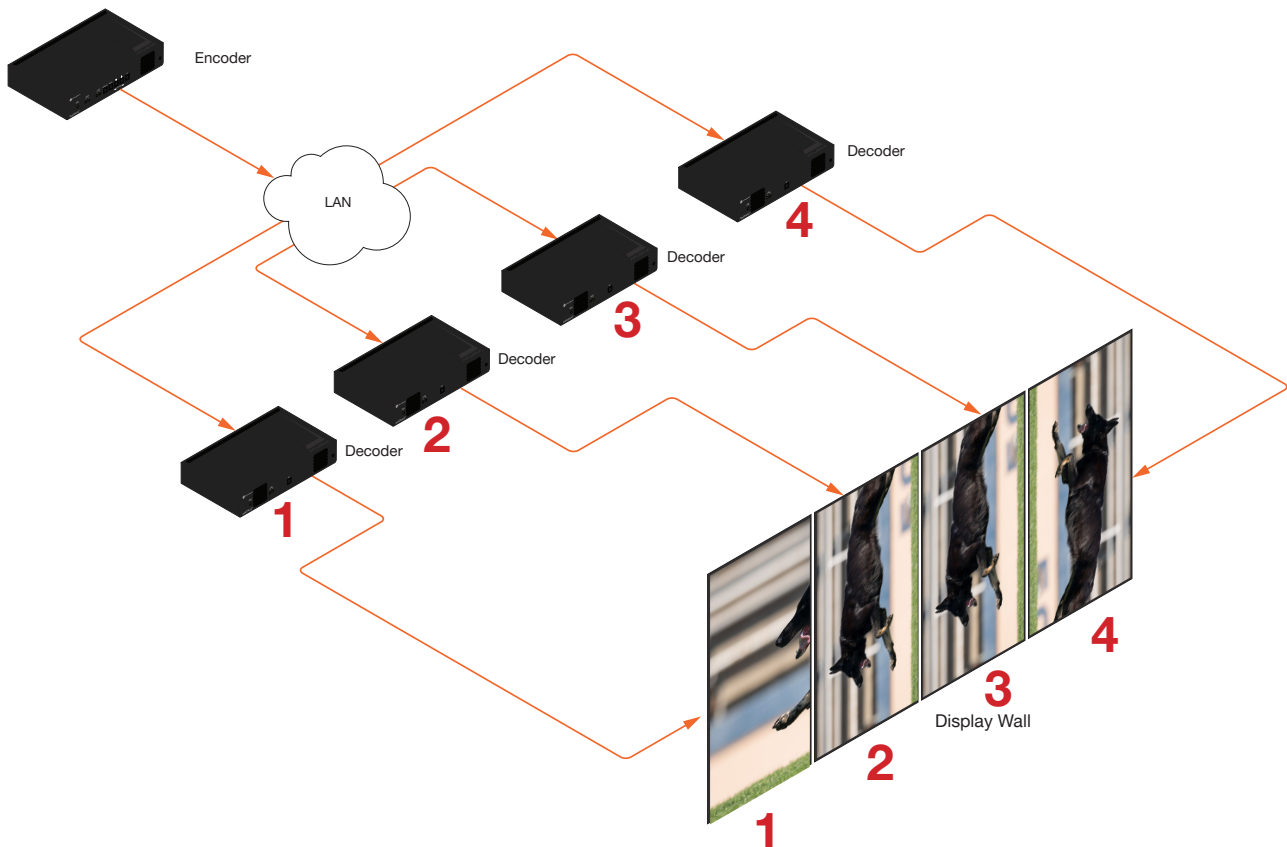
Source resolution	Width (pixels)	Height (pixels)
3840 x 2160 (UHD)	1080	2160
1920 x 1080 (1080p)	960	540

Table listing left and right coordinates for a 1x4 video wall.

Source resolution	Display 1	Display 2	Display 3	Display 4
3840 x 2160 (UHD)	0, 0	0, 1080	0, 2160	0, 3240
1920 x 1080 (1080p)	0, 0	0, 540	0,1080	0, 1620

The image on Display 1 is now cropped and rotated and is display correctly. At this point, one-fourth of the video wall has been configured.

Figure 2.2: Portrait-mode 1 x 4 video wall with Display 1 properly oriented.



10. Repeat steps 3 through 9 for decoders 2, 3, and 4. Since display 2 and 3 were mounted upside-down, they will require a rotation of 180° (to flip horizontally) + 90° (to align them as portrait), giving a total rotation of 270°.

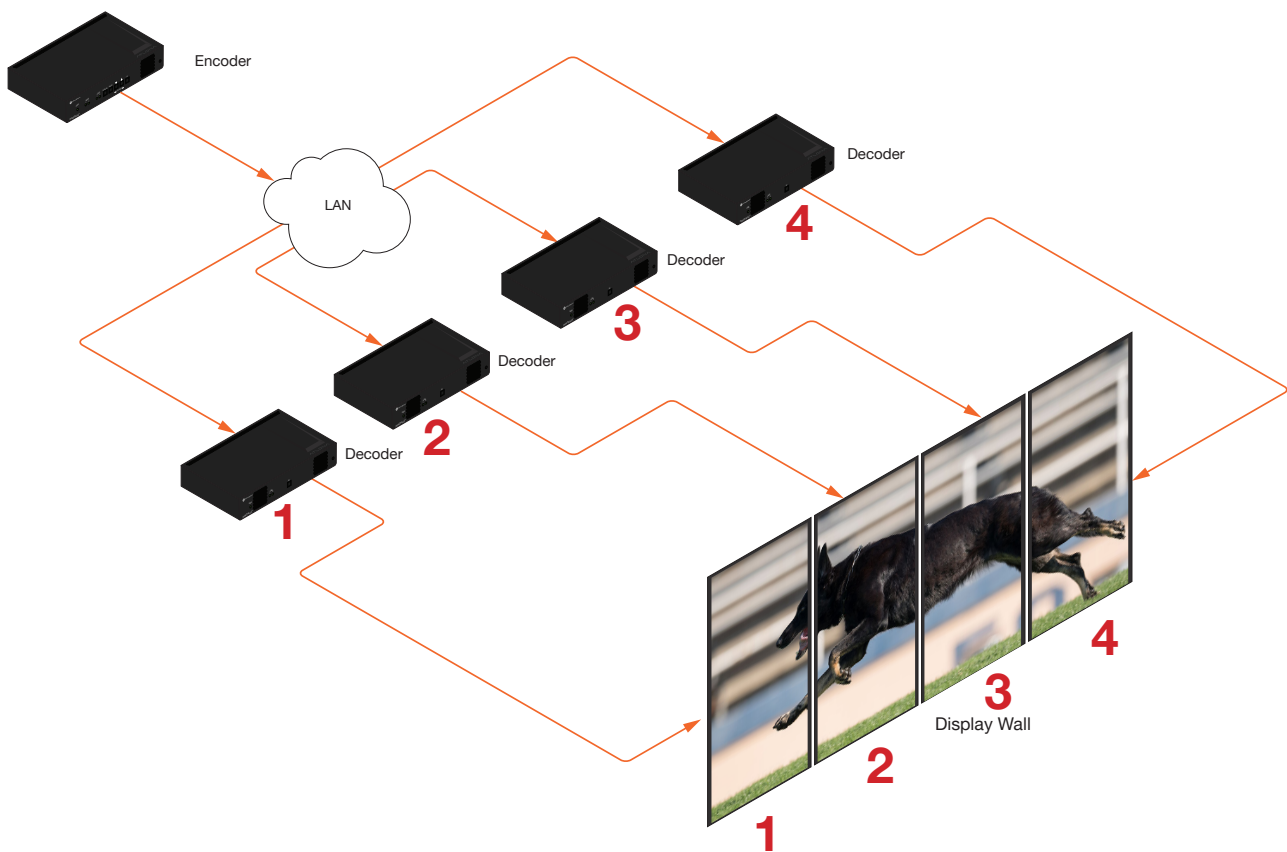


**IMPORTANT:** When using dual-channel decoders, the **Rotation** feature can only be used when a single HDMI channel is active. Image rotation is not supported on dual-channel decoders when both HDMI channels are active. Single-channel decoders do not have this restriction.

Once all four decoders have been properly configured, the image will be correctly displayed across all four displays. Refer to the illustration on the next page.

11. Check the image, on each display, and make sure they are aligned correctly with the other images on the video wall. Use the **Edge Compensation** drop-down list to adjust bezel compensation, if necessary. Refer to [Bezel Compensation \(page 87\)](#) for more information.

Figure 2.3: Portrait-mode 1 x 4 video wall displayed correctly.



### Bezel Compensation

Displays have a region where video is not displayed, called the bezel. This can cause display issues when creating video walls. Bezel compensation takes this area into account when a single video source is mapped across multiple displays. Bezel compensation can be adjusted at any time.

The illustration on the left shows a simple 2x2 video wall without bezel compensation. Note how the Atlona logo appears stretched, horizontally. On the right, bezel compensation is used to correct the image.

Image without bezel compensation



Image with bezel compensation applied



Bezel

1. Under the **Video Wall** section, click the **Edge compensation** drop-down list and select **Bezel compensation**.
2. Enter the **Top**, **Bottom**, **Left**, and **Right** values, as desired. Values can be entered in pixels, inches, or millimeters.
3. Click the **SAVE** button at the bottom of the **Output** window group to commit changes.

Video Wall	Enable	<input checked="" type="checkbox"/>
	Unit	pixels
	Width	1920
	Height	1080
	Horizontal	0
	Vertical	0
	Rotation (°)	0
1	Edge compensation	bezel compensation
2	Top	0
2	Bottom	0
2	Left	0
2	Right	0

Standby ?	Auto on	<input type="checkbox"/>
	Projector cooldown (s)	<input type="text"/>
	Timeout (s)	<input type="text"/>
	Type	Display
3	<b>SAVE</b>	

### Configuring Redundant Streams

OmniStream decoders have the ability to identify missing streams. Should an input be disconnected from the encoder, the image will recover almost instantaneously. The decoder can access the same stream from two separate multicast addresses and switch between them, when necessary.

1. Login to the decoder.
2. Click **HDMI Output** in the menu bar.
3. Under the **Video** section, click the **Backup mode** drop-down list to select the desired mode.

Mode	Description
Off	Redundancy off; output will never switch to the backup stream.
Join Active	The decoder sends a join request only when the primary stream is lost or if the decoder is manually switched to the backup stream. Switch time will not exceed 5 seconds.
Join Always	The decoder joins both the Primary and Backup stream at the same time. Switch time will not exceed 0.5 seconds.



**NOTE:** Switching time will be dependent upon the network switch that is used, as well as the number of hops between encoders and decoders on the network.

#### Redundancy Grace Period

During use, the decoder can be switched to another multicast stream. However, if the decoder encounters a missing stream, during the switch and when redundancy is enabled, then this will cause the decoder to automatically failover to the multicast source configured as the backup. This is to prevent a “ping pong” effect. The grace period is the time (in seconds) where the decoder will remain on the primary stream, until the decoder switches to the backup video stream. By default, the grace period is set to 0 seconds. If set to 0 seconds, automatic failover will occur if the stream is interrupted, for any reason. It should be noted that if the grace period is too low, the decoder may unintentionally switch to the backup video stream, when there are 2-3 video frames lost. This may or may not be desired.

1. Login to the decoder.
2. Click **HDMI Output** in the menu bar.
3. Under the **Video** section, locate the **Change grace period** field and enter the desired value, in seconds. By default, this value is set to 0.
4. Click the **Save** button, at the bottom of the **Output** window group.



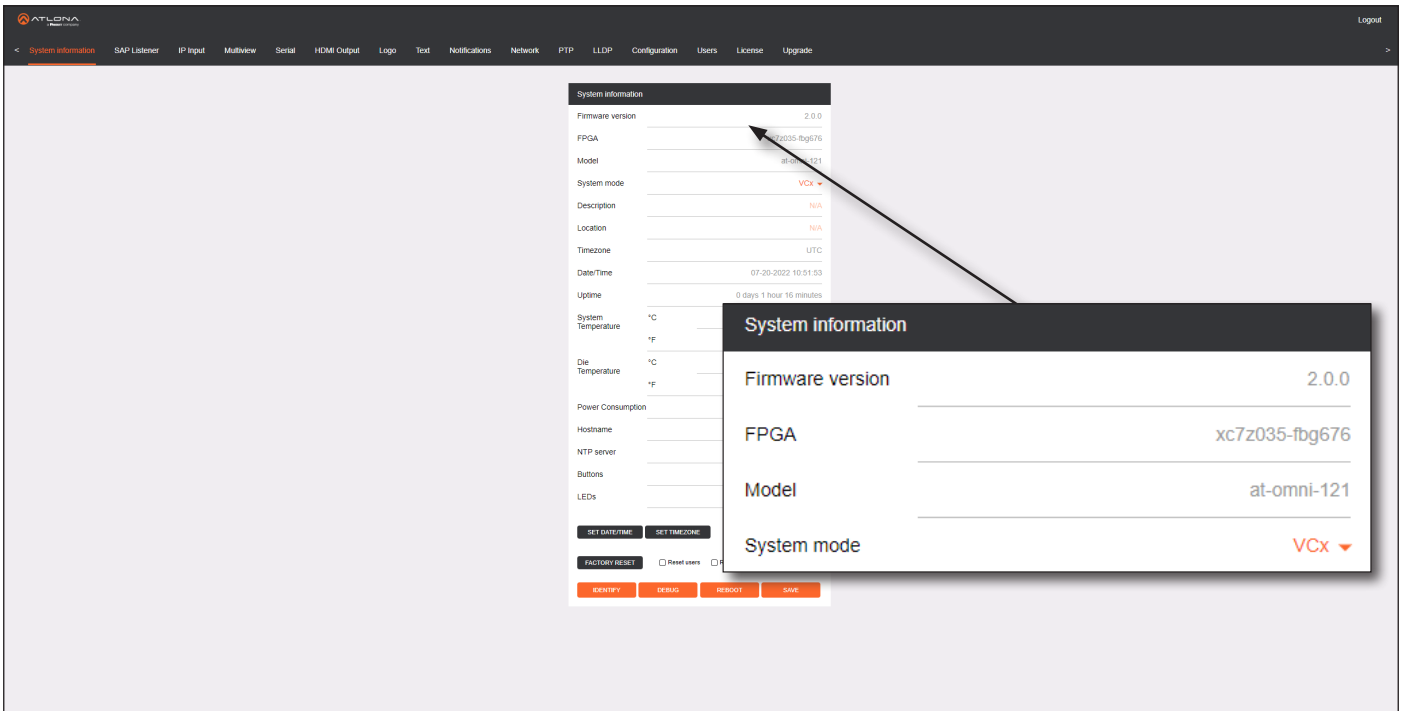
# Configuration and Management Interfaces

## 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 decoder 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.

Model	Description
AT-OMNI-121	Single-channel decoder
AT-OMNI-122	Dual-channel decoder

#### 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.

### Power Consumption

Displays the precise power consumption of the decoder.

### Hostname

Displays the hostname of the decoder. By default, OmniStream decoders are assigned a default hostname, which is constructed as follows: at-omni-[SKU]-[last five digits of serial number]. 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.

### Buttons

Click this toggle switch to enable or disable the front-panel buttons. If the buttons are disabled, their backlight turns off. When enabled, the toggle switch will be orange.

### 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.

Description		N/A
Location		N/A
Timezone		UTC
Date/Time		07-20-2022 10:51:53
Uptime		0 days 1 hour 16 minutes
System Temperature	°C	39.00 °C
	°F	102.20 °F
Die Temperature	°C	77.15 °C
	°F	170.86 °F
Power Consumption		8.94 W
Hostname		at-omni-121-02097
NTP server		pool.ntp.org
Buttons		<input checked="" type="checkbox"/>
LEDs		<input checked="" type="checkbox"/>

SET DATE/TIME SET TIMEZONE

FACTORY RESET  Reset users  Reset network  Reset defaults

IDENTIFY DEBUG REBOOT SAVE

## Configuration and Management Interfaces

### FACTORY RESET

Click this button to reset the decoder 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 decoder is reset with no factory-default settings.

Option	Description
None Checked	Resets the decoder with factory-default settings.
Reset User	Resets the decoder to factory-default settings and resets custom user information.
Reset Network	Resets the decoder to factory-default settings and resets network information.
Reset Defaults	Resets the decoder to factory-default settings and restores a default device configuration that includes defined multicast addresses.

### 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

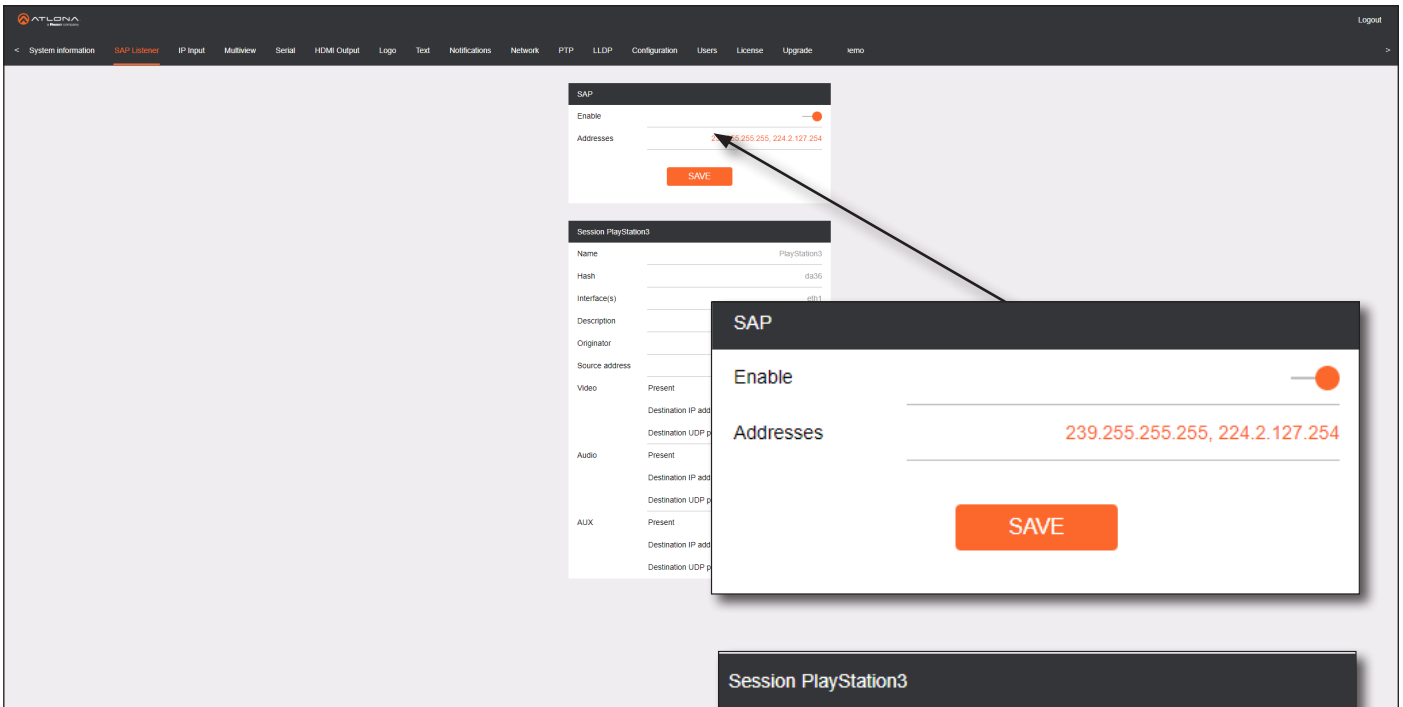
Click this button to perform a soft reboot of the decoder.

### 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

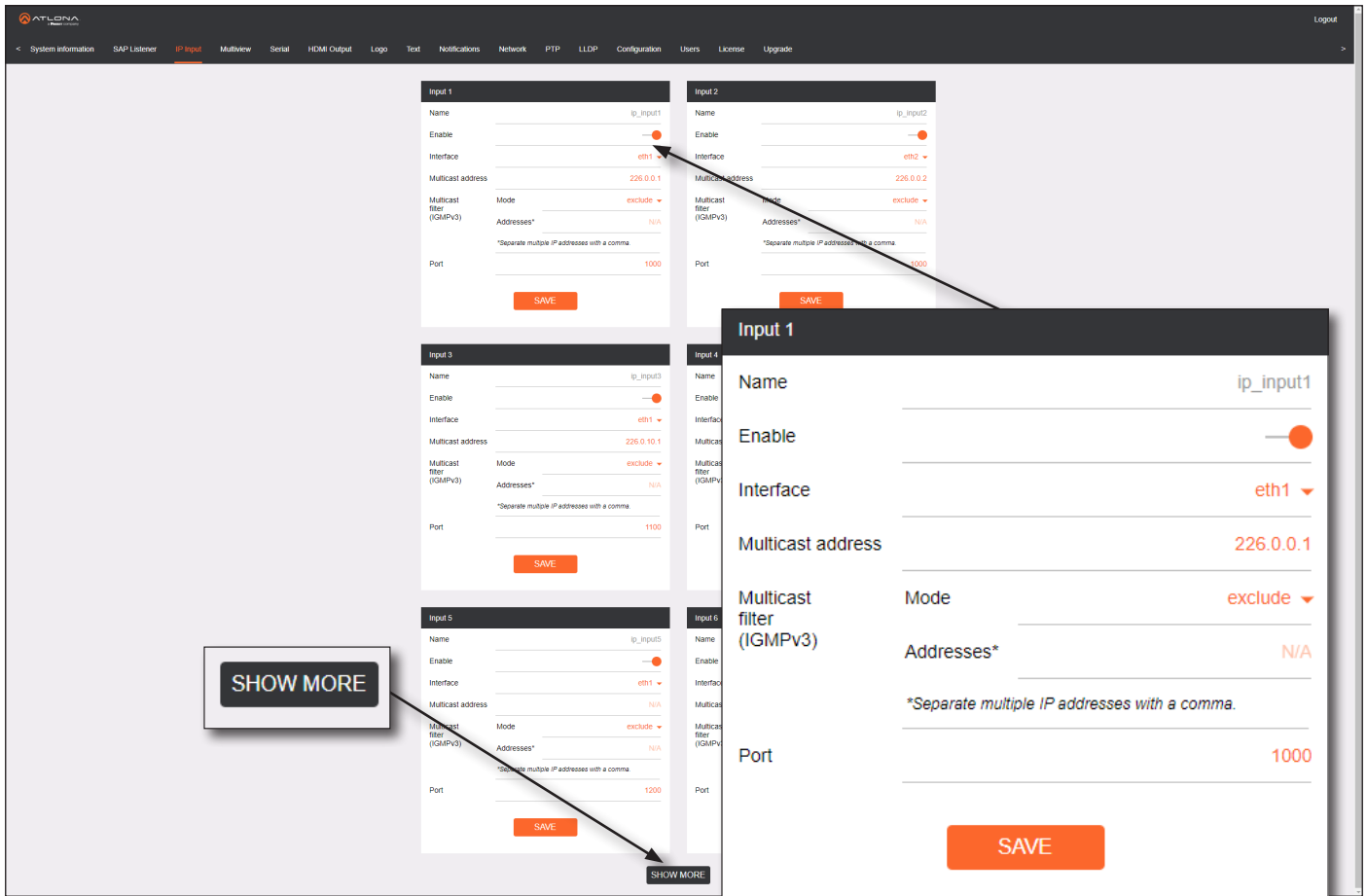
Session PlayStation3	
Name	PlayStation3
Hash	da36
Interface(s)	eth1
Description	N/A
Originator	-
Source address	10.1.0.12
Video	Present <span style="color: green;">●</span>
Destination IP address	226.0.0.1
Destination UDP port	1000
Audio	Present <span style="color: green;">●</span>
Destination IP address	226.0.10.1
Destination UDP port	1100
AUX	Present <span style="color: red;">●</span>
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

### IP Input page



### Input window groups

#### Name

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

#### Enable

Click this toggle switch to enable or disable the IP input.

#### Interface

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

#### Multicast address

Enter the multicast IP address of the subscribed encoder in this field.

#### Multicast filter (IGMPv3) > Mode

Click this drop-down list to select the multicast filtering mode. Available options are *exclude* or *include*.

#### Multicast filter (IGMPv3) > Addresses

Enter the desired address(es) in this field. Separate multiple multicast IP addresses with a comma delimiter.

#### Port

Enter the port number of the subscribed encoder in this field.

#### SAVE

Click this button to commit all changes in the **Input** window group.

#### SHOW MORE

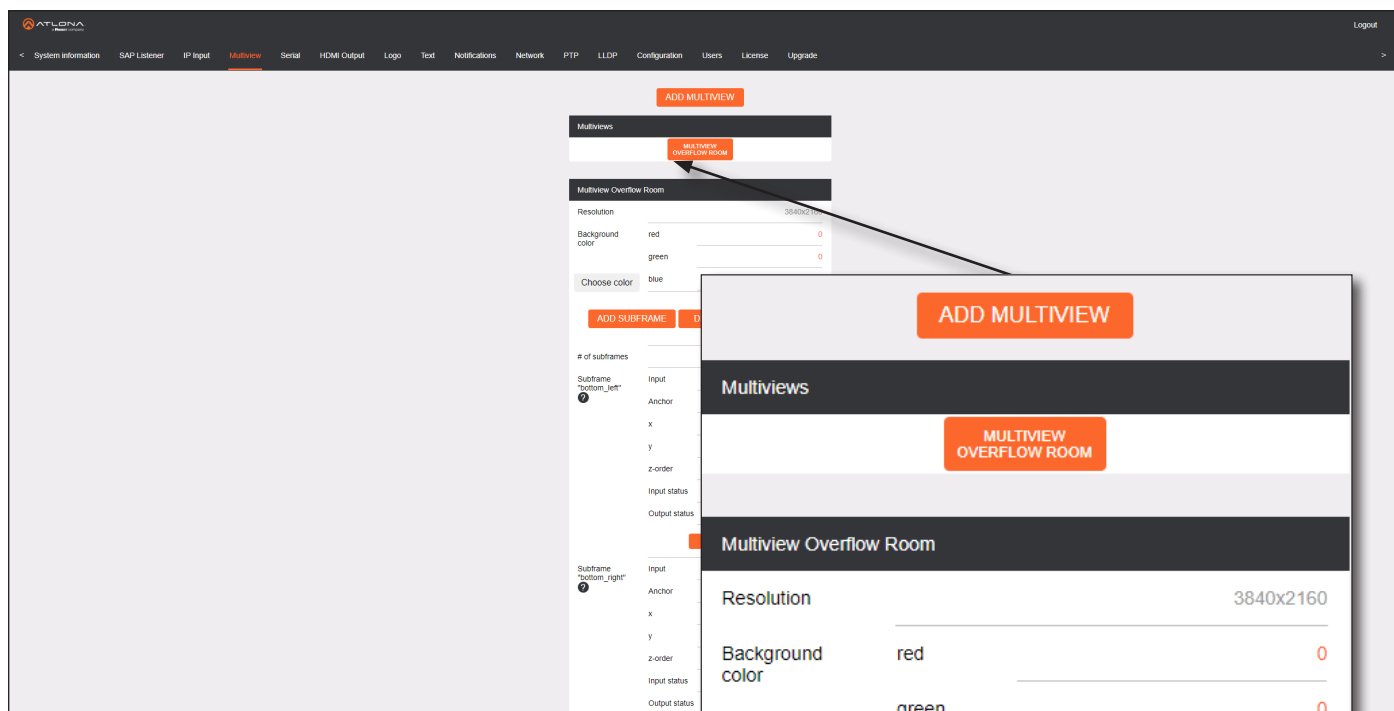
Click this button to expand the list of available Input window groups.

## Configuration and Management Interfaces

### Multiview page



**NOTE:** This page is only available if the **System mode** is set to VCx. Refer to [Setting the System Mode \(page 27\)](#) for more information.



#### ADD MULTIVIEW

If a multiview has not been configured, this will be the only button displayed on this page. Click this button to create a multiview. For details on configuring a multiview refer to [Multiview and Dual-Streaming Tutorial \(page 57\)](#) for more information.

#### Multiviews window group

When a multiview is created, the name of the multiview will be displayed here. More than one multiview can be created and will be represented by an orange button, along with the name of the multiview window group. Clicking on a multiview button will center the page on the associate multiview window group.

## Configuration and Management Interfaces

### Multiview window group

Each multiview that is created will have its own window group. The following are common to each window group.

#### Resolution

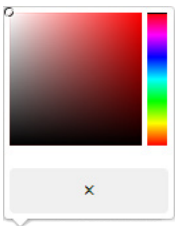
The resolution of the multiview canvas.

#### Background color

The background color is set using RGB values between 0 and 255. The default setting is black (0,0,0).

#### Choose color

Click this button to display the color picker. Click the mouse on the desired color, then click the “x” to close the color picker.



Multiview Overflow Room

Resolution		3840x2160
Background color	red	0
	green	0
	blue	0
Choose color		
<div style="display: flex; justify-content: space-around;"> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">ADD SUBFRAME</span> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">DELETE</span> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">SAVE</span> </div>		
# of subframes		4
Subframe "bottom_left" <span style="font-size: 1.2em;">?</span>	Input	ip_input3 (226.0.10.1:1100) ▼
	Anchor	top left ▼
	x	0
	y	1080
	z-order	3
	Input status	No video
	Output status	No video
<div style="display: flex; justify-content: flex-end; gap: 10px;"> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">SAVE</span> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">DELETE</span> </div>		

### ADD SUBFRAME

Click this button to create a new subframe. The **New Subframe in multiview** dialog will be displayed. Enter the required information and click the **SAVE** button to commit changes. Click **CANCEL** to abort.

New Subframe in multiviewOverflow Room

Name		subframe5
Input		None ▼
Anchor		top left ▼
x		0
y		0
z-order		1
<div style="display: flex; justify-content: space-around;"> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">CANCEL</span> <span style="background-color: #f44336; color: white; padding: 5px 15px; border-radius: 3px;">SAVE</span> </div>		

### DELETE

Click this button to delete the entire multiview configuration.



**WARNING:** Clicking DELETE will remove the entire multiview window group. To delete a subframe, click the smaller DELETE button under the **Output status** field.

## Configuration and Management Interfaces

### SAVE

Click this button to commit changes to the **Width**, **Height**, and **Background** color fields in the multiview window group.

### # of subframes

Displays the number of subframes within a multiview configuration.

### Subframe [position]

This is the name of the subframe. If default layouts are used, the default subframe names are the positions of the subframe in the multiview.

### Input

Click this drop-down list to select the desired IP input.

### Anchor

Click this drop-down list to select the anchor point for the subframe. Anchor points are: *top left*, *top right*, *bottom left*, *bottom right*, and *center*.

### x

Enter the x-position of the anchor point in this field.

### y

Enter the y-position of the anchor point in this field.

### z-order

Enter the z-order value in this field. Subframes with a higher z-order value will be moved to the front (on top of) subframes with lower z-order values.

### Input status

Displays the video stream resolution from the encoder.

### Output status

Displays the resolution of the subframe, taking into account any offset (x, y).

### SAVE

Click this button commit changes to the subframe settings (**Input**, **Anchor**, **x**, **y**, and **z-order**).

### DELETE

Deletes the subframe from the multiview.

Multiview Overflow Room

Resolution		3840x2160
Background color	red	0
	green	0
	blue	0

Choose color

ADD SUBFRAME
DELETE
SAVE

# of subframes		4
----------------	--	---

Subframe "bottom_left" <span style="font-size: 1.2em;">?</span>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Input</td> <td style="width: 70%; text-align: right;">ip_input3 (226.0.10.1:1100) ▼</td> </tr> <tr> <td>Anchor</td> <td style="text-align: right;">top left ▼</td> </tr> <tr> <td>x</td> <td style="text-align: right;">0</td> </tr> <tr> <td>y</td> <td style="text-align: right;">1080</td> </tr> <tr> <td>z-order</td> <td style="text-align: right;">3</td> </tr> <tr> <td>Input status</td> <td style="text-align: right;">No video</td> </tr> <tr> <td>Output status</td> <td style="text-align: right;">No video</td> </tr> </table>	Input	ip_input3 (226.0.10.1:1100) ▼	Anchor	top left ▼	x	0	y	1080	z-order	3	Input status	No video	Output status	No video	
Input	ip_input3 (226.0.10.1:1100) ▼															
Anchor	top left ▼															
x	0															
y	1080															
z-order	3															
Input status	No video															
Output status	No video															

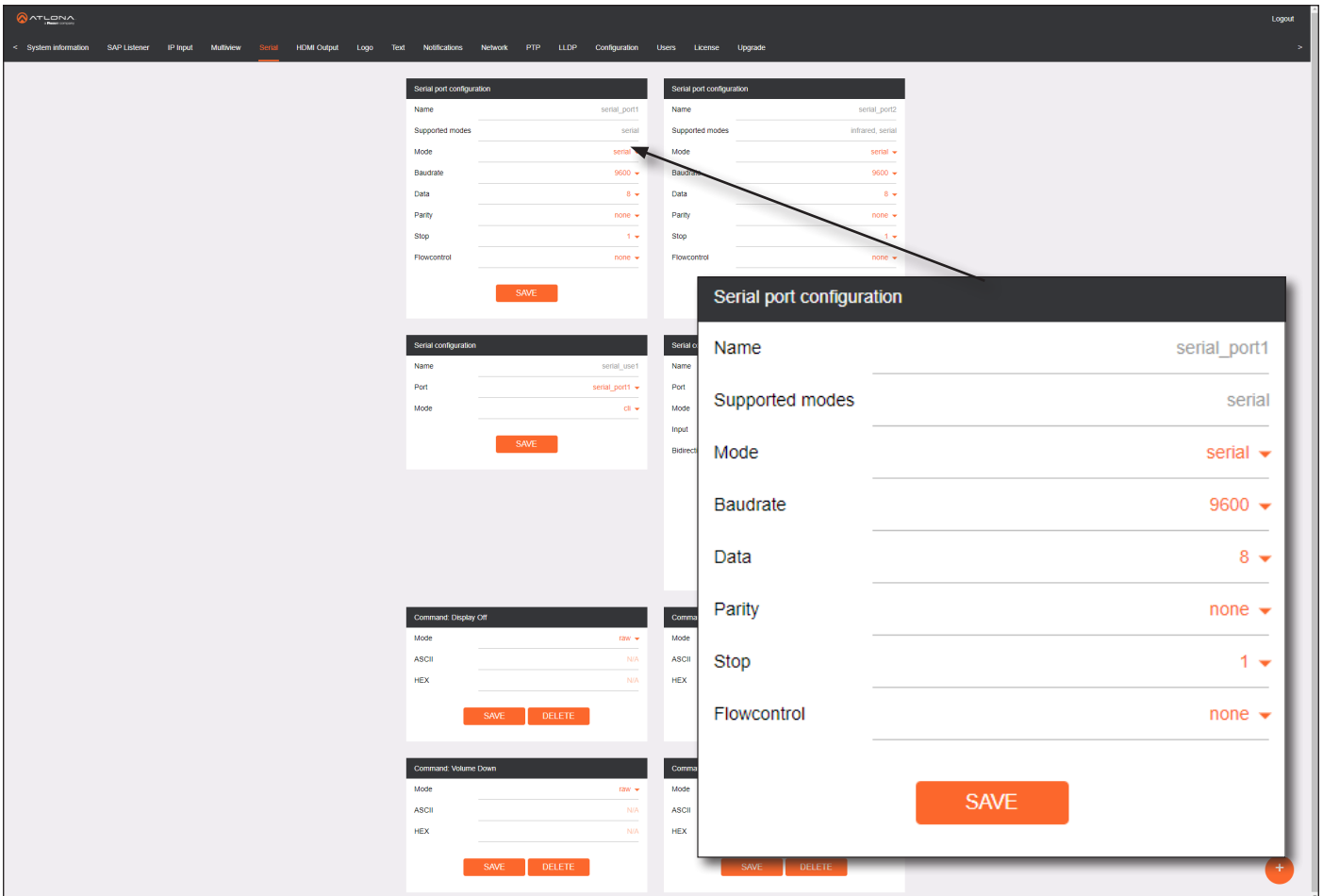
SAVE
DELETE

Subframe	Input	ip_input4 (226.0.10.2:1000) ▼
----------	-------	-------------------------------



## Configuration and Management Interfaces

### Serial page



### Serial port configuration window groups

The following fields apply to both **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.

#### 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.

## Configuration and Management Interfaces

### Serial configuration window groups

The following fields apply to both **Serial configuration** window groups.

#### Name

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

#### Port

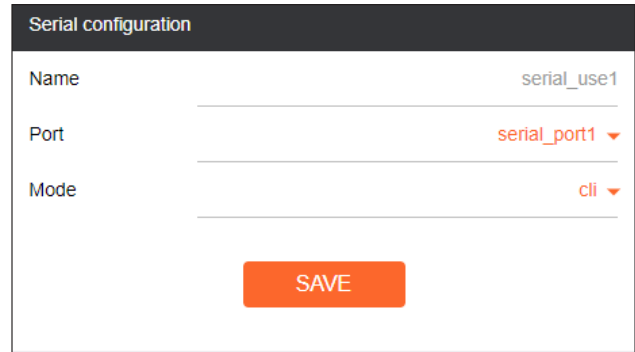
Click this drop-down list to select the desired serial port.

#### Mode

Click this drop-down list to select the desired control mode. Available values are: `cli`, `tcp-proxy`, and `output`. Select `tcp-proxy` 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 \(page 40\)](#) for more information.

#### SAVE

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



Serial configuration	
Name	serial_use1
Port	serial_port1 ▼
Mode	cli ▼
<input type="button" value="SAVE"/>	

### Command window groups

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

#### Mode

Click this drop-down list to select the mode: `raw` or `decoder`.

#### ASCII

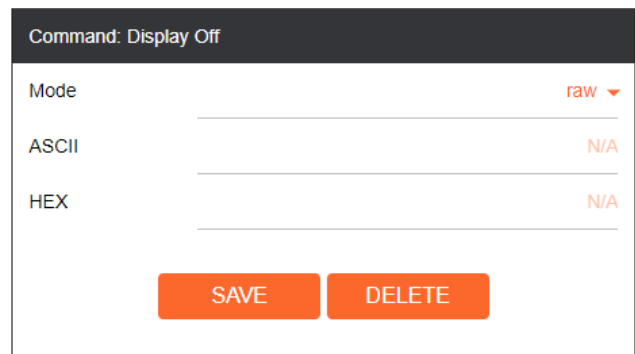
Enter the ASCII representation of the command string in this field.

#### HEX

Enter the hexadecimal representation of the command in this field.

#### SAVE

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



Command: Display Off	
Mode	raw ▼
ASCII	N/A
HEX	N/A
<input type="button" value="SAVE"/> <input type="button" value="DELETE"/>	



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

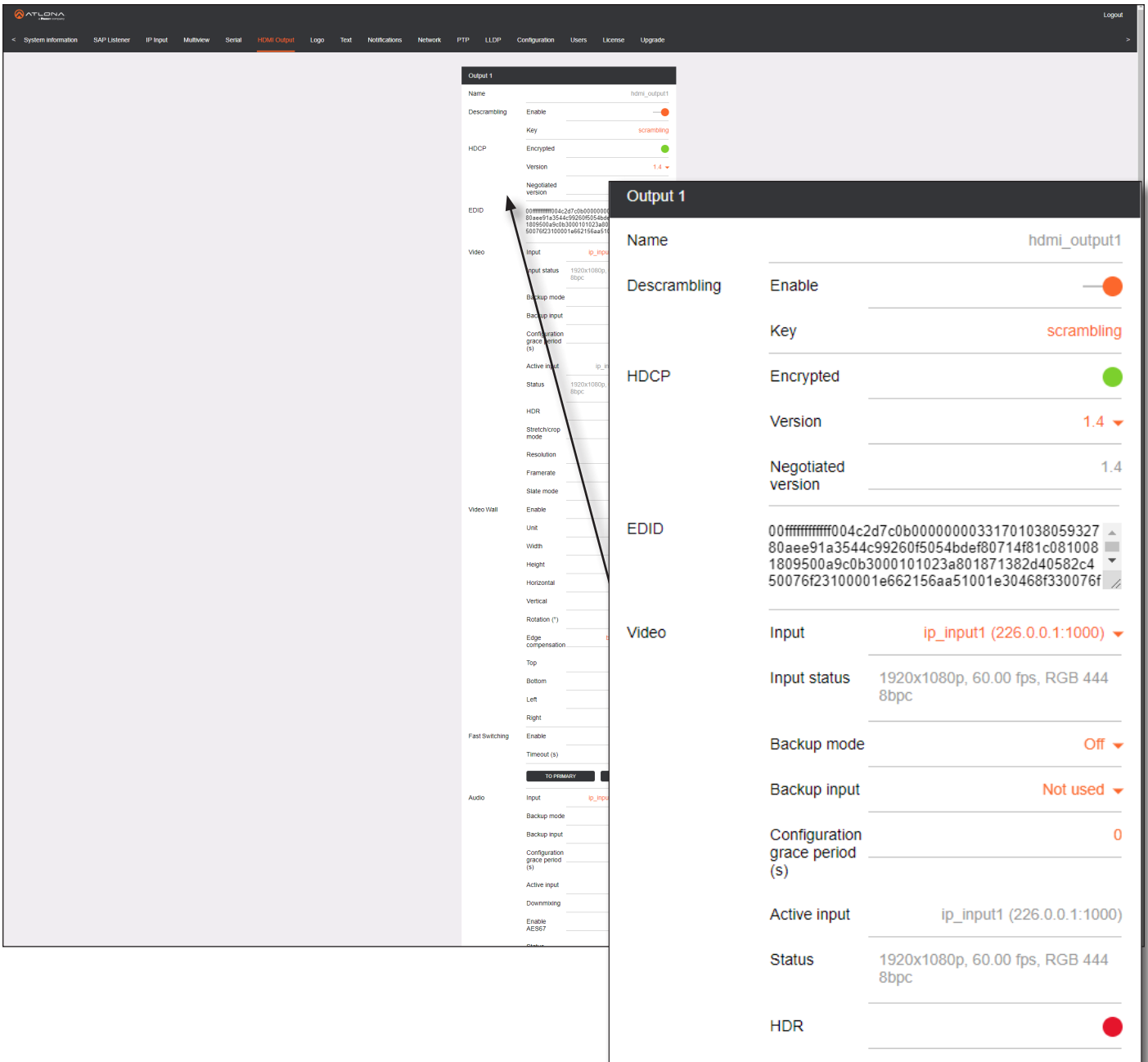


#### New Command

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

### HDMI Output page



### Output window groups

Dual-channel decoders have two **Output** window groups and the following fields apply to both **Output** window groups.

#### Name

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

#### Enable

Click this toggle switch to enable or disable scrambling. If a scrambling key is used on the subscribed encoder, then descrambling must be enabled on the decoder in order for the source signal to reach the sink device.

#### Key

Enter the descrambling key in this field. This key must match the scrambling key on the subscribed encoder.

## Configuration and Management Interfaces

### Encrypted

This indicator will be green if the HDMI output is HDCP-encrypted.

### Version

Click this drop-down list to select the supported version of HDCP.

### Negotiated

Displays the version of HDCP negotiated with the connected sink.

### EDID


This field will display the EDID of the connected display. This raw data can be copied and stored in the encoder, if desired.

### Input

Click this drop-down list to select the desired IP input. Available options are `ip_input1` - `ip_input16`, `none`, `video generator`, and `multiview` (if configured).

### Input status

Displays details about the video stream from the encoder. If no video stream is detected, then “No active video” will be displayed.

HDCP	Encrypted	
	Version	1.4 ▼
	Negotiated version	1.4
EDID	<pre>00ffffffff004c2d7c0b00000000331701038059327 80aee91a3544c99260f5054bdef80714f81c081008 1809500a9c0b3000101023a801871382d40582c4 50076f23100001e662156aa51001e30468f330076f</pre>	
Video	Input	ip_input1 (226.0.0.1:1000) ▼
	Input status	1920x1080p, 60.00 fps, RGB 444 8bpc
	Backup mode	Off ▼
	Backup input	Not used ▼
	Configuration grace period (s)	0
	Active input	ip_input1 (226.0.0.1:1000)
	Status	1920x1080p, 60.00 fps, RGB 444 8bpc

### Backup mode

Click this drop-down list to select the backup mode. Both Video and Audio provide the Backup Mode feature.

Mode	Description
Off	Backup source is disabled; join request not sent.
Join Active	The decoder sends a join request only when the decoder decides to switch between video sources. Switch time will not exceed 5 seconds.
Join Always	The decoder always joins to the backup video source. Switch time will not exceed 0.5 seconds.

### Backup Input

Select the secondary video backup IP input from this drop-down list. If the primary IP input is down, then the decoder will automatically switch to this input. Refer to the **Backup Mode** option, above, for setting the conditions for switching inputs. Both Video and Audio provide the Backup Input feature.

### Configuration Grace Period

To prevent the decoder from automatically making the redundancy switch, when redundancy is enabled, a grace period can be entered. By default, the grace period is set to zero seconds. If set to zero seconds, automatic failover will occur, if the stream is interrupted for any reason. Refer to [Configuring Redundant Streams \(page 88\)](#) for more information.

### Active Input

Displays the active video input.

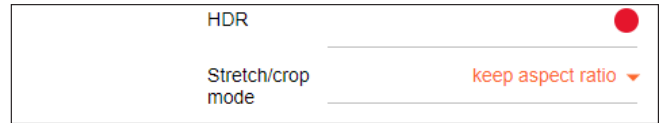
### Status

Displays details about HDMI output video after scaling, frame rate conversion, etc. If no input is active or detected, then this field will display “No active video”.

## Configuration and Management Interfaces

### HDR

This indicator will be green if the HDMI output video contains HDR content.



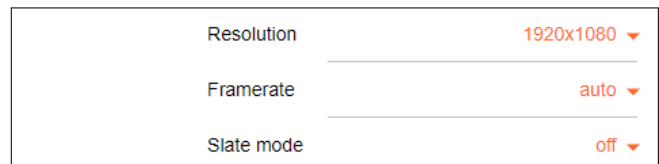
### Stretch / Crop Mode

Click this drop-down list to select the aspect ratio.

Mode	Description
Keep Aspect Ratio	Aspect ratio is preserved; the output on the decoder will be the same as the input on the encoder.
Full Screen	Stretches the image to fill the screen. In some cases this can distort (“stretch”) the image.
16:9	Sets the aspect ratio to 16:9 “widescreen” format, usually associated with HDTV formats.
16:10	Sets the aspect ratio to 16:10 “widescreen” format, usually associated with computer displays and smart devices.
4:3	Sets the aspect ratio to 4:3 “pan-and-scan” format, usually associated with SDTV.

### Resolution

Click this drop-down list to select the desired output resolution. This is a scaler feature which can either upscale or downscale the output on the decoder. If **Input** is selected, then no scaling will be applied to the output. Select **Auto** to use the EDID of the sink device to determine the output resolution.



Resolutions	
Input	1440x1050
Auto	1440x900
4096x2160	1280x1024
3840x2160	1280x800
1920x1200	1280x768
1920x1080	1280x720
1680x1050	1024x768
1600x900	



**NOTE:** When working with VESA resolutions 1360x768p60 and 1366x768p60, the **Resolution** drop-down list must be set to **Auto**.

### Framerate

Sets the output frame rate. Available options are **auto**, 60 Hz, 50 Hz, and 30 Hz, except for the OMNI-122 where the options are **auto** and 30 Hz.

### Slate Mode

Click this drop-down list to select the slate mode. Refer to [Slate / Logo Insertion \(page 71\)](#) for more information.

Mode	Description
Off	Disables the image from being displayed.
Manual	Stretches the image to fill the screen. In some cases this can distort (“stretch”) the image.
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.

## Configuration and Management Interfaces

### Video Wall > Enable

Click this toggle switch to enable or disable the video wall option. Refer to [Creating Video Walls \(page 77\)](#) for more information on using video walls.

### Video Wall > Unit

Click this drop-down list to specify the units. Available options are `pixels`, `mm`, and `inches`.

### Video Wall > Width

Specifies the width of the decoder's video output, which is a subset of the large video wall.

### Video Wall > Height

Specifies the height of the decoder's video output, which is a subset of the large video wall.

### Video Wall > Horizontal

The offset from the (0,0) reference point, of the defined width (see **Width**, above).

### Video Wall > Vertical

The offset from the (0,0) reference point, of the defined height (see **Height**, above).

### Video Wall > Rotation

Adjusts the rotation angle of the image. Available options are 0, 90, 180, and 270. Single-channel decoders are restricted to values 90 and 270.

### Video Wall > Edge Compensation

Adjusts edge compensation. Available options are `none`, `bezel compensation`, and `edge blending`.

### Video Wall > Top

Offset value for adjusting the top portion of the image. Units are specified in the **Unit** field.

### Video Wall > Bottom

Offset value for adjusting the bottom portion of the image. Units are specified in the **Unit** field.

### Video Wall > Left

Offset value for adjusting the left portion of the image. Units are specified in the **Unit** field.

### Video Wall > Right

Offset value for adjusting the right portion of the image. Units are specified in the **Unit** field.

### Fast Switching

Click this toggle switch to enable or disable fast-switching. When enabled, the fast-switching timeout interval can also be adjusted. Refer to [Fast Switching \(page 53\)](#) for more information.

### Timeout (s)

The timeout interval in seconds.

Video Wall	Enable	<input checked="" type="checkbox"/>
	Unit	pixels ▼
	Width	1920
	Height	1080
	Horizontal	0
	Vertical	0
	Rotation (°)	0 ▼
	Edge compensation	bezel compensation ▼
	Top	0
	Bottom	0
	Left	0
	Right	0
Fast Switching	Enable	<input checked="" type="checkbox"/>
	Timeout (s)	5

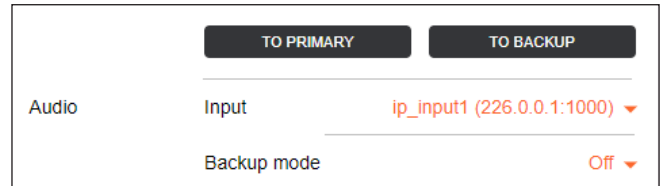
## Configuration and Management Interfaces

### TO PRIMARY

Click this button to assign as the Primary IP Input. Both Video and Audio support this feature.

### TO BACKUP

Click this button to force the audio stream to fall over to the Backup IP Input (if redundancy is configured). Both Video and Audio support this feature.



### Audio Input

Click this drop-down list to select the primary audio IP input. Select the `Not Used` option to leave the audio input unassigned.

### Backup Mode

Click this drop-down list to select the backup mode. Both Video and Audio provide the Backup Mode feature.

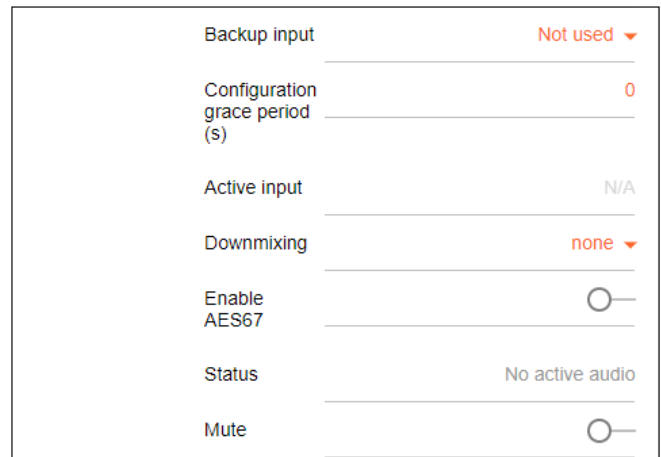
Mode	Description
Off	Backup source is disabled; join request not sent.
Join Active	The decoder sends a join request only when the decoder decides to switch between audio sources. Switch time will not exceed 5 seconds.
Join Always	The decoder always joins to the backup audio source. Switch time will not exceed 0.5 seconds.

### Backup Input

Select the secondary audio backup IP input from this drop-down list. If the primary IP input is down, then the decoder will automatically switch to this input. Refer to the **Backup Mode** option, above, for setting the conditions for switching inputs. Both Video and Audio provide the Backup Input feature.

### Configuration Grace Period

To prevent the decoder from automatically making the redundancy switch, when redundancy is enabled, a grace period can be entered. By default, the grace period is set to zero seconds. If set to zero seconds, automatic failover will occur, if the stream is interrupted for any reason. Refer to [Configuring Redundant Streams \(page 88\)](#) for more information.



### Active Input

Displays the active audio input.

### Downmixing

Click this drop-down list to select how LPCM audio will be down-mixed. Note that lossless audio formats cannot be down-mixed.

### Enable AES67

Click this toggle switch to enable or disable AES67. When enabled, the toggle switch will be orange. Refer to [AES67 Audio \(page 67\)](#) for more information.

### Status

Displays the active audio input. If no input is active or detected, then this field will display “No active audio”.

### Mute

Click this toggle switch to enable or disable the audio output. If enabled, the toggle switch will be orange.

## Configuration and Management Interfaces

### Volume

Click the speaker icon on the left to decrease volume. Click the speaker icon on the right to increase volume. Range: 0 to 15.

### Analog Power (indicator)

This indicator will be green when the decoder is powered by the optional external 48 V DC power supply.

### Analog Power (toggle switch)

If analog output is connected to the decoder, then click this toggle switch to use the analog audio output. When enabled, this toggle switch will be orange.

### TO PRIMARY

Click this button to assign as the Primary IP Input. Both Video and Audio support this feature.

### TO BACKUP

Click this button to force the audio stream to fall over to the Backup IP Input (if redundancy is configured). Both Video and Audio support this feature.

### AUX (CEC)

Click this drop-down list to select the desired IP input for CEC control. The available options will be based on which IP Input has been enabled on the decoder.

### Auto On

Click this toggle switch to enable or disable power-on and power-off on the connected sink using CEC. When enabled, this toggle switch will be green and the power-on command will be sent to the display when an A/V signal is detected.

### Projector Cooldown (s)

Enter the time interval, in seconds, before the projector can be powered-off. This time interval prevents the decoder from sending additional commands until the projector has had time to complete its cool-down process.

### Timeout (s)

Enter the time interval, in seconds, before the next command can be accepted by the display.

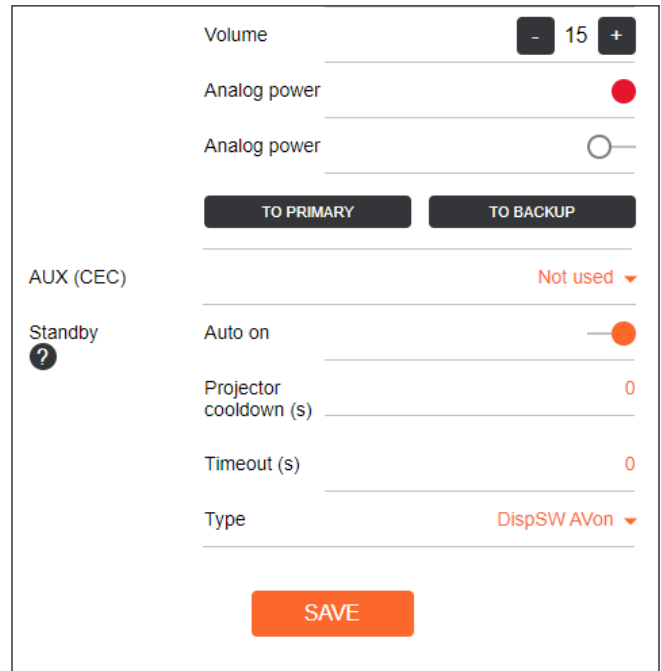
### Type

Click this drop-down list to select the display mode.

Type	Description
DispSW AVon	Display switches on/off, source audio/video signal always on.
DispSW AVSW	Display switches on/off, source audio/video signal switches on/off.
AV SW	Display is always on, source audio/video signal switches on/off
Always on	Display is always on, source audio/video signal always on.

### SAVE

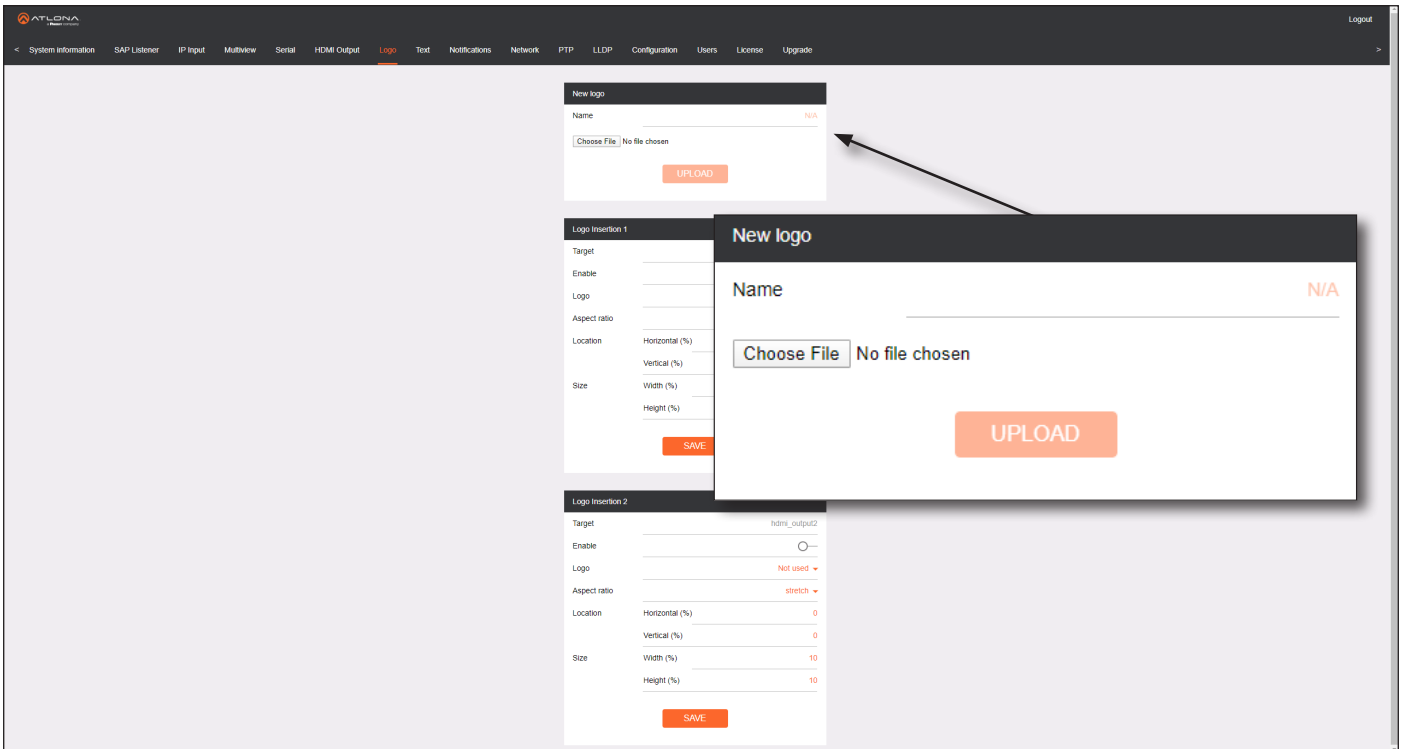
Click this button to commit all changes within the **Output** window group.





## 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 decoder.

### Logo Insertion window groups

The following fields apply to both **Logo Insertion** window groups. The single-channel decoder will only have one **Logo Insertion** window group.

#### Target

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

#### Enable

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	hdmi_output1
Enable	<input type="checkbox"/>
Logo	Not used ▼
Aspect ratio	stretch ▼

## Configuration and Management Interfaces

### 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.

### 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

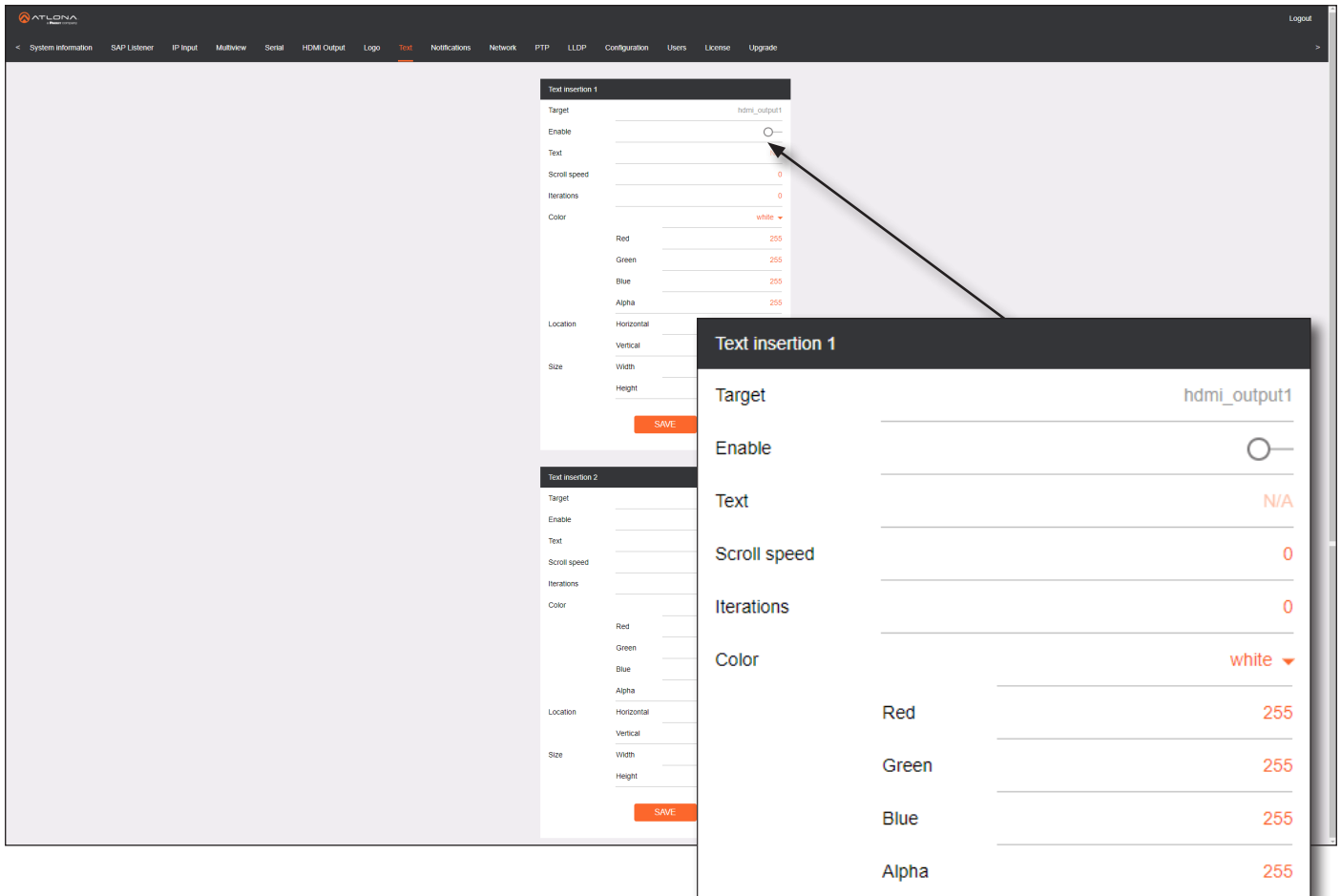
Click this button to commit all changes within the **Logo Insertion** window group.

Location	Horizontal (%)	0
	Vertical (%)	0
Size	Width (%)	10
	Height (%)	10

**SAVE**

## Configuration and Management Interfaces

### Text page



### Text insertion window groups

The following fields apply to both **Text insertion** window groups and is based on how many decoding channels there are. The AT-OMNI-122 will have two **Text Insertion** window groups.

#### Target

Displays the name of the output where the text will appear. This field cannot be changed.

#### Enable

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. 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. Numbers from 0 to 255 are valid for all fields.

## 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

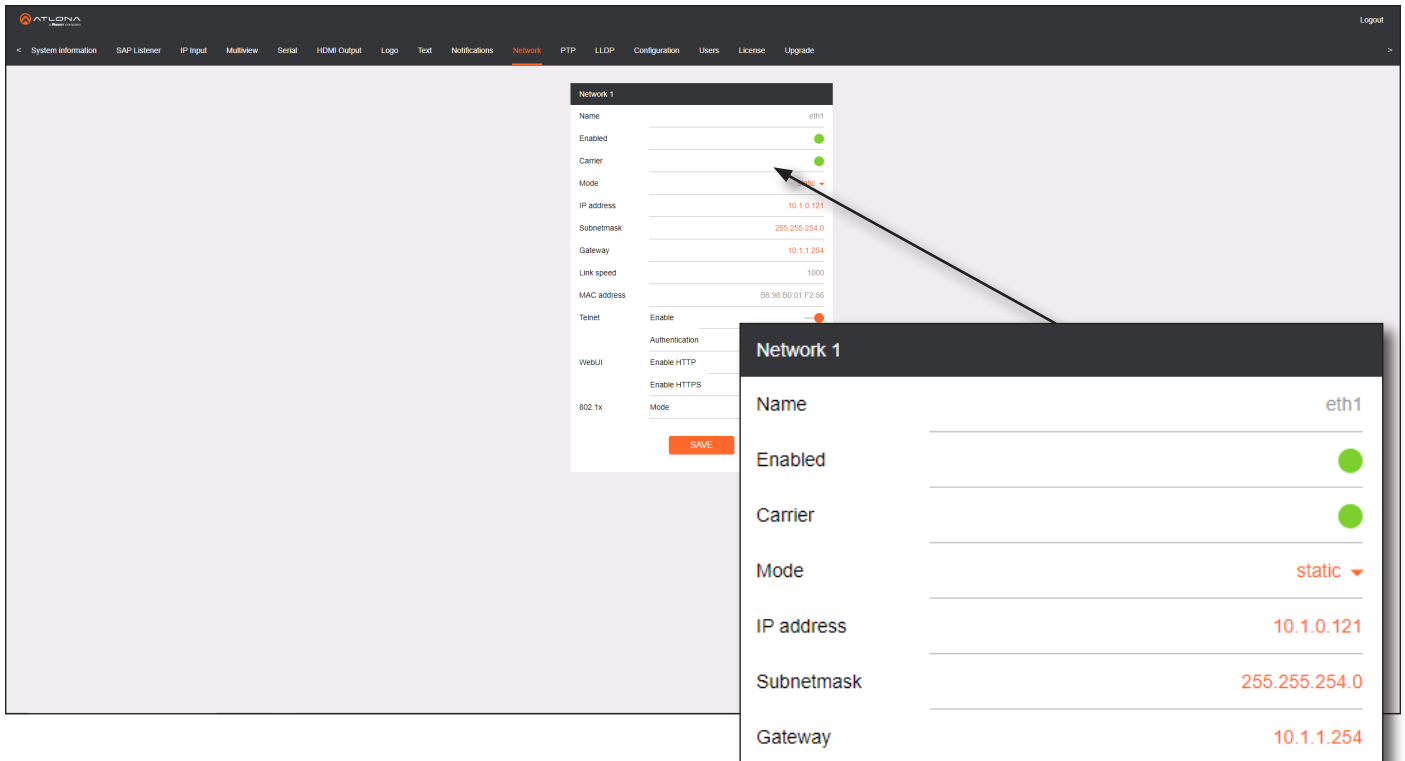
Click this button to commit all changes within the **Text insertion** window group.

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"/>

**SAVE**

## Configuration and Management Interfaces

### Network page



### Network window groups

The following fields apply to both **Network** window groups. The single-channel decoder will only have 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 decoder 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 decoder using Telnet will require login credentials. The default credentials are:

Username: admin  
 Password: Atlona

Gateway	10.1.1.254
Link speed	1000
MAC address	B8:98:B0:01:F2:56
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 <span>none ▾</span>

**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

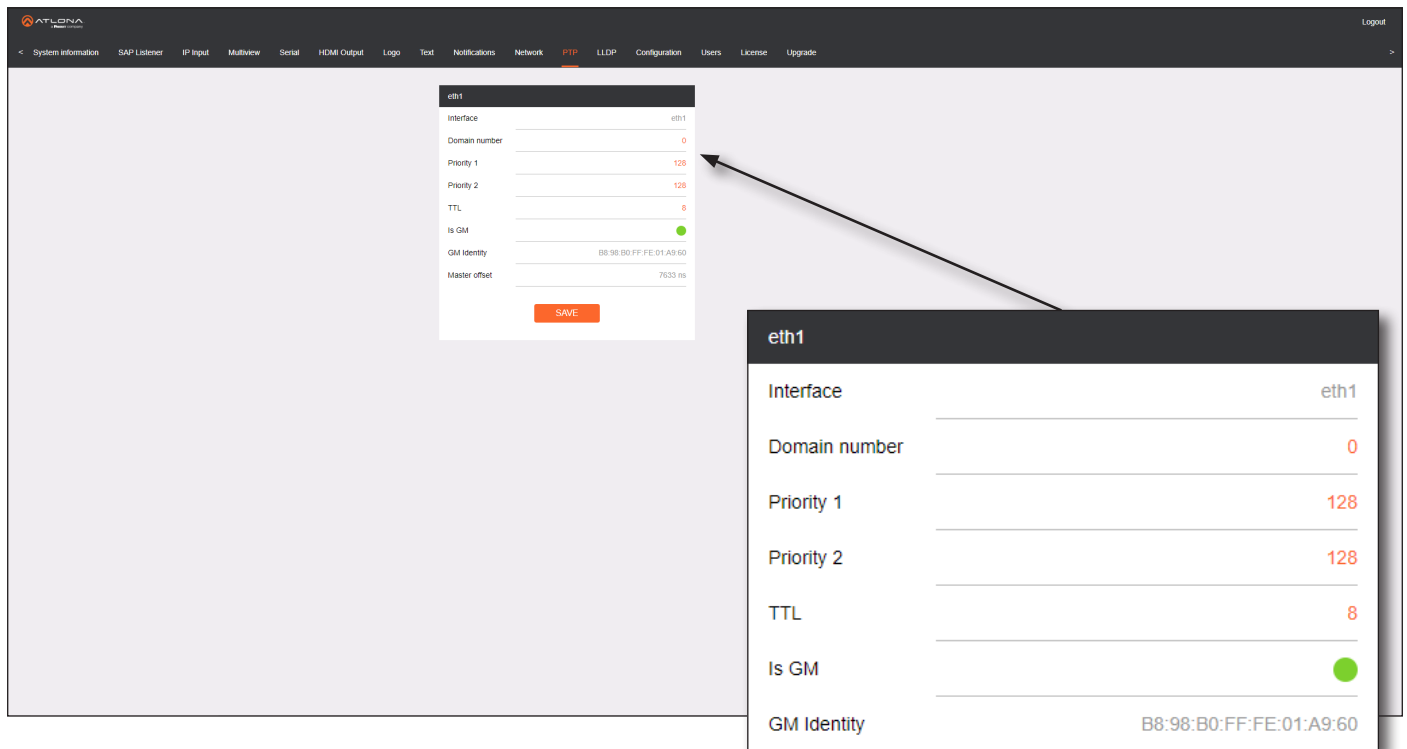
### PTP page

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.



eth1	
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:01:A9:60
Master offset	7633 ns

eth1	
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:01:A9:60

### eth window group

Dual-channel decoders will only have two **eth** window groups.

#### 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.

TTL	<input type="text" value="8"/>
Is GM	<input checked="" type="checkbox"/>
GM Identity	<input type="text" value="B8:98:B0:FF:FE:01:A9:60"/>
Master offset	<input type="text" value="7633 ns"/>



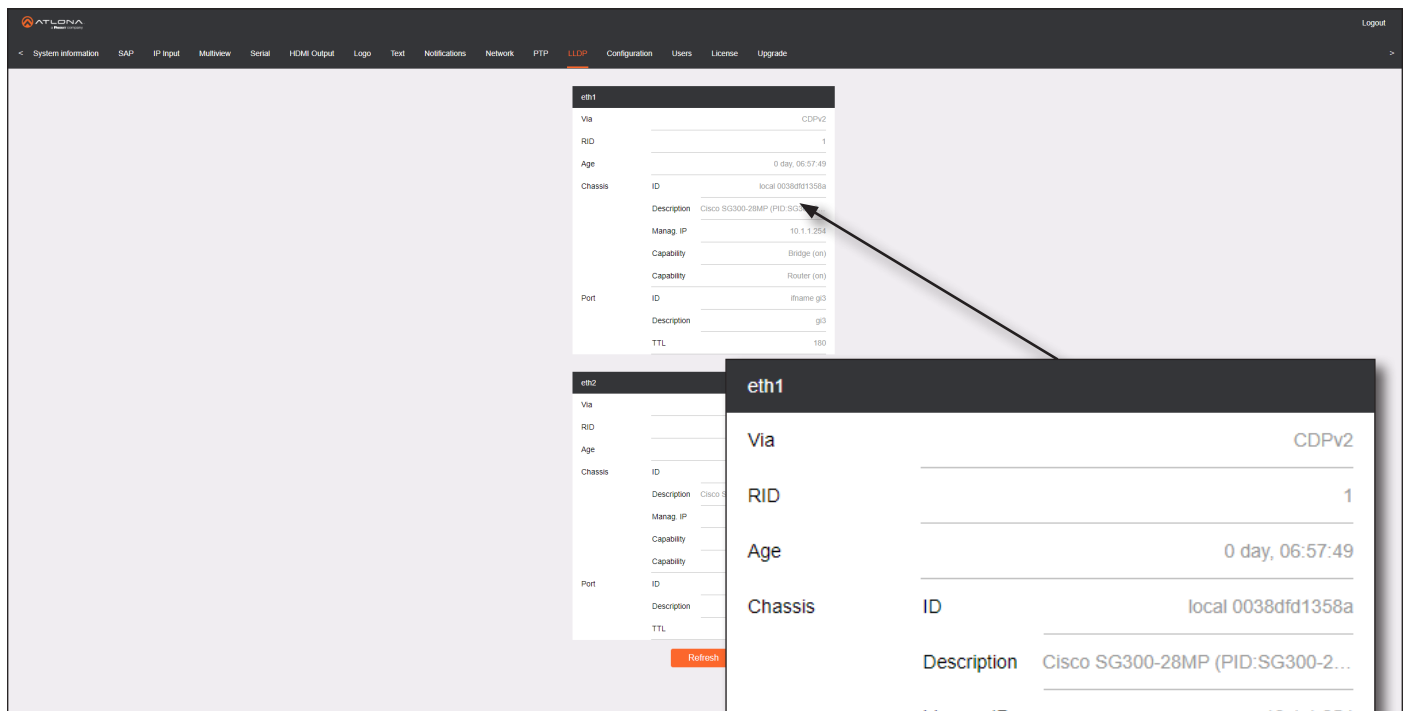
## Configuration and Management Interfaces

### LLDP page

The Link Layer Discovery Protocol (LLDP) page returns information about the switch that is connected to the decoder.



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



The screenshot shows the ATLONA web interface with the LLDP page selected. The main content area displays a 'Refresh' button and a detailed view of the eth1 interface configuration. The configuration details are as follows:

Category	Property	Value
Via	Via	CDPv2
	RID	1
	Age	0 day, 06:57:49
Chassis	ID	local 0038dfd1358a
	Description	Cisco SG300-28MP (PID:SG300-2...
	Manag. IP	10.1.1.254
	Capability	Bridge (on)
Capability	Capability	Router (on)
	Port	
Port	ID	ifname gi3
	Description	gi3
	TTL	180

#### 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.

#### Port > TTL

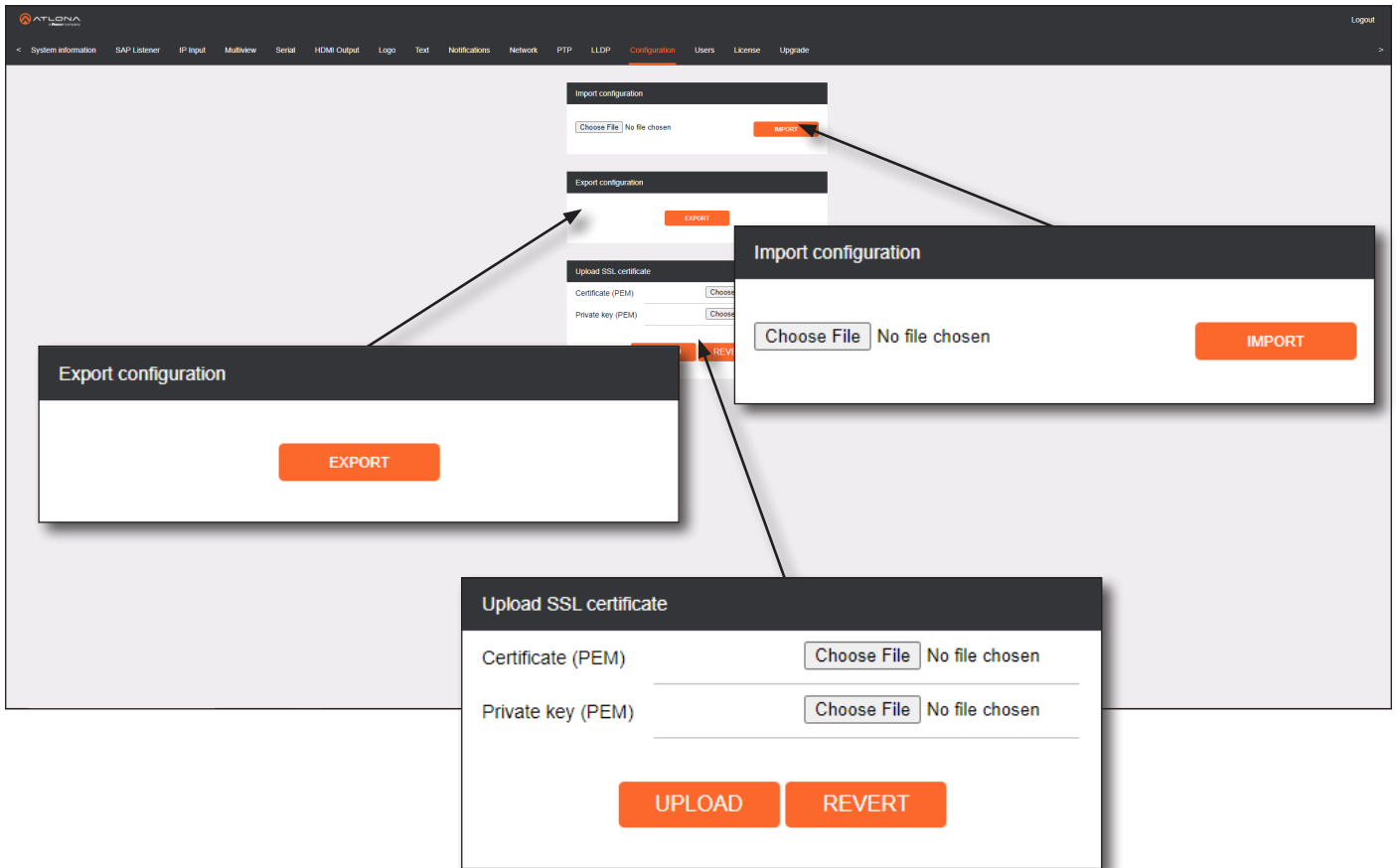
The Time-To-Live value.

#### 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 decoder system configuration to a .json file.

### Upload SSL certificate

#### Choose File

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

#### UPLOAD

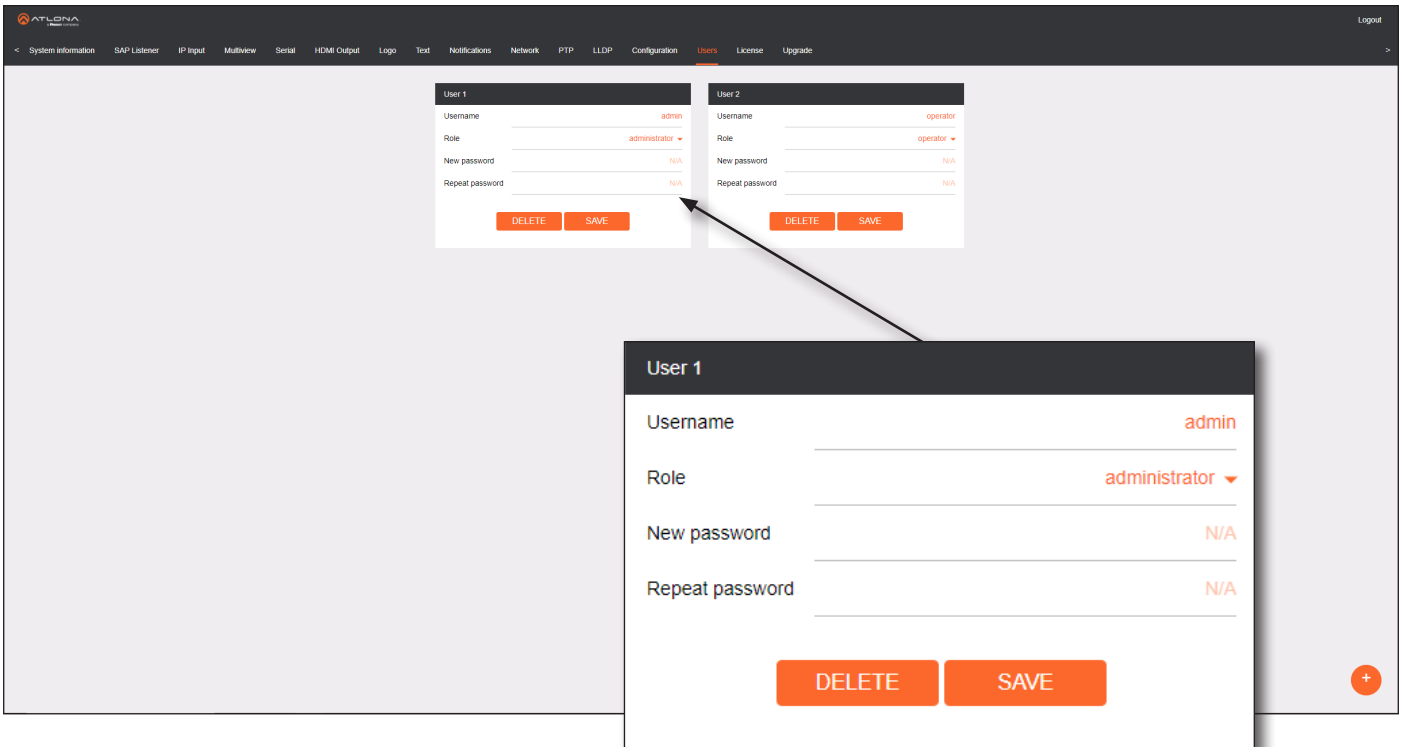
Click this button to upload the certificate/private key to the decoder.

#### 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.

#### Username

Enter the desired username in this field.

#### Role

Click this drop-down list to select the desired role of the user. Available options are: administrator, operator.

#### 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 administrator 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.



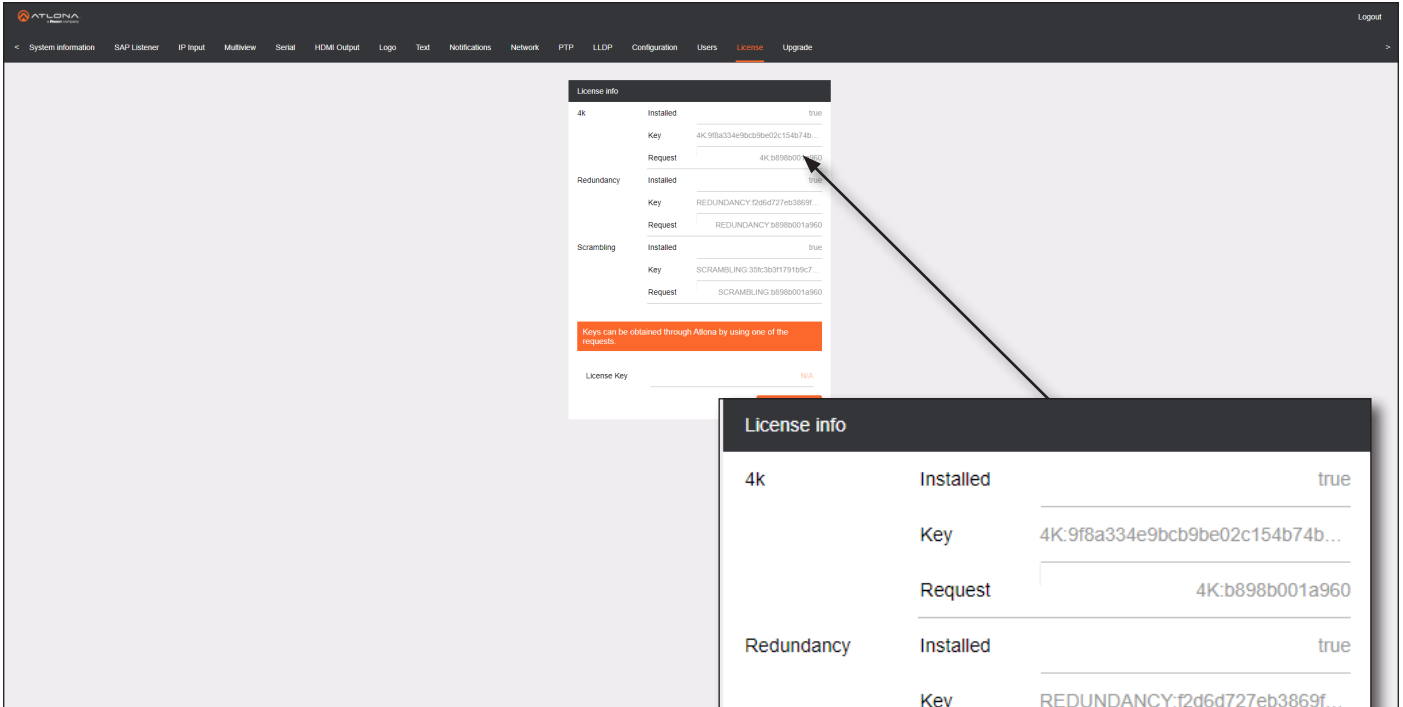
#### New user

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.

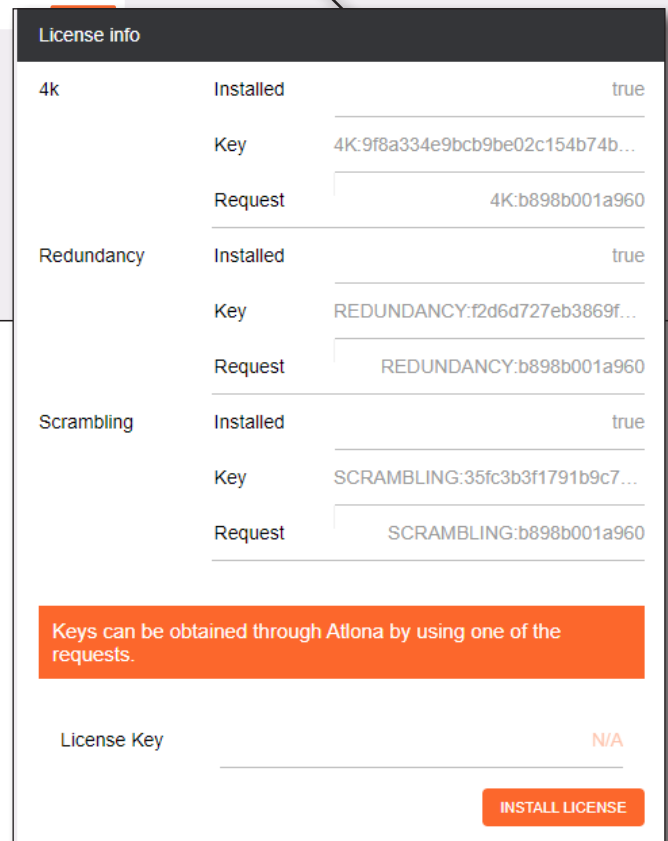


#### License info window group

This window group lists all installed licences, along with the key code and request codes

#### INSTALL LICENSE

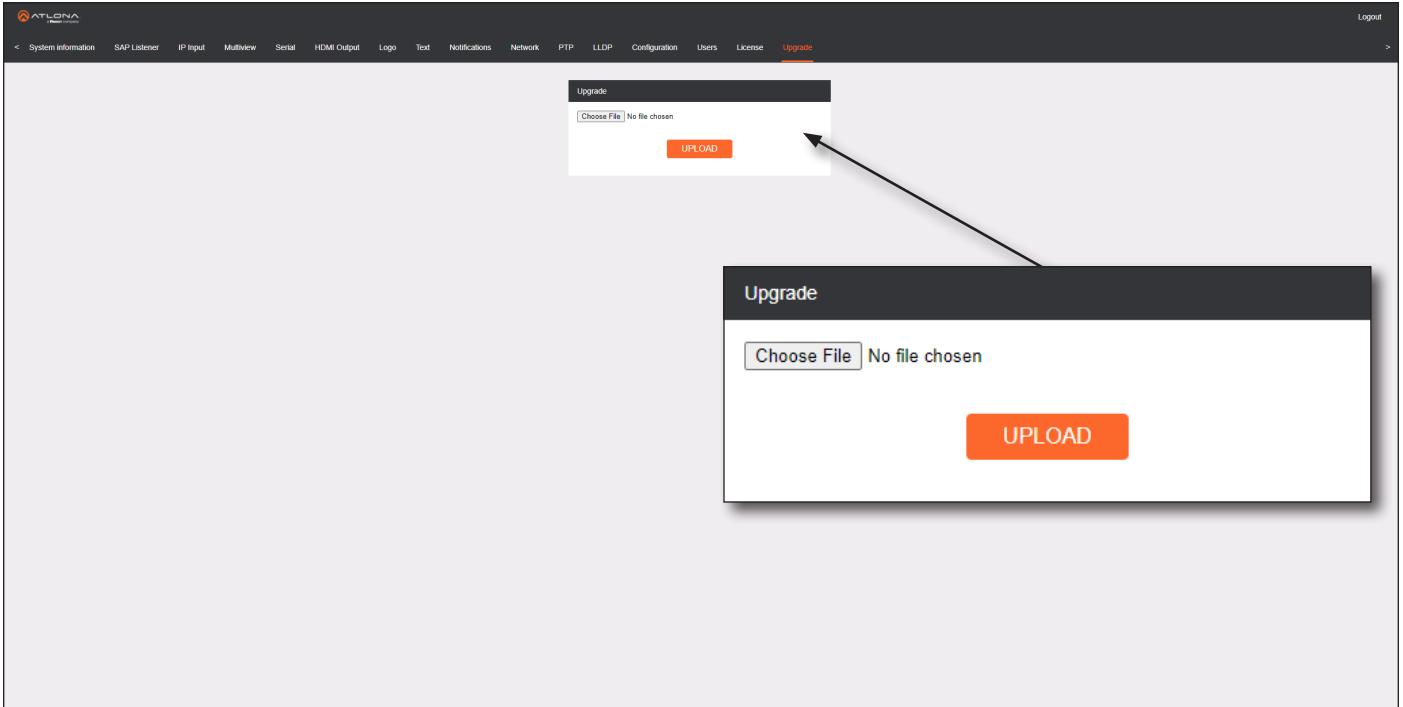
Click this button to validate and install the license.



## Configuration and Management Interfaces

### Upgrade page

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



### Upgrade window group

#### Choose File

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

#### UPLOAD

Click this button to upload the selected firmware file.

# Appendix

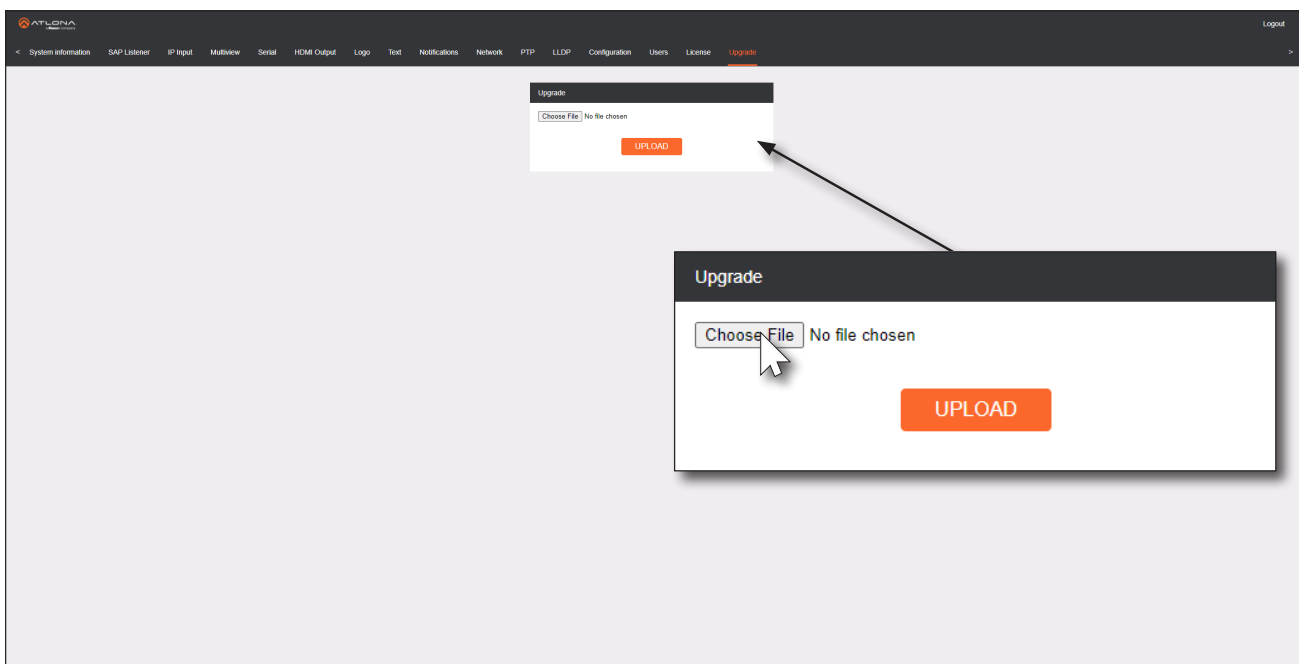
## Updating the Firmware

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.

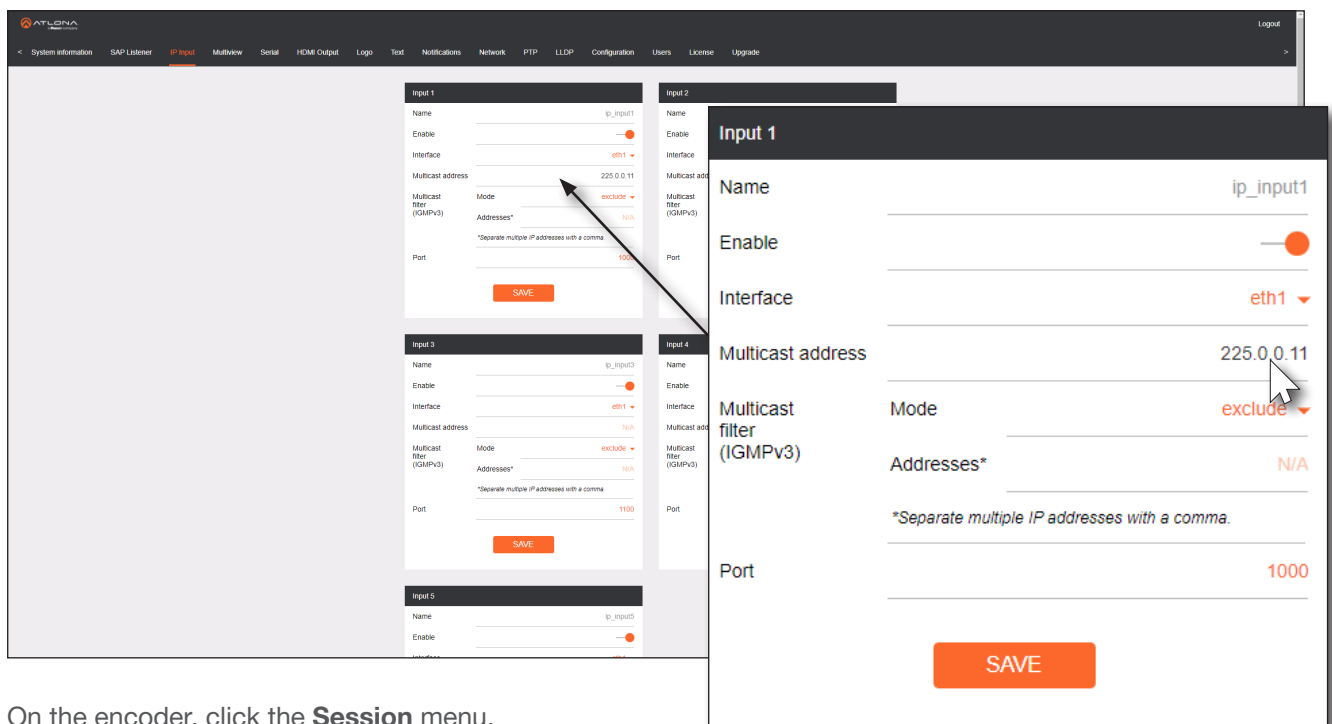
Firmware file	OmniStream SKU
at-omni-single-upgrd-os-[version].vpup2	AT-OMNI-111 AT-OMNI-121 AT-OMNI-111-WP
at-omni-dual-upgrd-os-[version].vpup2	AT-OMNI-112 AT-OMNI-122
at-omni-residential-upgrd-os-[version].vpup2	AT-OMNI-512 AT-OMNI-521

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.

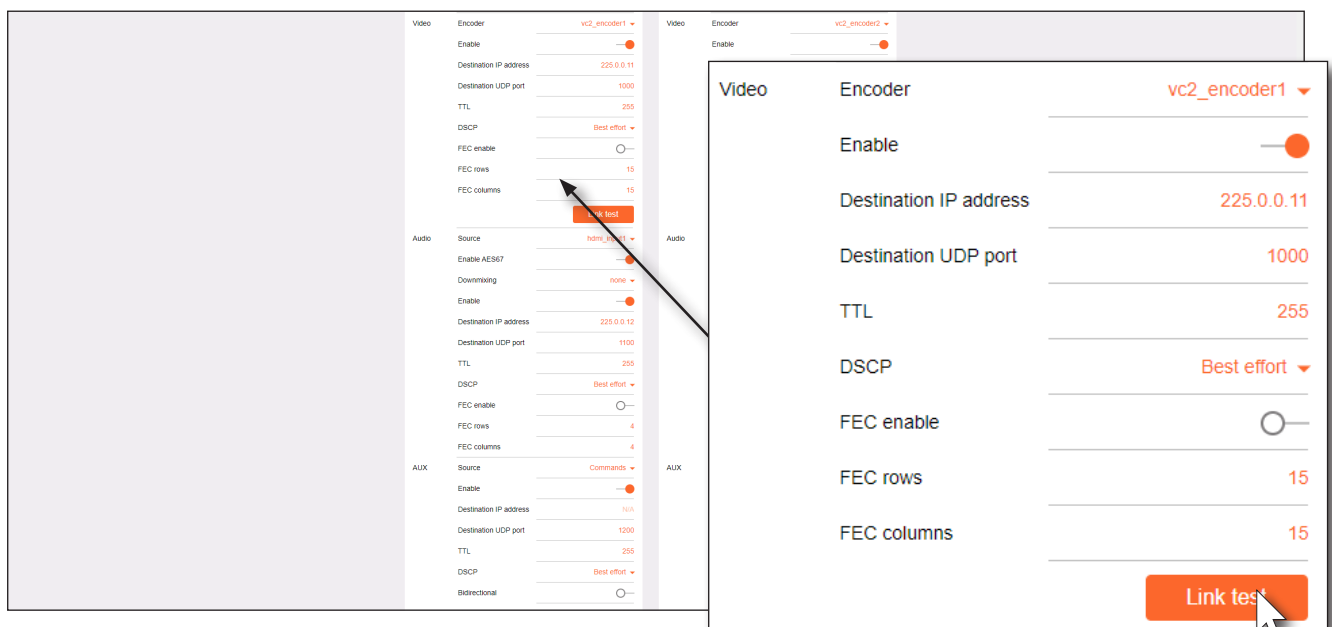
## Performing a Link Test

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

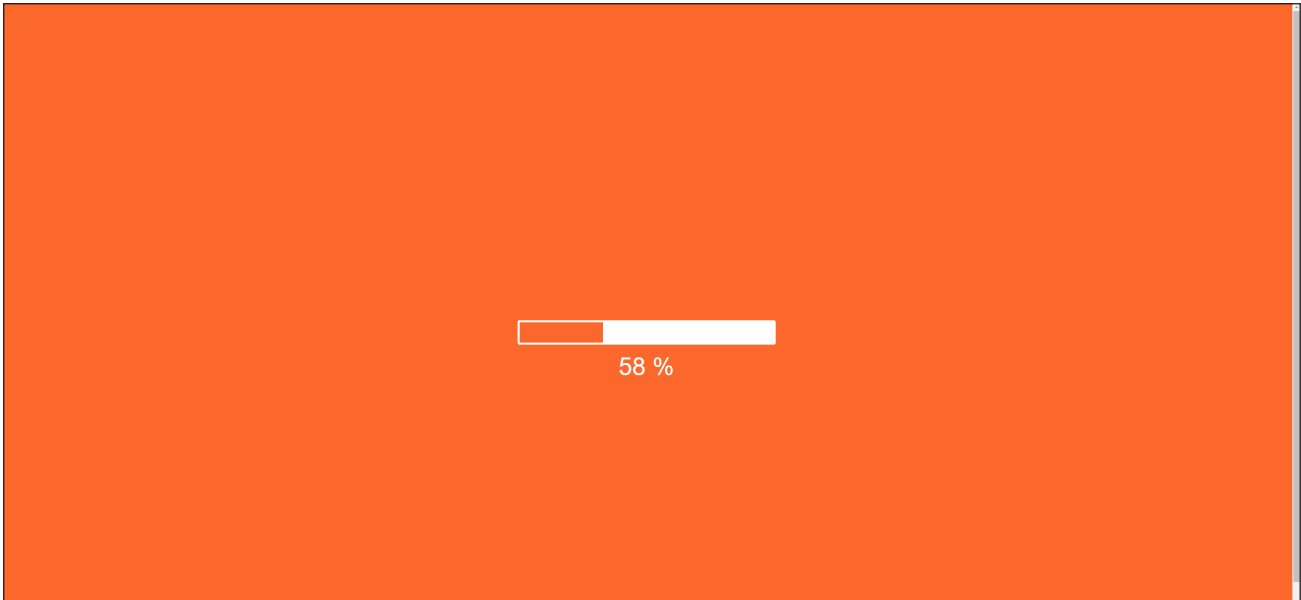
1. Launch a web browser and enter the IP address of the encoder in the address bar.
2. Open another tab in the browser and enter the IP address of the subscribing decoder in the address bar.
3. Verify that all desired decoders are subscribed to the encoder's multicast address and port number. In the 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.

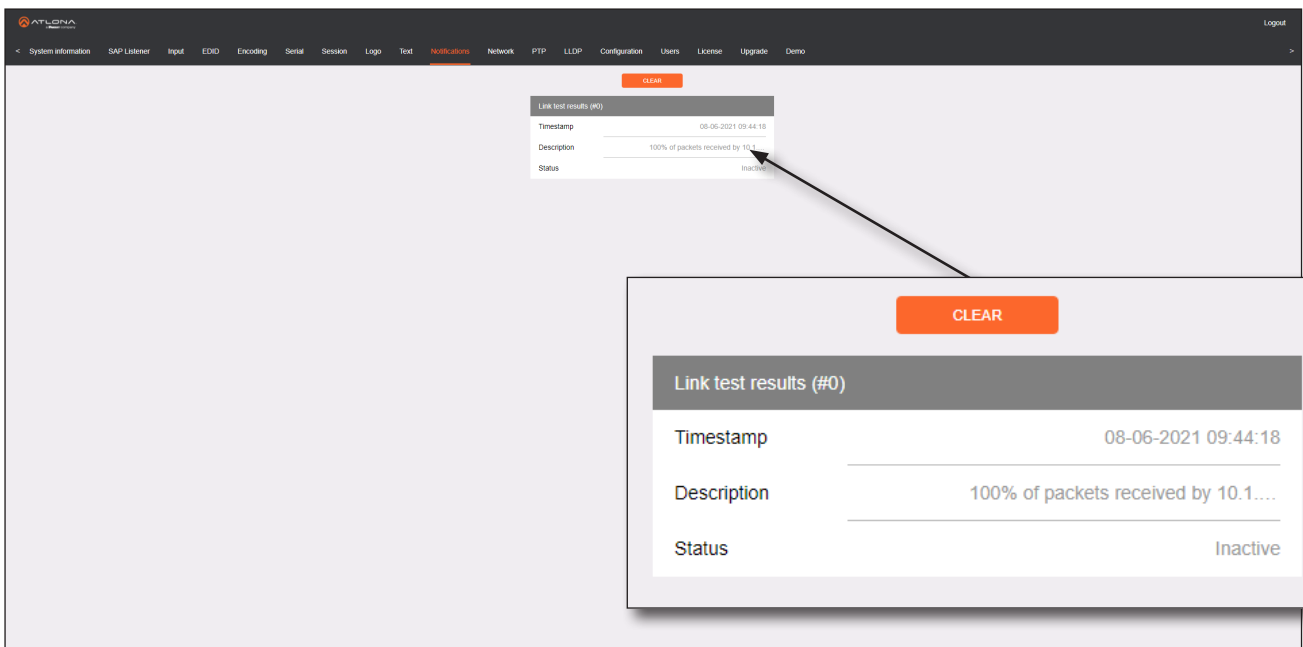


- An orange screen with a progress bar will be displayed during the testing procedure.



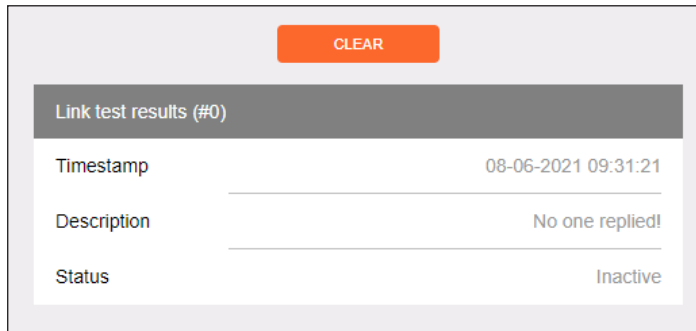
- After the test, the encoder web page will automatically redirect to the **Notifications** tab where the user can see the results.

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.

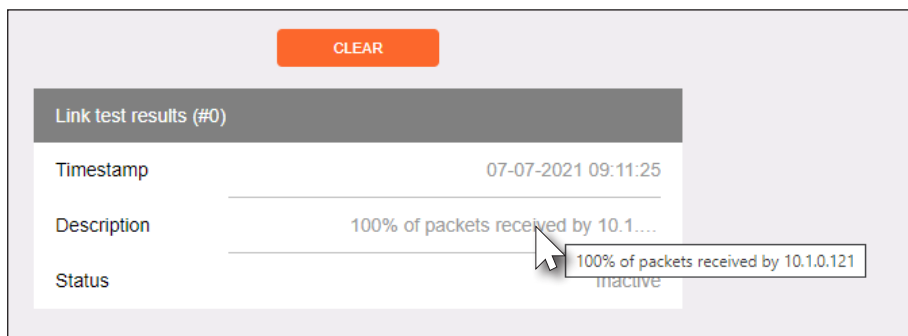




If the test fails, it could be that less than 100% of packets are received, indicating connectivity, but with some amount of packet loss. If it shows “No one replied!” or if the target decoder is not shown in results, it could indicate that there is a connectivity issue or that the decoder is not subscribed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



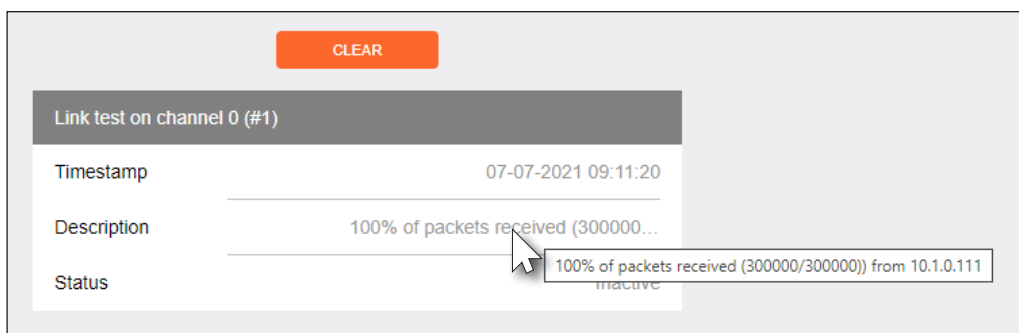
Hovering the mouse over the **Description** field will provide the full IP address of each decoder which received the test, as shown below. If multiple decoders were tested, additional IP addresses will be displayed.



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

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

- 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, Atлона 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.

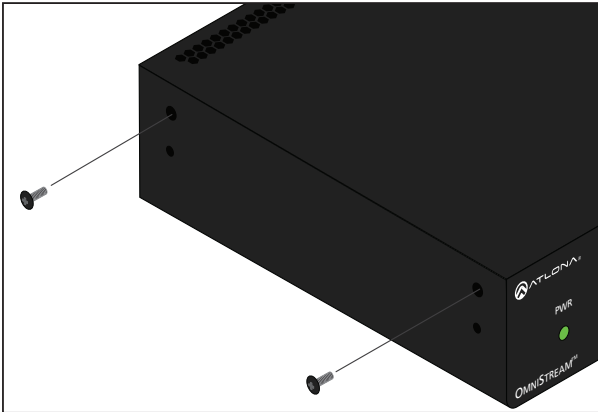
Format	1x4	2x4	4x4	10x10
2 channel PCM, 44.1 kHz	34.01 ms	68.03 ms	136.10 ms	850.30 ms
2 channel PCM, 48 kHz	31.25 ms	62.50 ms	125.00 ms	781.30 ms
2 channel PCM, 96 kHz	15.63 ms	31.25 ms	62.50 ms	390.60 ms
2 channel PCM, 192 kHz	7.81 ms	15.63 ms	31.25 ms	195.30 ms

- It is recommended to keep lip sync within  $\pm 1$  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

## Mounting Instructions

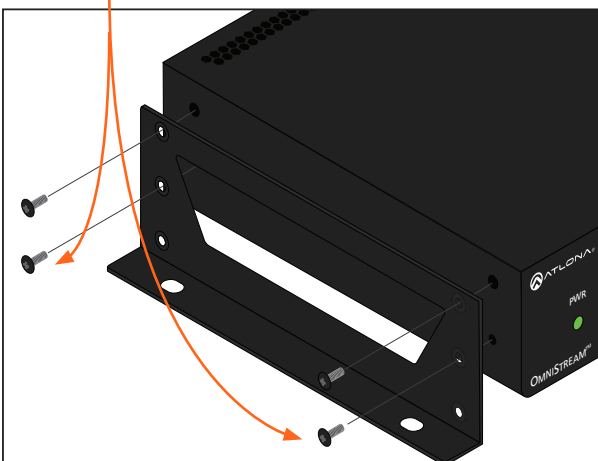
OmniStream decoders includes two mounting brackets and four mounting screws, which can be used to attach the unit to any flat surface.

1. Using a small Phillips screwdriver, remove the two screws from the left side of the enclosure.



2. Position one of the rack ears, as shown below, aligning the holes on the side of the enclosure with one set of holes on the rack ear.
3. Use the enclosure screws to secure the rack ear to the enclosure.

Included screws



4. To provide added stability to the rack ear, use two of the included screws and attach them to the two holes, directly below the enclosure screws, as shown above.
5. Repeat steps 1 through 4 to attach the second rack ear to the opposite side of the unit.

6. Mount the unit using the oval-shaped holes, on each rack ear. If using a drywall surface, a #6 drywall screw is recommended.



**NOTE:** Rack ears can also be inverted to mount the unit under a table or other flat surface.

## Rack Tray for OmniStream

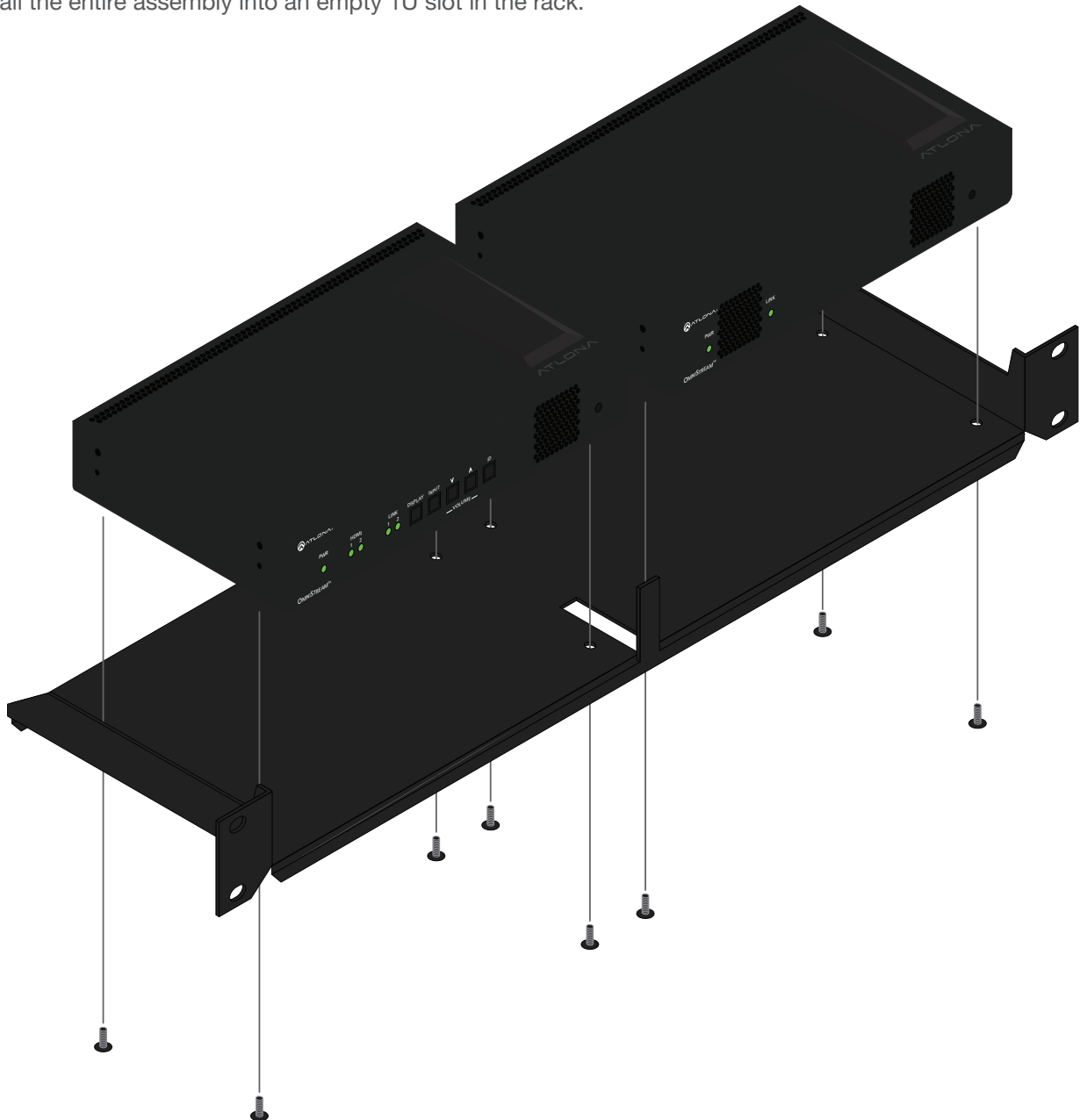
OmniStream decoders can also be mounted in the OmniStream rack tray (AT-OMNI-1XX-RACK-1RU). The rack tray is sold separately and provides easy mounting and organization of up to two OmniStream encoders/decoders in a convenient 1U rack tray. The OmniStream rack tray can be purchased directly from Atlona.

1. Position the OmniStream products, as shown in the illustration below.
2. Using the included screws, secure each unit to the rack with a Philips screwdriver.



**NOTE:** OmniStream units can be mounted forward-facing or back-facing, depending upon your requirements.

3. Install the entire assembly into an empty 1U slot in the rack.



## Specifications

### Single-Channel Decoder

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

Encoding				
Density	Single decoding 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 PC Application	VC-2 Video
	4:4:4	Yes	Yes	No
	4:2:2	Yes	Yes	No
	4:2:0	Yes	No	Yes
Color Depth	8-bit, 10-bit, 12-bit			
HDR	HDR10, HLG, Dolby® Vision™			
Bit Rate	Configurable up to 900 Mbps			
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.			
Output Resolution in Fast Switching Mode	Up to 4K60 (VCx) or 1080p60 (VC-2)			

Audio			
Pass-through	LPCM 2.0 LPCM 5.1 LPCM 7.1	Dolby® Digital Dolby Digital Plus Dolby TrueHD	Dolby Atmos® DTS® 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		
Analog audio <sup>(5)</sup>	Balanced output: +4 dBu nominal gain, +20 dB headroom Frequency response: 20 Hz to 20 kHz, ± 0.5 dB Output impedance: 150 Ω Stereo channel separation: > 90 dB THD+N: < 0.03% at 20 Hz to 20 kHz SNR: > 90 dB at 1 kHz, zero clipping @ 0 dBFS, unweighted		

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 <sup>(6)</sup>	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).

Control	
CEC	Supported and triggered from control systems and OmniStream encoders
RS-232	Device control and configuration; supports baud rates from 2400 to 9600 Bidirectional pass-through from control system to network Bidirectional TCP Proxy (RS-232 commands over IP)
IR	Pass-through from control system to network Pass-through from network to control system

Connectors	
HDMI	1 - Type A, 19-pin, female, locking
ETHERNET <sup>(7)</sup>	1 - RJ45, 10/100/1000 Mbps
RS-232 / IR	1 - Euroblock, 6-pin (2 ports); RS-232 on port 1 only, IR on port 2 only
AUDIO	1 - Euroblock 10-pin; AUDIO IN/OUT; accepts balanced or unbalanced line
Power	1 - Euroblock, 2-pin

Indicators and controls	
PWR	1 - LED, tricolor (red, amber, green)
LINK	1 - LED, bicolor (red, green)
ID	1 - Momentary, tact-type, backlit (blue); sends an identification broadcast message over the network to any listening devices.
Reboot	1 - Momentary, tact-type

Power	
PoE	IEEE 802.3af
Consumption	Up to 12 W (w/o analog audio), up to 24 W (w/ analog audio)
BTU/h	40.9 (w/o analog audio), 81.8 (w/ analog audio)
External Power Supply (optional)	Input: 110 - 220 V AC, 50/60 Hz Output: 48 V DC, 0.83 A

Environmental	
Cooling System	Front-to-rear airflow, temperature-controlled fans
Operating Temperature	+14 to +122 °F -10 to +50 °C
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)	1.34 in x 8.19 in x 4.41 in 34 mm x 208 mm x 112 mm
Weight	1.5 lbs / 0.7 kg

Certification	
Device	CE, FCC, CB, RoHS
Supply	CE, FCC, cULus, CB, RCM, RoHS

Compliance	
NDAA-899	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) Using VCx, streaming is supported up to 4K60 4:4:4. Using VC-2 Video Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:0 before streaming. Using VC-2 PC Application Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:2 or 4:2:0 before streaming.
- (3) All VESA resolutions are 60 Hz.
- (4) Only supported when System Mode is set to VC-2 Video mode.
- (5) External power supply is required when using the analog audio interface.
- (6) Slate insertion is limited to 1080p only.
- (7) Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.



