OmniStream™

Single-Channel / Dual-Channel

Networked AV Decoder

AT-OMNI-121
AT-OMNI-122

Atlona Manuals
Networked AV

Version Information

Version	Release Date	Notes
1	04/17	Initial release
2	06/17	New enclosure, documentation updates: AMS interface; front-panel buttons, decoder set tab
3	12/17	Video wall configuration plus bezel compensation, slate / logo insertion, text insertion, redundancy grace period for IP input changes
4	05/18	Updated to reflect AMS 2.0
5	07/18	Includes updates to 1.2.1 firmware; AMS updates

Welcome to Atlona!

Thank you for purchasing this Atlona product. We hope you enjoy it and will take a extra few moments to register your new purchase.

Registration only takes a few minutes and protects this product against theft or loss. In addition, you will receive notifications of product updates and firmware. Atlona product registration is voluntary and failure to register will not affect the product warranty.

To register your product, go to http://www.atlona.com/registration

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Operating Notes

- The Atlona Management System (AMS) is a free downloadable application from Atlona that provides network configuration assistance for this product. This application is available only for the Windows® Operating System and can be downloaded from the Atlona web site.

IMPORTANT: Visit http://www.atlona.com/product/AT-OMNI-121 and http://www.atlona.com/product/AT-OMNI-122 for the latest firmware updates and User Manual.

Atlona, Inc. (“Atlona”) Limited Product Warranty

Coverage

Atlona warrants its products will substantially perform to their published specifications and will be free from defects in materials and workmanship under normal use, conditions and service.

Under its Limited Product Warranty, Atlona, at its sole discretion, will either:

- repair or facilitate the repair of defective products within a reasonable period of time, restore products to their proper operating condition and return defective products free of any charge for necessary parts, labor and shipping.

OR

- replace and return, free of charge, any defective products with direct replacement or with similar products deemed by Atlona to perform substantially the same function as the original products.

OR

- refund the pro-rated value based on the remaining term of the warranty period, not to exceed MSRP, in cases where products are beyond repair and/or no direct or substantially similar replacement products exist.

Repair, replacement or refund of Atlona products is the purchaser’s exclusive remedy and Atlona liability does not extend to any other damages, incidental, consequential or otherwise.

This Limited Product Warranty extends to the original end-user purchaser of Atlona products and is non-transferrable to any subsequent purchaser(s) or owner(s) of these products.

Coverage Periods

Atlona Limited Product Warranty Period begins on the date of purchase by the end-purchaser. The date contained on the end-purchaser ‘s sales or delivery receipt is the proof purchase date.

Limited Product Warranty Terms – New Products

- 10 years from proof of purchase date for hardware/electronics products purchased on or after June 1, 2013.
- 3 years from proof of purchase date for hardware/electronics products purchased before June 1, 2013.
- Lifetime Limited Product Warranty for all cable products.

Limited Product Warranty Terms – Refurbished (B-Stock) Products

- 3 years from proof of purchase date for all Refurbished (B-Stock) hardware and electronic products purchased on or after June 1, 2013.

Remedy

Atlona recommends that end-purchasers contact their authorized Atlona dealer or reseller from whom they purchased their products. Atlona can also be contacted directly. Visit www.atlona.com for Atlona’s contact information and hours of operation. Atlona requires that a dated sales or delivery receipt from an authorized dealer, reseller or end-purchaser is provided before Atlona extends its warranty services. Additionally, a return merchandise authorization (RMA) and/or case number, is required to be obtained from Atlona in advance of returns.

Atlona requires that products returned are properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization or case number will be refused. Atlona, at its sole discretion, reserves the right to reject any products received without advanced authorization. Authorizations can be requested by calling 1-877-536-3976 (US toll free) or 1-408- 962-0515 (US/international) or via Atlona’s website at www.atlona.com.

Exclusions

This Limited Product Warranty excludes:

- Damage, deterioration or malfunction caused by any alteration, modification, improper use, neglect, improper packaging or shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature.

- Damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Atlona to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product.
- Equipment enclosures, cables, power supplies, batteries, LCD displays, and any accessories used in conjunction with the product(s).
- Products purchased from unauthorized distributors, dealers, resellers, auction websites and similar unauthorized channels of distribution.

Disclaimers

This Limited Product Warranty does not imply that the electronic components contained within Atlona’s products will not become obsolete nor does it imply Atlona products or their electronic components will remain compatible with any other current product, technology or any future products or technologies in which Atlona’s products may be used in conjunction with. Atlona, at its sole discretion, reserves the right not to extend its warranty offering in instances arising outside its normal course of business including, but not limited to, damage inflicted to its products from acts of god.

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The maximum liability of Atlona under this limited product warranty shall not exceed the original Atlona MSRP for its products. To the maximum extent permitted by law, Atlona is not responsible for the direct, special, incidental or consequential damages resulting from any breach of warranty or condition, or under any other legal theory. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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To the maximum extent permitted by law, this limited product warranty and the remedies set forth above are exclusive and in lieu of all other warranties, remedies and conditions, whether oral or written, express or implied. To the maximum extent permitted by law, Atlona specifically disclaims all implied warranties, including, without limitation, warranties of merchantability and fitness for a particular purpose. If Atlona cannot lawfully disclaim or exclude implied warranties under applicable law, then all implied warranties covering its products including warranties of merchantability and fitness for a particular purpose, shall provide to its products under applicable law. If any product to which this limited warranty applies is a “Consumer Product” under the Magnuson-Moss Warranty Act (15 U.S.C.A. §2301, ET SEQ.) or other applicable law, the foregoing disclaimer of implied warranties shall not apply, and all implied warranties on its products, including warranties of merchantability and fitness for the particular purpose, shall apply as provided under applicable law.

Other Conditions

Atlona’s Limited Product Warranty offering gives legal rights, and other rights may apply and vary from country to country or state to state. This limited warranty is void if (i) the label bearing the serial number of products have been removed or defaced, (ii) products are not purchased from an authorized Atlona dealer or reseller. A comprehensive list of Atlona’s authorized distributors, dealers and resellers can be found at www.atlona.com.

Important Safety Information

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

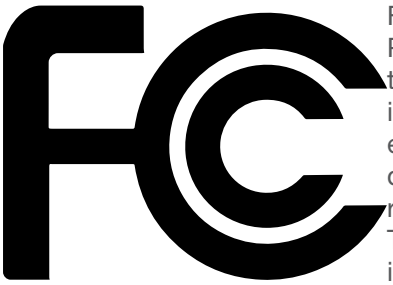
CAUTION: TO REDUCT THE RISK OF ELECTRIC SHOCK
DO NOT OPEN ENCLOSURE OR EXPOSE TO RAIN OR MOISTURE.
NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

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 Statement



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.

Table of Contents

Introduction 9

Features 9

Package Contents 9

Panel Description 10
- AT-OMNI-121 10
- AT-OMNI-122 11

Installation 12
- RS-232 Connections 12
- IR Connections 13
- Audio Connectors 15
- Connection Instructions 17
- Connection Diagram 18

Configuration 19
- Discovery using AMS 19
- Accessing Decoders in AMS 19
- Configuring a Static IP Address 22

Basic Operation 23
- LED Indicators 23
- Rebooting OmniStream 24
- ID Button 24
  - Broadcast Messaging 24
  - Reset to Factory-Default Settings. 24
- Unicast Mode 25
- Multicast Mode 27
- Configuring Audio Output 29
  - De-embedding Audio 29
  - Embedding Audio 30
- Control Using RS-232 Commands 31
  - Triggering Stored Commands 31
  - Using TCP Proxy 31
- 802.1X Authentication 32
  - PEAP/MSCHAPv2 Protocol 33
  - EAP-TLS Protocol 35
- AES67 Audio 37
- IR Configuration 39
- Scrambling 41
  - Standard Method 41
  - Using the Virtual Matrix 42
- Setting the Video Mode 44
- Slate / Logo Insertion 45
  - Deleting Slates / Logos 46
- Text Insertion 47
- Creating Video Walls 49
  - Bezel Compensation 55
  - Using Velocity™ 56
- Configuring Redundant Streams 64
  - Redundancy Grace Period 65

The AMS Interface 66
- Device Info page 66
- SAP page 69
- IP Input page 70
- HDMI Output page 72
  - Output 72
  - Video Optimization 76

Serial page 77
Serial Port 77
Serial Configuration 78
Command 79
Text page 80
Color 81
Location 81
Size 81
Logo page 82
PTP page 84
Network page 85
The Virtual Matrix 86

Appendix 89
Updating the Firmware 89
FEC Details 91
Matrix Size, Overhead, and Latency 91
FEC and Video Bitrate 91
FEC, Latency, and Lip Sync 92
Mounting Instructions 93
Rack Tray for OmniStream 94
Specifications 95
Dual-Channel Decoder 95
Single-Channel Decoder 97

Introduction

The Atlona OmniStream™ 121 (AT-OMNI-121) is a networked AV decoder for one HDMI source up to 4K/UHD, plus embedded audio and RS-232 control. The Atlona OmniStream™ 122 (AT-OMNI-122) adds a second channel of encoding for two HDMI sources up to 4K/UHD and RS-232 control and can deliver duplicate AV streams to two networks for full system redundancy in mission-critical applications. OmniStream features SMPTE VC-2 compression for critical-quality video applications, with extremely low, sub-frame latency from encode to decode. It also includes selectable AES-128 encryption and SMPTE 2022-5 Forward Error Correction (FEC) for robust AV distribution spanning multiple networks. Both OmniStream decoders are housed in compact enclosures that easily fit into a half RU space. They can be powered over the network through Power over Ethernet (PoE) or optionally from local AC power.

OmniStream was engineered from the ground up at Atlona to deliver the performance and dependability of traditional AV distribution, with the virtually unlimited scalability and cost efficiency of integrating over data networks. It addresses the many challenges AV and IT integrators encounter with implementing networked AV systems, while delivering immediate and long-term ROI to end users in enterprises and other organizations

Features

OmniStream Single-Channel Decoder

- Single-channel AV decoder for HDMI up to 4K/UHD
- Redundancy capabilities for mission critical applications
- SMPTE VC-2 compression
- RS-232 control
- Selectable AES-128 encryption
- SMPTE 2022-5 FEC
- Powered using PoE or optional external 48V DC power supply

OmniStream Dual-Channel Decoder

- Dual-channel AV decoder for HDMI up to 4K/UHD
- Redundancy capabilities for mission critical applications
- SMPTE VC-2 compression
- RS-232 control
- Audio embedding / de-embedding
- Selectable AES-128 encryption
- SMPTE 2022-5 (FEC)
- Powered using PoE or optional external 48V DC power supply

Package Contents

OmniStream Single-Channel Decoder

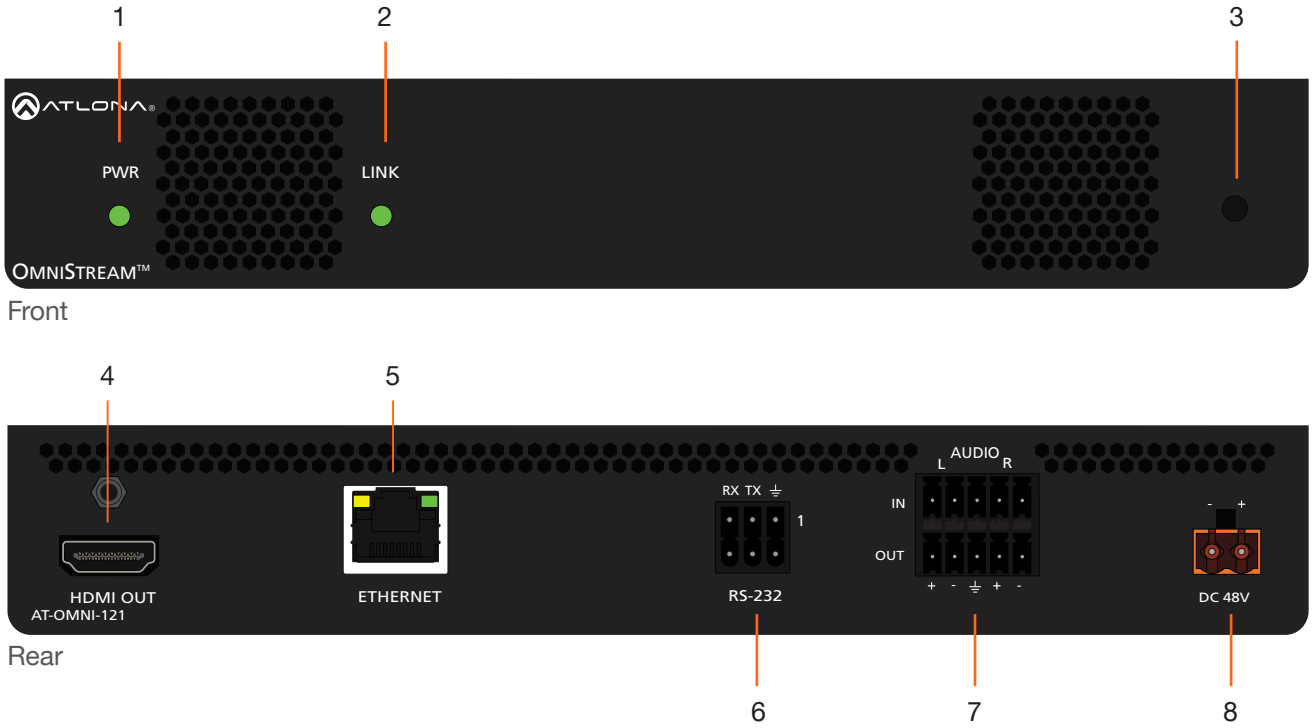
1 x AT-OMNI-121
1 x Phoenix terminal block, 6-pin (push spring)
1 x Wall/table mounting brackets
4 x Rubber feet
1 x Installation Guide

OmniStream Dual-Channel Decoder

1 x AT-OMNI-122
1 x Phoenix terminal block, 6-pin (push spring)
1 x Wall/table mounting brackets
4 x Rubber feet
1 x Installation Guide

Panel Description

AT-OMNI-121



1 **PWR**
This LED indicator is green when the unit is powered.

2 **LINK**
These LED indicators show the active input status.

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

4 **HDMI OUT**
Connect an HDMI cable from this port to an HD display.

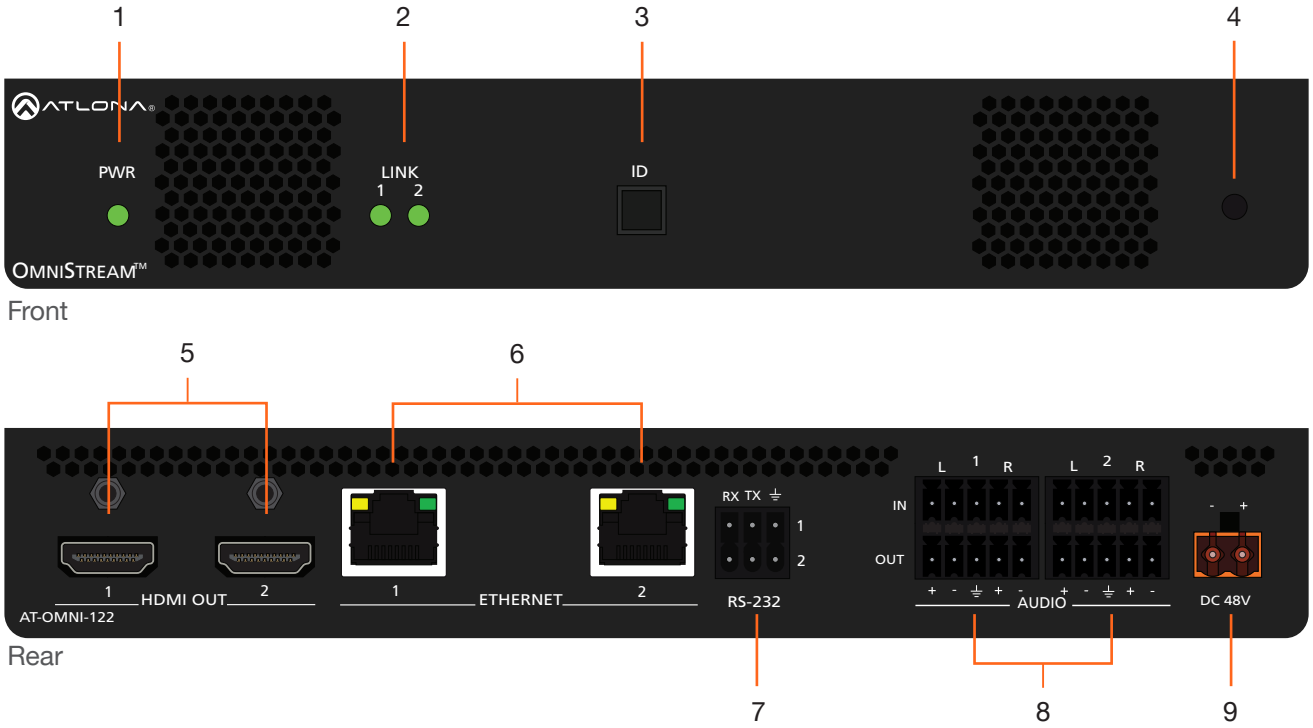
5 **ETHERNET**
Connect an Ethernet cable from this port to the Local Area Network (LAN).

6 **RS-232**
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 IR Connections (page 13) for more information.

7 **AUDIO**
Connect the included Phoenix terminal blocks 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.

AT-OMNI-122



1 PWR
This LED indicator is green when the unit is powered.

2 LINK 1 / LINK 2
These LED indicators show the active input status.

3 ID
Press this button to send out a broadcast message to any network devices that are listening. This button is also used to set the encoder to factory-default settings. Refer to ID Button (page 24) for more information.

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

5 HDMI OUT 1 / HDMI OUT 2
Connect HDMI cables from these ports to an HD display.

6 ETHERNET 1 / ETHERNET 2
Connect Ethernet cables from these ports to the Local Area Network (LAN).

7 RS-232
Use the included Phoenix terminal block 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 13) for more information.

8 AUDIO 1 / AUDIO 2
Connect the included Phoenix terminal blocks to embed audio on the output stream and/or connect to an audio output device.

9 DC 48V
Connect the optional 48V DC power supply to this power receptacle. This power supply is available, separately.

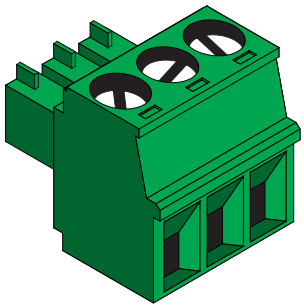
Installation

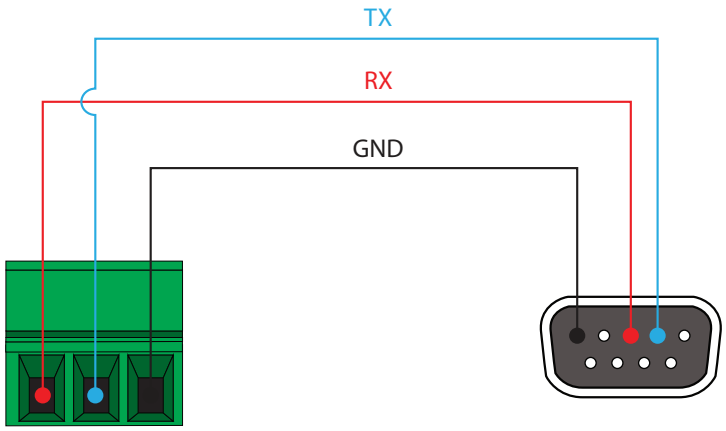
RS-232 Connections

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. Note that different Phoenix connectors are provided with each product.

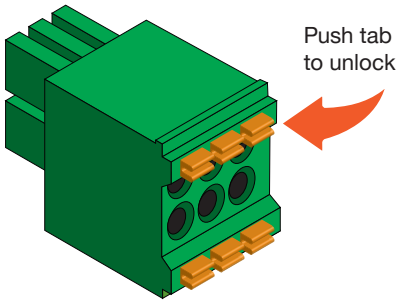
1. Use wire strippers to remove a portion of the cable jacket.
2. Remove at least 3/16” (5 mm) from the insulation of the RX, TX, and GND wires.
3. Insert the TX, RX, and GND wires into correct terminal on the included Phoenix block. If using non-tinned stranded wire, press the orange tab, above the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

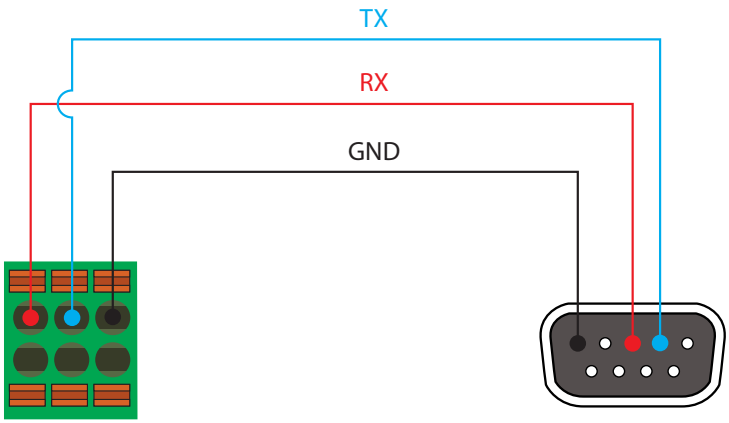
AT-OMNI-121





AT-OMNI-122

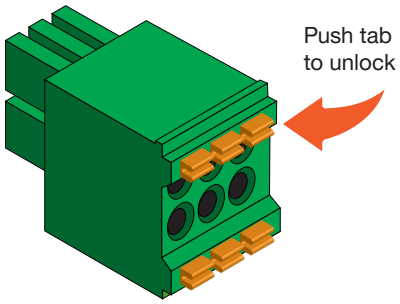




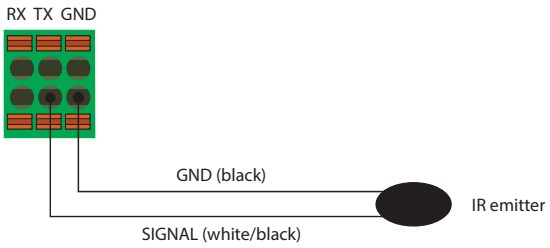
NOTE: Typical DB9 connectors use pin 2 for TX, pin 3 for RX, and pin 5 for ground. On some devices, pins 2 and 3 are reversed.

IR Connections

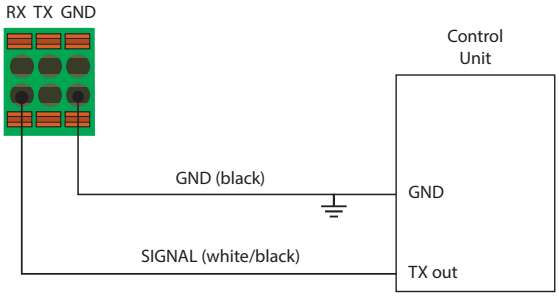
The same port that provides RS-232 connections also supports bidirectional IR pass-through, allowing a device to be controlled from either the headend or the decoder endpoint. This step is optional. Either the top three or bottom three set of terminals can be used for IR. Only the **RS-232 2** port (bottom set of connectors) supports both RS-232 and IR. Therefore, this port must be used for IR connections.



IR emitter configuration



IR extender configuration



The following components are required. Note that other components may also be used. However, Atlona has tested and verified the following components for this application:

- Xantech CB12 1 Zone Connecting Block
- Xantech 12 V PSU
- Atlona AT-IR-CS-RX
- Atlona AT-OMNI-IR-TX

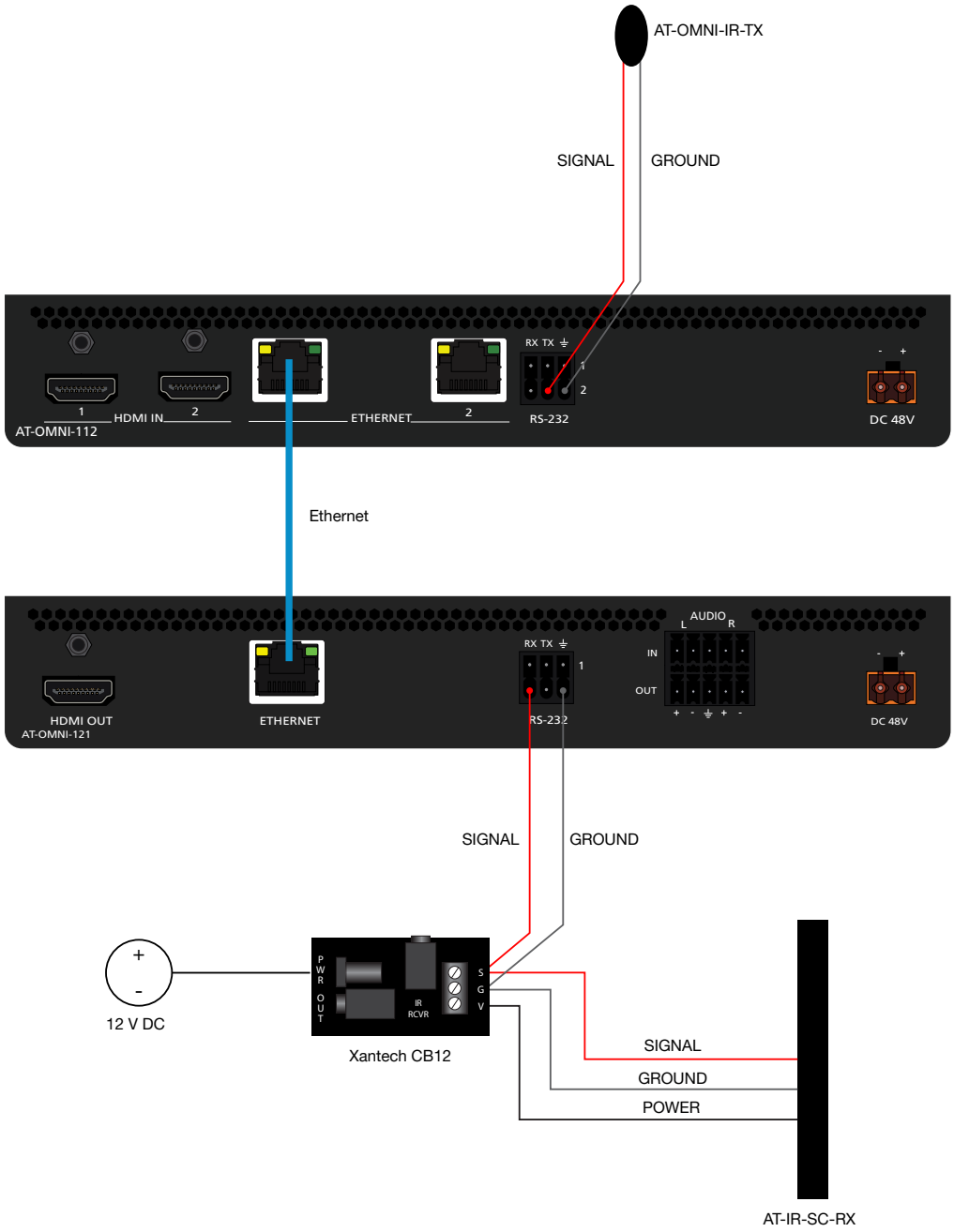
Decoder

1. Connect the SIGNAL, GROUND, and POWER leads from the Xantech CB12 to the AT-IR-SC-RX.
2. On the Xantech CB12, connect the SIGNAL and GROUND leads to the **RX** and ⏚ pins, respectively, of the **RS-232 2** port.
3. Connect the Xantech 12 V power supply (or other compatible 12 V DC power supply) to the Xantech CB12.

Encoder

4. Connect the SIGNAL and GROUND pins, from the AT-OMNI-IR-TX, to the **TX** and ⏚ pins, respectively, of the RS-232 2 port.
5. Refer to the illustration on the next page to verify that the correct connections have been made.

For downstream IR control, either multicast or unicast mode can be used. However, when controlling a source from the decoder (viewing location), unicast mode should be used. Refer to Unicast Mode (page 25) and Multicast Mode (page 27) for more information.



IMPORTANT: The IR emitter must be placed no more than 1" from the IR sensor on the device, in order to function properly.

Audio Connectors

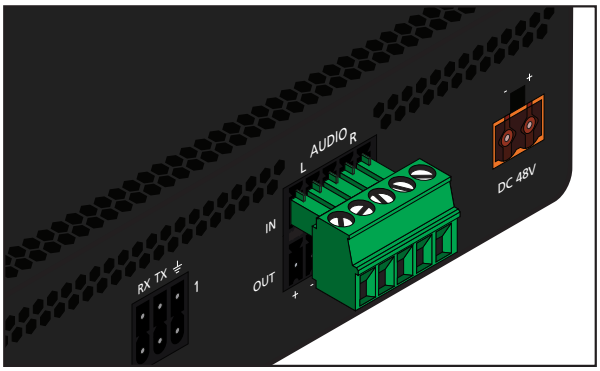
In addition to passing audio directly from the encoder to the decoder, both the AT-OMNI-121 and AT-OMNI-122 provide two additional audio options. Either option can be used or they can be used simultaneously.

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

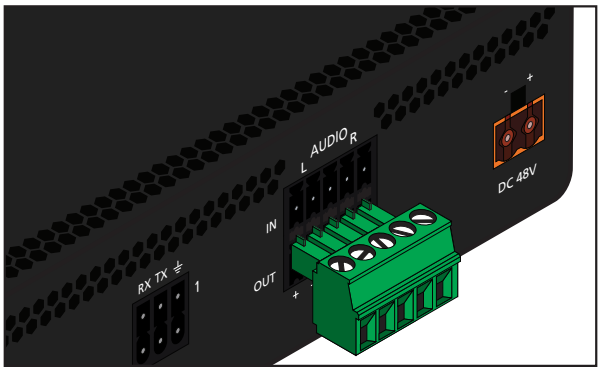
Use the included dual five-pin Phoenix blocks. Note that each product comes with different connector blocks. This step is optional. Refer to Configuring Audio Output (page 29) for more information.

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.

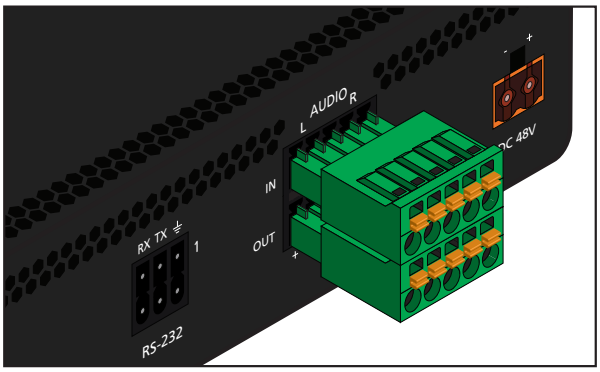


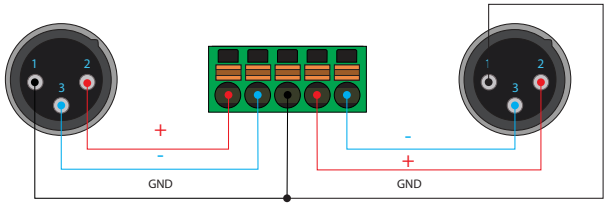
2-channel analog audio input (top)



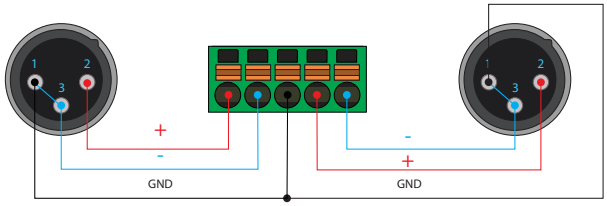
2-channel analog audio output (bottom)

- 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



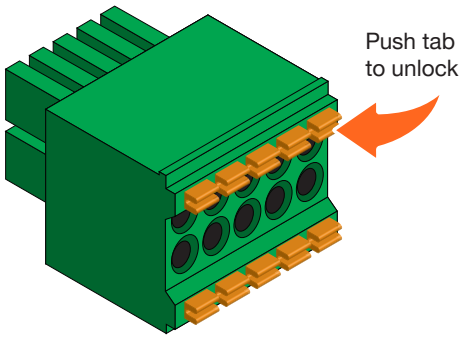
Unbalanced XLR audio

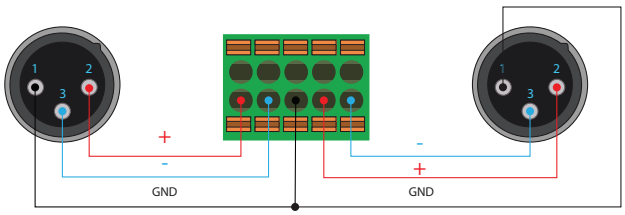
NOTE: Unblanaced XLR audio pins require Pin 1 and Pin 3 to be connected.

AT-OMNI-122

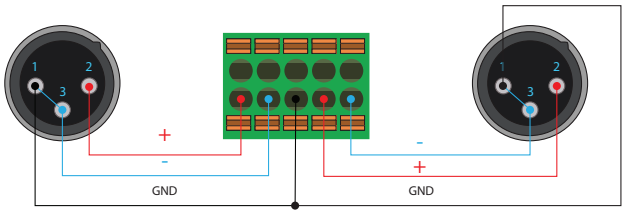
Use the top 5 pins to connect audio input sources. Use the bottom five pins to connect to audio output devices.

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

NOTE: Unblanaced 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 controller/automation system to the **RS-232** port on the decoder.
   - 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.

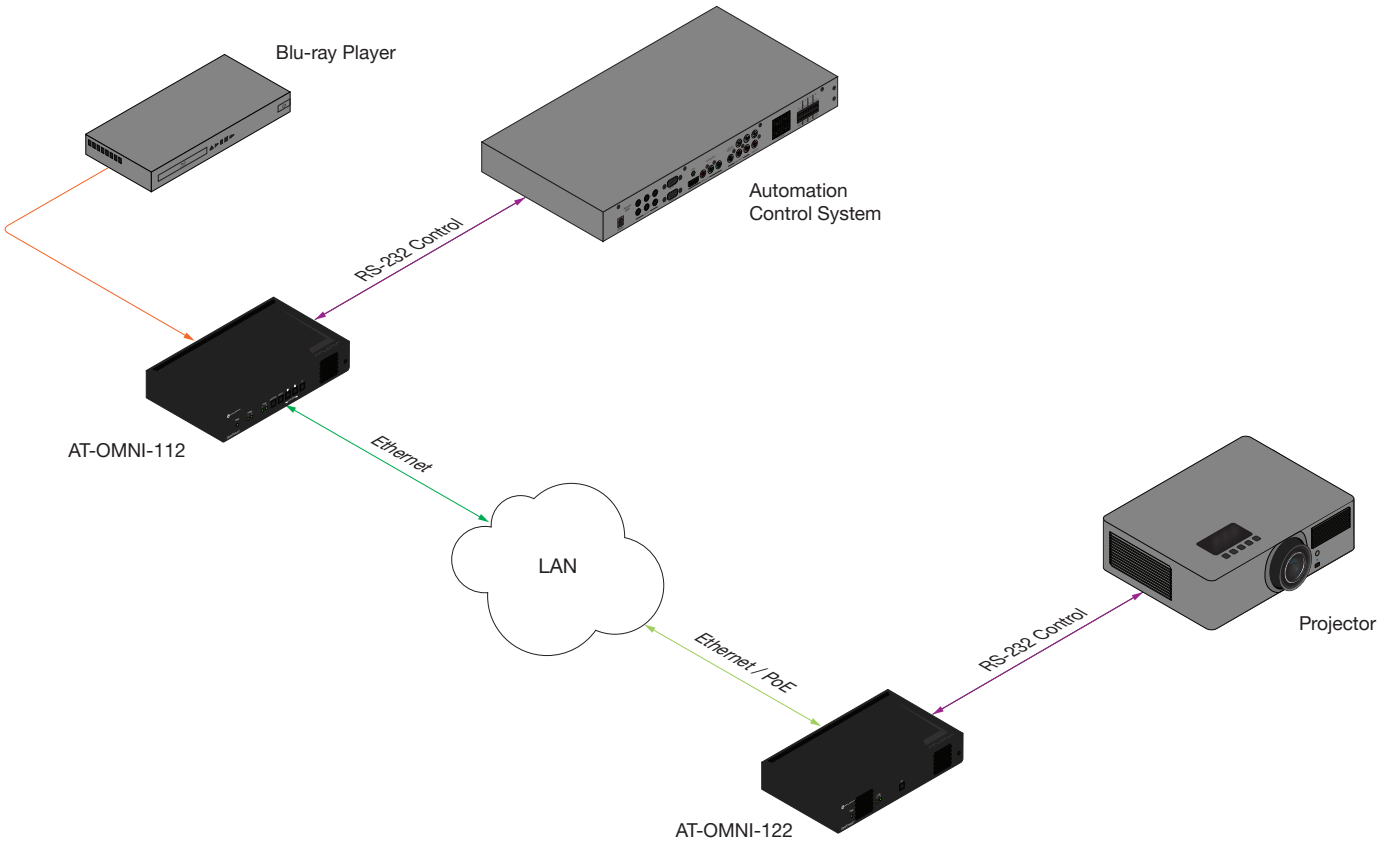
5. IR (optional)

   NOTE: For dual-channel decoders, only the **RS-232 2** port supports both serial and IR. Single-channel decoders only support IR on the **RS-232 2** port. The IR emitter or IR receiver must always be connected to this port. Refer to IR Configuration (page 39) for more information.

   - **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 1” 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



Configuration

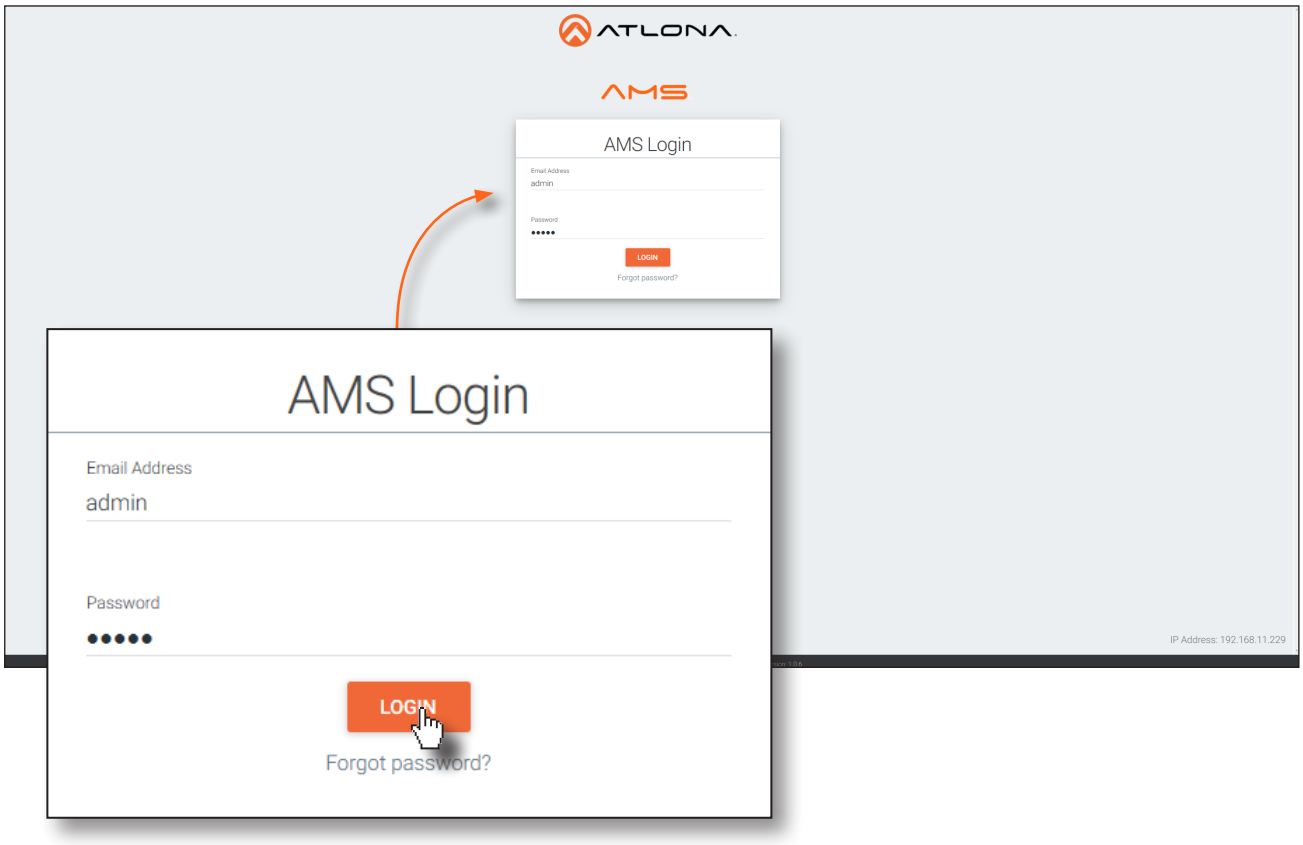
Discovery using AMS

It is recommended that the Atlona Management System (AMS) be used to configure and control OmniStream devices. AMS uses multicast Domain Name Server (mDNS) to automatically configure each decoder on the network. AMS is free and can be downloaded from https://www.atlona.com/ams.

By default, the decoders are set to DHCP mode, allowing a DHCP server (if present) to assign the decoder an IP address. Once an IP address has been assigned, the Atlona Management System (AMS) can be used to manage the product on the network. Note that AMS will only be able to discover decoders if they are on the same VLAN.

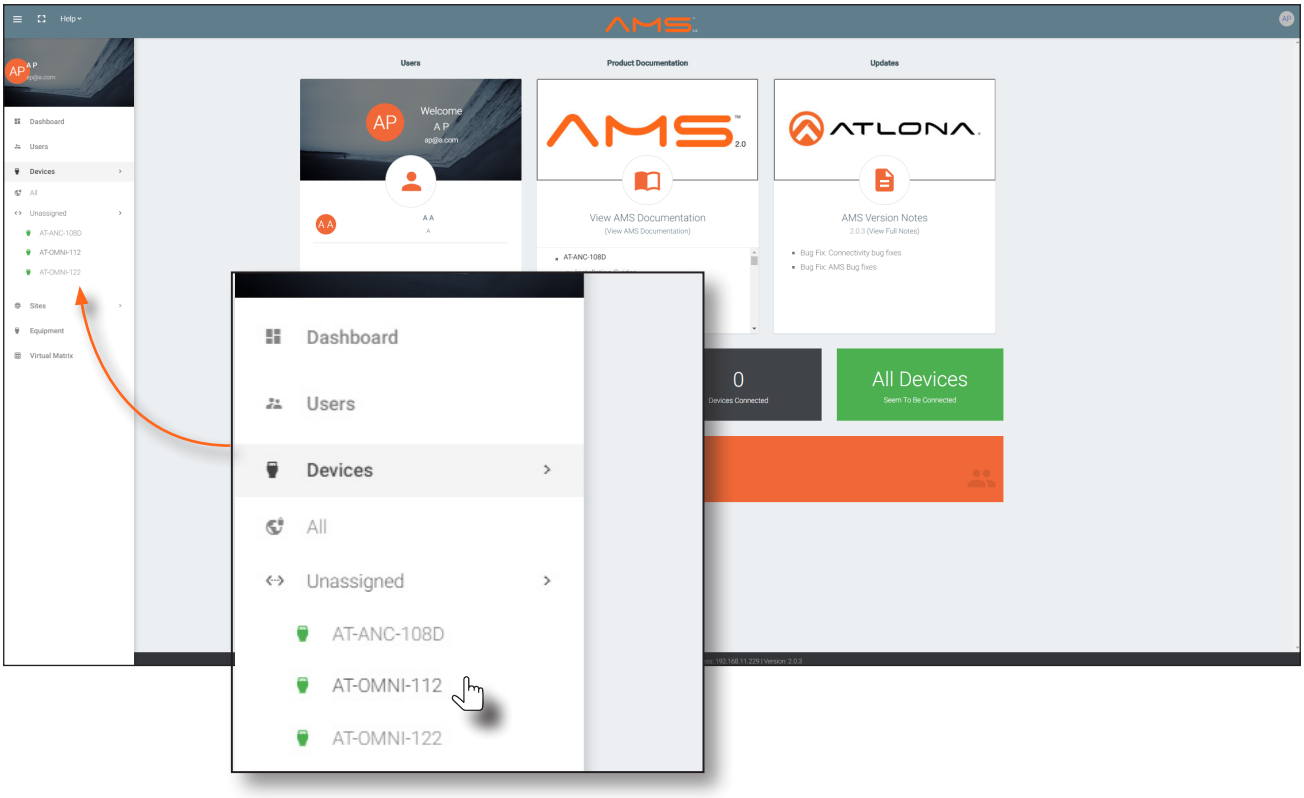
Accessing Decoders in AMS

1. Launch a web browser and enter the IP address of AMS, in the address bar.
2. Enter the required login credentials.



3. Click the **Login** button.
4. The AMS Dashboard will be displayed.
5. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.

6. Click **Devices** from the fly-out menu.
7. Click the **Unassigned** option.



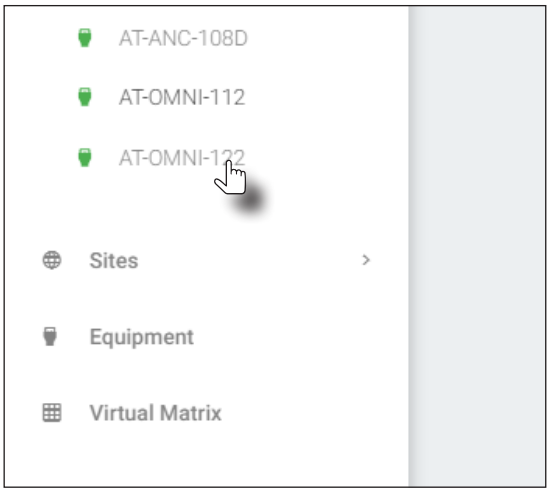
All available decoders will be displayed under the **Unassigned** category. When a decoder is unassigned, it means that it has not been assigned to a site, building, and/or room. Refer to the AMS User Manual for more information on these topics.

If a DHCP server is not found within 60 seconds, the decoder will be placed in Auto IP mode and assigned an IP address within the range of 169.254.xxx.xxx. If this occurs, configure the network interface of the computer that is running AMS, located on the same subnet (169.254.xxx.xxx, subnet mask 255.255.0.0). Refer to Configuring a Static IP Address (page 22) for more information on configuring an encoder in Auto IP mode.

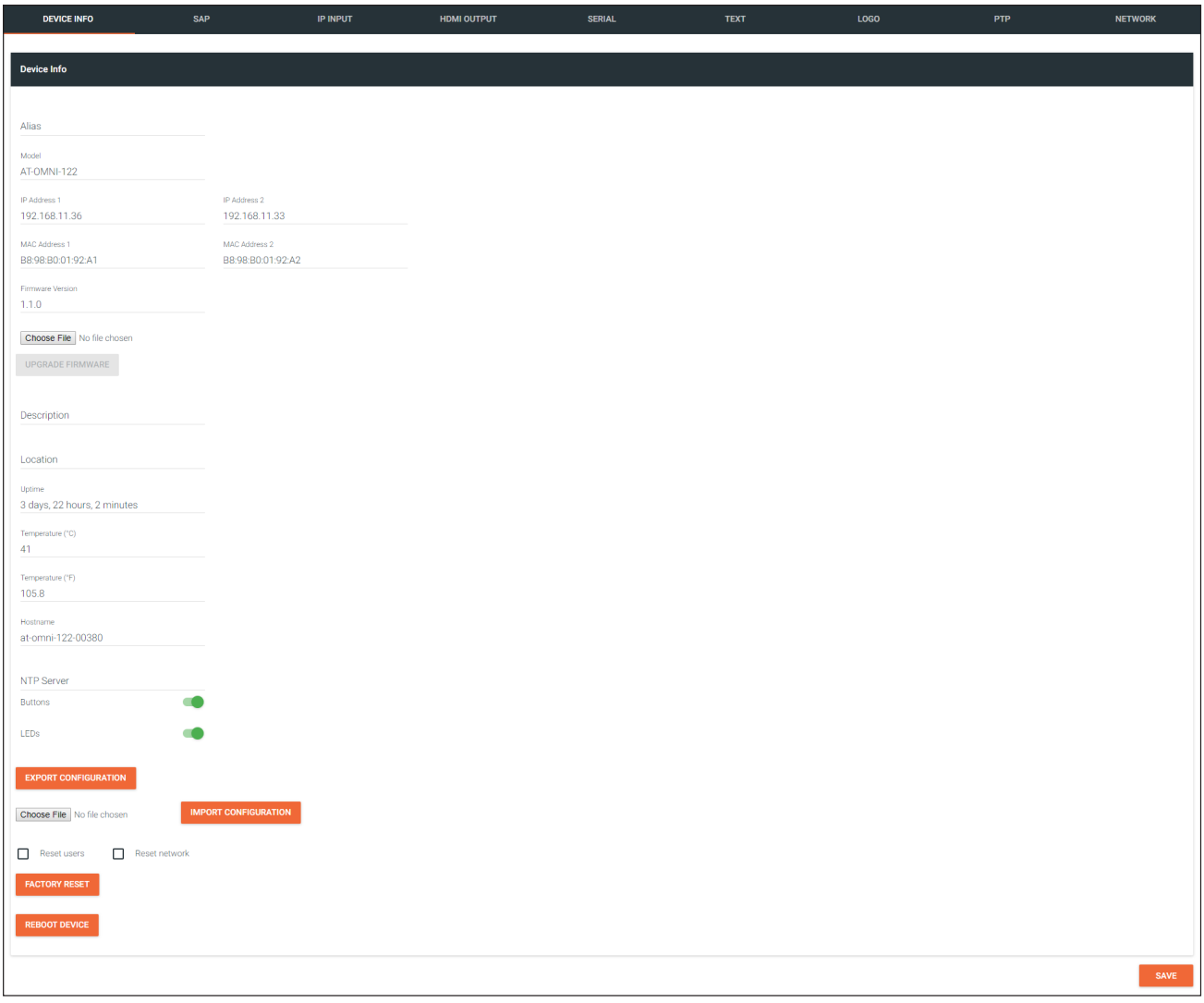
If no OmniStream decoders are found, then verify the following:

- The computer that is running AMS must be on the same network as the OmniStream device.
- Remove any network restrictions that may be in place. In order for mDNS to function properly, there must not be restrictions applied to the network.

8. Click the desired decoder from the **Unassigned** device list.



Once the unit is selected, the control interface for the encoder will be displayed. The illustration below shows the **DEVICE INFO** screen for an AT-OMNI-122 decoder.



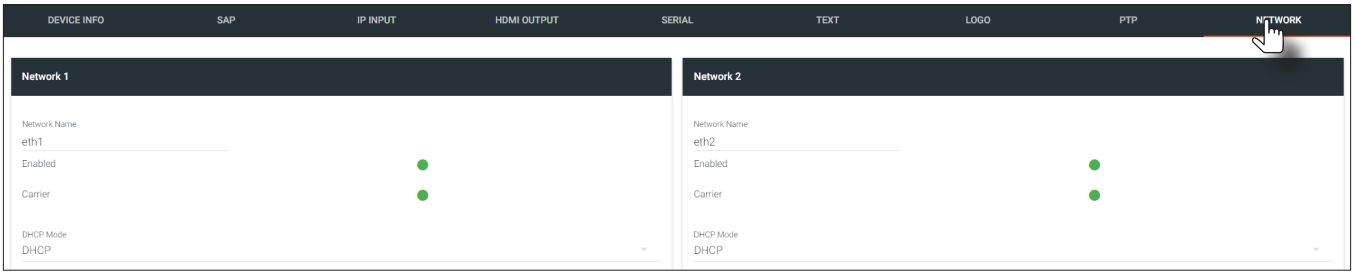
Configuring a Static IP Address

The following section is only required to set the decoder, currently in Auto IP mode, to a static IP address. If a DHCP server is not found within 60 seconds, encoders are automatically placed in Auto IP mode and will be assigned an IP address within the range 169.254.xxx.xxx. If this occurs, a static IP address can be assigned to the encoder in order for AMS to locate it on the network.

1. Make sure that the decoder is powered. Power will need to be supplied either by the external 48V power supply (not included) or by connecting an Ethernet cable from the decoder to a PoE-capable switch. If using the AT-OMNI-122, the Ethernet cable can be connected to either **ETHERNET 1** or **ETHERNET 2**.
2. Connect an Ethernet cable from the PC, directly to one of the Ethernet ports on the decoder. Make sure that the computer being used has AMS installed.
3. Configure the PC to a static IP address that is on the same subnet as the decoder.

IMPORTANT: Before continuing, write down the current IP settings in order to restore them, later. If *Obtain an IP address automatically* and *Obtain DNS server automatically* are selected, then this step is not required.

4. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
5. Locate the decoder under the **Unassigned** section within AMS.
6. Click on the device.
7. Under AMS, click the **NETWORK** tab.



8. Click the **DHCP Mode** drop-down list and select **Static**.

9. Enter the required network information for the decoder in the **IP Address**, **Subnet**, and **Gateway** fields.
10. Click the **Save** button in the bottom-right corner, to apply the changes.
11. Disconnect the decoder from the PC and connect it to the network.
12. The decoder is now ready for use.

Basic Operation

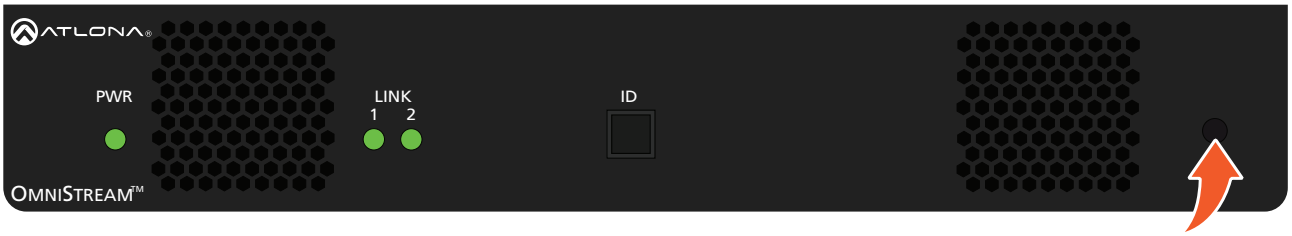
LED Indicators

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

LED		Description
PWR	Off ○	• If using a PoE switch, make sure that the port on the switch that is connected to the encoder, has PoE enabled. When the encoder is powered using PoE, the **PWR** indicator will be green. • Check the Ethernet cable for possible damage or loose connections. • Connect the optional 48V DC power supply (available from atlona.com) to the encoder. When using an external power supply, the **PWR** indicator will be red.
	Red ●	• The decoder is booting.
	Green ●	• The decoder is ready.
LINK 1 / 2	Red ●	• The optional 48V DC power supply is connected, but no Ethernet cables are connected between the switch and the **ETHERNET** port(s). • Check the Ethernet cable for possible damage or loose connections.
	Green ●	• Link integrity is good between the encoder and the network.

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.

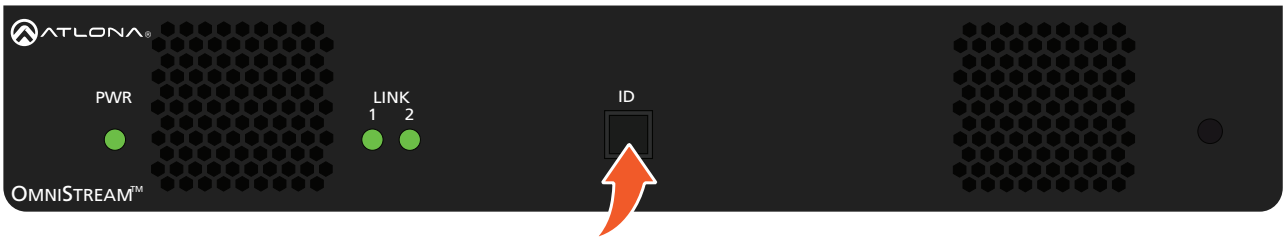


ID Button

This feature is not available on the single-channel OmniStream decoder (AT-OMNI-121).

The ID button serves two functions:

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



Broadcast Messaging

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

Reset to Factory-Default Settings.

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 encoder is now reset and will need to be reconfigured.

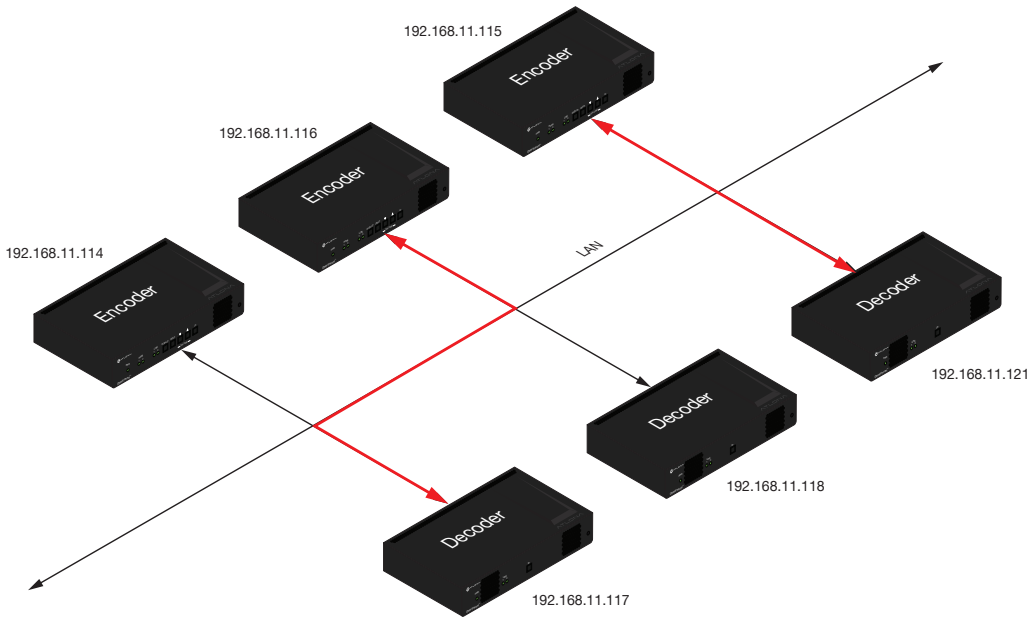
WARNING: Performing a factory-default reset will erase all user-programmed settings from the encoder. IP settings are not preserved.

Unicast Mode

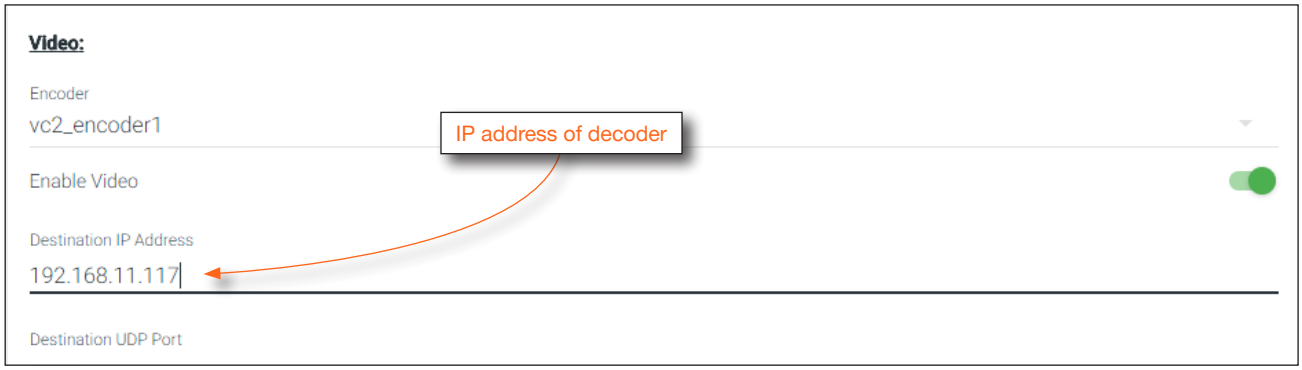
The term *unicast* is used to describe a configuration where information is sent from an encoder to a single decoder. Although it is common to have multiple encoder and decoder units within a system, it may also be desirable to restrict a single encoder to communicate with one decoder. In *unicast* mode, OmniStream encoders and decoders function similar to an n x 1 switcher. Changing the destination IP address at the encoder, will direct the stream to be received by a different decoder.

The illustration below shows three encoders and three decoders on a network, operating in *unicast* mode. The red lines indicate the data paths from each encoder to a separate (single) decoder.

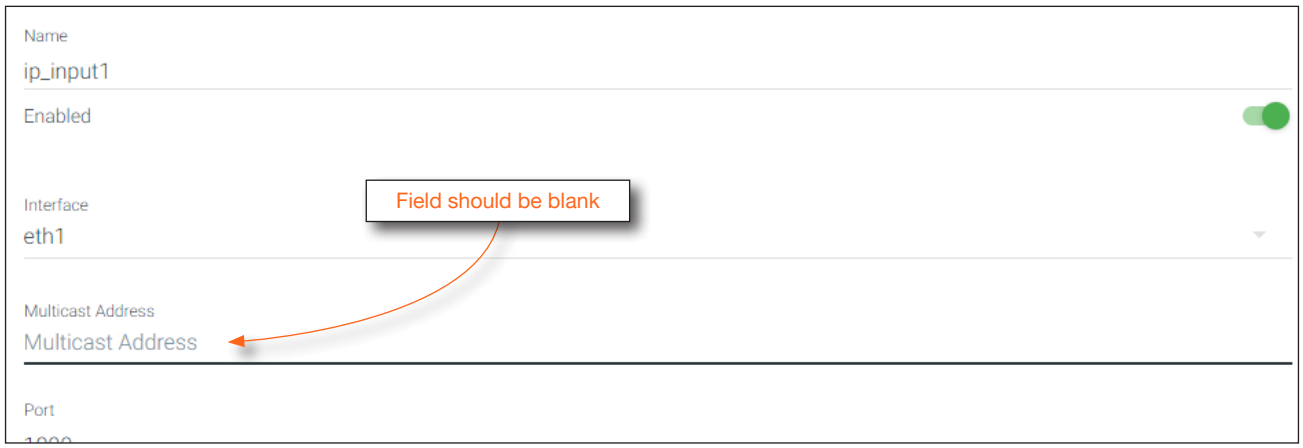
NOTE: By default, both encoders and decoders are shipped in multicast mode.



1. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
2. Go to the encoder AMS interface. Refer to the *OmniStream Single-Channel / Dual Channel A/V Encoder User Manual*, if necessary.
3. Click **SESSION** in the menu bar and scroll down to the **Video** section.
4. Enter the IP address of the decoder in the **Destination IP Address** field. If using dual-channel encoders, repeat this process for each session.



5. Go to the decoder AMS interface.
6. Click **IP INPUT** from the menu.
7. Remove the IP address from the **Multicast Address** field.
8. Click the **SAVE** button to commit changes.



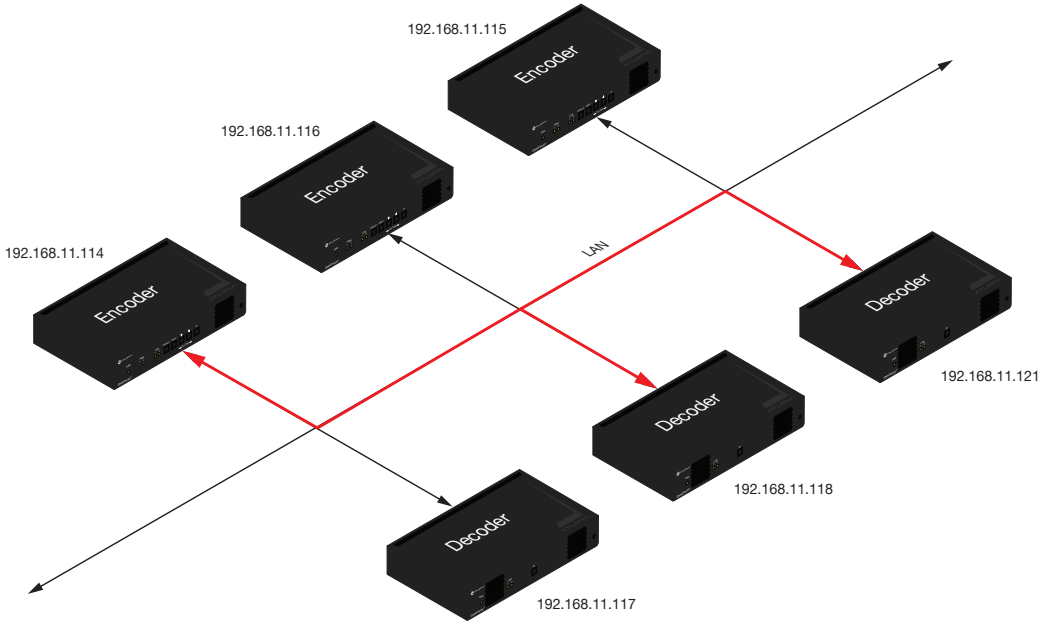
9. Unicast setup is complete. The decoder unit will now receive streams exclusively from the encoder containing the IP address of this decoder.

Multicast Mode

The term *multicast* is used to describe a configuration where information is sent from one or more points to a set of other points. For example, a single encoder can transmit data to multiple decoders. In addition, if multiple encoders are used, each encoder can stream data to any decoder that is not already receiving data from an encoder.
In *multicast* mode, OmniStream encoders and decoders function similar to a matrix switcher.

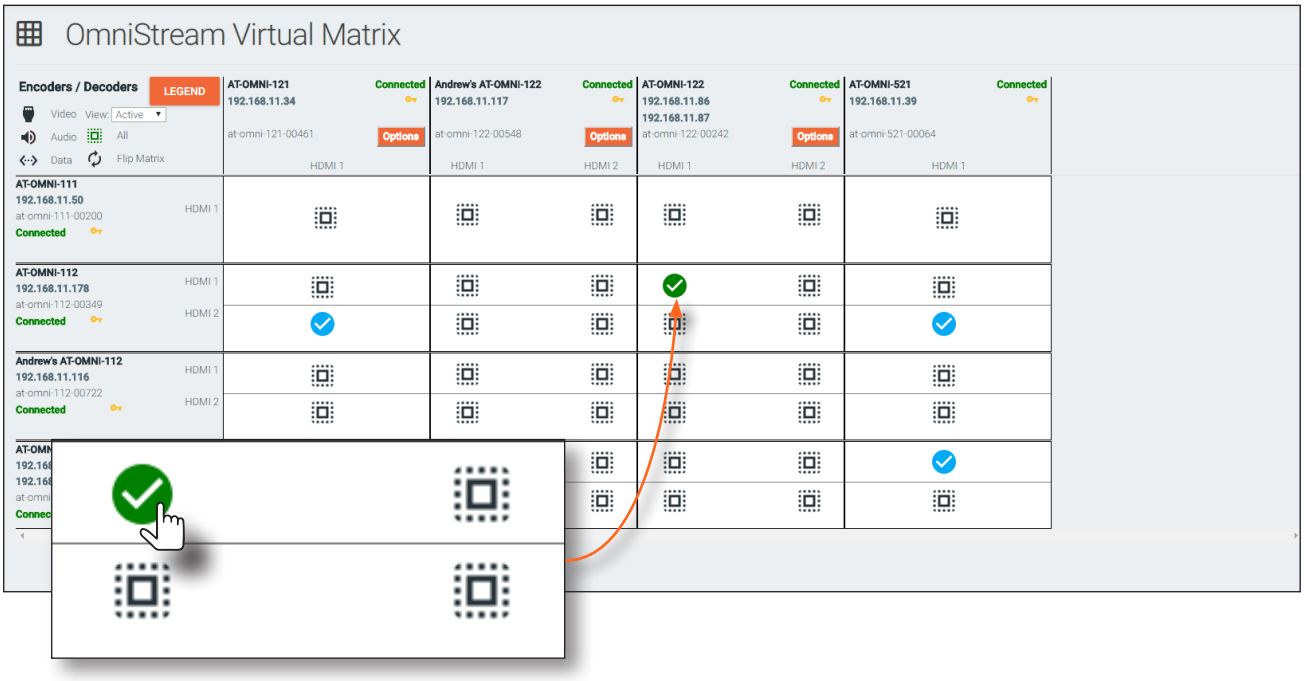
The illustration below shows three encoders and three decoders on a network, operating in *multicast* mode, where multiple decoders are subscribed to a single encoder. The red lines indicate the data paths from an encoder (192.168.11.117) to multiple decoders.

NOTE: By default, both encoders and decoders are shipped in multicast mode.



1. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
2. The AMS Dashboard will be displayed.
3. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
4. Click **Virtual Matrix** from the fly-out menu. Refer to The Virtual Matrix (page 86), if necessary.
5. Locate the desired encoder in the Virtual Matrix, as shown on the next page.
6. Create a cross-connection to the desired decoder. When a cross-connection is created, AMS will automatically assign a multicast IP address to both the encoder and decoder. By default, AMS automatically assigns a multicast IP address to each OmniStream encoder and decoder.

   Refer to the illustration on the following page, if necessary.


OmniStream Virtual Matrix
Encoders / Decoders
LEGEND
Video
View:
Active
Audio
All
Data
Flip Matrix
AT-OMNI-121
192.168.11.34
at-omni-121-00461
Connected
Options
Andrew's AT-OMNI-122
192.168.11.117
at-omni-122-00548
AT-OMNI-122
192.168.11.86
192.168.11.87
at-omni-122-00242
AT-OMNI-521
192.168.11.39
at-omni-521-00064
HDMI 1
HDMI 2
AT-OMNI-111
192.168.11.50
at-omni-111-00200
AT-OMNI-112
192.168.11.178
at-omni-112-00349
Andrew's AT-OMNI-112
192.168.11.116
at-omni-112-00722

Configuring Audio Output

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.

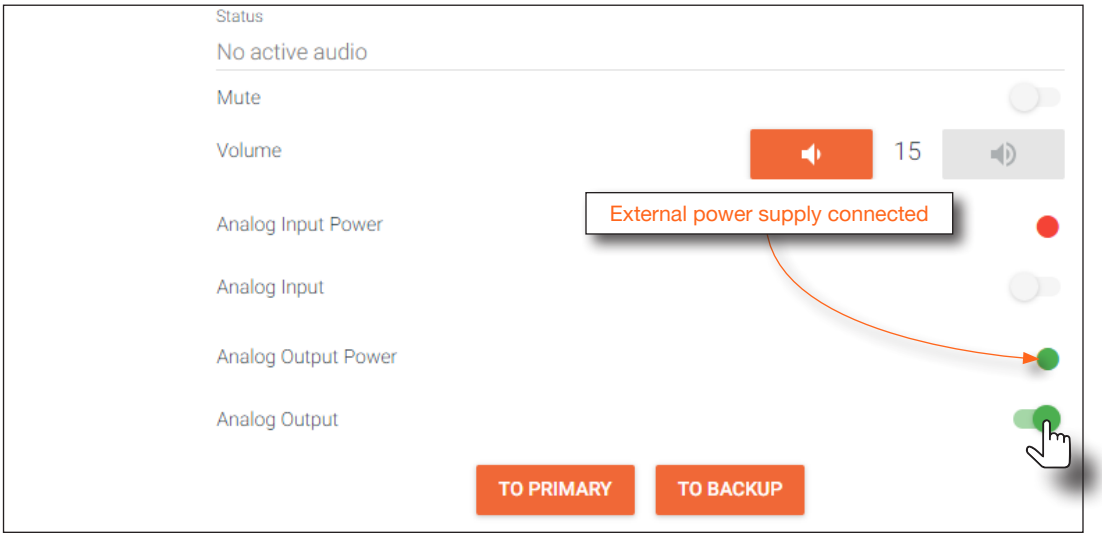
This section covers both methods. If using a single-channel decoder, only a single **AUDIO IN** and **AUDIO OUT** port will be available.

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.

De-embedding Audio

De-embedding audio will extract the HDMI 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 15) for wiring information.
3. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
4. Select the decoder in AMS.
5. Click **HDMI OUTPUT** in the menu bar.
6. Scroll down to the **Audio** section.
7. Click the **Analog Output** toggle switch to enable it. When enabled, the toggle switch will be green. Also note that the **Analog Output Power** indicator, above the toggle switch, will be green. This indicates that the external power supply is connected to the decoder.

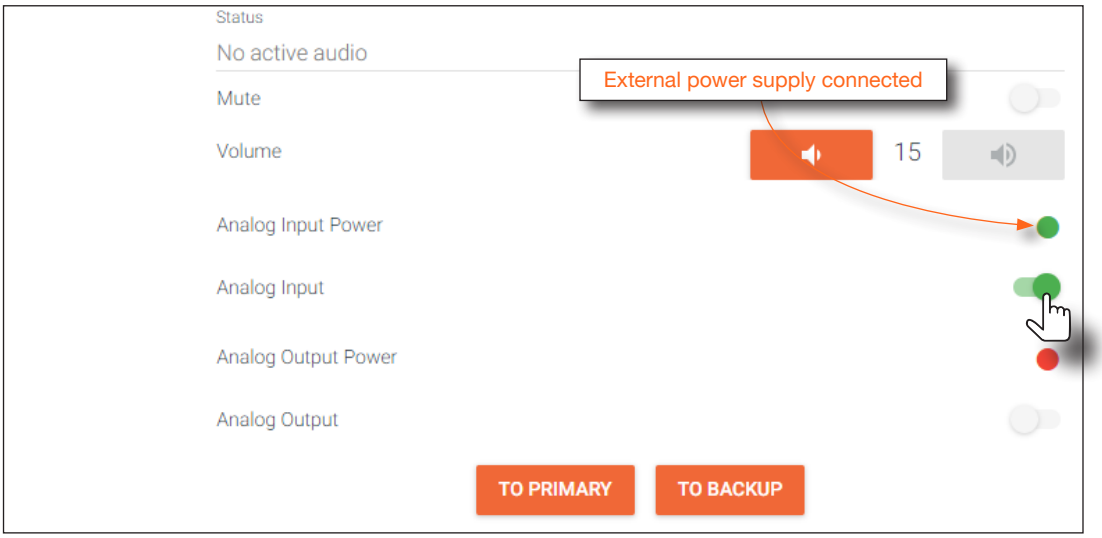


8. Audio from the source will now be heard on the **ANALOG OUT** port of the decoder. Note that when audio is de-embedded, it will not longer be audible using the HDMI OUT port on the decoder.

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 15) for wiring information.
3. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
4. Select the decoder in AMS.
5. Click **HDMI OUTPUT** in the menu bar.
6. Scroll down to the **Audio** section.
7. Click the **Analog Input** toggle switch to enable it. When enabled, the toggle switch will be green. Also note that the **Analog Input Power** indicator, above the toggle switch, will be green. This indicates that the external power supply is connected to the decoder.



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

Control Using RS-232 Commands

RS-232 data can be sent over IP using one of two methods:

- Triggering stored commands, directly from the decoder unit.
- Using the TCP proxy feature.

Both methods will be discussed in this section.

NOTE: When configuring RS-232, always make sure to configure the correct baud rate, data bits, parity bit, stop bits, and flow control settings, as required by the connected device. These settings can be changed in the **Serial Port** section, under the **SERIAL** menu.

Triggering Stored Commands

This method will trigger commands directly from the serial port on the decoder to the sink device. The decoder provides the following commands: **Display Off**, **Display On**, **Volume Up**, and **Volume Down**.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
2. Select the decoder in AMS.
3. Click **SERIAL** in the menu bar.
4. Configure the proper serial port settings under the **Serial Port** section for the connected device, then click the **SAVE** button.
5. Scroll down to the **Serial Configuration** section.
6. Click the **Port** drop-down list and select the desired serial port.
7. Click the **Mode** drop-down list and select the **Output** option, then click the **SAVE** button.
8. Scroll down to the **Command** sections. Each section is labeled for the command type.
9. Click the **Mode** drop-down list and select the **Decoder** option.
10. Enter the associated command in the **ASCII** or **HEX** fields, then click the **SAVE** button. Refer to the User Manual for the sink device for the list of available commands.
11. Repeat steps 8 - 10 for each command, as desired. Trigger the desired command by executing the TrigRS232 command. Refer to the *OmniStream Application Programming Interface* for more information.

Using TCP Proxy

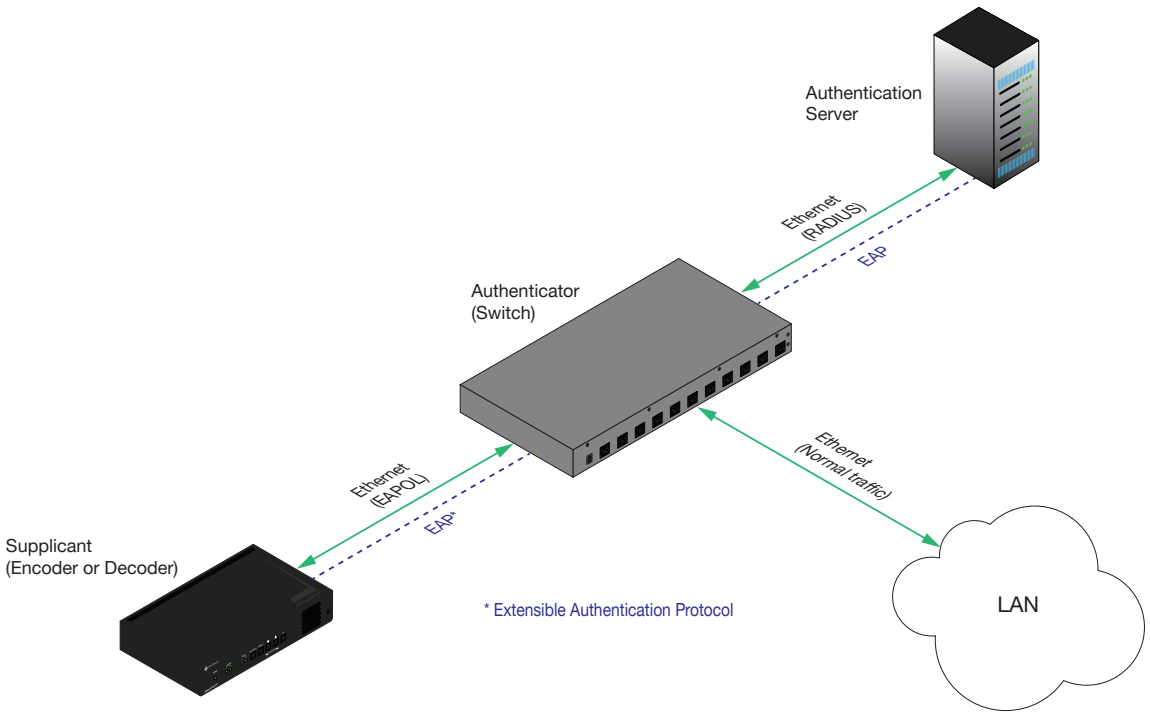
This method can be used, for example, to send a command to a projector that is connected using an Ethernet cable. In this way, the serial command can be sent to the projector over IP.

1. Follow steps 1 - 6, above, for Triggering Stored Commands.
2. Click the **Mode** drop-down list and select the **tcpproxy** option, then click the **SAVE** button.
3. Click the **Interface** drop-down list to select the interface (Ethernet port) that will be used to transmit the data.
4. Click the **Mode** drop-down list and select the **Decoder** option.
5. Enter the port number in the **Port** field. This number can be in the range from 0 to 65535.
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 through a public port. 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 encoder that does not function until the expected message is returned from a RADIUS server. If it is unclear as to whether the network uses 802.1X authentication, consult the IT administrator for assistance.

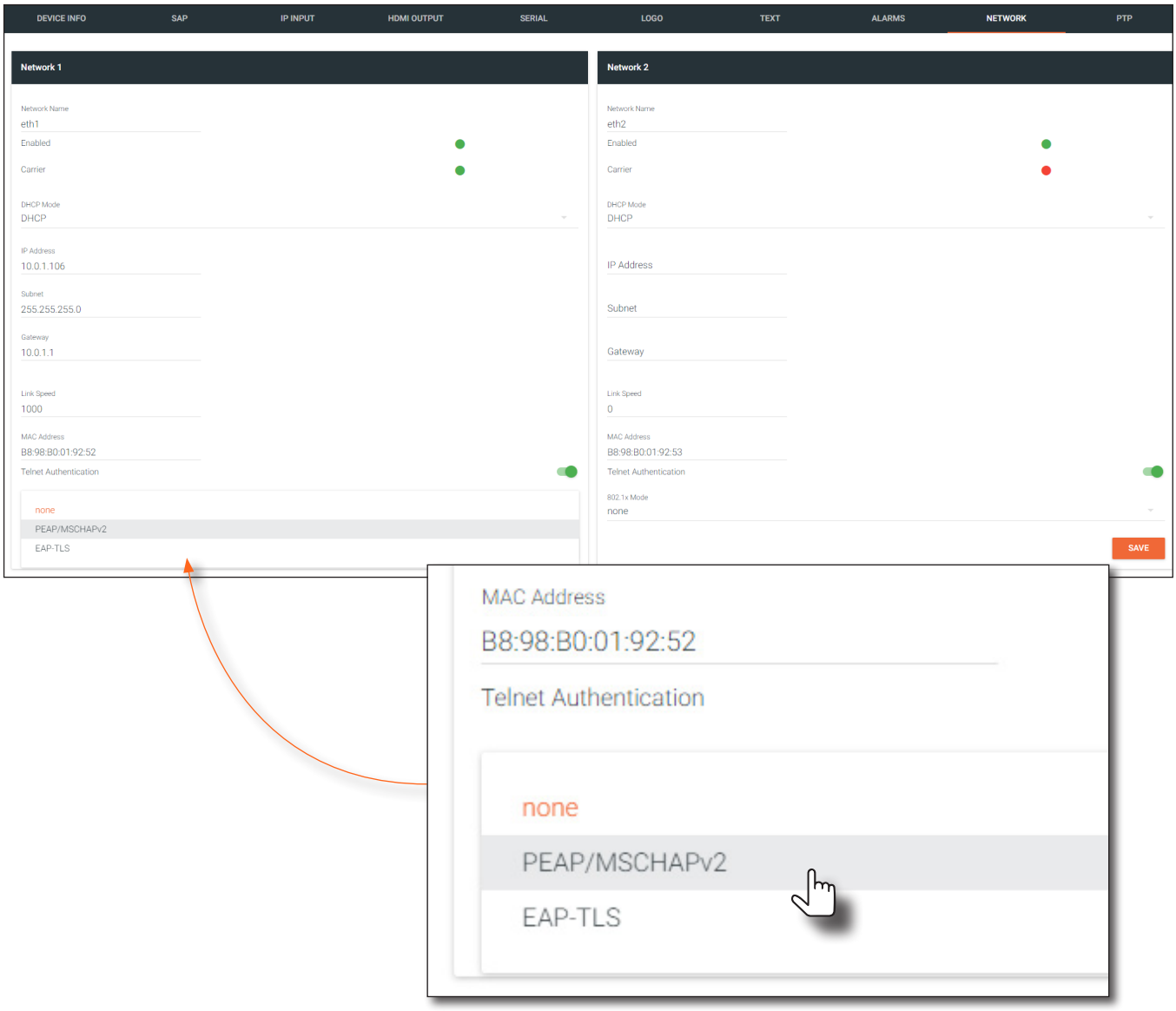


Three options are available on both the OmniStream encoder and decoder.

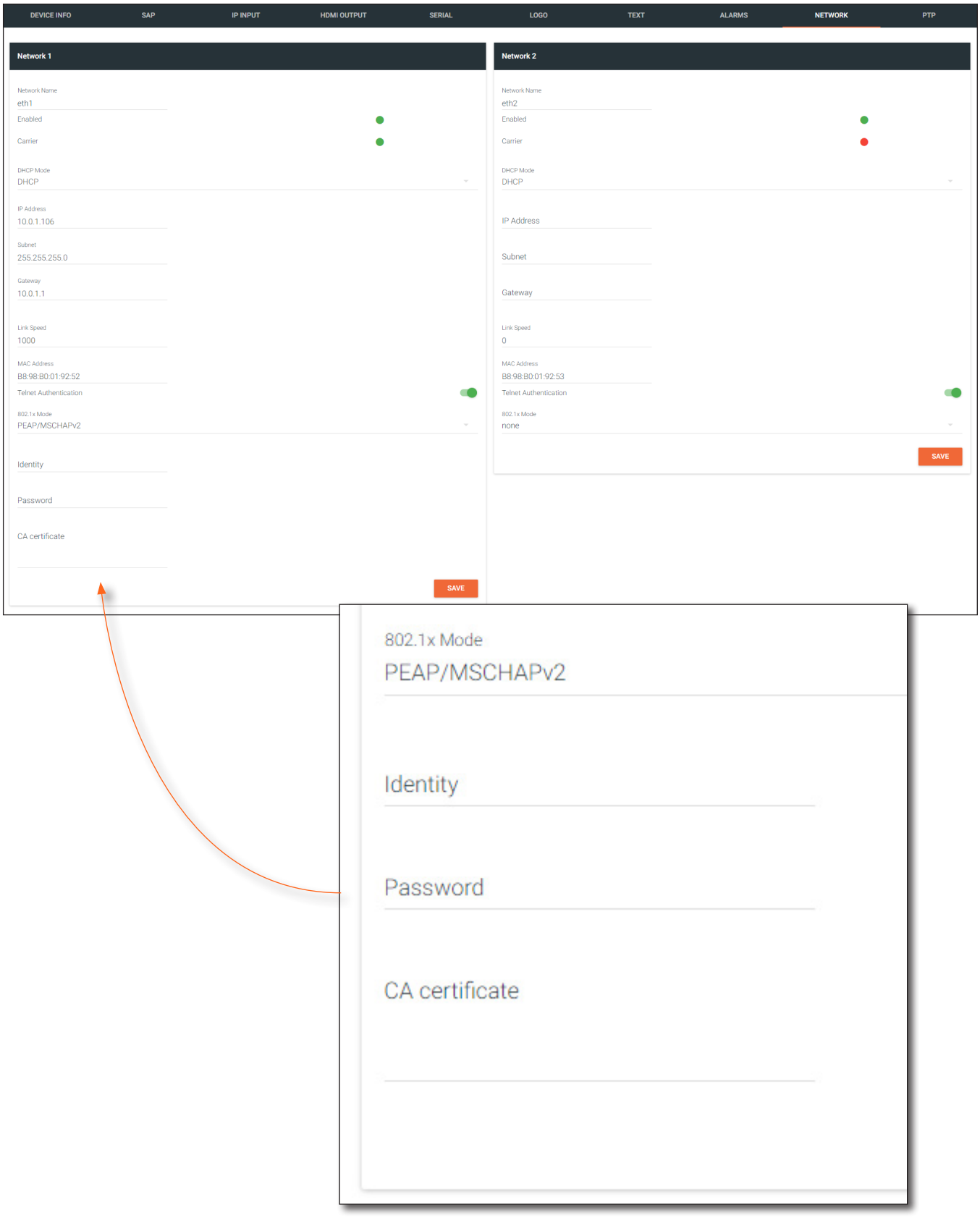
Protocol	Description
none	802.1X protocol disabled
PEAP/MSCHAPv2	Protected EAP; requires basic credentials in addition to a CA (certificate authority) certificate.
EAP-TLS	EAP Transport Layer Security; requires a client certificate, client private key, and CA (certificate authority) certificate.

PEAP/MSCHAPv2 Protocol

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19), if necessary.
2. The AMS Dashboard will be displayed.
3. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
4. Click **Devices** > **All** and select the desired decoder from the **Device List**.
5. Click **NETWORK** in the menu bar.
6. Click the **802.1x Mode** drop-down list, at the bottom of the page, and select **PEAP/MSCHAPv2**.



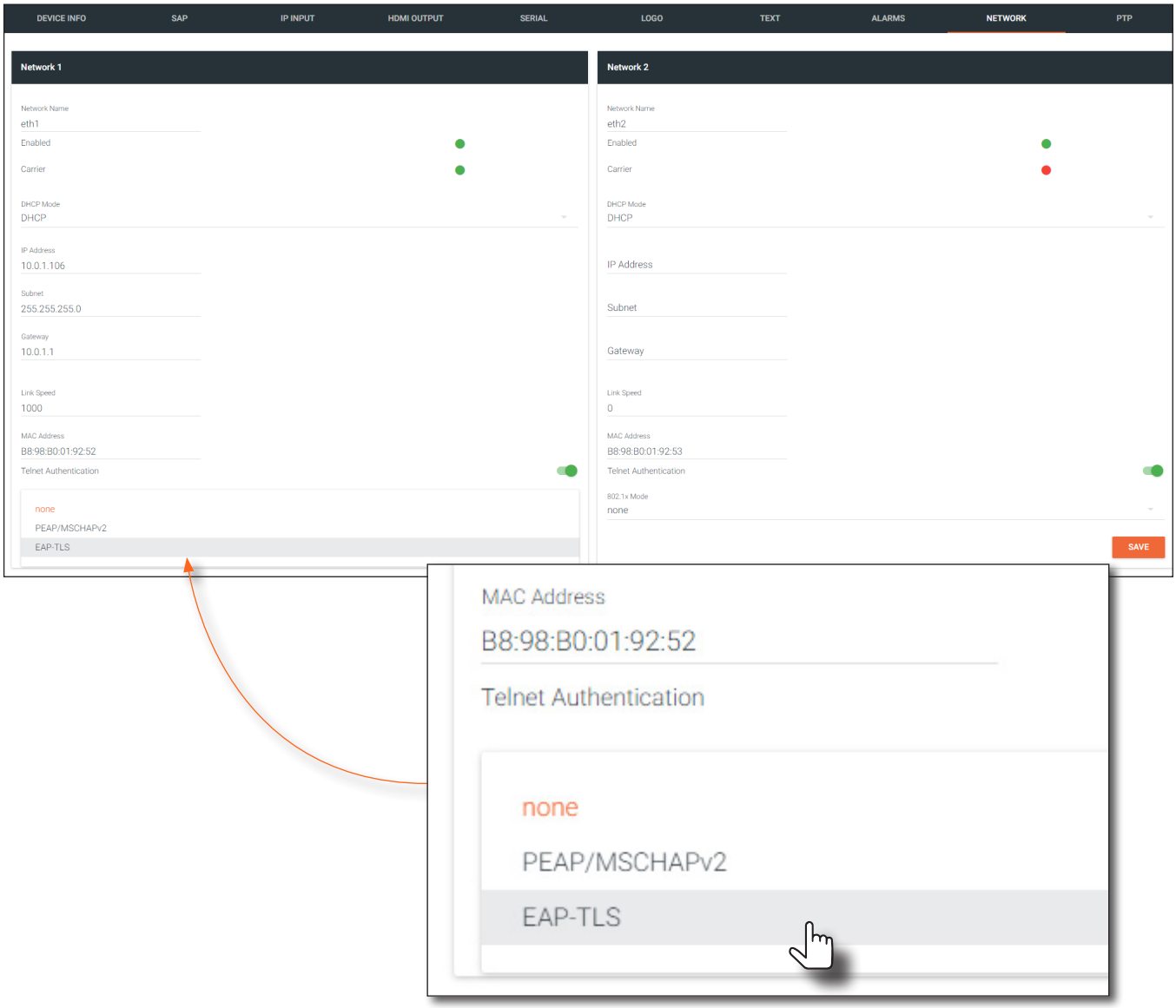
7. Three additional fields will be displayed: **Identify**, **Password**, and **CA certificate**. Provide the required information in each field. Refer to the illustration on the next page, if necessary.



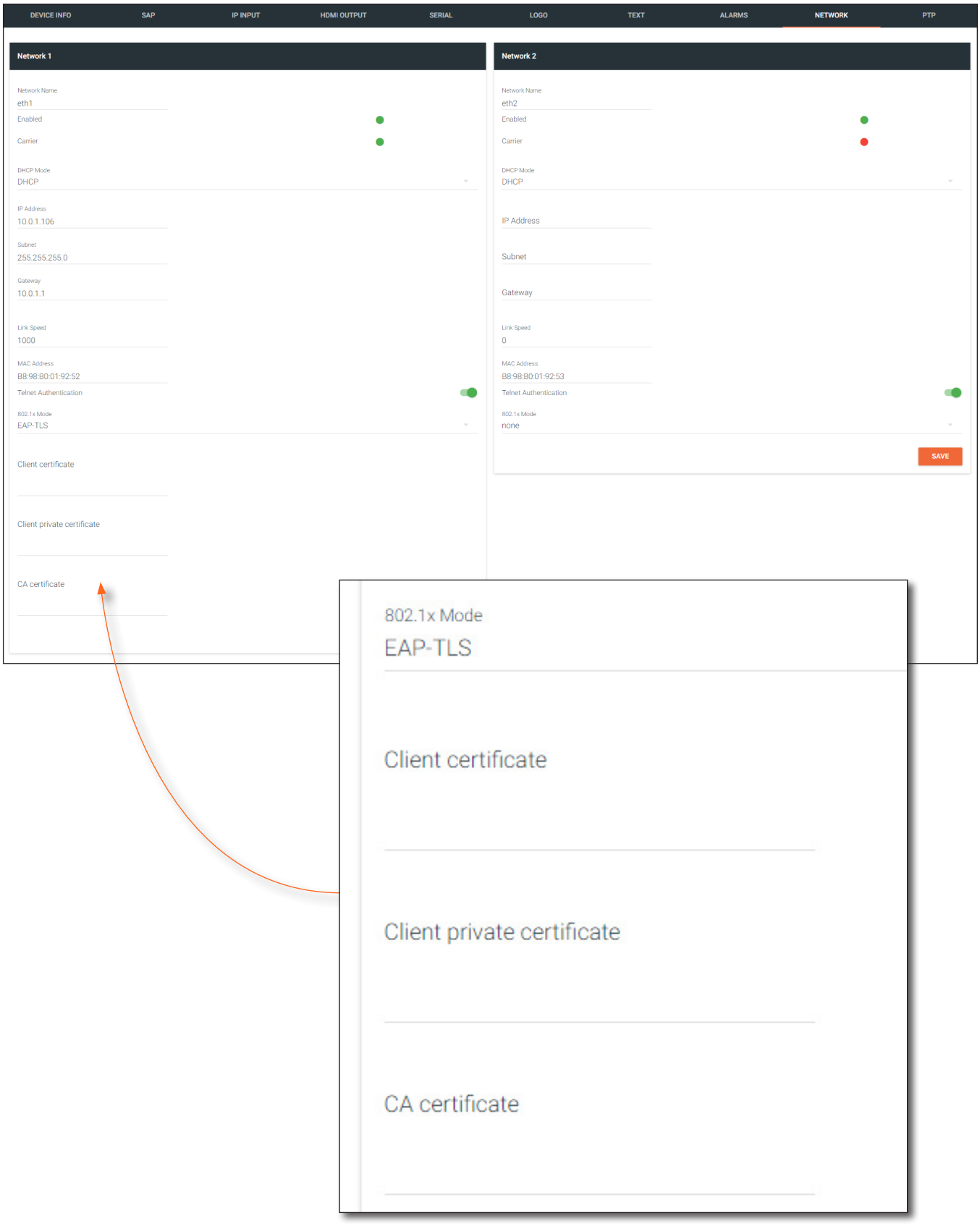
8. Click the **SAVE** button near the bottom of the page. If using dual-channel decoders, both **Network 1** and **Network 2** (both Ethernet ports) will need to be set up, depending upon the system requirements.

EAP-TLS Protocol

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19), if necessary.
2. The AMS Dashboard will be displayed.
3. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
4. Click **Devices** > **All** and select the desired decoder from the **Device List**.
5. Click **NETWORK** in the menu bar.
6. Click the **802.1x Mode** drop-down list, at the bottom of the page, and select **EAP-TLS**.



7. Three additional fields will be displayed: **Client certificate**, **Client private key**, and **CA certificate**. Provide the required information in each field. Refer to the illustration on the next page, if necessary.

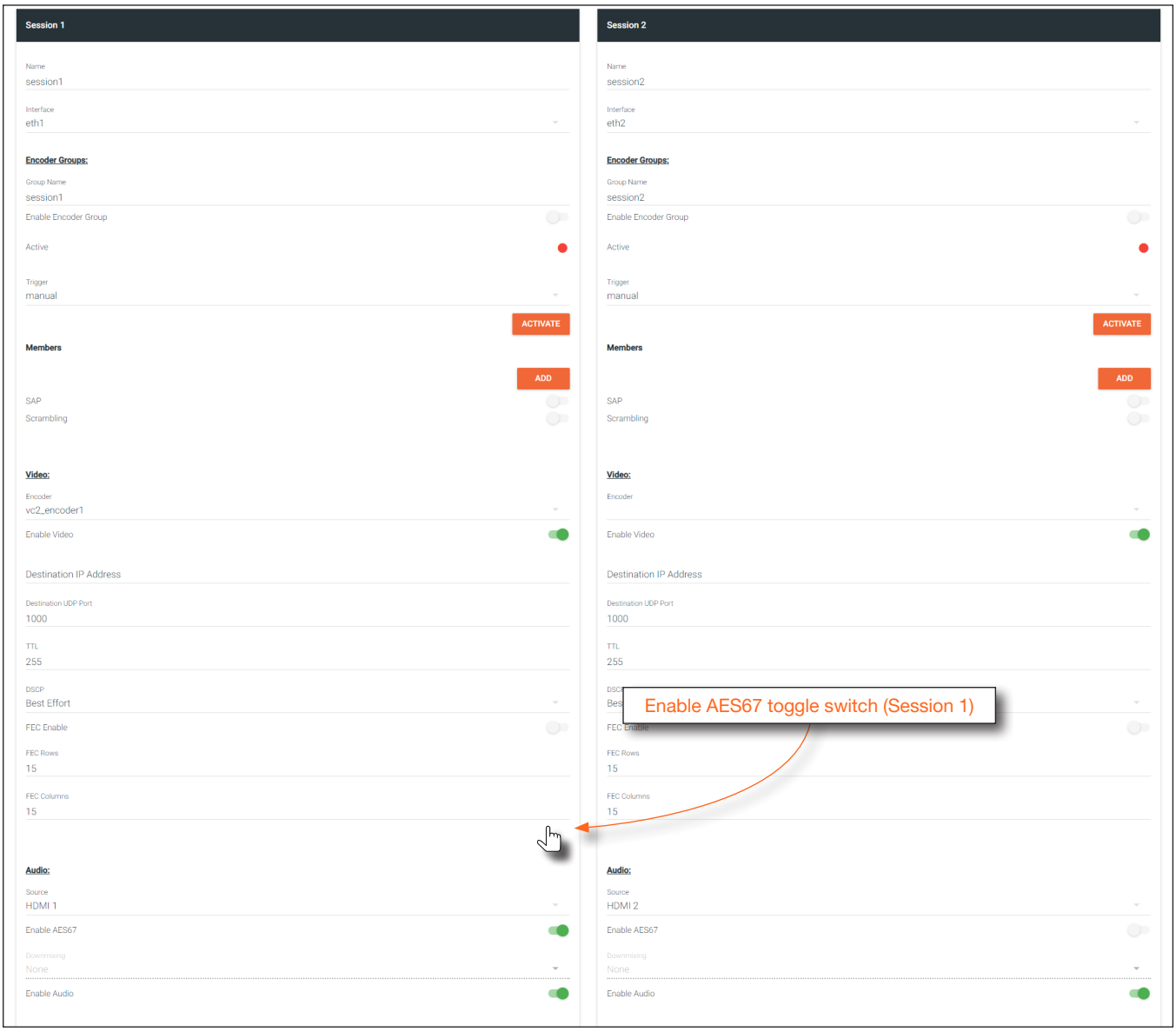


8. Click the **SAVE** button near the bottom of the page. If using dual-channel decoders, both **Network 1** and **Network 2** (both Ethernet ports) will need to be set up, depending upon the system requirements.

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 compressed audio formats, such as Dolby® Digital, and others. Source audio must be transmitted as LPCM 2.0 or 5.1.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19), if necessary.
2. The AMS Dashboard will be displayed.
3. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
4. Click **Devices** > **All** and select the desired encoder from the **Device List**.
5. Go to the encoder interface and click **SESSION** in the menu bar. Refer to the *OmniStream Single-Channel / Dual Channel A/V Encoder User Manual*, if necessary.
6. Scroll down to the **Audio** section and click the **Enable AES67** toggle switch to enable or disable this feature. When enabled, the toggle switch will be green.

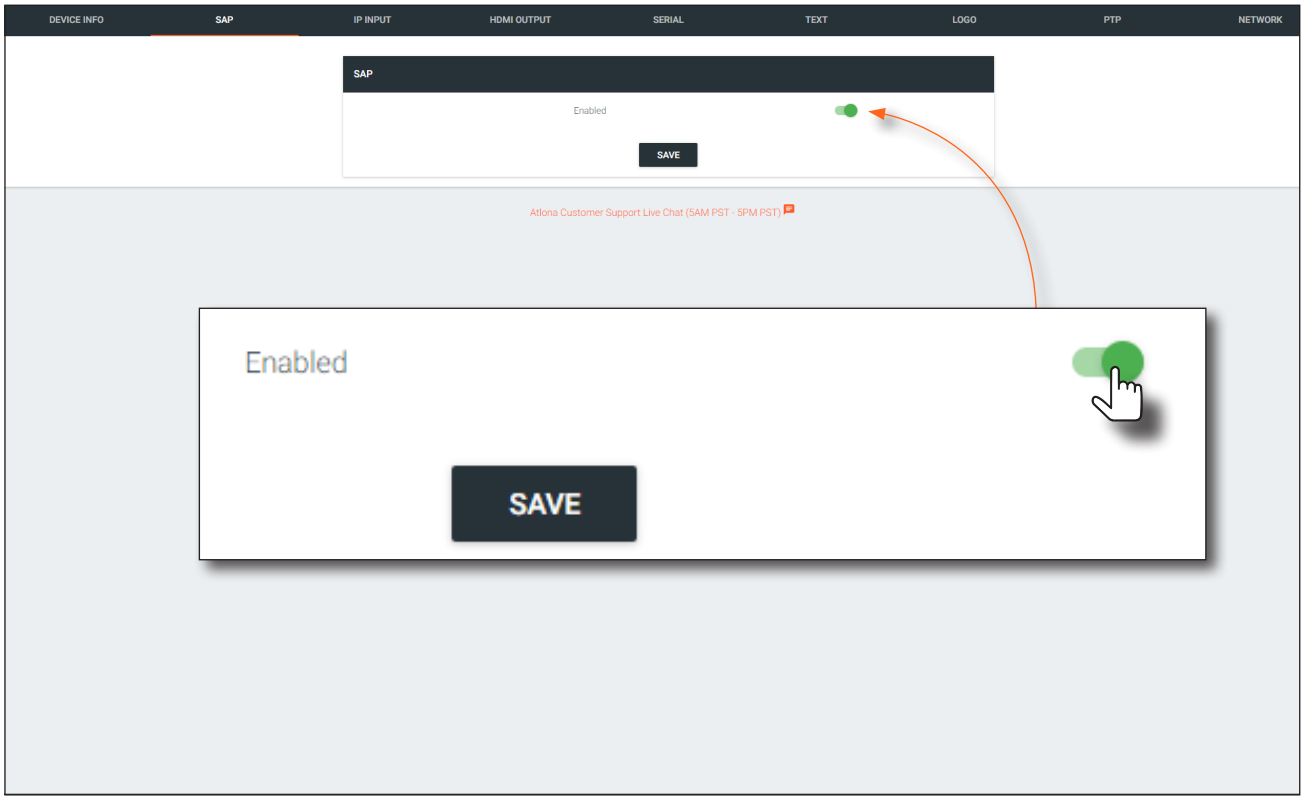


7. Select the type of downmixing from the **Downmixing** drop-down list, if desired. Available options are: **None**, **Stereo**, or **Mono**.

8. Click the **SAVE** button within the **Session** section.

9. Go to the decoder interface and click **SAP** from the menu bar, at the top of the screen. Under the **SAP** section, click the **Enable** toggle switch and enable SAP. When enabled, the toggle switch will be green. If the decoder is to receive AES67 audio, this step is *required*.

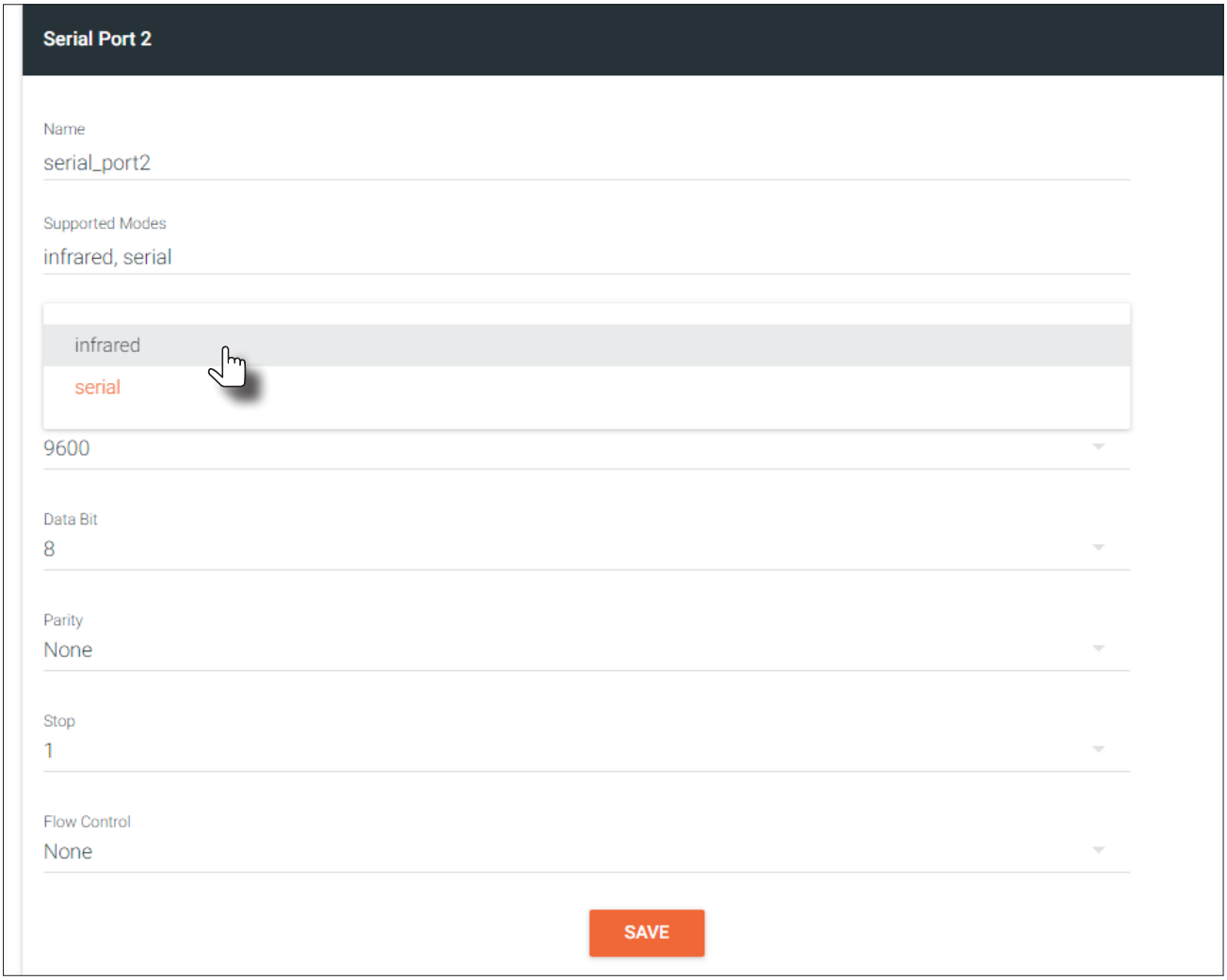
10. Click the **SAVE** button on the **SAP** page.



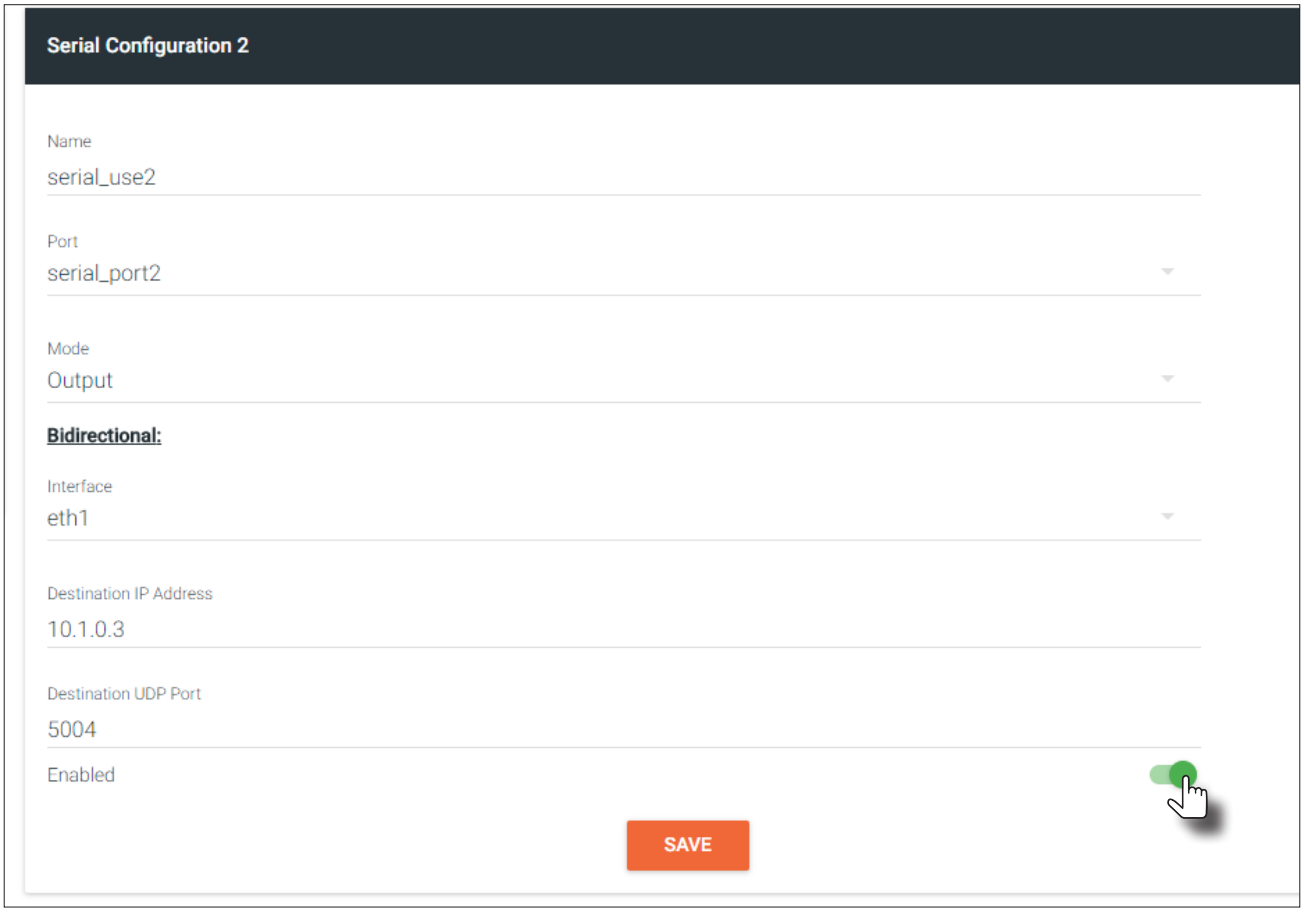
IR Configuration

NOTE: For dual-channel decoders, only the **RS-232 2** port supports both serial and IR. Single-channel decoders only support IR on the **RS-232 2** port. The IR emitter or IR receiver must be connected to this port. Refer to IR Connections (page 13) for wiring information.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19), if necessary.
2. The AMS Dashboard will be displayed.
3. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
4. Locate the desired decoder from the AMS Device List, then click **SERIAL** in the menu bar.
5. Under the **Serial Port 2** section, click the **Mode** drop-down list and select **infrared**. Note that for single-channel decoders, **infrared** will be the only option for **Serial Port 2**.



6. Click the **SAVE** button, in the **Serial Port 2** section to commit changes.
7. Scroll down and locate the **Serial Configuration 2** section.
8. Click the Interface drop-down list and select the desired interface.
9. Enter the IP address, in the **Destination IP Address** field, where the IR data will be sent.
10. Enter the port number in the **Destination UDP Port** field.
11. Click the **Enabled** toggle switch to enable the serial port. When enabled, the toggle switch will be green.
12. Click the **SAVE** button to commit changes.



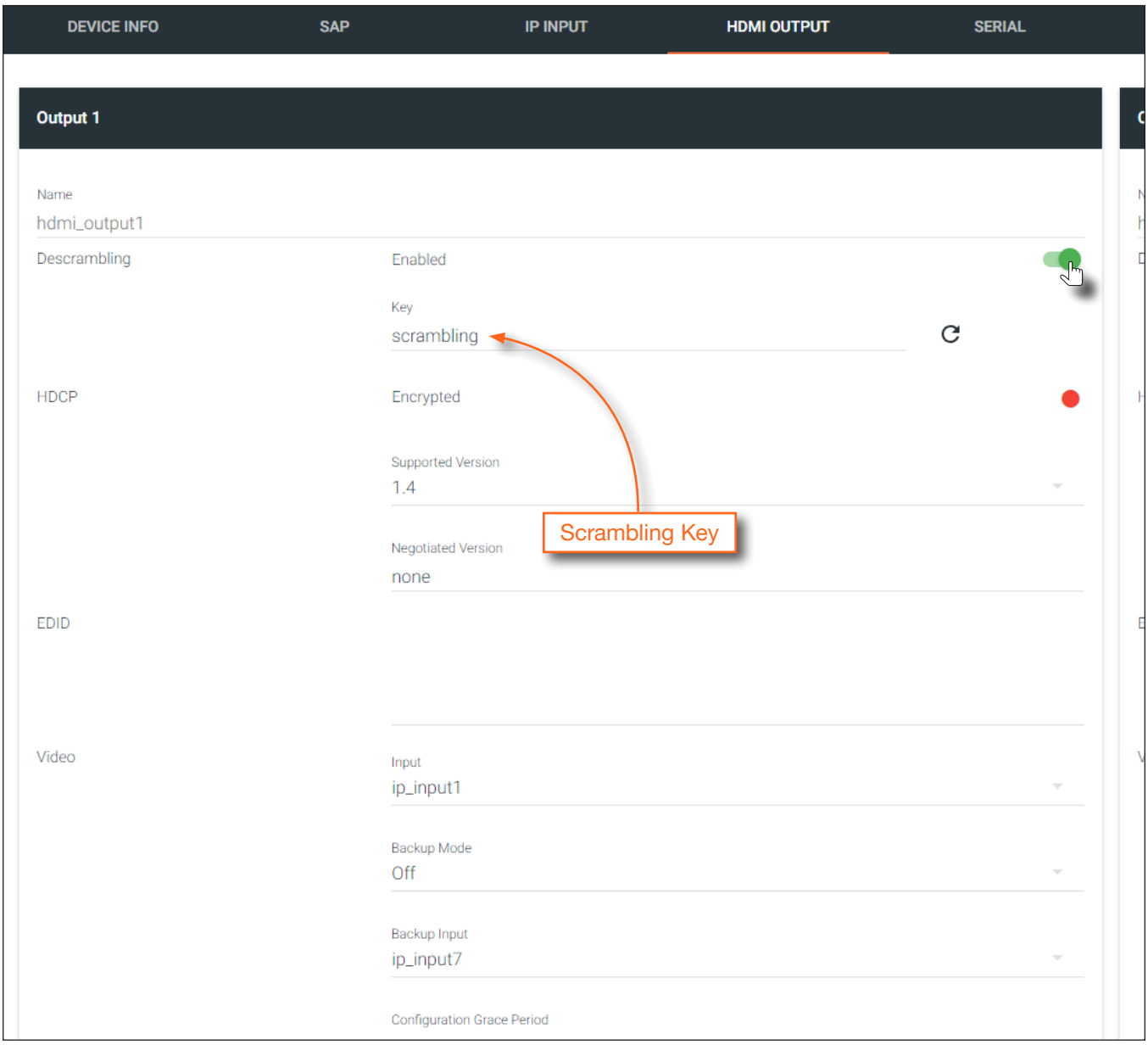
Scrambling

OmniStream supports 128-bit Advanced Encryption Standard (AES) scrambling for both audio and video streams. Scrambling can be enabled or disabled through AMS, and can be individually applied to video, audio, or both. Scrambling can be enabled either before or after the decoding process is started. Data streams cannot be scrambled; only video and audio can be scrambled. When scrambled information is received from an encoder, it will need to be descrambled before it can be displayed.

When scrambling is enabled, the scrambling key can be found under the **HDMI OUTPUT** page on the decoder.

Standard Method

1. Click **HDMI OUTPUT** in the menu bar.
2. Under the desired Session, click the **Enabled** toggle switch, next to Descrambling, to enable it. Once enabled, the toggle switch will be green and the **Key** field will be displayed.



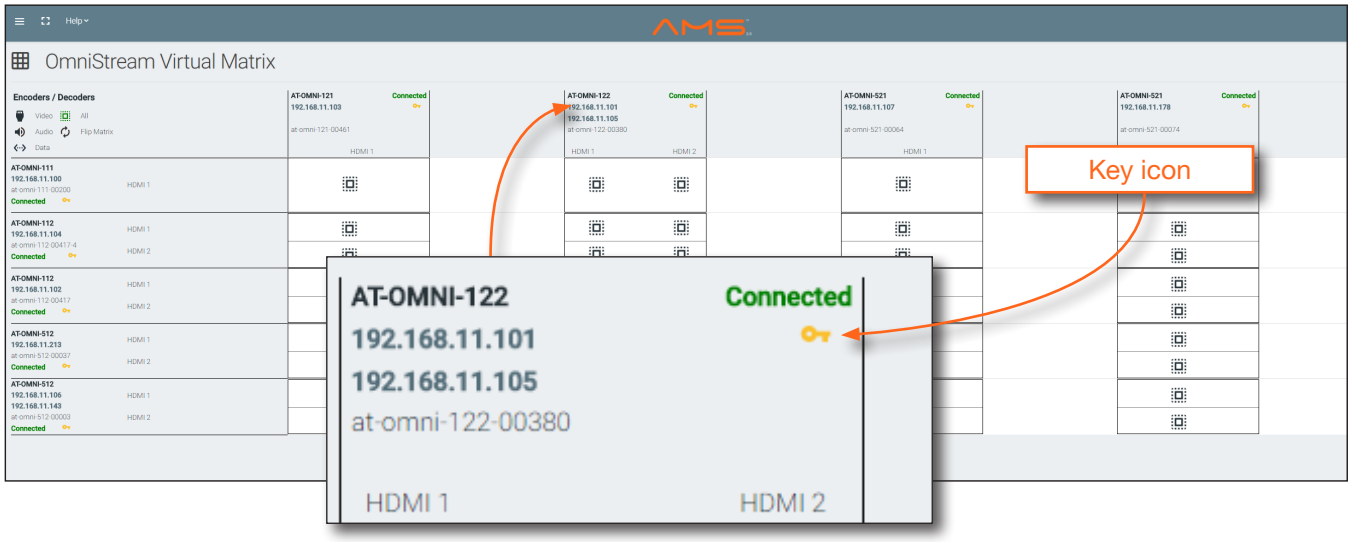
3. Enter the desired scrambling key in the **Key** field.

NOTE: If a user-defined key is specified, then it must be a minimum of eight alphanumeric characters. Special characters and spaces are not permitted.

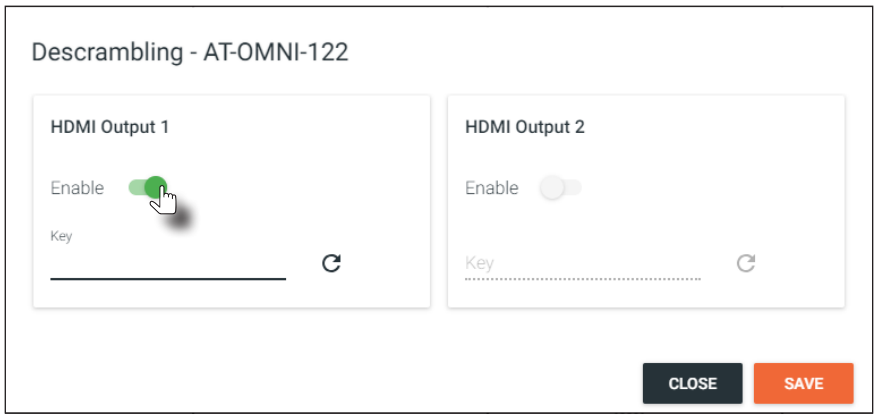
4. Click the **Save** button at the bottom of the page to commit the changes.

Using the Virtual Matrix

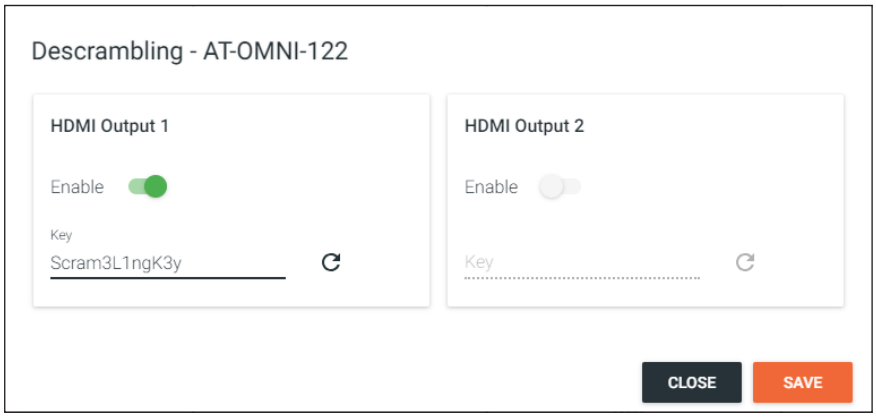
1. Access the Virtual Matrix. Refer to The Virtual Matrix (page 86) for more information.
2. Locate the desired encoder or decoder. Scrambling is handled on the encoder; descrambling is handled on the decoder.
3. Click the yellow key icon. The Scrambling dialog box will be displayed. If the key icon for a decoder is clicked, then the Descrambling dialog box will be displayed.



4. Click the **Enable** toggle switch to enable scrambling for the desired session.



5. Enter the desired scrambling key using one of the following methods:
   - Manual enter a user-defined key in the **Key** field.



   - Click the ↻ icon to generate a random key using AMS. Each time this icon is clicked, a new scrambling key will be generated.

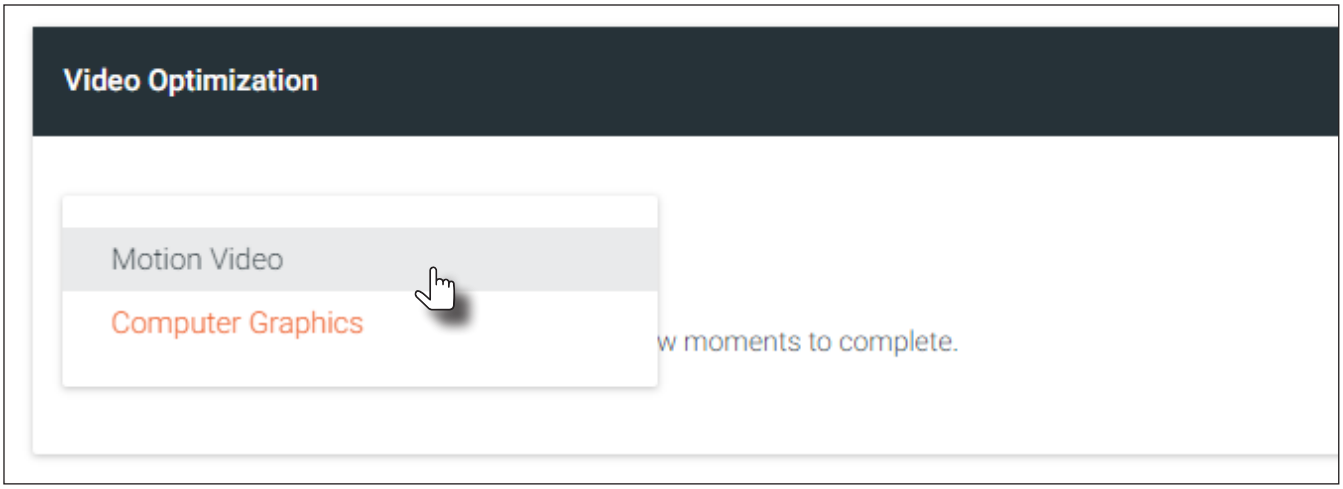
6. Repeat the above process for each session.
7. Click the **Save** button to commit the changes.

Setting the Video Mode

OmniStream offers two video modes: Video and PC application. These two modes will optimize the image, based on the type of information that is being displayed. Use the **Video** mode when display motion graphics/video. Set this mode to **PC application** when viewing static images, such as spreadsheets or similar content.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19), if necessary.
2. Click the **HDMI OUTPUT** in the menu bar.
3. Scroll down to the **Video Optimization** section and click the **Video Optimization** drop-down list to select the desired mode.

Mode	Description
Computer Graphics	Optimizes the image when viewing static images, such as spreadsheets or similar content.
Motion Video	Provides the best viewing experience when streaming motion graphics and/or video.



4. Click the **SAVE** button, within the **Video Optimization** section to commit changes. Note that switching between video modes may take a few moments to complete.
5. Go to the encoder interface and repeat the process. Refer to the *OmniStream Single-Channel / Dual Channel A/V Encoder User Manual*, if necessary.

NOTE: In order to use 3840x2160p60 signals, the **System mode** must be set to **Video**.

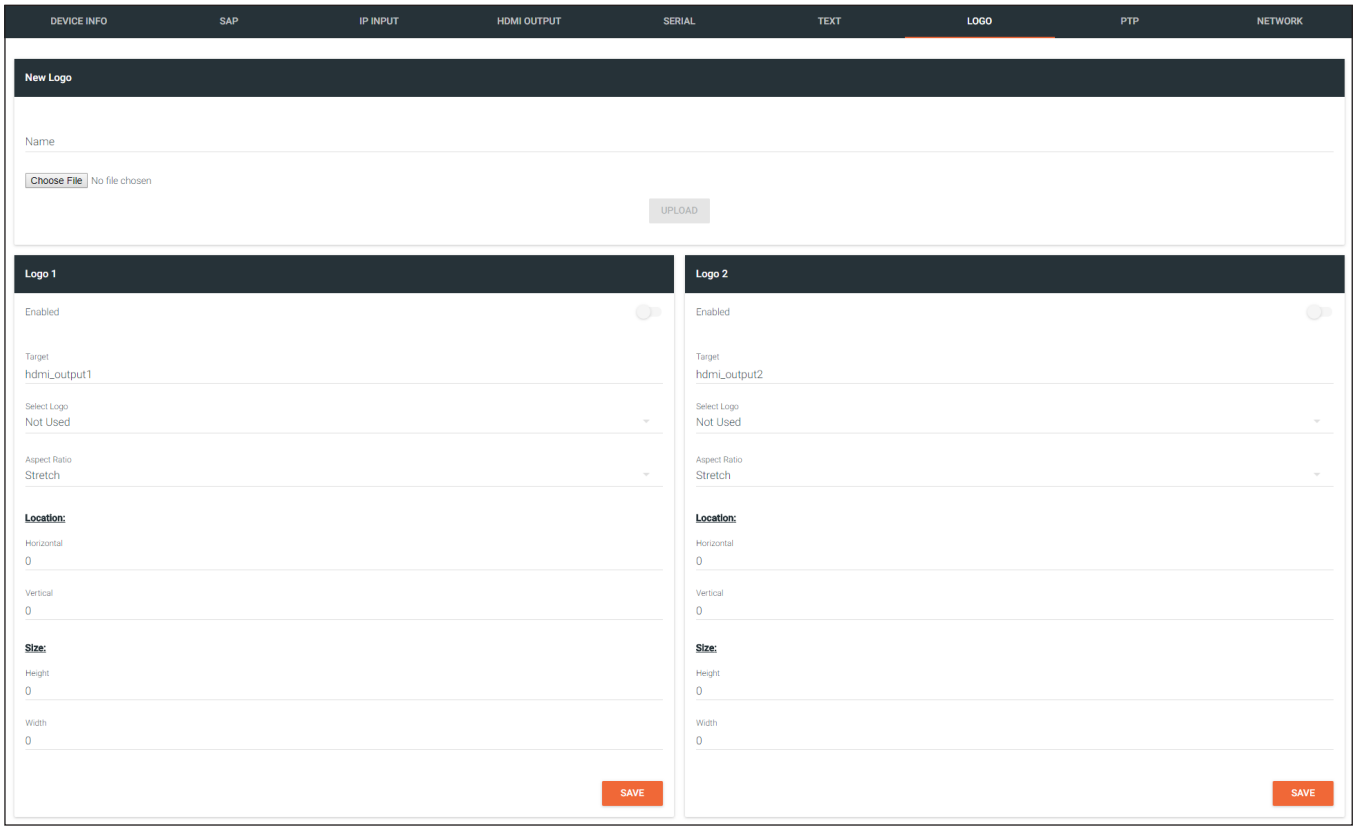
Slate / Logo Insertion

Slate / logo insertion is managed from within AMS. 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 will be from the encoder IP address(es) to which each decoder is subscribed. When configured on the decoder, the presence of the image is specified on the (individual) HDMI output. Refer to the *OmniStream Single-Channel / Dual Channel A/V Encoder User Manual*, for information on managing slate / logo insertion on encoder units.

IMPORTANT: When using 4K images, the image width must not exceed 30% of the horizontal resolution.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
2. Click the **LOGO** tab in the menu bar.



3. Under **New logo**, click the **Choose File** button and select the image to be used. Note that only .png files are valid selections.
4. Enter the name of the image in the **Name** field. If a name is not specified, then the **UPLOAD** button will be disabled.
5. Click the **UPLOAD** button to upload the file.
6. A new logo box will be added with the name of the logo that was provided in Step 4.

NOTE: If the selected image will be used as a *logo*, then proceed with Steps 7 through 9. If the image will be used as a *slate*, skip to Step 10.

7. Click the logo from the **Select Logo** drop-down list. To prevent the image from being displayed, select the Not used option.
8. Click the **Aspect Ratio** drop-down list to set the aspect ratio of the image. Selecting **Keep** will maintain the aspect ratio of the logo source file. Selecting **Stretch** will force the logo to adhere to the user configured settings for the logo size.
9. Set the location of the image by entering the desired values in the **Horizontal** and **Vertical** fields.
10. Define the size of the image by entering the desired values in the **Height** and **Width** fields.
11. Click the **HDMI OUTPUT** tab.
12. Click the **Slate mode** drop-down list, and select **Off**, **Manual**, or **Auto**.
    - **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.
13. Click the **Slate Logo** drop-down list and select the desired logo. Note that if **Slate Mode** is set to **Off**, then this field will not be visible.
14. Click the **SAVE** button to apply all changes.

Deleting Slates / Logos

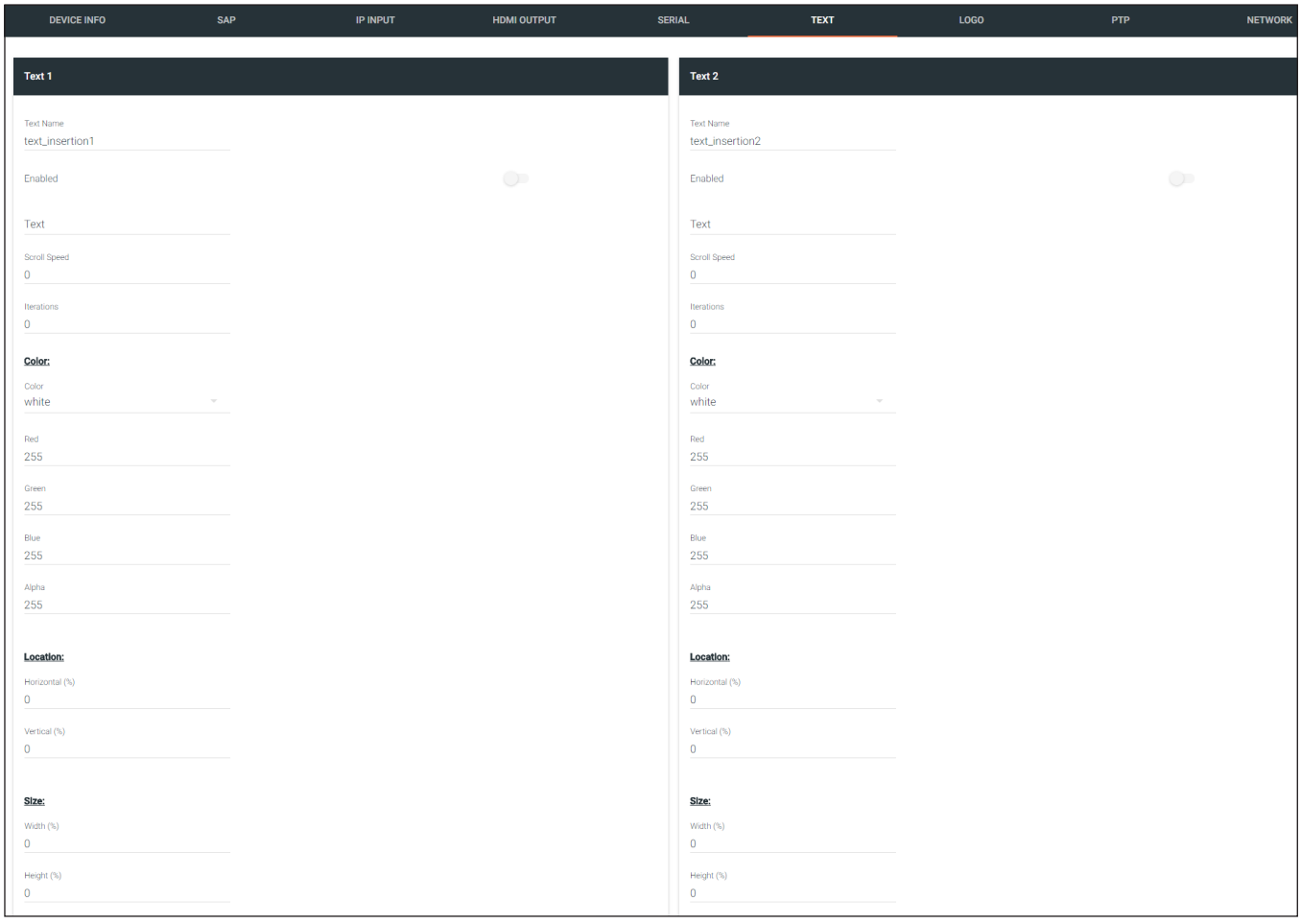
Follow the instructions below to remove a logo from the **Logo** tab.

1. Click the **LOGO** tab in the menu bar.
2. Click the **DELETE** button for the desired logo box. If the **DELETE** button is disabled, do the following:
    a. Scroll down to the **Logo Insertion** boxes.
    b. Click the **Select Logo** drop-down list and select **Not Used**.
    c. Click the **SAVE** button.
    d. Refresh the page.
    e. Click the **DELETE** button to remove the logo.

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 AMS. Refer to Refer to Accessing Decoders in AMS (page 19) if necessary.
2. Click **TEXT** in the menu bar.



3. Click the **Enable** toggle switch, to allow the text to be displayed.
4. In the **Text** field, enter the desired text.
5. Specify the speed of the scrolling text in the **Scroll Speed** field. 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.
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 screen.

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 screen.

10. Click the **SAVE** button to apply all changes.

Creating Video Walls

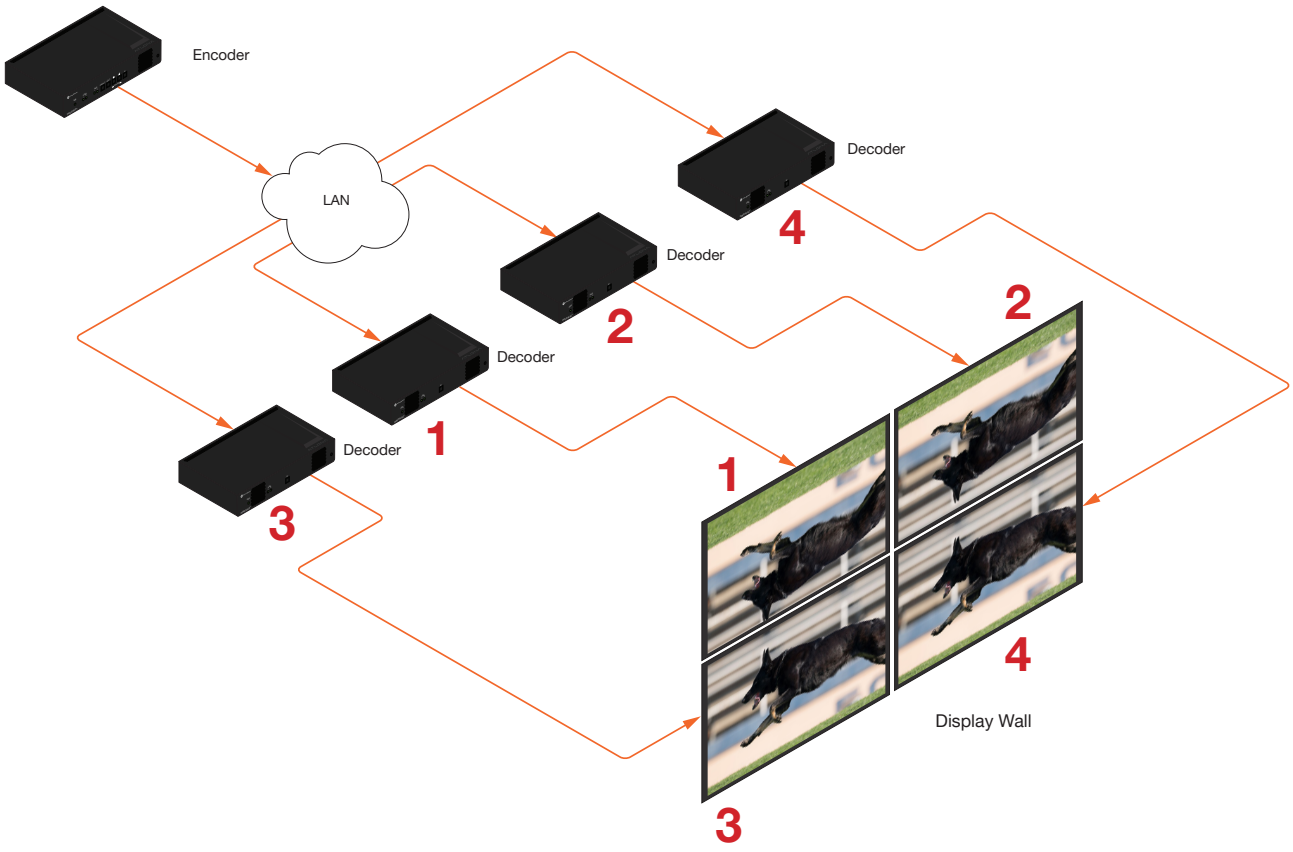
The following table lists the maximum video wall size, based on the source resolution.

4Kp60	4Kp60	1080p60
2 x 2	16 x 16	n x n (no limit)

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.

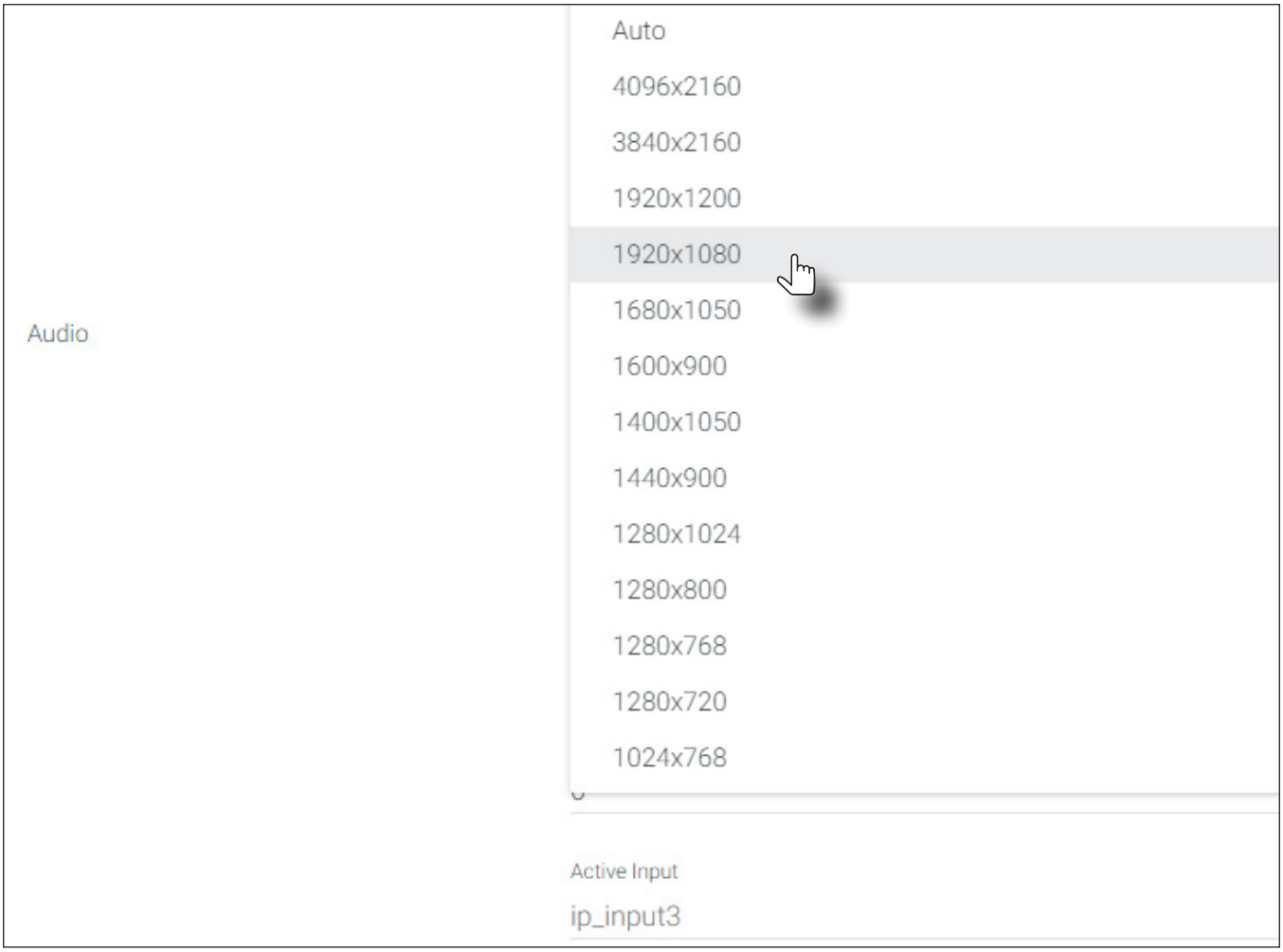
In order to create the video wall, the following steps will need to be taken: 1) Each image from the decoders will need to be scaled to one-fouth of the total image resolution (3840 x 2160 / 4). The crop-and-scale feature will be used to provide the correct output. 2) The top two displays have been mounted upside down. The rotate feature will be used to correct this problem.



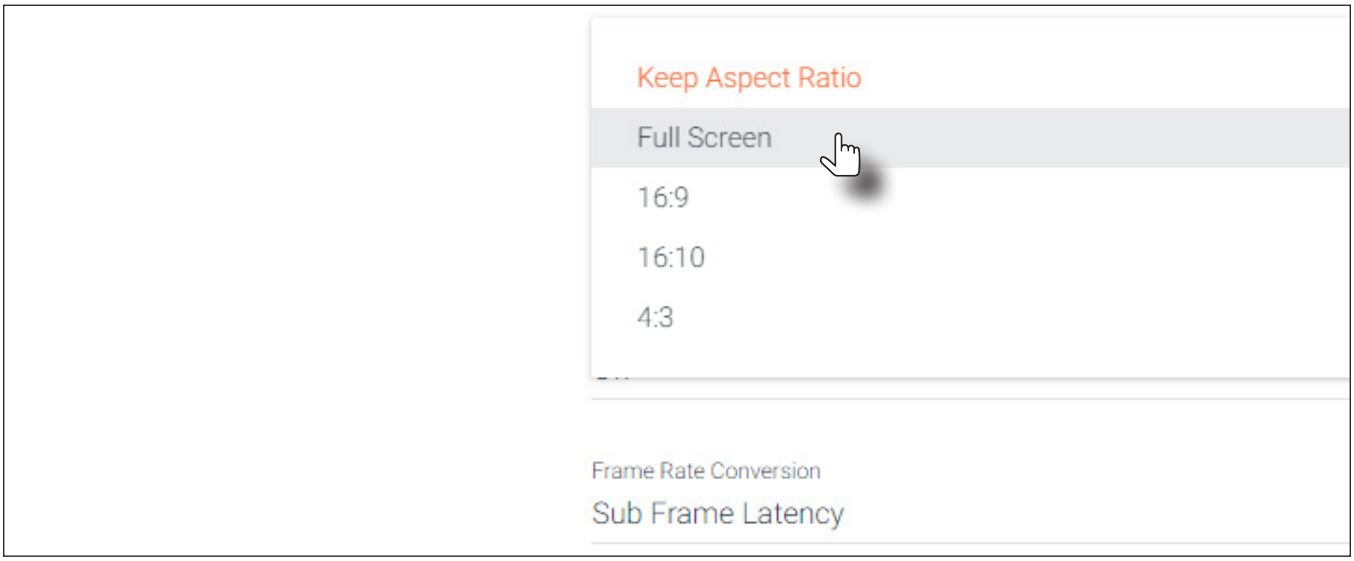
Note that the order in which each image is cropped, scaled, and/or rotated is arbitrary. In this example, the configuration process will begin with Display 1, in the top left.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
2. Click **HDMI OUTPUT** in the menu bar.

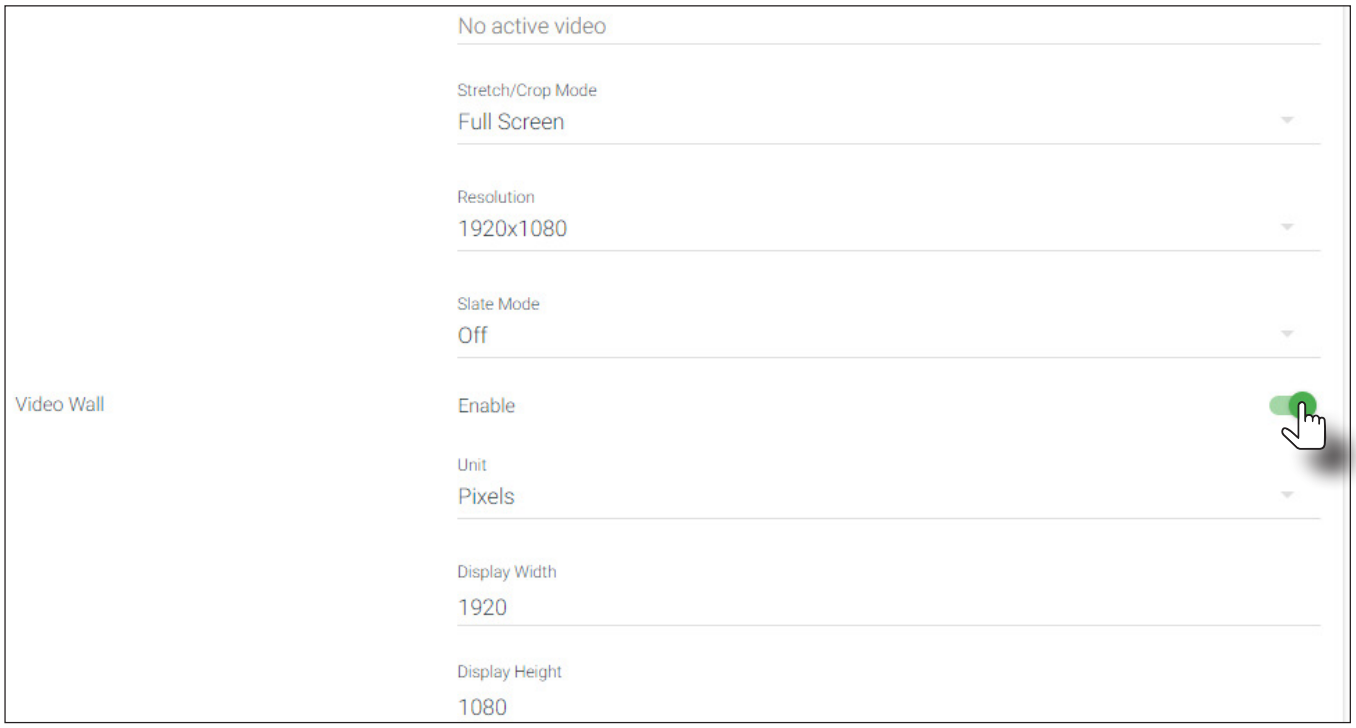
3. Locate the **Resolution** option, in the **Video** section, and select 1920x1080. This will scale the output resolution from each decoder to 1920x1080.



4. Click the **Stretch/Crop Mode** drop-down list and select fullscreen. This guarantees that the image will fill the screen.



5. Click the **Enable** toggle to activate the **Video wall** option. Once enabled, the **Video wall** section will be expanded and display all available options.



6. Enter the horizontal and vertical resolution of the display in the **Width** and **Height** fields. This is the size of the source to be used for this window of the video wall. The table below, lists width and height examples for a 2x2 video wall, with the specified source resolution.

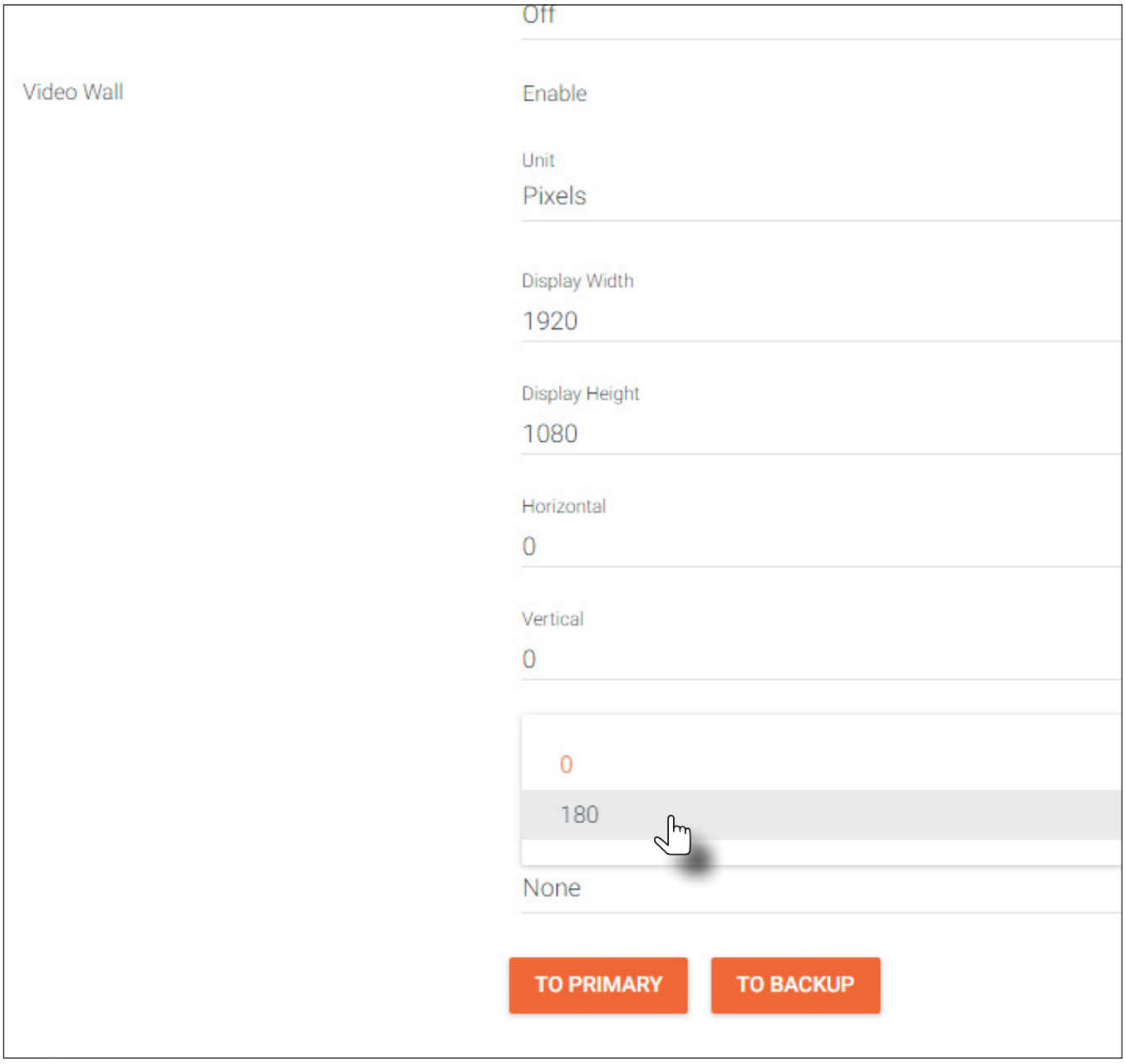
Source resolution	Width	Height
3840 x 2160 (UHD)	1920	1080
1920 x 1080 (1080p)	960	540

Since the example source is 3840 x 2160, the width and height for the Display 1 (upper-left corner) needs to be set 1920 and 1080, respectively, as shown below.

7. Enter the number of video wall rows in the **Horizontal** field and the number of columns in the **Vertical** field. 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.

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

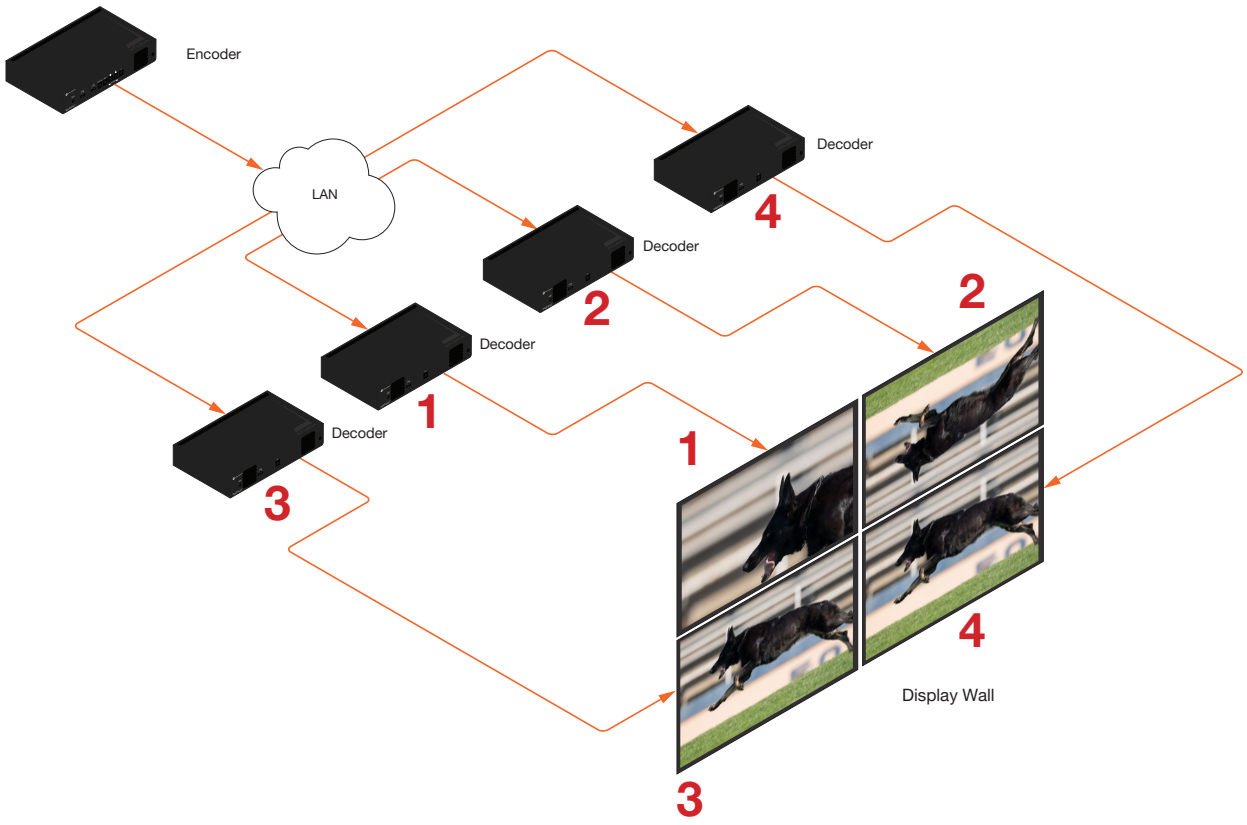
8. Click the **Rotation** drop-down list to select the rotation angle of the image. In this example, select **180** from the drop-down list. The image will be flipped, vertically.



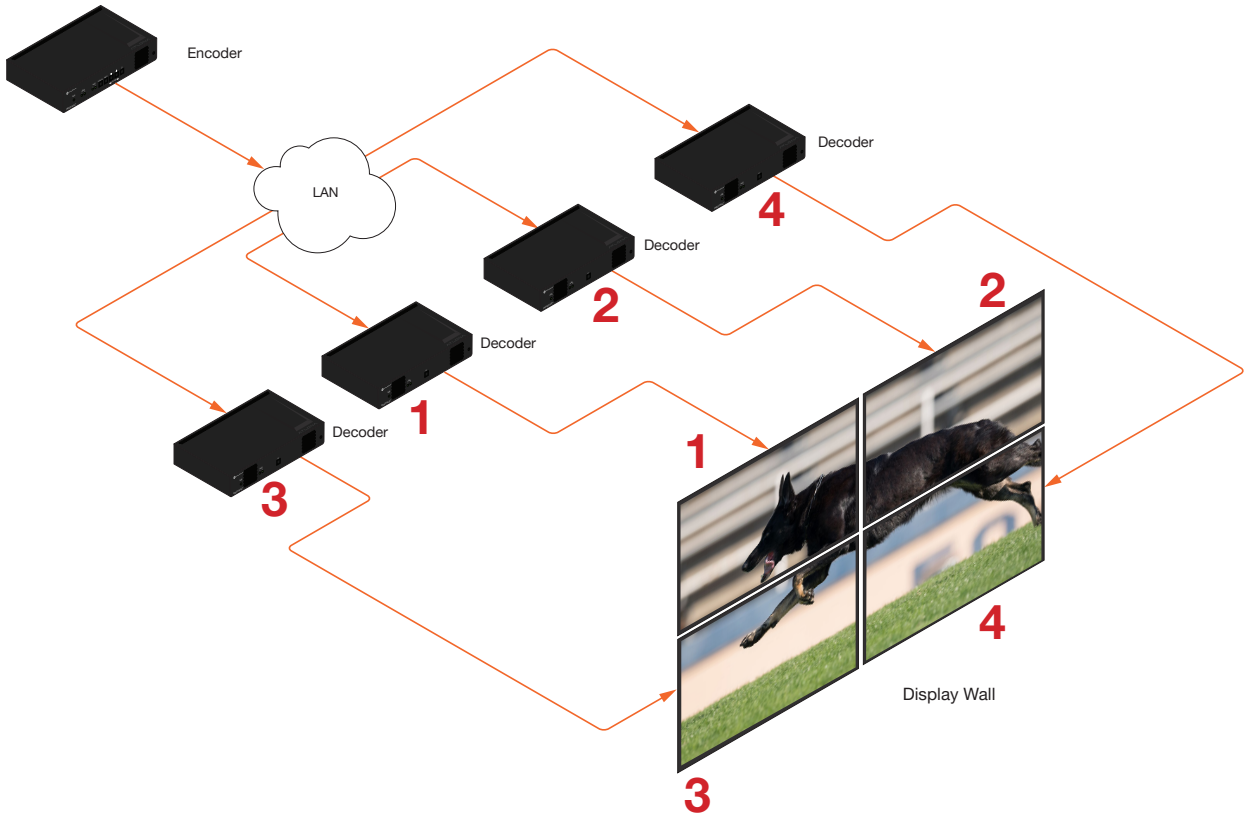
The image on Display 1, as shown below, has been cropped and rotated and now is displayed correctly.

9. Click the **SAVE** button at the bottom of the screen to accept changes.

10. Repeat steps 1 through 9 for decoders 2, 3, and 4. Note that in this example, at Step 10, decoders 3 and 4 will not require any rotation. In this case, make sure the **Rotation** option is set to 0.



Once all four decoders have been properly configured, the image will be correctly displayed across all four displays:



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 select the desired bevel compensation. See the next page for more information.

Bezel Compensation

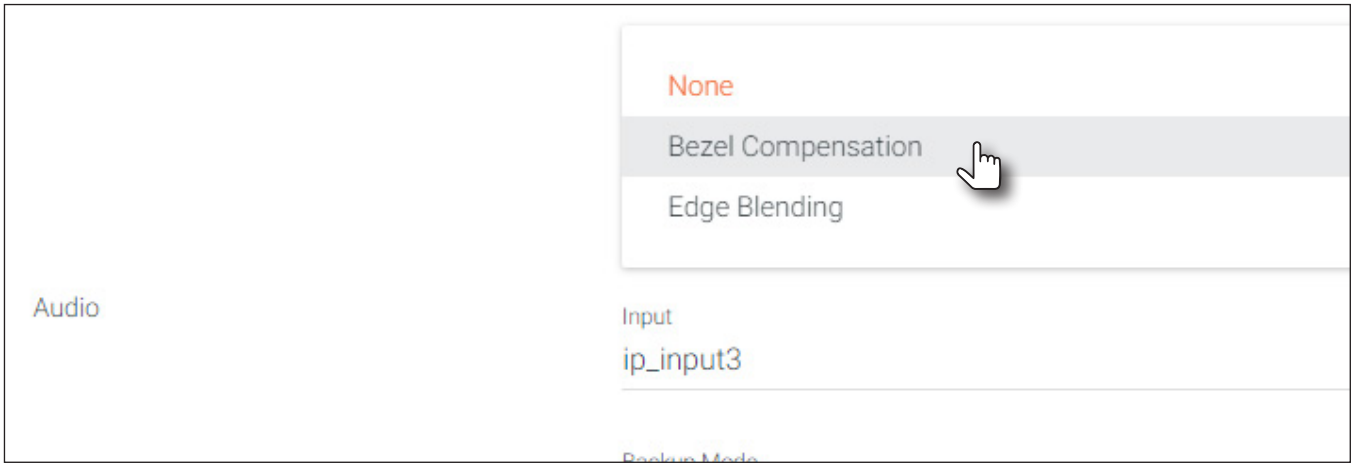
Displays have a region where video is not displayed, called the bezel. This can cause display issues when creating video walls. Bezel compensation takes this area into account when a single video source is mapped across multiple displays. Bezel compensation can be adjusted at any time.

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

Image without bezel compensation

Image with bezel compensation applied

1. Select **Bezel Compensation** from the **Edge Compensation** drop-down list.



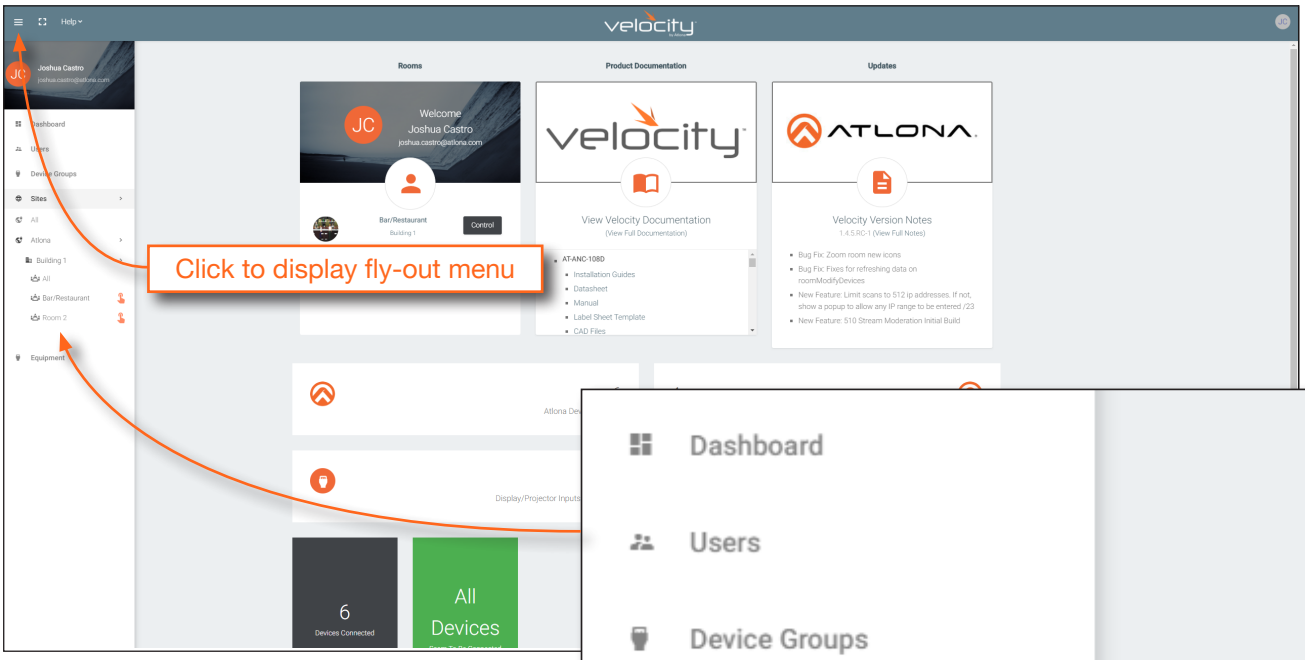
2. Enter the **Top**, **Bottom**, **Left**, and **Right** values, as desired. Values can be entered in pixels, inches, or millimeters.
3. Click the **SAVE** button at the bottom of the screen to accept changes.

Using Velocity™

The following section provides instructions on creating and using video walls with the Atlona Velocity Control Software. Familiarity with the Velocity software is assumed. Refer to the *Atlona Velocity User Manual* for more information, if necessary.

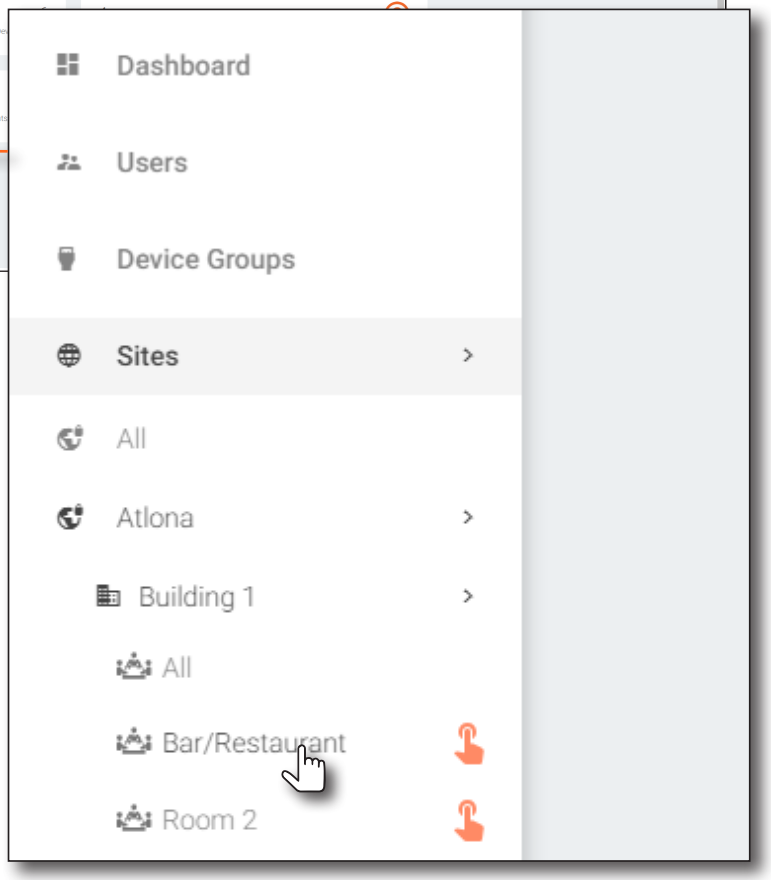
NOTE: As of this writing, the Velocity™ software is limited to a maximum video wall size of 12 x 12, for resolutions of 4Kp30 and 1080p60.

1. Launch a web browser and enter the IP address of AMS, in the address bar.
2. Enter the required login credentials.
3. Click the **Login** button.
4. The Velocity Dashboard will be displayed.
5. Click the ☰ icon, in the upper-left corner, to display the fly-out menu.

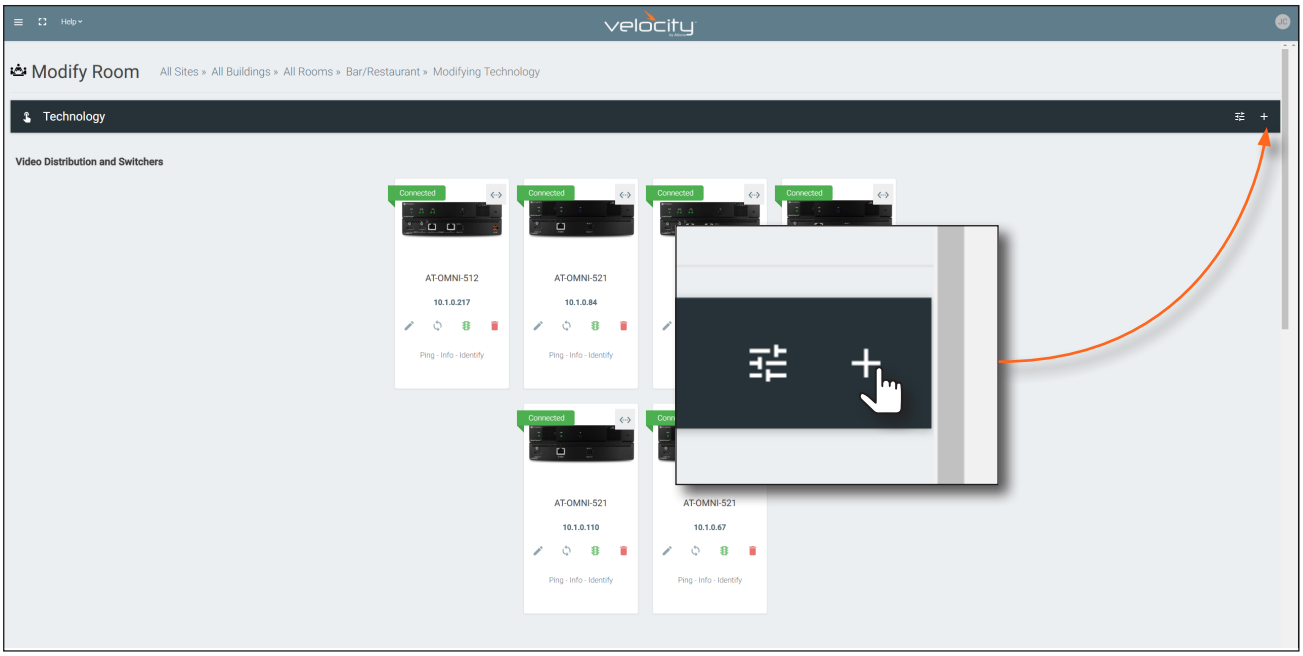


6. Click **Sites** in the menu bar to expand the list of buildings and rooms.
7. Click the desired room from the list.

   In the example on the right, a set of encoders and decoders have been set up in the **Bar/Restaurant** room of **Building 1**. This is where the video wall will be configured.



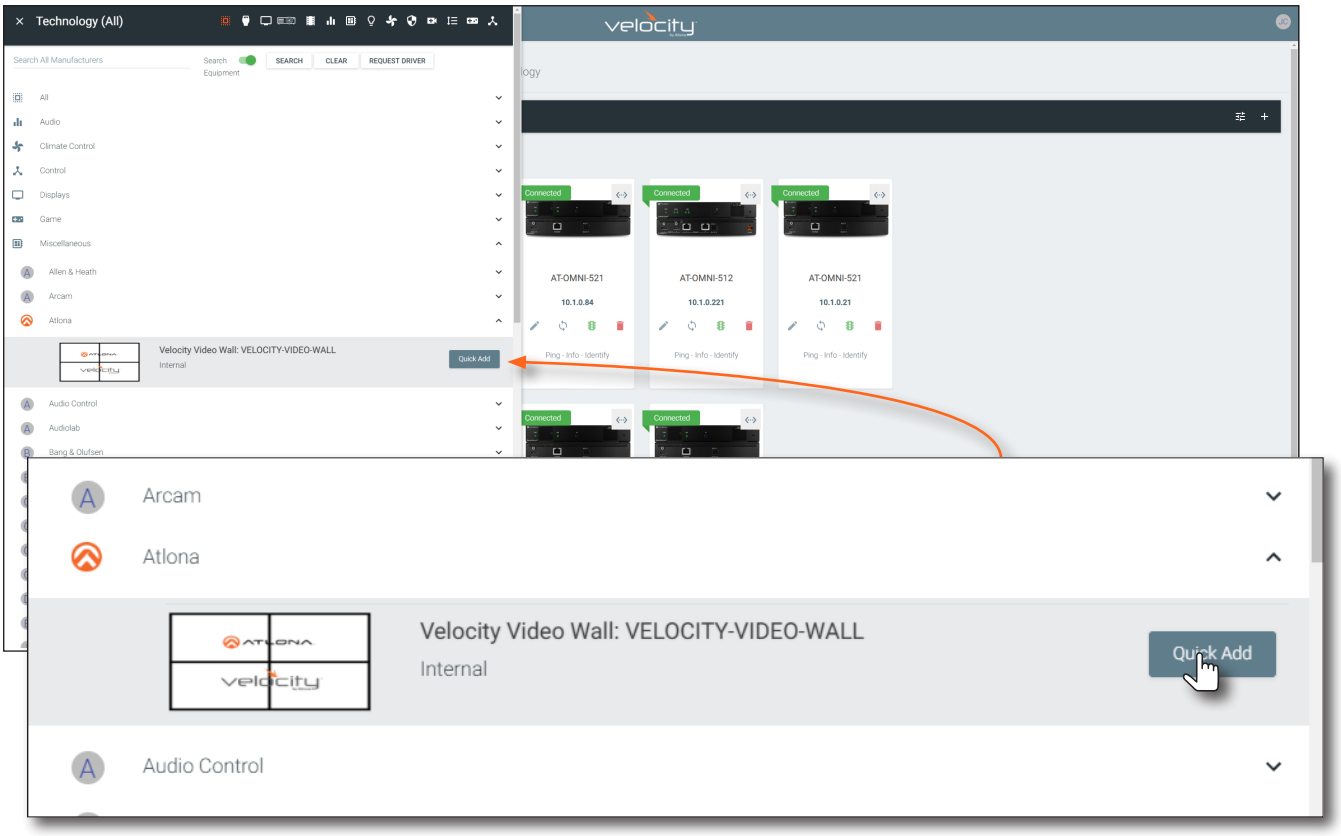
8. The **Modify Room** screen will be displayed. Click the **Add Technology** icon in the top far-right corner of the screen. This icon is represented by the **+** sign.



9. The **Technology** fly-out menu will be display.

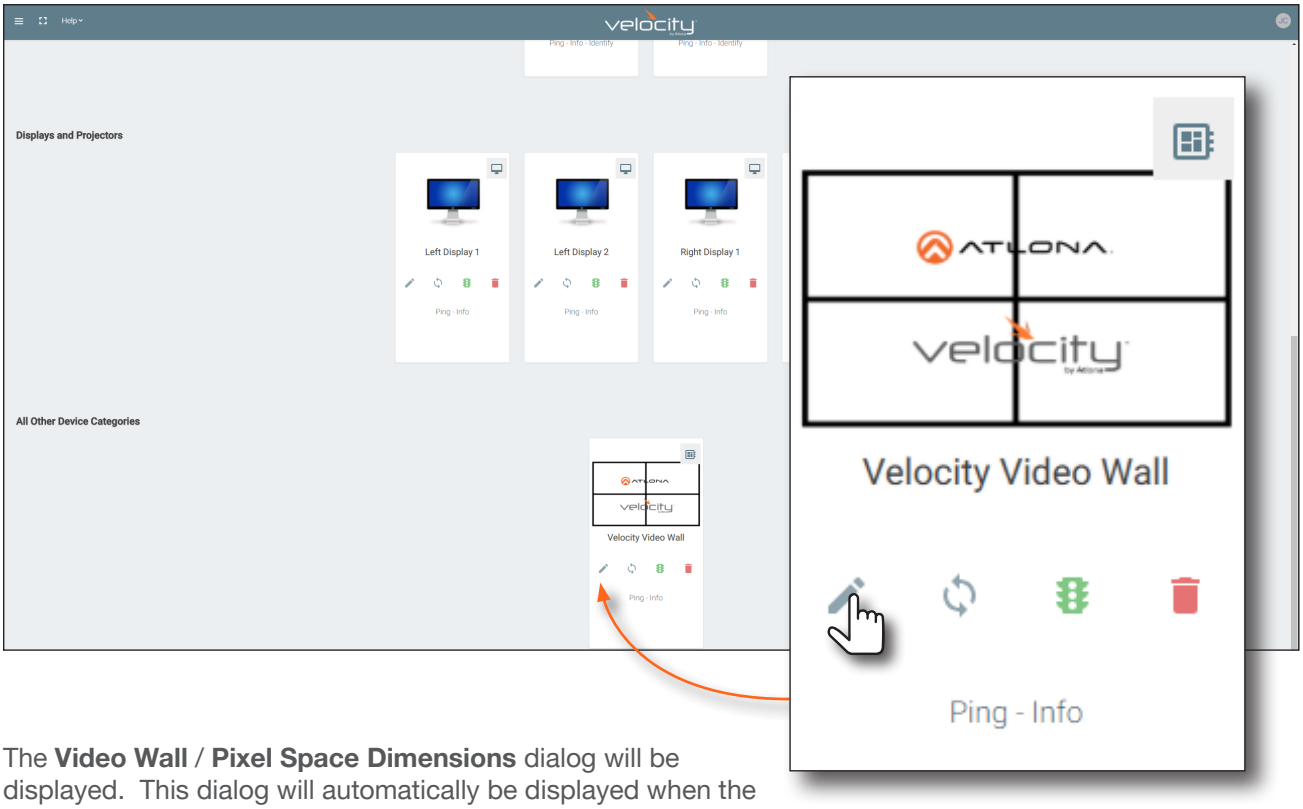
10. In the fly-out menu, click **Miscellaneous** > **Atlona** > to expand the Atlona technology menu.

11. Click the **Quick Add** button for **Velocity Video Wall: VELOCITY-VIDEO-WALL**. The video wall technology will be added to the room.



12. Scroll down to the bottom of the page and locate the **Velocity Video Wall** driver.

13. Click the **Edit** icon. This icon is represented by a pencil.

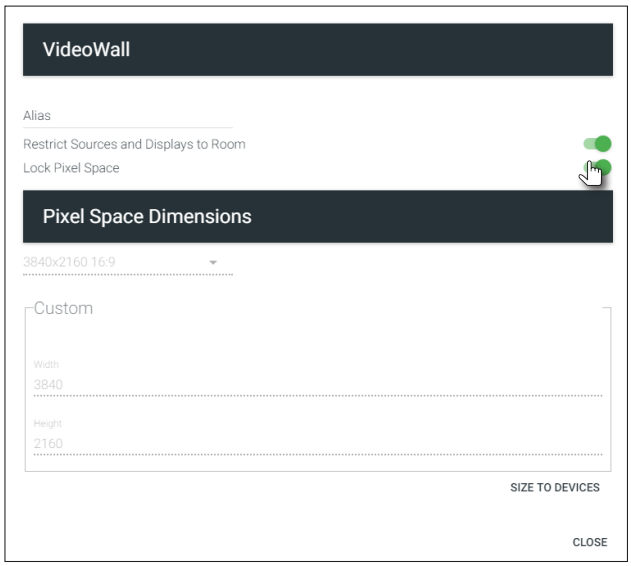


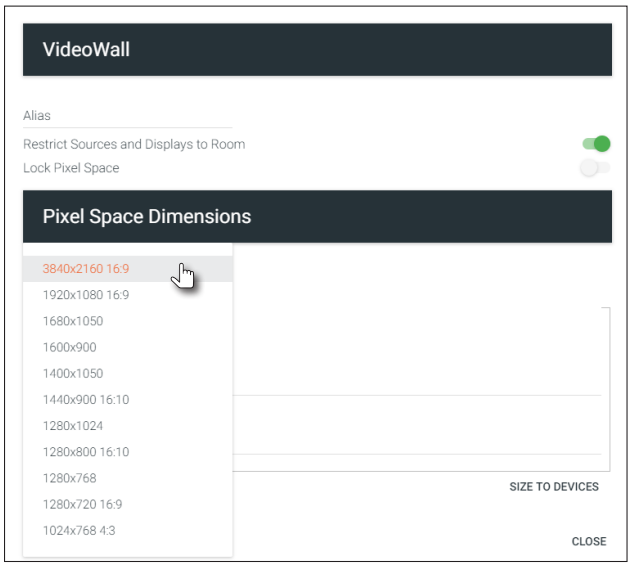
14. The **Video Wall** / **Pixel Space Dimensions** dialog will be displayed. This dialog will automatically be displayed when the video wall driver is edited for the first time.

    The default video wall dimensions are set to 3840 x 2160. To modify the video wall size, follow steps 14a through 14e. To continue with the default video wall dimensions, click the **CLOSE** button and go to step 15.

    a. Click the **Lock Pixel Space** toggle switch to disable it. When disabled, the toggle switch will turn gray.

    b. Under **Pixel Space Dimensions**, click the drop-down list to select the desired video wall dimensions.



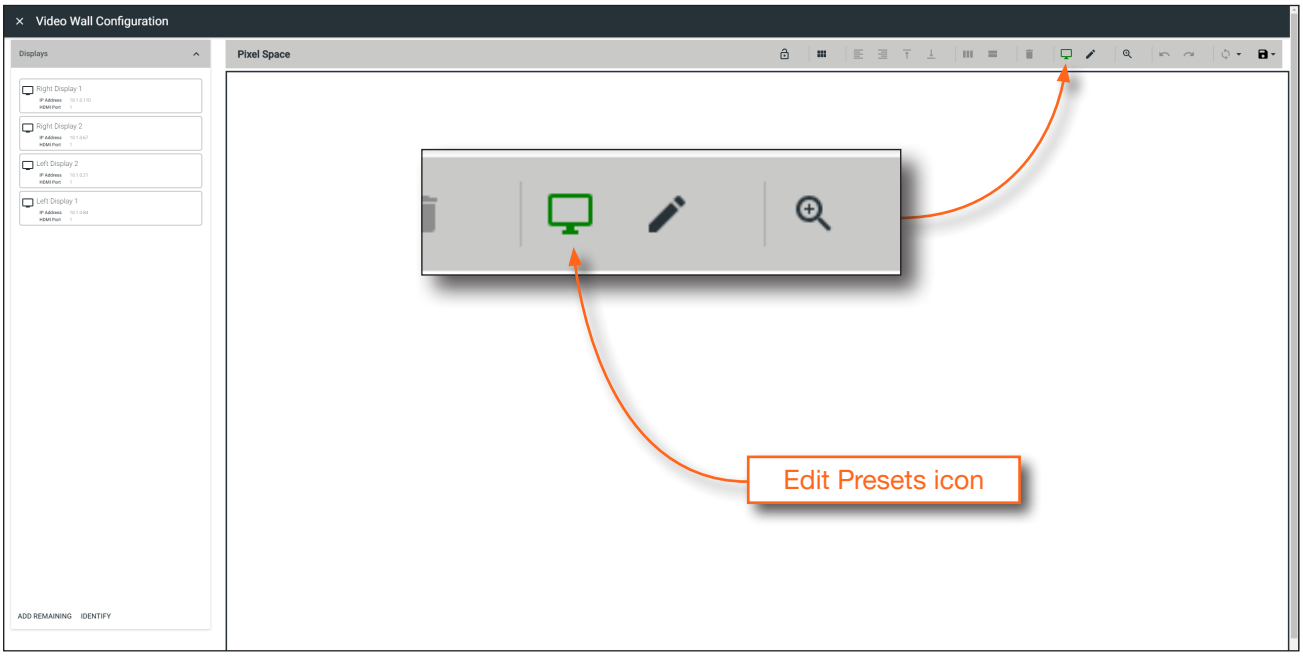


c. To create a custom size for the video wall, enter the desired dimensions under the **Custom** section. Enter the width and height directly, or use the spinner controls at the far end of each field, to adjust the values.

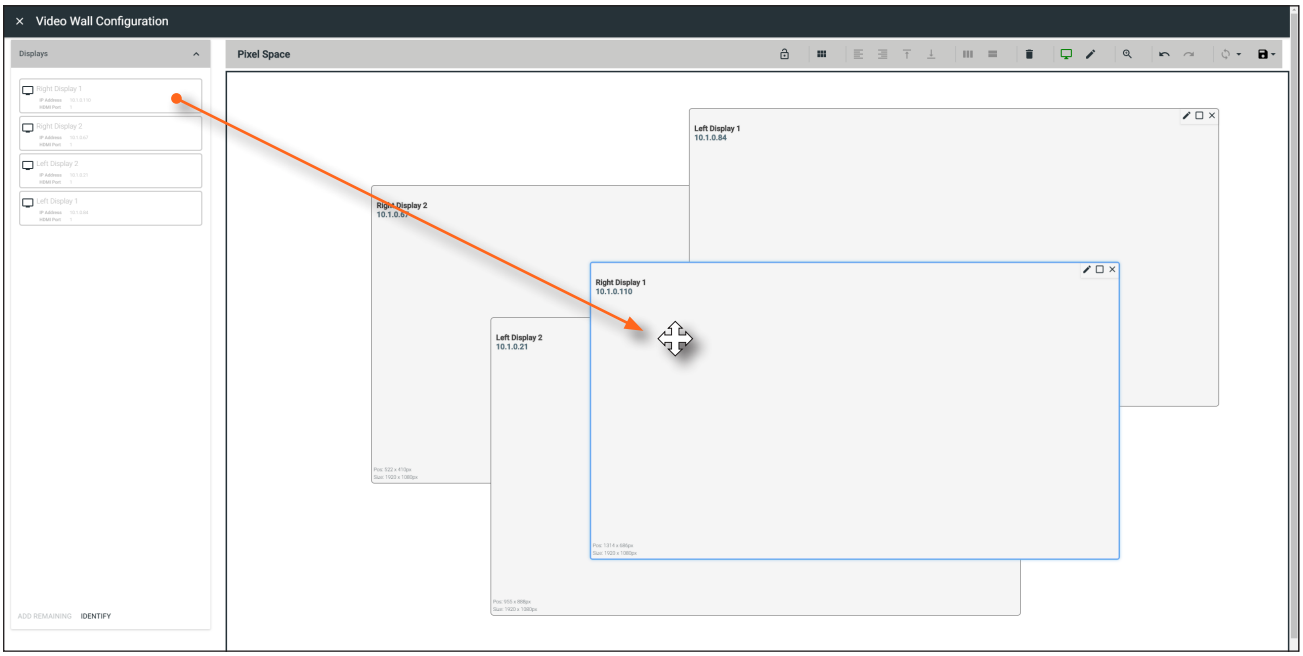
d. Save the video wall dimensions by clicking the **Lock Pixel Space** toggle switch to enable it.

e. Click the **CLOSE** button to dismiss the dialog.

15. The **Video Wall Configuration** screen will be displayed and will automatically be set to “edit mode”. In this mode, the **Edit Presets** icon in the menu bar will be green.

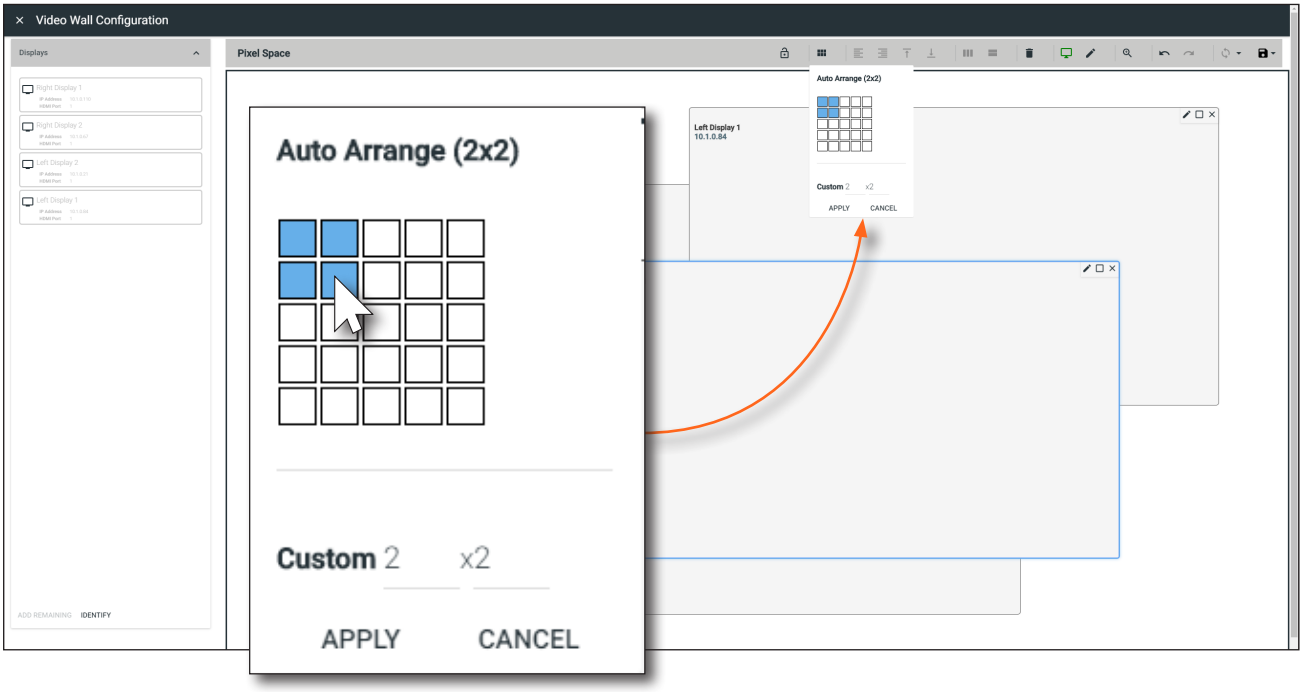


16. Under the **Displays** window, on the left side of the screen, drag and drop the desired displays to the to **Pixel Space** window.

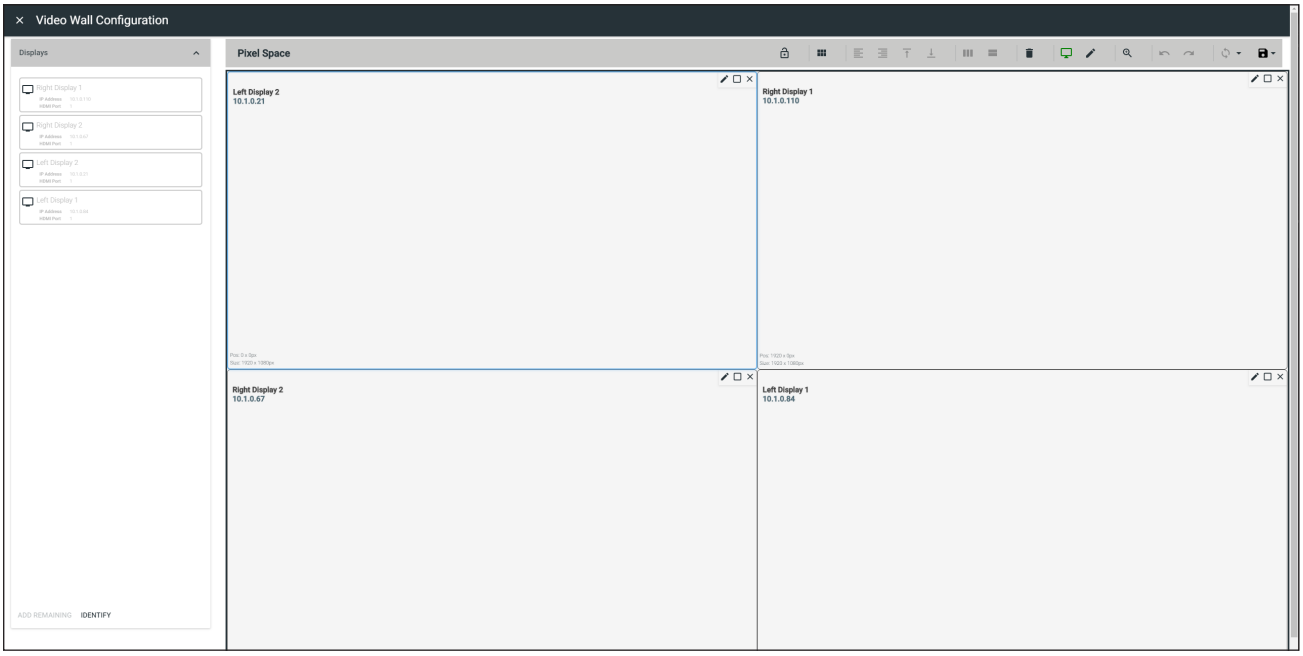


NOTE: The order in which the displays are placed in the **Pixel Space** window is not important and both the number of displays and how they are arranged can always be changed at a later time.

17. Click the **Auto Arrange** icon in menu bar at the top of the **Pixel Space** window. Move the mouse within the **Auto Arrange** pop-up dialog to adjust the size of the video wall. Click to commit the selection. In this example, a 2x2 video wall will be created.



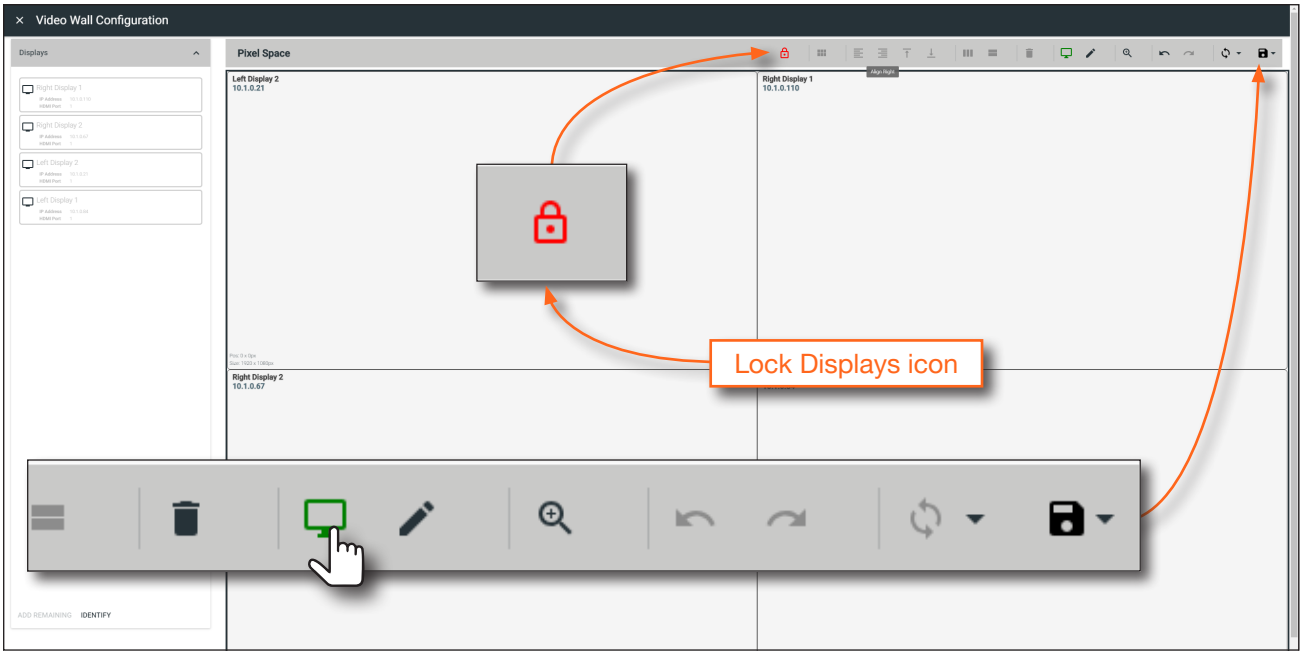
Once **Auto Arrange** has been applied, the **Pixel Space** window will appear similar to the following. It should be noted that each display can be rearranged if necessary. To reposition displays, click and drag them to the appropriate places, within the Pixel Space window. Note that each display is identified with a name and an IP address, in the upper-left corner. Refer to the *Atlona Velocity User Manual* for more information on naming devices.



18. Click the **Lock Displays** icon in the menu bar of the **Pixel Space** window. This is optional. However, enabling this feature will prevent accidental repositioning of the displays, during the configuration procedure. When locked, this icon will turn red. To unlock the displays (for adjustment purposes), click the **Lock Displays** icon again.

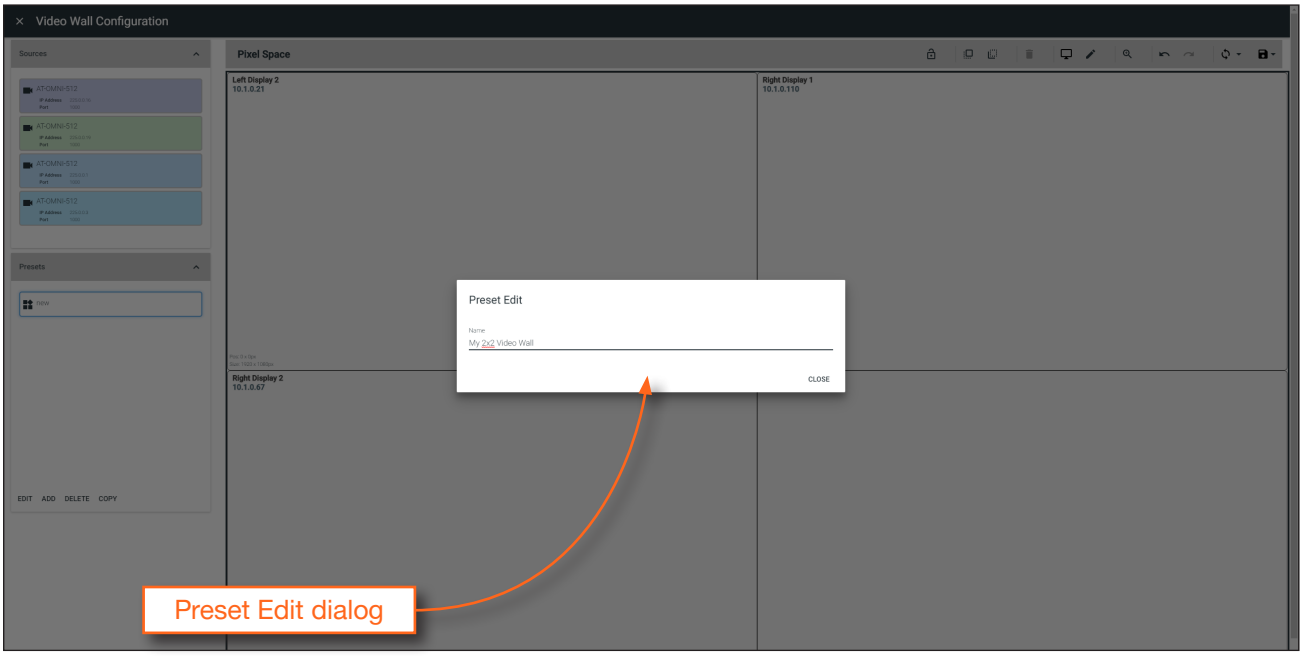
19. Click the **Save** icon in the upper-right corner of the **Pixel Space** window. This will save the current layout.

20. Click the **Edit Presets** icon to switch to “live mode”. In this mode, the icon will be gray.

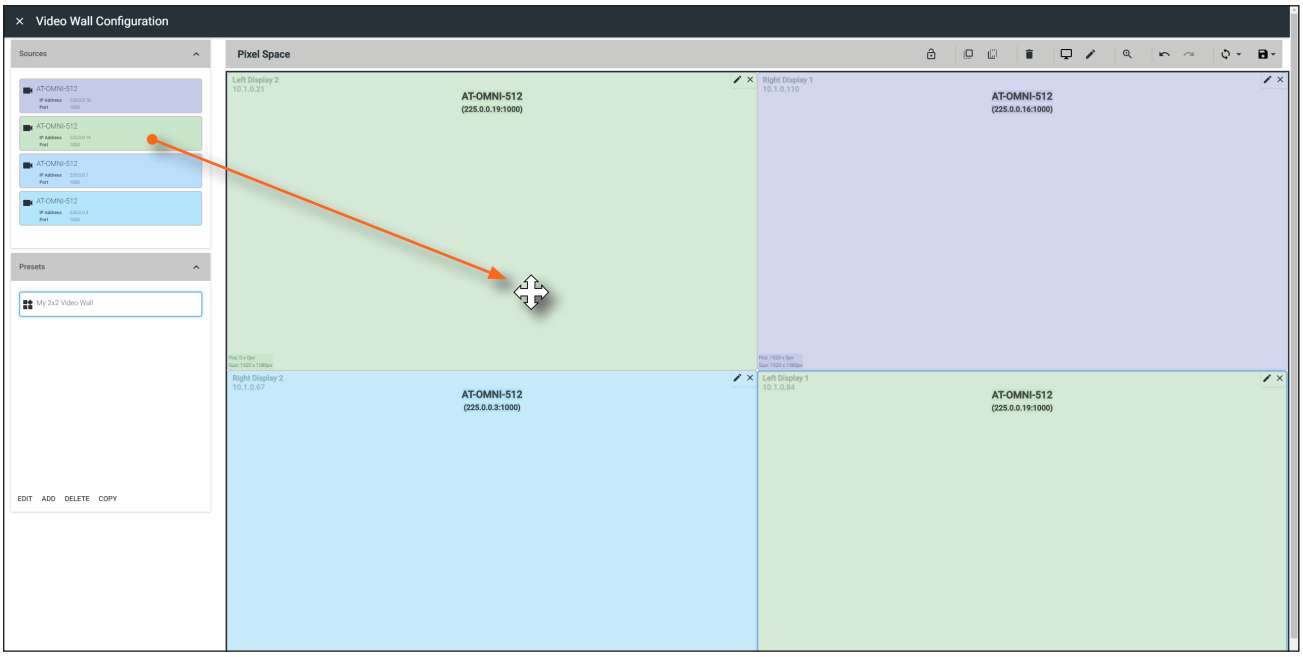


21. Enter than name of the preset in the **Preset Edit** dialog.

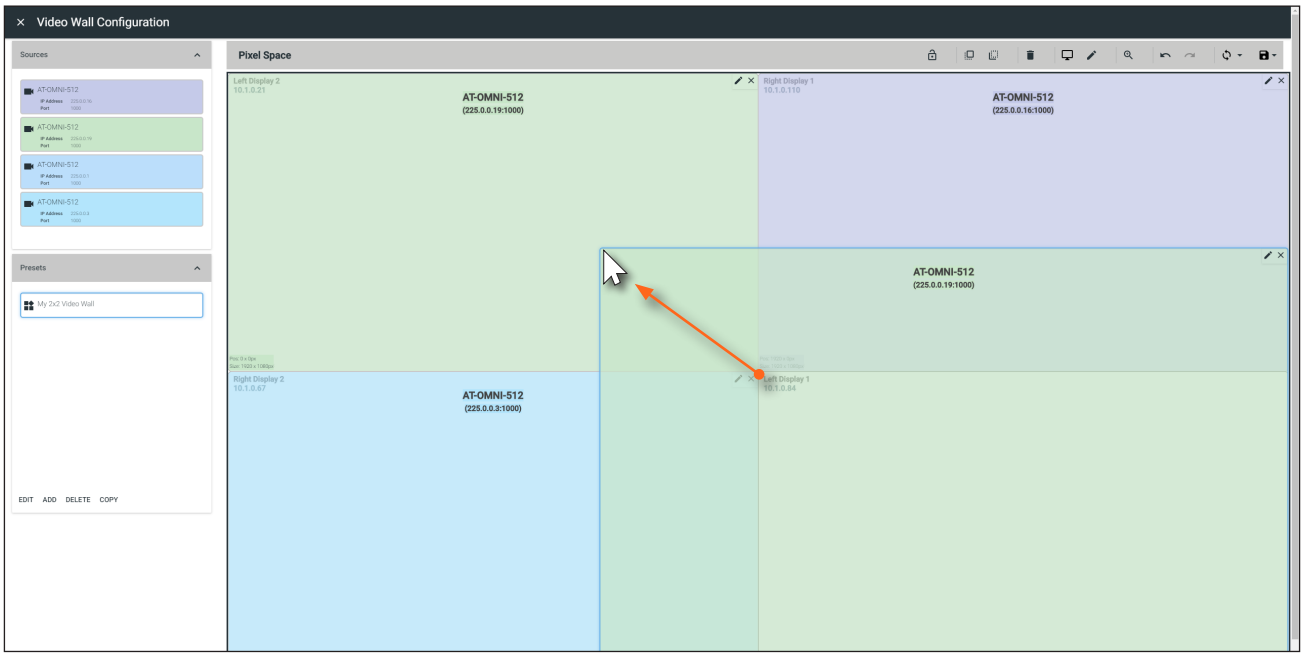
22. Click the **CLOSE** button to save the preset name and dismiss the dialog.



23. Under the **Sources** window, on the left side of the screen, drag and drop the desired source(s) to each display in the **Pixel Space** window. Note that more than one source can be mapped to each display. For example, in the illustration below, the AT-OMNI-512 (225.0.0.19, port 1000) has been mapped to both Left Display 2 (upper-left corner) and Left Display 1 (lower-right corner).



Sources can also be re-sized “on the fly” to achieve the desired presentation. To re-size a source, click and drag the source window horizontally, vertically, or diagonally. Release the mouse to commit the changes. Refer to the *Atlona Velocity User Manual* for more information on manipulating source windows.

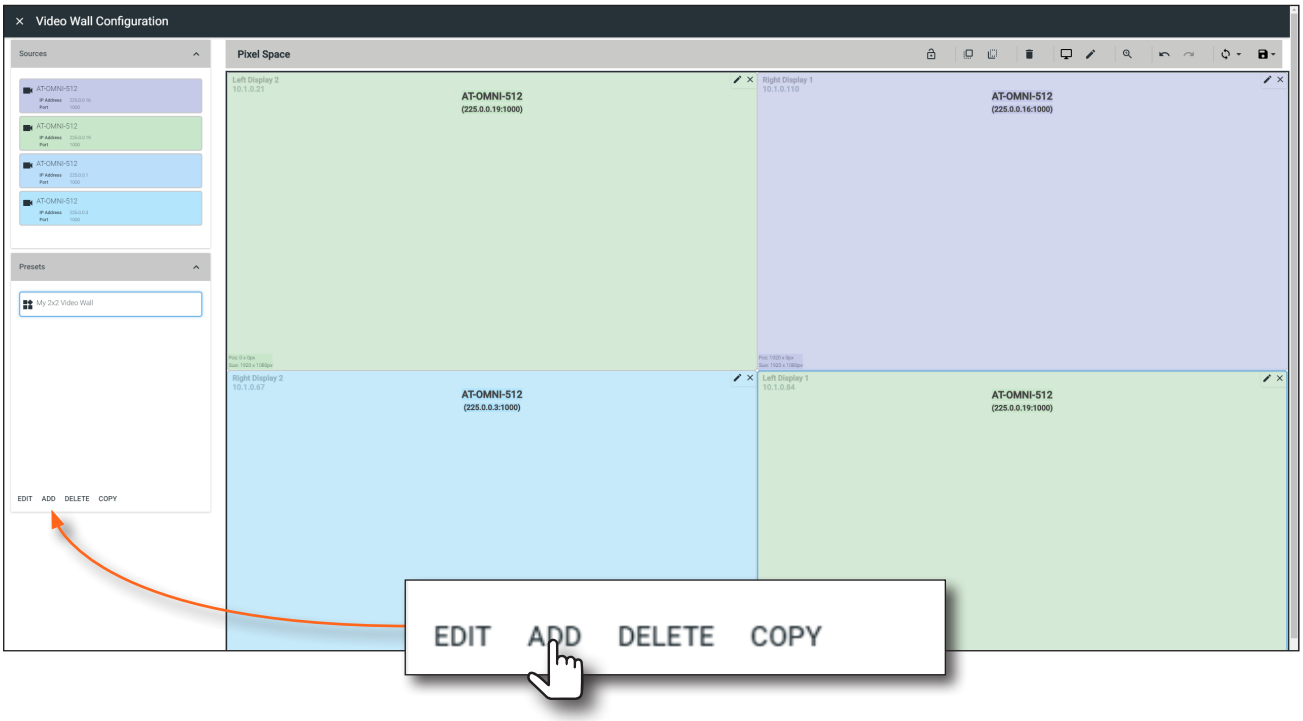


NOTE: When source windows are resized, they will “snap” to the nearest vertical or horizontal border, depending upon the direction that the mouse cursor is being moved. Source windows cannot occupy fractions of a display window.

24. Click **ADD**, under the **Presets** section, on the left side of the screen, to create additional presets.

25. Repeat steps 21 through 23 to create the preset. Once the desired presets have been created, click the preset name under the Presets section to recall it. The video wall will be updated with the selected preset.

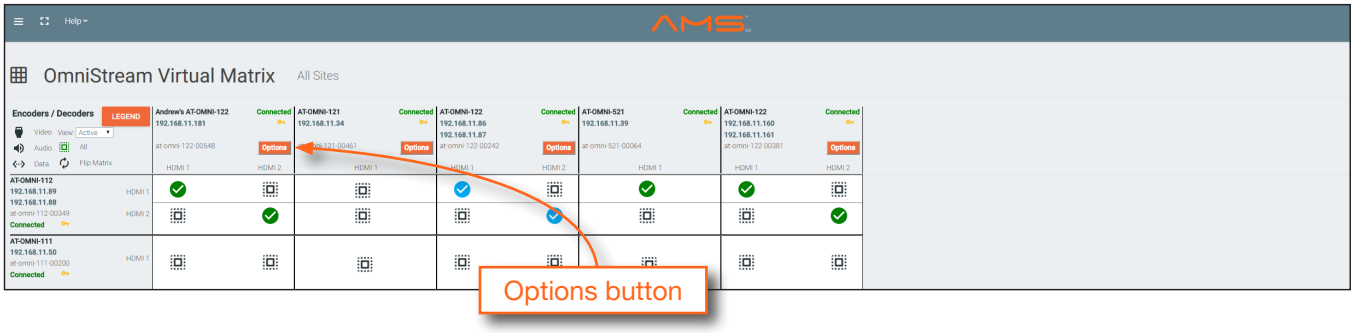
    Refer to the *Atlona Velocity User Manual* for more information on using and recalling presets.



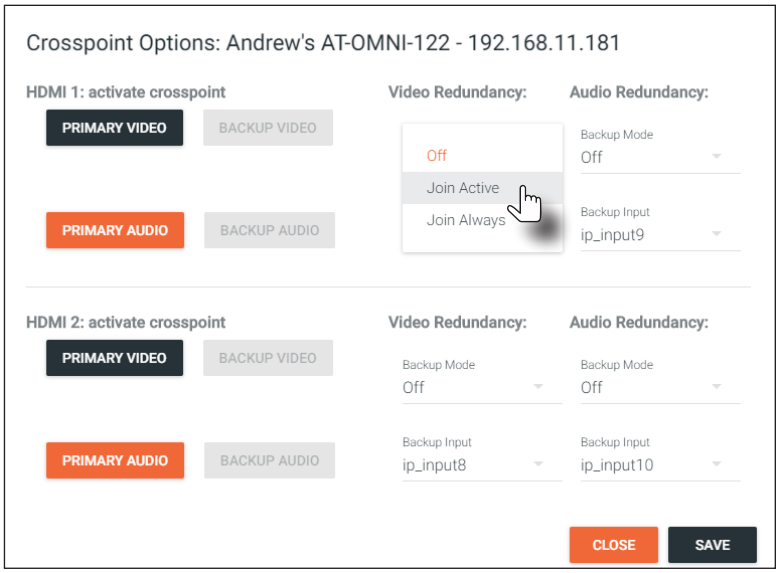
Configuring Redundant Streams

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

1. Login to AMS and access the Virtual Matrix. Refer to The Virtual Matrix (page 86) for more information.
2. In the Virtual Matrix, locate the decoder to be configured for redundancy.
3. Click the **Options** button for the desired decoder. In this example, the decoder in the upper-left corner of this matrix will be used. The **Crosspoint Options** dialog box will be displayed.



4. Select the backup mode for **Video Redundancy** and/or **Audio Redundancy** from the **Backup Mode** drop-down lists. Refer to the table below, for a listing and description of the available modes.



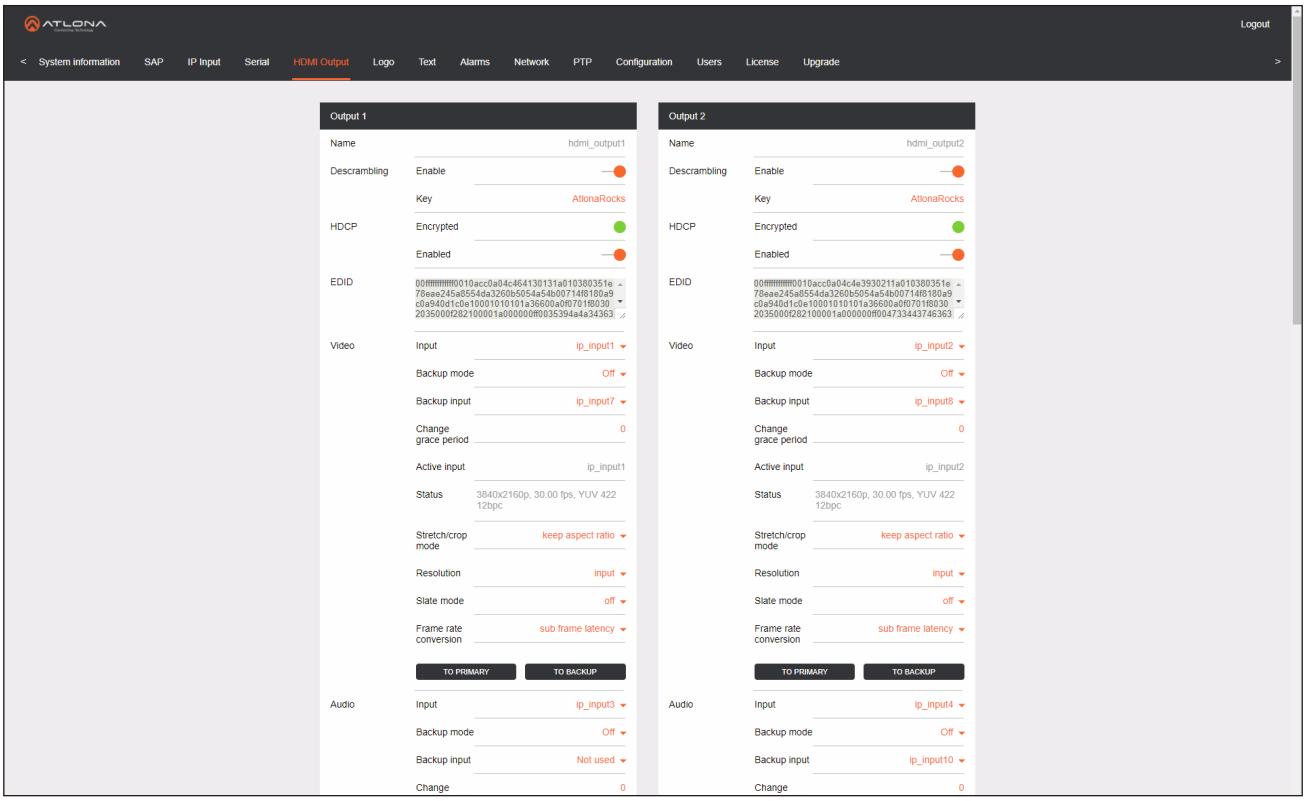
Mode	Description
Off	Redundancy off; output will never switch to the backup stream.
Join Active	The decoder sends a join request only when the primary stream is lost or if the decoder is manually switched to the backup stream. Switch time will not exceed 5 seconds.*
Join Always	The decoder joins both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

** 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.*

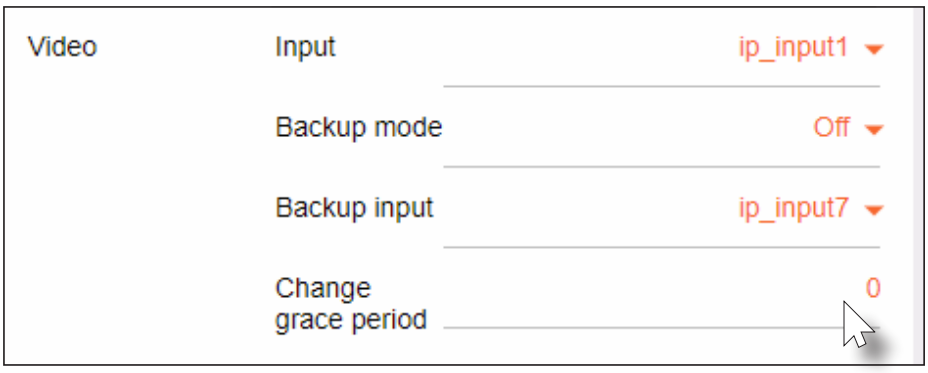
Redundancy Grace Period

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. 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 0 seconds. If set to 0 seconds, automatic failover will occur if the stream is interrupted, for any reason. Refer to Configuring Redundant Streams (page 54) for more information on enabling or disabling redundancy.

1. Login to AMS. Refer to Accessing Decoders in AMS (page 19) if necessary.
2. Click **HDMI OUTPUT** in the menu bar.



3. Locate the **Change grace period** field.
4. Enter the desired value, in seconds. By default, this value is set to 0.

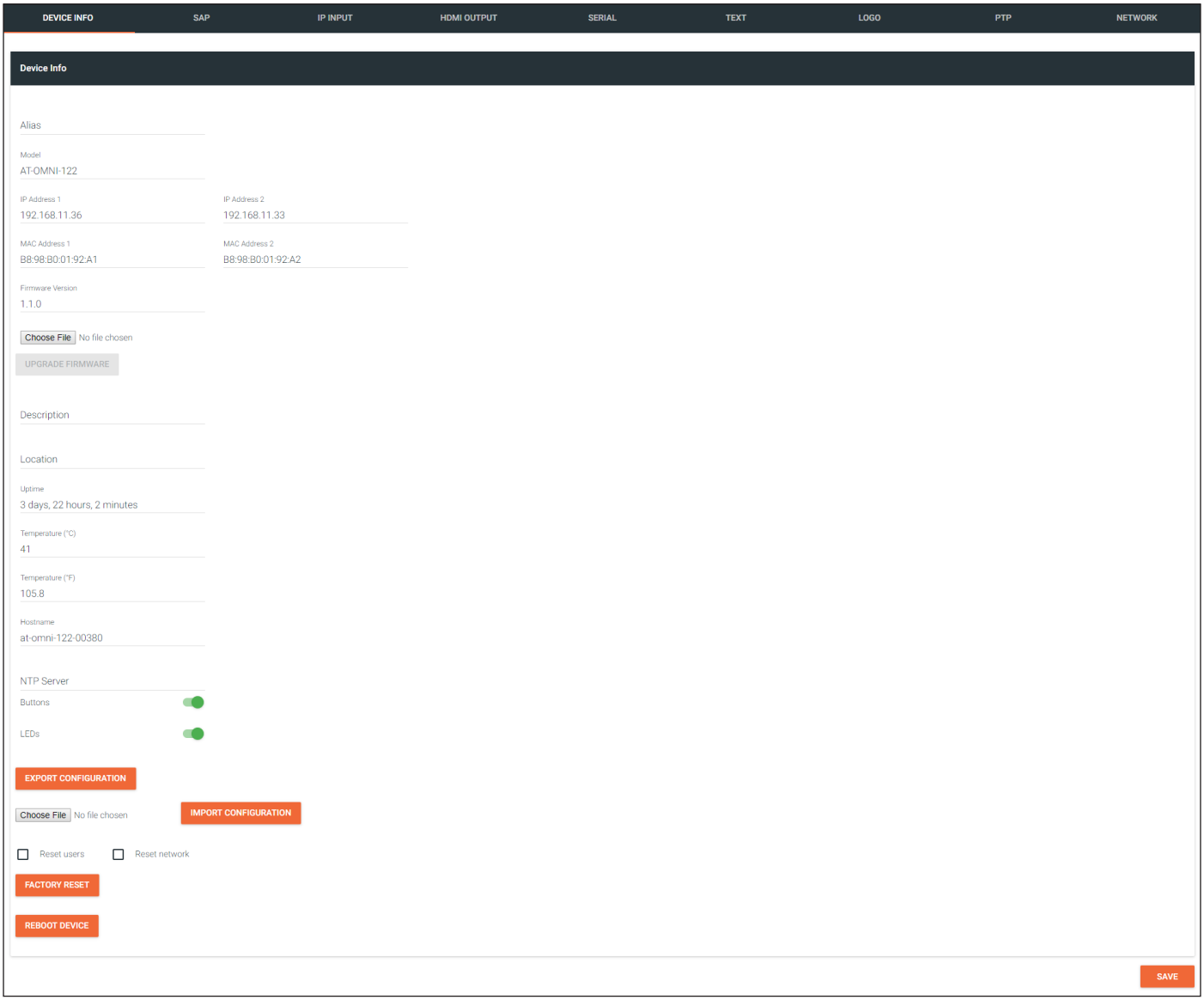


5. Click the **Save** button, at the bottom of the **Output** section.

The AMS Interface

Device Info page

The **Device Info** page provides general information about the decoder.



Alias
Enter a name for the unit in this field. This is optional.

Model
The model number of the unit.

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

IP Address 1 / IP Address 2
Displays the IP address of the ETHERNET 1 and ETHERNET 2 ports, respectively. Single-channel encoders will only have a single IP address.

MAC Address 1 / MAC Address 2
Displays the MAC address of the ETHERNET 1 and ETHERNET 2 ports, respectively. Single-channel encoders will only have a MAC address.

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

Choose File
Click this button to select the firmware file when upgrading the firmware.

UPGRADE FIRMWARE
Click this button to begin the firmware upgrade process.

Description
Provides the option of assigning descriptive name to the unit.

Location
Provides the option of assigning descriptor for the location of the unit.

Uptime
Time elapsed since the last reboot operation.

Temperature (°C)
The current internal temperature of the unit, in degrees Celsius.

Temperature (°F)
The current internal temperature of the unit, in degrees Fahrenheit.

Hostname
The hostname of this unit. This can be changed if desired. By default, the host name is automatically created using the model of the unit and adding the last five digits of the unit serial number.

NTP Server
Specify the desired NTP server in this field. This provides timestamps for any logs and alarms.

Buttons
Disabling this feature will lock the ID button on the front panel. This is enabled by default.

LEDs
Disabling this feature will turn off all LED indicators on the front panel. This is enabled by default.

EXPORT CONFIGURATION
Click this button to export the current configuration settings of the encoder to a local file on the computer. The configuration file will be saved in .json format. The default file name will be in the format: AT-OMNI-1xx_settings_[dd-mm-yyyy]_xx_xx.json.

Choose File
Click this button to select the desired configuration file to be uploaded to the encoder. Once the file is selected, click the **IMPORT CONFIGURATION** button to upload the file.

IMPORT CONFIGURATION
Click this button to upload the configuration file to the decoder.

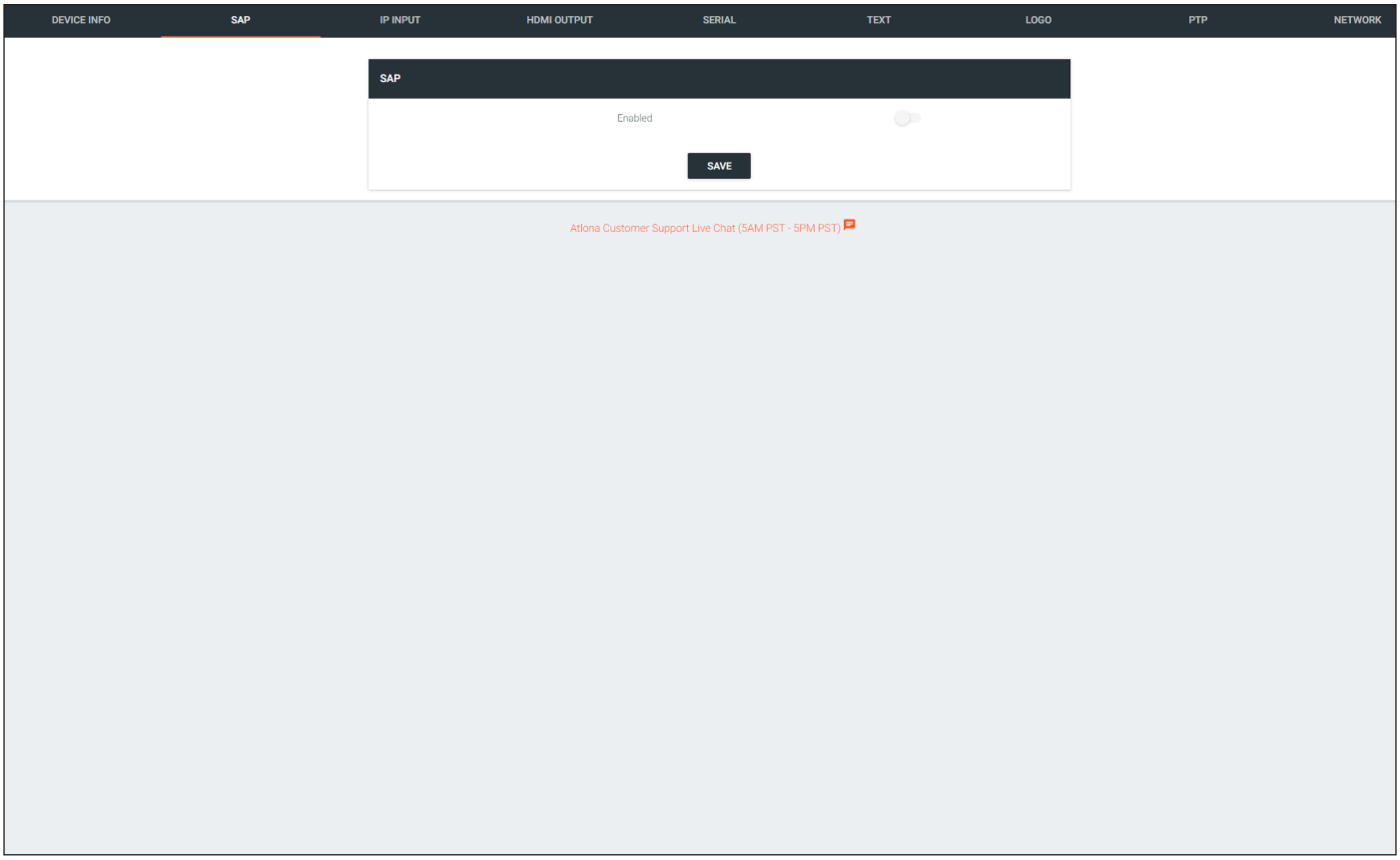
FACTORY RESET
Click this button to reset the encoder to factory-default settings. When performing a factory reset, the following options can be selected, by clicking the check box. If no options are selected, then the encoder is reset with no factory-default settings.

Option	Description
None Checked	Resets the encoder with no factory-default settings.
Reset User	Resets the encoder to factory-default settings and resets custom user information.
Reset Network	Resets the encoder to factory-default settings and resets network information.
Reset Defaults	Resets the encoder to factory-default settings. In addition, static multicast addresses are configured. This option can be used to configure a single encoder to transmit to any number of decoders without using the Virtual Matrix within AMS. **NOTE:** This will not work for multiple encoders on the same network.

REBOOT
Click the **Reboot** button to perform a soft reboot of the encoder.

SAP page

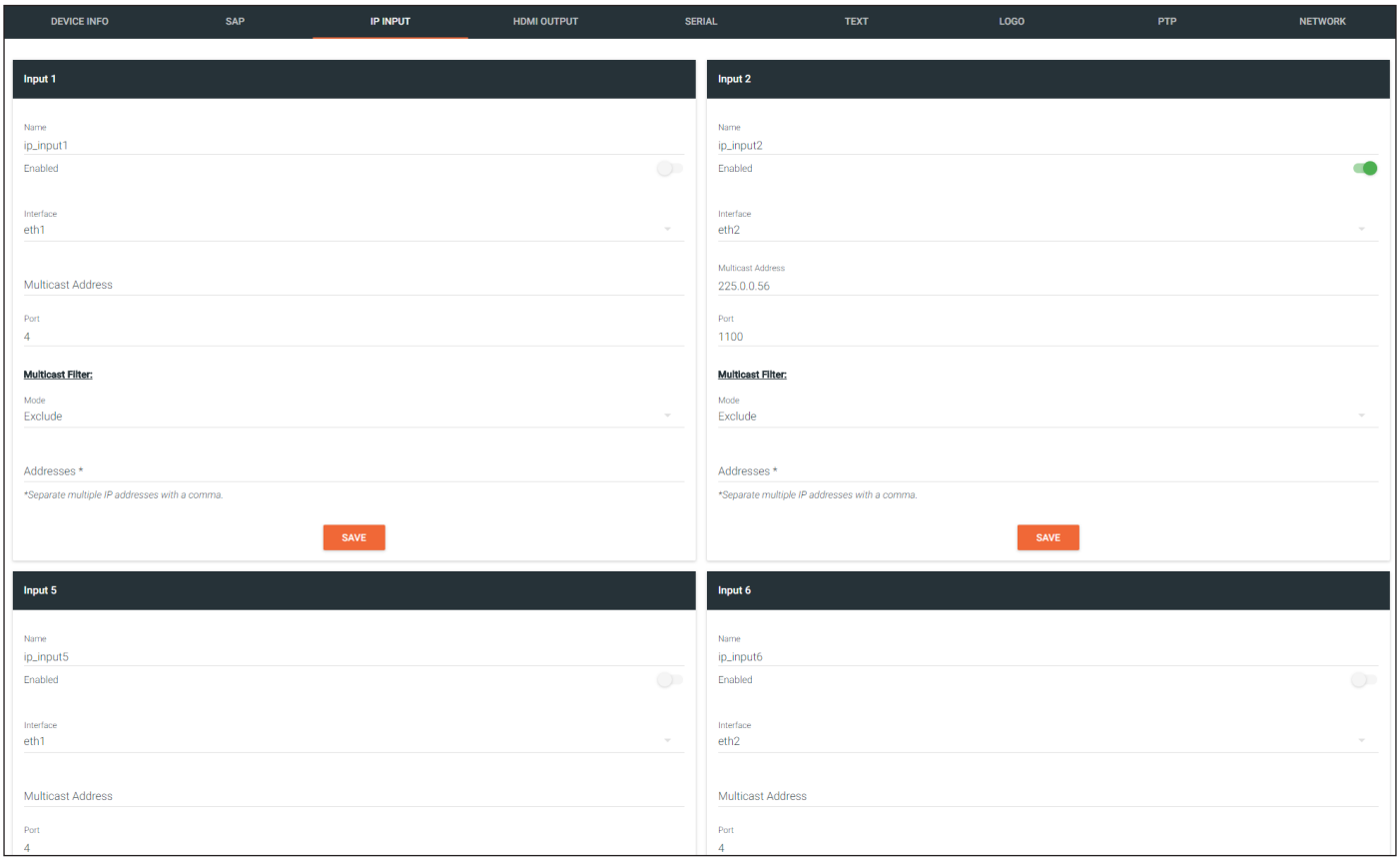
The **SAP** page enables or disables the Session Announcement Protocol protocol. Enabling SAP configures the decoder to look for SAP messages from encoders on the network that are configured to send SAP. Any messages that are discovered will be displayed here.



Enabled
Click this toggle switch to enable or disable SAP. If enabled, the toggle switch will be green. Click the **SAVE** button to commit changes.

IP Input page

The **IP Input** tab provides configuration of each input, the assigned multicast address(es), and ports.



Name
The name used by AMS to identify the IP input.

Enable
Click this checkbox to enable the IP input.

Interface
Select the physical interface, that will be used to carry the multicast traffic, from this drop-down list. When using a single-channel decoder, only **eth1** will be available.

Input	Description
eth1	ETHERNET 1 port
eth2	ETHERNET 2 port

Multicast Address
Enter the multicast address of the decoder stream.

Mode
Click this drop-down list to select the mode. Mode can be set to exclude or include and is specifically used when using Source Specific Multicast (SSM). SSM will only function if the network is properly set up to support it.

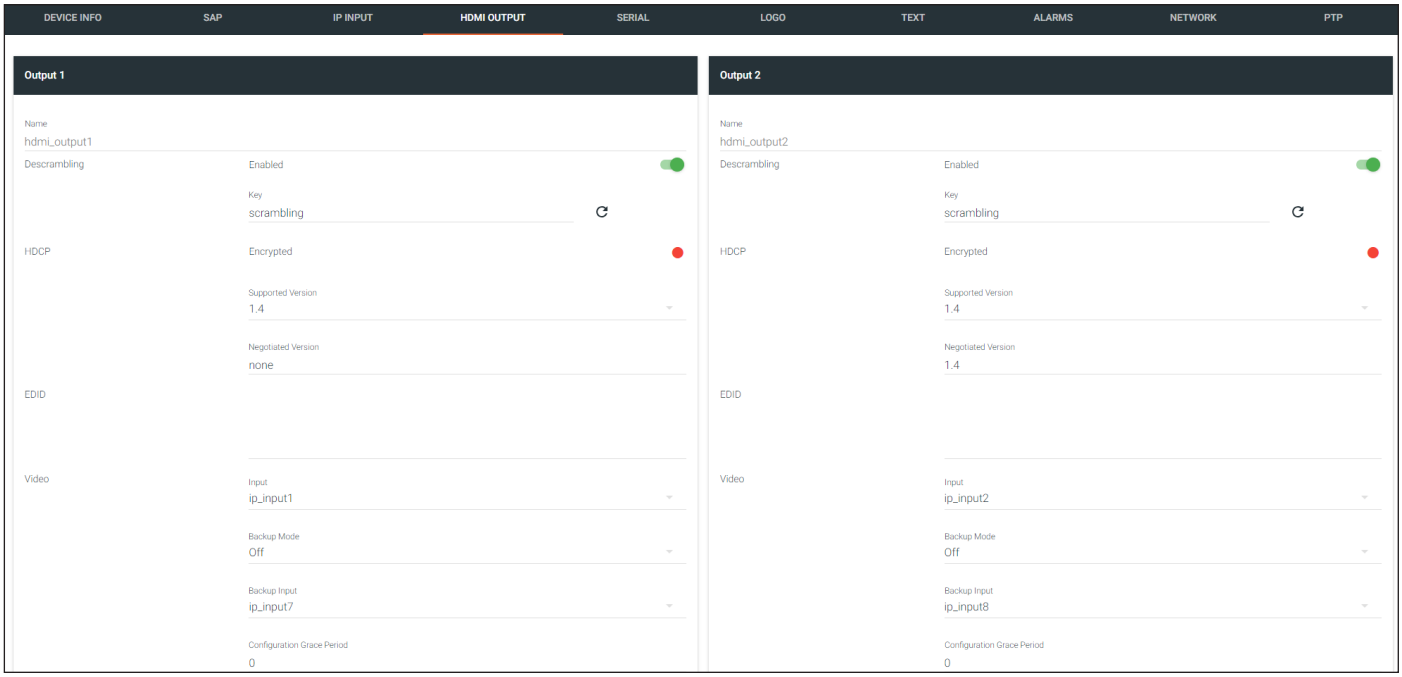
Mode	Description
exclude	Multicast content coming from the source mentioned in the Addresses section will be excluded (blocked).
include	Multicast content coming from the source mentioned in the **Addresses** section, on the next page, to be streamed to the decoder.

Addresses
Enter the IPv4 address of the encoder(s) in this field and is used as the SSM include/exclude list. Use the comma delimiter to separate multiple IP addresses. When using non-SSM networks, this field is ignored.

Port
Enter the multicast UDP listening port in this field.

HDMI Output page

The **HDMI Output** tab provides options to configure the output streams.



Output

Name
The name used by AMS to identify the HDMI output.

Enabled
Click this toggle switch to enable or disable scrambling on the decoder. When enabled, the toggle switch will be green.

Key
Enter the scrambling key in this field. The scrambling key must be ASCII and must contain a minimum of eight characters. Special characters and spaces are not permitted.

Encrypted
Indicates if the content is HDCP-encrypted or not. If true, then HDCP content is being passed in to the decoder and this indicator will be colored green.

Supported Version
Click this drop-down list to select the desired HDCP version. If set to none, then the sink is reported as “non-compliant” and will receive non-HDCP content.

Input	Description
none	The decoder will receive non-HDCP content.
1.4	The decoder will receive HDCP version 1.4 content.
2.2	The decoder will receive HDCP version 2.2 content.

Negotiated Version
The version of HDCP being received.

Video

Input
Click this drop-down list to select the desired primary video input. Select **generator** to use the internal signal generator. Select the **Not Used** option to leave the video input unassigned.

Backup Mode
Select the backup mode from this drop-down list.

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 sources. Switch time will not exceed 5 seconds.
Join Always	The decoder always joins to the backup 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.

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 64) for more information.

Active Input
Displays the currently active IP Input.

Status
This field will display the output resolution. If no video is present, then this field will display **No Active Video**.

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.
fullscreen	Stretches the image to fill the screen. In some cases this can distort (“stretch”) the image.

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	1440 x 1050
Auto	1440 x 900
4096 x 2160	1280 x 1024
3840 x 2160	1280 x 800
1920 x 1200	1280 x 768
1920 x 1080	1280 x 720
1680 x 1050	1024 x 768
1600 x 900	

Slate Mode
Click this drop-down list to select the slate mode. Refer to Slate / Logo Insertion (page 45) 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.

Enable
Click this toggle switch to enable or disable the video wall feature. When enabled, the toggle switch will be green. Refer to Creating Video Walls (page 49) for more information.

To Primary
Click this button to make the video use the Primary IP Input.

To Backup
Click this button to force the video stream to fall over to the Backup IP Input (if redundancy is configured).

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 audio backup mode.

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.

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 64) for more information.

Active Input
Displays the currently active IP 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.

Type	Description
None	Audio is not down-mixed.
Stereo	Audio is down-mixed to two-channel stereo.
Auto	Display is always on, source audio/video signal switches on/off

Enable AES67
Click this toggle switch to enable or disable AES67. When enabled, the toggle switch will be green. Refer to AES67 Audio (page 37) for more information.

Status
This field will display the audio type. If no audio is present, 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 green.

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

Analog Output
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 green.

TO PRIMARY
Click this button to make the audio use the Primary IP Input.

TO BACKUP
Click this button to force the audio stream to fall over to the Backup IP Input (if redundancy is configured).

Aux (CEC)

Auto On
Click this toggle switch to enable or disable power-on. 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.

Standby Timeout
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.

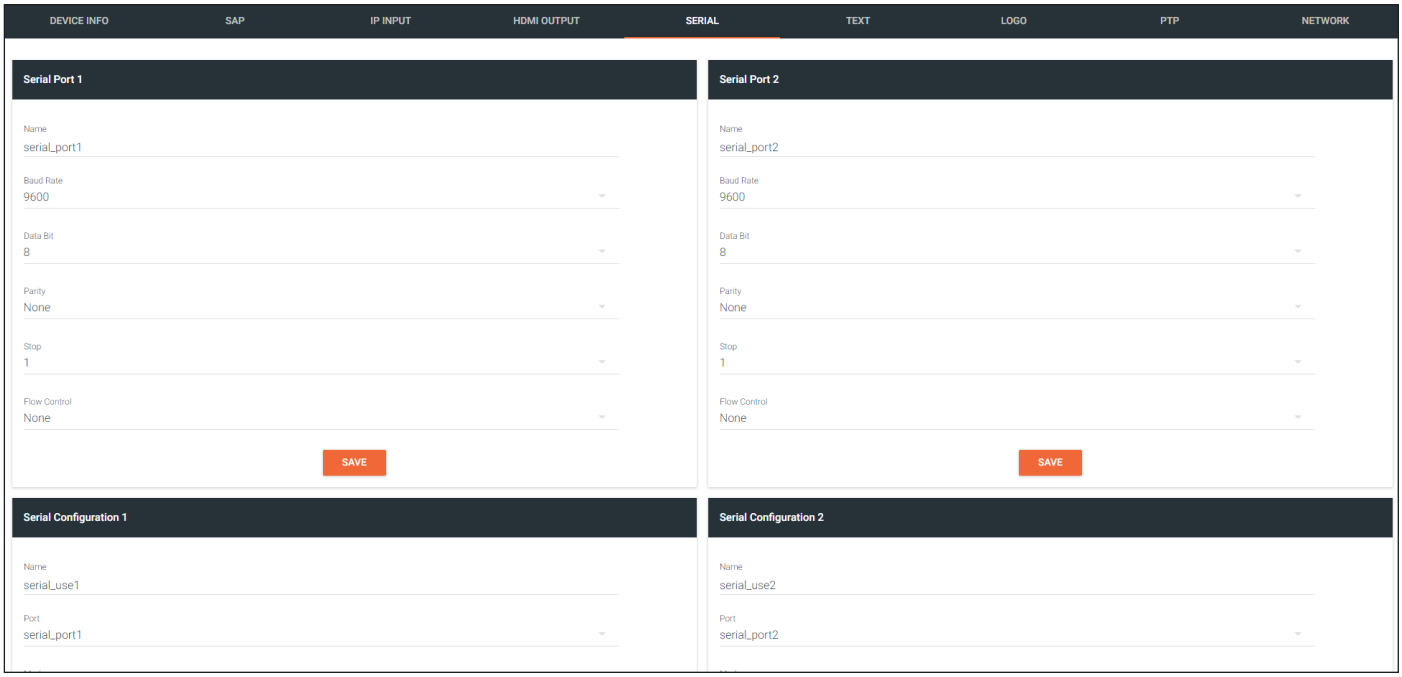
Type	Description
DispSW AVon	Display switches on/off, source audio/video signal always on.
DispSW AVSW	Display switches on/off, source audio/video signal switches on/off.
AV SW	Display is always on, source audio/video signal switches on/off
Always on	Display is always on, source audio/video signal always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

Video Optimization

Video Optimization
Sets the video mode to optimize the output for motion video or computer graphics. Refer to Setting the Video Mode (page 44) for more information.

Serial page

The **Serial Config** tab provides serial port configuration when using control signals.



Serial Port

Name
The name used by AMS to identify the serial port.

Supported Modes
Lists the supported protocols.

Mode
Click this drop-down list to select the desired serial mode: Infrared or Serial.

Baud Rate
Click this drop-down list to select the desired baud rate.

Data
Click this drop-down list to select the number of data bits.

Parity
Click this drop-down list to select the parity bit.

Stop
Click this drop-down list to select the stop bit.

Flow
Click this drop-down list to select the type of flow control.

NOTE: The single-channel decoder will only have one **Serial Port Configuration** section.

Serial Configuration

Name
The name used by AMS to identify the serial port.

Port
Click this drop-down list to select the port: **serial_port1**, **serial_port2**, or **Not Used**.

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

Interface	Description
cli	Displays the command-line interface of the decoder.
Output	Serial port will send commands directly to the display device.
tcpproxy	Commands are sent over IP but triggered over the serial port.

The following **Bidirectional** section must be completed if two-way communication, between the encoder and decoder is required. Bidirectional control is only supported for unicast control sources (not multicast).

NOTE: The **Bidirectional** block will only be displayed if **Mode** is set to **Output**.

Interface
Click this drop-down list to select the physical interface: eth1 or eth2.

Interface	Description
eth1	ETHERNET 1 port
eth2	ETHERNET 2 port

Destination IP address
Enter the IPv4 address of the encoder in this field.

Destination UDP port
Enter the destination UDP listening port in this field.

Enable
Click this toggle switch to enable bidirectional serial communication. When enabled, the toggle switch will be green.

Command

Command
Each of these The **Command** blocks are used to enter the command string for the desired operation: Display Off, Display On, Volume Down, and Volume Up.

Mode
Click this drop-down list to select where the command will be interpreted.

Interpret on	Description
Raw	Commands are interpreted at the encoder.
decoder	Commands are interpreted at the decoder.

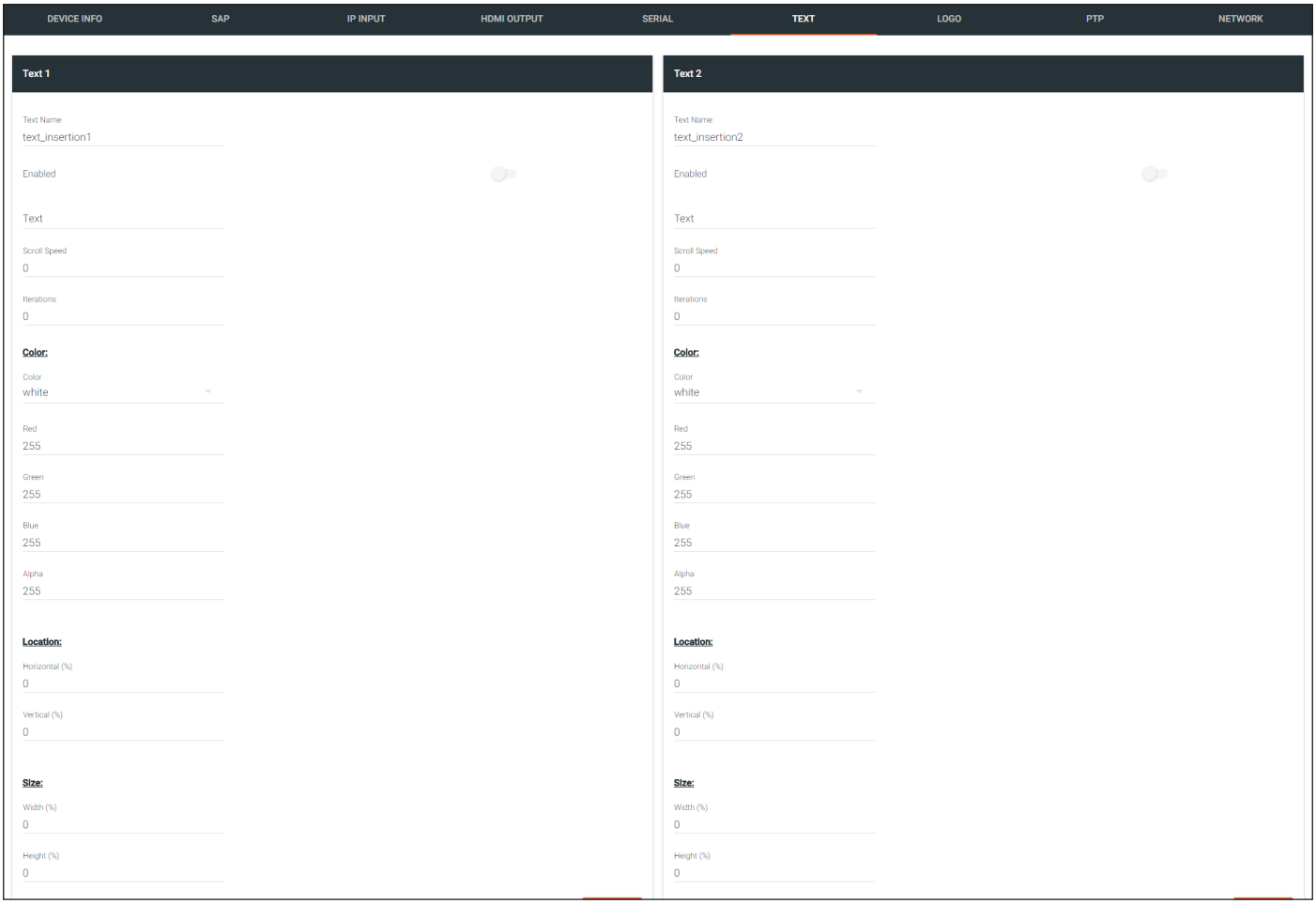
ASCII
Enter the ASCII representation of the command string in this field.

HEX
Enter the hexadecimal representation of the command in this field.

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 only one field be completed.

Text page

The **Text** tab provides the ability to configure text scrolling. Refer to Text Insertion (page 47) for more information.



Text Name
The name used by AMS to identify the text.

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

Text
Enter the desired text in this field.

Scroll Speed
Enter the scrolling speed in this field. 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

Red, Green, Blue, Alpha
Enter the RGBA values for each of the respective fields, to specify the color and transparency of the text. Enter the desired value in 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.

Location

Horizontal (%), Vertical (%)
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 screen.

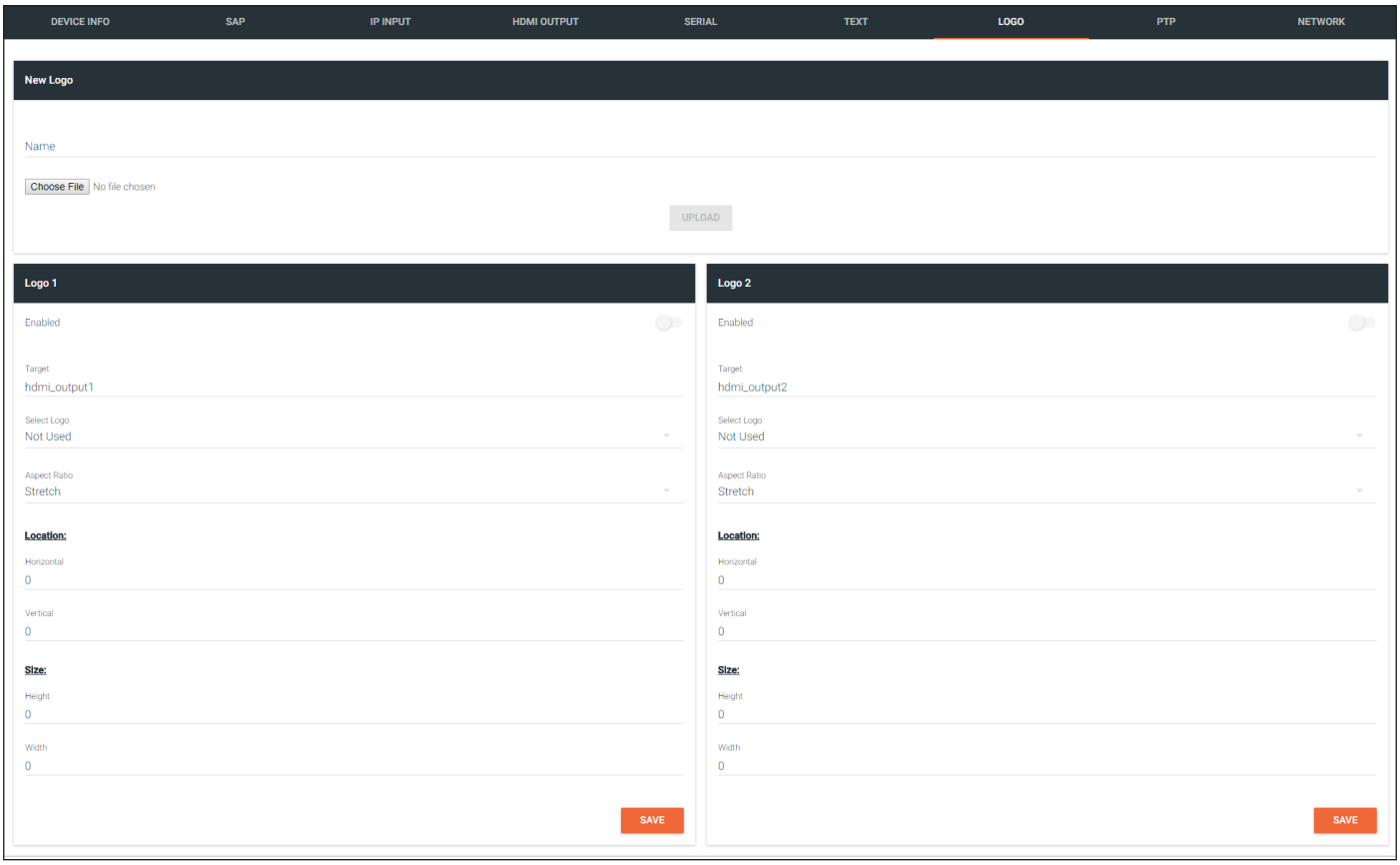
Size

Width (%), Height (%)
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 screen.

Logo page

The **Logo** tab provides the ability to upload a custom logo. This logo will be displayed when no video signal is detected. Separate logos can be uploaded: one for each channel.

Refer to Slate / Logo Insertion (page 45) for more information on using logos.



New Logo

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 format and must not exceed 5 MB (5210000 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

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

Target
The name used by AMS to identify the decoder.

Select Logo
Click this drop-down list to select the desired logo. If no logo files are uploaded, then this will be set to Not Used.

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

Horizontal
Enter the horizontal position of the logo on the screen.

Vertical
Enter the vertical position of the logo on the screen.

Height
Enter the horizontal resolution of the logo, in pixels.

Width
Enter the vertical resolution of the logo, in pixels.

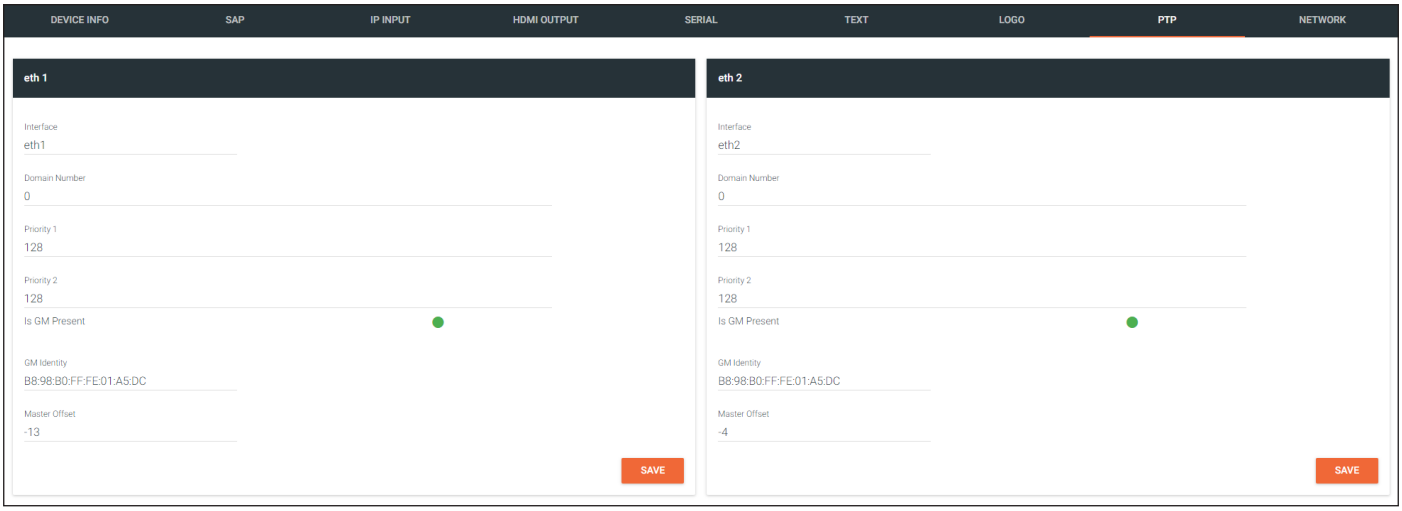
NOTE: Maximum logo resolution (both height and width) is 1/4 of the video resolution.

PTP page

The **PTP** tab 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 interface 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 unit is more likely to get selected as GM.

NOTE: 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.



Interface
The name used by AMS to identify the interface.

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.

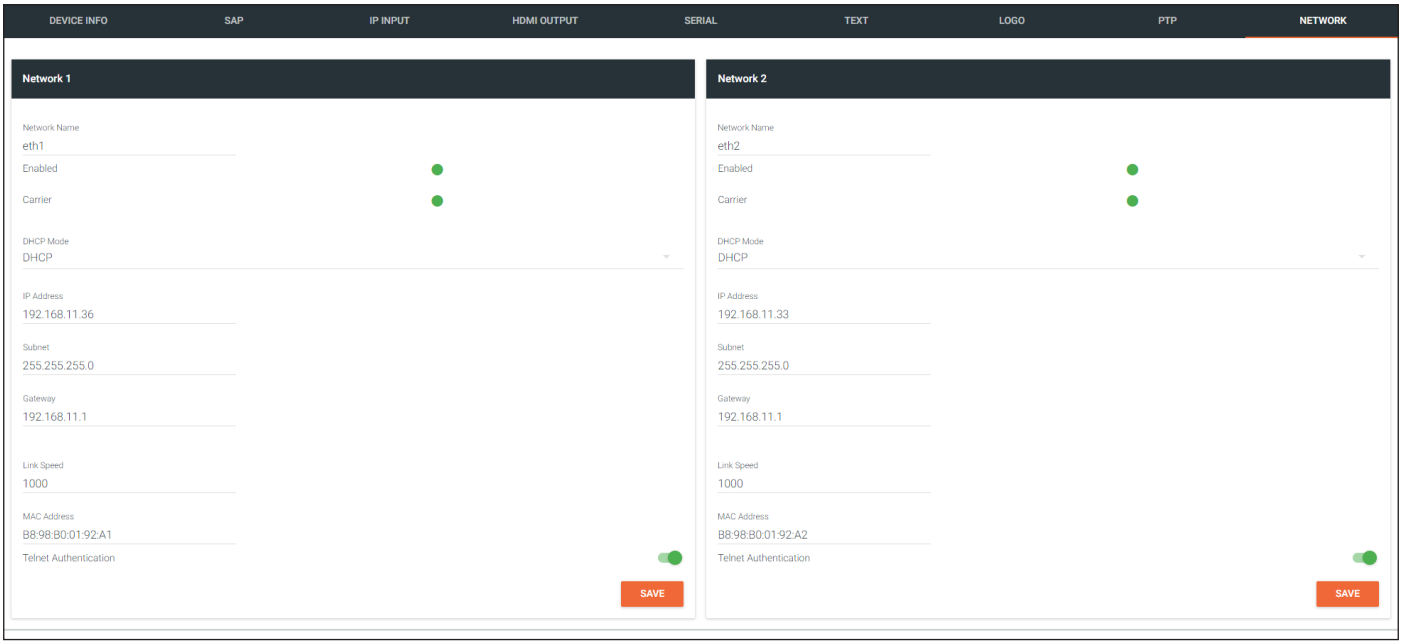
Is GM Present
This indicator displays the existence of a grandmaster clock for the specified PTP domain number. If the indicator is green, then the grandmaster clock exists on this interface.

GM Identity
The grandmaster clock identity. If this field is blank, then it means that this interface is the grandmaster clock.

Master Offset
Displays the grandmaster clock offset.

Network page

The **Network** tab provides the ability to enable or disable DHCP mode for each network interface. When DHCP mode is disabled, the IP address, subnet mask, and gateway must be provided.



Name
The name used by AMS to identify the interface.

Enabled
This indicator displays whether or not the video stream for this channel is active. If the indicator is green, then the video stream is active.

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

DHCP Mode
Click this drop-down list to select the desired network mode. Select DHCP to let the DHCP server (if present) assign the decoder the IP settings; **Subnet** and **Gateway** fields will automatically be populated. When **Static** mode is selected, the information for the **IP Address**, **Subnet**, and **Gateway** fields must be entered.

IP Address
Displays the IP address used by the channel. This field can only be changed if **Static** mode is selected.

Subnet
Displays the subnet mask for the channel. This field can only be changed if **Static** mode is selected.

Gateway
Displays the gateway (router) address for the channel. This field can only be changed if **Static** mode is selected.

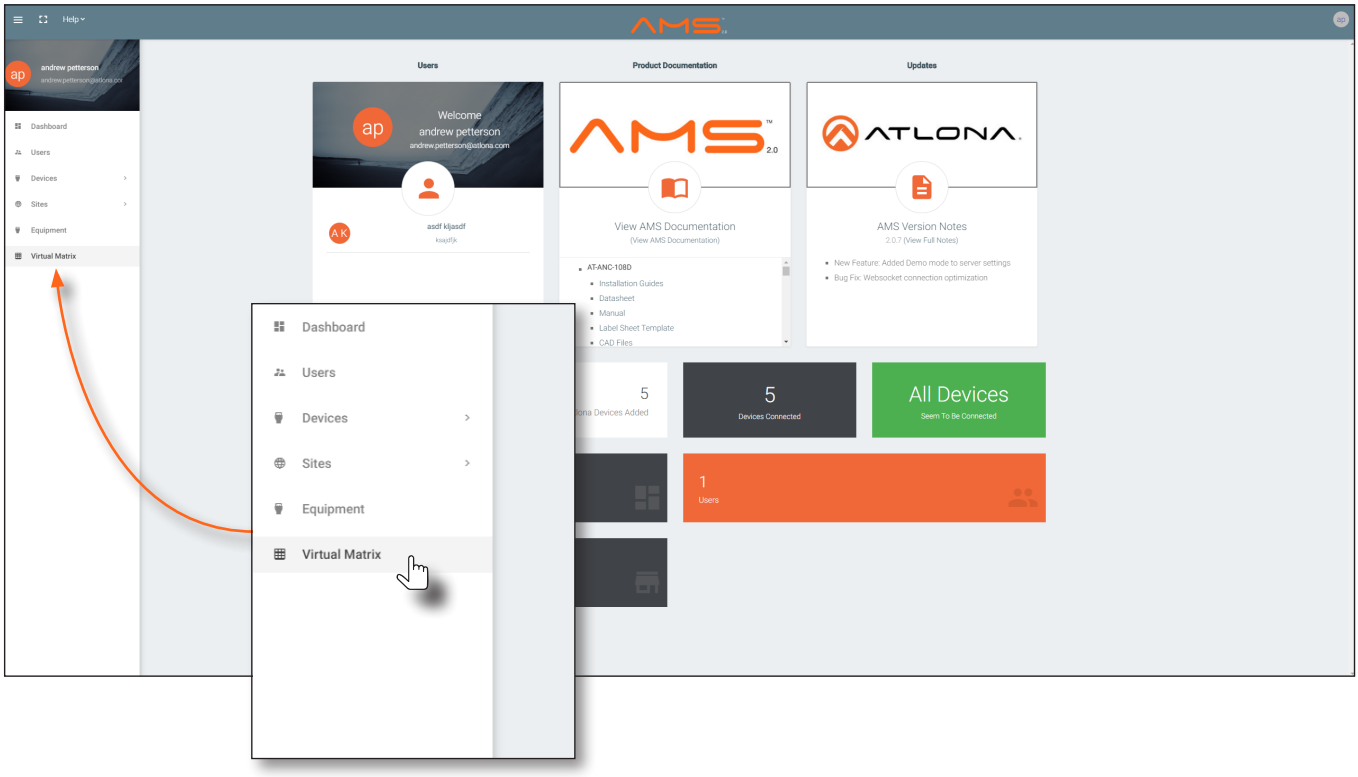
Link Speed
Displays the port speed in Mbps.

MAC Address
The MAC address of the Ethernet channel.

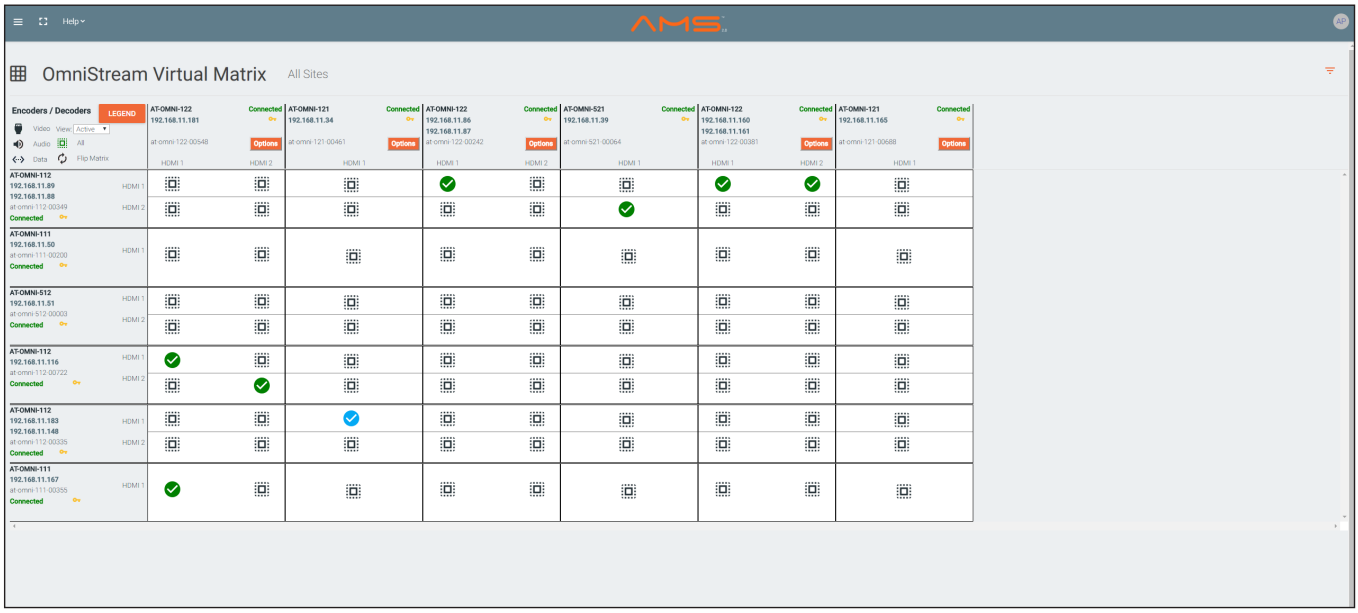
Telnet Authentication
Click this toggle switch to enable or disable Telnet authentication. If the toggle switch is green, then login credentials will be required at the start of a Telnet session.

The Virtual Matrix

1. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
2. Click **Virtual Matrix**.



3. The **OmniStream Virtual Matrix** page will be displayed.



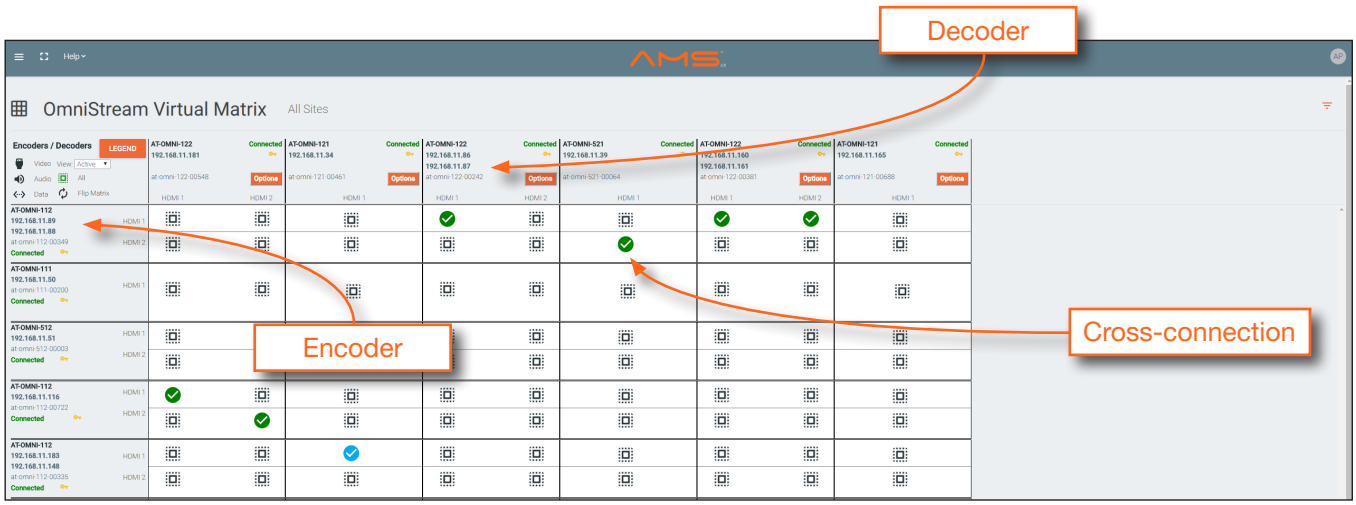
Layout and Operation

The illustration below, shows a multiple OmniStream units (encoders and decoders). The Virtual Matrix is organized into rows and columns.

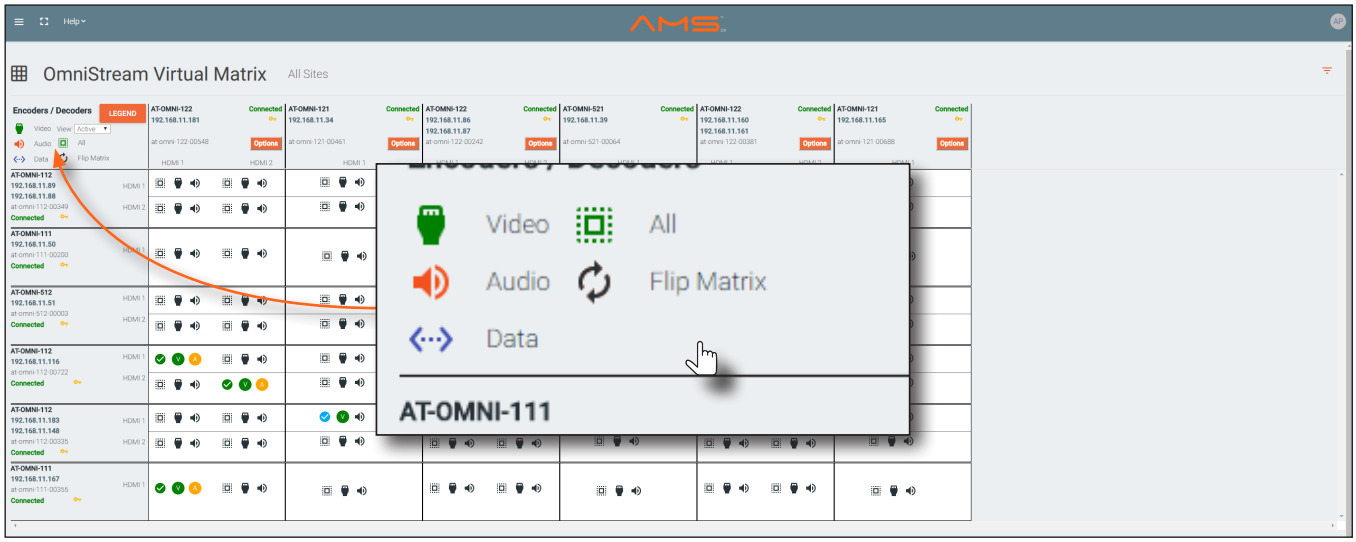
The blue circle with the checkmark indicates that these two OmniStream units are connected to one another. The second column identifies a dual-channel decoder (AT-OMNI-122). The third row shows a dual-channel encoder (AT-OMNI-112). In this example, the source signal on **HDMI 1 IN** (encoder) is being sent out, over the network, and will be displayed on **HDMI 1** on the decoder. This will create a *cross-connection*, which connects both the encoder and decoder together.

- **Creating a cross-connection**
  To route an input on an encoder to an output, locate the row and column where an input and output intersect, then click the square with the dots around it.

- **Removing a cross-connection**
  To remove a *cross-connection*, click on the desired circle icon with the check mark symbol. The square with the dots around it will be displayed indicating that the *cross-connection* has been removed.

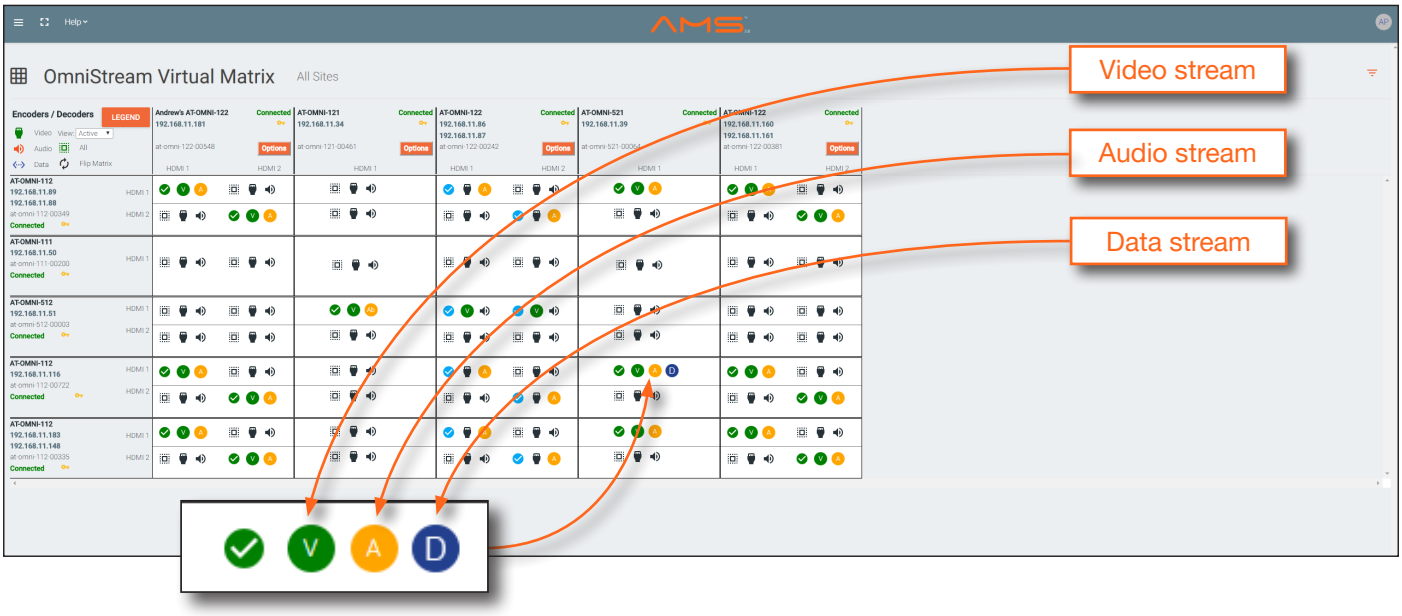


- To view the individual streams for video, audio, and data, click the icons on the upper-left corner of the screen.



When these icons are clicked, the associated icons will be displayed in the rows and columns of the Virtual Matrix.

Symbol	Description
V	Video only
A	Audio only
D	Data only
✓	Connected; not all signals are active
✓	Connected; all streams are being used



IMPORTANT: R-Type and Pro compatiblity: R-Type encoders (AT-OMNI-512) and decoders (AT-OMNI-521) operate in Video Mode, only. Pro encoders can be set to either Video Mode or PC Mode. Video Mode is incompatible with PC Mode. Therefore, in order for both R-Type and Pro encoders/decoders to work within a system, Pro encoders/decoders must be set to Video Mode. Refer to Setting the Video Mode (page 44) for more information.

- Click the **Video**, **Audio**, and **Data** icons to return to the normal view.
- Since only HDMI (both audio and video) is being used, the V (video) and A (audio) icons are displayed. The blue circle with the checkmark indicates that the cross-section has been created. However, not all streams are being used. Refer to the chart below.
- This illustration also shows that the data stream (the icon with two arrows and three dots), which is used for control, is also being used and is displayed as a dark-blue circle with the letter “D”.
- The icons in the upper-left corner can also act as a filter. This allows for a clear breakdown of where signals are being routed and is useful when several encoders and decoders are used on a network.

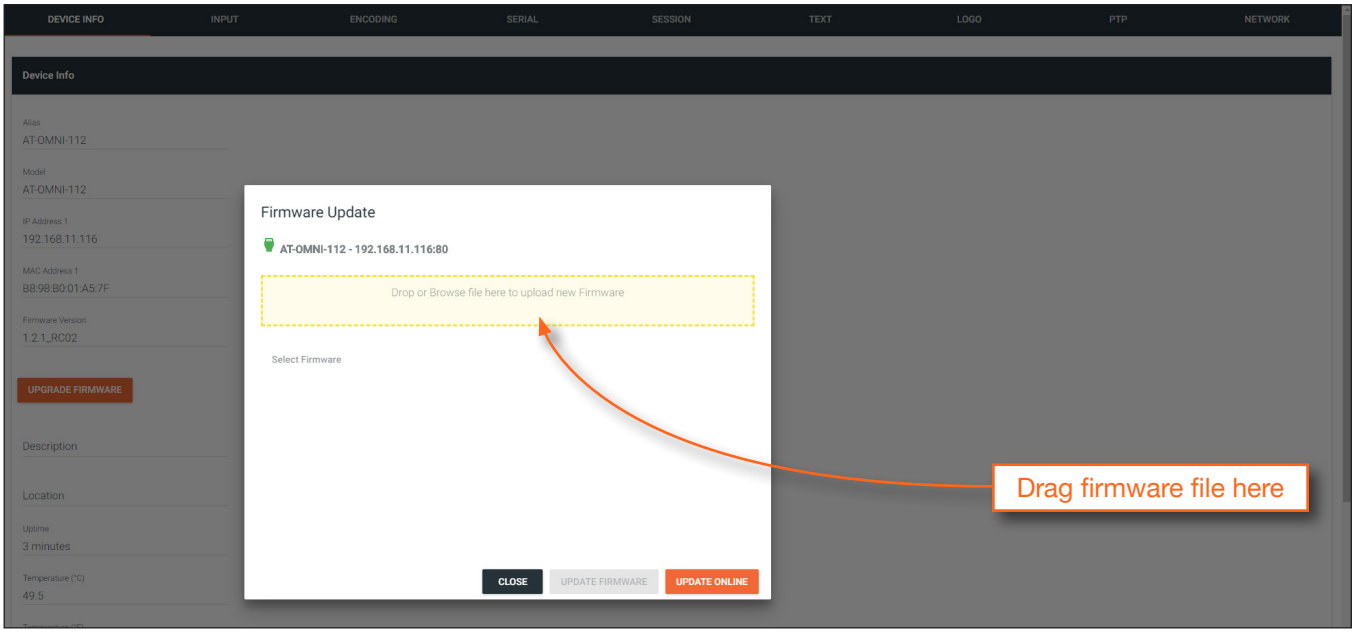
Appendix

Updating the Firmware

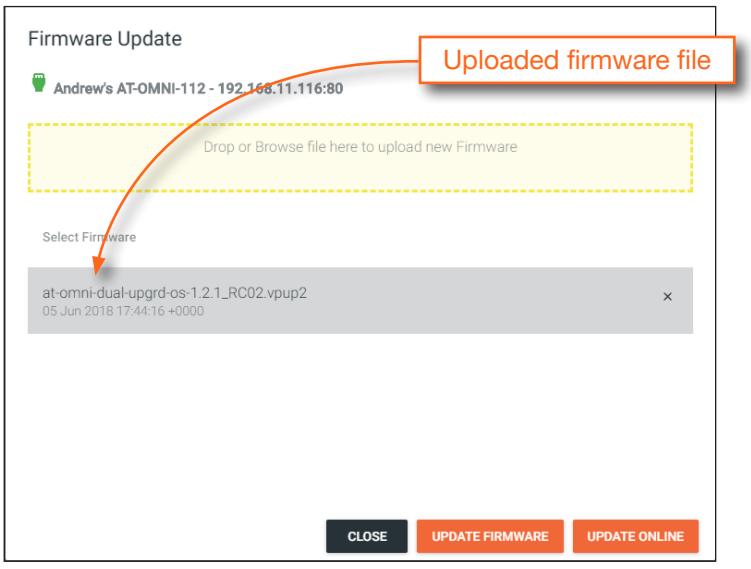
Firmware updates are managed through the Atlona Management System (AMS) software.

IMPORTANT: If updating to 1.2.1 from version 1.0, OmniStream units must first be updated to version 1.1.

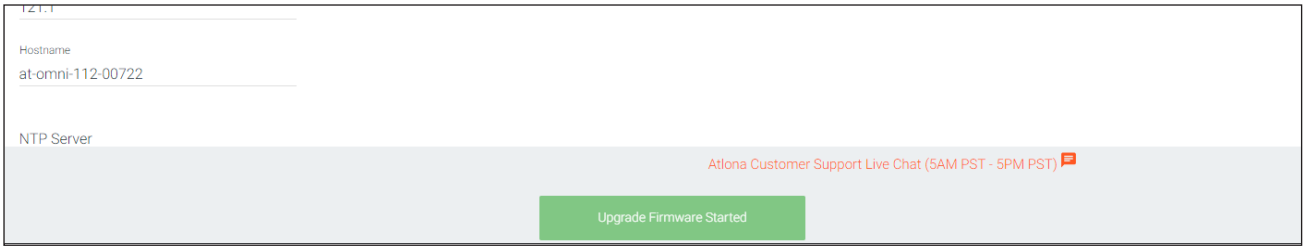
1. Click **DEVICE INFO** in the menu bar.
2. Click the **UPDATE FIRMWARE** button to display the **Firmware Update** dialog.



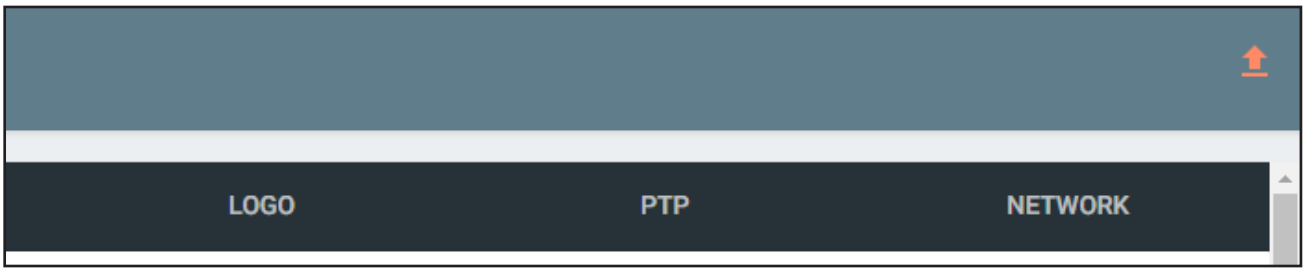
3. Click and drag the firmware file to yellow box, to upload the firmware to the device. OmniStream firmware files use the .v2pup file extension. Once the firmware file has been uploaded, it will appear under the **Select Firmware** section of the dialog box.
4. Click the **UPDATE FIRMWARE** button to begin the update process.
5. Click and drag the firmware file to yellow box, to upload the firmware to the device. OmniStream firmware files use the .v2pup file extension. Once the firmware file has been uploaded, it will appear under the **Select Firmware** section of the dialog box.
6. Click on the firmware file name to highlight it.
7. Click the **UPDATE FIRMWARE** button, at the bottom of the dialog box, to begin the update process.



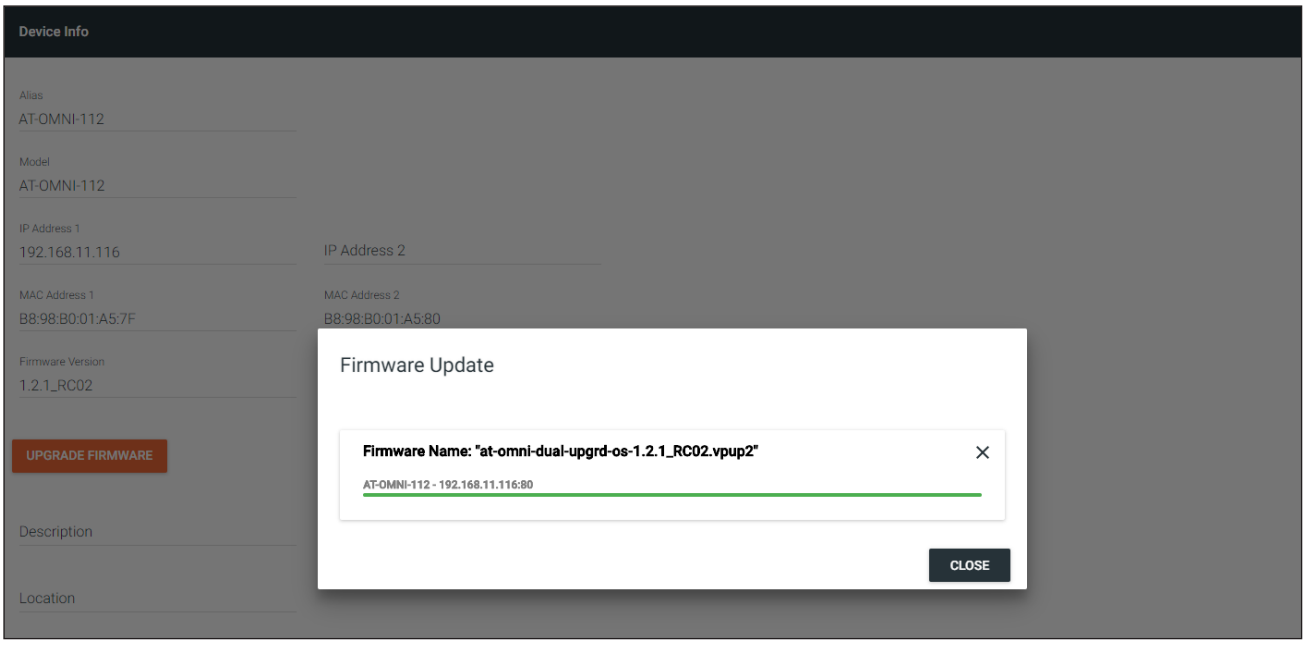
After the **UPDATE FIRMWARE** button is clicked, the Upgrade Firmware Started message box will be displayed.



8. Click the orange up-arrow icon, in the upper-right corner of the screen, as shown below. If this icon is orange, it indicates that a firmware update is in progress.



The progress bar for the update process will be displayed. The update process should take a few seconds.



9. Click the “X” to close out the progress bar window, then click the **CLOSE** button to dismiss the **Firmware Update** message box.
10. The firmware update process is complete.
11. Clear the web browser cache and refresh the web page. The new firmware version will appear in the **Firmware Version** field, in the **DEVICE INFO** page.

FEC Details

Matrix Size, Overhead, and Latency

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

FEC and Video Bitrate

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

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

$$\text{FEC rate} = \text{Configured bit rate} - \text{Video rate}$$

- 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, Atlona recommends either leaving FEC disabled for audio or using a very small matrix.
- Latency calculations are complex. The tables below provide some common working benchmarks. In order to minimize lip sync issues, try to match the additional latencies for video and audio as closely as possible.
  - » Video - additional video latency for enabling FEC using various matrix sizes.

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

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

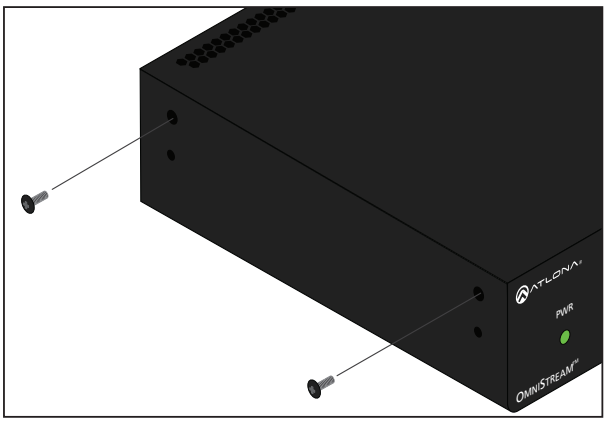
Format	1x4	2x4	4x4	10x10
2 channel PCM, 44.1 kHz	34.01 ms	68.03 ms	136.10 ms	850.30 ms
2 channel PCM, 48 kHz	31.25 ms	62.50 ms	125.00 ms	781.30 ms
2 channel PCM, 96 kHz	15.63 ms	31.25 ms	62.50 ms	390.60 ms
2 channel PCM, 192 kHz	7.81 ms	15.63 ms	31.25 ms	195.30 ms

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

Mounting Instructions

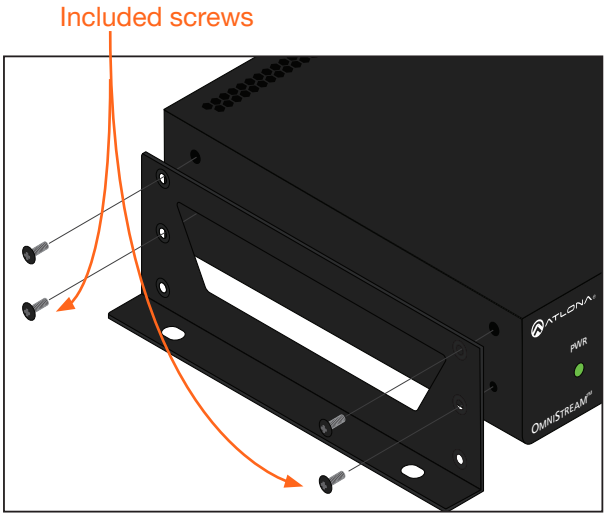
OmniStream decoders includes two mounting brackets and four mounting screws, which can be used to attach the unit to any flat surface.

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.



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.

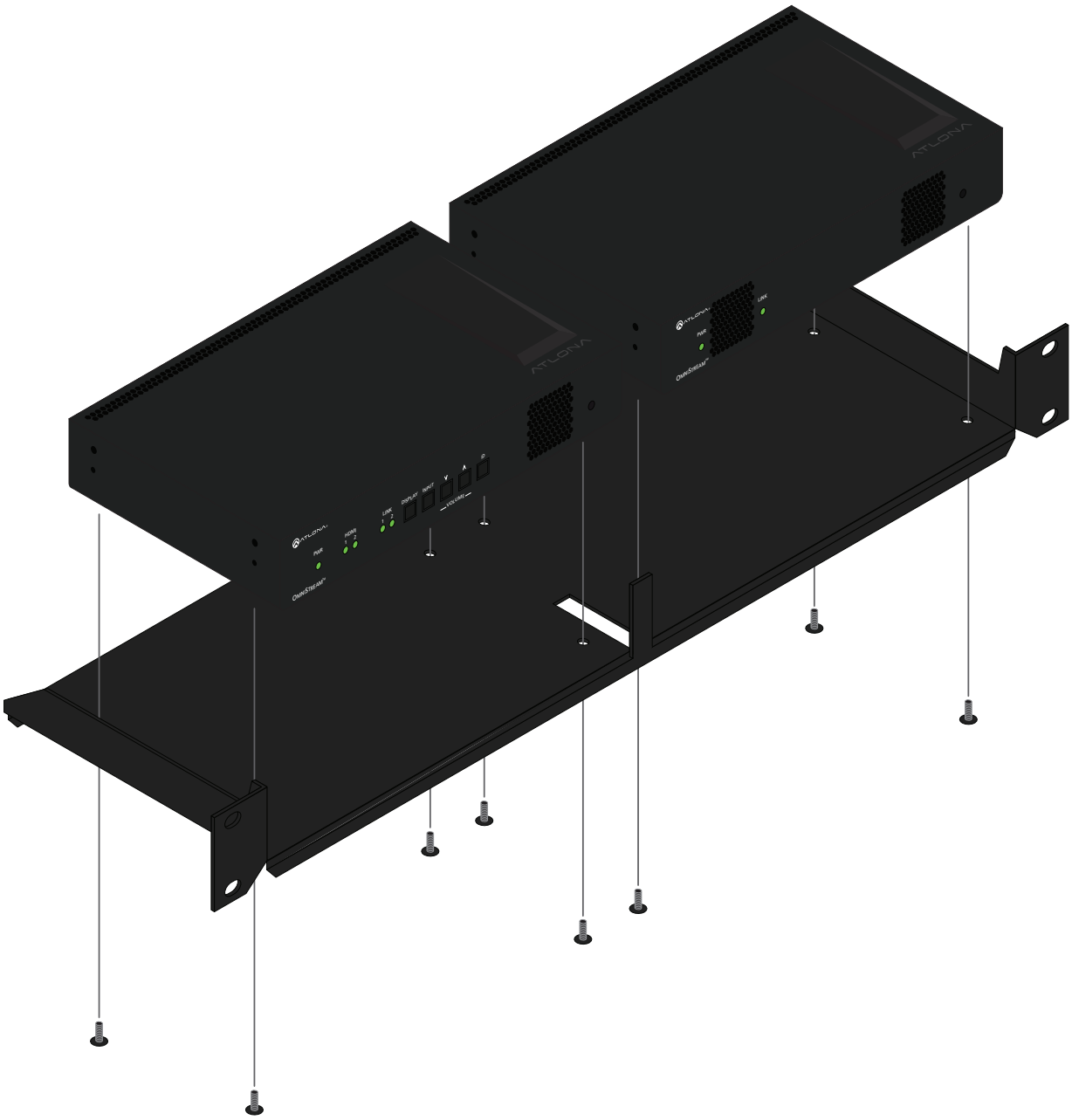
Rack Tray for OmniStream

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

Dual-Channel Decoder

Video	
HDMI Specification	HDMI 2.0, HDCP 1.4
UHD/HD	4096×2160 (DCI) @60/30/24 Hz, 3840×2160(UHD)@60/50/24/25/30 Hz, 1080p@23.98/24/25/29.97/30/50/59.94/60 Hz, 1080i@25/29.97/30 Hz, 720p@30/50/59.94/60 Hz
VESA*	1920x1200, 1680x1050, 1600x1200, 1600x900, 1440x900, 1400x1050, 1366x768, 1360x768, 1280x1024, 1280x800, 1280x768, 1152x768, 1024x768
Color Space	YUV, RGB

*All VESA resolutions are 60 Hz.

Decoding	
Density	Two decoding engines
Decoding Format	VC-2 (SMPTE-2042)
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0
Video Quality Optimization	User-selectable: Computer Graphics or Motion Video
Color Depth	8-bit, 10-bit, 12-bit
HDR	HDR10, HLG
Bit Rate	Supports bit rates up to 900 Mbps
Latency	0.5 frame (e.g. 1080p @ 60 Hz latency is < 8 ms between encoder and decoder) Note: Unusual network configurations may increase overall latency

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, 44.1k Hz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
Bit Depth	Up to 24-bit
Analog audio†	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

†External power supply is required when using the analog audio interface.

Protocols	
Audio Video Streaming	RTP
Audio Transport	AES67
Addressing	DHCP, static
Decryption	AES-128
Management	HTTPS, SSH, SCP, and WebSockets with TLS
Authentication	IEEE 802.1x: PEAP/MSCHAPv2 or EAP-TLS

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

Control	
CEC	Supported and triggered from control systems and OmniStream encoders
RS-232	Device control and configuration; supports baud rates from 2400 to 115200 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	2 - Type A, 19-pin, female, locking
ETHERNET†	2 - RJ45, 10/100/1000 Mbps
RS-232 / IR	1 - Euroblock, 6-pin (2 ports); RS-232 on port 1 and 2, IR on port 2 only
AUDIO	2 - Euroblock 10-pin; AUDIO 1 IN/OUT, AUDIO 2 IN/OUT; accepts balanced or unbalanced line
Power	1 - Euroblock, 2-pin

†Maximum distance per hop 300 ft (100 m), depending upon network configuration.

Indicators and controls	
PWR	1 - LED, tricolor (red, amber, green)
HDMI	2 - LED, bicolor (red, green)
LINK	2 - 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 25 W (w/ analog audio)
External Power Supply (optional)	Part number: AT-PS-48083-C Input: 110 - 220 V AC, 50/60 Hz Output: 48 V DC, 0.83 A
Safety	CE, FCC, cULus, RoHS, RCM

Environmental	
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
Safety	CE, RoHS, FCC

Single-Channel Decoder

Video	
HDMI Specification	HDMI 2.0, HDCP 1.4 / 2.2
UHD/HD	4096×2160 (DCI) @60/30/24 Hz, 3840×2160(UHD)@60/50/24/25/30 Hz, 1080p@23.98/24/25/29.97/30/50/59.94/60 Hz, 1080i@25/29.97/30 Hz, 720p@30/50/59.94/60 Hz
VESA*	1920x1200, 1680x1050, 1600x1200, 1600x900, 1440x900, 1400x1050, 1366x768, 1360x768, 1280x1024, 1280x800, 1280x768, 1152x768, 1024x768
Color Space	YUV, RGB

*All VESA resolutions are 60 Hz.

Decoding	
Density	One decoding engine
Decoding Format	VC-2 (SMPTE-2042)
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0
Video Quality Optimization	User-selectable: Computer Graphics or Motion Video
Color Depth	8-bit, 10-bit, 12-bit
HDR	HDR10, HLG
Bit Rate	Supports bit rates up to 900 Mbps
Latency	0.5 frame (e.g. 1080p @ 60 Hz latency is < 8 ms between encoder and decoder) Note: Unusual network configurations may increase overall latency

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, 44.1k Hz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
Bit Depth	Up to 24-bit
Analog audio†	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

†External power supply is required when using the analog audio interface.

Protocols	
Audio Video Streaming	RTP
Audio Transport	AES67
Addressing	DHCP, static
Decryption	AES-128
Management	HTTPS, SSH, SCP, and WebSockets with TLS
Authentication	IEEE 802.1x: PEAP/MSCHAPv2 or EAP-TLS

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

Control	
CEC	Supported and triggered from control systems and OmniStream encoders
RS-232	Device control and configuration; supports baud rates from 2400 to 115200 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†	1 - RJ45, 10/100/1000 Mbps
RS-232 / IR	1 - Euroblock, 6-pin (2 ports); RS-232 on port 1 and 2, IR on port 2 only
AUDIO	1 - Euroblock 10-pin; AUDIO IN/OUT; accepts balanced or unbalanced line
Power	1 - Euroblock, 2-pin

†Maximum distance per hop 300 ft (100 m), depending upon network configuration.

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 25 W (w/ analog audio)
External Power Supply (optional)	Part number: AT-PS-48083-C Input: 110 - 220 V AC, 50/60 Hz Output: 48 V DC, 0.83 A
Safety	CE, FCC, cULus, RoHS, RCM

Environmental	
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
Safety	CE, RoHS, FCC