

OmniStream™ R-Type Single-Channel Networked AV Decoder



Version Information

Version	Release Date	Notes
1	4/18	Initial release

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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-521> 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.

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Remedy

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Exclusions

This Limited Product Warranty excludes:

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

- 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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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: 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.

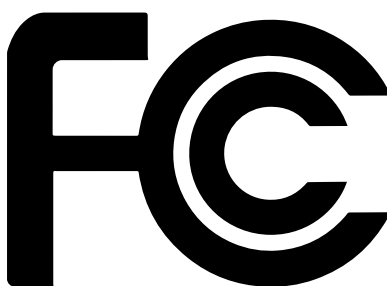


The information bubble is intended to alert the user to helpful or optional operational instructions in the literature accompanying the product.

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	8
Features	8
Package Contents	8
Panel Description	9
Installation	10
RS-232	10
IR	10
Connection Instructions	11
Connection Diagram	12
Configuration	13
Discovery using AMS	13
Accessing Decoders in AMS	13
Configuring a Static IP Address	16
Front Panel Controls	17
ID Button	17
Broadcast Messaging	17
Reset to Factory-Default Settings.	17
Rebooting OmniStream	17
LED Indicators	18
The Virtual Matrix	19
Accessing the Virtual Matrix	19
Layout and Operation	20
The AMS Interface	22
Device Info tab	22
SAP tab	25
IP Input tab	26
HDMI Output tab	28
Serial tab	31
Serial Port	31
Serial Configuration	32
Command	32
Text tab	33
Color	34
Size	34
Logo tab	35
PTP tab	37
Network tab	38
Configuring Video Walls	40
Bezel Compensation	46
Slate / Logo Insertion	48
Deleting Slates / Logos	49
Text Insertion	50
Appendix	52
Mounting Instructions	52
Rack Tray for OmniStream	53
Specifications	54

Introduction

The Atlona **OmniStream™ 521 (AT-OMNI-521)** is a networked AV decoder for an OmniStream-encoded video stream up to UHD @ 60 Hz and HDR, plus embedded audio and RS-232 or IR control pass-through. It is part of the **OmniStream R-Type Series**, designed for high performance, flexible distribution of AV over Gigabit Ethernet in residential and commercial applications. The OmniStream 521 is HDCP 2.2 compliant and ideal for the latest as well as emerging UHD and HDR displays. It features visually lossless compression, optimized for motion video, pristine-quality imaging, and extremely low, sub-frame latency from encode to decode – critical for demanding applications such as gaming. This decoder includes an HDMI output, high performance upscaling and downscaling, aspect ratio control, and video wall processing, plus presentation enhancement features such as logo insertion and scrolling on-screen text

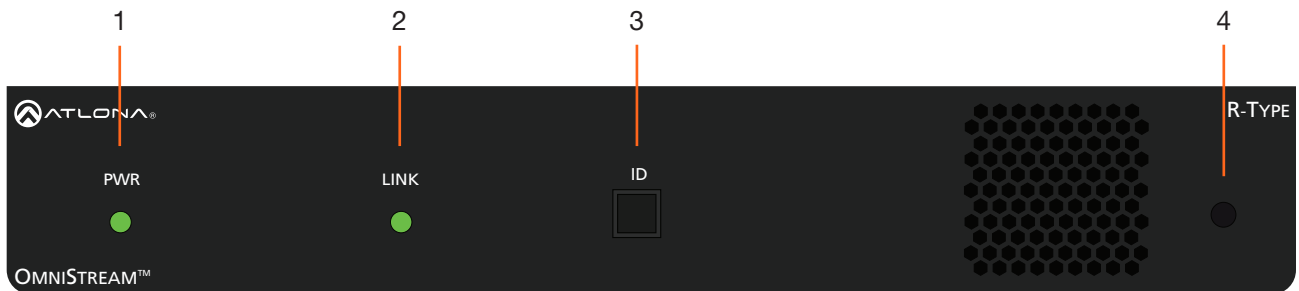
Features

- AV decoder for HDMI® up to 4K/UHD, plus embedded audio and RS-232 or IR control pass-through
- Supports UHD @ 60 Hz plus HDR formats
- High performance, visually lossless video compression
- Pristine-quality downscaling and upscaling
- Simplify integration with plug-and-play network switch compatibility
- Remotely powered via PoE (Power over Ethernet)
- Video wall processing
- Enhance AV presentations with visual enhancements

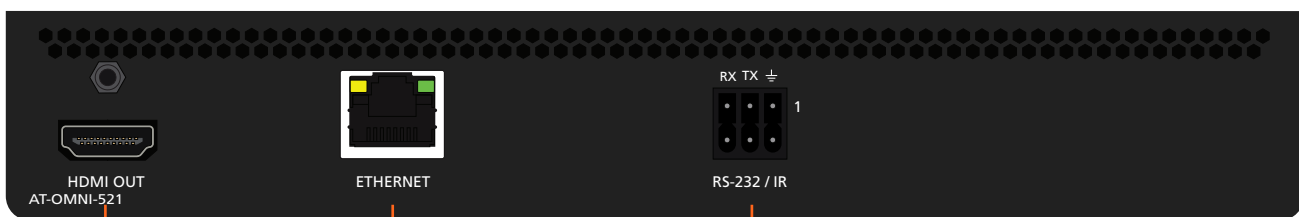
Package Contents

- 1 x AT-OMNI-521
- 1 x Push spring connector, 6-pin
- 1 x Wall/table mounting brackets
- 4 x Rubber feet
- 1 x Installation Guide

Panel Description



Front



Rear

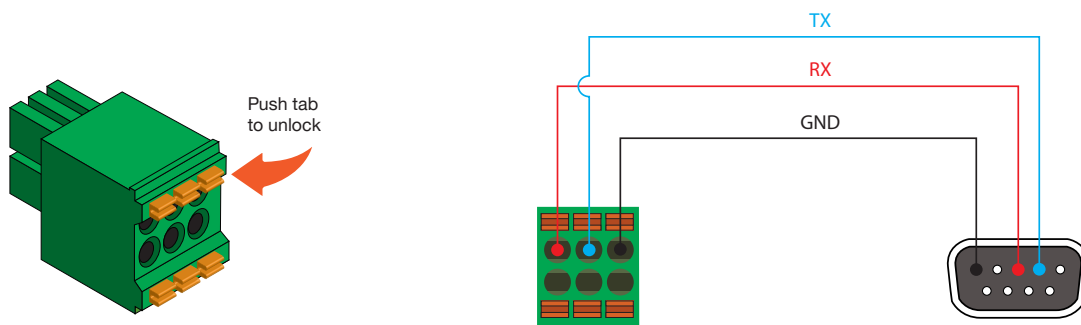
- | | |
|--|--|
| <p>1 PWR
This LED indicator glows bright green when the unit is powered.</p> <p>2 LINK
This LED indicator shows the link status of the decoder.</p> <p>3 ID
Press this button to send a broadcast message to any network devices that are listening. This button is also used to set the decoder to factory-default settings. Refer to ID Button (page 17) for more information.</p> <p>4 Reboot button
Press this button, using a small, pointed object to reboot the unit.</p> | <p>5 HDMI OUT
Connect an HDMI cable from this port to a UHD/HD display.</p> <p>6 ETHERNET
Connect an Ethernet cable from this port to the Local Area Network (LAN).</p> <p>7 RS-232 / IR
Connect the included 6-pin push spring block to connect an automation system and an IR emitter or extender. RS-232 (page 10) for more information.</p> |
|--|--|

Installation

RS-232

The AT-OMNI-521 provides RS-232 over IP which allows communication between an automation system and an RS-232 device. This step is optional. Either the top three or bottom three set of terminals can be used for RS-232.

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.



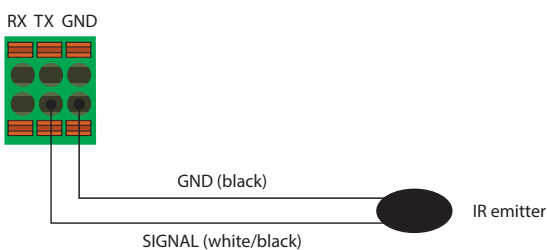
NOTE: Typical DB9 connectors use pin 2 for TX, pin 3 for RX, and pin 5 for ground. On some devices, pins 2 and 3 are reversed.

IR

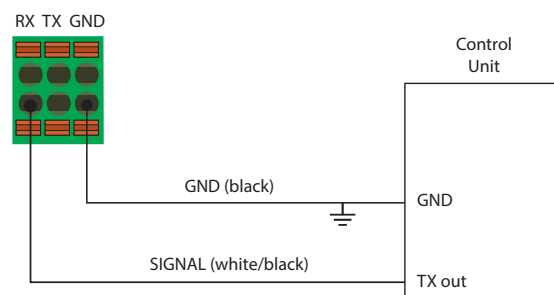
The same port that provides RS-232 connections also supports either an IR extender or IR emitter. This step is optional. Either the top three or bottom three set of terminals can be used for IR.

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 wires.
3. Insert the wires into correct terminal on the included push-pin connector, following the desired application, illustrated below.

IR emitter configuration



IR extender configuration



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

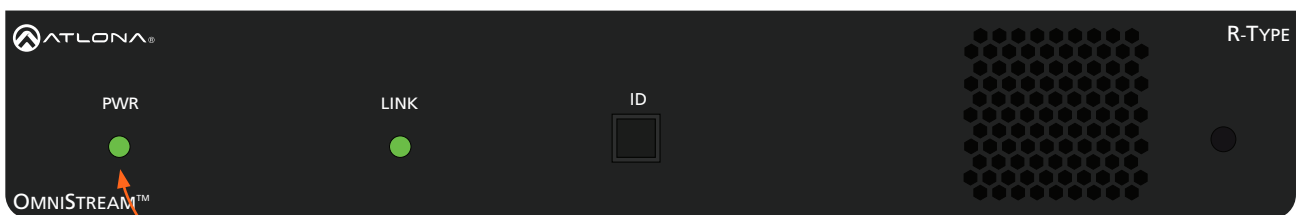
Connection Instructions

1. Connect an HDMI cable from the **HDMI OUT** port to a UHD/HD display.
2. Connect the included 6-pin push-spring connector block to the **RS-232 / IR** port on the decoder. This step is optional. Refer to [RS-232 \(page 10\)](#) for wiring.
3. Connect an Ethernet cable from the **ETHERNET** port on the decoder to a PoE-capable switch on the Local Area Network (LAN).



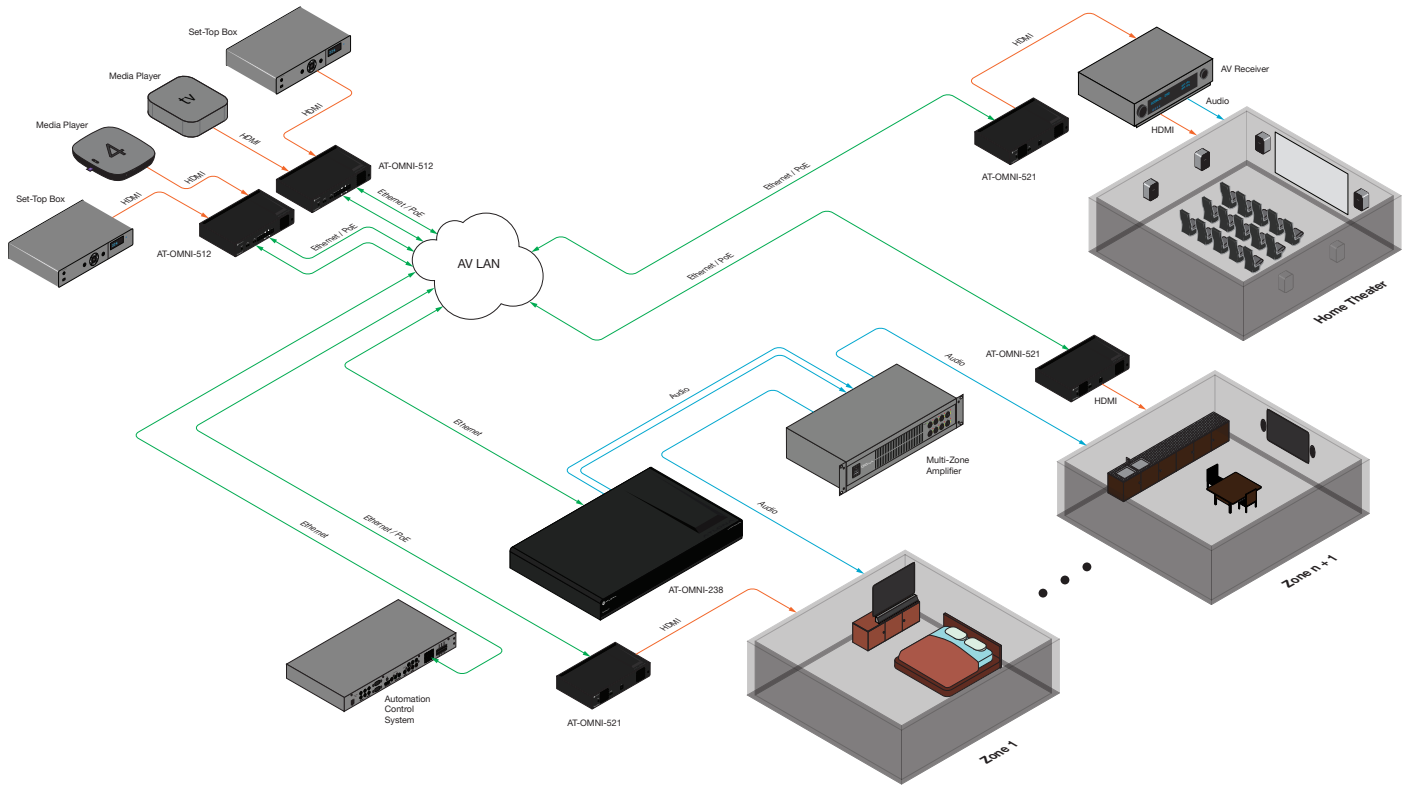
IMPORTANT: If a PoE-capable switch is not available, a PoE injector (purchased separately) must be used.

The **PWR** indicator on the front panel displays the power status of the decoder. When the decoder is powered using either PoE or a PoE injector (not included) the LED initially turns red. After a few moments it will turn green.



PWR indicator

Connection Diagram



Configuration

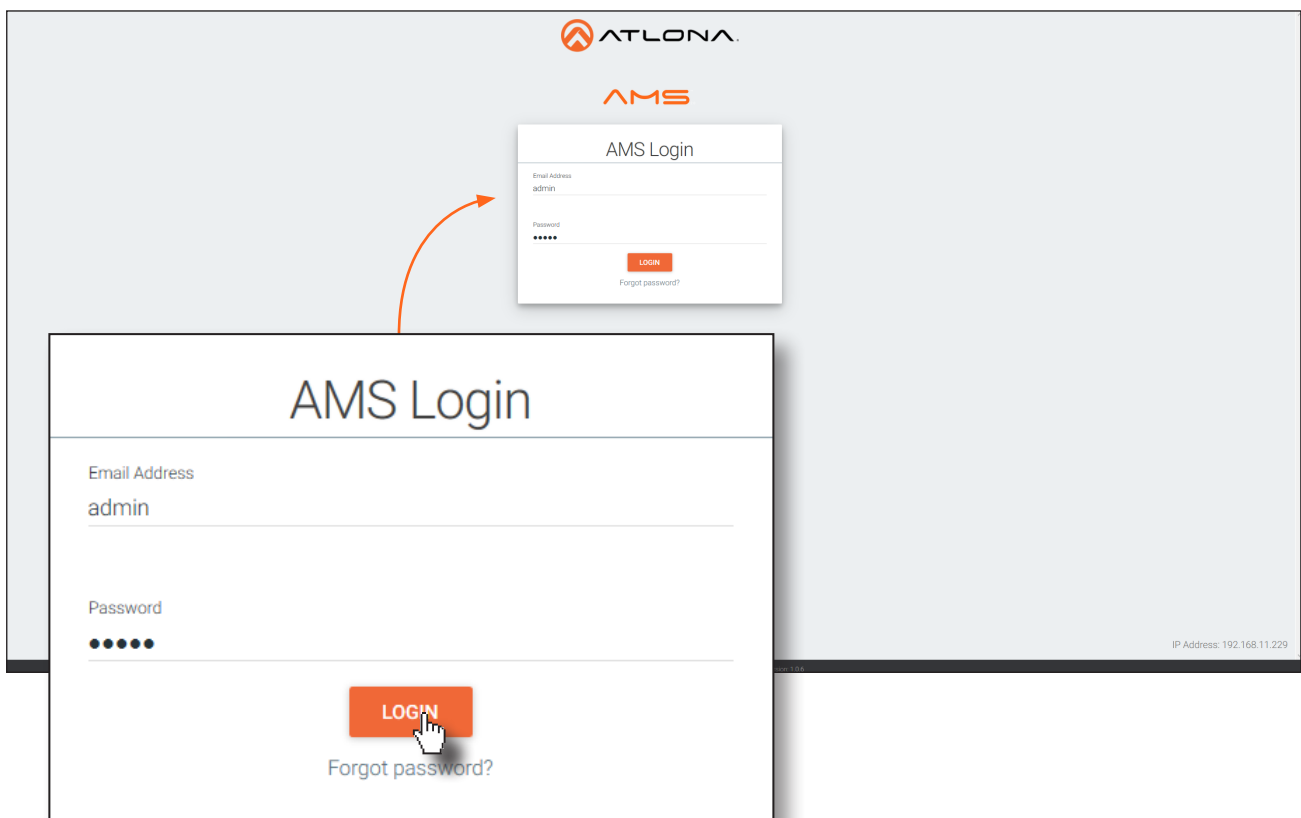
Discovery using AMS


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 AT-OMNI-521 on the network. AMS is free and can be downloaded from <https://www.atlona.com/ams>.

By default, the AT-OMNI-521 is 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.

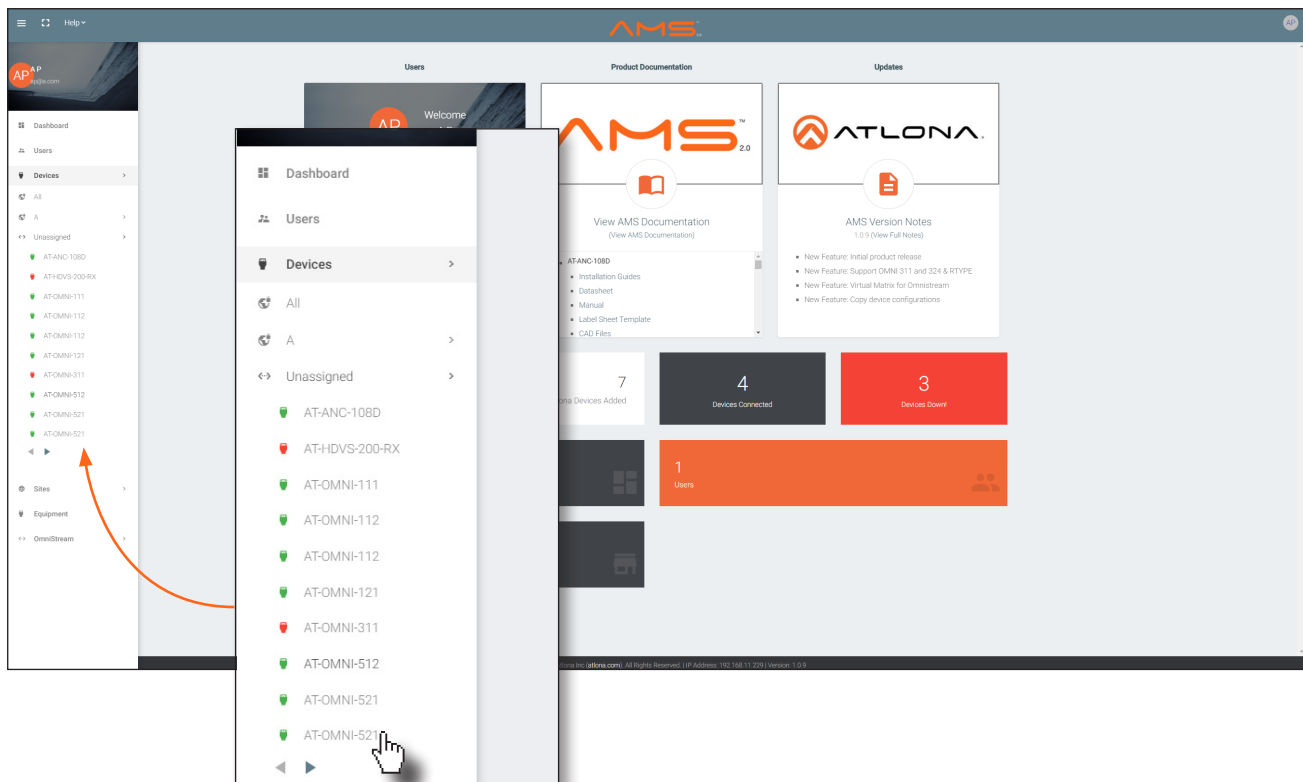
Accessing Decoders in AMS

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.



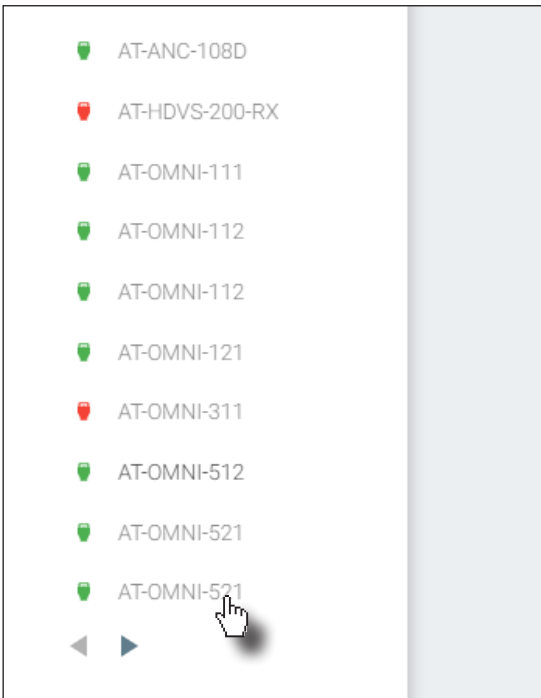
All available OmniStream decoders will be displayed under the **Unassigned** category. When a device is unassigned, it means that the device has not yet been assigned to a site, building, and/or room. Refer to the AMS User Manual for more information on these topics.

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 \(page 14\)](#) for more information on configuring an decoder in Auto IP mode.

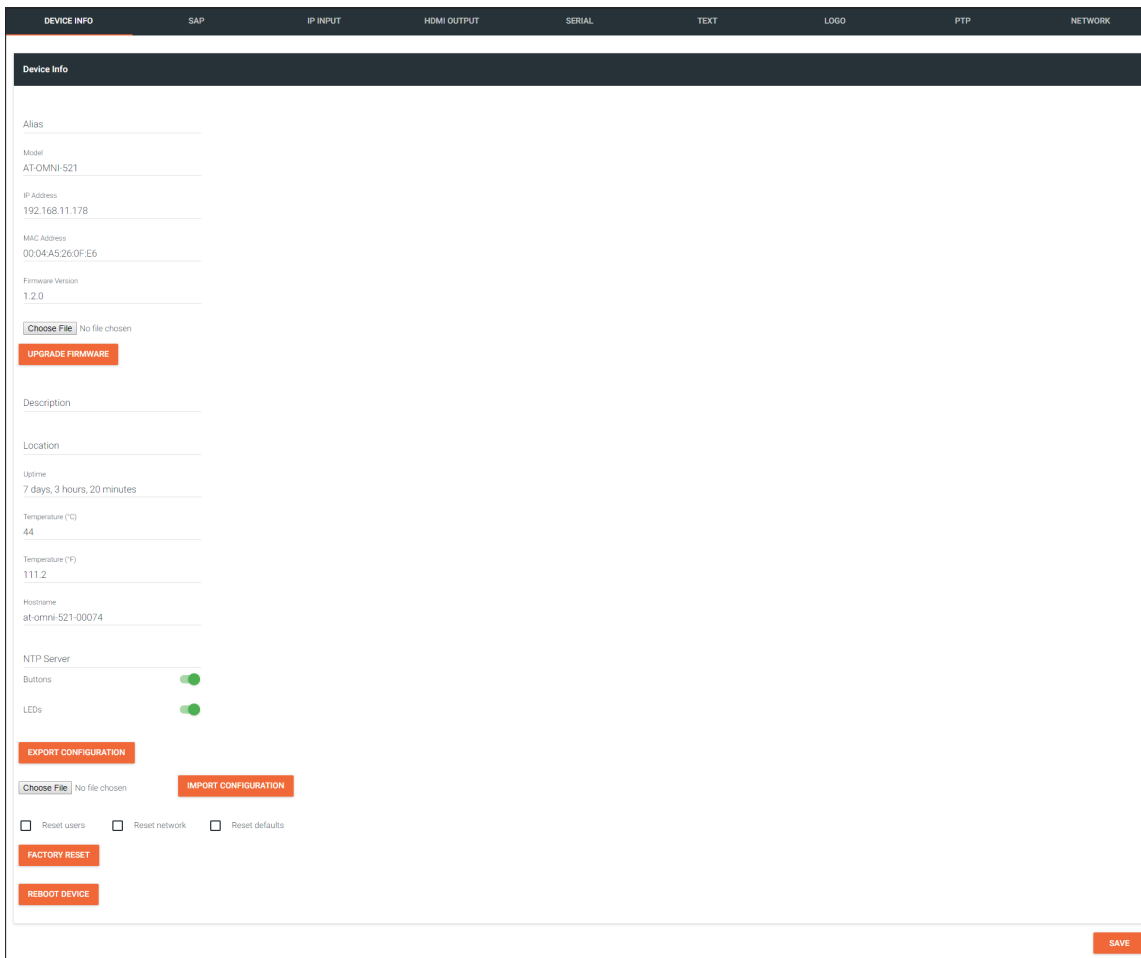
If no AT-OMNI-521 decoders are found, then verify the following:

- The computer that is running AMS must be on the same network as the AT-OMNI-521.
- 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 AT-OMNI-521 from the **Unassigned** device list.



Once the unit is selected, the control interface for the AT-OMNI-521 will be displayed.



Configuring a Static IP Address

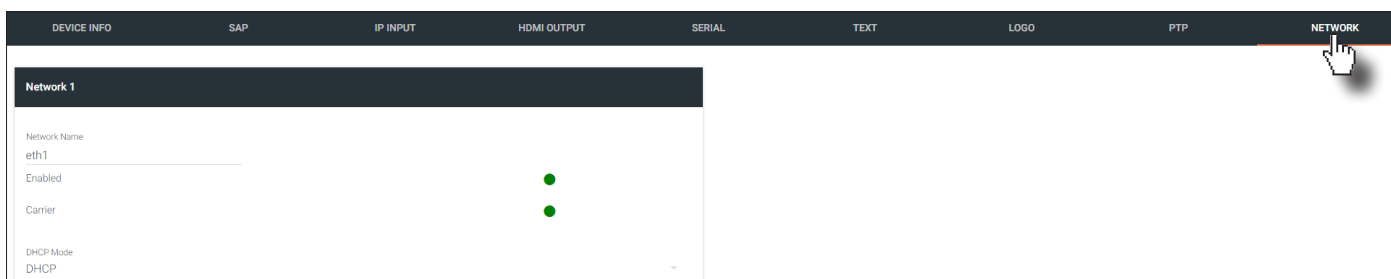
The following section is only required to set the AT-OMNI-521 decoder, currently in Auto IP mode, to a static IP address. If a DHCP server is not found within 60 seconds, decoders are automatically placed in Auto IP mode and will be assigned an IP address within the range 169.254.xxx.xxx. If this occurs, a static IP address can be assigned to the decoder in order for AMS to locate it on the network.

1. Make sure that the AT-OMNI-521 is powered. Power is supplied by connecting an Ethernet cable from the **ETHERNET** port on the decoder to a PoE-capable switch. If a PoE switch is not being used, then a PoE injector (not included) will need to be used.
2. Connect an Ethernet cable from the PC directly to one of the Ethernet ports on the switch. 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 \(page 13\)](#) for information on the login process.
5. Locate the AT-OMNI-521 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**.



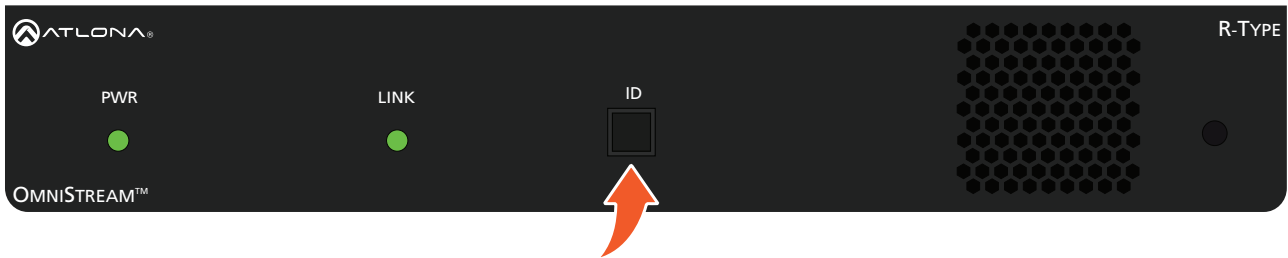
9. Enter the required network information for the decoder in the **IP Address**, **Subnet**, and **Gateway** fields.
10. Click the **Save** button in the bottom-right corner, to apply the changes.
11. Disconnect the decoder from the PC and connect it to the network.
12. The decoder is now ready for use.

Front Panel Controls

ID Button

The ID button serves two functions:

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



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.

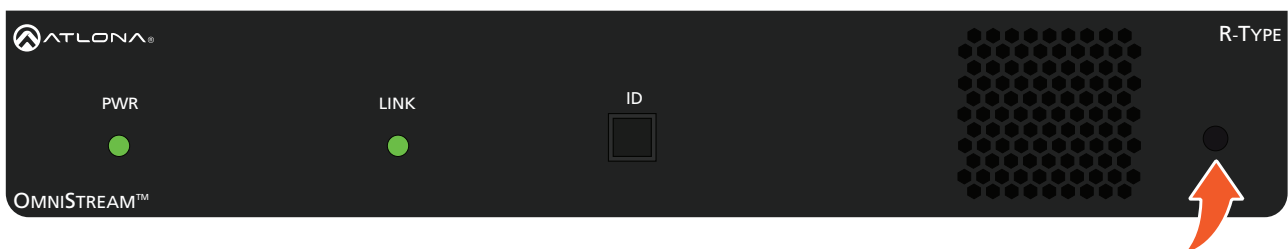
1. Press and hold the **ID** button for approximately 30 seconds.
2. The LED indicators on the front panel will flash, then turn “off.”
3. The decoder is now reset and will need to be reconfigured.



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






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.



LED Indicators

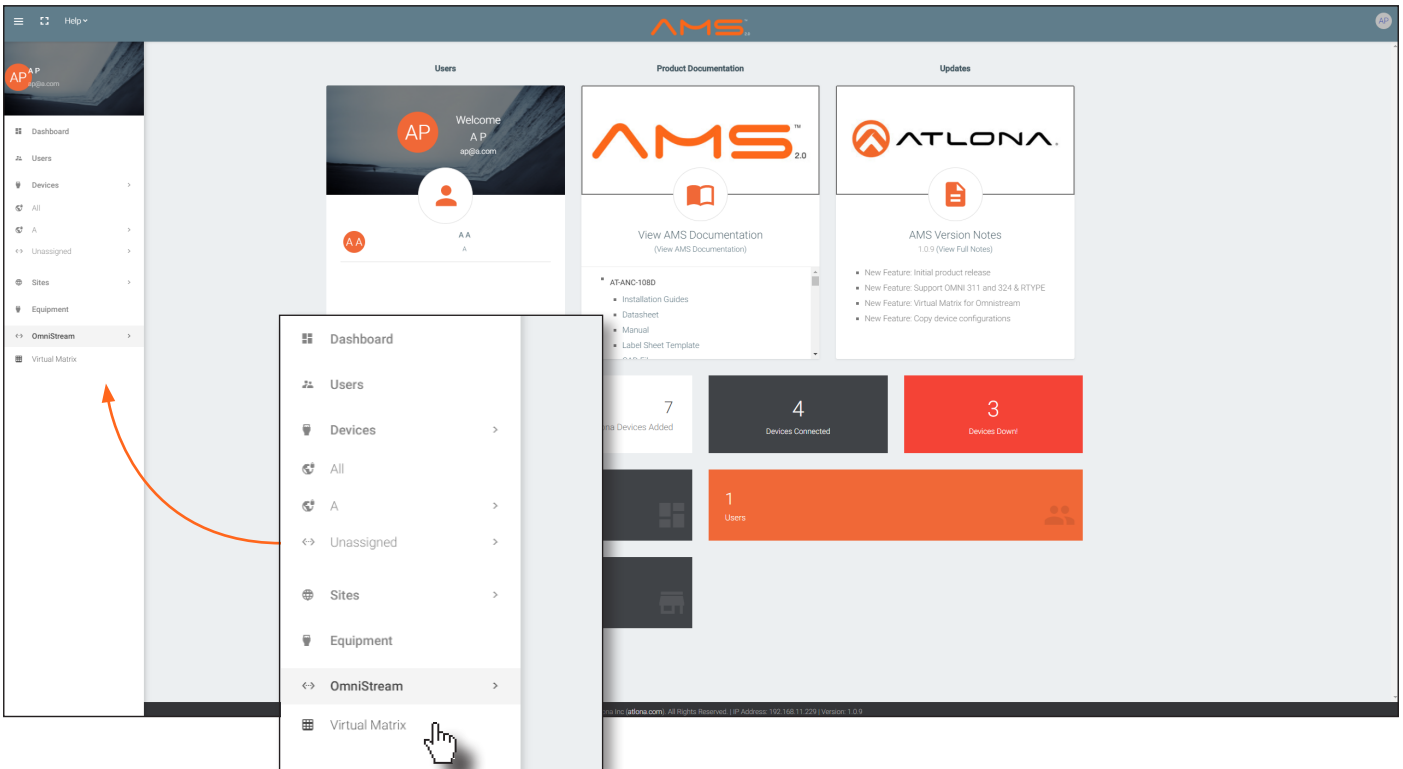
The following table provides a listing of front-panel LED indicators and their status:

LED		Description
PWR	Off 	Unit is powered off. <ul style="list-style-type: none"> If using a PoE switch, make sure that the port on the switch that is connected to the decoder, has PoE enabled. When the decoder is powered using PoE, the PWR indicator will be green. Check the Ethernet cable for possible damage or loose connections. If a PoE switch is not being used, then a PoE injector (not included) will need to be connected to the decoder.
	Red 	The decoder is booting.
	Green 	The decoder is ready.
LINK	Red 	The decoder is powered, but no Ethernet cables are connected between the switch and the ETHERNET port. <ul style="list-style-type: none"> Check the Ethernet cable for possible damage or loose connections.
	Green 	Link integrity is good between the decoder and the network.

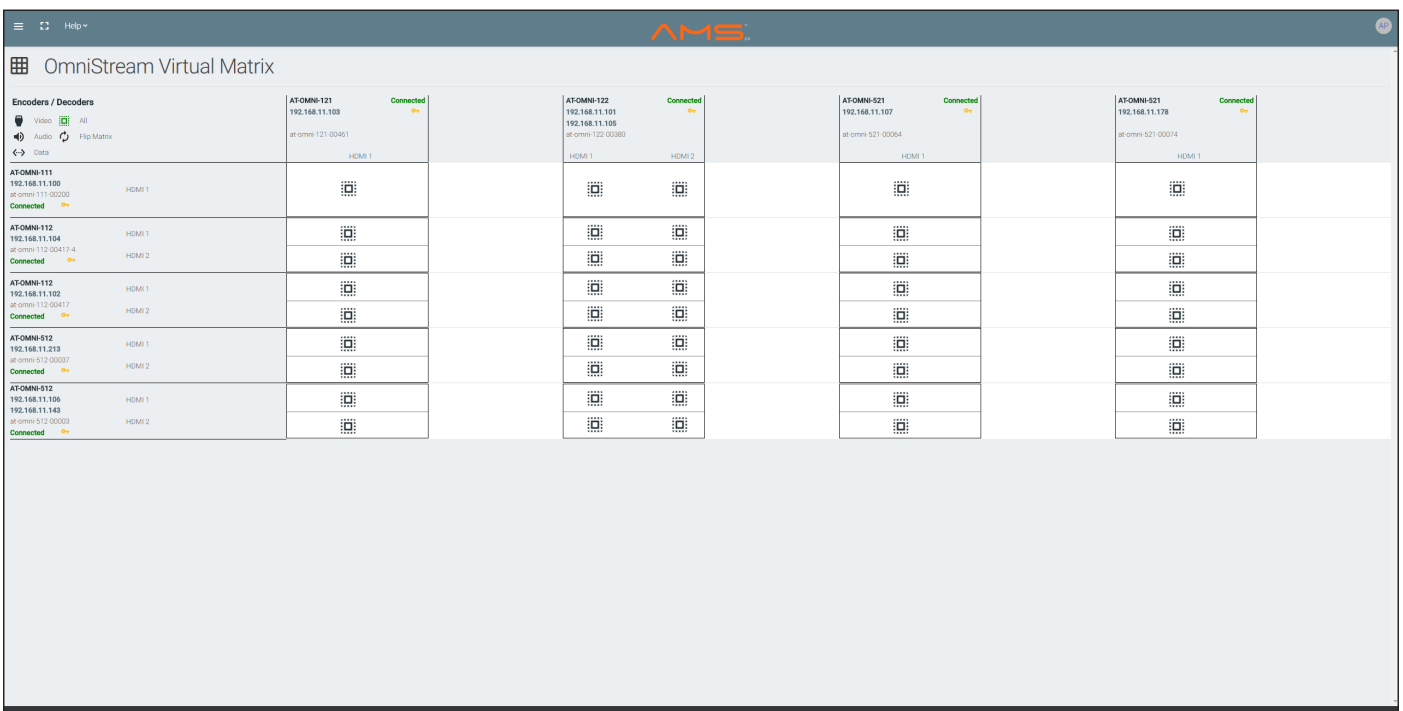
The Virtual Matrix

Accessing the Virtual Matrix

1. In AMS, click **Devices** from the fly-out menu.
2. Click the **OmniStream** option.
3. Click **Virtual Matrix**.



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



Layout and Operation

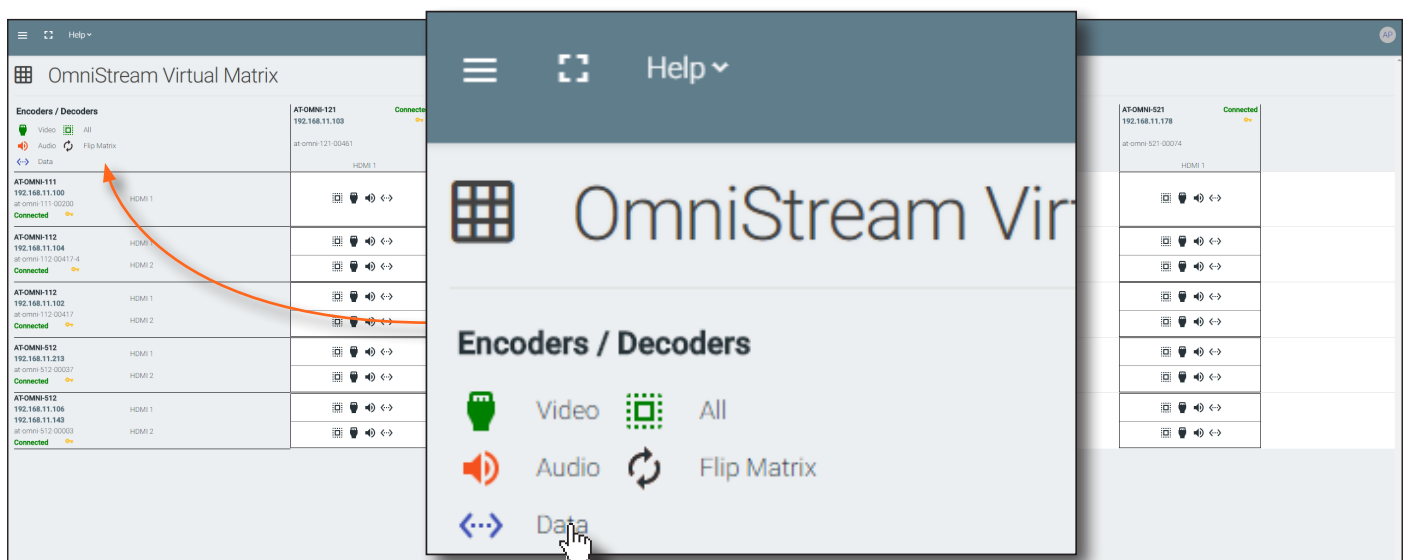
The illustration below, shows a multiple OmniStream units (encoders and decoders). The Virtual Matrix is organized into rows and columns.

The blue circle with the checkmark indicates that these two OmniStream units are connected to one another. The third column shows an OmniStream R-Type decoder (AT-OMNI-521). The fourth row shows an OmniStream R-Type encoder (AT-OMNI-512). 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.

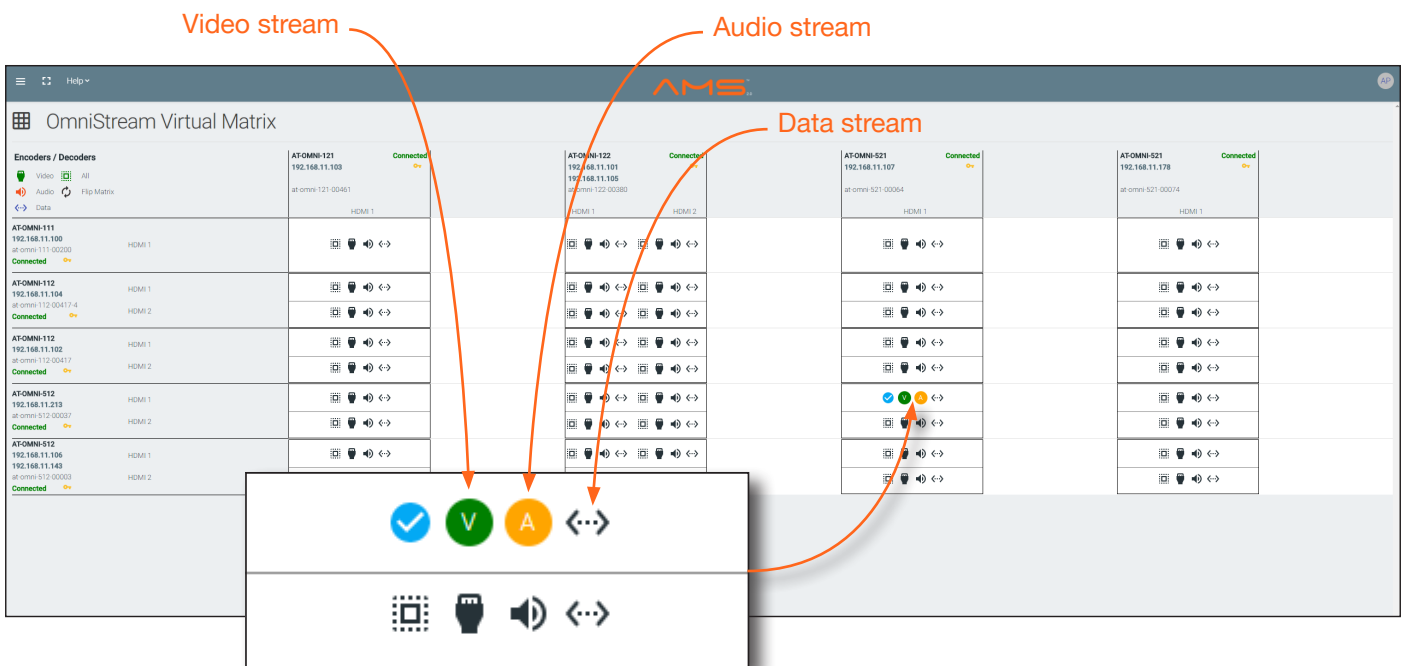


- To view the individual streams for video, audio, and data, click the icons on the upper-left corner of the screen.



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

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

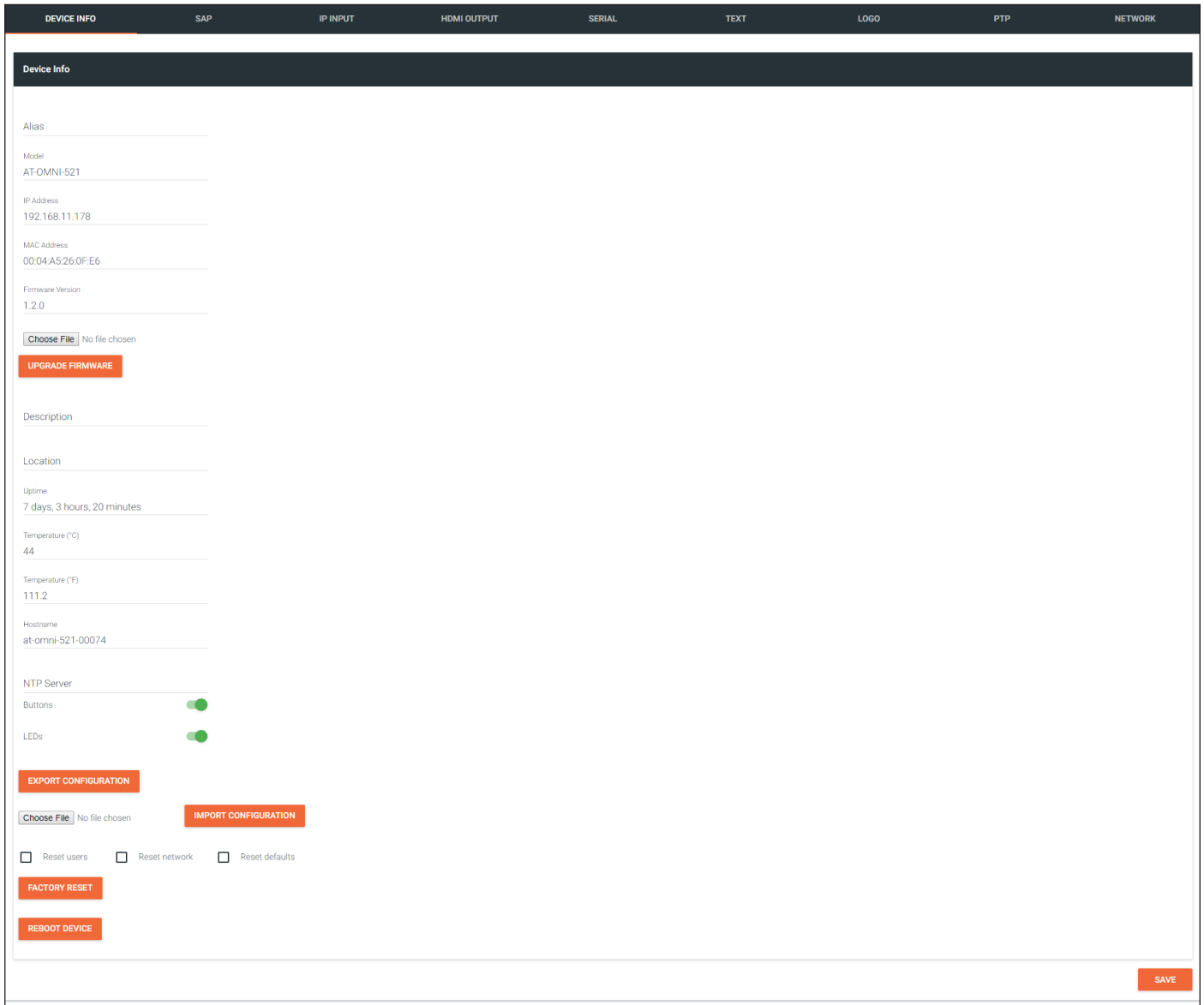


- Since HDMI (both audio and video) is being used, the V (video) and A (audio) icons are displayed. The blue circle with the checkmark indicates that the cross-section has been created. However, not all streams are being used. Refer to the chart below.
- Note that the data stream (the icon with two arrows and three dots), which is used for control, is not being displayed as a dark-blue circle with the letter “D”. This is because the data stream is not currently being used. For example, if RS-232 were being transmitted, then the data icon would be displayed.
- 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.

The AMS Interface

Device Info tab

The **Device Info** tab provides general information about the decoder. The encoder has an identical interface.



Alias

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

Model

The mode number of the unit.

IP Address

Displays the IP address of the **ETHERNET** port.

MAC Address

Displays the MAC address of the **ETHERNET** port.

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.

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 (AT-OMNI-521) 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 AT-OMNI-521 to a local file on the computer. The configuration file will be saved in .json format. The default file name will be: AT-OMNI-521_settings_[dd-mm-yyyy]_12_7.json.


Choose File

Click this button to select the desired configuration file to be uploaded to the AT-OMNI-521. Once the file is selected, click the **IMPORT CONFIGURATION** button to upload the file.

FACTORY RESET

Click this button to reset the AT-OMNI-521 to factory-default settings. When performing a factory reset, the following options can be selected, by clicking the check box. If no options are selected, then the decoder is reset with no factory-default settings.

See the next page for a description of each option.

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

REBOOT DEVICE

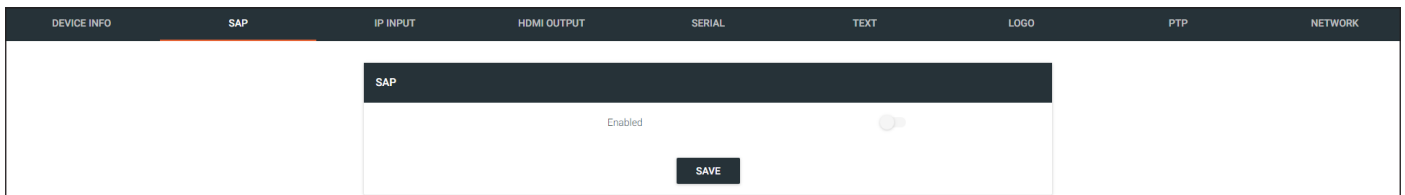
Click this button to reboot the AT-OMNI-521. No settings are changed during a reboot.

SAP tab

The SAP tab 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.



IMPORTANT: For a decoder to receive AES67, SAP must be enabled.



Enabled

Click this toggle switch to enable or disable SAP. If enabled, the decoder will listen for SAP messages. Click the **SAVE** button to commit any changes to this page.

IP Input tab

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

DEVICE INFO	SAP	IP INPUT	HDMI OUTPUT	SERIAL	TEXT	LOGO	PTP	NETWORK	
Input 1		Input 2							
Name ip_input1		Name ip_input2							
Enabled <input checked="" type="checkbox"/>		Enabled <input type="checkbox"/>							
Interface eth1		Interface eth1							
Multicast Address 225.0.12.178		Multicast Address							
Port 1000		Port 1000							
Multicast Filter:		Multicast Filter:							
Mode Exclude		Mode Exclude							
Addresses *		Addresses *							
<small>*Separate multiple IP addresses with a comma.</small>		<small>*Separate multiple IP addresses with a comma.</small>							
<input type="button" value="SAVE"/>		<input type="button" value="SAVE"/>							
Input 3		Input 4							
Name ip_input3		Name ip_input4							
Enabled <input checked="" type="checkbox"/>		Enabled <input type="checkbox"/>							
Interface eth1		Interface eth1							
Multicast Address 225.0.12.179		Multicast Address							
Port 1100		Port 1100							
Multicast Filter:		Multicast Filter:							
Mode Exclude		Mode Exclude							
Addresses *		Addresses *							
<small>*Separate multiple IP addresses with a comma.</small>		<small>*Separate multiple IP addresses with a comma.</small>							
<input type="button" value="SAVE"/>		<input type="button" value="SAVE"/>							
Input 5									
Name ip_input5									
Enabled <input checked="" type="checkbox"/>									
Interface eth1									
Multicast Address									
Port 1200									
Multicast Filter:									
Mode Exclude									
Addresses *									
<small>*Separate multiple IP addresses with a comma.</small>									
<input type="button" value="SAVE"/>									

Name

The name used by AMS to identify the IP input.

Enabled

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

Interface

Click this drop-down list to select the physical interface that will be used to carry the IP traffic. Since this is a single-channel decoder, only eth1 will be available. "eth1" describes the **ETHERNET** port on the decoder.

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.

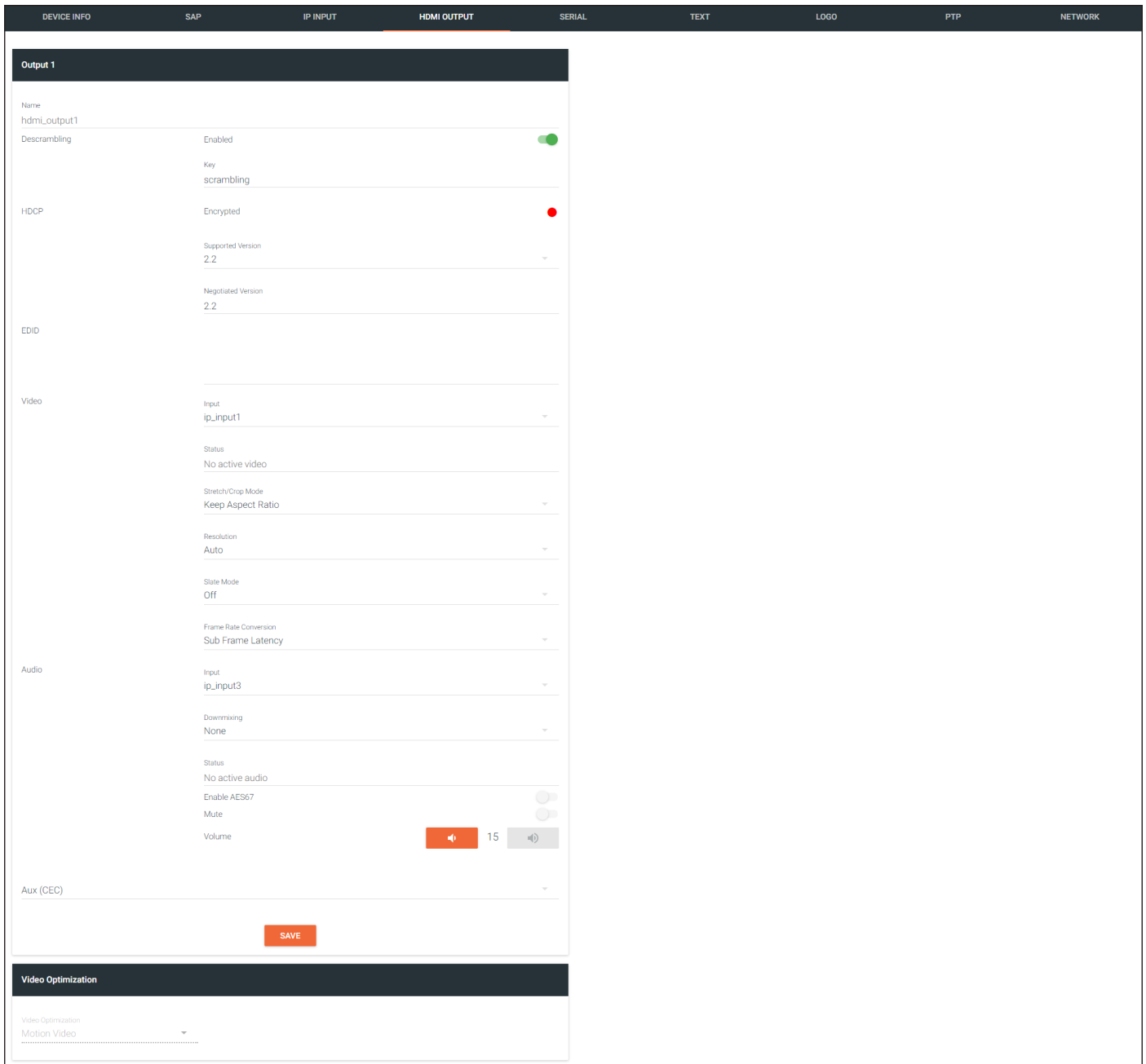
Mode	Description
exclude	Multicast content coming from the source mentioned in the Addresses section will be excluded (blocked).
include	Multicast content coming from the source mentioned in the Addresses section, on the next page, to be streamed to the decoder.

Addresses

Enter the IPv4 address of the decoder(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.

HDMI Output tab

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



Name

The name used by AMS to identify the HDMI output.

Enabled

Click this toggle switch to enable or disable de-scrambling.

Key

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

Encrypted

Indicates if the HDCP handshake with the sink device was successful or not. If this indicator is green, then the handshake was successful.

Supported Version

Click this drop-down list to select the version of HDCP to be supported: 2.2, 1.4, or None. If None is selected, then HDCP-encrypted content cannot be passed-through.



NOTE: If the decoder is connected to a sink that is not capable of HDCP 2.2, then the supported version must be set to 1.4.

Negotiated Version

The version of HDCP that the decoder negotiated with the sink device.

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. Inputs are configured under the **IP Input tab** (page 26).

Status

Displays the current video input status.

Stretch/Crop Mode

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

Mode	Description
Keep Aspect Ratio	The output aspect ratio is the same as the source (input).
Full Screen	Scales the video source to fill the entire screen.
16:9	The output is displayed as 16:9, which is the common HDTV format.
16:10	The output is displayed as 16:10.
4:3	Output is set to 4:3. Note that when an HDTV format is converted to 4:3, up to 30% of the horizontal portion of the image will be cropped.

Resolution

Sets the output resolution. To keep the output resolution the same as the input resolution, select **Input** from the drop-down list. Select **Auto** to have the decoder automatically choose whether to pass the input resolution to the output or to scale it, depending on the capabilities reported by the EDID of the sink device.

Available Resolutions	
Input	Auto
4096x2160	3840x2160
1920x1080	1280x720

Slate Mode

Click this drop-down list to select the slate mode. Refer to **Slate / Logo Insertion** (page 48) for more information.

Frame Rate Conversion

Click this drop-down list to select the desired frame rate conversion mode. This feature is used when configuring video walls.

Input

Click this drop-down list to select the desired primary audio input. Select the **Not Used** option to leave the audio input unassigned. Inputs are configured under the [IP Input tab \(page 26\)](#).

Downmixing

Select **Stereo** from this drop-down list to mix-down audio channels to two-channel stereo. To leave the audio unchanged, select **None**.

Status

Displays the current audio input status.

AES67

This option puts the decoder in AES67 mode and must be enabled for the decoder to receive AES67 streams. It must be disabled to receive OmniStream pass-through audio streams.

Mute

This feature only applies to PCM audio. For compressed audio signals, this option is ignored. Click this toggle switch to enable or disable audio muting.

Volume

This feature only applies to PCM audio. For compressed audio signals, this option is ignored. Click the speaker icon on the left to reduce the output volume. Click the speaker icon on the right to increase the output volume. The current output level is displayed between the two icons. Maximum volume output is 15.

Aux

Click this drop-down list to select the input used to send CEC commands (aux data).

Video Optimization

This option is locked to Motion Video and cannot be changed.

Serial tab

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

DEVICE INFO	SAP	IP INPUT	HDMI OUTPUT	SERIAL	TEXT	LOGO	PTP	NETWORK
Serial Port 1		Serial Port 2						
Name serial_port1		Name serial_port2						
Supported Modes Serial		Supported Modes infrared						
Mode serial		Mode infrared						
Baud Rate 9600		Baud Rate 9600						
Data Bit 8		Data Bit 8						
Parity None		Parity None						
Stop 1		Stop 1						
Flow Control None		Flow Control None						
<input type="button" value="SAVE"/>		<input type="button" value="SAVE"/>						
Serial Configuration 1								
Name serial_use1								
Port serial_port1								
Mode cli								
<input type="button" value="SAVE"/>								
Command: Display Off		Command: Display On						
Mode Raw		Mode Raw						
ASCII		ASCII						
HEX		HEX						
<input type="button" value="SAVE"/>		<input type="button" value="SAVE"/>						
Command: Volume Down		Command: Volume Up						
Mode Raw		Mode Raw						
ASCII		ASCII						
HEX		HEX						
<input type="button" value="SAVE"/>		<input type="button" value="SAVE"/>						

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.

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. Currently, only cli (command line interface) is supported.

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.

Interpret on

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

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

ASCII

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

HEX

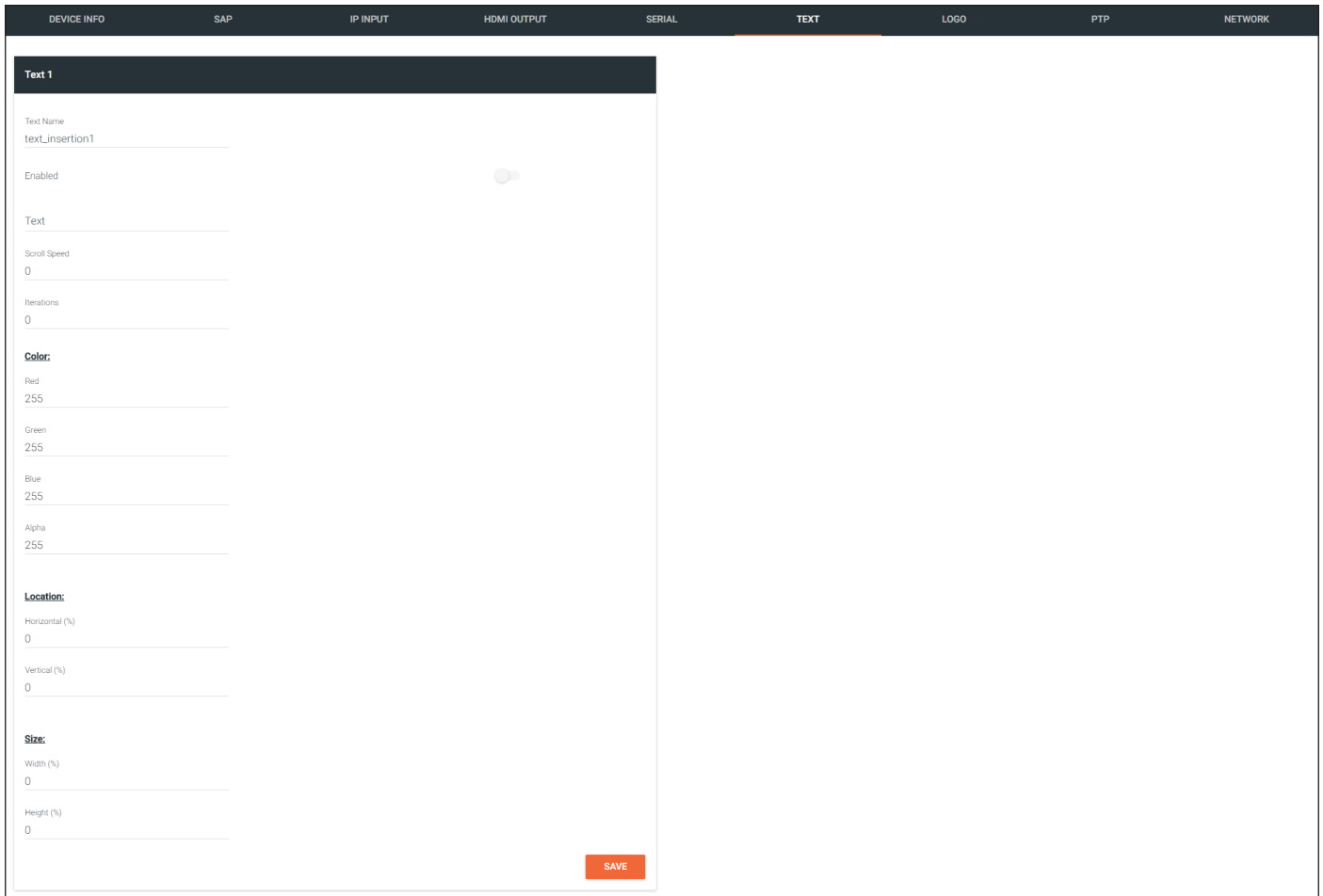
Enter the hexadecimal representation of the command in this field.



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 one field be completed.

Text tab

The **Text** tab provides the ability to configure text scrolling. Refer to [Text Insertion \(page 50\)](#) 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.

Size

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.

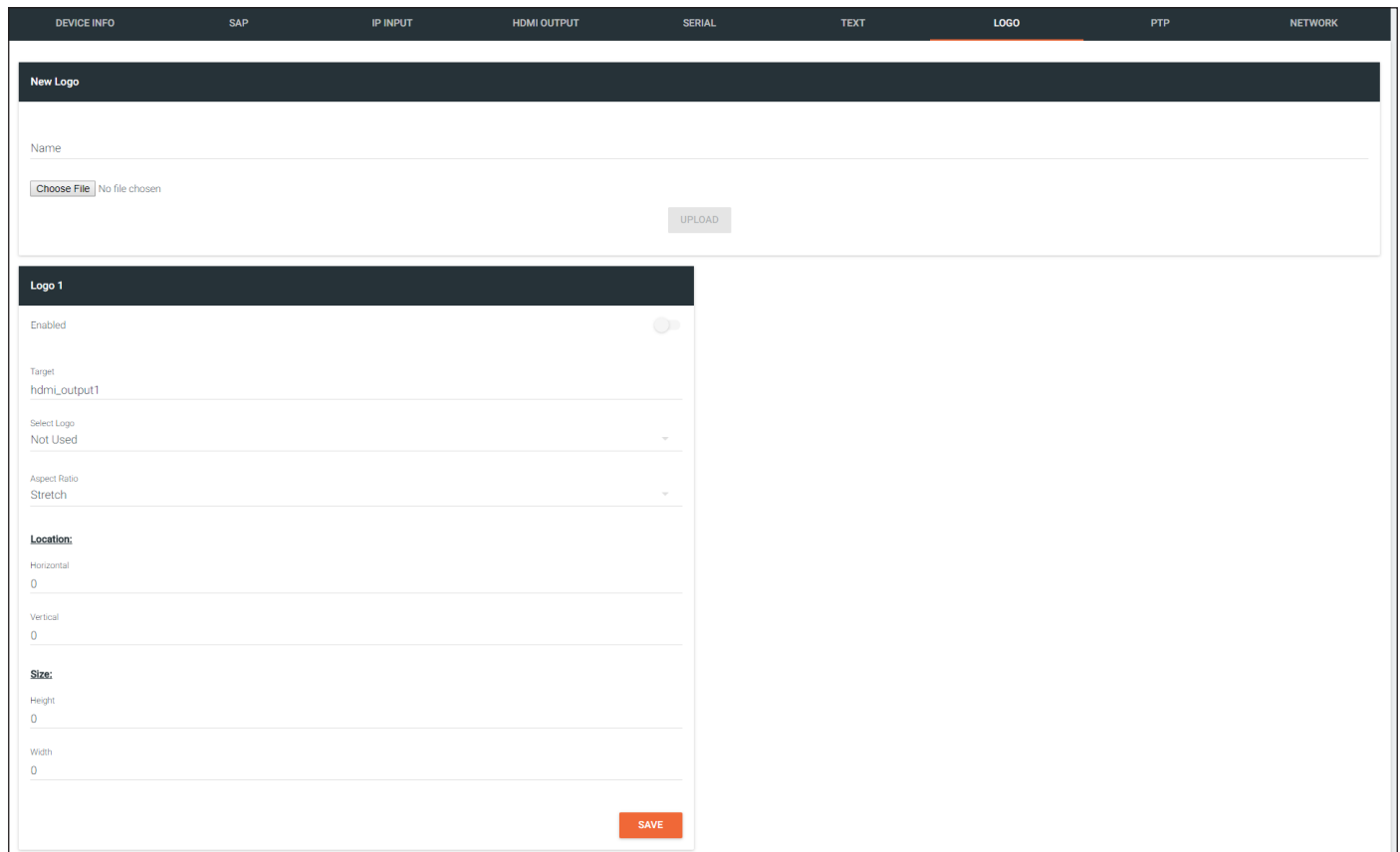
Width (%), Height (%)

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 tab

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 \(page 48\)](#) 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 AT-OMNI-521.

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.

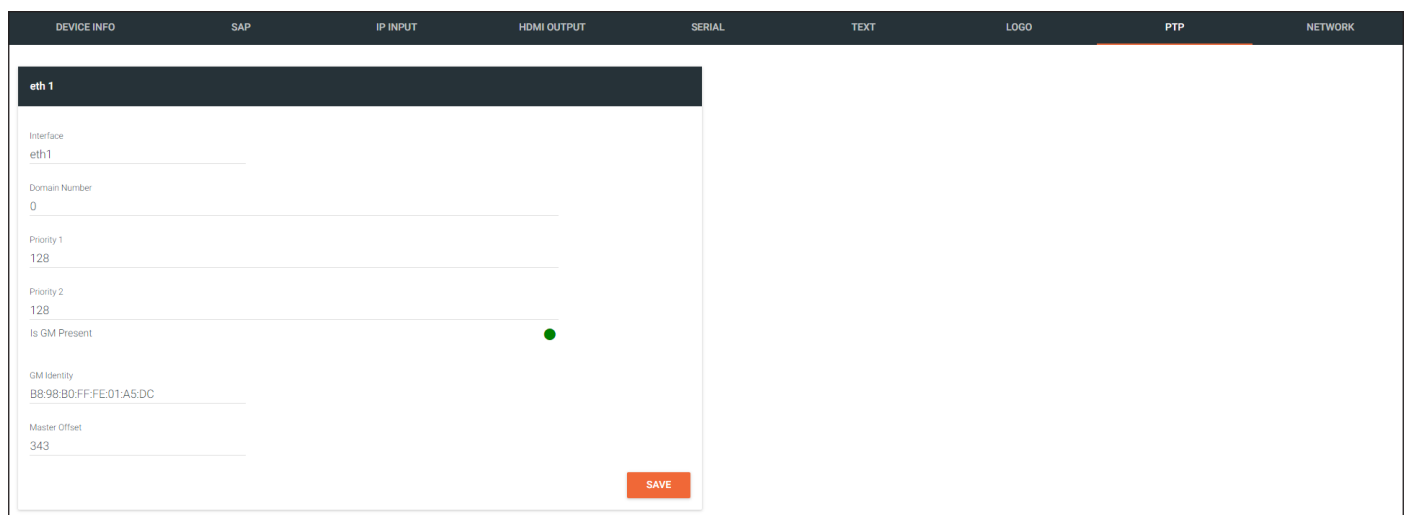
PTP tab

The **PTP** tab provides options for adjust Precision Time Protocol (PTP) for AES-67 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.



The screenshot shows the PTP configuration page for interface 'eth1'. The page has a dark navigation bar with tabs: DEVICE INFO, SAP, IP INPUT, HDMI OUTPUT, SERIAL, TEXT, LOGO, PTP (active), and NETWORK. The configuration form includes the following fields:

- Interface:** eth1
- Domain Number:** 0
- Priority 1:** 128
- Priority 2:** 128
- Is GM Present:** A green dot indicator is shown.
- GM Identity:** BB:98:B0:FF:FE:01:A5:DC
- Master Offset:** 343

A 'SAVE' button is located at the bottom right of the form.

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

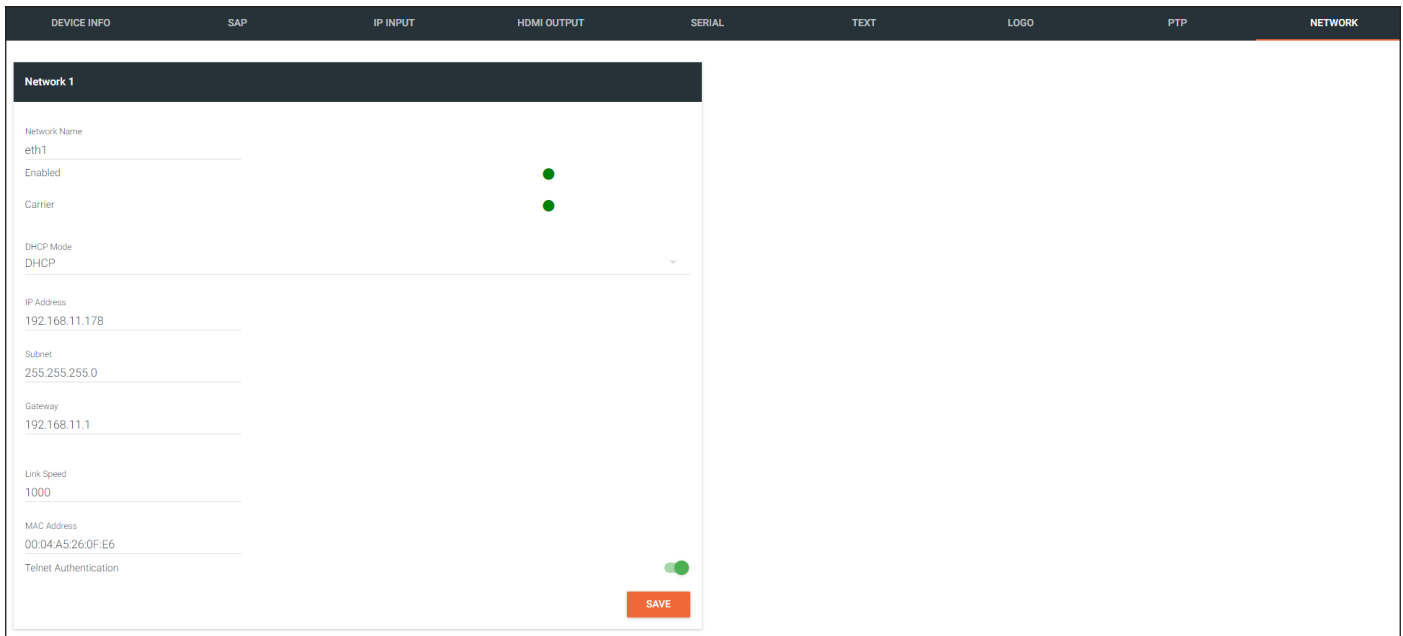
The grandmaster clock identity. If this field is blank, then it means that this interface is the grandmaster clock.

Master Offset

Displays the grandmaster clock offset.

Network tab

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.

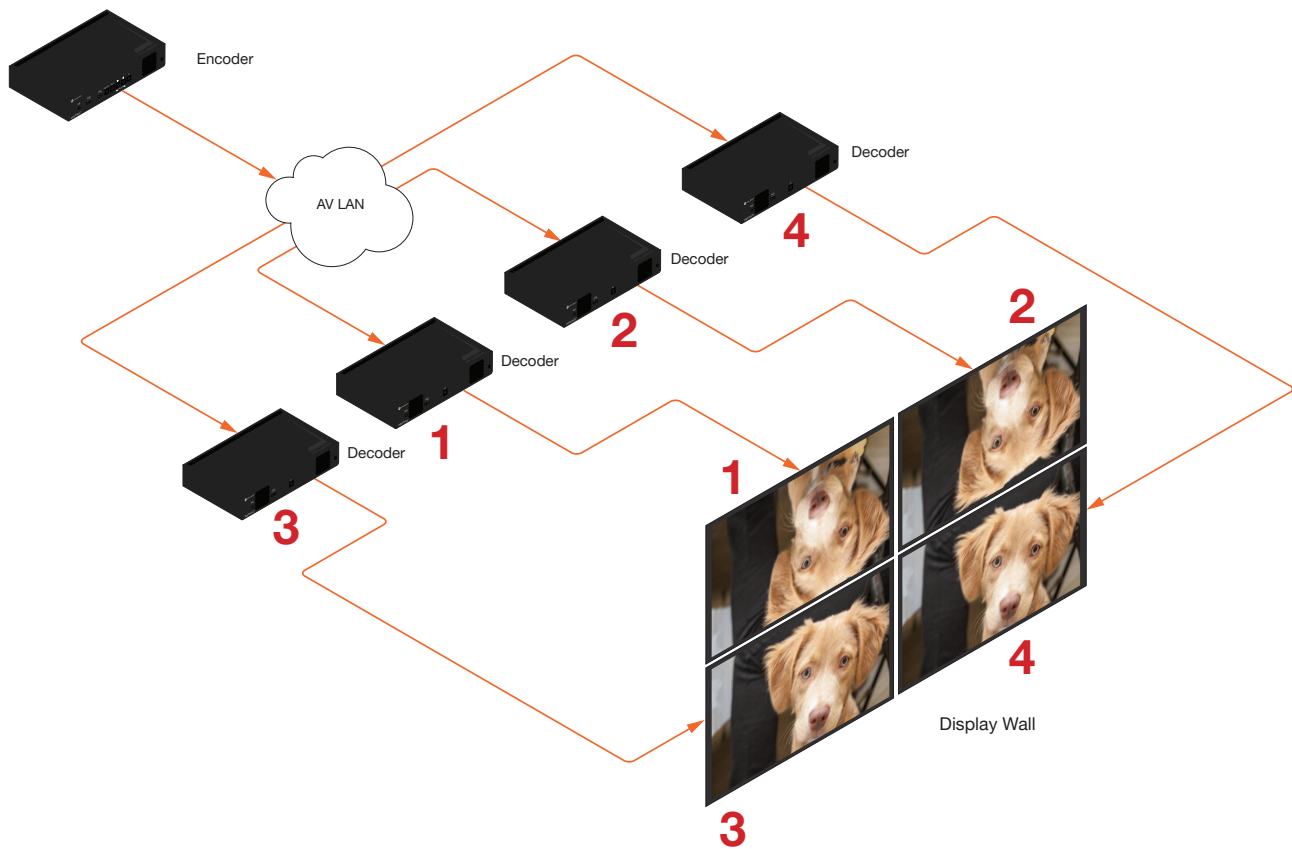
Telnet Authentication

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.

Configuring Video Walls

The following example illustrates how to configure a 2x2 video wall.

Below, four decoders are subscribed to a single encoder. The decoder is displaying the same image on all four displays. The video source is 3840 x 2160. In order to create a single image using all four displays, each source image will need to be cropped and scaled to one-fourth of the total image resolution. The “crop and scale” feature will be used to provide the correct output. Also note that the top two displays are mounted upside down. The “rotate” feature can be used to correct such a scenario.

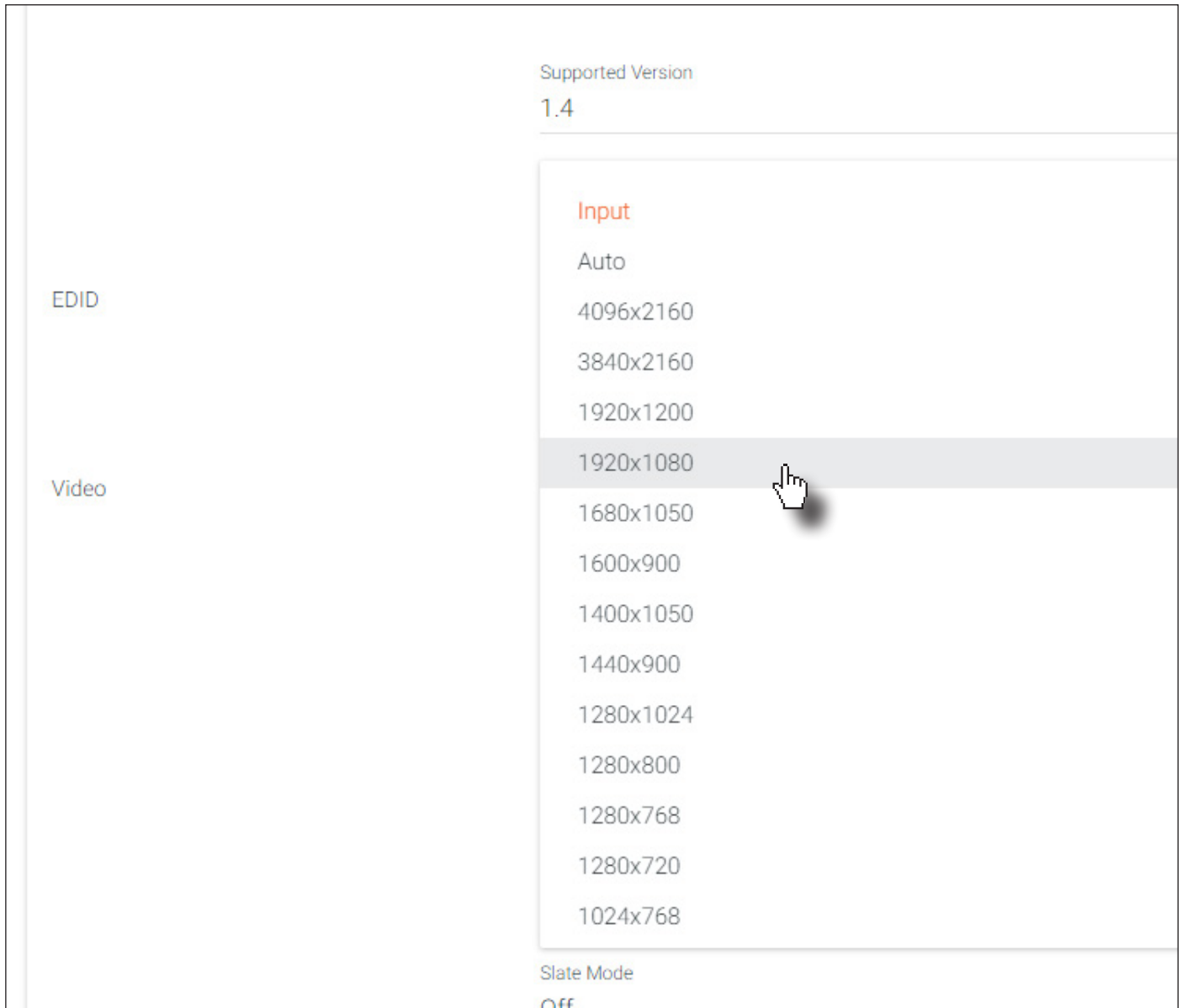


Note that the order in which each image is cropped, scaled, and/or rotated is arbitrary. In this example, the configuration process will begin with Display 1, in the top left.

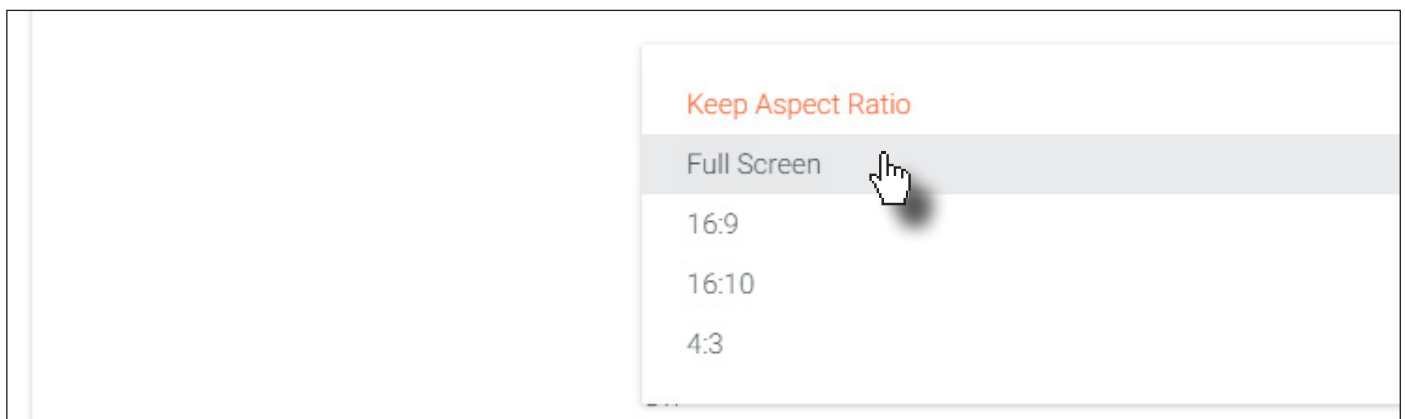
1. Login to AMS. Refer to [Accessing Decoders in AMS \(page 13\)](#) if necessary.
2. Click **HDMI OUTPUT** in the menu bar.



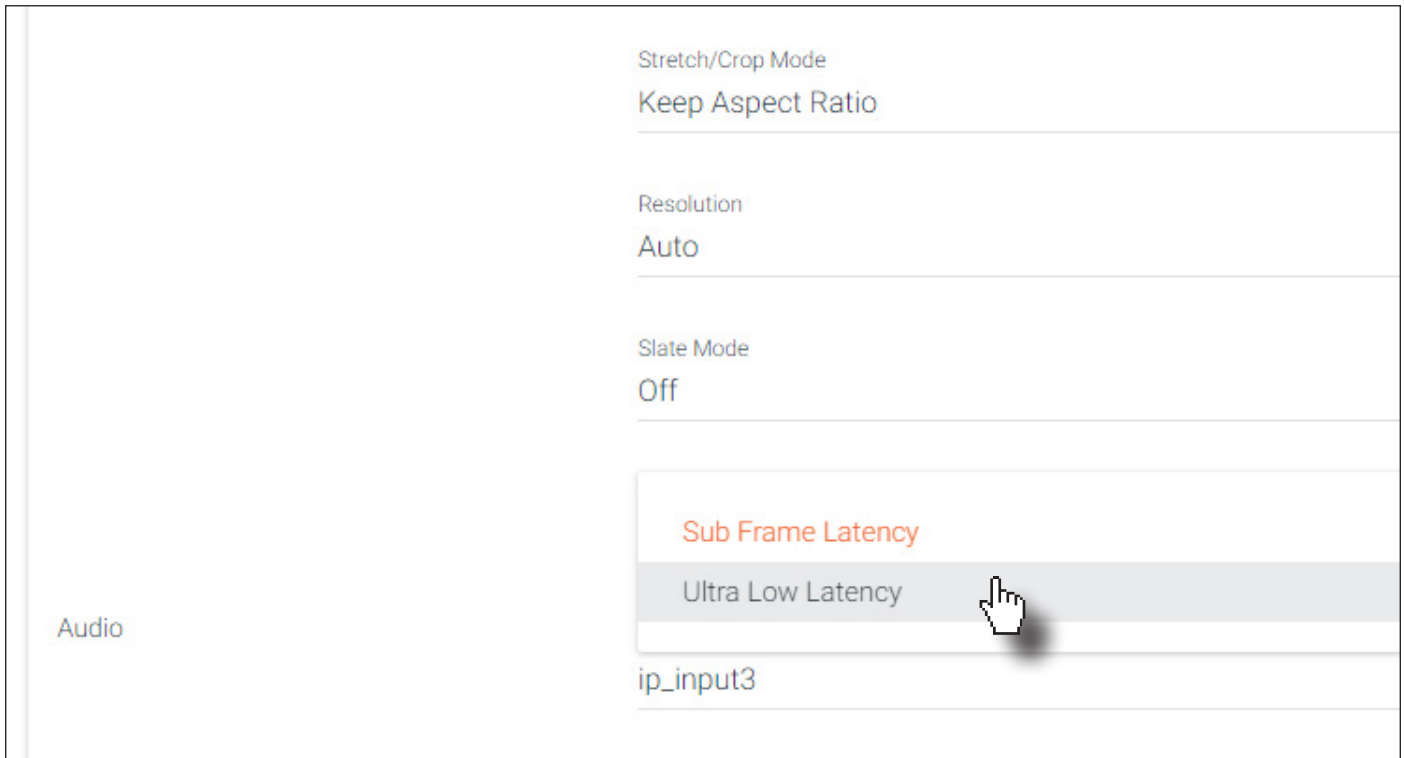
3. Locate the **Resolution** option and select 1920x1080. This will scale the output resolution from each decoder to 1920x1080.



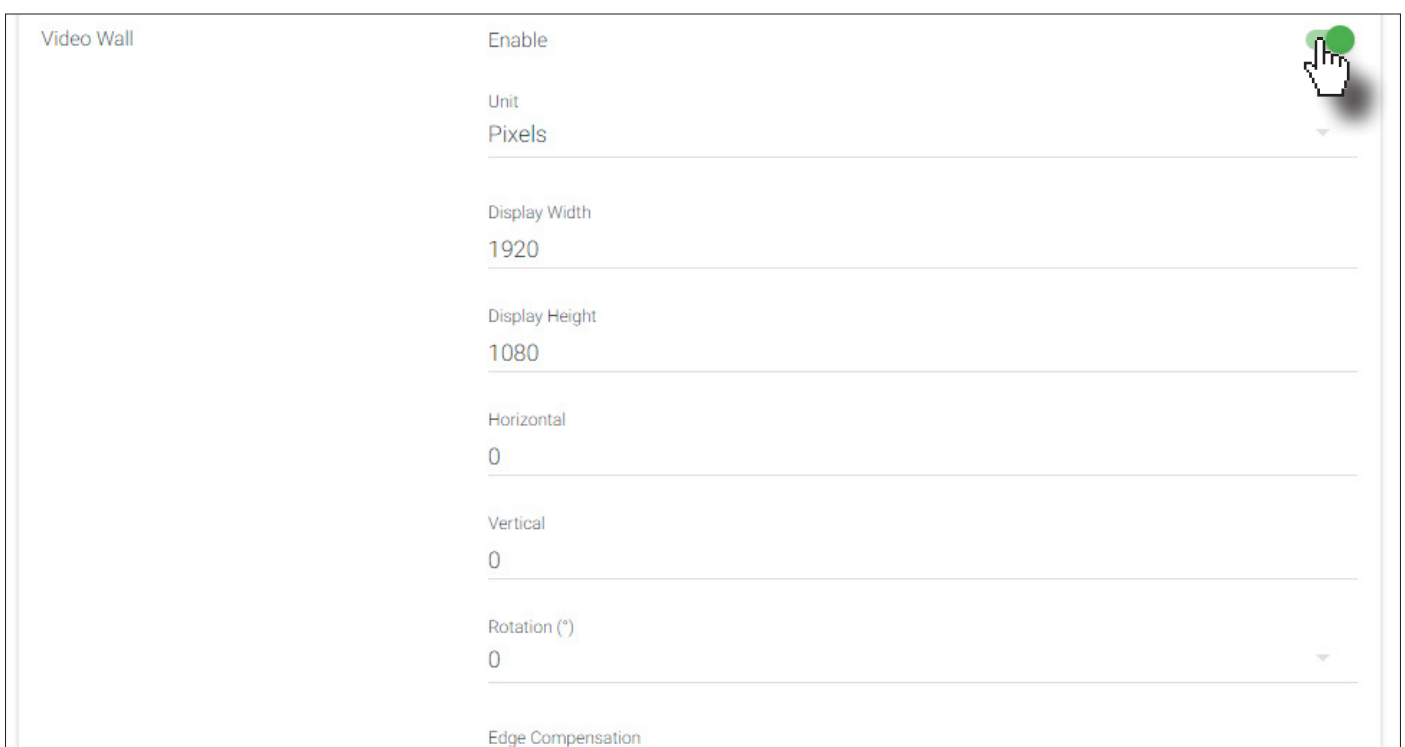
4. Click the **Stretch/Crop Mode** drop-down list and select fullscreen. This guarantees that the image will fill the screen.



- Click the **Frame Rate Conversion** drop-down list, and select **Ultra Low Latency**. Note that this option will add approximately 1 frame of latency.



- The **Video Wall** option will be displayed. By default, this option is disabled.
- Click the **Enable** toggle to activate the **Video wall** option. Once enabled, the **Video wall** section will be expanded and display all available options.



The AMS Interface

8. 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.

Video Wall Enable

Unit
Pixels

Display Width
1920

Display Height
1080

9. 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

10. 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.

0

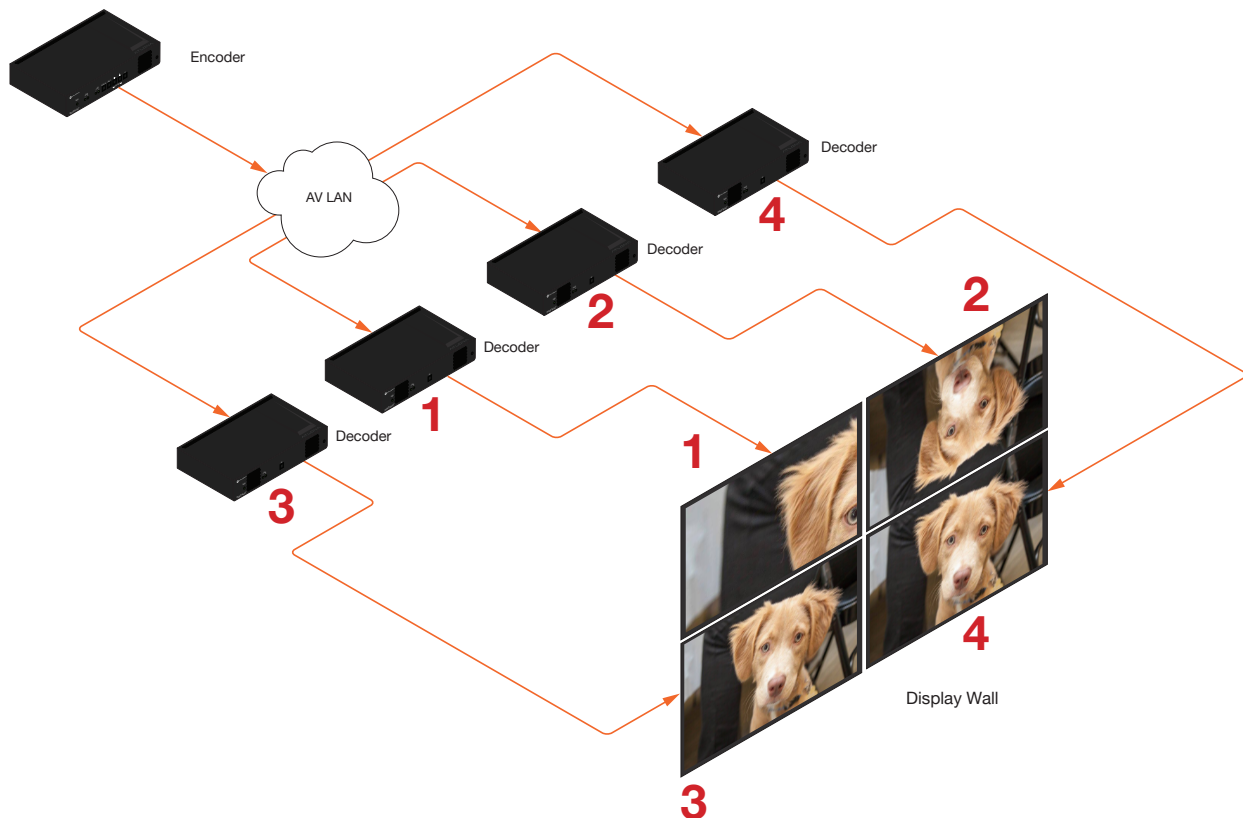
0

180

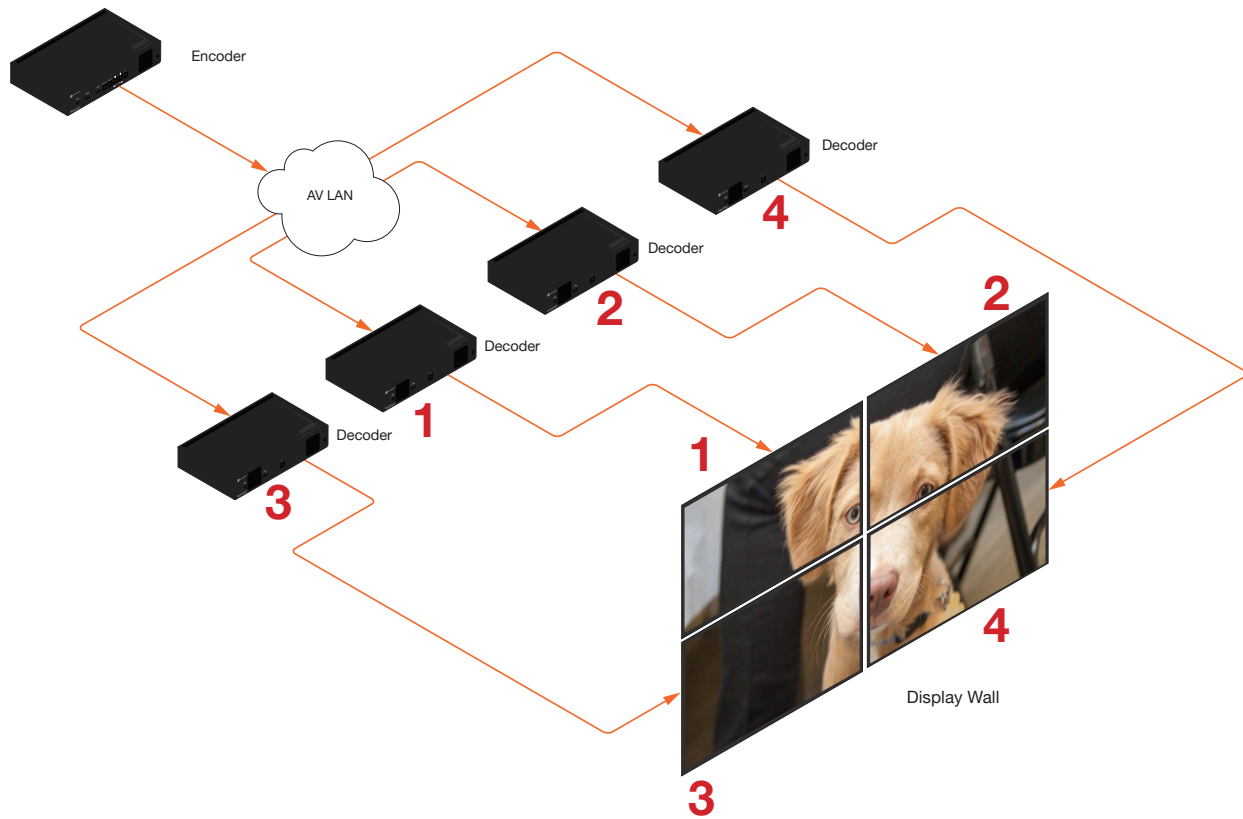
Bezel Compensation

The image on Display 1 has been cropped and rotated and now is displayed correctly.

11. Click the **SAVE** button at the bottom of the screen to accept changes.
12. 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 video wall should appear similar to the following:



13. 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

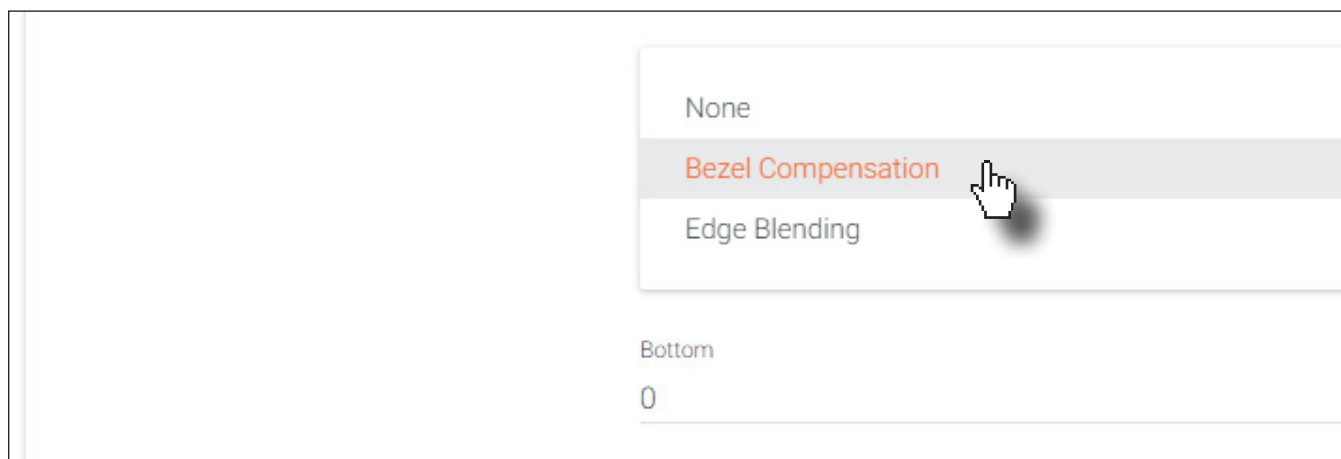


Image with bezel compensation applied



Bezel

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



2. Adjust the **Top**, **Bottom**, **Left**, and **Right** values, as desired. All entered values are applied to the physical displays in 1 pixel increments. Refer to the examples, below, to properly calculate the amount of bezel compensation.

If one bezel needs compensating in each direction (e.g. on a 2x2 wall, where only bezel is in the way, in each direction), use the following formula:

$$\text{Bezel width (px)} = \left(\frac{\text{Total width (px)}}{[\text{display area width (in/mm)} + \text{bezel width (in/mm)}]} \right) \times \text{bezel width (in/mm)}$$

If two bezels need compensating (e.g. on a 3x3 wall, where the middle display has two bezels is in the way, in each direction), use the following formula:

$$\text{Bezel width (px)} = \left(\frac{\text{Total width (px)}}{[\text{display area width (in/mm)} + \text{bezel width \#1 (in/mm)} + \text{bezel width \#2 (in/mm)}]} \right) \times \text{bezel width (in/mm)}$$

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

Slate / Logo Insertion

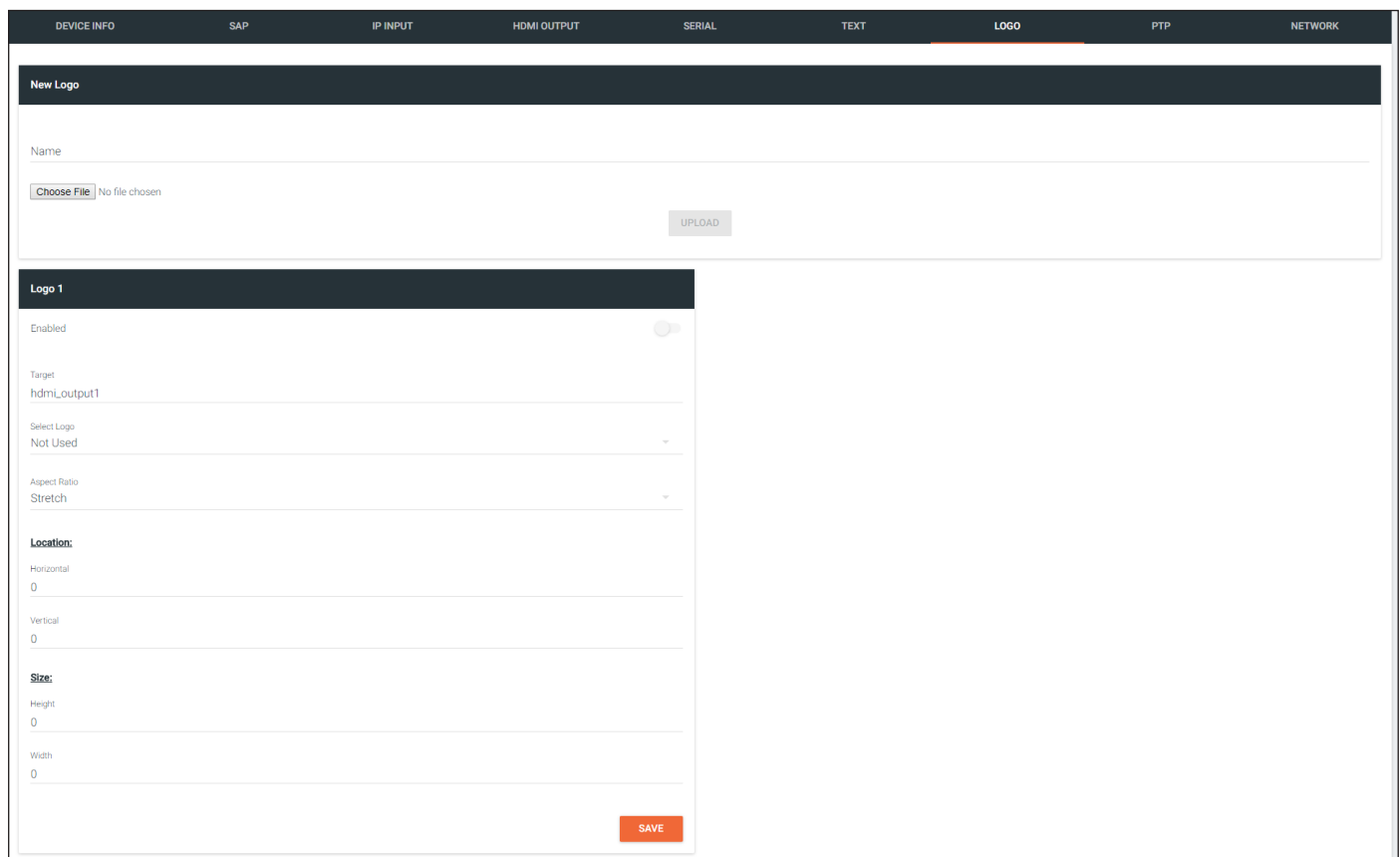


NOTE: Slate Insertion is only supported when the frame rate conversion is set to sub-frame latency mode. To set the frame rate conversion mode, go to the **HDMI Output** menu and select **Sub Frame Latency** from from the **Frame Rate Conversion** drop-down list.

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 slate / logo insertion is configured from the decoder, the image that is displayed on the output is determined by the encoder IP addresses to which each decoder is subscribed. When configuring slate / logo insertion from the decoder, the presence of the image is specified on the (individual) HDMI output. Refer to the User Manual for the AT-OMNI-512 for information on managing slate / logo insertion on encoder units.

1. Login to AMS. Refer to [Accessing Decoders in AMS \(page 13\)](#) if necessary.
2. Click the **LOGO** tab in the menu bar.



The screenshot shows the 'LOGO' tab selected in the top navigation bar. Below the navigation bar is a 'New Logo' section with a 'Name' input field, a 'Choose File' button (with 'No file chosen' text), and an 'UPLOAD' button. Below this is a configuration section for 'Logo 1' with the following fields:

- Enabled:
- Target: hdml_output1
- Select Logo: Not Used (dropdown)
- Aspect Ratio: Stretch (dropdown)
- Location:
 - Horizontal: 0
 - Vertical: 0
- Size:
 - Height: 0
 - Width: 0

A 'SAVE' button is located at the bottom right of the configuration section.

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.

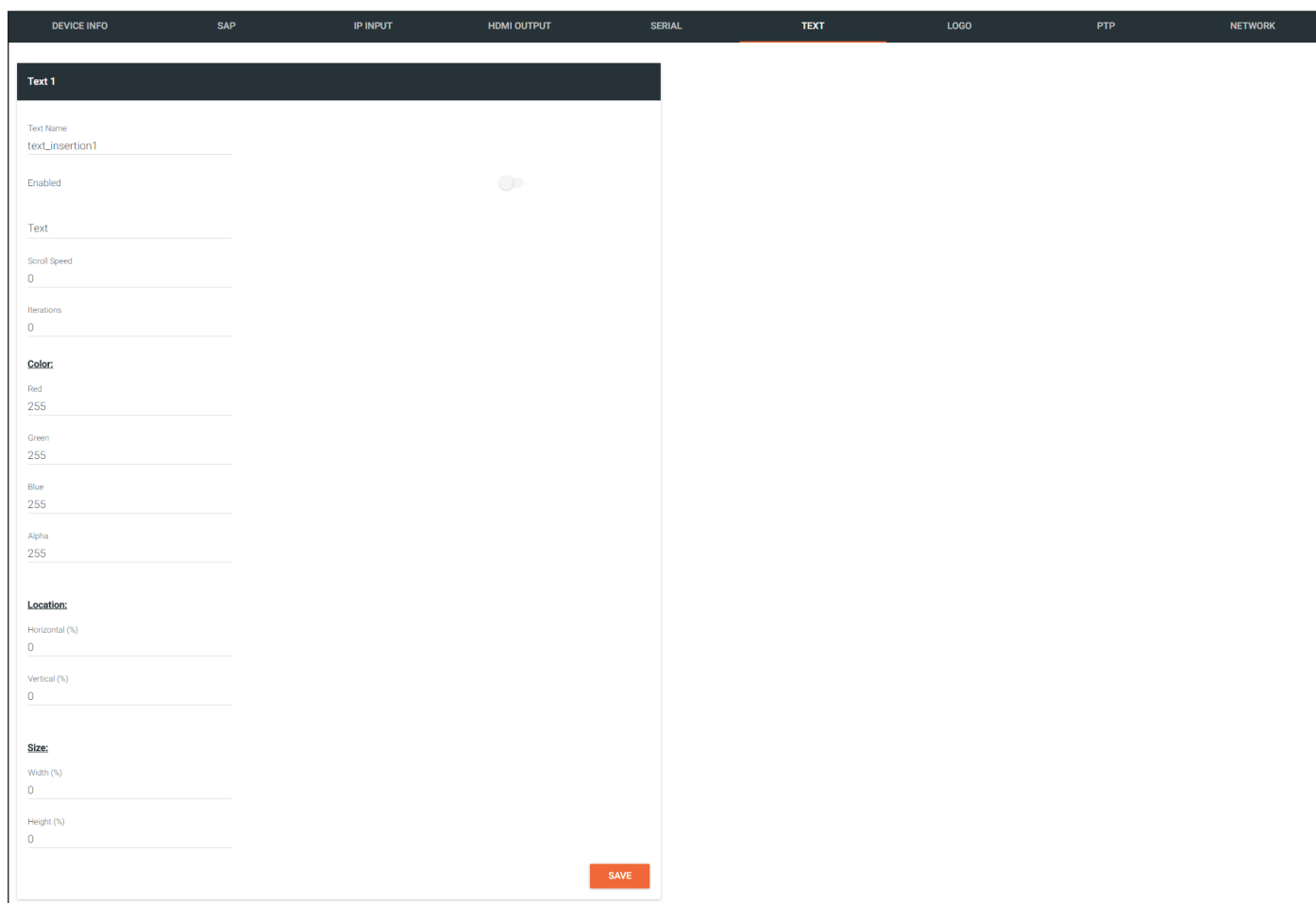
1. Click the **LOGO** tab in the menu bar.
2. Click the **DELETE** button for the desired logo box. If the **DELETE** button is disabled, do the following:
 - a. Scroll down to the **Logo Insertion** boxes.
 - b. Click the **Select Logo** drop-down list and select **Not Used**.
 - c. Click the **SAVE**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

Text Insertion



NOTE: Text Insertion is only supported when the frame rate conversion is set to sub-frame latency mode. To set the frame rate conversion mode, go to the **HDMI Output** menu and select **Sub Frame Latency** from from the **Frame Rate Conversion** drop-down list.

1. Login to AMS. Refer to [Accessing Decoders in AMS \(page 13\)](#) if necessary.
2. Click the **TEXT** tab in the menu bar.



The screenshot shows the AMS interface with the 'TEXT' tab selected in the top navigation bar. The main content area displays a configuration form for 'Text 1'. The form includes the following fields and controls:

- Text Name:** text_insertion1
- Enabled:** A toggle switch that is currently turned off.
- Text:** A text input field.
- Scroll Speed:** A numeric input field with the value 0.
- Iterations:** A numeric input field with the value 0.
- Color:** A section with four input fields: Red (255), Green (255), Blue (255), and Alpha (255).
- Location:** A section with two input fields: Horizontal (%) (0) and Vertical (%) (0).
- Size:** A section with two input fields: Width (%) (0) and Height (%) (0).
- SAVE:** An orange button at the bottom right of the form.

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.

The AMS Interface

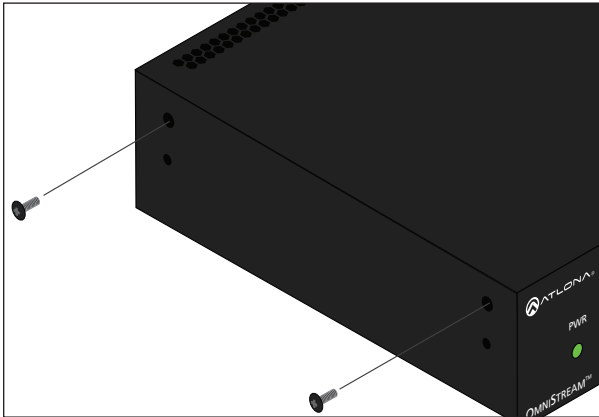
9. Specify the size of the text in the **Width (%)** and **Height (%)** fields. Each of these values is based on the horizontal and vertical resolution of the screen.
10. Click the **SAVE** button to apply all changes.

Appendix

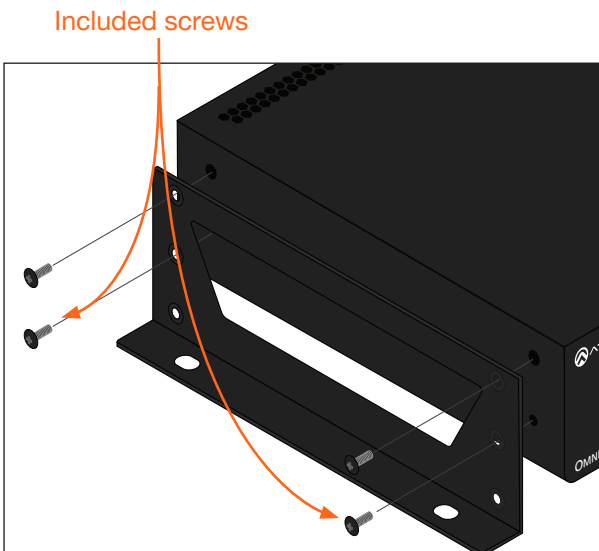
Mounting Instructions

The AT-OMNI-521 decoder 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.

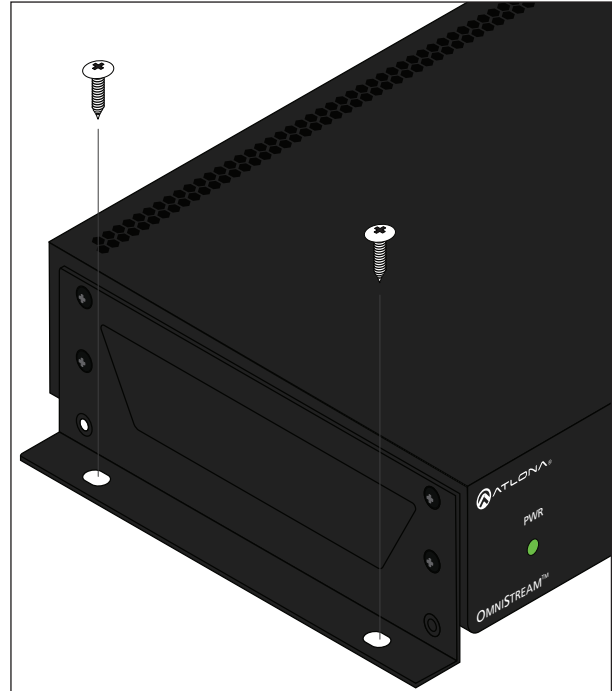


2. Position one of the rack ears, as shown below, aligning the holes on the side of the enclosure with one set of holes on the rack ear.
3. Use the enclosure screws to secure the rack ear to the enclosure.



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

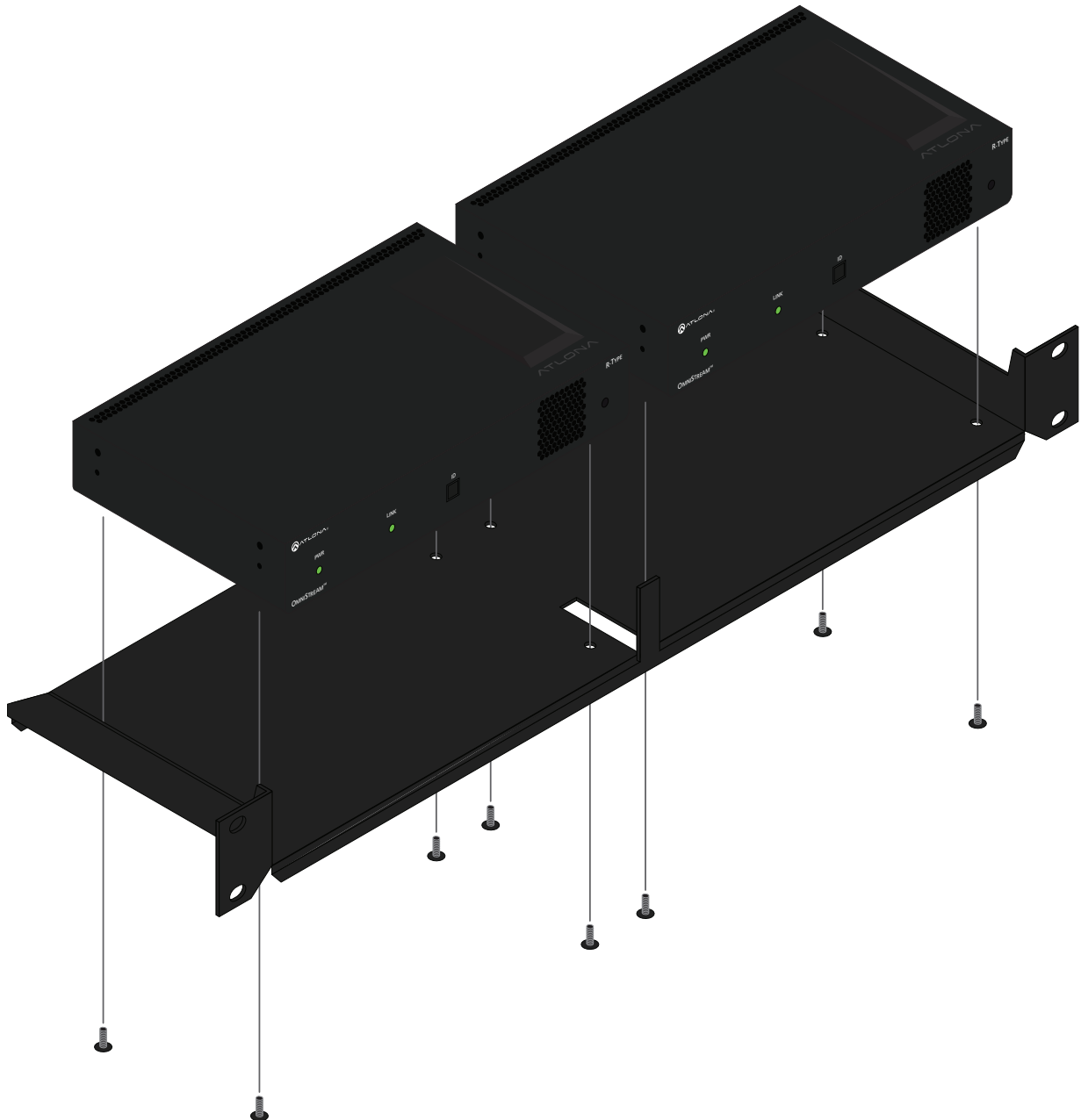
OmniStream decoders can also be mounted in the OmniStream rack tray (AT-OMNI-1XX-RACK-1RU). The rack tray is sold separately and provides easy mounting and organization of up to two OmniStream encoders/decoders in a convenient 1U rack tray. The OmniStream rack tray can be purchased directly from Atlona.

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

Video		
UHD/HD	4096x2160@24Hz, 3840x2160@60/50/24/25/30Hz (UHD), 1080p@23.98/24/25/29.97/30/50/59.94/60Hz, 1080i@25/29.97/30Hz, 720p@30/50/59.94/60Hz	
Latency	0.5 frames (e.g. 1080p @ 60 Hz latency is < 8 ms) Note: Unusual network configurations may increase overall latency	
Bitrate	900 Mbps	
Color Space	YUV, RGB	
Color Depth	8-bit, 10-bit, 12-bit	
HDR modes	HDR10, HLG	
Audio		
Digital IN	LPCM 2.0, LPCM 5.1, LPCM 7.1, Dolby® Digital, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos®, DTS®, DTS-HD Master Audio™	
Sample Rate	32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz	
Bit Depth	up to 24-bit	
Distance		
Maximum distance depends on network configuration		
Signal		
CEC	Yes	
HDCP	2.2	
Scrambling	AES 128-bit for HDCP sources	
IP		
Protocol	RTP	
Ethernet Speed	10/100/1000 Mbps	
Address	DHCP, static	
RS-232		
Bit Rate	2400 - 115200 bps	
Connector	Molex - 2 x 3 pin	
IR	Pass-through	
Temperature		
	Fahrenheit	Celsius
Operating	14 to 122 °F	-10 to 50 °C
Storage	-14 to 140 °F	-10 to 60 °C
Humidity (RH)	20% to 95%, non-condensing	
Power		
Consumption	12 W	
Supply	Ethernet PoE	
Dimensions		
	Inches	Millimeters
H x W x D	1.34 x 8.19 x 4.41	34 x 208 x 112
Weight		
	Pounds	Kilograms
Device	3.08	1.4
Certification		
Device	CE, RoHS, FCC	

