

OmniStream[™] Single-Channel / Dual-Channel Networked AV Encoder





AT-OMNI-111 Atlona Manuals AT-OMNI-112 Networked AV



Version Information

Version	Release Date	Notes
19	Jan 2024	Updated warranty information



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Operating Notes

IMPORTANT: Visit http://www.atlona.com/product/AT-OMNI-111 and http://www.atlona.com/ product/AT-OMNI-112 for the latest firmware updates and User Manual.

Warranty



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Safety and Certification



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.



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Introduction

The Atlona **AT-OMNI-111** is a networked AV encoder for HDMI sources up to 4K/60 4:4:4 and HDR (High Dynamic Range), plus embedded audio and RS-232 or IR control pass-through. **OmniStream** is designed for high performance, flexible distribution of AV over standard, off-the-shelf Gigabit Ethernet switches in commercial audiovisual applications. The OMNI-111 encoder features the advanced VCx[™] codec which delivers 4K/60 4:4:4 video from encode to decode, with artifact-free presentation of computer-generated content and fast-motion video, and ultra-low latency less than one frame. VCx offers high-efficiency coding with simultaneous 4K/60 4:4:4 and 1080p streaming through dual encoders and scaling engines built into the OMNI-111. This encoder is housed in a half-width rack enclosure with front-to-back air flow, and is ideal for high-density, compact installation in a centralized equipment location.

The Atlona **AT-OMNI-112** is a networked AV encoder with two independent channels of encoding for two HDMI sources up to 4K/60 4:4:4 and HDR (High Dynamic Range), plus embedded audio and RS-232 or IR control pass-through. **OmniStream** is designed for high performance, flexible distribution of AV over standard, off-the-shelf Gigabit Ethernet switches in commercial audiovisual applications. The OMNI-112 features the advanced VCx[™] codec which delivers 4K/60 4:4:4 video from encode to decode, with artifact-free presentation of computer-generated content and fast-motion video, and ultra-low latency less than one frame. This dual-channel encoder is housed in a half-width rack enclosure with front-to-back air flow, and is ideal for high-density, compact installation in a centralized equipment location.

Features

- Best-in-class AV over IP performance and reliability over Gigabit Ethernet.
- AV encoder for HDMI up to 4K/UHD, plus embedded audio and RS-232 or IR control pass-through.
- Supports 4K/60 4:4:4 plus HDR formats.
- Advanced VCx codec.
- High-efficiency coding.
- Dual, integrated high-quality scalers.
- OMNI-111 includes an integrated, high-performance scaling engine for each encoder.
- Provides upscaling and downscaling for a wide array of 4K/UHD, HD, and VESA resolutions.
- HDCP compliance.
- Ultra-fast switching between 4K/60 video streams.
- Encoder grouping.
- Multiview window processing (with AT-OMNI-121 decoder).
- Integrated Ethernet link testing.

- Thumbnail preview of encoded video streams.
- Networked AV redundancy.
- Network error resilience with FEC (forward error correction).
- Simplify integration with plug-and-play network switch compatibility.
- Local or PoE (Power over Ethernet) powering.
- Secure content distribution with AES-128 encryption.
- Supports industry-standard, network security features and protocols.
- AES67-compatible.
- Simultaneous OmniStream and AES67 audio streaming.
- Enhance AV presentations with visual enhancements.
- EDID management.
- Audio processing and pass-through.
- System management.
- Compact enclosure.

Package Contents

OmniStream Single-Channel Encoder

1 x AT-OMNI-111

- 1 x Phoenix terminal block, 6-pin (push spring)
- 2 x Mounting brackets
- 4 x Rubber feet

OmniStream Dual-Channel Encoder

- 1 x AT-OMNI-112
- 1 x Phoenix terminal block, 6-pin (push spring)
- 2 x Mounting brackets
- 4 x Rubber feet



OmniStream 101

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

DEFINITIONS

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

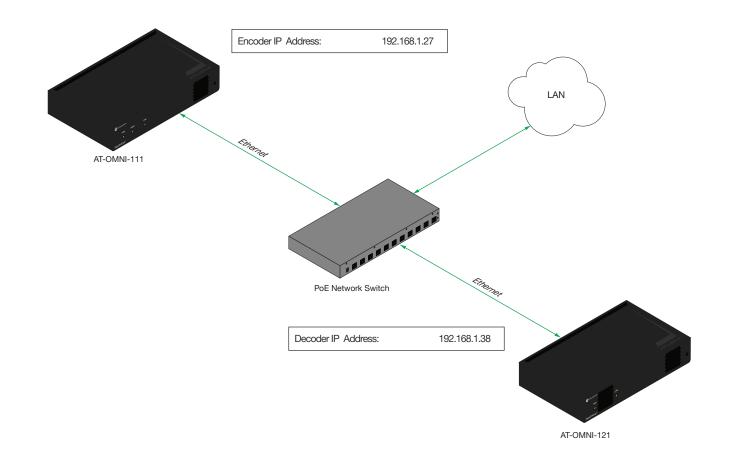
Decoder – Receives and decompresses signals from an encoder and sends them to an output device, such as a display or other sink device.

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

IP Address Assignment

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

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





Network Bandwidth and OmniStream Compression

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

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

* Data rate is shown without compression.

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

Streams

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

Sessions

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

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

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

Session

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



Subscribing to a Stream

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

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

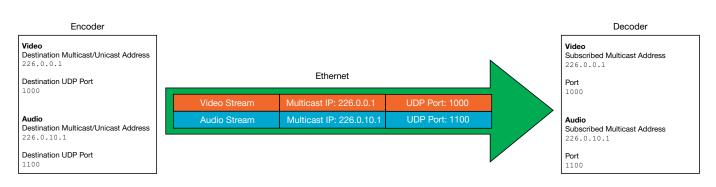
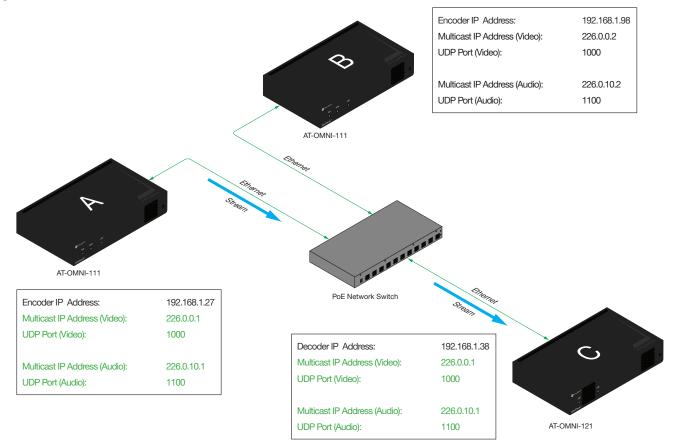


Figure 1.3 shows two encoders and a single decoder connected to a network switch. Decoder "C" is subscribed to encoder "A", since the multicast IP addresses and UDP port numbers for both video and audio are set to the same values as encoder "A".

Figure 1.3 - Decoder "C" subscribed to encoder "A".





DEFINITIONS

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

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

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

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

OmniStream Naming Schema

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

Encoders	Description			
AT-OMNI-111	One HDMI input			
AT-OMNI-111-WP	One Ethernet output			
	Supports up to six sessions			
AT-OMNI-112	Two HDMI inputs			
	Two Ethernet outputs			
	Supports up to six sessions			
AT-OMNI-512	Two HDMI inputs			
	Two Ethernet outputs			
	Supports up to four sessions			

Decoders	Description			
AT-OMNI-121	One HDMI output			
	One Ethernet input			
AT-OMNI-122	Two HDMI outputs			
	Two Ethernet inputs			

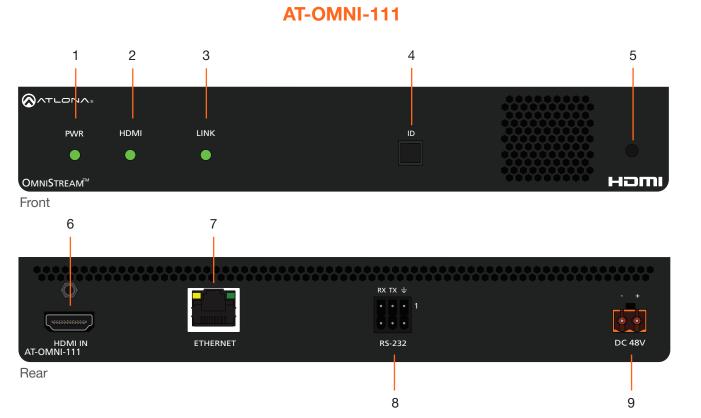
The last three numbers of the OmniStream SKU, describe the model version, model type, and number of inputs/ outputs. The number of Ethernet ports and HDMI ports will be the same.

For example, the numbering scheme on the AT-OMNI-112 is read as follows:

- AT-OMNI-**112**
- **1**= OmniStream Pro ("R-Type" models begin with the number "5").
 - **1** = Indicates that the device is an *encoder* (*decoders* are identified with the number "2").
 - **2** = The number of sources (encoder)/sinks (decoder).



Panel Description



1 PWR

This LED indicator is green when the unit is powered and fully booted.

2 HDMI

This LED indicator is green when the link between source and encoder is good.

3 LINK

This LED indicator will be green when the link integrity between the between the encoder and the network switch is good.

4 ID

This button provides two functions: (1) Press and release this button to send a broadcast network notification to any devices that may be listening. (2) Press and hold this button for 30 seconds to perform a factory-reset of the unit. Refer to ID Button (page 21) for more information.

Ø

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

5 REBOOT

Use a small, pointed object to press this recessed button and reboot the unit.

6 HDMI

Connect an HDMI cable from this port to a UHD/ HD source.

7 ETHERNET

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

8 RS-232

Use the included Euroblock push-spring terminal block to connect an RS-232 controller or automation system. Refer to RS-232 Connections (page 15) for more information.

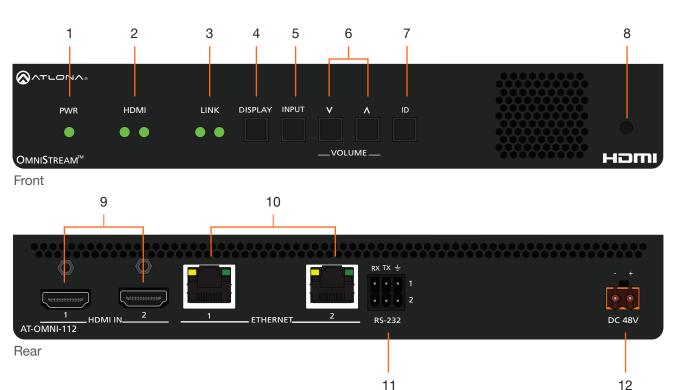
9 DC 48V

Connect the optional 48V DC power supply to this power receptacle. This power supply is available, separately, and is required when connecting the encoder to non-PoE compatible switch.



Panel Description

AT-OMNI-112



1 PWR

This LED indicator is green when the unit is powered and booted.

2 HDMI 1 / HDMI 2

These LED indicators are green when the link between source and encoder is good.

3 LINK 1 / LINK 2

These LED indicators will be green when the link integrity between the between the encoder and the network switch is good.

4 DISPLAY

Press this button to toggle the power state of the desired display. Refer to Powering the Display (page 19) for more information.

5 INPUT

Press this button to switch between HDMI 1 and HDMI 2 inputs. Refer to Selecting the Input (page 19) for more information.

6 VOLUME

Press these buttons to adjust the output volume of the desired display. Refer to Adjusting Volume (page 20) for more information.

7 ID

This button provides two functions: (1) Press and release this button to send a broadcast network notification to any devices that may be listening. (2) Press and hold this button for 30 seconds to perform a factory-reset of the unit. Refer to ID Button (page 21) for more information.



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

8 REBOOT

Press this button, using a small, pointed object to reboot the unit.

9 HDMI IN 1 / HDMI IN 2

Connect HDMI cables from these ports to a UHD/HD source.

10 ETHERNET 1 / ETHERNET 2

Connect Ethernet cables from these ports to the Local Area Network (LAN).

11 RS-232 1 / RS-232 2

Use the included Euroblock push-spring terminal block to connect up to two RS-232 devices to this port. Refer to RS-232 Connections (page 15) for more information.

12 DC 48V

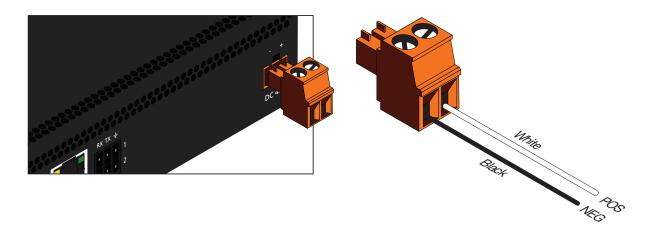
Connect the optional 48V DC power supply to this power receptacle. This power supply is available, separately, and is required when connecting the encoder to non-PoE compatible switch.



Installation

External Power (Optional)

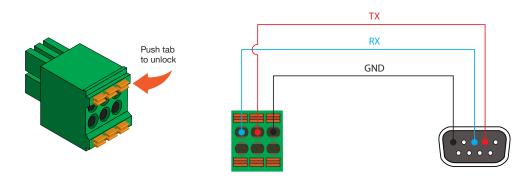
OmniStream encoders are powered by PoE (Power over Ethernet), when connected to a PoE-capable switch. If a PoE-switch is not used, then the optional 48 V power supply (Atlona part no. AT-PS-48083-C) can be purchased, separately. Insert the positive and negative leads, from the power supply, into the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



RS-232 Connections

Both the AT-OMNI-111 and AT-OMNI-112 provide RS-232 over IP, allowing communication between an automation system and an RS-232 device. This step is optional.

- 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 TX, RX, and GND wires.
- 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.



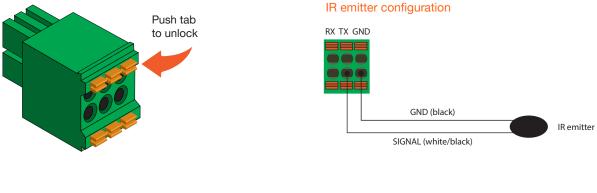
Ø

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.

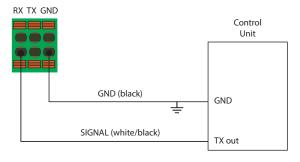


IR Connections

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. IR control is only supported on **RS-232 2** port (bottom set of connectors). Refer to IR Control (page 11) for configuration details.



IR extender configuration





Connection Instructions

 Connect an Ethernet cable from the ETHERNET port on the encoder to a PoE-capable switch on the Local Area Network (LAN). If using the dual-channel encoder, connect 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 encoder.

- 2. Connect an HDMI cable from each source to the HDMI ports on the encoder.
- 3. RS-232 (optional)
 - Connect the RS-232 controller/automation system to the RS-232 port on the encoder.
 - Connect the RS-232 device to the **RS-232** port on the decoder.
- 4. IR (optional)
 - IR emitter

Connect the IR emitter to the **TX** and **GND** pins of the **RS-232 2** port. The IR emitter must be placed no more than one inch from the IR sensor on the device, in order to function properly.

IR extender

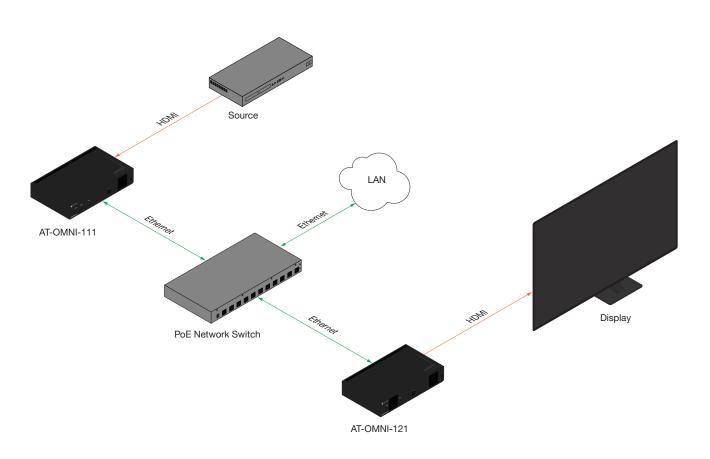
Connect the IR extender from the **RX** and **GND** pins of the **RS-232 2** port to the associated pins on the control system.

5. Once power is applied, the **PWR** indicator, on the front panel, will turn red, then amber, then green.





Connection Diagram





Getting Started

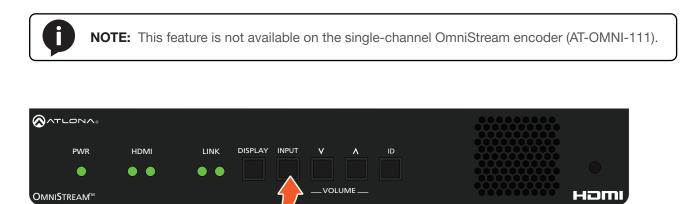
Rebooting OmniStream

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



Selecting the Input

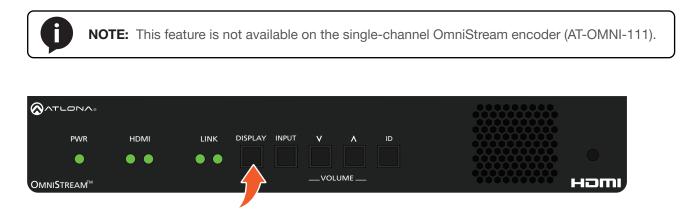
Press and release the **INPUT** button to select the desired input: **HDMI 1** or **HDMI 2**. When a new active input is selected, the previous input will remain "live". This will allow connected devices, such as laptop computers, to remain in "presentation mode" and not revert to single-screen mode.



Powering the Display

Press and release the **DISPLAY** button to send the command to toggle power on the display that is connected to the decoder. The command is sent over IP. After the decoder receives the command, it is executed and transmitted to the display using RS-232 and/or CEC.

Refer to the OmniStream Single-Channel / Dual Channel A/V Decoder User Manual, for configuration information.





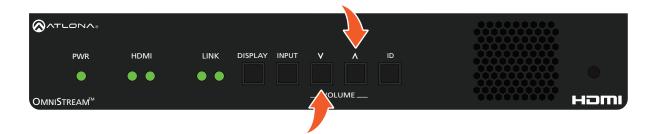
Adjusting Volume

Refer to the OmniStream Single-Channel / Dual Channel A/V Decoder User Manual, for configuration information.

Press and release the Λ (up) or V (down) VOLUME buttons to increase or decrease the audio volume, respectively, in 1 dB increments. The volume command is sent over IP. After the decoder receives the command, it is executed and transmitted to the display using RS-232 and/or CEC. These buttons also concurrently affect the analog output port volume. The maximum audio output level is +15 dB.

When either of these buttons are pressed, the associated HDMI indicator, on the front panel, will glow bright orange to indicate that the stream is being controlled.

Press and hold either of these buttons to rapidly increase or decrease the volume.



Depending upon the output mode of the encoder, the VOLUME buttons will behave differently.

Single-output Mode

Press the desired **VOLUME** control button to immediately change the volume on the display.

Dual-output Mode

OmniStream does not provide a method for managing the currently-controlled stream. To select a stream, the **INPUT** button must first be pressed. Once the stream is selected, the **VOLUME** buttons can be used to change the volume of the display.

- 1. Press and release the **INPUT** button to toggle between the HDMI 1 and HDMI 2 streams.
- 2. The current stream will be indicated by a bright orange HDMI indicator.

The following example shows HDMI 2 as the currently selected stream. If **HDMI 1** is desired, press and release the **INPUT** button.

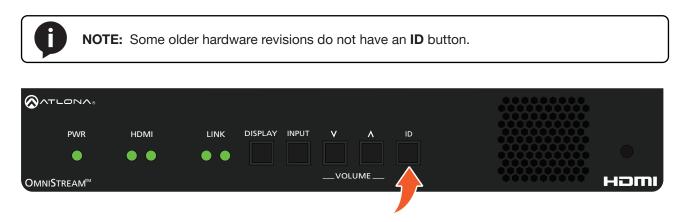




ID Button

The ID button, on both the AT-OMNI-111 and AT-OMNI-112, 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.



Resetting to Factory-Defaults

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

Using the ID button

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

Using the Mclear command

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

Using the Web Server

- 1. Log in to the encoder using the built-in web server. Refer to Accessing the Web Server (page 24) for more information.
- 2. Click the **FACTORY RESET** button.
- 3. The encoder is now reset and will need to be reconfigured.



LED Indicators

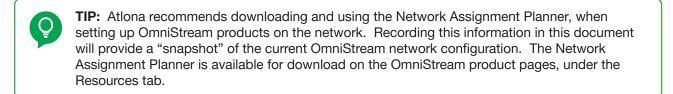
The following table provides a listing of front-panel LED indicators and their status:

LED			Description
PWR	Off	0	 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 green.
	Red	•	The encoder is booting.
	Amber	•	• The encoder is booting and/or attempting to locate a DHCP server.
	Green	•	• The encoder is ready.
HDMI 1 / 2	Red	•	No source is connected to the input.
			Check the HDMI cable for possible damage or loose connections.
	Green	•	• The link integrity between the source and the encoder is good.
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.
	Amber	•	• The encoder is booting.
	Green	•	• Link integrity is good between the encoder and the network.



Accessing the Web Server

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



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

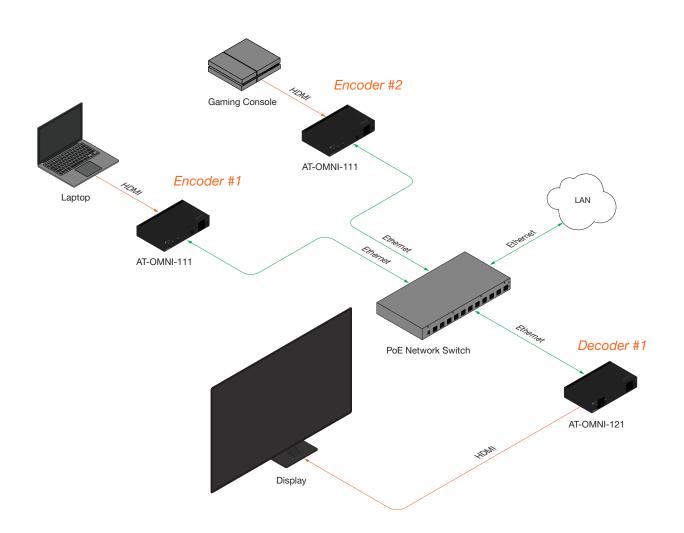
Username: Password:	admin Atlona		Username admin	
			Password	
				_
		Sign in to OmniStream arm Passed 		

3. The System Information page will be displayed.



This section provides a tutorial on configuring two AT-OMNI-111 single-channel encoders and one AT-OMNI-121 single-channel decoder. Make sure the encoders are connected to a source device and that the decoder is connected to a display. Both encoders and the decoder should be connected to the same local network. Refer to Connection Instructions (page 17) for more information.

Physical Connections





Setting the System Mode

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

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

< System information SAP Listener Input EDID Encoding Sestial Session Logo Text Notifications Network PTP LLDP Configuration Users	License Upgrade Demo	
System information		
Firmware version	2.0.0	
FPGA	xc7z045-flg676	
Model	Quotom information	
System mode Description	System information	
Location Inscore	Firmware version	2.0.0
Desertine Uptine	FPGA	xc7z045-ffg676
System *C Yes	Model	at-omni-112
Die "C Temporature *F	System mode	2 VCx -
Power Consumption Hostname		
NTP server	Description	VCx fra
Butions		VC-2 Video
LEDs	Location	
SET DATE/TIME SET TIME20NE		VC-2 PC application
Nucleary Reset	Timezone	UTC
668/1977 (58506) 184	Date/Time	10-13-2022 16:17:26
	Uptime	0 days 0 hours 37 minutes
	System	°C 47.00 °C
	Temperature	
		°F 116.60 °F

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

3. Click **SAVE** at the bottom of the page to commit changes.

Login to the decoder interface and repeat this process.

SET DATE/TIME	SET TIMEZONE		
FACTORY RESET	Reset users	Reset network	Reset defaults
IDENTIFY	DEBUG	REBOOT	3 SAVE



Configuring Inputs

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

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

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



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

3. Click the **EDID** drop-down list to select an EDID. For now, leave this setting at Default HDR MCH. This EDID provides general compatibility with most displays.

Contract of the second					
< System Information SAP Listener Input EDID Encoding Serial Session Logo	Text Notificatio	ns Network PTP LLDP Configuration Users	License Upgrade Demo		
0	Input 1	Vid	eo generator 1		
•	Name	hdmi_input1 Na	Input 1		
	Cable present		or depr		
	HDCP	Encrypted • Fra	merate Name		hdmi_input1
			isampi		
		version	Cable present		2 •
	Video	Color depth B Subsampling 444			
		Colorspace RGB	EDID		3 Default HDR MCH -
		Resolution 1920 x 1080p Framerate 60.00	HDCP	Encrypted	4
		HDR			
	Audio	Bit depth Channel 2		Version	5 2.2 -
		Format LPCM		Negotiated	none
		Frequency 48kHz		version	
		SAVE			
			Video	Color depth	8
				Subsampling	444
				Colorspace	RGB
				Resolution	1920 x 1080p
				Framerate	60.00
		a a ava a if			
he HDCP > Encrypted indicato				HDR	•
IDCP content is present. In this					
connected to HDMI IN 1 is not tr	ansmi	itting HDCP	Audio	Bit depth	16

Channel count

- connected to **HDMI IN 1** is not transmitting HDCP content. Therefore, the indicator is red.
- Click the HDCP > Version drop-down list to restrict HDCP to a particular version. By default, this is set to 2.2 and this setting should be used for most applications.

4.

2



- The Video section provides information about the input signal: color depth, subsampling, color space, resolution, frame rate, and HDR (High Dynamic Range). If the HDR indicator is green, this will indicate that HDR content is being transmitted from the source device. Refer to the Input page (page 86) for more information.
- 7. The **Audio** section displays audio information (if present) from the source device: bit depth, the number of audio channels, the audio format, and the frequency. Refer to the Input page (page 86) for more information.
- 8. Click **SAVE** to commit all changes.

Input 1		
Name		hdmi_input1
Cable present		•
EDID		Default HDR MCH 👻
HDCP	Encrypted	•
	Version	2.2 🗸
	Negotiated version	none
Video 6	Color depth	8
	Subsampling	444
	Colorspace	RGB
	Resolution	1920 x 1080p
	Framerate	60.00
	HDR	•
Audio 7	Bit depth	16
	Channel count	2
	Format	LPCM
	Frequency	48kHz
	8 SAVE	



Encoder Settings

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

1. Click **Encoding** in the menu bar.

a **Panduit** company

- 2. Under the Encoder 1 window group, click the Input drop-down list and select hdmi input1.
- 3. Enter 750 in the **Max bit rate** field. This means 750 Mbps. Maximum bandwidth per port is 900 Mbps. On single-channel encoders, the bandwidth of all enabled sessions should be less than this maximum bandwidth. On dual-channel encoders, 900 Mbps of bandwidth is available on each Ethernet port, and the bandwidth of all enabled sessions assigned to each port should be less than this maximum.
- 4. Click the Bit depth drop-down list to change the bit depth. In this example, it will be set to 8-bit.

Contractioner	Logast
	22.000
Name encodert Name Input Mont_input - Input	Encoder 1
Мак оф тялік В я фарті 8 бал ч Ві фа	
Subsamping 422 • Subsa Force YUV O- Force	
State mode off - State State topo State	
Scaler Goster Scale	
	Bit depth 4 8-bit -
	Subsampling 5 4:2:2 -
SAVE	Force YUV 6 O-
	Slate mode off 🗸
	Slate logo 🗸
	Scaler disable 🗸
	Thumbnail Enable 7
	COPY URL
Click the Subsampling field to set the chroma subsampling value. In this example it will be set to 4:2:2.	the second
The Force YUV toggle switch can be set to on to force YUV color space. In this example, it will be disabled (default). If enabled, the toggle switch will be orange.	SAVE 8

- 7. Click the **Thumbnail** > **Enable** toggle switch to enable it and display a thumbnail of the source. When enabled, the toggle switch is orange and a thumbnail of the source will be displayed. If no thumbnail is displayed when this feature is enabled, verify that the source is connected, powered, and is configured correctly under the **Input** menu.
- 8. Click **SAVE** to commit all changes.

5.

6.



Creating a Session

Before the video and audio (if any) can be sent out over the network, a session must be created on the encoder. The session assigns each stream to a unique multicast IP address and UDP port assignment. Sessions are always created on encoders. Refer to Session page (page 95) for a detailed description of all settings. <u>The following</u> procedure should be performed on both AT-OMNI-111 encoders, except where noted.

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

						Logout
< System information SAP Listener Input EDID Encoding Serial Session Logo Te	xt Notific	cations Network PTP LLDP C	onfiguration Users License L	Jpgrade Demo		*
	Session 1		Session 2			
	Name		session1 Name	session2		
	Interface EncGroup	Enable	eth1 - Interface	eth2 -		
	SAP	Enable	O- SAP Enable	0-		
	Scrambling	Enable	Scrambling Enable			
	Video		rambling Key toder1 - Video Encoder	encoder2 -		
	Video	Enable		encoder2 -		
		Destination IP address	126.0.0.1 Destination	P address 226.0.0.2		
		Destination UDP port	1000 Destination			
		TTL DSCP Des	255 TTL teffort - DSCP	255 Rest effort		
		FEC enable	O- FEC enabl			
		FEC rows	15 FEC rows	15		
		FEC columns	15 EEC colum	15		
		Linkt	Session 1			
	Audio	Source hdmi_				
		Enable	Name		2	session1
		Destination IP address 22	2			
		Destination UDP port	Interface		3	eth1 👻
		TTL DSCP Bes			•	
		FEC enable	EncGroup	Enable		0-
		FEC rows	Encoroup	Enable		\cup
	AUX	FEC columns Source Comm	0.00	Fachle		0
	AUX	adulte Com	SAP	Enable		0
The late of a second second list as a		the e				
The Interface drop-down list assignment			Scrambling	Enable	4	
session to an Ethernet output. Th					-	
changed to eth1 or none. For this	is e	xample,		Key	5	scrambling
Session 1 will be transmitted over				-		
ETHERNET 1 port. Therefore, set			Video	Encoder	6	encoder1 👻
EINERINE I POR. INCICIOLE, SE	L LI II	S IO ELIII.				
The Corombling > Enable tessels		toh io		Enable	7	
The Scrambling > Enable toggle				Enable		_
enabled by default. When enabled						
will be orange. Leave this setting	ena	abled.		Destination IP address	8	226.0.0.1

- 5. The **Scrambling** > **Key** field is set to scrambling by default. Scrambling keys can be any combination of alphanumeric characters and it is good practice to use them. For this tutorial, use the default key.
- 6. Select the encoder for the session. In this example, hdmi_input1 is assigned to Encoder 1 (refer to Step 2 on previous page). Therefore, set the Video > Encoder field to encoder1 for Session 1.
- Click the Video > Enable toggle switch and make sure it is enabled for Session 1. When enabled, the toggle switch will be orange. If set to disabled, then the encoder video stream will be disabled.
- 8. Enter the multicast IP address for the video stream in the **Destination IP address** field. Atlona recommends using multicast IP addresses as shown in <u>Table 2.1</u>, on the next page. Enter 226.0.0.1 in the **Destination IP** address field for **Session 1** on *Encoder #1*. For *Encoder #2*, enter 226.0.0.2 in the **Destination IP address** field for **Session 1**.

3.

4.



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

<u>Table 2.1</u> - Recommended multicast IP address for video, audio, and data streams.

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

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

9 1000	Destination UDP port		Enter the UDP port in the Destination UDP port field. Although any valid UDP port can	9.
255	TTL		be used, Atlona suggests using the UDP port numbers in <u>Table 2.2</u> , shown above. Since	
Best effort 👻	DSCP		this is a video stream, enter 1000 in the Destination UDP port field for Session 1 .	
0—	FEC enable		0. Click the Audio > Source drop-down list	10.
15	FEC rows		and select the HDMI audio input for the session. The source is connected to HDMI	
15	FEC columns		IN. Therefore, set this to hdmi_input1 for Session 1.	
Link test			. Click the Audio > Enable toggle switch	11.
hdmi_input1 🗸	Source	Audio	and make sure it is enabled. When enabled, it will be orange. If disabled, no audio will be	
0—	Enable AES67		streamed from the encoder.	
1	Enable		. Enter the multicast IP address for the audio stream in the Destination IP address field.	12.
226.0.10.1	Destination IP address		Refer to <u>Table 2.1</u> , above. In this example, enter 226.0.10.1 for Session 1 on <u>Encoder</u>	
1100	Destination UDP port		#1 and 226.0.10.2 for Session 1 on Encoder #2.	
255	TTL		. Enter the audio stream UDP port in the	13.
Best effort 👻	DSCP		Destination UDP port field for Session 1 . Refer to <u>Table 2.2</u> , above. Since	
0—	FEC enable		this is an audio stream, use UDP port 1100.	
4	FEC rows		 Click the SAVE button to commit all changes to Session 1. 	14.
4	FEC columns	AUX		
Commands 👻	Source			
0—	Enable			

14

SAVE



Subscribing to an Encoder

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

Video Configuration

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

				Logout
< System information SAP Listener IP Input Multiview Serial HDMI Output Logo Text Notifica	ations Network PTP LLDP Configu	ration Users License Upgrade		
Input 1 Name	la la	Input 2 Input1 Name	lp_input2	
Enable				
Interface		eth1 Interface	eth1	
Muticast	address 226	0.0.1 Multicast address	226.0.2	
Port	1	1000 Port	1000	
Muticast	Mode excl	ude - Multicast Mode	exclude 👻	
filer (IGM/Pv3)	Addresses*	(CMP/3)		
	"Separate multiple IP addresses with a comma.	Input 1		
	SAVE	· ·		
		Namo		in inputd
		Name		ip_input1
Input 3 Name				
Englie	V	Enable		2
Interface				•
Muticast	address			
Port		Interface		eth1
Multicast filer	Mode ex			
(IGMPv3)	Addresses.	Multicast address		3 226.0.0.1
	"Separate multiple /P addresses with a comma.			
	SAVE			•
		Port		4 1000
Input 5				-
ingoi 3 Name		Multicast	Mode	exclude 👻
Enable		filter	Mode	CACINGC +
Interface		(IGMPv3)		
Muticast a	address		Addresses*	N/A
Port				
Muticast filter	Mode ex		*Separate multiple IP addresses with	h a comma
(IGMPv3)	Addresses		Separate multiple in addresses with	ra comma.
	"Separate multiple IP addresses with a comma.			
	SAVE			
			0.01/5	
			SAVE	5
				E E



Audio Configuration

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

					Logout
< System information SAP Listener IP Input Multiview Serial HDMI Output Logo Text Notifications	Network PTP LLDP Configuration	Users License Up	grade		>
Input 1		Input 2			
Name	ip_input1	Name	lp_input2		
Enable		Enable	• eth1		
Multicast address	226.0.0.1	Multicast address	226.0.0.2		
Port	1000	Port	1000		
Muticast fiter ((GMPX3)	Addresses* N/A	Multicast Mo filter (IGMPv3)	de exclude •		
	*Separate multiple IP addresses with a comma.		parate multiple /P addresses with a comme.		
	SAVE		SAVE		
		1.0			
Input 3	In	iput 3			
Name					
Enable	N	ame			ip_input3
Multicast address	22				
Port	E	nable			
Muticast filer ((GMP/3)	Mode ex				
	Addresses* "Separate multiple IP address with a comma	iterface			eth1
	SAVE				
		lulticast add	dress		2 226.0.10.1
Input 5					
Name	P	ort			3 1100
Enable					
Interface	M	lulticast	Mode		exclude 👻
		ter	Wode		
		GMPv3)	Addresse	o*	N/A
			Addresse	5	N/A
			*Oonerste	multiple ID addresses with	
			-Separate i	multiple IP addresses with	r a comma.
			_		
				SAVE	4
					I
	_				

Input Configuration Notes

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

Table 2.3 - Video and Audio information for each encoder.

Encoder #1

Encoder #2

Input	Multicast Address	Input	Multicast Address
Input 1	Video (226.0.0.1:1000)	Input 2	Video (226.0.0.2:1000)
Input 3	Audio (226.0.10.1:1100)	Input 4	Audio (226.0.10.2:1100)

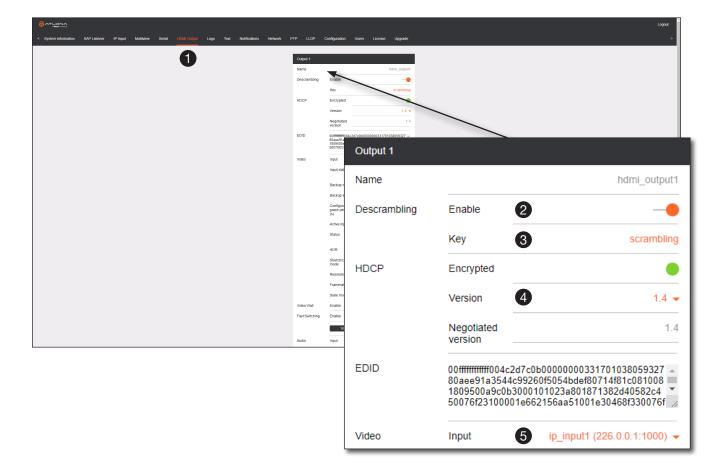


Configuring the HDMI Output Stream

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

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

Since this is the **Video** field, a video source should be selected. Referring to <u>Table 2.3</u>, on the previous page, ip_input1 (226.0.0.1:1000) and ip_input2 (226.0.0.2:1000) are video data, from two different encoders. For this example, this field will be set to ip input1 (226.0.0.1:1000).





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

Table 2.3 - Video and Audio information for each encoder.

E.	000	1	· ~ +	11
	10:03	Ю	Y #	FI
		~~~		

#### Encoder #2

Input	Multicast Address / Port	Input	Multicast Address / Port
Input 1	Video (226.0.0.1:1000)	Input 2	Video (226.0.0.2:1000)
Input 3	Audio (226.0.10.1:1100)	Input 4	Audio (226.0.10.2:1100)

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

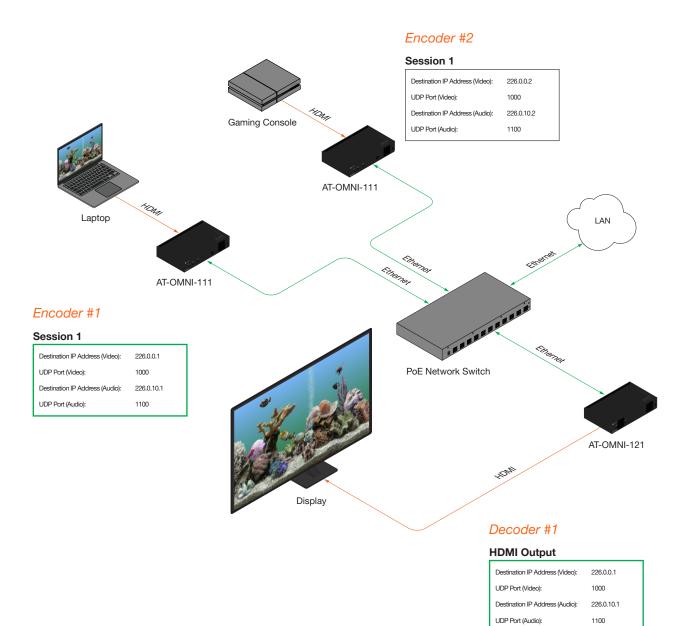
Audio	Input 6	ip_input3 (226.0.10.1:1100) 🗸
	Backup mode	Off 👻
	Backup input	Not used 👻
Standby	Auto on	-•
•	Projector cooldown (s)	0
	Timeout (s)	0
	Туре	DispSW AVon 👻
	SAVE	0

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

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

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





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





## **Troubleshooting**

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

## **Encoder Checklist**

- Verfiy that all encoders and decoders are set to the same system mode. In this tutorial, both encoders and the decoder should be set to VCx. Refer to Setting the System Mode (page 26).
- Go to the **Input** menu and make sure that the **Cable present** indicator, under the **Input 1** window group, is green. If it is not green, replace the HDMI cable or the encoder EDID. Refer to Configuring Inputs (page 27) for more information.
- Go to the Encoding menu and verify the following under the Encoder 1 window group. Refer to Encoder Settings (page 29) for more information.
  - » Make sure the **Input** drop-down list is assigned to an input. In this tutorial, the **Input** field, under the **Encoder 1** window group, is set to hdmi_input1.
  - » Verify that the Max bit rate field is set to at least 450.
  - » Verify that a **Thumbnail** > **Enable** toggle switch is enabled and a thumbnail of the source is displayed.
- Go to the **Session** menu and verify the following under the **Session** window groups. Refer to Creating a Session (page 30) for more information.
  - » Make sure the Interface field for both encoders is set to eth1.
  - » Check that the Scrambling > Enable toggle switch is enabled. Also check that the Scrambling > Key field, for this example, is set to scrambling.
  - » Verify that the Video > Enable toggle switch is set to enabled.
  - » Check the Video > Destination IP address field is set to the correct multicast IP address. In the example, 226.0.0.1. is used on *Encoder* #1 and 226.0.0.2 is used on *Encoder* #2.
  - » Check that the Video > Destination UDP port field is set to 1000.
  - » Make sure the Audio > Source is set to hdmi input1.
  - » Verify that the **Audio** > **Enable** toggle switch is enabled.
  - » Check the Audio > Destination IP address field is set to the correct multicast IP address. In this example, 226.0.10.1 is used on Encoder #1 and 226.0.10.2 is used on Encoder #2.
  - » Check that the Audio > Destination UDP port field is set to 1100.



## **Basic Configuration Tutorial**

#### **Decoder Checklist**

- Verfiy that all encoders and decoders are set to the same system mode. In this tutorial, both encoders and the decoder should be set to VCx. Refer to Setting the System Mode (page 26).
- Go to the **IP Input** menu and verify the following. Refer to Subscribing to an Encoder (page 32) for more information.
  - » Under both the **Input 1** and **Input 2** window groups, verify that the **Enable** toggle switch is enabled.
  - » Check that the **Multicast address** field is set to the correct multicast IP address. In this example, 226.0.0.1 for **Input 1** and 226.0.0.2 for **Input 2**.
  - » Check that the **Port** field is set to the proper port. In this example, 1000 for both **Input 1** and **Input 2**.
  - » Under both the **Input 3** and **Input 4** windows groups, verify that the **Enable** toggle switch is enabled.
  - » Check that the **Multicast address** field is set to the correct multicast IP address. In this example, 226.0.10.1 for **Input 3** and 226.0.10.2 for **Input 4**.
  - » Check that the **Port** field is set to 1100 for both **Input 3** and **Input 4**.
- Go to the HDMI Output menu and verify the following. Refer to Subscribing to an Encoder (page 32) for more information.
  - » Make sure that the **Descrambling** > **Enable** toggle switch is enabled.
  - » Check the HDCP > Version field to make sure the correct version is selected. Also note the color of the HDCP > Encrypted indicator. if it is red, then a picture may not be displayed and result in a "blue screen" on the display. Change the HDCP > Version field, if necessary.



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

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



# **Device Operation**

## **EDID Management**

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

## Selecting an EDID Preset

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

2	Input 1 Name	hdmi_input	Input 2 Name	hdr	mi_input2		
	Cable present	•	Cable presen		•		
	EDID HDCP E	Default HDR MCH	HDCP	Input 1			
	N Video		Video	Name			hdmi_input
	Audio	ATL 1080P 2CH ATL 1080P DD ATL 1080P DVI	Audio	Cable present			
		ATL 1080P MCH ATL 1280x800 RGB DVI PCWXGADVI		EDID		3	Default HDR MCH
	Video generator 1 Name	ATL 1280x800 RGB PCWXGA2CH video_generator	Video graera Name	HDCP	En	Default HDR MCH	
	Color depth	8				Default HDR 2CH	
	Colorspace	YUV -			Vei	Default DV MCH	
	Subsampling Resolution width	444 -	Resolution wi		Ne ver	Default DV 2CH	
	Resolution height	108	Resolution he		_	Default SDR MCH	շիտ
		SAVE		Video		Default SDR 2CH	
				Audio		ATL 1080P 2CH	
						ATL 1080P DD	
						ATL 1080P DVI	
						ATL 1080P MCH	
ck the <b>SAVE</b> button withir commit changes.	n the Input w	vindow group	)			ATL 1280x800 RGB	DVI PCWXGADVI

4.

J



## Adding a Custom EDID

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

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

		l.
< System information SAP Listener Input EDID Encoding Serial Session Logo Text Notifications Network PTP LLDP	Configuration	Users License Upgrade
Defaut		
Product		AT-OMNI-112
Vendor		ATL
Preferred mode	1	3840x2160p30Hz (297 MHz)
Supported modes	Mode	800x500p60Hz (40 MHz)
1100-2	Mode	1024x768p60Hz (65 MHz)
	Mode	1920x1200p60Hz (193 MHz)
	Mode	1680x1050p60Hz (147 MHz)
	Mode	1600x1200p60Hz (162 MHz)
	Mode	1600x900p60Hz (118 MHz)
	Mode	1440x900p60Hz (106 MHz)
	Mode	1400x1050p60Hz (122 MHz)
	Mode	1280x1024p60Hz (108 MHz)
	Mode	1280x800p60Hz (83 MHz)
	Mode	3840x2160p30Hz (297 MHz)
	Mode	1920x1080p60Hz (148 MHz)
	Mode	3840x2160p25Hz (297 MHz)
	Mode	3840x2160p24Hz (297 MHz)
	Mode	4096x2160p30Hz (297 MHz)
	Mode	4096x2160p25Hz (297 MHz)
	Mode	4096x2160p24Hz (297 MHz)
	Mode	1920x1080p50Hz (148 MHz)
	Mode	1920x1080p30Hz (74 MHz)
	Mode	1920x1080p25Hz (74 MHz)
	Mode	1920x1080p24Hz (74 MHz)
	move	rason roughzanz (raimnz)
Default (DV)		
Product		AT-OMNI-112

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

																					Logout
< System information	SAP Listener	Input	EDID Encoding	) Serial	Session	Logo	Text	Notifications	Network	PTP LLDP	Configuration	Users Lice	se Upgrade	Demo							>
									3	New EDID Name Raw	CANCEL	FFF004C2DO		ew ED							
														ew EL	טוי						
													N	ame	4					my	EDID
													R	aw	5	00FFFFFFF	FFFFF	004C2D	CB0B000	000000D	)1801(
															6	CANCEL		CREA	TE		



## **Device Control**

### Downstream Control using RS-232

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

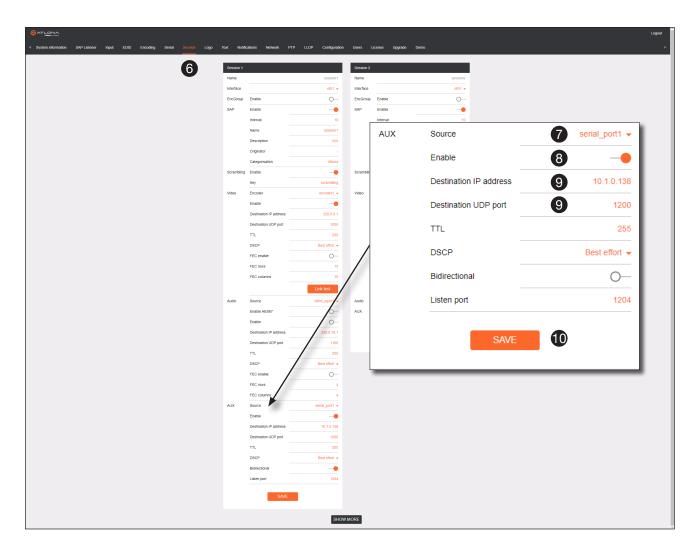
- 1. Login to the encoder and click the **Serial** menu.
- 2. Under the Serial Port Configuration window group, click the Mode drop-down list and select Serial.
- 3. Click the **SAVE** button.

Very Have Wei Köll Very Köll	
Nime Mile   Bases Serial port configuration   Name Serial port   Supported modes infrared, serial   Mode 2   Serial configuration   Name   Baudrate 9600 •   Data 8 •   Parity none •	
Note Serial port   Supported modes infrared, serial   Mode 2   Serial Serial configuration   Name Serial   Baudrate 9600   Data 8   Parity None	
Serial port configuration   Name   Supported modes   infrared, serial   Mode   2   Serial   Mode   2   Serial   Mode   2   Serial   Mode   Parity	
Serial port configuration   Name   Supported modes   infrared, serial   Mode   2   Serial configuration     Mode   2   Serial configuration     Mode   2   Serial configuration     Mode   2   Serial configuration     Mode   Parity     Name     Serial configuration     Mode     Serial configuration     Serial configuration     Mode     Serial configuration     Serial configuration     Mode     Serial configuration     Serial configuration     Serial configuration     Serial configuration     Serial configuration     Serial configuration	
Serial port configuration   Name   Supported modes   infrared, serial   Mode   2   serial   Baudrate   9600   Data   8   Parity	
Serial port configuration   Name   Supported modes   infrared, serial   Mode   2   Serial   Outon   Parity	
Serial port configuration   Name   Supported modes   infrared, serial   Mode   Baudrate   9600   Data   Parity	
Serial port configuration   Name   Supported modes   infrared, serial   Mode   Baudrate   9600   Data   Parity	
Serial port configuration   Name   Supported modes   Mode   2   Baudrate   9600   Data   Parity	
Serial port configuration     Sole       Name     serial_port1       Supported modes     infrared, serial       Mode     2       Baudrate     9600 +       Data     8 +       Parity     none +	
Name serial_port1   Supported modes infrared, serial   Mode 2   Baudrate 9600 •   Data 8 •   Parity none •	
Supported modes     infrared, serial       Mode     2       Baudrate     9600       Data     8       Parity     none	
Supported modes     infrared, serial       Mode     2       Baudrate     9600       Data     8       Parity     none	
Supported modes     infrared, serial       Mode     2       Baudrate     9600       Data     8       Parity     none	
Mode     2     serial configuration       Baudrate     9600     Name       Data     8     Asci       Parity     None     Mode	
Mode     2     serial     I     Sware       Baudrate     9600     I     Image: Sware     Port     Image: Sware       Data     8     I     Image: Sware     Mode     Image: Sware       Parity     none     Image: Sware     Image: Sware     Image: Sware	
Baudrate 9600 V Data 8 V Parity None V Market Ktare Dan Mode Mode	
Parity None V Swe	serial_u
Parity none  Port	
Data     8     NA     Ascil       Parity     none     NM	Not used
Parity none  Mode	
	C
Stop 1 - SAVE	
	,
Flowcontrol none -	
	•
SAVE 3	

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



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



### 10. Click the **SAVE** button.

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





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

						Logout
< System information SAP Listener IP Input Multiview Serial HDMI Output Logo Text I	Notifications	Network PTP LLDP Configuration	Users	License Upgrade		>
1	put 1		Inpu	**		
		ip_input1	Nar		ip_input2	
Ene	nable		Ena	Input 5 10		
Inte	terface	eth1	Inte	Input 5 12		
Mu	ulticast address	226.0.0.1	Mul		la lassif.	
Por		1000	Port		ip_input5	
	er	Addresses" N/A	Mul filter (IGI			
		*Separate multiple IP addresses with a comma.		Enable		
		SAVE		Interface	eth1	
	put 3		Inpu	Multicast address	N/A	
Na		ip_input3	Nar			
Ene	nable		Ena	Port	14 1200	
Inte	terface	eth1	17			
	ulticast address	226.0.10.1	144	Multicast	Mode exclude -	
Por		Mode exclude	Por	filtor		
	er	Addresses*	Mul filter (IGP	(IGMPv3)	Addresses* N/A	
		"Separate multiple IP addresses with a comp				
		SAVE			*Separate multiple IP addresses with a comma.	
Inp	put 5		Inpu			
Nar	ame	ip_input5	Nar		SAVE 15	
En	nable	-•	Ena			
	terface	eth1	Inte			
Mu	ulticast address		Port		1200	
		Mode exclude -		licast Mode	exclude +	
file	er ZMD(2)	Addresses" N/A	100	MPv3) Addresses*	NA	
		"Separate multiple IP addresses with a comma.		"Separate multiple IP addresses with a com	192	
		SAVE		SAVE		
		SHOW	V MORE			

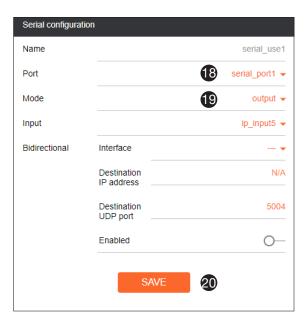
- 15. Click the **SAVE** button.
- 16. Click the **Serial** menu, and under **Serial port configuration**, click the **Mode** drop-down list and select serial.
- 17. Click the **SAVE** button.

Serial port configurati	on
Name	serial_port1
Supported modes	serial
Mode	16 serial 🗸
Baudrate	9600 🗸
Data	8 🗸
Parity	none 👻
Stop	1 👻
Flowcontrol	none 👻
	SAVE 17



## **Device Operation**

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



## Control using TCP Proxy

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

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

						Logout
System information SAP Listener Input	EDID Encoding Serial Session Logo Text Notifications	Network PTP LLDP Configuration	Users Licens	e Upgrade Demo		
	1 Serial port configu		Serial port config			
	Serial port configu Name	abon serial_port1	Senal port config Name	uration serial_port2		
	Supported modes	infrared, serial	Supported mode			
	Mode	serial 👻	Mode	infrared 👻		
	Baudrate	9600 -		SAVE		
	Data	8 -				
	1	1.	Serial configurati	on		
	Flowcontrol	none 👻	Name	serial_use1		
		SAVE	Port	serial_port1 👻		
			Mode	topproxy 👻		
Serial port configu	uration		TCPProxy	Port 10000		
Name		serial_port1		SAVE		
Supported modes		infrared, serial				
Supported modes	·	initaleu, senai	Command: Displ	ay Off		
Mode	2	serial 👻 💆	ASCII	NA		
mode	9	d •	HEX	NA		
Baudrate		9600 🖵		SAVE DELETE		
Bullandio				UNL DELETE		
Data		8 🗸 📩	Command: Volur	ne Down		
			Interpret on	decoder 🛩		
Parity		none 🚽 🔤	ASCII	N/A		
		N/A	HEX	N/A		
Stop		1 👻		SAVE DELETE		
			_			
Flowcontrol		none 👻 💼				
		iet 👻				
		NA				
	SAVE 3					
		·				•
		- H				-



## **Device Operation**

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

Serial configura	tion	
Name		serial_use1
Port		4 serial_port1 -
Mode		5 tcpproxy -
TCPProxy	Interface	6 eth1 -
	Port	7 10000
	SAVE	8



### Downstream Control using Triggering

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

#### **Option 1: Defining Commands on the Decoder**

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

					Loge
nformation SAP Listener IP Input Multiview Serial HDMI I	Julput Logo Text Notifications Network PTP LLDP Configuration	Users License Upgr	ade		
0	Serial port configuration	Serial port configuration			
•	Name serial_port1	Name	serial_port2		
	Supported modes serial Mode	Supported modes Mode	infrared		
	Baudrate 9600 -	M006	initalied •		
	Data 8 🗸		SAVE		
	Parity none -				
	3×1-	Serial configuration			
	Flowcontrol none -	Name	serial_use1		
	SAVE	Port	serial_port1 ▼		
Serial port configuration		Input	No sed -		
Senai port configuration		Bidirectional Interf	ace		
Name	serial_port1	Desti IP ad	nation N/A dress		
Name	Schai_port1	Desti	nation 5004		
Supported modes	serial	Enab			
	Johan		Serial configura	tion	
Mode	2 serial 🗸				
			Name		serial_u
Baudrate	9600 👻 🔤	Command: Display Off Mode	•		
		ASCII	Port		4 serial_por
Data	8 🗸 🚥	HEX			
		SA	Mode		5 outp
Parity	none 👻				
		Command: Volume Down	Input		6 Not use
Stop	1 👻 🔤	Mode			
	NA	ASCII	Bidirectional	Interface	
Flowcontrol	none 👻 🔤	HEX			
		SA	Æ	Destination IP address	
		_			
	AVE 3			Destination	
				UDP port	
	NA				
	, N/A			Enabled	(
	SAVE DELETE				
			7	SAVE	6
			1	SAVE	

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



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

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

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



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

TrigRS232X Y

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



#### **Option 2: Defining Commands on the Encoder**

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

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

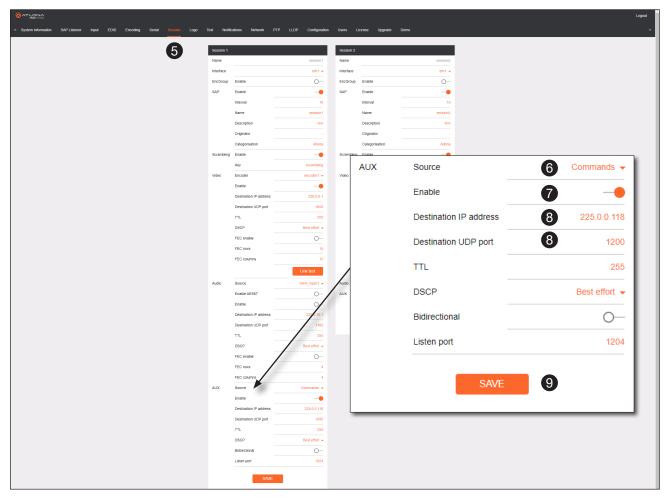
**NOTE:** Setting the **Interpret on** drop-down list to encoder implies that commands are defined/ stored on the encoder. If set to decoder, commands are defined/stored on the decoder.

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

SAP Listener Input EDID Encoding Serial Session	Logo Text Notifications Network	PTP LLDP Configuration	Users License	Upgrade Demo		
0	Serial port configuration		Serial port configurati	on		
	Name	serial_port1	Name		al_port2	
	Supported modes	infrared, serial	Supported modes	1	infrared	
	Mode	serial 👻	Mode	inte	rared 👻	
	Baudrate	9600 🗸				
	Data	8 🗸		SAVE		
	Parity	none 👻				
	Stop	1.+	Serial configuration			
	Flowcontrol	none 👻	Name	seria	al_use1	
	SAVE	_	Port	serial_	port1 👻	
	SAVI	-	Mode	topp	proxy 👻	
			TCPProxy In	terface	eth1 👻	
			F	ort	10000	
				SAVE		
	Serial configuration		Command: Display O		_	
	Name	serial_use2	Interpret on		oder 👻	
	Port	Not used +	ASCII		NA	
	Mode	di 🗸	HEX		NA	
			-			
	SAVE			SAVE DELETE		
	Command: Display On		Command: Volume D	האכ		
	Interpret on	decoder 👻	Interpret on	dec	oder 👻	
	ASCII	N/A	ASCII		N/A	
	HEX	N/A	HEX		N/A	
	CONT.	DELETE	_	SAVE DELETE		
	SAVE	DELETE		SAVE DELETE		
	Command: Volume Up					
	Interpret on	decoder 👻				
	ASCII	NIA				
	HEX	NIA	Comn	nand: Display On		
	SAVE	DELETE				
			Interp	ret on		2 decoder 🗸
			1			_
			ASCII			3 N/A
						<b>V</b>
			HEX			3 N/A
				<b>4</b> s	AVE DELE	TE
			1			



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



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

Input 5 10		
Name		ip_input5
Enable		1
Interface		eth1
Multicast address		N/A
Port		1200
Multicast filter	Mode	exclude 👻
(IGMPv3)	Addresses*	N/A
	*Separate multiple IP addr	esses with a comma.
	SAVE	13



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

nformation SAP Listener IP Input Multiview Serial HDMI Output Logo	Text Notifications Network PTP LLDP (	Configuration Use	rs License Upgrai	e		
12	Setial port configuration Name Supported modes		Serial port configuration Name Supported modes	serial_port2 infrared		
	Mode Basistate Data Patty 3/0	9600 ¥ 8 ¥ none ¥ 1 ¥	Mode	Infrared -		
Serial port configuration	Flewcontrol	ų.	Name Port Mode Input Bidirectional Interfac Destina	tion N/A		
Name	serial_port	11	IP addi Destin UDP pi Enable		on	
Mode	t5 serial		-	Name		serial_u
Baudrate	9600 、	100	Command: Display Off	Port		serial_port
Data	8 •	ci -	ASCII	Mode		18 output
Parity	none	11	SAVE	Input		Not use
Stop	1 •		Command: Volume Down	Bidirectional	Interface	-
Flowcontrol	none	N/A	ASCII		Destination IP address	
SAVE	16	J.	SAV		Destination UDP port	5
		N/A			Enabled	C
	SAVE DELETE					19

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

where x is the number of the input: 1, 2, or tog.

DisplayBtnX Y

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

VolumeBtn X

where x is the volume-up or volume-down command.



### Upstream Control using RS-232

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

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

rmation SAP Listener IP Input Muthview Serial HIDMI Outpu	at Logo Text Notifications Network PTP LLDP Config	uration Users License	Upgrade		
1	Serial port configuration	Serial port configu	ation		
•		L_port1 Name	serial_port2		
		serial Supported modes	infrared		
	Data	8 ↔ 8 ↔	SAVE		
	Powentrel	Name Port	serial_use1 serial_port1 →		
Serial port configuration		Mode Input Bidirectional	eutrorite etht +		
Name	serial_port1		Destination 10.1.0.149 Paddress Destination UDP port		
Supported modes	serial		Serial configurat	lion	
Mode	2 serial -	Command: Display	Name		serial
Baudrate	9600 👻	cse2 Mode	Port		4 serial_po
Data	8 🗸	di 🗸 HEX	Mode		5 out
Parity	none 👻	Command: Volume	Input		6 ip_inp
Stop	1 👻	Mode N/A ASCII	Bidirectional	Interface	<b>7</b> e
Flowcontrol	none 👻	HEX	SAVE	Destination IP address	10.1.
SA	ME 3	• • •	_	Destination UDP port	
		1		Enabled	
				SAVE	

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



## **Device Operation**

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



						Logout
ormation SAP Listener Input EDID Encoding Serial Session	n Logo Text Notifications Network PTP LLDP Configuration	Users License Upgrade Dem	no			5
1	Serial port configuration	Serial port configuration				
•	Name serial_port1	Name	serial_port2			
	Supported modes Infrared, serial	Supported modes	Infrared			
	Mode serial - Baudrate 9600 -	Mode	infrared 👻			
	Data 8 -	SAVE				
	Parity none -					
	Flowcontrol none -	Serial configuration				
		Port	serial_use1			
	SAVE	Mode	di v			
Serial port configuration		SAVE				
		SIWE.				
Name	serial_port1	Command: Display Off				
		Interpret on	decoder 🛩			
Supported modes	infrared, serial	ASCII	rial configuration			
		HEX	nar configuration			
Mode	12 serial 🗸	SAVE Nai	me			serial_u
Baudrate	9600 🖵 🗖				•	
Daudrate	5000 🗸	Command: Volume Down	rt		14	Not use
Data	8 🗸 🗤	ASCII			•	
	NA	HEX MO	de			С
Parity	none 🗸 👘					
		SAVE			-	
Stop	1 🗸 🗖			SAVE	15	
•						
Flowcontrol	none 👻 🙀					
	NA					
						•
SAV	E 13					
SAV						

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

#### AT-OMNI-111 / AT-OMNI-112



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

16	Session 1			Session 2				
	Name		session1	Name		session2		
	Interface		etht 👻	Interface		eth1 👻		
	EncGroup	Enable	0-	EncGroup	Enable	0-		
	SAP	Enable		SAP	Enable			
		Interval	10	Г	Interval	10		
		Name	session1		AUX	Source	17	serial_port1 👻
		Description	N/A					
		Originator Categorisation	Ationa			Enable	18	
	Scrambling			Scrambli				
		Key	scrambling			Destination IP address	19	10.1.0.138
	Video	Encoder	encoder1 👻	Video				
		Enable				Destination UDP port	19	1200
		Destination IP address	226.0.0.1					
		Destination UDP port	1000			TTL		255
		TTL	255			112		200
		DSCP	Best effort 👻			DSCP		Deet offert
		FEC enable				DSCP		Best effort 👻
		FEC rows	15					-
		FEC columns	15			Bidirectional	20	
			Link test					
	Audio	Source	hdml_input/~	Audio		Listen port		1204
		Enable AES67 Enable	<u>0</u>	AUX				
		Destination IP address	226.0.10.1					
		Destination UDP port	1100			SAVE	21	
		TTL	255			SAVE		
		DSCP	Best effort -					
		FEC enable						
		FEC rows	4					
		FEC columns	4					
	AUX	Source	serial_port1 👻					
		Enable						
		Destination IP address	10.1.0.138					
		Destination UDP port	1200					
		TTL	255					
		DSCP	Best effort 👻					
		Bidirectional	1204					
		caren por	1204					

### Upstream Control using IR

To control of headend source from downstream, refer to the Upstream Control using RS-232 (page 51) instructions. Once configured, make sure that the serial port is configured for infrared, as shown.

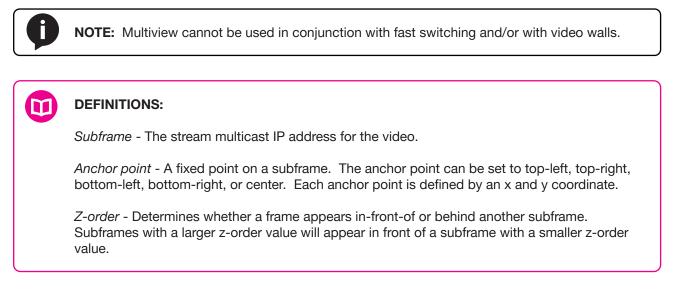
		dware, IR <u>may</u> also be supported on <b>RS-232</b> port 1. ion to determine its capabilities. For decoders, IR is
Serial port con		
Name Supported mo	des infrared	infrared
Mode	infrared 🗸	
	SAVE	



## **Multiview Nomenclature**

### **General Overview**

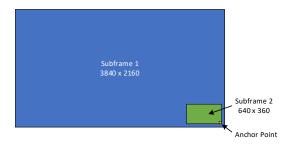
A *multiview* is comprised of a canvas (display area) containing at least two, but no more than four subframes, where each subframe has the following parameters:



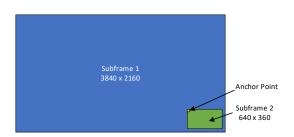
The images below shows the different anchor point options on a particular subframe. For any given subframe, only one of these will be selected as the anchor point.

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

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

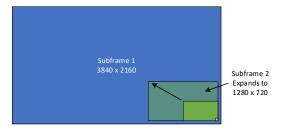


By contrast, consider the same multiview layout, but with the P-i-P subframe having a top left anchor point.

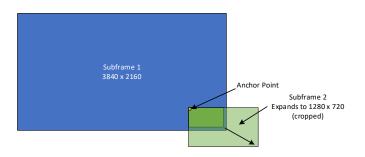




If the incoming stream changes resolution to 1280x720, then the subframe will grow in size, but it will still fit onscreen, because its bottom right Anchor point has not changed position.



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



## Anchor Points

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

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

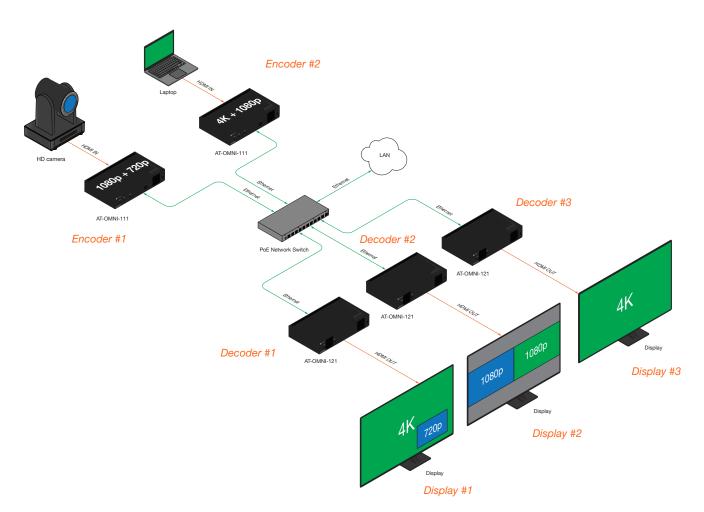
Top Left	Top Right
Bottom Left	Bottom Right



## **Multiview and Dual-Streaming Tutorial**

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

## **Physical Connections**



OmniStream Device	Description (decoders only subscribe to streams that are shown)
Encoder #1	Dual-streaming configuration.
(AT-OMNI-111)	Transmits both 1080p and 720p streams.
Encoder #2	Dual-streaming configuration.
(AT-OMNI-111)	Transmits both 4K and 1080p streams.
Decoder #1	Multiview configuration (picture-in-picture).
(AT-OMNI-121)	Subscribes to the 4K and 720p streams in multiview.
Decoder #2	Multiview configuration (side-by-side).
(AT-OMNI-121)	Subscribes to two 1080p streams in multiview.
Decoder #3 (AT-OMNI-121)	Subscribes to a single 4K stream.



### **Dual-Streaming Encoder Configuration**

#### Encoder #1

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

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



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

- 2. Click the Input menu and select Default HDR MCH from the EDID drop-down list.
- 3. Click the HDCP > Version drop-down list and select 2.2. Click the SAVE button to commit changes.
- 4. Click the **Encoding** menu.
- 5. Under the Encoder 1 window group, select hdmi input1 from the Input drop-down list.
- 6. Set the Max bit rate field to 450.
- 7. Click the Scaler drop-down list and select 1920x1080.
- Click the Enable toggle switch in the Thumbnail field to enable thumbnails of the source. This will verify that the input source is configured correctly and will provide a visual reference for the encoder stream. Thumbnails are updated every 2 seconds.



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

- 9. Click the SAVE button, under the Encoder 1 window group, to commit changes.
- 10. Under the Encoder 2 window group, select hdmi input1 from the Input drop-down list.
- 11. Set the Max bit rate field to 150.
- 12. Click the Scaler drop-down list and select 1280x720.
- 13. Click the SAVE button, under the Encoder 2 window group, to commit changes.
- 14. Click the **Session** menu and configure each video session, using the information in the table bellow. Audio streams will not be configured for this tutorial.

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

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



#### Encoder #2

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

- 1. Go to the **System information** page, click the **System mode** drop-down list, and select VCx. Click the **SAVE** button to commit changes.
- 2. Click the Input menu and select Default HDR MCH from the EDID drop-down list. Click the SAVE button to commit changes.
- 3. Click the **Encoding** menu.
- 4. Under the Encoder 1 window group, select hdmi input1 from the Input drop-down list.
- 5. Set the Max bit rate field to 750.
- 6. Click the Scaler drop-down list and select 3840x2160.



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

- 7. Click the **Enable** toggle switch in the **Thumbnail** field to enable thumbnails of the source. This will verify that the input source is configured correctly and will provide a visual reference for the encoder stream. Thumbnails are updated every 2 seconds.
- 8. Click the **SAVE** button, under the **Encoder 1** window group, to commit changes.
- 9. Under the Encoder 2 window group, select hdmi input1 from the Input drop-down list.
- 10. Set the Max bit rate field to 150.
- 11. Click the Scaler drop-down list and select 1920x1080.
- 12. Click the SAVE button, under the Encoder 2 window group, to commit changes.
- 13. Click the **Session** menu and configure each video session, using the information in the table bellow. Audio streams will not be configured for this tutorial.

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

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



## **Decoder Configuration**

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

#### Encoder #1 (source: HD camera)

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

#### Encoder #2 (source: Laptop)

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

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

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

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

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

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

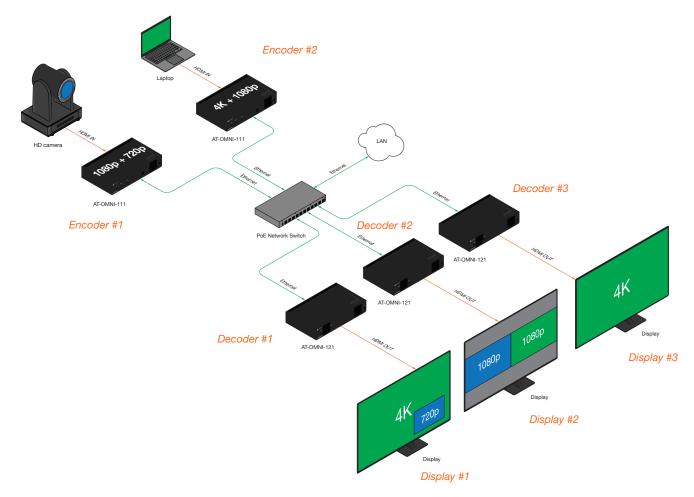
ip_	input1	(226.0.0.1:1000)
ip_	input2	(226.0.0.2:1000)
ip_	_input3	(226.0.0.3:1000)
ip_	input4	(226.0.0.4:1000)

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



### **Multiview Configuration**

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



#### Decoder #1

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

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

- 5. Click the **Resolution** drop-down list and select 3840x2160.
- 6. Click the Layout drop-down list to view the available layouts, and select pip-bottom-right.
- 7. Click the 1 main (3840x2160) drop-down list and select ip input3 (226.0.0.3:1000).
- 8. Click the 2 bottom_right (1280x720) drop-down list and select ip input2(226.0.0.2:1000).





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

#### Decoder #2

- 1. Click **Multiview** in the menu bar.
- 2. Click the ADD MULTIVIEW button.
- 3. The **New Multiview** dialog box will be displayed.
- 4. Enter a name for the multiview configuration in the **Name** field. Since this decoder will be a side-by-side layout, use the name sbs, or similar.
- 5. Click the **Resolution** drop-down list and select 3840x2160.
- 6. Click the Layout drop-down list to view the available layouts, and select side-by-side.
- 7. Click the 1 left (1920x1080) drop-down list and select ip input1 (226.0.0.1:1000).
- 8. Click the 2 right (1920x1080) drop-down list and select ip input4 (226.0.0.4:1000).
- 9. Click the SAVE button.
- 10. Click HDMI Output in the menu bar.
- 11. Locate the **Video** section, click the **Input** drop-down list, and select the name of the side-by-side multiview configuration that was created.
- 12. Click the SAVE button at the bottom of the Output 1 window group.

#### Decoder #3

- 1. Since no multiview is used on this decoder, click HDMI Output in the menu bar.
- 2. Locate the Video section, click the Input drop-down list, and select ip input3 (226.0.0.3:1000).
- 3. Click the SAVE button at the bottom of the Output 1 window group.

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



### **Positioning Subframes**

Each subframe in a multiview can be repositioned on the screen based on its anchor point. The anchor point (0, 0) represents the top left corner of the multivew canvas. For example, in the picture-in-picture example that was created on *Decoder* #1, the settings for each subframe are as follows:

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

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

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

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

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

### Changing the Background Color

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



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

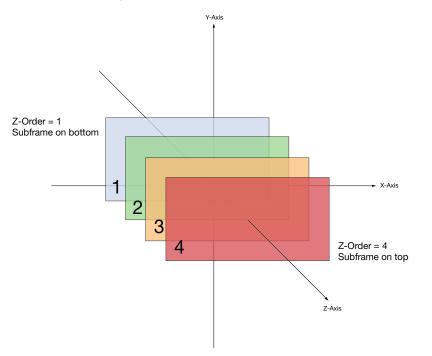
	ADD MULTIVIEW	
Multiviews		
	MULTIVIEW 2	
Multiview 1		
Resolution		3840x2160
Background color	red	0
2	green	0
Choose color	blue	0
ADD SUBF	RAME DELETE	4 SAVE
		3
		×



## Changing the Z-Order

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

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



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



#### Adding Subframes

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

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

#### Deleting a Subframe

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

#### **Deleting a Multiview**

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



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

#### Using Audio in Multiview

When using multiview, a decoder can only subscribe to a single audio stream. To use an audio stream in multiview, simply configure the audio as part of the session (Audio > Source > hdmi_input1, for example). Refer to Creating a Session (page 30) for more information.



## AES67 Audio

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

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

			Session 2			Session 1
	eth1 -		Name	eth1 -		Name
			EncGroup	0-	Enable	
2 -	Enable	SAP	SAP	-•	Enable	SAP
				10	Interval	
1	Interval			session1	Name Description	
					Originator	
session	Name			Ationa	Categorisation	
N/	Description		Scrambling	-•		Scrambling
IN/	Description		Video	scrambling encoder1 +	Key Encoder	Video
	Originator		NGC0		Enable	VIGCO
	Chymatol			226.0.0.1	Destination IP address	
Atlon	Categorisation			1000	Destination UDP port	
Alion	Categorisation	SCP		255	Π.	
	Best effort V	FEC enable		Best effort 👻	DSCP FEC enable	
				15	FEC rows	
hdmi_input1	Source	Audio		15	FEC columns	
				Link test		
3 -(	Enable AES67		Audio	hdmi_input1 👻	Source	Audio
			AUX	 stereo 🗸	Enable AES67	
4 stereo	Downmixing			none	Enable	
none				mono stereo	Destination Teress	
none	Enable			1100	Destination UDP port	
mono				255 Exhefted	TTL	
steren	Destination IP address			~	FEC enable	
Sicient	Destinction UDD part			4	FEC rows	
~	Destination UDP port			4	FEC columns	
25	TTL			Commands -	Source	AUX
20	112			0-	Enable	
Best effort	DSCP				SAVE	
Dest chort	5361			_		
$\bigcirc$	FEC enable		MORE	SHOW		
0						
	FEC rows					
	FEC columns					
Commands	Source	AUX				
0-	Enable					
0-						



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

	Loge	ut
< System information SAP Listener IP input MultiView Serial HDMI Output Logo Text Notifications Netwo	Network PTP LLDP Configuration Users License Upgrade	>
6	SAP Ensite -	
	Citizie	
	SAP	
	No sessions.	
	Enable 7 -	
	Addresses 224.2.127.254, 239.255.255.	255
	SAVE 8	
		_
		Т

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

SATLONA.							Logout
< System information SAP Listener IP leput Multiview Serial HDMI Output Logo	Text Notifications	Network PTP LLDP Configuration	Users License	Upgrade			*
9	Input 1		Input 2				
9	Name	ip_input1			in inaut?		
	Enable	-•	Enable		Input 3		
	Interface	eth1	Interface				
	Multicast address			is	Name		ip_input3
	Port	1000 Mode exclude -					42
	filter (IGMPv3)	Addresses" N/A	filter	Mode Addresse	Enable		10
		"Separate multiple IP addresses with a comma.		*Separate	Lindbio		
					Interface		eth1
		SAVE		_	Internace		Curr
	_				Multicast address		226.0.10.1
	Input 3		Input 4		Municast address		228.0.10.1
	Name	ip_input3		-	Deat		44.00
	Enable	eth1	Enable	_	Port		1100
	Multicast address						
	Port	1100			Multicast filter	Mode	exclude 👻
	Multicast	Mode exclude v	Multicast	Mode	(IGMPv3)		
	(IGMPv3)	Addresses* N/A		Addresse		Addresses*	N/A
		"Separate multiple IP addresses with a comma		"Separate			
		SAVE				*Separate multiple IP add	Iresses with a comma.
	Input 5		Input 6				
	Name	ip_input5				SAVE	12
	Enable						
	Interface	etht	Interface				



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

					Logout
	PTP LLDP	Configuration Users License Up	ngrade		>
13	Output 1				
	Name Descrambling	Enable			
			ambling		
	HDCP	Version	1.4 -		
		Negotiated version	Audio I	nput	14 ip_input3 (226.0.10.1:1100) 👻
	EDID	NA	_		
	Video	Input ip_input1 (226.0.0.1)	E	Backup mode	Off 👻
		Input status No acti Backup mode	E	Backup input	Not used 👻
		Backup input No		-	
		Configuration grace period (S)		Configuration	0
		Active input ip_input1 (226.0.0		s)	
		HDR	μ	Active input	Not used
		Stretch/crop keep aspectmode			
		Resolution Framerate	C	Downmixing	none 👻
	Video Wall	State mode Enable	F	Inable	<b>(b</b> -•
	Fast Switching	Enable		AES67	
		TO PRIMARY TO BACKU	G	Status	No active audio
	Audio	Input Input3 (226 0.10.1) Backup mode		-	
		Backup input Not	N	/lute	0—
		Configuration grace period (5)	1	/olume	- 15 +
		Active input 1 Downmixing		-	
		Enable AES67	A	Analog power	•
		Status No acti Mute		Analog power	$\bigcirc$
		Volume	,	-	0—
		Analog power		TO PRIMA	ARY TO BACKUP
			Standby A	Auto on	
			-	Projector	0
				cooldown (s)	
			г	Timeout (s)	0
			т	Гуре	DispSW AVon 👻
			_		
				CA	ME 16
				SA	



## **Encoder Grouping**

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

### **Encoder Configuration**

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

em information SAP Listener Input EDID Encoding Serial	Session Logo Text Notifica	ations Network P	TP LLDP Configuration	Users L	cense Upgrade Demo		
	Session 1			Session 2			
	Name		session1	Name	Session 1		
	Interface		etht 👻	Interface	Session		
	EncGroup	Enable		EncGroup	News		
		Name	group1	SAP	Name		session1
		Active .	manual 🗸	Scrambling			
		Trigger		Video	Interface		eth1 👻
			Activate				
	Members		~		EncGroup	Enable	2 -•
			Add				
	SAP Scrambling	Enable	-0			Name	3 group1
		Enable -	scrambling	1			•
		Encoder	vc2_encoder1 -			Active	•
		Enable					
		Destination IP address	226.0.0.2			Trigger	4 manual 🗸
		Destination UDP port	1000			mggei	
		πι	255	Audio			
		DSCP	Best effort 👻				Activate
		FEC enable	0-				
		FEC rows	15		Members		
		FEC columns	15		Members		
			Link test				
		Source	hdmi_input1 👻				Add
		Enable AES67	<u> </u>				
		Enable	O 226.0.10.2		FEC columns	4	
		-	22000-10-2	AUX	AUX	Source	Commands 👻
		Lauria II.a	t a ca al			Enable	0—
k the <b>EncGroup</b> > <b>Tri</b>	<b>gger</b> arop-d	iown lis	tand				0
ect the desired option.							
							SAVE 5

5. Click the **SAVE** button.

4.

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

**NOTE:** Setting **Trigger** to input connected should not be used when **Slate Mode** is set to Auto. Doing so will cause the slate to be displayed when switching inputs. If encoder auto-switching is being used, set the **Slate Mode** to Auto, on the decoder. Refer to Slate / Logo Insertion (page 76) for more information.



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

Session 1		
Name		session1
Interface		eth1 👻
EncGroup	Enable	-•
	Name	group1
	Active	•
	Trigger	manual 👻
		Activate
Members		
		6 Add

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

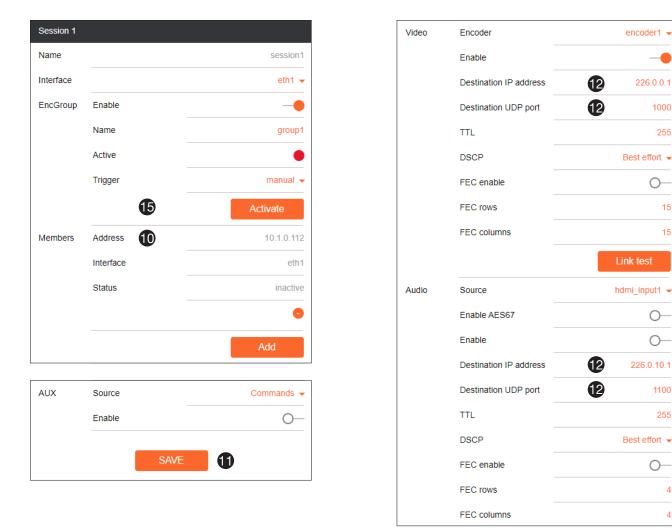
**IMPORTANT:** The IP address for each encoder must be added to the group. This <u>includes</u> the IP address of the encoder that is being used to create the group.

																					Logo	ut
<ul> <li>System tolomation</li> </ul>	SAP Listoner	input	EDIO Enco	ing Serial	Session	Logp	Text	Notifications	Network	PTP LLDF		EATE	New Me Session Address	ember	7				8		sion1	*
																ANCE	CF	REATE		9		



## **Device Operation**

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



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

If using manual triggering, then click the Activate button. Otherwise, connect an active HDMI source to an encoder within the group.

Scrambling	Enable		13	-•
	Key		13	scrambling
AUX	Source			Commands 👻
	Enable			0—
		SAVE	14	

4

4



## **Decoder Configuration**

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

0	Input 1		Input 2				
U	Name	ip_input1	Name		ip_input2		
	Enable	-•	Enable		-•		
	Interface	eth1	Interface		eth1		
	Multicast addres		Multicast addre	98	226.0.0.2		
	Port	1000	Port		Input 1		
	Multicast fiter (IGMPv3)	Mode exclude •	Multicast fiter (IGMPv3)	Mode			
		Addresses" N/A "Separate multiple /P addresses with a comm		Addresse "Seperate	Name		ip_input1
							•
		SAVE			Enable		2 -•
			/				•
	Input 3		Inp.14		Interface		eth1
	Name	ip_input3	Name	_			-
	Enable		Enable		Multicast address		3 226.0.0.1
	Interface Multicast addres		Multicast addre				-
	Port	1100	Port		Port		3 1000
	Multicast	Mode exclude 🗸	Multicast	Mode			
	(IGMPv3)	Addresses* N/A	(IGMPv3)	Addresse	Multicast	Mode	exclude 👻
		"Separate multiple /P addresses with a comma.		*Separate	filter		
		SAVE			(IGMPv3)	Addresses*	N/A
	Input 5		Input 6			*Separate multiple IP address	es with a comma.
	Name	ip_input5	Name				
	Enable	-•	Enable				

5. Click the **HDMI Output** menu.

4.

6. Click the Video > Input drop-down list and select the IP Input used for video, audio, and control.

					Logout
< System information SAP Listener IP Input Multiview Serial HDMI Output Logo Text Notifications Network	PTP LLDP	Configuration Users License Upgrade			>
5	Output 1				
	Name	hdmi_output	1		
	Descrambling	Enable			
	HDCP	Key scramt	Video	Input 6	ip_input1 (226.0.0.1:1000) 👻
		Negotated n		Input status	No active video
	EDID			Backup mode	Off 🗸
	Video	Input Ip_input1 (226.0.0.1:1000 Input status No active v Backup mode Q		Backup input	Not used 👻
		Backup input Configuration grace period (5)		Configuration	0
		(5) Active input ip_input1 (226.0.01 Status No active v		grace period (s)	
		HDR Stretch/crop keep aspect rati		Active input	ip_input1 (226.0.0.1:1000)
		Resolution aut Framerate aut		Status	No active video
	Video Wall	Slate mode d Enable C		HDR	•
	Fast Switching	Enable C		Stretch/crop	keep aspect ratio 👻
	Audio	Input Not use		mode	



## **Device Operation**

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

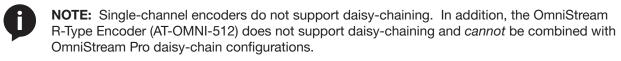
Output 1		
Name		hdmi_output1
Descrambling	Enable	7 -•
	Кеу	o scrambling
HDCP	Encrypted	•
	Version	1.4 👻
	Negotiated version	none
Standby	Auto on	•
	Projector cooldown (s)	0
	Timeout (s)	0
	Туре	DispSW AVon 👻
	SAVE	8



# **Daisy-Chaining Encoders**

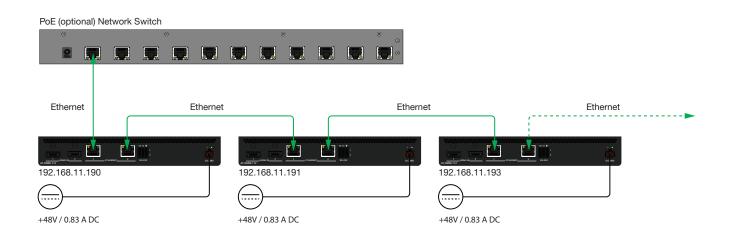
Encoders can be daisy-chained to one another. This is particularly useful when only a single distribution point and one display exists in a room. Daisy-chaining transforms multiple encoders into a single multiple-input encoder with a single multicast IP address.

In the diagram below, three dual-channel OmniStream encoders are connected to a switch. In order to daisy-chain them, they must be reconnected in a different configuration. Each encoder has been labeled with an arbitrary IP address, for identification purposes.



- 1. Reconnect the encoders to one another, and to the switch, as shown in the illustration below.
- 2. Connect the optional OmniStream power supply (AT-PS-48083-C) to each encoder in the chain.

**IMPORTANT:** The optional OmniStream power supply (AT-PS-48083-C) must be connected to each encoder that is daisy-chained, in order to supply the required power. Note that since each encoder must use an external power supply, connection to a PoE switch is not required.



- 3. Login to the encoder.
- 4. Click Session in the menu bar.
- 5. Create an encoder group for using each encoder in the chain. Refer to Encoder Grouping (page 68) for more information. Since there are three encoders in this example, each encoder will be listed under the **Session** page, as shown. Encoders can be added to an encoder group in any order.

To delete an encoder from the **Members** list, click the trash can icon to the right of its IP address.



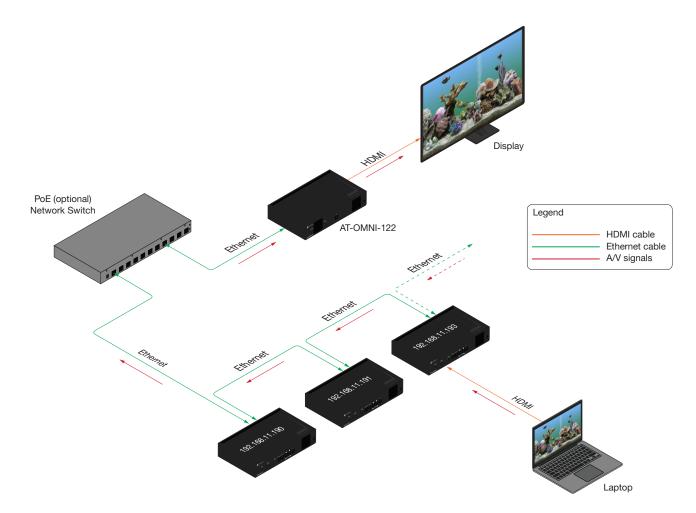


Figure 1. Daisy-chained encoders with single decoder and display (sink).

6. Click the **Trigger** drop-down list to select the trigger mode. Selecting the trigger mode will set how the OmniStream encoder will respond when a source is disconnected/connected.

The diagram above shows a basic daisy-chain setup. The path of the A/V signal is identified with red arrows. When encoders are daisy-chained, they function as one single encoder. In this example, daisy-chaining three dual-channel encoders, creates a single "logical" encoder with six HDMI inputs.

When daisy-chaining encoders, the following rules apply:

- All encoders will stream content using the same multicast IP address. Therefore, the decoder must be subscribed to this multicast IP address in order to display the content.
- Daisy-chained encoders can only display one source at a time. Click the **Trigger** drop-down list to determine how the encoder will handle switching between sources.
- The last source that is connected will be the one that is displayed. However, this is only occurs if the **Trigger** mode is set to input connected.
- Pressing the **INPUT** button, on the front panel of an encoder, will toggle between HDMI inputs.



# Scrambling

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

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

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



# Slate / Logo Insertion

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

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

# Adding Slates / Logos

- 1. Login to the encoder.
- 2. Click Logo in the menu bar.
- 3. Under the **New logo** window group, enter the name of the logo in the **Name** field.
- 4. Click the Choose File button and select the desired image. Only .png or .svg files are valid selections.
- 5. Click the **UPLOAD** button to upload the file.

a **Panduit** company

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



# 14. Click **Encoding** in the menu bar.

15. Click the Slate mode drop-down list, and select Off, Manual, or Auto.

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

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

# **Deleting Slates**

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

# **Deleting Logos**

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



# **Text Insertion**

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

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



# **Configuring a Static IP Address**

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

AT LENA				Logout
< system monimutana SAV-takener ingad LCHO Encoding Senial Session Logo in	Reference in the second	Network 2 Network 2 Name Enaland Camer Mode	200 0 0 2002 •	
	Subnetmask         255 255 254 0           Gateway         10.1.1.254           Link speed         1000	Network 1		
	MAC address B8 98 80 01 F7 EB Teinet Enable	Name		eth1
	Authentication	Enabled		۲
	602.1x Mode none -	Carrier		۲
		Mode		2 static -
	$\backslash$	IP address		3 10.1.0.112
		Subnetmask		4 255.255.254.0
		Gateway		5 10.1.1.254
Click the Mode drop-down list an static.	d select	Link speed		1000
Enter the desired IP address in the	e IP address	MAC address		B8:98:B0:01:F7:EB
field.		Telnet	Enable	-•
Enter the subnet mask in the Sub	netmask field.		Authentication	
Enter the gateway (switch/router) a Gateway field.	address in the	WebUI	Enable HTTP	-•
Click the SAVE button to commit	all changes.		Enable HTTPS	•
		802.1x	Mode	none 👻
			SAVE	6

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

2.

3.

4.

5.

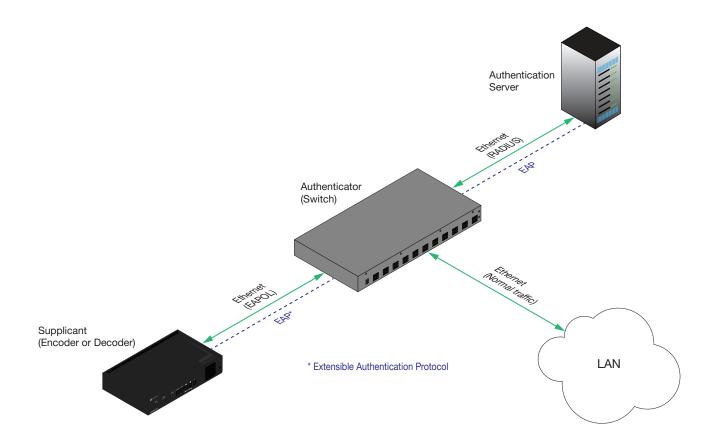
6.



# **802.1X Authentication**

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

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



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

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



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

<b>W AT</b>									Logout	
< Syst	m information SAP Listener Input EDID Encoding Serial Session Logo 1	Fext Notifications	Network PTP	LLDP Configuration	Users License	e Upgradk	Demo		>	
		Network 1	-1		Network 2					
		Name		eth1	Name		eth2			
		Enabled		•	Enabled		•			
		Carrier		•	Carrier		•			
		Mode		static 👻	Mode		static 🛩			
		IP address		10.1.0.112	IP address		10.1.0.120			
		Subnetmask		255.255.254.0	Subnetmask Gateway		255.255.254.0			
		Link speed		10.1.1.204	Link speed		10.1.1.254			
		MAC address		88:98:80:01:F7:E8	MAC and ess		B8:96:B0:01:F7:EC			
		Teinet	Enable		Teinet	Enable	-			
			Authentication	-•		Authentica	bor -			
		WebUI	Enable HTTP	-•	WebUI	Enable HT	IP			
			Enable HTTPS	-•		Enable HT	TPS —			
		802.1x	Mode	none 👻	802.1x	Mode	Network 1			
			SAVE	PEAP/MSCHAPv2						
				EAP-TLS			Name		eth1	
							Enabled		•	
							Carrier			
							ounici			
		+ la a f; .					Mode		static 👻	
	the PEAP/MSCHAPv2 option,	the ne	elos are				wode		Static •	
des	scribed as follows:						IP address 10.1.0.1			
							IP address	10.1.0.1		
_	lala astitu						O the strength	055 055 054		
•	Identity						Subnetmask	255.255.254.0		
	Enter the identity of the authe	enticat	ion serv	er						
	in this field. PEAP uses this f						Gateway		10.1.1.254	
	correct authentication server	which	i will pro	cess th	е		Link speed		1000	
	credentials. For example, if f	oola	uthser	v.com						
	is entered, then this identifies						MAC address		B8:98:B0:01:F7:EB	
			ISERV a	as the						
	RADIUS (authentication) serve	er.					Telnet	Enable		
•	CA certificate							Authentication		
	Click the <b>Browse</b> button to		+ + h = = = =	4:f: +: _				, lational dation		
							WebUI	Enable HTTP		
	authority (CA) certificate. To	remov	e a cert	ificate, o	click		WEDOI	LINADIC ITTTE		
	the <b>Remove</b> button.			,						
	the nemove button.							Enable HTTPS		
•	Username						802.1x	Mode 2	none 👻	
	Enter the username in this fie	ld				0000				
									none	
•	Password							3 SAVE	PEAP/MSCHAPV	
-										
	Enter the password in this field.								EAP-TLS	
	•									

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

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



# Web Server

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

# System information page

	Lapu
< System information SAP Listener Input EDIO Encoding Serial Session Logo Text Notifications Network	k PTP LLDP Configuration Users License Upgrade Demo
	System information
	Firmware version 200
	FPGA 72035-fbg576
	Model alog 111
	System mode VCX - Description NA
	Description NA Location NA
	Timesone UTC
	Date/Time 10-13-2022 23.01.08
	Uptime 0 days 7 hours 21 minutes
	System C System information
	De repeater , Firmware version 2.0.0
	Power Consumption
	Hootsame FPGA xc7z035-fbg676
	NTP server
	LEDS Model at-omni-111
	Set INTEGRATE SET THREADER VCX  VCX
	ICENTRY DEBUO REBOOT SWE

# **Firmware version**

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

# **FPGA**

Displays the FPGA model number and the size.

# Model

The model number of the unit.

Model	Description
AT-OMNI-111	Single-channel encoder
AT-OMNI-112	Dual-channel encoder

# System mode

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

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



# Description

Provides the option of assigning descriptive name to the unit.

# Location

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

### Timezone

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

#### Date/Time

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

#### Uptime

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

#### **System Temperature**

Displays the ambient enlosure temperature.

#### **Die Temperature**

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

#### **Power Consumption**

Displays the precise power consumption of the encoder.

#### Hostname

Displays the hostname of the encoder. By default, OmniStream encoders are assigned a default hostname, which is constructed as follows: at-omni-[SKU]-[last five digits of serial number]. If using a custom hostname, it must meet the hostname standards, defined here: <u>https://tools.ietf.org/html/</u> <u>rfc1123</u>.

### **NTP Server**

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

#### **Buttons**

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

# LEDs

Click this toggle switch to enable or disable <u>all</u> front-panel LED indicators and button backlight indicators. When enabled, the toggle switch will be orange.

# SET DATE/TIME

Click this button to set the current date and time.

Description			N/A						
Location			N/A						
Timezone	UTC								
Date/Time	10-13-2022 23:01:08								
Uptime	0 days 7 hours 21 minutes								
System Temperature	°C		42.50 °C						
Temperature	°F		108.50 °F						
Die Temperature	°C	65.46 °C							
Temperature	°F 149.82								
Power Consumption	8.38 W								
Hostname		ł	at-omni-111-01466						
NTP server			pool.ntp.org						
Buttons									
LEDs									
SET DATE/TIME	SET TIMEZONE								
FACTORY RESET	Reset users	Reset network	Reset defaults						
IDENTIFY	DEBUG	REBOOT	SAVE						



# SET TIMEZONE

Click this button to set the desired time zone.

# **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 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 and restores a default device configuration that includes defined multicast addresses. This option can be used to configure a single encoder to transmit to any number of decoders.									



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

# **IDENTIFY**

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

# DEBUG

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

# REBOOT

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

# SAVE

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



# SAP Listener page

																Logout
< System information	SAP Listener	Input	EDID	Encoding	Serial	Session	Logo	Text	Notifications	Network	PTP LLDP	P Co	Infiguration	Users License	Upgrade	Demo >
											SAP					
											Enable					
											Addresses			2 255 255 255, 224		
													SAVE			
											Session Plays	/Station3				
											Name			P	layStation3	
											Hash				da36	
											Interface(s)				eth1	
											Description			SAP		
											Originator					
											Source addre			Enabl	е	
											Video		resent estination IP add			
													lestination UDP p		2000	239.255.255.255, 224.2.127.254
											Audio		resent	Addie	3303	200.200.200, 224.2, 121.204
													estination IP add	1		
												D	estination UDP p			
											AUX	Pr	resent			SAVE
												D	lestination IP add	1		C/WE
												D	estination UDP p	2		
														_	_	
														Casaia		v/Ctation?

### Enable

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

# Addresses

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

#### SAVE

Click this button to save all changes

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

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



SAVE

# Input page

					Logout
< System information SAP Listener Input EDID Encoding Serial Session L	ogo Text Notifications Network	PTP LLDP Configuration Users	License Upgrade Demo		>
	trpof 1  Table Present Cable present EDD  HDCP Encrypted Version Negatured Subampting Colorsance Resolution Framewate	Iteration         Iteration           html, iteration         Casta           Default         EDDid           22         EDDid           14         HDC           444         Audor           10/a         HDC           10/a         HDC           10/a         HDC	e present P Encrypted Version Input 1 Name	html, insut Default = 22 =	hdmi_input1
	Audio Bit depth Channel		Cable present		Default 👻
	count Format Frequency	LPCM 48kHz	HDCP	Encrypted	•
	SA	WE		Version	2.2 🗸
	Video generator 1 Name Color depth	Video_generator1 Name 8  Color	e	Negotiated	1.4
	Colorspace Framerate Subsampling	YUV ▼         Color           60         Fram           444 ▼         Subs	Video	Color depth	8
	Resolution width	1920 Reso		Subsampling	444
Input window groups				Colorspace	RGB
The following fields apply to both <b>2</b> window groups. Single-channel	-	-		Resolution	1920 x 1080p
single <b>Input</b> window group.		ny navo a		Framerate	60.00
Name				HDR	•
The name of the input. This field	cannot be ch	angeo.	Audio	Bit depth	16
<b>Cable present</b> This indicator will be red if the en			Channel	2	
the source signal. This may indic cable. If this indicator is green (s	hown), then th		Format	LPCM	
integrity is good, and additional f and Audio sections will be displa			Frequency	48kHz	

#### EDID

Click this drop-down list to select the desired EDID. The default setting is Default HDR MCH.

# AT-OMNI-111 / AT-OMNI-112

EDID	Description
Default HDR MCH	Default EDID with HDR (3840x2160p60) and multichannel audio
Default HDR 2CH	Default EDID with HDR (3840x2160p60) and two-channel audio
Default DV MCH	Default EDID with Dolby Vision (3840x2160p60) and multichannel audio
Default DV 2CH	Default EDID with Dolby Vision (3840x2160p60) and two-channel audio
Default SDR MCH	Default EDID with SDR (3840x2160p60) and multichannel audio
Default SDR 2CH	Default EDID with SDR (3840x2160p60) and two-channel audio
ATL 1080P 2CH	1920x1080p60 with two-channel PCM audio
ATL 1080P DD	1920x1080p60 with Dolby Digital
ATL 1080P DVI	1920x1080p60 formatted as DVI



EDID	Description
ATL 1280x800 RGB DVI PCWXGADVI	1280x800 formatted as DVI
ATL 1280x800 RGB PCWXGA2CH	1280x800p60 PC format with two-channel PCM audio
ATL 1280x800 RGB TVWXGA2CH	1280x800p60 TV format with two-channel PCM audio
ATL 2160P 2CH	3840x2160p30 with two-channel PCM audio
ATL 2160P MCH	3840x2160p30 with multichannel PCM audio
ATL 2560x1600 2CH	2560x1600p60 with two-channel PCM audio
ATL 2560x1600 MCH	2560x1600p60 with multichannel PCM audio
ATL 720P DD	1280x720p60 with Dolby Digital audio
ATL 720P 2CH	1280x720p60 with Dolby Digital two-channel audio
ATL VR (2160x1200)	2160x1200p90 (Compatible with HTC VIVE® VR system)

# **HDCP**

# Encrypted

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

#### Version

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

#### **Negotiated Version**

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

# Video

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

#### **Color Depth**

Displays the color depth of the source content.

#### Subsampling

Displays the chroma subampling value of the source content.

**Colorspace** Displays the color space of the source content.

**Resolution** Displays the resolution of the source content.

# **Audio**

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

#### **Bit Depth**

Displays the bit depth of the source audio.

#### **Channel count**

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

**Format** Displays the audio format of the source content.

**Frequency** Displays the audio frequency of the source content.

# Framerate

Displays the frame rate of the source content.

#### HDR

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



# SAVE

Click this button to save all changes under the **Input** window group.

Video generator 1	
Name	video_generator1
Color depth	8 🗸
Colorspace	YUV 🗸
Framerate	60
Subsampling	444 👻
Resolution width	1920
Resolution height	1080
	SAVE

# Video generator window groups

The following fields apply to both the **Video generator 1** and **Video generator 2** window groups. This signal can be used to test the video capability of the network. Single-channel encoders will have one **Video generator** window group.

#### Name

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

#### **Color Depth**

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

#### Colorspace

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

#### Framerate

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

#### Subsampling

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

#### **Resolution width**

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

# **Resolution height**

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

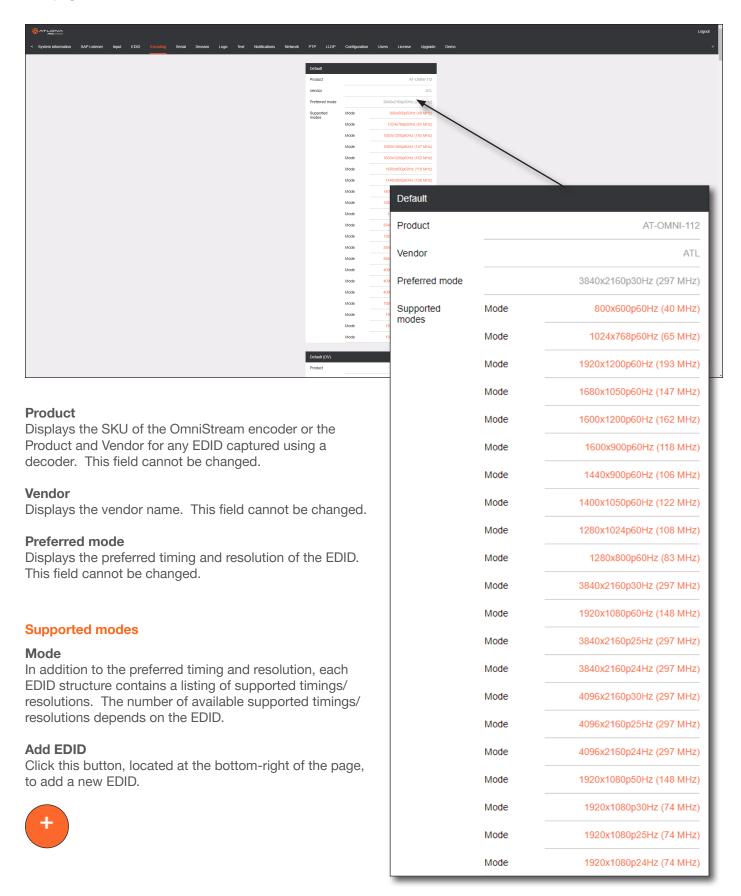
# SAVE

Click this button to save all changes under the Video generator window group.



# EDID page

This page is used to show details about each EDID that is loaded on the unit.





# Encoding page

						Logout
< System information SAP Listener Input EDID Encoding Serial Session Logo	o Text Notification	Network PTP LLDP Configuration	Users License Upg	grade Demo		*
	Encoder 1		Encoder 2			
	Name	encoder1	Name	e	incoder2	
	Input	hdmi_input1 👻	Input	hdmi_ii	input2 👻	
	Max bit rate	450	Max bit rate		450	
	Bit depth	+ IId-8	Bit depth		8-bit 👻	
	Subsampling	4:22 -	Subsamping		422 -	
	Force YUV	<u> </u>	Force YUV		0-	
	Slate mode Slate logo	off	Slate mode		off -	
	Thumbnail	Enable O-	Thum			
	COPY URL		Encod			
		THUMBNAIL DISABLED	Name	•		encoder1
		SAVE	Input			hdmi_input1 👻
			Max b	oit rate		450
			Bit de	pth		8-bit 👻
			Subsa	ampling		4:2:2 👻
			Force	YUV		0—
			Slate	mode		off 👻
Encoder window groups			Slate	logo		🔻
					Enable	$\sim$
The following fields apply to both the <b>Encoder 1</b> and				bnail		$\cup$

The following fields apply to both the **Encoder 1** and Encoder 2 window groups.

# Name

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

#### Input

Click this drop-down list to select the input. Available options are: not used, hdmi input1, hdmi input2, video generator1, and video generator2. Singlechannel encoders will only have the following options: not used, hdmi input1, and video generator1.

# Max bit rate

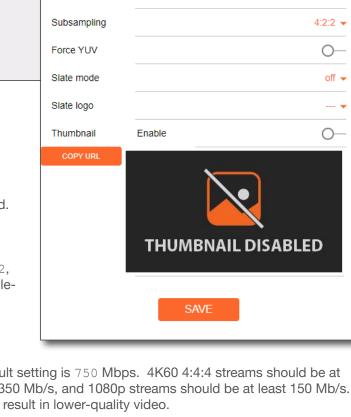
Click this field to enter the maximum bit rate. The default setting is 750 Mbps. 4K60 4:4:4 streams should be at least 700 Mb/s, 4K30 4:4:4 streams should be at least 350 Mb/s, and 1080p streams should be at least 150 Mb/s. Setting this field below these recommended values will result in lower-quality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

# **Bit depth**

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

# Subsampling

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





# Force YUV

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

# Slate mode

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

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

# Slate logo

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

# Scaler

This feature is only available on the AT-OMNI-111 and AT-OMNI-111-WP. Click this drop-down list to select the desired output resolution.

Encoder 1	Encoder 2
disable	N/A
3840x2160	N/A
2880x1524	N/A
2592x1440	N/A
2560x1440	N/A
1920x1104	N/A
1920x1080	1920x1080
1920x1072	1920x1072
1792x960	1792x960
1728x960	1728x960
1440x816	1440x816
1280x736	1280x736
1280x720	1280x720
960x544	960x544
960x528	960x528
864x480	864x480
640x368	640x368
640x360	640x360
480x272	480x272



# **Thumbnail Enable**

Click this toggle switch to enable to disable a thumbnail of the input stream. When enabled, this toggle switch will be orange and an image of the input stream will be displayed. Thumbnails are updated every 2 seconds.



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

# **COPY URL**

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

# SAVE

Click this button to save all changes.



# Serial page

					Logo	4
< System information SAP Listener Input EDID Encoding Serial Session Logo	Text Notifications Network PTP LLDP	Configuration	Users Licer	ise Upgrade Demo		*
	Serial port configuration		Serial port conf	nuration		
	Name	serial_port1	Name	serial_por	2	
	Supported modes	infrared, serial	Supported mod	es infrared, seri		
	Mode	serial 👻	Mode	serial		
	Baudrate	R.	Baudrate	9600		
	Parity	1.	Data Parity	8 		
	Stop	1 -	Stop	1		
	Flowcontrol	none 🗸	Floycontrol	none		
	SAVE			SAVE		
	Serial configuration		Serial configura			
	Port		Name Port	serial_use serial_port2		
	Mode		Mode	cl		
	SAVE			SAVE		
	Command: Display Off	denoter	Command: Dis	otay On decoder		
	ASCII		Interpret on ASCII	decoder		
	нех		HEX S	erial port configuration		11
				shar port conliguration		88
	SAVE DELETE		Comma	ame	serial_port1	I
	ASCII	decoder 👻		upported modes	infrared, serial	I
	HEX SAVE DELETE	N/A	HEX M	ode	serial 👻	I
			В	audrate	9600 👻	F
Serial port configuration window	aroups		Di	ata	8 🗸	
Senai por configuration willdow	groups		P	arity	none 👻	
The following fields apply to both Se	erial port					
configuration window groups.			St	ор	1 👻	L
			FI	owcontrol	none 👻	
Name The name of the serial port. This fie	eld cannot be cha	anged.			SAVE	

# **Supported Modes**

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

#### Mode

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

#### **Baudrate**

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

# Data

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

# Parity

 $\label{eq:click this drop-down list to select the parity bit: {\tt None, Odd, Even, Mark, or Space}.$ 

# Stop

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



serial use1

serial_port1 -

cli 👻

# **Flow Control**

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

# SAVE

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

# Serial configuration window groups

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

# Name

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

# Port

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

#### Mode

Click this drop-down list to select the desired control mode. Available values are: cli and tcpproxy. Select tcpproxy to translate received IP control traffic to RS-232 output. Selecting the cli option will force the serial port to function as a Command-Line Interface (CLI) for control of the encoder. Refer to Device Control (page 41) for more information.

Serial configuration

Name

Port

Mode

# SAVE

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

# **Command window groups**

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

# Interpret on

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

# ASCII

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

# HEX

Enter the hexadecimal representation of the command in this field.

# SAVE

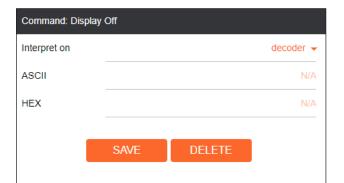
Click this button to commit all changes within the Command window group.

# DELETE

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



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



SAVE

# +

# New Command

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



# Session page

Text Notifi	cations Network	PTP LLDP Configuration	Users	License Uograde Dem	,			Logout >
		,						
Session 1			Session 2					
Name		session1	Name		session2			
Interface		eth1 👻	Interface		eth2 👻			
EncGroup	Enable		EncGroup		0-			
	Name	session1	Scrambling	Enable	0-			
	Active	manual 👻	Video	Encoder	O			
		Activate	1000	Enable				
		Activate		Destination IP address	N/A			
Members				Destination UDP port	4000			
		Add		TTL	255			
SAP	Enable			DSCP	Best effort 👻			
	Interval	10		FEC enable	0-			
	Name	session1		Session 1				
	Description							
	Originator Categorisation	Ationa		Name			ococio	<b>n</b> 1
Scrambling			Audio	Name			sessio	411
	Key	N/A						
Video	Encoder	vc2_encoder1 +		Interface			eth1	-
	Enable							- 1
	Destination IP address	N/A		EncGroup	Enable			•
	Destination UDP port	1000		·····		-	,	- I
	TTL	255			Name		occolo	<b>n</b> 1
	DSCP	Best effort 👻			Name		sessio	
	FEC enable	0-				-		- 1
	FEC rows	15			Active			•
	FEC columns	15	AUX			-		- 1
		Link test			Trigger		manual	( 🖵 📗
Audio	Source	hdmi_input1 👻			00	-		_
	Enable AES67							<u> </u>
	Downmixing	none 👻	Session 3				Activate	
	Enable		Name					_
	Destination IP address		Interface	Mombors				- E
	Destination UDP port	1100	EncGroup	Members				- E
	TTL	255 Best effort 👻	SAP					<u> </u>
	FEC enable		Scramblin				Add	
	FEC rows	4	Video					- 1
	FEC columns		Audio	Source	Not used 👻	_		
AUX	Source	Commands 👻	AUX	Source	Commands 👻			
	Enable			Enable	0-			
	Destination IP address			SAVE				
	Destination UDP port	1200						
	TTL	255			_			
	DSCP	Best effort 👻	Session 4					
	Bidirectional	0-	Name		session4			
	Listen port	1204	EncGroup	Fnable	Not used -			
	SAVE		SAP	Enable				
	SAVE	-	Scrambling					
			Video	Encoder	Not used -			
				L-1.000	not used 👻			

### Session window groups

The following fields apply to all **Session** window groups. Both the dual-channel and single-channel encoders have support for up to six **Session** window groups.

#### Name

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

# Interface

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

Interface	Description
eth1	ETHERNET 1 port
eth2	ETHERNET 2 port (AT-OMNI-112 only)



# EncGroup

### Enable

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

#### Name

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

#### Active

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

EncGroup

Enable

Name

Active

Trigger

# Trigger

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

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

### Activate

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

# Members

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

#### Add

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

# SAP

# SAP

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

#### Interval

Sets the announcement interval in seconds.

# Name

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

Description

The SAP description.

		Activate
Members		
		Add
SAP	Enable	_●
	Interval	10
	Name	session1
	Description	N/A
	Originator	
	Categorisation	Atlona

# Originator

The ID of the SAP message originator.

#### Categorisation

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

dicator will be green. Only available if encoder groupin
or input connected. Only available if encoder
e input. When set to manual, click the Activate button

session1

manual 🤜



# Scrambling

### Enable

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

Scrambling	Enable	-•
	Кеу	N/A

# Key

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

# Video

#### Encoder

Click this drop-down list to select the encoder input.

#### Enable

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

### **Destination IP address**

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

# **Destination UDP port**

Enter the destination UDP port in this field.

# TTL

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

#### DSCP

Click this drop-down list to select the DSCP value. Refer to Differentiated Services Code Point (page 120) for more information on this topic.

# FEC enable

Click this toggle switch to enable (orange) or disable Forward Error Correction (FEC). This feature can be used when transporting streams over a network that is suspected to be unreliable, due to noise or other factors. By default, this feature is disabled. Refer to FEC Details (page 118) for more information.

#### **FEC** rows

Specify the number of FEC rows in this field. Refer to FEC Details (page 118) for more information.

# **FEC Columns**

Specify the number of FEC columns in this field. Refer to FEC Details (page 118) for more information.

#### **Link Test**

Click this button to perform a link integrity test. This feature validates the quality of the link between the encoder and decoder. Link tests are initiated at an encoder, and any decoders that are configured to join that encoder's video multicast address will return packet loss statistics to the encoder, which displays the combined results under the **Notifications** tab. Refer to Performing a Link Test (page 114) for more information.

/ideo	Encoder	vc2_encoder1 👻
	Enable	
	Destination IP address	N/A
	Destination UDP port	1000
	TTL	255
	DSCP	Best effort 👻
	FEC enable	0—
	FEC rows	15
	FEC columns	15
		Link test



# Audio

# Source

Click this drop-down list to select the desired input. Available values are: Not used, audio_generator1, hdmi_input1, and hdmi_input2. hdmi_input2 is only available on the AT-OMNI-112.

# Enable AES67

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

#### **Downmixing**

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

#### Enable

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

# encoder to the decoder.

#### Destination IP address

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

### **Destination UDP port**

Enter the destination UDP port in this field.

#### TTL

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

#### DSCP

Click this drop-down list to select the DSCP value. Refer to Differentiated Services Code Point (page 120) for more information on this topic.

#### **FEC** enable

Click this toggle switch to enable (orange) or disable Forward Error Correction (FEC). This feature can be used when transporting streams over a network that is suspected to be unreliable, due to noise or other factors. By default, this feature is disabled. Refer to FEC Details (page 118) for more information.

#### **FEC** rows

Specify the number of FEC rows in this field. Refer to FEC Details (page 118) for more information.

# **FEC Columns**

Audio	Source	hdmi_input1 👻
	Enable AES67	-•
	Downmixing	none 👻
	Enable	•
	Destination IP address	N/A
	Destination UDP port	1100
	TTL	255
	DSCP	Best effort 👻
	FEC enable	0—
	FEC rows	4
	FEC columns	4



# AUX

Specify the number of FEC columns in this field. Refer to FEC Details (page 118) for more information. **Source** 

Source	Description
Not Used	Serial control is disabled
Commands	Stored commands in the encoder are sent to the decoder serial port. Refer to Downstream Control using Triggering (page 46) for more information.
Serial Port 1	Commands are transmitted using Serial Port 1
Serial Port 2	Commands are transmitted using Serial Port 2

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

# Enable

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

# **Destination IP address**

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

# **Destination UDP port**

Enter the destination UDP port in this field.

# TTL

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

# DSCP

Click this drop-down list to select the DSCP value.

Refer to Differentiated Services Code Point (page 120) for more information on this topic.

# Bidirectional

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

# Listen port

Enter the listening port in this field.

# SAVE

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

AUX	Source	Commands 👻
	Enable	-•
	Destination IP address	N/A
	Destination UDP port	1200
	TTL	255
	DSCP	Best effort 👻
	Bidirectional	0—
	Listen port	1204
	SAVE	



# Logo page

			Logout
< System information SAP Listener Input EDID Encoding Serial Session Logo Text Notifications Network		Configuration User	kens License Upgrade Demo >
	New logo Name		NA
	Choose File No	file chosen	
		UPLOAD	
	Logo Insertion 1		
	Target Enable		vc_encoder1
	Logo		New logo
	Aspect ratio		
	Location	Horizontal (%)	Name N/A
		Vertical (%)	
	Size	Width (%)	
		Height (%)	Choose File No file chosen
		SAVE	
	Logo Insertion 2		UPLOAD
	Target		
	Enable		-
	Logo Aspect ratio		Notused + streich +
	Location	Horizontal (%)	0
		Vertical (%)	0
	Size	Width (%)	10
		Height (%)	10
		SAVE	

# New logo window group

#### Name

Enter a name for the logo in this field.

#### **Choose File**

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

Logo Insertion 1

#### UPLOAD

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

#### Logo Insertion window groups

The following fields apply to both **Logo Insertion** window groups. Single channel decoders only have one **Logo Insertion** window group.

#### Target

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

Target	vc2_encoder1
Enable	0—
Logo	Not used 👻

#### Enabled

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

#### Logo

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



# **Aspect Ratio**

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

# Horizontal (%)

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

# Vertical (%)

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

#### Width (%)

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

#### Height (%)

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

### SAVE

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

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



# Text page

다느ュ가스스 Sem information SAP Listener Input EDIO Encoding Setial Session Logo Test Notifications Netwo	ork PTP LLDP	Configuration Use	rs License Upgrade Demo		١٥
	Text insertion 1 Target		vc2_encoder1		
	Enable		0-		
	Text		N/A		
	Scroll speed				
	Iterations		0		
	Color		while 🗸		
		Red	255		
		Green	265		
		Blue	255		
		Alpha	Tout incortion 4		
	Location	Vertical	Text insertion 1		
	Size	Width			
		Height	Target		vc2_encoder1
		SAVE	Enable		0—
	Text insertion 2		Text		N/A
	Target				
	Enable		O		
	Text		Scroll speed		C
	Scroll speed				
	Iterations		Iterations		0
	Color				
		Green	Color		white 👻
		Blue			
		Alpha		Red	255
	Location	Horizontal		Reu	200
		Vertical			
	Size	Width		Green	255
		Height			
				Blue	255
		SAVE			
				Alpha	255
				, apria	200

# Text insertion window groups

The following fields apply to both **Text insertion** window groups and is based on how many encoding channels there are. Both the AT-OMNI-111 and OMNI-112 will have two **Text Insertion** window groups.

#### Enabled

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

#### Text

Enter the desired text in this field.

#### Scroll Speed

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

#### Iterations

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

# Color

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

# Red, Green, Blue, Alpha

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



# Horizontal

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

# Vertical

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

# Width

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

# Height

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

# SAVE

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

Location	Horizontal	0
	Vertical	0
Size	Width	10
	Height	10
	SAVE	



# Network page

### Network window groups

The following fields apply to both **Network** window groups. The single-channel encoder will only have one **Network** window group.

#### Name

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

#### Enabled

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

#### Carrier

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

#### Mode

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

#### **IP Address**

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

#### Subnetmask

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

# Gateway

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



# Link speed

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

# **MAC** address

Displays the MAC address of the Ethernet interface.

# **Telnet Enable**

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

# **Telnet Authenticator**

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

Username: admin Password: Atlona

# WebUI Enable HTTP

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

# WebUI Enable HTTPS

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

#### 802.1x Mode

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

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

#### SAVE

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

Link speed		1000
MAC address		B8:98:B0:01:F7:EB
Telnet	Enable	-•
	Authentication	-•
WebUI	Enable HTTP	-•
	Enable HTTPS	-•
802.1x	Mode	none 👻
	SAVE	



# PTP page

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

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

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

The following fields apply to both **eth** window groups. The single-channel encoder will only have one **eth** window group.

# Interface

Displays the Ethernet interface associated with the PTP settings.

#### **Domain Number**

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

# **Priority 1**

Enter the priority number in this field.

#### **Priority 2**

Enter the priority number in this field.



# TTL

Displays the TTL value. The default IPV4 TTL value used for PTP is  $\ensuremath{\mathfrak{B}}.$ 

#### Is GM

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

# **GM** Identity

The grandmaster clock identity.

# Master Offset

Displays the grandmaster clock offset.

# SAVE

Click this button to commit all changes.

eth1	
Interface	eth1
Domain number	0
Priority 1	128
Priority 2	128
TTL	8
Is GM	•
GM Identity	B8:98:B0:FF:FE:01:A9:60
Master offset	-16 ns
	SAVE



# LLDP page

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

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

© AT L <u>ONA</u>					Logou
< System information SAP-Latener Input EDIO Encoding Sectual Section Logo Text Holdkattoric Network		Configuration Use	ers License Upgrade Demo		
	eth1 Via		CDPv2		
	RID		1		
	Age		0 day, 00:21:44		
	Chassis	ID	local 0038dfd1358a		
		Description Cisco S	SG300-28MP (PID:SG300-2		
		Manag. IP	10.1.1.254		
		Capability	Bridge (on) Router (on)		
	Port	Capability	ifname gi1		
		Description	g 1		
		TTL	180		
en/2					
	Via		CDPv2		
RIO Age			0 day, 00:02:44		
	Chassis	ID	local 0038dfd1358a		
			5G300-28MP (PID:SG300-2		
		Manag. IP	10.1.1.254		<u> </u>
		Capability	eth2		
		Capability	0.012		
	Port	ID	Via		CDPv2
		Description	Vid		CDFV2
		Refresh	RID		1
			Age		0 day, 00:02:44 -
			Chassis	ID	local 0038dfd1358a
Via					
The discovery protocol being used.				Description	Cisco SG300-28MP (PID:SG300-2
					·
RID				Manag. IP	10.1.1.254
				manag. II	10.1.1.204
The router ID.				Capability	Dridge (ep)
				Capability	Bridge (on)
Age					
				Capability	Router (on)
Up-time of the interface.					
			Port	ID	ifname gi3
Chassis ID					
The MAC address of the interface.				Description	gi3
Chassis Capability				TTL	180
Indicates the device function, such as bridge (s	switch	),		_	
router, etc.				R	efresh

The port ID.

Port ID

# **Port Description**

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

# The Time-To-Live value.

TTL

Refresh

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



# **Configuration and Management Interfaces**

### Configuration page

			Logout
<ul> <li>System information SAP Listener Input EDID Encoding Serial Session Logo Text</li> </ul>	Notifications Network PTP LLDP C	Configuration Users License Upgrade Demo	*
	Import configuration		
	Choose File No file	s chosen Rencert	
	_		
	Export configuration		
	Upload SSL certificat		
	Certificate (PEM) Private key (PEM)	Choose	
		Choose File No file chosen	IMPORT
Export configuration			
EXPORT			
	Upload SSL certifica	ate	
	Certificate (PEM)	Choose File No file chosen	
	Private key (PEM)	Choose File No file chosen	
	, , , , , , , , , , , , , , , , , , , ,		
	_		
		UPLOAD REVERT	
	_		

### Import configuration

#### **Choose File**

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

#### **IMPORT**

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

#### **Export configuration**

#### **EXPORT**

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

### **Upload SSL certificate**

#### **Choose File**

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

#### UPLOAD

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

### REVERT

Click this button to restore the previous configuration.



## **Configuration and Management Interfaces**

### Users page

		Logout
< System information SAP Listener Input EDID Encoding Serial Session Logo Text Notifications Network PTP LLDP C	Configuration Users License Upgrade Demo	
User1	User 2	
Username	admin Username operator	
Role admit	inistrator - Role operator -	
New password	N/A New password N/A	
Repeat password	N/A Repeat password N/A	
DELETE SAVE	DELETE SAVE	
	User 1	
	Username	admin
	Role	administrator
	R0le	administrator 👻
	New password	N/A
		1923
	Repeat password	N/A
	DELETE SAVE	
	DEELTE SAVE	

### User window groups

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

### Username

Enter the desired username in this field.

#### Role

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

### New password

Enter the desired password for the username in this field.

#### Repeat password

Confirm the new password by entering it in this field.

#### DELETE

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

#### SAVE

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



#### New user

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



### License page

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

				Log
< System information SAP Listener Input EDIO Encoding Serial Session Logo Text Notifications +	Network PTP LLDP Configuration	Users License Upgrade Demo		
	License info 4k Installed	true		
	Key 4K	cbf3eb428527156a8cae4d32bf 4K:b896b001f7eb		
	fec Installed	true		
	Request	FEC:b898b00117eb		
		true RAMBLING:20b914ecbc20211c		
	Request	SCRAMBLING:b898b001f7eb		
	Keys can be obtained through Atlo requests.	na by using one of the		
	License Key	License info		
		4k	Installed	true
			Key	4K:cbf3eb428527156a8cae4d32bf
			Request	4K:b898b001f7eb
		fec	Installed	true
			Key	FEC:b324492b3ba036f84a105786
			Request	FEC:b898b001f7eb
<b>License Key</b> Enter the license key in this field.		Scrambling	Installed	true
Litter the license key in this lield.			Key	SCRAMBLING:20b914ecbc202f1c
INSTALL LICENSE Click this button to validate and install the lid	cense.		Request	SCRAMBLING:b898b001f7eb
		Keys can be requests.	obtained throug	gh Atlona by using one of the
		License Kev		N/A
		License Key		N/A



# **Configuration and Management Interfaces**

### Upgrade page

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

System information SAP Listener Input EDID Encoding Sectial Section Logo Text Notifications Network PTP LLDP Configuration Listes Litense Liggeste Demo >
Upgrade Choose File No file chosen UPLOAD

### Choose File

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

### UPLOAD

Click this button to upload the selected firmware file.



# **Updating the Firmware**

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

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

Username: admin Password: Atlona

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

SATURNA < System information SAP Latence Input EDID Encoding Senial Session Logo Text Notifications Network PTP LLDP Configuration Us	es Lone Voget Deno >
Ligner Chrone Tier UR CAR	

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

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

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



# **Performing a Link Test**

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

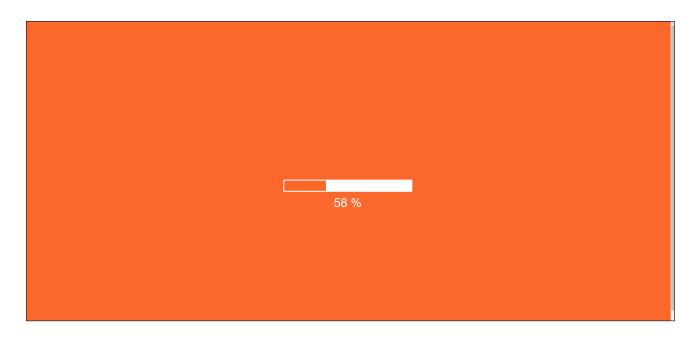
- 1. Launch a web browser and enter the IP address of the encoder in the address bar.
- 2. Open another tab in the browser and enter the IP address of the subscribing decoder in the address bar.
- 3. Verify that all desired decoders are subscribed to the encoder's multicast address and port number. In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

SATLONA.						Logout
< System information SAP Listener IP Input Multiview Serial HDMI Output Logo 1	Text Notifications	Network PTP LLDP Configuration	Users Licens	se Upgrade		>
	Input 1		Input 2			
	Name	ip_input1	Name			
	Enable	-•	Enable	Input 1		
	Interface	eth1 🛩	Interface			
	Multicast address		Multicast add	Name		ip_input1
	Multicast filter (IGMPv3)	Mode exclude - Addresses" N/A	Multicast filter (IGMPv3)			'F
		"Separate multiple IP addresses with a comma	1	Enable		
	Port	100	Port	Enable		
		SAVE		Interface		eth1 👻
	Input 3		Input 4	Multicast address		225.0,0.11
	Name	ip_input3	Name			
	Interface	etht 🗸	Interface	Multicast	Mode	exclude -
	Multicast address		Multicast add		Moue	CACING +
	Multicast	Mode exclude 🗸	Multicast	(IGMPv3)		
	(IGMPv3)	Addresses* N/A	(IGMPv3)	(	Addresses*	N/A
		"Separate multiple iP addresses with a comma.				
	Port	1100	Port		*Separate multiple IP addre	esses with a comma.
		SAVE				
				Port		1000
	Input 5					
	Name	ip_input5				
	Enable	-•				
	Interdence			•	SAVE	

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

Enable		vc2_encoder1 +	Encoder	Video	Video Encoder vc2_encoder1				
Destination IP address		-•	Enable		Enable				
Destination UDP port			Destination IP address		Destination IP address N	Destination	nation UDP port	1100	
Video Er		1000	Destination UDP port		Destination UDP port 100	Vid	/ideo	Encoder	vc2_encoder1 👻
		255	TTL		TTL 21				_
_		Best effort 👻	DSCP		DSCP Best effort				
Er		0	FEC enable		FEC enable			Enable	
		15	FEC rows		FEC rows				
De	AU:	15 Lok test	FEC columns		FEC columns	AUX		Destination IP address	N/A
		hdmi_inp_et +	Source	Audio	Audio Source hdmi_ing1				
De	\	->	Enable AES67		Enable AES67			Destination UDP port	1000
		none 🗸	Downmixing		Downmixing none				
			Enable		Enable	Ression 3		TTL	255
			Destination IP address		Destination IP address N	Name		TIL	200
		1100	Destination UDP port		Destination UDP port 110	Interface			
DS		255	TTL		TTL 22	EncGroup		DSCP	Best effort 🤜
		Best effort 👻	DSCP		DSCP Best effort	Scrambling			
		0-	FEC enable		FEC enable O-	Video			
FE		4	FEC rows		FEC rows	Audio		FEC enable	0—
		4	FEC columns		FEC columns	AUX			
FF	10	Commands 👻	Source	AUX	AUX Source Commands	100		FEC rows	15
		-•	Enable		Enable			I LO IOWS	10
			Destination IP address		Destination IP address N				
FE		1200	Destination UDP port		Destination UDP port 120			FEC columns	15
		255	TTL		TTL 25				
		Best effort 👻	DSCP		DSCP Best effort	Session 4			
		0	Bidirectional		Bidirectional	Name			Link test
ue	Inte					menace			





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

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

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

ØNTL <u>ONN</u>		Logout
System indomation SVP Littlerer input EDID Excoding Sectal Section Logio Text Motification Network PTP LLDP Configuration LLDP Configuration LL	Upper         Licence         Upper         Demo           CBI 00         5221         079.44         18           100% of packets received by 101         Biol.new         100         100	•
	Link test results (#0)	CLEAR
	Timestamp	08-06-2021 09:44:18
	Description	100% of packets received by 10.1
	Status	Inactive
Ļ		



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

Link test results (#0)	
Timestamp	08-06-2021 09:31:21
Description	No one replied!
Status	Inactive

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

	CLEAR
Link test results (#0)	
Timestamp	07-07-2021 09:11:25
Description	100% of packets received by 10.1
Status	100% of packets received by 10.1.0.121

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

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

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

	CLEAR	
Link test on channel 0 (	(#1)	
Timestamp	07-07-2021 09:11:20	
Description	100% of packets received (300000	
Status	100% of packets	received (300000/300000)) from 10.1.0.111

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



# **Notes on Dual Streaming**

Dual streaming is supported exclusively on the AT-OMNI-111 and allows two unique streams per HDMI input at different bit rates and resolutions. Dual streaming on the AT-OMNI-111 provides two benefits:

- To allow two streams at two different resolutions for use with the Multiview capabilities of the AT-OMNI-121.
- To provide another option for bandwidth management, where users could, for example, choose to only use lower-resolution, lower-bitrate streams in scenarios where the stream needs to traverse multiple switches.

### Frequently Asked Questions

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Question:What is the maximum video bit rate of each of the two streams?Answer:The maximum video bit rate for the encoder is 900 Mb/s and can be allocated across the streams.<br/>If only one stream is being used, then the maximum bandwidth (900 Mb/s) will be availble. If two<br/>streams are being used, then the bandwidth allocation will need to be managed so that the<br/>combined bit rate does not exceed 900 Mb/s. The encoder will generate a notification if the<br/>maximum bandwidth of 900 Mb/s is attempted from an encoder.

#### **Question:** Are there bit rate recommendations for each stream?

**Answer**: The ideal bit rate for each stream depends on the resolution of the stream. The following guidelines are offered, and the bit rate can always be adjusted as desired.

Resolution	Recommended Bit Rate
4K60 4:4:4	750 Mb/s
4K60 4:2:0	350 Mb/s
4K30 4:4:4	350 Mb/s
1080p60 4:4:4	150 Mb/s

**Question**: What are the scaling capabilities of each stream?

Answer: The AT-OMNI-111 has two independent scalers – one for each stream. The scaler on Encoder 1 is capable of scaling up and down to resolutions as high as 3840x2160. The scaler on Encoder 2 is capable of scaling up and down to resolutions as high as 1920x1080. For each scaler, there is a list of resolutions that can be selected. Arbitrary scaling resolutions cannot be created and used.

Question: Does each stream have its own session?

Answer: The AT-OMNI-111 has six sessions that can be fully configured. Each session can utilize either of the two encoders, and the most common use case will be to have Session 1 using Encoder 1 and Session 2 using Encoder 2, creating two unique streams at two resolutions. However, there is nothing that prevents using Encoder 1 or Encoder 2 on both sessions.



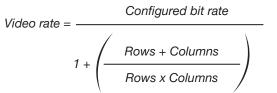
# **FEC Details**

### 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:



FEC rate = Configured bit rate - Video rate

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

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



### FEC, Latency, and Lip Sync

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

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

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

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

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





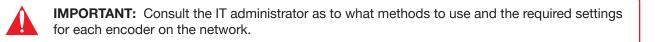
# **Differentiated Services Code Point**

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

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

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

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



### Table 1 - Assured Forwarding

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

### Table 2 - Class Selectors

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

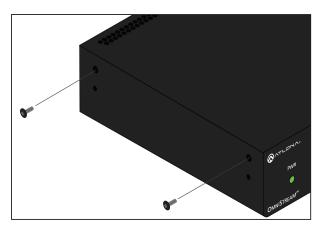


### **Mounting Instructions**

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

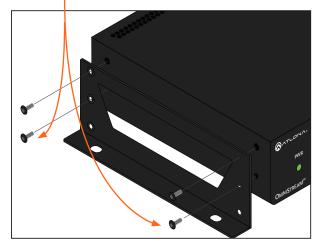
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1. Using a small Phillips screwdriver, remove the two screws from the left side of the enclosure.



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

Included screws



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

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





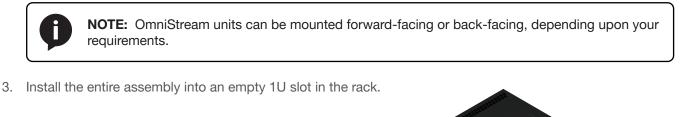
**NOTE:** Rack ears can also be inverted to mount the unit under a table or other flat surface.

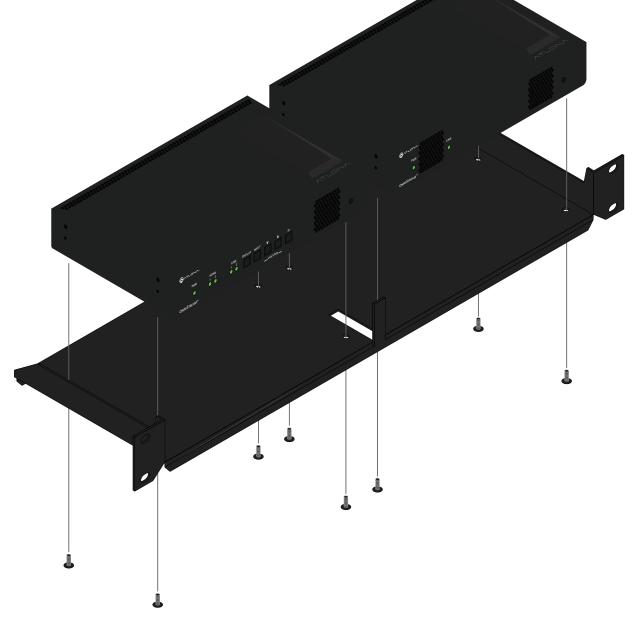


# **Rack Tray for OmniStream**

OmniStream encoders 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.







# **Specifications**

### Single-Channel Encoder

Video					
Signal	HDMI				
Copy Protection	HDCP 2.2				
UHD/HD/SD	3840×2160 (UHD) ⁽¹⁾ @ 60/50/24/25/30 Hz 1920x1080p @ 23.98/24/25/29.97/30/50 /59.94/60 Hz		Hz 720x576p @ 50 720x576i @ 720x480p @		
VESA ⁽³⁾	1920x1200       1         1680x1050       1         1600x1200       1         1600x900       1         1440x900       1		1366x768 1360x768 1280x1024 1280x800 1280x768 1152x768 1024x768	1360x768 1280x1024 1280x800 1280x768 1152x768	
Color Space	YUV, RGB				
Encoding					
Density	Dual encoding engine with independent scalers (VCx codec only)				
Compression Format	VCx and VC-2 (SMPT	,			
Video Quality Optimization	User-selectable: PC				
Chroma Subsampling	Chroma	VCx	VC-2 PC Applica		
	4:4:4	Yes	Yes	No	
	4:2:2	Yes	Yes	No	
	4:2:0	Yes	No	Yes	
Color Depth	8-bit, 10-bit, 12-bit				
HDR	HDR10, HLG, Dolby®	Vision™			
Bit Rate	Configurable up to 90	00 Mbps ⁽⁴⁾			
Scaler ⁽⁵⁾	Encoder 1		Encoder 2		
	Up and down, 3840x	2160 max.	Up and down	, 1920x1080 max.	
Latency	<ul> <li>0.5 frame (e.g. 1080p @ 60 Hz latency is &lt; 8 ms between encoder and decoder).</li> <li>1.5 frames in Fast Switching mode (e.g. 1080p @ 60 Hz latency is &lt; 24 ms between encoder and decoder).</li> <li>Note: Unusual network configurations may increase overall latency.</li> </ul>				
Thumbnails	Number of thumbnails: 1 per HDMI input Resolution: 320x180px File format: JPG Update frequency: 2 seconds				
Audio					
Audio Pass-through	LPCM 2.0 LPCM 5.1 LPCM 7.1	Dolby [®] Dig Dolby Digi Dolby True	tal Plus	Dolby Atmos® DTS [®] DTS-HD Master Audio™	
Down-mixing	Multichannel LPCM to two-channel LPCM				



Protocols			
Video Streaming	RTP		
Audio Streaming	RTP, up to 7.1 channels		
5	AES67, up to LPCM 7.1 channels		
Addressing	DHCP, static		
Encryption	AES-128		
QoS Tagging	RFC 2475		
Discovery	Multicast DNS, LLDP, SAP		
Management	HTTPS, SSH, Telnet, and WebSockets with TLS		
Authentication	IEEE 802.1x: PEAP/MSCHAPv2 or EAP-TLS		
IP Multicast	IGMPv2 and IGMPv3 support		
Graphics Features			
Text Insertion	Adjustable height/width, scrolling (speed, direction, or static), iterations (up to infi- nite), 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			
RS-232	Device control and configuration; supports baud rates from 2400 to 9600		
	Bidirectional pass-through from control system to network		
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 ⁽⁶⁾	1 - RJ45, 10/100/1000 Mbps		
RS-232 / IR	1 - Captive screw, 6-pin (2 ports); RS-232 on port 1, IR on port 2		
Power	1 - Captive screw, 2-pin		
Indicators and Controls	1 LED tricolor (red orthog group)		
PWR HDMI	1 - LED, tricolor (red, amber, green)		
LINK	<ul><li>1 - LED, bicolor (red, green)</li><li>1 - LED, bicolor (red, green)</li></ul>		
ID	1 - Momentary, tact type		
	<ul> <li>Provides two separate functions:</li> <li>(1) Sends an identification broadcast message over the network to any listening devices.</li> <li>(2) Reset the unit to factory-default settings.</li> </ul>		
Reboot	1 - momentary, tact-type		
Power			
PoE	IEEE 802.3af		
Consumption	Up to 12 W		
BTU/h	40.9		
External Power Supply	Input: 110 - 220 V AC, 50/60 Hz		
(optional)	Output: 48 V DC, 0.83 A		



Environmental	Fahrenheit	Celsius
Operating Temperature	+14 to +122	-10 to +50
Storage Temperature	-14 to +140 °F	-10 to +60 °C
Operating Humidity (RH)	20% to 95%, non-condensing	
Maximum Operating Altitude	2000 meters	
Cooling System	Front-to-rear airflow, temperature-control	led fans
Chassis		
Dimensions (H x W x D)	1.34 in x 8.19 in x 4.41 in 34 mm x 208 mm x 112 mm	
Weight	1.5 lbs 0.7 kg	
Certification		
Device	CE, FCC, CB, RoHS	
Supply	CE, FCC, cULus, CB, RCM, RoHS	
Compliance		
Compliance NDAA-899	Yes	
TAA	Yes	
	165	
Warranty		
Device	10 years	

### Footnotes

(1) Interlaced sources are passed-through without modification, and do not support scaling, video wall, logo insertion, text insertion, fast switching, or multiview.

(2) Using VCx, streaming is supported up to 4K60 4:4:4. Using VC-2 Video Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:0 before streaming. Using VC-2 PC Application Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:2 or 4:2:0 before streaming.

- (3) All VESA resolutions are 60 Hz.
- (4) Bandwidth is shared between both encoding engines.
- (5) Scaler is limited to a fixed list of resolutions. Refer to documentation for more information.
- (6) Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.



### **Dual-Channel Encoder**

Video					
Signal	HDMI				
Copy Protection	HDCP 2.2 ⁽¹⁾				
UHD/HD/SD	3840×2160 (UHD) ⁽²⁾ @ 60/50/24/25/30 Hz 1920x1080p @ 23.98/24/25/29.97/30/50 /59.94/60 Hz		Hz 720x576p 50 720x576i @ 720x480p	1280x720p @ 30/50/59.94/60 Hz 720x576p @ 50 Hz 720x576i @ 25 Hz 720x480p @ 59.94/60 Hz 720x480i @ 29.97/30 Hz	
VESA ⁽⁴⁾	1920x1200 1680x1050 1600x1200 1600x900 1440x900 1400x1050		1366x768 1360x768 1280x1024 1280x800 1280x768 1152x768 1024x768	1360x768 1280x1024 1280x800 1280x768 1152x768	
Color Space	YUV, RGB				
Es e elle e					
Encoding	Dual anading angin	<u>_</u>			
Density Compression Format	Dual encoding engin				
Video Quality Optimization	VCx and VC-2 (SMPTE-2042) User-selectable: PC Application or Video mode (VC-2 codec only)				
Chroma Subsampling	Chroma	VCx	VC-2 PC Applic		
Onionia oubsampling	4:4:4 4:2:2 4:2:0	Yes Yes Yes	Yes Yes No	No No Yes	
Color Depth	8-bit, 10-bit, 12-bit				
HDR	HDR10, HLG, Dolby®	[®] Vision [™]			
Bit Rate	Configurable up to 9				
Scaler	None				
Latency	<ul> <li>0.5 frame (e.g. 1080p @ 60 Hz latency is &lt; 8 ms between encoder and decoder).</li> <li>1.5 frames in Fast Switching mode (e.g. 1080p @ 60 Hz latency is &lt; 24 ms between encoder and decoder).</li> <li>Note: Unusual network configurations may increase overall latency.</li> </ul>				
Thumbnails	Number of thumbnails: 1 per HDMI input Resolution: 320x180px File format: JPG Update frequency: 2 seconds				
Audio					
Pass-through	LPCM 2.0 LPCM 5.1 LPCM 7.1	Dolby® Dig Dolby Digi Dolby True	tal Plus	Dolby Atmos® DTS® DTS-HD Master Audio™	
Down-mixing	Multichannel LPCM to two-channel LPCM				
Sample Rate	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz				
Bit Depth	Up to 24-bit				
•					



Protocols			
Video Streaming	BTP		
Ŭ			
Audio Streaming	RTP, up to 7.1 channels AES67, up to LPCM 7.1 channels		
Addressing	DHCP, static		
Encryption	AES-128		
QoS Tagging	RFC 2475		
Discovery	Multicast DNS, LLDP, SAP		
Management	HTTPS, SSH, Telnet, and WebSockets with TLS		
Authentication	IEEE 802.1x: PEAP/MSCHAPv2 or EAP-TLS		
IP Multicast	IGMPv2 and IGMPv3 support		
Graphics Features			
Text Insertion	Adjustable height/width, scrolling (speed, direction, or static), iterations (up to infinite), positioning, and adjustable color and alpha (transparency) channels.		
Slate / Logo Insertion	PNG file format, adjustable aspect ratio (keep or stretch), horizontal/vertical size, screen position; slate mode can be set to off, manual (image always displayed, superimposed on the source signal, and will remain if source signal is lost), auto (image will only be displayed when source signal is lost).		
Control			
RS-232	Device control and configuration; supports baud rates from 2400 to 9600 Bidirectional pass-through from control system to network		
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 ⁽⁵⁾	2 - RJ45, 10/100/1000 Mbps		
RS-232 / IR	1 - captive screw, 6-pin (2 ports); RS-232 on port 1, IR on port 2		
Power	1 - captive screw, 2-pin		
Indicators and Controls	1 LED trippler (red ember green)		
PWR	1 - LED, tricolor (red, amber, green)		
HDMI	2 - LED, bicolor (red, green)		
LINK	2 - LED, bicolor (red, green)		
ID	<ul> <li>5 - Momentary, tact-type, backlit (blue)</li> <li>DISPLAY: Triggers CEC or RS-232 display power on/off commands from cross-connected decoders.</li> <li>INPUT: Switches between HDMI inputs.</li> <li>VOLUME: Triggers CEC or RS-232 volume up/down commands from cross-connected decoders.</li> <li>ID: Sends an identification broadcast message over the network to any listening</li> </ul>		
	devices.		



Power		
PoE	IEEE 802.3af	
Consumption	Up to 12 W	
BTU/h	40.9	
External Power Supply (op-	Input: 110 - 220 V AC, 50/60 Hz	
tional)	Output: 48 V DC, 0.83 A	
Environmental	Fahrenheit	Celsius
Operating Temperature	+14 to +122	-10 to +50
Storage Temperature	-14 to +140 °F	-10 to +60 °C
Operating Humidity (RH)	20% to 95%, non-condensing	
Maximum Operating Altitude	2000 meters	
Cooling System	Front-to-rear airflow, temperature-control	led fans
Dimensions (H x W x D)	Inches	Millimeters
Unit	1.34 x 8.19 x 4.41	34 x 208 x 112
Weight	Pounds	Kilograms
Unit	1.5	0.7
Certification		· · · · · · · · · · · · · · · · · · ·
Device	CE, FCC, CB, RoHS	
Supply	CE, FCC, cULus, CB, RCM, RoHS	
Compliance		
NDAA-899	Yes	
ТАА	Yes	
Marranty	,	
Warranty Device	To view the product warranty, use the foll	owing link:
	https://atlona.com/warranty	

### Footnotes

(1) HDMI 2.0b and HDCP 2.2 are only supported by hardware revision C or later. Previous hardware revisions use HDMI 1.4 and HDCP 1.4.

(2) Using VCx, streaming is supported up to 4K60 4:4:4. Using VC-2 Video Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:0 before streaming. Using VC-2 PC Application Mode, 4K60 and 4K50 resolutions will be chroma subsampled to 4:2:2 or 4:2:0 before streaming.

(3) Interlaced sources are passed-through without modification, and do not support scaling, video wall, logo insertion, text insertion, fast switching, or multiview.

(4) All VESA resolutions are 60 Hz.

(5) Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.



