OmniStream™
Single-Channel / Dual-Channel
Networked AV Encoder
# Version Information

<table>
<thead>
<tr>
<th>Version</th>
<th>Release Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Apr 2017</td>
<td>Initial release</td>
</tr>
<tr>
<td>2</td>
<td>Jun 2017</td>
<td>New enclosure, documentation updates: AMS interface; front-panel buttons, decoder set tab</td>
</tr>
<tr>
<td>3</td>
<td>Nov 2017</td>
<td>Added EDID management, text insertion, state / logo insertion, encoder grouping</td>
</tr>
<tr>
<td>4</td>
<td>May 2018</td>
<td>Updated to reflect AMS 2.0</td>
</tr>
<tr>
<td>5</td>
<td>Jun 2018</td>
<td>Includes updates to 1.2.1 firmware; AMS updates</td>
</tr>
<tr>
<td>6</td>
<td>Jan 2019</td>
<td>1.2.2 firmware; encoder daisy-chaining</td>
</tr>
<tr>
<td>7</td>
<td>Mar 2019</td>
<td>1.2.3 firmware; supports ID button for AT-OMNI-111 Rev. J hardware; refer to 1.2.3 release note for a list of all features / fixes</td>
</tr>
<tr>
<td>8</td>
<td>Aug 2019</td>
<td>Documentation updated to support AMS 2.4.0</td>
</tr>
<tr>
<td>9</td>
<td>Sep 2019</td>
<td>Documentation updated to support OmniStream 1.2.5; various bug fixes and added Virtual Reality EDID resolution. Refer to EDID Management (page 58) for more information.</td>
</tr>
</tbody>
</table>
| 10      | Feb 2020     | Added web server documentation reflecting changes to 1.2.6 firmware. Refer to the release notes for a complete listing features and bug fixes.  
- Audio tone generator option added under Session > Audio > Source. Refer to the Session page (page 111).  
- LLDP menu item added. Refer to the LLDP page (page 125). |
| 11      | Jan 2021     | **Firmware 1.2.7**  
- FPGA information now available under the System Information page. Refer to System information page (page 99) for more information.  
- NTP server set to pool.ntp.org, by default; change under the System Information page. Refer to System information page (page 99) for more information.  
- Custom SAP multicast address can now be configured under the SAP page. Refer to SAP page (page 102) for more information.  
- Telnet session can now be disabled under the Network page. Refer to Network page (page 121) for more information. |
Sales, Marketing, and Customer Support

Main Office
Atlona Incorporated
70 Daggett Drive
San Jose, CA 95134
United States

Office: +1 (877) 536-3976 (US Toll-free)
Office: +1 (408) 962-0515 (US/International)

Sales and Customer Service Hours
Monday - Friday: 6:00 a.m. - 4:30 p.m. (PST)

International Headquarters
Atlona International AG
Tödistrasse 18
8002 Zürich
Switzerland

Office: +41 (43) 508-43-21

Sales and Customer Service Hours
Monday - Friday: 09:00 - 17:00 (UTC +1)

http://www.atlona.com/

Operating Notes

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


  NOTE: Scaling and deinterlacing is not supported at 1080i.
Atlona, Inc. ("Atlona") Limited Product Warranty

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

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

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

OR

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

OR

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

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

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

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

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

Limited Product Warranty Terms – Refurbished (B-Stock) Products and Discontinued Products
• 3 years from proof of purchase date for all Refurbished (B-Stock) and Discontinued hardware and electronic products purchased on or after June 1, 2013.

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

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

Exclusions
This Limited Product Warranty excludes:
• Damage, deterioration or malfunction caused by any alteration, modification, improper use, neglect, improper packaging or shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature.
At the end of a page.
Safety and Certification

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this product near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of a polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the product.
11. Only use attachments/accessories specified by Atlona.
12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
13. Unplug this product during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the product has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the product, the product has been exposed to rain or moisture, does not operate normally, or has been dropped.

FCC Compliance

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

Copyright, Trademark, and Registration

© 2021 Atlona Inc. All rights reserved. “Atlona” and the Atlona logo are registered trademarks of Atlona Inc. Pricing, specifications and availability subject to change without notice. Actual products, product images, and online product images may vary from images shown here.

Dolby, Dolby Atmos, and the double-D symbol are registered trademarks of Dolby Laboratories Licensing Corporation.

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI licensing Administrator, Inc.

For DTS patents, see http://patents.dts.com. Manufactured under license from DTS, Inc. DTS, the Symbol, DTS and the Symbol together, and Digital Surround are registered trademarks and/or trademarks of DTS, Inc. in the United States and/or other countries. © DTS, Inc. All Rights Reserved.

All other trademark(s), copyright(s), and registered technologies mentioned in this document are the properties of their respective owner(s).
# Table of Contents

Introduction 9
Features 9
Package Contents 9
Panel Description 10
AT-OMNI-111 10
AT-OMNI-112 11
Installation 12
External Power (Optional) 12
RS-232 Connections 12
IR Connections 13
Connection Instructions 14
Connection Diagram 15
Configuration 16
Accessing Encoders in AMS 16
Configuring a Static IP Address 20
Input Selection 21
Input Selection 21
Verifying the Input 22
Session Configuration 23
Basic Operation 24
LED Indicators 24
Rebooting OmniStream 25
Selecting the Input 25
Powering the Display 25
Adjusting Volume 26
Single-output Mode 26
Dual-output Mode 26
ID Button 27
Broadcast Messaging 27
Reset to Factory-Default Settings 27
Input Switching Configuration 28
Unicast Mode 29
Multicast Mode 31
IR Control 33
Controlling the Display using the Display’s IR Remote 33
Required Equipment 34
Connecting the IR Receiver to the Encoder 34
Connecting the IR Emitter to the Decoder 35
Identifying the Encoder using AMS 36
Configuring the Encoder Serial Port 37
Configuring the Encoder Session 38
Configuring the Decoder Serial Port 40
Testing IR Functionality 43
Controlling the Display using a Control System 44
Using the Virtual Matrix 45
Advanced Operation 48
Control Using RS-232 48
RS-232 Pass-through 48
Using TCP Proxy 48
Using the Virtual Matrix 49
802.1X Authentication 54
AES67 Audio 57
EDID Management 58
Selecting an EDID Preset 58
# Table of Contents

Using a Custom EDID 58  
Copying an EDID from the Display 60  
Encoder Grouping 63  
Daisy-Chaining Encoders 65  
Scrambling 67  
Standard Method 67  
Using the Virtual Matrix 68  
Setting the Video Mode 69  
Slate / Logo Insertion 70  
Adding Slates / Logos 70  
Deleting Slates / Logos 73  
Text Insertion 74  

## The AMS Interface 75  
Device Info page 75  
Input page 78  
Serial page 81  
Session page 83  
Network page 87  
Other page 89  
Logo 89  
Text 90  
PTP 91  
The Virtual Matrix 93  
Layout and Operation 94  

## Web Server 96  
Accessing the Web Server 96  
Getting the IP Address 96  
Logging In 97  
System information page 99  
SAP page 102  
Input page 103  
EDID page 106  
Encoding page 107  
Serial page 109  
Session page 111  
Logo page 117  
Text page 119  
Network page 121  
PTP page 123  
LLDP page 125  
Configuration page 126  
Users page 127  
License page 128  
Upgrade page 129  

## Appendix 130  
Updating the Firmware using Velocity™/AMS 130  
Updating the Firmware using the Web Server 133  
FEC Details 134  
Matrix Size, Overhead, and Latency 134  
FEC and Video Bitrate 134  
FEC, Latency, and Lip Sync 135  
Mounting Instructions 136  
Rack Tray for OmniStream 137  
Specifications 138  
Single-Channel Encoder 138  
Dual-Channel Encoder 141
Introduction

The Atlona OmniStream™ 111 (AT-OMNI-111) is a networked AV encoder for one HDMI source up to 4K/UHD, plus embedded audio and RS-232 control. The Atlona OmniStream™ 112 (AT-OMNI-112) adds a second channel of encoding for two HDMI sources up to 4K/UHD and RS-232 control and can deliver duplicate AV streams to two networks for full system redundancy in mission-critical applications. OmniStream features SMPTE VC-2 compression for critical-quality video applications, with extremely low, sub-frame latency from encode to decode. It also includes selectable AES-128 encryption and SMPTE 2022-5 Forward Error Correction (FEC) for robust AV distribution spanning multiple networks. This encoder is housed in a half-rack width enclosure. Both OmniStream encoders are housed in compact enclosures that easily fit into a half RU space. They can be powered over the network through Power over Ethernet (PoE) or optionally from local AC power.

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

Features

OmniStream Single-Channel Encoder
- Single-channel AV encoder for HDMI up to 4K/UHD
- SMPTE VC-2 compression
- RS-232 control
- Selectable AES-128 encryption
- SMPTE 2022-5 FEC
- Powered using PoE or optional external 48V DC power supply

OmniStream Dual-Channel Encoder
- Dual-channel AV encoder for HDMI up to 4K/UHD
- Secondary channel provides redundancy for mission-critical applications
- SMPTE VC-2 compression
- RS-232 control
- Selectable AES-128 encryption
- SMPTE 2022-5 (FEC)
- Powered using PoE or optional external 48V DC power supply

Package Contents

OmniStream Single-Channel Encoder
1 x AT-OMNI-111
1 x Phoenix terminal block, 6-pin (push spring)
1 x Wall/table mounting brackets
4 x Rubber feet
1 x Installation Guide

OmniStream Dual-Channel Encoder
1 x AT-OMNI-112
1 x Phoenix terminal block, 6-pin (push spring)
1 x Wall/table mounting brackets
4 x Rubber feet
1 x Installation Guide
Panel Description

AT-OMNI-111

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 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 (AMS).
(2) Press and hold this button for 30 seconds to perform a factory-reset of the unit. Refer to ID Button (page 27) for more information.

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 12) 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 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 25) for more information.

5 INPUT
Press this button to switch between HDMI 1 and HDMI 2 inputs. Refer to Selecting the Input (page 25) for more information.

6 VOLUME
Press these buttons to adjust the output volume of the desired display. Refer to Adjusting Volume (page 26) 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 (AMS). (2) Press and hold this button for 30 seconds to perform a factory-reset of the unit. Refer to ID Button (page 27) for more information.

i 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).

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 12) for more information.

11 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 RX, TX, and GND wires.
3. Insert the TX, RX, and GND wires into correct terminal on the included Phoenix block. If using non-tinned stranded wire, press the orange tab, above the terminal, while inserting the exposed wire. Repeat this step for the TX, RX, and GND connections.

NOTE: Typical DB9 connectors use pin 2 for TX, pin 3 for RX, and pin 5 for ground. On some devices, pins 2 and 3 are reversed.
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 port (bottom set of connectors). Refer to IR Control (page 33) for configuration details.

IR Connections

IR emitter configuration

IR extender configuration

Push tab to unlock
Connection Instructions

1. 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.
Configuration

Accessing Encoders in AMS

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

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

In order for AMS to automatically assign multicast IP addresses to OmniStream encoders, the destination IP addresses for the session streams must be cleared.

**NOTE:** The following steps are required only if a pre-existing multicast IP address is assigned to each session and if automatic assignment of these multicast IP addresses, using AMS, is desired.

1. Launch a web browser and enter the IP address of AMS, in the address bar.
2. Enter the required login credentials. The default login is:
   - Username: admin
   - Password: Atlona
3. Click the **Login** button.
4. The AMS Dashboard will be displayed.
5. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.
6. Click **Devices** from the fly-out menu.

7. Click the **Unassigned** option.

8. Click the left and right arrows, at the bottom of the **Unassigned** list, to scroll through all available devices.
All available encoders will be displayed under the **Unassigned** category. When an encoder is unassigned, it means that it has not been assigned to a site, building, and/or room. Refer to the AMS User Manual for more information on these topics.

If a DHCP server is not found within 60 seconds, the encoder will be placed in Auto IP mode and assigned an IP address within the range of 169.254.xxx.xxx. If this occurs, configure the network interface of the computer that is running AMS, located on the same subnet (169.254.xxx.xxx, subnet mask 255.255.0.0). Refer to **Configuring a Static IP Address** (page 20) for more information on configuring an encoder in Auto IP mode.

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

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

9. Click the desired encoder within the **Unassigned** list.

10. Once the unit is selected, the control interface for the encoder will be displayed. The illustration below shows the **DEVICE INFO** screen for an AT-OMNI-112 encoder.
11. Click **SESSION** in the top menu bar.

12. Locate the **Video** section.

13. Delete the value in the **Destination Multicast / Unicast Address** field.

14. Locate the **Audio** section and delete the value in the **Destination Multicast / Unicast Address** field.

15. Scroll down to the bottom of the page and click the **SAVE** button at the bottom of the **Stream 1** window group.

16. Repeat steps 12 through 15 under for **Stream 2** (dual-channel encoder only), if required. If there are multiple encoders on the system, then these steps will need to be completed for each encoder.
Configuring a Static IP Address

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

1. Make sure that the encoder is powered. Power will need to be supplied either by the external 48V power supply (not included) or by connecting an Ethernet cable from the encoder to a PoE-capable switch. If using the AT-OMNI-112, the Ethernet cable can be connected to either ETHERNET 1 or ETHERNET 2 (dual-channel only).

2. Connect an Ethernet cable from the PC, directly to one of the Ethernet ports on the encoder. Make sure that the computer being used has AMS installed.

3. Configure the PC to a static IP address that is on the same subnet as the encoder.

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

4. Login to AMS. Refer to Accessing Encoders in AMS (page 16) for information on the login process.

5. Locate the encoder under the Unassigned section within AMS.

6. Click on the device.

7. Under AMS, click NETWORK in the menu bar.

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

9. Enter the required network information for the encoder in the IP Address, Subnet, and Gateway fields.

10. Click the Save button in the bottom-right corner, to apply the changes.

11. Disconnect the encoder from the PC and connect the encoder to the network.

12. The encoder is now ready for use.
Configuration

Input Selection

Once the OmniStream encoder is configured, and can be located on the network, the encoder will need to be instructed on how to handle source devices and to which stream each source is assigned.

**Input Selection**

1. Under AMS, click **INPUT** in the menu bar.
2. Click the **Input** drop-down list for **HDMI Input 1** and select the input.

3. Enter the desired bit rate in the **Bit Rate** field. Specifying lower bit rates will reduce video quality. This value is in megabits-per-second (Mbps). 4K/UHD streams should be set to 900 Mbps. The recommended bandwidth for 1080p60 video is also 450 Mbps. Setting this field below these recommended values will result in lower-quality video.

4. Enter the bit depth from the **Bit Depth** drop-down list.

5. Select the chroma subsampling value from the **Subsampling** drop-down list. Available values are 4:2:0, 4:2:2, and 4:4:4.

6. Click the **Force YUV** toggle switch to enable or disable the use of YUV color space. Enable (the toggle switch will be green) this feature to force the output of the encoder to output YUV, regardless of whether the input is RGB or YUV. In order for the chroma scaling to work on RGB inputs, this feature must be enabled.
Configuration

Dual-channel encoder only:
7. Repeat the above steps for the Encoder 2 section (dual-channel OmniStream only). If a secondary HDMI source is not connected to the encoder, then these fields may be left at their current settings.

Dual-channel / single-channel encoder:
8. Click the SAVE button in the right-hand corner of the HDMI Input 1 window group to commit changes.

Verifying the Input
1. Click INPUT in the menu bar.

2. Check the Cable Present indicator. If a cable is connected from a source to an input on the encoder, then the indicator will be green. If no cable is connected, then the indicator will be red.

Note that this indicator may also reflect the integrity of the cable: if the cable is bad or does not maintain a secure connection, then the Cable Present indicator may also be displayed as red. If this is the case, try a different HDMI cable.
Configuration

Session Configuration

Once the inputs have been assigned to the desired source, the next step is to configure each session. A session is a class-D multicast IP address that is assigned to an AV stream. If each stream is configured for bit rates less than 450 Mbps (only recommended for 1080p and lower resolutions), a single Ethernet cable can transport two sessions. The dual-channel encoder supports up to four sessions, which allows for redundancy in dual 1080p-use cases. The single-channel encoder supports a maximum of two sessions to enable redundancy for single 1080p-use cases.

Video

1. Under AMS, click Session in the menu bar.
2. Click the desired physical interface from the Interface drop-down list: eth1 or eth2.
3. Select the desired encoder session from the Encoder drop-down list: HDMI Input 1 or HDMI Input 2.
4. Under the Video section, make sure that the Enable Video toggle switch is enabled (green). To disable video at any time, click the toggle switch so that it appears gray.
5. Enter the destination multicast IP address in the Destination Multicast/Unicast IP Address field, within the range 224.0.0.0 through 239.255.255.255.
6. Enter the port number in the Destination UDP Port field.

Audio

1. Locate the Audio section.
2. Click the Source drop-down list and select the HDMI source.

   NOTE: If AES67 audio will be used, refer to AES67 Audio (page 57) for more information.

3. Click the Enable Audio toggle switch and make sure it is enabled (green). To disable audio at any time, click the toggle switch so that it appears gray.
4. Enter the specific destination IP address, if desired, in the Destination Multicast/Unicast IP Address field. By default, AMS will automatically populate this field.
5. Enter the port number in the Destination UDP Port field.

   IMPORTANT: AMS does not allow the same port numbers to be used on both video and audio. Always specify unique ports for both video and audio.
## LED Indicators

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

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PWR** | ![Off](not-off.png) • 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    | ![Red](red.png) • The encoder is booting.                                   |
| Green  | ![Green](green.png) • The encoder is ready.                                 |
| **HDMI 1 / 2** | ![Red](red.png) • No source is connected to the input.  
  • Check the HDMI cable for possible damage or loose connections. |
| **HDMI 1 / 2** | ![Green](green.png) • The link integrity between the source and the encoder is good. |
| **LINK 1 / 2** | ![Red](red.png) • 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. |
| **LINK 1 / 2** | ![Green](green.png) • Link integrity is good between the encoder and the network. |
Basic Operation

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

**IMPORTANT:** This feature is not available on the single-channel OmniStream encoder (AT-OMNI-111).

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. After the input is selected, AMS will require configuration. Refer to Input Switching Configuration (page 28) for more information.

Powering the Display

**IMPORTANT:** This feature is not available on the single-channel OmniStream encoder (AT-OMNI-111).

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 A (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. Refer to Input Switching Configuration (page 28) for more information.

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.
Basic Operation

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.

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

Broadcast Messaging

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

Reset to Factory-Default Settings

**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 Logging In (page 97) for more information. Note that OmniStream devices communicate using both LLDP and CDP protocols. Consult the switch documentation for information on returning neighbor details from the CLI. Neighbor details will include the IP address of the encoder.
2. Click the Reset Defaults checkbox and click the FACTORY RESET button.
3. The encoder is now reset and will need to be reconfigured.
Basic Operation

Input Switching Configuration

**IMPORTANT**: This feature is not available on the single-channel OmniStream encoder (AT-OMNI-111).

The INPUT button on the front panel can be configured to switch between both HDMI inputs. This is useful in meeting room applications, allowing switching between two sources. Note that when configuring input switching, one of the encoder sessions will be lost, causing dual-channel encoders to function as single-channel encoders.

1. Verify that there are two HDMI sources are connected to the encoder.
2. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
3. Click SESSION in the menu bar.
4. Under the Stream 2 window group, click the Encoder drop-down list and select Not Used.

   It should be noted that Not Used could have been set under Stream 1, instead. The concept is to remove the source assignment from either Stream 1 or Stream 2.

5. Click the SAVE button, under Stream 2 to commit the changes.
6. Configuration is complete.
7. Press the INPUT button on the front panel of the encoder to switch between HDMI IN 1 and HDMI IN 2. To return the encoder to the previous state (disable input switching), assign the Encoder field, under the Stream 2 window group, to HDMI Input 2.
Unicast Mode

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

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

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

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click **SESSION** in the menu bar and locate the **Video** section.
3. Enter the IP address of the decoder in the **Destination Multicast/Unicast Address** field. If using dual-channel encoders, repeat this process for each stream.
4. Scroll down to the bottom of the page and click the **SAVE** button to commit all changes.

6. Click IP INPUT from the menu.

7. Remove the IP address from the Multicast Address field.

8. Click the SAVE button to commit changes.

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

Multicast Mode

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

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

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

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. The AMS Dashboard will be displayed.
3. Click the icon, in the upper-left corner of the AMS Dashboard.
4. Click Virtual Matrix from the fly-out menu. Refer to The Virtual Matrix (page 93), if necessary.
5. Locate the desired encoder in the Virtual Matrix, as shown on the next page.
6. Create a cross-connection to the desired decoder. When a cross-connection is created, AMS will automatically assign a multicast IP address to both the encoder and decoder. By default, AMS automatically assigns a multicast IP address to each OmniStream encoder and decoder.

Refer to the illustration on the following page, if necessary.
## Basic Operation

### OmniStream Virtual Matrix

<table>
<thead>
<tr>
<th>Encoder / Decoder</th>
<th>Connected</th>
<th>AT-OMNI-112 Connected</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT-OMNI-111</td>
<td>HDMI 1</td>
<td>192.168.11.34</td>
</tr>
<tr>
<td>192.168.11.83</td>
<td>HDMI 1</td>
<td>192.168.11.34</td>
</tr>
<tr>
<td></td>
<td>HDMI 2</td>
<td>192.168.11.34</td>
</tr>
<tr>
<td></td>
<td>HDMI 3</td>
<td>192.168.11.34</td>
</tr>
<tr>
<td>AT-OMNI-112</td>
<td>HDMI 1</td>
<td>192.168.11.86</td>
</tr>
<tr>
<td>192.168.11.177</td>
<td>HDMI 1</td>
<td>192.168.11.86</td>
</tr>
<tr>
<td></td>
<td>HDMI 2</td>
<td>192.168.11.86</td>
</tr>
<tr>
<td></td>
<td>HDMI 3</td>
<td>192.168.11.86</td>
</tr>
<tr>
<td>AT-OMNI-152</td>
<td>HDMI 1</td>
<td>192.168.11.87</td>
</tr>
<tr>
<td>192.168.11.117</td>
<td>HDMI 1</td>
<td>192.168.11.87</td>
</tr>
<tr>
<td></td>
<td>HDMI 2</td>
<td>192.168.11.87</td>
</tr>
<tr>
<td></td>
<td>HDMI 3</td>
<td>192.168.11.87</td>
</tr>
<tr>
<td>AT-OMNI-201</td>
<td>HDMI 1</td>
<td>192.168.11.36</td>
</tr>
<tr>
<td></td>
<td>HDMI 2</td>
<td>192.168.11.36</td>
</tr>
<tr>
<td></td>
<td>HDMI 3</td>
<td>192.168.11.36</td>
</tr>
</tbody>
</table>

### Connectors

- HDMI 1
- HDMI 2
- HDMI 3
IR Control

Controlling the Display using the Display’s IR Remote

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).

The following sections provide step-by-step instructions for the following topics:

- Controlling the Display using the Display’s IR Remote
- Controlling the Display using a Control System

The illustration below shows a display device being controlled from the encoder. Refer to the next page for details on how to connect the IR emitter and IR receiver.
IR Control

Required Equipment
Atlona has tested and verified the following components for this application. However, other components may also be used. Note that IR control is only supported on RS-232 2 port (bottom set of connectors) of the OmniStream encoder and decoder.

- Xantech 789-44 4-Source Connecting Block
- Xantech 12 V PSU
- IR Receiver (Atlona AT-IR-CS-RX)
- IR Emitter (Atlona AT-OMNI-IR-TX)

Connecting the IR Receiver to the Encoder
1. Unscrew the captive screw connectors on the Xantech 789-44 4-Source Connecting Block, using a regular screwdriver, and connect the SIGNAL, GROUND, and POWER leads of the AT-IR-CS-RX to the Xantech 789-44 4-Source Connecting Block, as shown below. The presence or absence of white markings on each wire of the AT-IR-CS-RX will denote the signal type:

   IR IN    = Dashed dark gray line
   GND      = Solid (no marking) black wire
   +12 VDC  = Solid dark gray line
2. Connect the IR IN and GND leads, from the 789-44 4-Source Connecting Block, to the \( \text{RX} \) and \( \frac{1}{2} \) pins, respectively, of the RS-232 2 port (bottom port) of the encoder, as shown.

**NOTE:** The IR IN, GND, and +12 VDC wires, from Step 1, have been removed from the illustration below, for purposes of clarity.

3. Connect the Xantech 12 V power supply (or other compatible 12 V DC power supply) to the 12VDC connector on the Xantech 789-44 4-Source Connecting Block.

**Connecting the IR Emitter to the Decoder**

1. Connect the included 6-pin Euroblock push-spring connector to the RS-232 2 port on the encoder.
2. Connect the SIGNAL wire of the AT-OMNI-IR-TX, to the \( \text{TX} \) (middle) terminal on the RS-232 2 port.
3. Connect the GROUND wire of the AT-OMNI-IR-TX to the \( \frac{1}{2} \) terminal on the RS-232 2 port.
Identifying the Encoder using AMS

1. Launch a web browser and enter the IP address of AMS in the address bar.

2. Enter the required login credentials. The default login is:
   
   Username: admin  
   Password: Atlona

3. Click the **Login** button.

4. The AMS Dashboard will be displayed.

5. Click the ☰ icon, in the upper-left corner of the AMS Dashboard.

6. Click **Devices** from the fly-out menu.

7. Click the **All** option.

8. Click the desired encoder, within the **Device List** window, to display the AMS interface.

9. Locate and make note of the IP address of the encoder, which can be found in the **IP Address** field.
Configuring the Encoder Serial Port

The first step will be to configure the RS-232 port on the encoder to use IR. Only the RS-232 port supports both RS-232 and IR. Therefore, this port must be used for IR. RS-232 port configuration is managed under the Serial page of the encoder web interface.

1. Enter the IP address of the encoder in the address bar of the web browser.
2. Enter the required login credentials. The default login is:
   - Username: admin
   - Password: Atlona
3. Click the Login button.
4. Click Serial in the top menu bar.
5. Locate the Serial port configuration window group. The Name field, within this window group, should read serial_port2. Click the Mode drop-down list and select Infrared.
6. Click the SAVE button to commit changes.
Configuring the Encoder Session
The next step is to assign the IR control for Serial Port 2 to the desired Session.

1. Click **SESSION** in the top menu bar.

2. Locate the **Session 1** window group.

   **NOTE:** **Session 2** can also be used with IR. However, in this example, **Session 1** will be configured.

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name</td>
</tr>
<tr>
<td>Interface</td>
<td>Interface</td>
</tr>
<tr>
<td>EncGroup</td>
<td>Enable</td>
</tr>
<tr>
<td>SAP</td>
<td>Enable</td>
</tr>
<tr>
<td></td>
<td>Interval  10</td>
</tr>
<tr>
<td>Name</td>
<td>session1</td>
</tr>
<tr>
<td>Description</td>
<td>N/A</td>
</tr>
<tr>
<td>Origantor</td>
<td>-</td>
</tr>
<tr>
<td>Scrambling</td>
<td>Enable</td>
</tr>
<tr>
<td>Key</td>
<td>scrambling</td>
</tr>
<tr>
<td>Video</td>
<td>Encoder vc2_encoder1</td>
</tr>
<tr>
<td></td>
<td>Enable</td>
</tr>
<tr>
<td></td>
<td>Destination IP address 225.0.0.1</td>
</tr>
<tr>
<td></td>
<td>Destination UDP port 1000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Scroll down and locate the **AUX** section.
4. Click the **Source** drop-down list and select **serial_port2**.

5. Enable the auxiliary (AUX) channel by clicking the **Enable** toggle switch. When the auxiliary channel is enabled, this toggle switch will be orange.

6. Enter the IP address of the **decoder** in the **Destination IP Address** field. This is the decoder to which the IR emitter is connected. In this example, the decoder IP address is 10.20.200.141.

7. Enter the port number in the **Destination UDP Port** field.

8. Click the **SAVE** button to commit changes.
IR Control

Configuring the Decoder Serial Port

1. Select the desired decoder within the AMS Device List window and make note of the decoder IP address.

2. Enter the required login credentials. The default login is:
   - Username: admin
   - Password: Atlona

3. Click the Login button, then click IP Input in the top menu bar.

4. Scroll down to the Input 5 window group.

5. Enable Input 5 by clicking the Enable toggle switch. When enabled, this toggle switch will be orange.

   **NOTE:** Input 5 is dedicated to IR. Therefore, this input must be used in order for end-to-end IR to function properly.

6. Enter the port in the Port field. This port number must be the same port used by the encoder, and is the input of the decoder that will receive IR data.

   **IMPORTANT:** Do not change the contents of the Multicast Address field. Unicast mode uses the IP address of the decoder for communication. Therefore, only the port number is required.

7. Click the SAVE button to commit changes.
8. Click **Serial** in the top menu bar.

9. Locate the **Serial port configuration** window group. The **Name** field, within this group, should read **serial_port2**. Click the **Modes** drop-down list and select **Infrared**.

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

11. Scroll down the page and locate the **Serial Configuration** window group. The **Name** field, within this group, should read **serial_use2**.

12. Click the **Port** drop-down list and select **serial_port2**.

13. Click the **Mode** drop-down list and select **output**.

14. Click the **Input** drop-down list and select **ip_input5**.
15. Click the **SAVE** button to commit changes.
**Testing IR Functionality**

1. Point IR remote to at the IR Receiver, as shown in the diagram below.

2. The IR remote will now send IR data to the decoder where it will be relayed to the display device.

**IMPORTANT:** The IR lens of the emitter must be within 1 inch (2.54 centimeters) of the IR window on the display device. If this distance is exceeded, then IR functionality may fail.
Controlling the Display using a Control System

The following steps are similar to Controlling the Display using the Display’s IR Remote (page 33), except that the control system wiring should be used, instead of an IR receiver, as shown below.
Using the Virtual Matrix

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16) if necessary.

2. Click the icon, in the upper-left corner of the AMS Dashboard.

3. Click on Virtual Matrix.

4. The OmniStream Virtual Matrix page will be displayed.
5. Click on the **View** drop-down list and select **Control**.

6. The Control screen will be displayed. In the Control screen, **HDMI** ports are replaced with control ports: **Port 1 In** / **Port 1 In** for encoders and **Port 1 Out** / **Port 2 Out** for decoders.

7. Click the **Options** button next to the desired decoder.
8. The **Crosspoint Options** dialog will be displayed.

![Crosspoint Options](image)

9. Click the **Serial Port 2** drop-down list and select **IR Passthrough**.

   **NOTE:** Only Serial Port 2 supports IR pass-through. The IR emitter or IR receiver must be connected to this port. Refer to [RS-232 Connections (page 12)](#) for wiring information.

10. Click **SAVE** to commit changes, then click **CLOSE** to dismiss the dialog and return to the Virtual Matrix page. To return to the Virtual Matrix page without saving changes, click the **CLOSE** button to dismiss the dialog.
Control Using RS-232


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

### RS-232 Pass-through

This method will pass-through RS-232 data, directly from a control system, to the sink device that is connected to the decoder.

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16) if necessary.
2. Select the decoder in AMS.
3. Click SERIAL in the menu bar.
4. Configure the proper serial port settings under the Serial Port section for the connected device, then click the SAVE button.
5. Scroll down to the Serial Configuration section.
6. Click the Mode drop-down list and select the Cli option, then click the SAVE button.

### Using TCP Proxy

This method is used to send IP commands directly to the decoder, which are then output over RS-232 to the display (sink) device.

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16) if necessary.
2. Select the encoder in AMS.
3. Click SERIAL in the menu bar.
4. Click the Mode drop-down list and select Serial.
5. Configure the proper serial port settings under the Serial Port section for the connected device, then click the SAVE button.
6. Scroll down to the Serial Configuration section and select the desired serial port from the Port drop-down list. Note that for single-channel encoders, only Serial Port 1 will be available.
7. Click the Mode drop-down list and select the tcpproxy option, then click the SAVE button.
8. Click SESSION in the menu bar.
9. Locate the Control Serial section, under the desired Stream, and click the Source drop-down list to select the serial port to which the control device is connected.
10. Click the SAVE button to commit all changes.
Using the Virtual Matrix

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16) if necessary.
2. Click the icon, in the upper-left corner of the AMS Dashboard.
3. Click on Virtual Matrix.

4. The OmniStream Virtual Matrix page will be displayed.
5. Click on the **View** drop-down list and select **Control**.

6. The Control screen will be displayed. In the Control screen, **HDMI** ports are replaced with control ports: **Port 1 In** / **Port 1 In** for encoders and **Port 1 Out** / **Port 2 Out** for decoders.

7. Click the **Options** button next to the desired decoder.
6. The **Crosspoint Options** dialog will be displayed.

![Crosspoint Options](image)

The table below provides a summary of serial port control methods available for each encoder/decoder. Orange circles indicate that the feature is available on that port.

<table>
<thead>
<tr>
<th>Control Method</th>
<th>AT-OMNI-111</th>
<th>AT-OMNI-112</th>
<th>AT-OMNI-121</th>
<th>AT-OMNI-122</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232 Pass-Through</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>IR Pass-Through</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Serial over IP Proxy</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>RS-232 Trigger</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>RS-232 Encoder Buttons</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

7. Click the **ADVANCED** button, near the bottom of the dialog. This will enable additional options in the Serial Port drop-down lists. In the **BASIC** mode, only **RS232 Passthrough** is available from drop-down list.

When the **ADVANCED** option is enabled, the following modes will be available. Refer to the list of modes, on the right-hand side of the dialog for a description of each.
Advanced Operation

RS232 Passthrough

This is the most basic option: the control system (DTE device) sends RS-232 commands from the encoder, downstream, to the decoder. The RS-232 commands are then received by a display (DCE device) or other sink device.

1. Select **RS232 Passthrough** from the **Serial Mode** drop-down list.

2. Click **SAVE** to commit changes, then click **CLOSE** to dismiss the dialog and return to the Virtual Matrix page. To return to the Virtual Matrix page without saving changes, click the **CLOSE** button to dismiss the dialog.
Advanced Operation

Serial over IP Proxy (TCP Proxy)

This method is used to send IP commands directly to the decoder, which are then output over RS-232 to the display (sink) device.

1. Select **Serial over IP Proxy** from the **Serial Mode** drop-down list. If it is not listed, make sure that the **Advanced** button is clicked, at the bottom of the dialog.

2. Scroll down to the **Serial Port** settings and provide the required settings. These settings must match the port settings on the display (sink) device.
   a. Click the **Interface** drop-down list to select the interface (Ethernet port) that will be used to transmit the data.
   b. Enter the port number in the **TCP Proxy Port** field. This number can be in the range from 0 to 65535.
   c. Specify the baud rate, data bit, parity, stop bit, and flow control in the appropriate fields.

3. Click **SAVE** to commit changes, then click **CLOSE** to dismiss the dialog and return to the Virtual Matrix page. To return to the Virtual Matrix page without saving changes, click the **CLOSE** button to dismiss the dialog.
802.1X Authentication

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

**WARNING:** Connecting an 802.1X-enabled 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.

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>802.1X protocol disabled</td>
</tr>
<tr>
<td>PEAP/MSCHAPv2</td>
<td>Protected EAP; requires basic credentials in addition to a CA (certificate authority) certificate.</td>
</tr>
<tr>
<td>EAP-TLS</td>
<td>EAP Transport Layer Security; requires a client certificate, client private key, and CA (certificate authority) certificate.</td>
</tr>
</tbody>
</table>
1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.

2. Click Devices > All and select the desired encoder from the Device List.

3. Click NETWORK in the menu bar.

   NOTE: If using dual-channel encoders, both Network 1 (eth1) and Network 2 (eth2) will need to be set up, depending upon the system requirements.

4. Click the SHOW ADVANCED button to expand the options under both Network window groups.

5. Click the 802.1x Mode drop-down list, at the bottom of the page, and select the desired authentication method. In the example below, PEAP/MSCHAPv2 is selected.

6. Once a method is selected, the required fields for that method will be displayed. Enter the required information in each field. For the PEAP/MSCHAPv2 option, the fields are described as follows:

   - **Identity**
     Enter the identity of the authentication server in this field. PEAP uses this field to identify the correct authentication server which will process the credentials. For example, if foo@authserv.com is entered, then this identifies AUTHSERV as the RADIUS (authentication) server.

   - **Username**
     Enter the username in this field

   - **Password**
     Enter the password in this field.

   - **CA certificate**
     Click the Browse... button to select the certification authority (CA) certificate. To remove a certificate, click the Remove button.
7. Click **SAVE** to commit changes.

8. 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.

<table>
<thead>
<tr>
<th>Authentication Method</th>
<th>Identity</th>
<th>Password</th>
<th>CA Certificate</th>
<th>CA Certificate</th>
<th>Client Private Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEAP/MSCHAPv2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAP-TLS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. 802.1X authentication configuration is complete. If desired, click the **HIDE ADVANCED** button to collapse the options under both **Network** window groups.
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 AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click Devices > All and select the desired encoder from the Device List.
3. Click SESSION in the menu bar.
4. Locate the Audio section, under the desired Stream, and click the Enable AES67 toggle switch to enable this feature. When enabled, the toggle switch will be green.

5. Select the type of downmixing from the Downmixing drop-down list, if desired. Available options are: None, Mono, or Stereo.
6. Click the SAVE button within the Stream window group.
7. Go to the decoder interface and click OTHER in the menu bar.
8. Click SAP in near the upper-left corner of the AMS screen.
9. Click the Enable toggle switch to enable SAP. When enabled, the toggle switch will be green. Refer to the OmniStream Single-Channel / Dual Channel A/V Decoder User Manual, if necessary. If the decoder, Dante controller, or DSP is to receive AES67 audio, this step is required.
10. Click the SAVE button on the SAP page.
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 AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click INPUT in the menu bar.
3. Click the EDID drop-down list, within the desired HDMI Input window group, and select the EDID.
4. Click the SAVE button to commit changes.

Using a Custom EDID

Encoders can be assigned a custom EDID. The raw EDID data must be in hexadecimal format. Commas or spaces can be included as delimiters to separate each hexadecimal value.

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click INPUT in the menu bar.
3. Click the EDID drop-down list.
4. Scroll down to the bottom of the list and select + Add Custom EDID.
5. Enter the name of the EDID in the EDID Name field. Spaces and special character are valid entries. Use a descriptive name for this field.
6. 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 can be included as delimiters to separate each hexadecimal value.

7. Click the SUBMIT button to commit changes or click CANCEL to abort the addition of a custom EDID. Once a custom EDID is created, it will be added to the drop-down list and can be selected without re-entering the information.

The following tables provide a list of which EDID to use with each video mode. Note that the available EDID selections will depend upon the current video mode. Refer to Setting the Video Mode (page 69) for more information.

### Common

<table>
<thead>
<tr>
<th>EDID</th>
<th>2CH LPCM</th>
<th>MCH LPCM</th>
<th>DTS</th>
<th>Dolby</th>
<th>Dolby Digital*</th>
<th>DTS-HD MA †</th>
<th>Dolby True HD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080P 2CH</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>1080P DD</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>1080P MCH</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ATL VR (2160x1200)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### PC application mode only

<table>
<thead>
<tr>
<th>EDID</th>
<th>2CH LPCM</th>
<th>MCH LPCM</th>
<th>DTS</th>
<th>Dolby</th>
<th>Dolby Digital*</th>
<th>DTS-HD MA †</th>
<th>Dolby True HD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1080P DVI</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>1280x800 RGB DVI PCWXGADVI</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>1280x800 RGB PCWXGA2CH</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>1366x768 RGB TVWXGA2CH</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2160P 2CH</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2160P MCH</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2560x1600 2CH</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2560x1600 MCH</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
**Advanced Operation**

**Video mode only**

<table>
<thead>
<tr>
<th>EDID</th>
<th>2CH LPCM</th>
<th>MCH LPCM</th>
<th>DTS</th>
<th>Dolby</th>
<th>Dolby Digital*</th>
<th>DTS-HD MA †</th>
<th>Dolby True HD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default - Video Mode</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Default - Video Mode (No HDR)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4K60 MCH</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4K60 PCM-MCH</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>460 LPCM 2CH</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>720P DD</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>720P 2CH</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

* Dolby Atmos® is carried with either Dolby Digital Plus or Dolby True HD audio streams.
† DTS:X is carried with DTS-HD MA audio streams.

**Copying an EDID from the Display**

In order to allow the source device to send all AV formats that are supported by the display device, the EDID from the decoder must be copied to the encoder. Access to a decoder will be required.

1. Login to AMS and access the desired decoder. Refer to Accessing Encoders in AMS (page 16) except instead of clicking on an encoder, click on a decoder (AT-OMNI-121 or AT-OMNI-122).
2. Make sure the display, where the EDID will be fetched, is connected to the decoder. Select the desired decoder from within AMS.
3. Click **HDMI OUTPUT** in the menu bar.
Advanced Operation

4. Locate the **EDID** section. This is the EDID of the display which is connected to the decoder. Click and select the data in this field, then press [CTRL]+[C] to copy the data.

```
Display's EDID
```

5. Select the desired encoder, within AMS.

6. Click **INPUT** in the menu bar.

7. Click the **EDID** drop-down list, in the desired **HDMI Input** window group.

8. Scroll down to the bottom of the list and select + **Add Custom EDID**.

```
Add Custom EDID
```
9. Enter the name of the EDID in the **EDID Name field**. Spaces and special character are valid entries. Use a descriptive name for this field.

10. Paste the EDID data into the **Raw EDID** field by pressing [CTRL]+[P].

11. Click the **Submit** button to commit changes or click **Cancel** to abort the addition of the custom EDID. Once a custom EDID is created, it will be added to the drop-down list and can be selected without re-entering the information.
Encoder Grouping

Grouping encoders allows a group of encoders to feed a single decoder, simultaneously. The stream will be displayed by the decoder using either manual or automatic input-selection, based on the presence of a source signal.

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click SESSION in the menu bar.
3. Click the SHOW ADVANCED button to expand options for the desired Stream.
4. Locate Encoder Groups and enter a name for the group in the Group Name field. The default group names for Stream 1 and Stream 2 are session1 and session2, respectively.

5. Under Members, click the ADD button and enter the IP address of the encoder to be added to the group.
6. Click the Interface drop-down list to select the desired interface.
7. Click the SUBMIT button to commit changes to the encoder group.
8. Repeat steps 5 through 8 for each encoder to be added to the encoder group.

**IMPORTANT:** The IP address for each encoder must be added to the group. This includes the IP address of the encoder that is being used to create the group.
9. Click the **Enable Encoder Group** toggle switch to enable encoder grouping. When enabled, this toggle switch will be green.

10. Click the **Trigger** drop-down list and select the desired trigger mode.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>manual</td>
<td>Use this setting to manually enable the input. When set to manual, click the <strong>Activate</strong> button to perform the input switching.</td>
</tr>
<tr>
<td>input connected</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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 70) for more information.

11. Click the **SAVE** button, at the bottom of the **Stream** window group to commit all changes.
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.

**NOTE:** Single-channel encoders do not support daisy-chaining. In addition, the OmniStream R-Type Encoder (AT-OMNI-512) does not support daisy-chaining and cannot be combined with OmniStream Pro daisy-chain configurations.

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 AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
4. Click SESSION in the menu bar.
5. Create an encoder group for using each encoder in the chain. Refer to Encoder Grouping (page 63) 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.
Advanced Operation

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

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

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.
Advanced Operation

Scrambling

OmniStream supports 128-bit Advanced Encryption Standard (AES) scrambling and is required for HDCP-encrypted streams. Scrambling can be enabled or disabled through AMS, 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”.

Standard Method

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click SESSION in the menu bar.
3. Under the desired Stream, click the Scrambling toggle switch to enable it. Once enabled, the toggle switch will be green and the Key field will be displayed.

4. Enter the desired scrambling key in the Key field. If a random key is desired, click the icon to generate a key. Each time this icon is clicked, a new scrambling key will be generated.

   **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.

5. Click the Save button at the bottom of the page to commit the changes.
Advanced Operation

Using the Virtual Matrix

1. Access the Virtual Matrix. Refer to The Virtual Matrix (page 93) for more information.

2. Locate the desired encoder or decoder. Scrambling is managed on the encoder; descrambling is managed on the decoder.

3. Click the key icon. The Scrambling dialog box will be displayed. If the key icon for a decoder is clicked, then the Descrambling dialog box will be displayed.

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

5. Enter the desired scrambling key using one of the following methods:
   - Manual enter a user-defined key in the Key field.
   - Click the icon to generate a random key using AMS. Each time this icon is clicked, a new scrambling key will be generated.

6. Repeat the above process for each session.

7. Click the Save button to commit the changes.
Advanced Operation

Setting the Video Mode

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

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click INPUT in the menu bar.
3. Click the SHOW ADVANCED button, under the HDMI Input 1 window group.
4. Click the Video Optimization drop-down list to select the desired mode.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Graphics</td>
<td>Optimizes the image when viewing static images, such as spreadsheets or similar content.</td>
</tr>
<tr>
<td>Motion Video</td>
<td>Provides the best viewing experience when streaming motion graphics and/or video.</td>
</tr>
</tbody>
</table>

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

IMPORTANT: In order to use 3840x2160p60 signals, Video Optimization must be set to Motion Video.
Slate / Logo Insertion

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

Slate / logo insertion can be performed on both the encoder and decoder. When configured on the encoder, the image that is displayed 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 AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click OTHER in the menu bar.
3. Verify that Logo is selected, near the upper-left corner of the screen. Logo is the default selection and applies to both logo and slate images.
4. Enter the name of the image in the Name field. If a name is not specified, then the UPLOAD button will be disabled.
5. Under the New logo window group, click the Choose File button and select the image to be used. Only .png files are valid selections.
6. Click the UPLOAD button to upload the file.
7. A new window group will be created with the name of the logo that was provided in Step 4.
Advanced Operation

8. Perform one of the following:
   - If the selected image will be used as a logo, then proceed with Steps 9 through 13.
   - If the image will be used as a slate, skip to Step 14.

9. Under the HDMI Input Logo 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.
10. 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 fill the screen.

11. Enter the location of the on-screen image, in pixel values, by entering the desired values in the Horizontal and Vertical fields.

12. Click the Enabled toggle switch to activate the logo/slate feature. When enabled, this toggle switch will be green.

13. Click the SAVE button to commit changes.

14. Click INPUT in the menu bar, then click the SHOW ADVANCED button.

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Disables the image from being displayed.</td>
</tr>
<tr>
<td>Manual</td>
<td>The image will always be displayed, superimposed on the source signal, and will remain even if the source signal is lost.</td>
</tr>
<tr>
<td>Auto</td>
<td>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.</td>
</tr>
</tbody>
</table>

16. Click the Slate Logo drop-down list and select the desired image. Note that 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 / Logos

Follow the instructions below to remove a logo/slate image.

1. Click OTHER in the menu bar.

2. Click the DELETE button in the desired image window group. When the DELETE button is clicked, the window group and the associated image will be deleted from the encoder. If the DELETE button is disabled, do the following:
   a. Locate the HDMI Input Logo window groups.
   b. Click the Select Logo drop-down list and select Not Used.
   c. Click the SAVE button.
   d. Refresh the page.
   e. Click the DELETE button to remove the logo.
Text Insertion

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click OTHER in the menu bar.
3. Click Text in the side menu bar, in the upper-left corner of the AMS screen.
4. Click the Enabled toggle switch, to allow the text to be displayed. When enabled, this toggle switch will be green.

4. In the Text field, enter the desired text.

5. Specify the speed of the scrolling text in the Scroll Speed field. Values from -255 to 255 are valid. Negative numbers will scroll the text from left to right. Positive numbers will scroll text from right to left.

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

7. Click the Color drop-down list to select the color of the text. The Red, Green, and Blue fields can be changed to further modify the color of the text. Adjust the Alpha field to control the transparency of the text. A value of 255 is opaque and a value of 0 is transparent. Numbers from 0 to 255 are valid for each of these fields.

8. Specify the location of the text in the Horizontal (%) and Vertical (%) fields. Each of these values is based on the horizontal and vertical resolution of the screen.

9. Specify the size of the text in the Width (%) and Height (%) fields. Each of these values is based on the horizontal and vertical resolution of the screen.

10. Click the SAVE button to commit all changes.
The AMS Interface

Device Info page

The Device Info page provides general information about the encoder.

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

Model
The model number of the unit.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT-OMNI-111</td>
<td>Single-channel encoder</td>
</tr>
<tr>
<td>AT-OMNI-112</td>
<td>Dual-channel encoder</td>
</tr>
</tbody>
</table>

IP Address
Displays the IP address of the encoder.

MAC Address
Displays the MAC address of the encoder.

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

FIRMWARE UPDATE
Click this button to update the firmware.

Description
Provides the option of assigning descriptive name to the unit.
The AMS Interface

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

Uptime
Time elapsed since the last reboot operation.

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

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None Checked</td>
<td>Resets the encoder with no factory-default settings.</td>
</tr>
<tr>
<td>Reset User</td>
<td>Resets the encoder to factory-default settings and resets custom user information.</td>
</tr>
<tr>
<td>Reset Network</td>
<td>Resets the encoder to factory-default settings and resets network information.</td>
</tr>
<tr>
<td>Reset Defaults</td>
<td>Resets the encoder to factory-default settings. In addition, static multicast addresses are configured. This option can be used to configure a single encoder to transmit to any number of decoders without using the Virtual Matrix within AMS.</td>
</tr>
</tbody>
</table>

⚠️ IMPORTANT: This 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.

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

Advanced Settings
Click the SHOW ADVANCED button to view the following options.

Timezone
Click this drop-down list to select the time zone, expressed in Universal Coordinated Time (UTC).

System Temperature
The current internal temperature of the unit listed in both degrees Fahrenheit and Celsius.

Die Temperature
The component chip temperature listed in both degrees Fahrenheit and Celsius.

Power Consumption
The current power consumption value.
The AMS Interface

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

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

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

The Input page provides signal information for each channel (input). If using the single-channel encoder, only a single (input) channel will be displayed.

**Input**
The selected input. This value can be **HDMI Input 1**, **Video Generator 1**, or **None**.

**Bit Rate**
The current video bit rate. Specifying lower bit rates will reduce video quality. This value is in megabits-per-second (Mbps). 4K/UHD streams should be set to 900 Mbps. The recommended bandwidth for 1080p60 video is also 450 Mbps. Setting this field below these recommended values will result in lower-quality video.

**Subsampling**
Click this drop-down list to select the desired maximum chroma subsampling value. Any input with a higher chroma subsampling will have their chroma scaled to the configured value using a very high quality chroma scaler to preserve quality.

**Force YUV**
When this toggle switch is enabled (green), 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.

**Cable Present**
Indicates whether or not a connection is detected. The indicator, to the left, indicates the current state. If the indicator is green, then a source signal is detected. If the indicator is red, then check the cable connection and make sure that the source is powered. Damaged cables may also display a red indicator.
The AMS Interface

**EDID**
Click the drop-down list to select the desired EDID. Refer to the table below for a list of available EDID selections.

<table>
<thead>
<tr>
<th>EDID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Default OmniStream EDID</td>
</tr>
<tr>
<td>ATL 1080P 2CH</td>
<td>1920x1080p60 with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 1080P DD</td>
<td>1920x1080p60 with Dolby Digital audio</td>
</tr>
<tr>
<td>ATL 1080P DVI</td>
<td>1920x1080p60 with video formatted as DVI</td>
</tr>
<tr>
<td>ATL 1080P MCH</td>
<td>1920x1080p60 with multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 1280x800 RGB DVI PCWXGADVI</td>
<td>1280x800p60 with video formatted as DVI</td>
</tr>
<tr>
<td>ATL 1280x800 RGB PCWXGA2CH</td>
<td>1280x800p60 PC format with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 1280x800 RGB TVWXGA2CH</td>
<td>1280x800p60 TV format with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 2160P 2CH</td>
<td>3840x2160p30 with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 2160P MCH</td>
<td>3840x2160p30 with multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 2560x1600 2CH</td>
<td>2560x1600p60 with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 2560x1600 MCH</td>
<td>2560x1600p60 with multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 4K60 MCH</td>
<td>3840x2160p60 with multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 4K60 PCM_MCH</td>
<td>3840x2160p60 with two-channel / multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 720P DD</td>
<td>1280x720p60 with Dolby Digital audio</td>
</tr>
<tr>
<td>ATL 720P 2CH</td>
<td>1280x720p60 with Dolby Digital two-channel audio</td>
</tr>
</tbody>
</table>

**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.

*NOTE:* Disabling HDCP compliance does not decrypt HDCP content.

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

**Video**
The current sampling rate for the input video signal.

**Audio**
The sampling frequency for the input audio signal.
Advanced Settings
Click the **SHOW ADVANCED** button to view the following options.

Slate Mode
Click this drop-down list to enable slate mode or select the desired slate to be used. Refer to *Slate / Logo Insertion (page 70)* for more information.

Video Optimization
Sets the output video mode. Refer to *Setting the Video Mode (page 69)* for more information.
The AMS Interface

Serial page

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

**Supported Modes**
Lists the supported protocols for the serial port.

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

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

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

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

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

**Flow Control**
Click this drop-down list to select the type of flow control: **None, xonxoff, or hw**.

**Port**
Click this drop-down list to select the desired serial port: **Serial Port 1 or Serial Port 2**.

**Mode**
Click this drop-down list to select the desired control mode: **cli or tcpproxy**.
The AMS Interface

**Advanced Settings**
Click the **SHOW ADVANCED** button to view the following options.

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

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

<table>
<thead>
<tr>
<th>Interpret on</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>decoder</td>
<td>Commands are interpreted at the decoder.</td>
</tr>
<tr>
<td>encoder</td>
<td>Commands are interpreted at the encoder.</td>
</tr>
</tbody>
</table>

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

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

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

Session page

The Session page provides the ability to configure all session parameters. Up to four sessions are supported on dual-channel encoders. Single-channel encoders are limited to a maximum of two sessions.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>eth1</td>
<td>ETHERNET 1 port</td>
</tr>
<tr>
<td>eth2</td>
<td>ETHERNET 2 port</td>
</tr>
</tbody>
</table>

SAP
Click this switch to enable to disable the Session Announcement Protocol. When enabled, the toggle switch will be green.

Scrambling
Click this toggle switch to enable (green) or disable scrambling.

Key
This field is only displayed if the Scrambling toggle switch is enabled (green). 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.
Encoder
Click this drop-down list to select the desired HDMI input.

Enable Video
Click the toggle switch to enable or disable the video stream. When enabled, the toggle switch will be green. By default, video streaming is enabled. Disabling the video stream can be used to “mask” the video on the decoder endpoints.

Destination Multicast/Unicast Address
Enter the IP address of the decoder that will be receiving the video stream. By default, AMS will automatically populate multicast IP addresses for the encoder.

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.

Source
Select the desired HDMI input from the Source drop-down list.

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

Downmixing
This field will only be available when AES67 is enabled.

Enable Audio
Click the toggle switch to enable the audio stream. By default, audio streaming is disabled.

Destination Multicast/Unicast Address
Enter the IP address of the decoder that will be receiving the audio stream.

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.

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

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Used</td>
<td>Serial control is disabled</td>
</tr>
<tr>
<td>Commands</td>
<td>Commands are sent using CEC (over HDMI)</td>
</tr>
<tr>
<td>Serial Port 1</td>
<td>Commands are transmitted using Serial Port 1</td>
</tr>
<tr>
<td>Serial Port 2</td>
<td>Commands are transmitted using Serial Port 2</td>
</tr>
</tbody>
</table>
Advanced Settings

Click the **SHOW ADVANCED** button to view the following options. **DSCP, FEC Enable, FEC Rows, and FEC Columns** apply to both **Video** and **Audio** sections.

**DSCP**

*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 and Class Selectors.

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

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

### Table 1.1 - Assured Forwarding

<table>
<thead>
<tr>
<th>Selection</th>
<th>Queue Classification</th>
<th>Drop Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF11</td>
<td>Class 1</td>
<td>Low</td>
</tr>
<tr>
<td>AF21</td>
<td>Class 2</td>
<td>Low</td>
</tr>
<tr>
<td>AF31</td>
<td>Class 3</td>
<td>Low</td>
</tr>
<tr>
<td>AF41</td>
<td>Class 4</td>
<td>Low</td>
</tr>
</tbody>
</table>

### Table 1.2 - Class Selectors

<table>
<thead>
<tr>
<th>Selection</th>
<th>Class Selector Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0 / Best Effort</td>
<td>Routine</td>
</tr>
<tr>
<td>CS1</td>
<td>Priority</td>
</tr>
<tr>
<td>CS2</td>
<td>Immediate</td>
</tr>
<tr>
<td>CS3</td>
<td>Flash</td>
</tr>
<tr>
<td>CS4</td>
<td>Flash Override</td>
</tr>
<tr>
<td>CS5</td>
<td>Critical</td>
</tr>
<tr>
<td>CS6</td>
<td>Interwork Control</td>
</tr>
<tr>
<td>CS7</td>
<td>Network Control</td>
</tr>
<tr>
<td>EF</td>
<td>Expedited Forwarding</td>
</tr>
</tbody>
</table>
The AMS Interface

**FEC Enable**
Click this toggle switch to enable (green) 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 enabled. Refer to [FEC Details (page 134)](https://example.com) for more information.

**FEC rows**
Specify the number of FEC rows in this field. Refer to [FEC Details (page 134)](https://example.com) for more information.

**FEC Columns**
Specify the number of FEC columns in this field. Refer to [FEC Details (page 134)](https://example.com) for more information.

**Group Name**
The name of the encoder group.

**Enable Encoder Groups**
Click this toggle switch to enable (green) or disable encoder groups for the stream.

**Active**
Indicates if the encoder group is active. If active, this indicator will be green.

**Trigger**
Click this drop-down list to select the trigger type: manual or input connected.

**ACTIVATE**
Click this button to activate the encoder group.

**ADD**
Click this button to add the IP address of an encoder to the encoder group.
The AMS Interface

Network page

The Network page provides the ability to enable or disable DHCP mode for each video channel. When DHCP mode is disabled, the IP address, subnet mask, and gateway must be provided. If using the dual-channel version, then the information on both Channel 1 and Channel 2 are provided. This screen is identical to the Network page for the decoder.

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

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

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

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

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

Gateway
Displays the gateway (router) address for the channel. This field can only be changed if Static mode is selected.
**Advanced Settings**
Click the **SHOW ADVANCED** button to view the following options.

**Link Speed**
Displays the port speed in Mbps.

**MAC Address**
The MAC address of the Ethernet channel.

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

- **Username:** admin
- **Password:** Atlona

**802.1x Mode**
Click this drop-down list to select the desired authentication mode. Refer to [802.1X Authentication (page 54)](#) for more information.
The AMS Interface

**Other page**

The **Other** page provides logo/slate, text, and PTP management. Click the menu in the upper-left corner of the AMS screen to switch between **Logo**, **Text**, and **PTP** screens.

**Logo**

The **Logo** page provides the ability to upload a custom logo. This logo will be displayed when no video signal is detected. Separate logos can be uploaded: one for each channel. Refer to Slate / Logo Insertion (page 70) for more information on these settings.

**Name**

Enter a name for the logo in this field.

**Choose File**

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

**UPLOAD**

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

**Enabled**

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

**Target**

The name used by AMS to identify the encoder.

**Select 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 on the screen.
The AMS Interface

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

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

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

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

**Text**
The *Text* page provides the ability to display scrolling or stationary text superimposed on the source image. Refer to *Text Insertion (page 74)* for more information.

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

**Text**
Enter the desired text in this field.

**Scroll Speed**
Enter the scrolling speed in this field. Values from -255 to 255 are valid. Negative numbers will scroll the text from left to right. Positive numbers will scroll text from right to left.

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

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

**Horizontal (%), Vertical (%)**
Specify the location of the text in the Horizontal (%) and Vertical (%) fields. Each of these values is based on the horizontal and vertical resolution of the screen.

**Width (%), Height (%)**
Specify the size of the text in the Width (%) and Height (%) fields. Each of these values is based on the horizontal and vertical resolution of the screen.

**Advanced Settings**
Click the **SHOW ADVANCED** button to view the following options.

**Red, Green, Blue, Alpha**
Enter the RGBA values for each of the respective fields, to specify a custom color and transparency of the text. Enter the desired value in the Alpha field to control the transparency of the text. A value of 255 is opaque and a value of 0 is transparent. Numbers from 0 to 255 are valid for each of these fields.

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

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

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

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

**Priority 1**
Enter the priority number in this field.

**Priority 2**
Enter the priority number in this field.

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

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

**Master Offset**
Displays the grandmaster clock offset.
The AMS Interface

The Virtual Matrix

1. Login to AMS. Refer to Accessing Encoders in AMS (page 16), if necessary.
2. Click the icon, in the upper-left corner of the AMS Dashboard.
3. Click Virtual Matrix.
4. The OmniStream Virtual Matrix page will be displayed.
The illustration below shows multiple OmniStream units (encoders and decoders). The Virtual Matrix is organized into rows and columns.

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

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

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

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

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️ V</td>
<td>Video only</td>
</tr>
<tr>
<td>✔️ A</td>
<td>Audio only</td>
</tr>
<tr>
<td>✔️ B</td>
<td>Data only</td>
</tr>
<tr>
<td>✔️ ✔️</td>
<td>Connected; not all signals are active</td>
</tr>
<tr>
<td>✔️ ✔️</td>
<td>Connected; all streams are being used</td>
</tr>
</tbody>
</table>

**IMPORTANT:** R-Type and Pro compatibility: R-Type encoders (AT-OMNI-512) and decoders (AT-OMNI-521) operate in Video Mode, only. Pro encoders can be set to either Video Mode or PC Mode. Video Mode is incompatible with PC Mode. Therefore, in order for both R-Type and Pro encoders/decoders to work within a system, Pro encoders/decoders must be set to Video Mode. Refer to Setting the Video Mode (page 69) for more information.

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

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 more than one method. Running IP scanner software or using the Address Resolution Protocol (ARP) are two possibilities. When running an IP scanner or using ARP, both the computer and the OmniStream encoders/decoders must be connected to the same network.

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

Getting the IP Address

The following method uses the `arp` command, which is available from the command line in Windows. The `arp` command will display the IP-to-physical address translation tables used by the Address Resolution Protocol (ARP). The following procedure can be used for both encoders and decoders.

1. Identify the desired encoder/decoder by locating the MAC address on the bottom of the unit. *Figure 1.1* shows a sample label from an AT-OMNI-112 dual-channel encoder.

   The MAC address for the Ethernet 1 physical interface is B8:98:B0:01:F7:EB.

   *Figure 1.1* - Sample label on the bottom of a dual-channel encoder.

   **NOTE:** Dual-channel encoders have two Ethernet interfaces and two MAC addresses:

   Ethernet 1 = MAC address 1
   Ethernet 2 = MAC address 2

   Therefore, if both physical interfaces are connected to the network, the encoder will have two IP addresses. However, the same encoder can be accessed through either IP address.

2. Connect a PC to the same network where the OmniStream encoders/decoders are connected.

3. Type `cmd` in the search bar, then press [ENTER] to launch the command line interface.
4. At the command prompt, type `arp -a`. Make sure to include a space between `arp` and the `-a` argument, then press [ENTER].

5. Press [ENTER]. Several lines of information will be displayed. Locate the MAC address of the encoder/decoder, under the **Physical Address** column. Directly across from the MAC address, the IP address of the encoder/decoder will be listed under the **Internet Address** column.

```
Interface: 10.1.0.4 --- 0x16

Internet Address   Physical Address   Type
10.1.0.3           30-cd-a7-37-26-bb   dynamic
10.1.0.8           b8-98-b0-01-fa-58   dynamic
10.1.0.11          b8-98-b0-01-f2-56   dynamic
10.1.0.12          b8-98-b0-01-f7-eb   dynamic
10.1.1.254         00-38-df-d1-35-8a   dynamic
10.1.1.255         ff-ff-ff-ff-ff-ff   static
224.0.0.2          01-00-5e-00-00-02   static
224.0.0.22         01-00-5e-00-00-16   static
224.0.0.230        01-00-5e-00-00-e6   static
224.0.0.252        01-00-5e-00-00-fc   static
239.255.255.250    01-00-5e-7f-ff-fa   static
255.255.255.255    ff-ff-ff-ff-ff-ff   static
```

Logging In

1. Launch the desired web browser and enter the IP address of the encoder in the address bar.

2. Enter the username and password. Note that the password field will always be masked. The default credentials are:

```
Username: admin
Password: Atlona
```
3. The **System Information** page will be displayed.

4. The login process is complete.
System information page

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

**FPGA**
Displays the FPGA model number and the size.

**Model**
The model number of the unit.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT-OMNI-111</td>
<td>Single-channel encoder</td>
</tr>
<tr>
<td>AT-OMNI-112</td>
<td>Dual-channel encoder</td>
</tr>
</tbody>
</table>

**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.
**Web Server**

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

**System Temperature**
Displays the ambient enclosure temperature.

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

**Power Consumption**
Displays the precise power consumption of the 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 MAC address]. If using a custom hostname, it must meet the hostname standards, defined here: [https://tools.ietf.org/html/rfc1123](https://tools.ietf.org/html/rfc1123).

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

**Buttons**
Click this toggle switch to enable or disable the button backlight indicators on the front-panel.

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

**SET DATE/TIME**
Click this button to set the current date and time.

**SET TIMEZONE**
Click this button to set the desired time zone.

**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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None Checked</td>
<td>Resets the encoder with no factory-default settings.</td>
</tr>
<tr>
<td>Reset User</td>
<td>Resets the encoder to factory-default settings and resets custom user information.</td>
</tr>
<tr>
<td>Reset Network</td>
<td>Resets the encoder to factory-default settings and resets network information.</td>
</tr>
<tr>
<td>Reset Defaults</td>
<td>Resets the encoder to factory-default settings. In addition, static multicast addresses are configured. This option can be used to configure a single encoder to transmit to any number of decoders without using the Virtual Matrix within AMS.</td>
</tr>
</tbody>
</table>

**IMPORTANT:** This 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 page

Enable
Click this toggle to enable or disable SAP. This feature is enabled when the toggle switch is orange. This is the default setting.

Addresses
Encoders currently send SAP announcements on two multicast addresses: 224.2.127.254 and 239.255.255.255. In some rare instances, this can conflict with other network address settings. Custom SAP addresses can be specified in this field.

NOTE: 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.
Input window groups
The following fields apply to both the Input 1 and Input 2 window groups. Single-channel encoders only have a single Input window group.

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

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

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

<table>
<thead>
<tr>
<th>EDID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Default EDID (3840x2160p30)</td>
</tr>
<tr>
<td>Default (DV)</td>
<td>Default EDID with Dolby Vision (3840x2160p30)</td>
</tr>
<tr>
<td>ATL 1080P 2CH</td>
<td>1920x1080p60 with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 1080P DD</td>
<td>1920x1080p60 with Dolby Digital</td>
</tr>
<tr>
<td>ATL 1080P DVI</td>
<td>1920x1080p60 formatted as DVI</td>
</tr>
<tr>
<td>ATL 1080P MCH</td>
<td>1920x1080p60 with multichannel audio</td>
</tr>
<tr>
<td>ATL 1280x800 RGB DVI</td>
<td>1280x800 formatted as DVI</td>
</tr>
<tr>
<td>ATL 1280x800 RGB PCWXGA2CH</td>
<td>1280x800p60 PC format with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 1280x800 RGB TVWXGA2CH</td>
<td>1280x800p60 TV format with two-channel PCM audio</td>
</tr>
<tr>
<td>EDID</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>ATL 2160P 2CH</td>
<td>3840x2160p30 with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 2160P MCH</td>
<td>3840x2160p30 with multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 2560x1600 2CH</td>
<td>2560x1600p60 with two-channel PCM audio</td>
</tr>
<tr>
<td>ATL 2560x1600 MCH</td>
<td>2560x1600p60 with multichannel PCM audio</td>
</tr>
<tr>
<td>ATL 720P DD</td>
<td>1280x720p60 with Dolby Digital audio</td>
</tr>
<tr>
<td>ATL 720P 2CH</td>
<td>1280x720p60 with Dolby Digital two-channel audio</td>
</tr>
<tr>
<td>ATL VR (2160x1200)</td>
<td>2160x1200p90 (Compatible with HTC VIVE® VR system)</td>
</tr>
</tbody>
</table>

**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. If None is selected, then HDCP-encrypted content cannot be passed-through.

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

- **Color Depth**
  Displays the color depth of the source content.

- **Subsampling**
  Displays the chroma subsampling value of the source content.

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

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

**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 present 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.
**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 of the video generator signal. The default value is 60 Hz.

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

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

**Vertical width**
Click in this field to change the vertical resolution of the signal.
**Product**
Displays the SKU of the OmniStream encoder. This field cannot be changed.

**Vendor**
Displays the vendor name (ATL). This field cannot be changed.

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

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

**Add EDID**
Click this button, located at the bottom-right of the page, to create a new EDID.
**Encoding page**

**Encoder window groups**

The following fields apply to both the **Encoder 1** and **Encoder 2** window groups. Single-channel encoders will have one **Encoder** window group.

**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**. Single-channel 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 **900 Mbps**. Specifying lower bit rates will reduce video quality. 4K/UHD streams should be set to 900 Mbps. The recommended bandwidth for 1080p60 video is 450 Mbps. 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 (green), 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.
Web Server

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Disables the image from being displayed.</td>
</tr>
<tr>
<td>Manual</td>
<td>The image will always be displayed, superimposed on the source signal, and will remain even if the source signal is lost.</td>
</tr>
<tr>
<td>Auto</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

System mode
Click this drop-down list to select PC application or Video mode. By default, units are set to PC Application mode.

<table>
<thead>
<tr>
<th>System mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC Application</td>
<td>Optimizes the image when viewing static images, such as spreadsheets or similar content.</td>
</tr>
<tr>
<td>Video</td>
<td>Provides the best viewing experience when streaming motion graphics and/or video.</td>
</tr>
</tbody>
</table>

**IMPORTANT:** If decoders are configured to be used in a video wall application, then Force YUV must be enabled.
**Serial port configuration window groups**

The following fields apply to both Serial port configuration window groups. Although single-channel encoders will also have two Serial port configuration window groups, serial port 2 only supports IR.

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

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

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

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

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

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

**Stop**
Click this drop-down list to select the stop bit: 1, 1.5, or 2.
Flow Control
Click this drop-down list to select the type of flow control: none, xonxoff, or hw.

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

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

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 send IP commands directly to the decoder, which are then output over RS-232 to the display (sink) device. Selecting the cli option will pass through RS-232 data, directly from a control system, to the sink device that is connected to the decoder.

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.

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

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

The following fields apply to all Session window groups. The dual-channel encoder has six Session window groups. The single-channel encoder will only have two 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.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>eth1</td>
<td>ETHERNET 1 port</td>
</tr>
<tr>
<td>eth2</td>
<td>ETHERNET 2 port</td>
</tr>
</tbody>
</table>
Web Server

**EncGroup**

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

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

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

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>manual</td>
<td>Use this setting to manually enable the input. When set to manual, click the <strong>Activate</strong> button to perform the input switching.</td>
</tr>
<tr>
<td>input connected</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Activate**
Click this button to activate 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. When enabled, the toggle switch will be orange.

**Interval**
Sets the announcement interval.

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

**Description**
The SAP description.

**Originator**
The ID of the SAP message originator.

**Categorisation**
The SAP category. This field can be changed, if desired.
**Web Server**

**Scrambling**

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

<table>
<thead>
<tr>
<th>Scrambling</th>
<th>Enable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Key**
This field is only displayed if the Scrambling toggle switch is enabled (green). 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 IP address of the decoder that will be receiving the video stream.

**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**
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 and Class Selectors.

The tables on the next page provide a list of the available selections and their description.

**IMPORTANT:** Consult the IT administrator as to what methods to use and the required settings for each encoder on the network.
**Table 1.1 - Assured Forwarding**

<table>
<thead>
<tr>
<th>Selection</th>
<th>Queue Classification</th>
<th>Drop Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF11</td>
<td>Class 1</td>
<td>Low</td>
</tr>
<tr>
<td>AF21</td>
<td>Class 2</td>
<td>Low</td>
</tr>
<tr>
<td>AF31</td>
<td>Class 3</td>
<td>Low</td>
</tr>
<tr>
<td>AF41</td>
<td>Class 4</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Table 1.2 - Class Selectors**

<table>
<thead>
<tr>
<th>Selection</th>
<th>Class Selector Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0 / Best Effort</td>
<td>Routine</td>
</tr>
<tr>
<td>CS1</td>
<td>Priority</td>
</tr>
<tr>
<td>CS2</td>
<td>Immediate</td>
</tr>
<tr>
<td>CS3</td>
<td>Flash</td>
</tr>
<tr>
<td>CS4</td>
<td>Flash Override</td>
</tr>
<tr>
<td>CS5</td>
<td>Critical</td>
</tr>
<tr>
<td>CS6</td>
<td>Interwork Control</td>
</tr>
<tr>
<td>CS7</td>
<td>Network Control</td>
</tr>
<tr>
<td>EF</td>
<td>Expedited Forwarding</td>
</tr>
</tbody>
</table>

**FEC enable**
Click this toggle switch to enable (green) 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 enabled. Refer to [FEC Details (page 134)](#) for more information.

**FEC rows**
Specify the number of FEC rows in this field. Refer to [FEC Details (page 134)](#) for more information.

**FEC Columns**
Specify the number of FEC columns in this field. Refer to [FEC Details (page 134)](#) for more information.
Web Server

Audio

Source
Click this drop-down list to select the desired input. Available values are: Not used, audio_generator1, hdmi_input1, and hdmi_input2.

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

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

Enable Audio
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 IP address of the decoder that will be receiving the audio stream.

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
Refer to the information on page 113 on DSCP settings.

FEC enable
Click this toggle switch to enable (green) 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 enabled. Refer to FEC Details (page 134) for more information.

FEC rows
Specify the number of FEC rows in this field. Refer to FEC Details (page 134) for more information.

FEC Columns
Specify the number of FEC columns in this field. Refer to FEC Details (page 134) for more information.
**Web Server**

**AUX**

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

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Used</td>
<td>Serial control is disabled</td>
</tr>
<tr>
<td>Commands</td>
<td>Commands are sent using CEC (over HDMI)</td>
</tr>
<tr>
<td>Serial Port 1</td>
<td>Commands are transmitted using Serial Port 1</td>
</tr>
<tr>
<td>Serial Port 2</td>
<td>Commands are transmitted using Serial Port 2</td>
</tr>
</tbody>
</table>

**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**
Refer to page 113 for information on DSCP settings.

**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.
Logo page

New logo window group

Name
Enter a name for the logo in this field.

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

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

Logo Insertion window groups

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

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

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

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

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

**Horizontal (%)**
Enter the horizontal position of the logo on the screen. This value is based on the total horizontal resolution of the screen.

**Vertical (%)**
Enter the vertical position of the logo on the screen. This value is based on the total vertical resolution of the screen.

**Width (%)**
Enter the width of the logo. This value is based on the total horizontal resolution of the screen.

**Height (%)**
Enter the height of the logo. This value is based on the total vertical resolution of the screen.

**SAVE**
Click this button to commit all changes within the Logo Insertion window group.
Text insertion window groups
The following fields apply to both Text insertion window groups. The single-channel encoder will only have one Text insertion window group.

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

Text
Enter the desired text in this field.

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

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

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

Red, Green, Blue, Alpha
Click these fields to fine tune the color of the text. Adjust the Alpha field to control the transparency of the text. An alpha value of 255 is opaque and a value of 0 is transparent. Numbers from 0 to 255 are valid for all fields.
Web Server

**Horizontal**
Enter the horizontal position of the text in this field.

**Vertical**
Enter the vertical position of the text in this field.

**Width**
Enter the width of the text in this field. This value is based on the horizontal resolution of the screen.

**Height**
Enter the height of the text in this field. This value is based on the vertical resolution of the screen.

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

<table>
<thead>
<tr>
<th>Location</th>
<th>Horizontal</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Width</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
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 whether or not the video stream for this channel is active. If the indicator is green, then the video stream is active.

**Carrier**
If this indicator is green, then an active link exists. Otherwise, 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; **Subnet** and **Gateway** fields will automatically be populated. When **Static** mode is selected, the information for the **IP Address**, **Subnet**, and **Gateway** fields must be entered.

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

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

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

**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.

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

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 interface to be used as the PTP grandmaster (GM) clock, based on the accuracy of the device’s clock and the device’s configured priority. A lower priority number means the unit is more likely to get selected as GM.

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

eth window groups

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. PTP uses a default IPv4 TTL value of 1 for multicast. This value may be changed, if necessary, in order for the replies to reach the PTP monitor.

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

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

Master Offset
Displays the grandmaster clock offset.
LLDP page

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

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

**Via**
The discovery protocol being used.

**RID**
The router ID.

**Age**
Up-time of the interface.

**Chassis ID**
The MAC address of the interface.

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

**Port ID**
The port ID.

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

**TTL**
The Time-To-Live value.

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

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

IMPORT
Click this button to upload the selected configuration file to the encoder.

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.
Users page

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

Username
Enter the desired username in this field.

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

New password
Enter the desired password for the username in this field.

Repeat password
Confirm the new password by entering it in this field.

DELETE
Click this button to delete the user in the current window group. Note that 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.

License Key
Enter the license key in this field.

INSTALL LICENSE
Click this button to validate and install the license.
Upgrade page
This page is used to update the firmware on the encoder.

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

UPLOAD
Click this button to upload the selected firmware file.
Appendix

Updating the Firmware using Velocity™/AMS

**IMPORTANT:**

- If updating from version 1.0.x, OmniStream units must first be updated to version 1.1. Note that this does *not* apply to OmniStream R-Type units. If running version 1.0.x, contact an Atlona Technical Support Engineer before updating the firmware.

- When updating the firmware, make sure that the unit does not lose power. The firmware update process should take approximately 1 to 2 minutes.

- For full functionality of OMNI 1.2.1 (or later), Velocity must be running at least 1.4.5 and AMS must be on firmware version 2.0.12 and above.

1. Click **DEVICE INFO** in the menu bar.

2. Click the **UPDATE FIRMWARE** button to display the **Firmware Update** dialog.
Appendix

3. Click and drag the firmware file to the yellow box, to upload the firmware to the device. OmniStream firmware files use the .v2pup file extension. Once the firmware file has been uploaded, it will appear under the Select Firmware section of the dialog box.

4. Click the UPDATE FIRMWARE button to begin the update process.

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

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

The progress bar for the update process will be displayed. The update process should take a few seconds.
7. Click the “X” to close out the progress bar window, then click the **CLOSE** button to dismiss the **Firmware Update** message box.

8. The firmware update process is complete.

9. Clear the web browser cache and refresh the web page. The new firmware version will appear in the **Firmware Version** field, in the **DEVICE INFO** page.
Appendix

Updating the Firmware using the Web Server

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

1. Launch the desired web browser and enter the IP address of the encoder/decoder in the address bar.

2. Enter the username and password. Note that the password field will always be masked. The default credentials are:

   Username: admin  
   Password: Atlona

3. The System Information page will be displayed.

4. Click Upgrade in the menu bar to display the Upgrade page.

5. Click the Choose File button.

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

<table>
<thead>
<tr>
<th>Firmware file</th>
<th>OmniStream SKU</th>
</tr>
</thead>
<tbody>
<tr>
<td>at-omni-single-upgrd-os-[version].vpup2</td>
<td>AT-OMNI-111, AT-OMNI-121,</td>
</tr>
<tr>
<td></td>
<td>AT-OMNI-111-WP</td>
</tr>
<tr>
<td>at-omni-dual-upgrd-os-[version].vpup2</td>
<td>AT-OMNI-112, AT-OMNI-122</td>
</tr>
<tr>
<td>at-omni-residential-upgrd-os-[version].vpup2</td>
<td>AT-OMNI-512, AT-OMNI-521</td>
</tr>
</tbody>
</table>

7. Click the UPLOAD button.

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

9. The upgrade process is complete.
FEC Details

Matrix Size, Overhead, and Latency

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

FEC and Video Bitrate

- The bitrate configured on the video encoder includes FEC overhead and will automatically adjust itself depending on the bitrate needed for FEC.
- **FEC overhead can be calculated using the following formulas:**
  \[
  \text{Video rate} = \frac{\text{Configured bit rate}}{1 + \frac{\text{Rows + Columns}}{\text{Rows} \times \text{Columns}}} \quad \text{FEC rate} = \text{Configured bit rate} - \text{Video rate}
  \]
- The following table provides a few examples of how this works.

<table>
<thead>
<tr>
<th>FEC / matrix usage</th>
<th>Configured bit rate</th>
<th>Used for video</th>
<th>Used for FEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEC disabled</td>
<td>900 Mbps</td>
<td>900 Mbps</td>
<td>0 Mbps</td>
</tr>
<tr>
<td>FEC enabled, 4x4</td>
<td>900 Mbps</td>
<td>600 Mbps</td>
<td>300 Mbps</td>
</tr>
<tr>
<td>FEC enabled, 10x10</td>
<td>900 Mbps</td>
<td>750 Mbps</td>
<td>150 Mbps</td>
</tr>
<tr>
<td>FEC enabled, 20x20</td>
<td>900 Mbps</td>
<td>818 Mbps</td>
<td>82 Mbps</td>
</tr>
<tr>
<td>FEC enabled, 4x4</td>
<td>450 Mbps</td>
<td>300 Mbps</td>
<td>150 Mbps</td>
</tr>
<tr>
<td>FEC enabled, 10x10</td>
<td>450 Mbps</td>
<td>375 Mbps</td>
<td>75 Mbps</td>
</tr>
<tr>
<td>FEC enabled, 20x20</td>
<td>450 Mbps</td>
<td>409 Mbps</td>
<td>41 Mbps</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Configured bit rate</th>
<th>4x4</th>
<th>10x10</th>
<th>20x20</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 Mbps</td>
<td>0.64 ms</td>
<td>3.20 ms</td>
<td>11.74 ms</td>
</tr>
<tr>
<td>450 Mbps</td>
<td>1.28 ms</td>
<td>6.40 ms</td>
<td>23.47 ms</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Format</th>
<th>1x4</th>
<th>2x4</th>
<th>4x4</th>
<th>10x10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 channel PCM, 44.1 kHz</td>
<td>34.01 ms</td>
<td>68.03 ms</td>
<td>136.10 ms</td>
<td>850.30 ms</td>
</tr>
<tr>
<td>2 channel PCM, 48 kHz</td>
<td>31.25 ms</td>
<td>62.50 ms</td>
<td>125.00 ms</td>
<td>781.30 ms</td>
</tr>
<tr>
<td>2 channel PCM, 96 kHz</td>
<td>15.63 ms</td>
<td>31.25 ms</td>
<td>62.50 ms</td>
<td>390.60 ms</td>
</tr>
<tr>
<td>2 channel PCM, 192 kHz</td>
<td>7.81 ms</td>
<td>15.63 ms</td>
<td>31.25 ms</td>
<td>195.30 ms</td>
</tr>
</tbody>
</table>

- It is recommended to keep lip sync within ±1 frame of video to prevent any noticeable syncing issues.

- Examples of good choices to minimize lip sync issues are:
  
  » Video configured for 450 Mbps, FEC 10x10; Audio is 2 channel PCM, 192 kHz, FEC 1x4: 6.40 ms – 7.81 ms = -1.41 ms
  
  » Video configured for 900 Mbps, FEC 10x10; Audio is 2 channel PCM, 48 kHz, FEC disabled: 6.40 ms – 0 ms = 6.40 ms
Mounting Instructions

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

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

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

3. Use the enclosure screws to secure the rack ear to the enclosure.

4. To provide added stability to the rack ear, use two of the included screws and attach them to the two holes, directly below the enclosure screws, as shown above.

5. Repeat steps 1 through 4 to attach the second rack ear to the opposite side of the unit.

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

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

OmniStream 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.

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

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

### Single-Channel Encoder

#### Video

<table>
<thead>
<tr>
<th>HDMI Specification</th>
<th>HDMI, HDCP 2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>UHD/HD/SD</td>
<td>4096x2160 (DCI) @ 30/24 Hz</td>
</tr>
<tr>
<td></td>
<td>3840x2160 (UHD) @ 60(^{th})/50/24/25/30/50</td>
</tr>
<tr>
<td></td>
<td>1920x1080p @ 23.98/24/25/29.97/30/50/59.94/60 Hz</td>
</tr>
<tr>
<td></td>
<td>1920x1080p@ @ 25/29.97/30 Hz</td>
</tr>
<tr>
<td></td>
<td>1280x720p @ 30/50/59.94/60 Hz</td>
</tr>
<tr>
<td>VESA(^{(1)})</td>
<td>2560x1600</td>
</tr>
<tr>
<td></td>
<td>1920x1200</td>
</tr>
<tr>
<td></td>
<td>1680x1050</td>
</tr>
<tr>
<td></td>
<td>1600x1200</td>
</tr>
<tr>
<td></td>
<td>1600x900</td>
</tr>
<tr>
<td></td>
<td>1440x900</td>
</tr>
<tr>
<td></td>
<td>1400x1050</td>
</tr>
</tbody>
</table>

#### Virtual Reality

| 2160 x 1200 @ 90\(^{th}\) Hz (HTC\(^{®}\) Vive) |

#### Color Space

| YUV, RGB |

### Encoding

<table>
<thead>
<tr>
<th>Density</th>
<th>Single encoding engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compression Format</td>
<td>VC-2 (SMPTE-2042)</td>
</tr>
<tr>
<td>Video Quality Optimization</td>
<td>User-selectable: PC Application or Video mode</td>
</tr>
<tr>
<td>Chroma Subsampling</td>
<td>PC Application</td>
</tr>
<tr>
<td>4:4:4</td>
<td>Yes</td>
</tr>
<tr>
<td>4:2:2</td>
<td>Yes</td>
</tr>
<tr>
<td>4:2:0</td>
<td>No</td>
</tr>
</tbody>
</table>

#### Color Depth

| 8-bit, 10-bit, 12-bit |

#### HDR

| HDR10, HLG, Dolby\(^{®}\) Vision™ |

#### Bit Rate

| Configurable up to 900 Mbps |

#### Latency

| 0.5 frame (e.g. 1080p @ 60 Hz latency is < 8 ms between encoder and decoder) |
| 1.5 frames in Fast Switching mode (e.g. 1080p @ 60 Hz latency is < 24 ms between encoder and decoder) |
| Note: Unusual network configurations may increase overall latency |

### Audio

#### Pass-through

<table>
<thead>
<tr>
<th>LPCM 2.0</th>
<th>Dolby(^{®}) Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPCM 5.1</td>
<td>Dolby Digital Plus</td>
</tr>
<tr>
<td>LPCM 7.1</td>
<td>Dolby TrueHD</td>
</tr>
</tbody>
</table>

#### 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 |
## Appendix

### Indicators and Controls

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR</td>
<td>1 - LED, tricolor (red, amber, green)</td>
</tr>
<tr>
<td>HDMI</td>
<td>1 - LED, bicolor (red, green)</td>
</tr>
<tr>
<td>LINK</td>
<td>1 - LED, bicolor (red, green)</td>
</tr>
<tr>
<td>ID</td>
<td>1 - Momentary, tact type</td>
</tr>
<tr>
<td></td>
<td>Provides two separate functions:</td>
</tr>
<tr>
<td></td>
<td>(1) Sends an identification broadcast message over the network to any listening devices.</td>
</tr>
<tr>
<td></td>
<td>(2) Reset the unit to factory-default settings.</td>
</tr>
<tr>
<td>Reboot</td>
<td>1 - Momentary, tact-type</td>
</tr>
</tbody>
</table>

### Connectors

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI</td>
<td>1 - Type A, 19-pin, female, locking</td>
</tr>
<tr>
<td>ETHERNET</td>
<td>1 - RJ45, 10/100/1000 Mbps</td>
</tr>
<tr>
<td>RS-232 / IR</td>
<td>1 - Euroblock, 6-pin (2 ports); RS-232 on port 1, IR on port 2</td>
</tr>
<tr>
<td>Power</td>
<td>1 - Euroblock, 2-pin</td>
</tr>
</tbody>
</table>

### Protocols

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

### Graphics Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text Insertion</td>
<td>Adjustable height/width, scrolling (speed, direction, or static), iterations (up to infinite), positioning, and adjustable color and alpha (transparency) channels.</td>
</tr>
<tr>
<td>Slate / Logo Insertion</td>
<td>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).</td>
</tr>
</tbody>
</table>

### Control

<table>
<thead>
<tr>
<th>Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>Device control and configuration; supports baud rates from 2400 to 115200; Bidirectional pass-through from control system to network</td>
</tr>
<tr>
<td>IR</td>
<td>Pass-through from control system to network; Pass-through from network to control system</td>
</tr>
</tbody>
</table>

### Connectors

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI</td>
<td>1 - Type A, 19-pin, female, locking</td>
</tr>
<tr>
<td>ETHERNET</td>
<td>1 - RJ45, 10/100/1000 Mbps</td>
</tr>
<tr>
<td>RS-232 / IR</td>
<td>1 - Euroblock, 6-pin (2 ports); RS-232 on port 1, IR on port 2</td>
</tr>
<tr>
<td>Power</td>
<td>1 - Euroblock, 2-pin</td>
</tr>
</tbody>
</table>
Appendix

### Power

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PoE</td>
<td>IEEE 802.3af</td>
</tr>
<tr>
<td>Consumption</td>
<td>Up to 12 W</td>
</tr>
<tr>
<td>External Power Supply</td>
<td>Input: 110 - 220 V AC, 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>Output: 48 V DC, 0.83 A</td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling System</td>
<td>Front-to-rear airflow, temperature-controlled fans</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>+14 to +122 °F</td>
</tr>
<tr>
<td></td>
<td>-10 to +50 °C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-14 to +140 °F</td>
</tr>
<tr>
<td></td>
<td>-10 to +60 °C</td>
</tr>
<tr>
<td>Operating Humidity (RH)</td>
<td>20% to 95%, non-condensing</td>
</tr>
</tbody>
</table>

### Chassis

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (H x W x D)</td>
<td>1.34 in x 8.19 in x 4.41 in</td>
</tr>
<tr>
<td></td>
<td>34 mm x 208 mm x 112 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.5 lbs</td>
</tr>
<tr>
<td></td>
<td>0.7 kg</td>
</tr>
</tbody>
</table>

### Certification

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>CE, FCC, CB, RoHS</td>
</tr>
<tr>
<td>Supply</td>
<td>CE, FCC, cULus, CB, RCM, RoHS</td>
</tr>
</tbody>
</table>

### Footnotes

1. Only supported when Video Quality Optimization is set to Video mode.
2. Scaling and deinterlacing are not supported at 1080i.
3. All VESA resolutions are 60 Hz.
4. Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.
## Dual-Channel Encoder

### Video

<table>
<thead>
<tr>
<th>HDMI Specification(1)</th>
<th>HDMI, HDCP 2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>UHD/HD/SD</td>
<td>4096x2160 (DCI) @ 30/24 Hz</td>
</tr>
<tr>
<td></td>
<td>3840x2160 (UHD) @ 60(2)/50/24/25/30 Hz</td>
</tr>
<tr>
<td></td>
<td>1920x1080p @ 23.98/24/25/29.97/30/50</td>
</tr>
<tr>
<td></td>
<td>/59.94/60 Hz</td>
</tr>
<tr>
<td></td>
<td>1920x1080p(3) @ 25/29.97/30 Hz</td>
</tr>
<tr>
<td></td>
<td>1280x720p @ 30/50/59.94/60 Hz</td>
</tr>
<tr>
<td>VESA(6)</td>
<td>2560x1600</td>
</tr>
<tr>
<td></td>
<td>1920x1200</td>
</tr>
<tr>
<td></td>
<td>1680x1050</td>
</tr>
<tr>
<td></td>
<td>1600x1200</td>
</tr>
<tr>
<td></td>
<td>1600x900</td>
</tr>
<tr>
<td></td>
<td>1440x900</td>
</tr>
<tr>
<td></td>
<td>1400x1050</td>
</tr>
<tr>
<td>Virtual Reality</td>
<td>2160x1200 @ 90(2) Hz (HTC® Vive)</td>
</tr>
<tr>
<td>Color Space</td>
<td>YUV, RGB</td>
</tr>
</tbody>
</table>

### Encoding

<table>
<thead>
<tr>
<th>Density</th>
<th>Dual decoding engines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compression Format</td>
<td>VC-2 (SMPTE-2042)</td>
</tr>
<tr>
<td>Video Quality Optimization</td>
<td>User-selectable: PC Application or Video mode</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chroma Subsampling</th>
<th>Chroma</th>
<th>PC Application</th>
<th>Video Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:4:4</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4:2:2</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4:2:0</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Color Depth</th>
<th>8-bit, 10-bit, 12-bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDR</td>
<td>HDR10, HLG, Dolby® Vision™</td>
</tr>
<tr>
<td>Bit Rate</td>
<td>Configurable up to 900 Mbps</td>
</tr>
<tr>
<td>Latency</td>
<td>0.5 frame (e.g. 1080p @ 60 Hz latency is &lt; 8 ms between encoder and decoder)</td>
</tr>
<tr>
<td>Note: Unusual network configurations may increase overall latency</td>
<td></td>
</tr>
</tbody>
</table>

### Audio

<table>
<thead>
<tr>
<th>Pass-through</th>
<th>LPCM 2.0</th>
<th>Dolby® Digital</th>
<th>Dolby Atmos®</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPCM 5.1</td>
<td></td>
<td>Dolby Digital Plus</td>
<td>DTS®</td>
</tr>
<tr>
<td>LPCM 7.1</td>
<td></td>
<td>Dolby TrueHD</td>
<td>DTS-HD Master Audio™</td>
</tr>
<tr>
<td>Down-mixing</td>
<td>Multichannel LPCM to two-channel LPCM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Rate</td>
<td>32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bit Depth</td>
<td>Up to 24-bit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Protocols

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

### Graphics Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text Insertion</td>
<td>Adjustable height/width, scrolling (speed, direction, or static), iterations (up to infinite), positioning, and adjustable color and alpha (transparency) channels.</td>
</tr>
<tr>
<td>Slate / Logo Insertion</td>
<td>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).</td>
</tr>
</tbody>
</table>

### Control

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>Device control and configuration; supports baud rates from 2400 to 115200</td>
</tr>
<tr>
<td></td>
<td>Bidirectional pass-through from control system to network</td>
</tr>
<tr>
<td>IR</td>
<td>Pass-through from control system to network</td>
</tr>
<tr>
<td></td>
<td>Pass-through from network to control system</td>
</tr>
</tbody>
</table>

### Connectors

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI</td>
<td>2 - Type A, 19-pin, female, locking</td>
</tr>
<tr>
<td>ETHERNET</td>
<td>2 - RJ45, 10/100/1000 Mbps</td>
</tr>
<tr>
<td>RS-232 / IR</td>
<td>1 - Euroblock, 6-pin (2 ports); RS-232 on port 1, IR on port 2</td>
</tr>
<tr>
<td>Power</td>
<td>1 - Euroblock, 2-pin</td>
</tr>
</tbody>
</table>

### Indicators and Controls

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR</td>
<td>1 - LED, tricolor (red, amber, green)</td>
</tr>
<tr>
<td>HDMI</td>
<td>2 - LED, bicolor (red, green)</td>
</tr>
<tr>
<td>LINK</td>
<td>2 - LED, bicolor (red, green)</td>
</tr>
<tr>
<td>ID</td>
<td>5 - Momentary, tact-type, backlit (blue)</td>
</tr>
<tr>
<td>DISPLAY</td>
<td>Triggers CEC or RS-232 display power on/off commands from cross-connected decoders.</td>
</tr>
<tr>
<td>INPUT</td>
<td>Switches between HDMI inputs.</td>
</tr>
<tr>
<td>VOLUME</td>
<td>Triggers CEC or RS-232 volume up/down commands from cross-connected decoders.</td>
</tr>
<tr>
<td>ID</td>
<td>Sends an identification broadcast message over the network to any listening devices.</td>
</tr>
<tr>
<td>Reboot</td>
<td>1 - momentary, tact-type</td>
</tr>
</tbody>
</table>
## Appendix

### Power

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PoE</td>
<td>IEEE 802.3af</td>
</tr>
<tr>
<td>Consumption</td>
<td>Up to 12 W</td>
</tr>
</tbody>
</table>
| External Power Supply (optional) | Input: 110 - 220 V AC, 50/60 Hz  
                             | Output: 48 V DC, 0.83 A       |

### Environmental

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling System</td>
<td>Front-to-rear airflow, temperature-controlled fans</td>
</tr>
</tbody>
</table>
| Operating Temperature          | +14 to +122 °F         
                             | -10 to +50 °C          |
| Storage Temperature            | -14 to +140 °F         
                             | -10 to +60 °C          |
| Operating Humidity (RH)        | 20% to 95%, non-condensing |

### Chassis

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| Dimensions (H x W x D)         | 1.34 in x 8.19 in x 4.41 in  
                             | 34 mm x 208 mm x 112 mm     |
| Weight                        | 1.5 lbs / 0.7 kg       |
| Safety                        | CE, RoHS, FCC          |

### Certification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>CE, FCC, CB, RoHS</td>
</tr>
<tr>
<td>Supply</td>
<td>CE, FCC, cULus, CB, RCM, RoHS</td>
</tr>
</tbody>
</table>

### 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. Only supported when Video Quality Optimization is set to Video mode.
3. Scaling and deinterlacing are not supported at 1080i.
4. All VESA resolutions are 60 Hz.
5. Maximum distance per hop is 330 feet (100 meters), depending upon network configuration.