



HW-LUMA-E4211

LumaStream™ 4K HDMI Encoder

Instructions for Use

Version 1.X



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Version Information

This section lists document revisions. Update the table whenever the manual is revised.

Version	Date	Notes
R1.X2 (Draft)	[Release Date]	Initial draft release

Sales, Marketing & Customer Support

Main Office (US)	Hall Research, 1234 Lakeshore Dr Suite #150, Coppell, TX 75019
Support Hours	Monday – Friday, 8:00 a.m. – 5:00 p.m. (CST)
Website	https://www.hallresearch.com
Product Page	https://www.hallresearch.com/product/HW-LUMA-E4211

IMPORTANT: Visit <https://www.hallresearch.com/product/HW-LUMA-E4211> for the latest firmware updates and Instructions for Use.

Warranty

To view the product warranty, use the following link: <https://hallresearch.com/warranty>

Important Safety Information

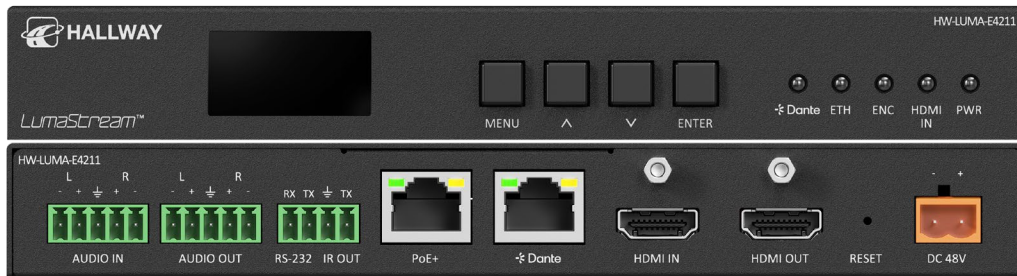
CAUTION: Risk of electric shock. Do not open the enclosure or expose to rain or moisture. No user-serviceable parts inside. Refer servicing to qualified service personnel.

- Do not expose this apparatus to rain, moisture, dripping, or splashing and ensure no objects filled with liquids are placed on the unit.
- Do not install in a bookcase, cabinet, or other confined space. Ensure the unit is well ventilated.
- Do not obstruct ventilation openings with newspapers, tablecloths, curtains, or similar items.
- Do not install near any heat sources such as radiators, heat registers, stoves, or amplifiers.
- Do not place sources of naked flames, such as lighted candles, on the unit.
- Clean this apparatus only with a dry cloth.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Protect the power cord from being walked on or pinched, particularly at plugs.
- Only use attachments and accessories specified by the manufacturer.
- Refer all servicing to qualified service personnel.

FCC Compliance

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.

Introduction



Atlona HW-LUMA-E4211 LumaStream™ Encoder

The Atlona HW-LUMA-E4211 is a LumaStream™ 4K HDMI encoder designed for enterprise AV-over-IP distribution. LumaStream products operate on a similar basic concept as matrix switch endpoints: A/V signals are transmitted from one location to another over category cable. However, LumaStream differs from traditional matrix switchers because it is an IP-based solution, allowing data to be distributed over a standard IP network.

These endpoints are referred to as encoders and decoders. Encoders function like transmitters, while decoders function like receivers.

Network Architecture

Each encoder and decoder must have a unique IP address on the network. By default, LumaStream encoders and decoders are DHCP-enabled — when connected to a network with a DHCP server, a unit automatically receives an IP address. If no DHCP server is available, the unit assigns itself an IP address in the 169.254.xxx.xxx/16 range. Static IP addressing can also be configured when needed.

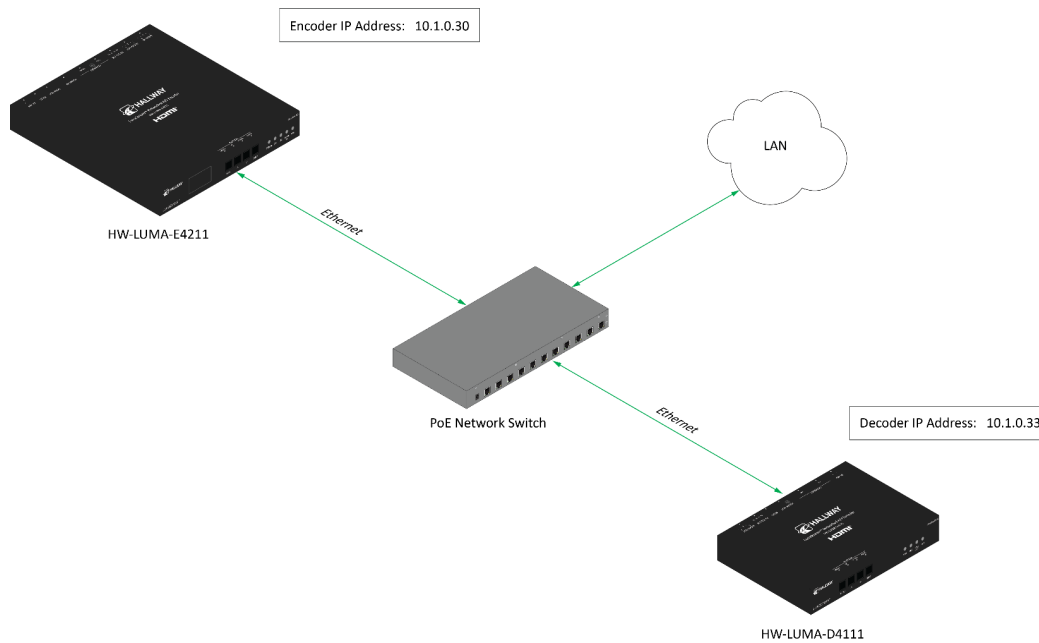


Figure 1.1 — Encoder and decoder connected through a network switch

Subscribing to a Stream

To receive content from an encoder, the decoder must subscribe to the multicast IP address and UDP port of the stream. This process is similar to changing channels on a set-top box: for a decoder to receive content from a specific encoder, the decoder's multicast IP address and UDP port must match those of the encoder stream it is intended to receive.

NOTE: The encoder and decoder management IP (Class C) address is different from its multicast IP address. The device IP address identifies the unit on the network, while the multicast IP (Class D) address identifies the stream being transmitted.

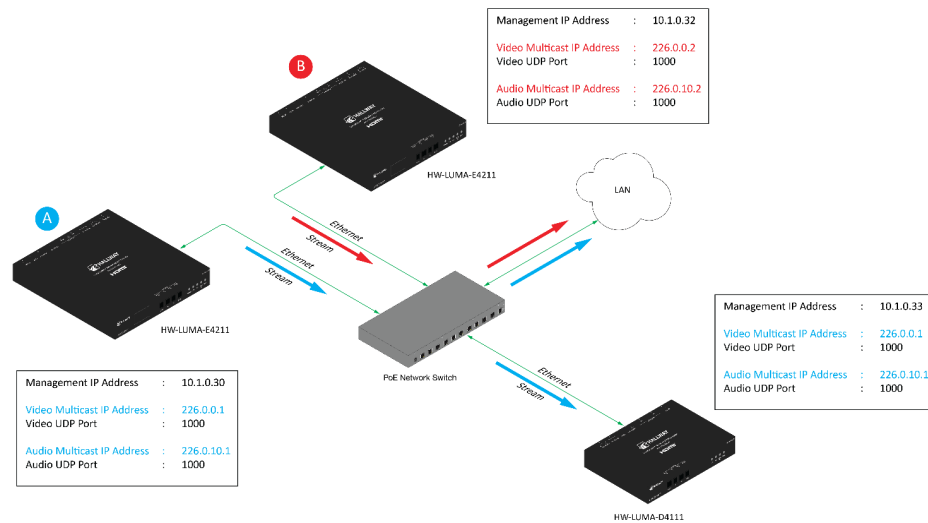


Figure 1.2 — Two encoders and a single decoder; decoder subscribes to one encoder's stream

Configuration

LumaStream simplifies system configuration by incorporating auto-assignment intelligence directly into the endpoints. When powered on and connected to the network, each encoder automatically boots, assigns itself a multicast stream based on its MAC address, and begins transmitting video. By default, decoders select an available stream automatically, allowing the system to display content quickly with minimal installer intervention.

Features

- 4K HDMI input with HDMI loop-through output (confidence monitor support).
- IP-based AV-over-IP distribution over standard 1 Gbps Ethernet.
- H.265 and H.264 video compression (main stream); MJPEG preview stream.
- Bit rate: 128 kbps – 60 Mbps (main stream); 128 – 2048 kbps (preview stream).
- Maximum latency: 150 ms end-to-end.
- HDCP 1.4 / 2.2 support.
- Dante® audio support over main LAN or dedicated Dante LAN port.
- Balanced analog audio input and output (5-pin captive screw).
- RS-232 and IR pass-through via 4-pin captive screw connector.
- RTMP streaming to external servers and platforms (e.g., YouTube Live, Vimeo).
- Preview stream (low-bandwidth MJPEG) for monitoring.
- Text and logo overlay on stream for branding and identification.
- AES-128 stream encryption.
- IEEE 802.1X network authentication (PEAP-MSCHAPv2, EAP-TLS).
- Powered via PoE+ (IEEE 802.3at) or optional 48 V DC power supply (AT-PS-48083-C).
- OLED front-panel display with MENU / UP / DOWN / ENTER buttons for local configuration.
- Web server GUI for full remote configuration and management.
- NDAA-889 compliant.
- CE, FCC certified.

Package Contents

Verify all items are included. Contact Hall Research if any item is missing or damaged.

- 1 × HW-LUMA-E4211 LumaStream™ Encoder
- 1 × 5-pin captive screw connector (AUDIO IN)
- 1 × 5-pin captive screw connector (AUDIO OUT)
- 1 × 4-pin captive screw connector (RS-232 / IR OUT)
- 1 × 2-pin captive screw connector (DC 48V IN)
- 1 × Installation guide

NOTE: A 48 V DC power supply (part no. AT-PS-48083-C) is sold separately. The encoder can be powered from a PoE+ (IEEE 802.3at) switch without the external power supply.

Panel Description

The HW-LUMA-E4211 features a front panel with an OLED display and navigation buttons, and a rear panel with all connections. The panel illustration below identifies each component.



Figure: HW-LUMA-E4211 Front and Rear Panel

Front Panel — Display & Controls

#	Name	Description
1	LCD / OLED Display	Displays the OSD Menu System, device information, IP address, stream status, and other status data. OLED, 128×64 matrix.
2	MENU Button	Press to display the OSD menu system on the LCD display.
	UP Button	Press to scroll up in the menu system.
	DOWN Button	Press to scroll down in the menu system.
	ENTER Button	Press to confirm / select the current menu system entry.

Front Panel — LED Indicators

LED / State	Description
DANTE (Green)	Green — Dante audio is active and in use.
ETH (Green)	Green — A valid Ethernet link is established between the encoder and the network switch.

ENC (Green)	Green — Encoding is active and the stream is being transmitted.
HDMI IN (Green)	Green — An active HDMI source is connected to the HDMI IN port.
PWR (Green)	Green — The encoder is powered on.

Rear Panel — Connections

#	Name	Description
4	AUDIO IN	Connect a balanced or unbalanced stereo analog audio source to this 5-pin captive screw terminal. For balanced: connect L+, L-, R+, R-, and G. For unbalanced: connect L+ and R+ to signal conductors, G to ground; leave L- and R- unconnected.
5	AUDIO OUT	Connect this 5-pin captive screw terminal to a balanced or unbalanced stereo audio input on the destination device. Same wiring convention as AUDIO IN.
6	RS-232/IR OUT	Connect an RS-232 device and/or IR blaster using the included 4-pin captive screw connector.
7	PoE+	Connect to a PoE+ (IEEE 802.3at) compliant network switch using a standard Ethernet cable. Provides both data and power to the device.
8	Dante	Connect to a Dante network to transmit and/or receive Dante audio over Ethernet.
9	HDMI IN	Connect an HDMI cable from this port to the source device.
10	HDMI OUT	Connect an HDMI cable from this port to a confidence monitor (loop-through output).
11	RESET	Press and hold using a small pointed object (e.g., a paper clip) to restore factory-default settings. Do not use excessive force.
12	DC 48V	Connect a 48 V DC power supply (AT-PS-48083-C, sold separately) when a PoE+ switch is not available.

NOTE: The encoder can be powered by either a 48 V DC power adapter or a PoE+ switch. When both power sources are connected, the device gives priority to the 48 V DC power adapter.

Installation

This section covers all connections required to install the HW-LUMA-E4211. Ensure all devices are powered off before making any connections.

HDMI Connections

- **HDMI IN** — Connect an HDMI cable from the source device (PC, media server, Blu-ray player, etc.) to the HDMI IN port on the rear panel.
- **HDMI OUT (Loop-Through)** — Connect an HDMI cable to a confidence monitor or local display. This port mirrors the source signal for local monitoring and does not affect the encoded stream.

Audio Connections

The HW-LUMA-E4211 includes a balanced analog audio input and output via 5-pin captive screw connectors. These are in addition to the audio embedded in the HDMI stream.

- **AUDIO IN (5-pin)** — Pin assignments: L+ (Left positive), L- (Left negative), G (Ground), R+ (Right positive), R- (Right negative). For unbalanced sources, connect L+ and R+ to signal; G to ground; leave L- and R- unconnected.
- **AUDIO OUT (5-pin)** — Same pin convention as AUDIO IN. Connect to a balanced or unbalanced stereo audio destination device.

Control Connections

The RS-232/IR OUT connector on the rear panel allows pass-through control commands to a connected display or device.

- **RS-232/IR OUT (4-pin captive screw)** — Pin assignments: TX (Transmit), RX (Receive), G (Ground), IR OUT. Connect a 3-wire RS-232 cable (TX, RX, G) for serial control, or an IR blaster cable to the IR OUT pin.

Network and Power Connections

- **PoE+ (LAN)** — Connect to a PoE+ (IEEE 802.3at) compliant switch using Cat 5e or better cable. The switch supplies both data and power to the encoder.
- **DC 48V** — If a PoE+ switch is not available, connect an AT-PS-48083-C 48 V DC power supply (sold separately) to the DC 48V captive screw connector. When both PoE+ and DC power are connected, the 48 V DC supply takes priority.

- Dante LAN — Connect to a Dante-enabled Ethernet switch if using Dante audio. This port can share the main LAN or connect to a dedicated Dante network.

Connection Instructions

Follow these steps to complete the installation:

1. Connect the HDMI source to HDMI IN on the rear panel.
2. (Optional) Connect a confidence monitor to HDMI OUT.
3. (Optional) Wire the AUDIO IN and AUDIO OUT terminal blocks.
4. (Optional) Connect an RS-232 device or IR blaster to RS-232/IR OUT.
5. Connect the PoE+ port to a PoE+ (IEEE 802.3at) switch using a Cat 5e or better Ethernet cable.
6. If PoE+ is unavailable, connect the AT-PS-48083-C 48 V DC power supply to DC 48V.
7. (Optional) Connect the Dante LAN port to a Dante-enabled network switch.
8. Power on the PoE+ switch and all source devices.
9. The encoder will boot and the OLED display will show device status and network information.

Connection Diagram

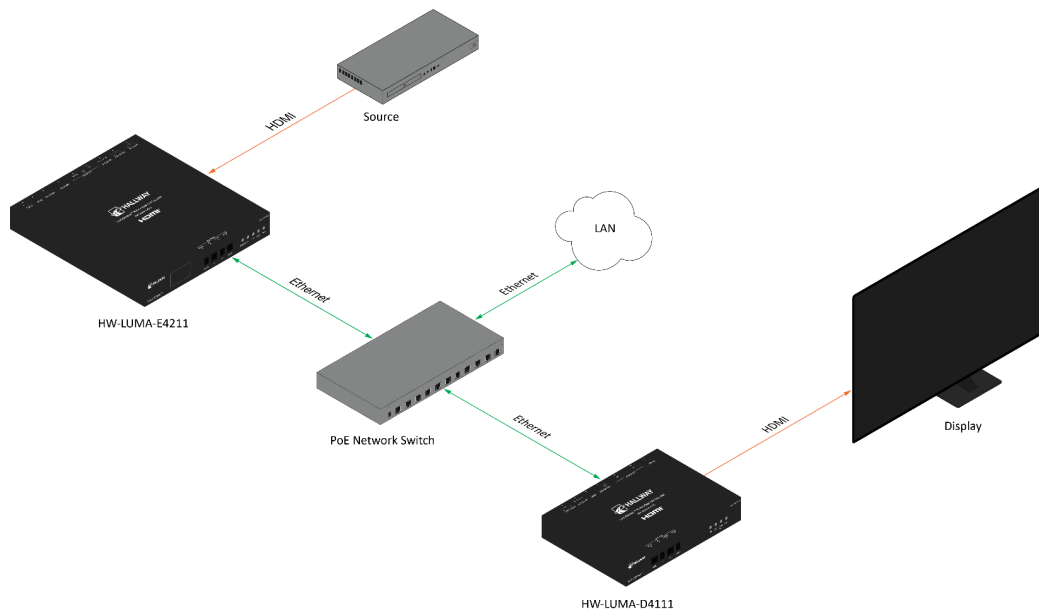


Figure: HW-LUMA-E4211 Connection Diagram

IP Configuration

By default, the HW-LUMA-E4211 is configured for DHCP. When connected to a network with a DHCP server, the encoder automatically receives an IP address. If no DHCP server is present, the unit auto-assigns an address in the 169.254.xxx.xxx/16 (link-local) range.

Viewing the IP Address

Press the MENU button on the front panel and use the DOWN button to navigate to the Network Status screen. The current IP mode and management IP address are displayed.

Switching to Static IP via the Front Panel

10. Press MENU and navigate to the Network Status screen.
11. Press ENTER to enter Static IP mode.
12. Press ENTER again to confirm, or press MENU / UP / DOWN to cancel.
13. Configure the static IP address, subnet mask, and gateway through the web server (System > Network page) once the device is accessible.

Configuring Static IP via the Web Server

14. Open a web browser and navigate to the encoder's current IP address.
15. Log in to the web server (default password: password).
16. Go to System > Network.
17. Select Static under IP Mode and enter the desired IP address, subnet mask, and gateway.
18. Click Save. The encoder will apply the new network settings.

NOTE: Write down the new static IP address before saving. If the management address changes, your browser must be pointed to the new IP to reconnect.

Device Operation

Encoder OSD Menu System

To display the on-screen menu on the encoder, press the MENU button on the front panel. The main menu screen will appear on the OLED display. Press UP or DOWN to scroll through the available screens. Press ENTER to make selections.

Menu Screen Overview

```
LUMA-E4-0F0239
SN:09503348-
 25042800036
10.1.0.34
```

Main Menu (Device ID, Serial, IP)

```
INPUT STATUS:
1920X1080P60
2CH AUDIO
NO HDCP
```

Input Status (Resolution, Channels, HDCP)

```
IP MODE:DHCP
10.1.0.34
255.255.254.0
[CHANGE MODE]
```

Network Status (IP Mode, Address, Mask)

```
PRESS ENTER TO
CHANGE MODE TO
STATIC
```

Confirm Static IP

```
MAC ADDRESS
B898B00F0239
```

MAC Address

```
MAIN VID STREAM
H.265
239.70.2.57
1000
```

Video Stream Status (Codec, IP, UDP Port)

```
MAIN AUD STREAM
PCM
239.80.2.57
1000
```

Audio Stream Status (Type, IP, UDP Port)

```
RTMP STREAM
NOT AVAILABLE
[START/STOP]
1000
```

RTMP Stream Status

```
[RESET UNIT]
```

Firmware Version (ARM & MCU)

```
[REBOOT]
FACTORY RESET
```

Reset / Reboot (REBOOT or FACTORY RESET)

OSD Menu Screens — Detail

Press the DOWN button from the main screen to cycle through the following screens in order:

- 1. Input Status** — Displays the input resolution, the number of audio channels, and whether HDCP-protected content is being received.
- 2. Network Status** — Displays current IP mode, management IP address, and subnet mask. Press ENTER to switch to STATIC IP mode (press ENTER again to confirm, or MENU / UP / DOWN to cancel).
- 3. MAC Address** — Displays the MAC address of the encoder.
- 4. Video Stream Status** — Displays compression type, video multicast IP address, and UDP port number.

- 5. Audio Stream Status** — Displays audio type, audio multicast IP address, and UDP port number.
- 6. RTMP Stream Status** — Displays current RTMP streaming status, if configured.
- 7. Firmware Version** — Displays current firmware versions for the ARM and MCU.
- 8. Reset / Reboot** — Press ENTER to access reboot or factory reset options. Use UP / DOWN to select REBOOT or FACTORY RESET; press ENTER to execute, or MENU to cancel.

Web Server

The HW-LUMA-E4211 includes a built-in web server for remote configuration and monitoring. To access it, open a web browser and enter the encoder's IP address (found on the OLED Network Status screen) in the address bar.

Logging In

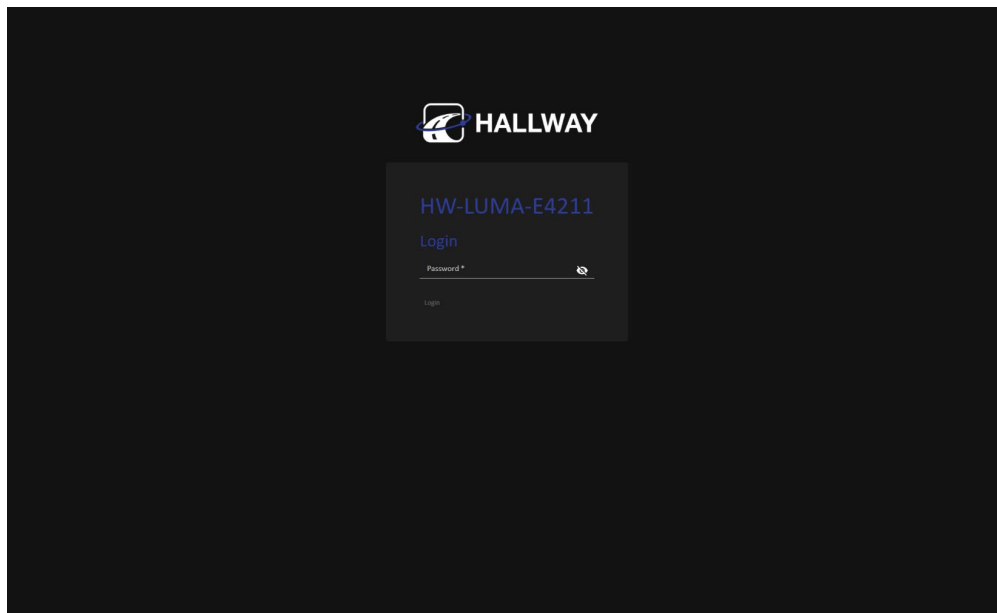


Figure: Web Server Login page

19. Enter the encoder's IP address or domain name in the browser address bar.
20. Enter the password. The default password is: password. Click the eye icon to show or hide the password.
21. On first login, you will be prompted to change the password.

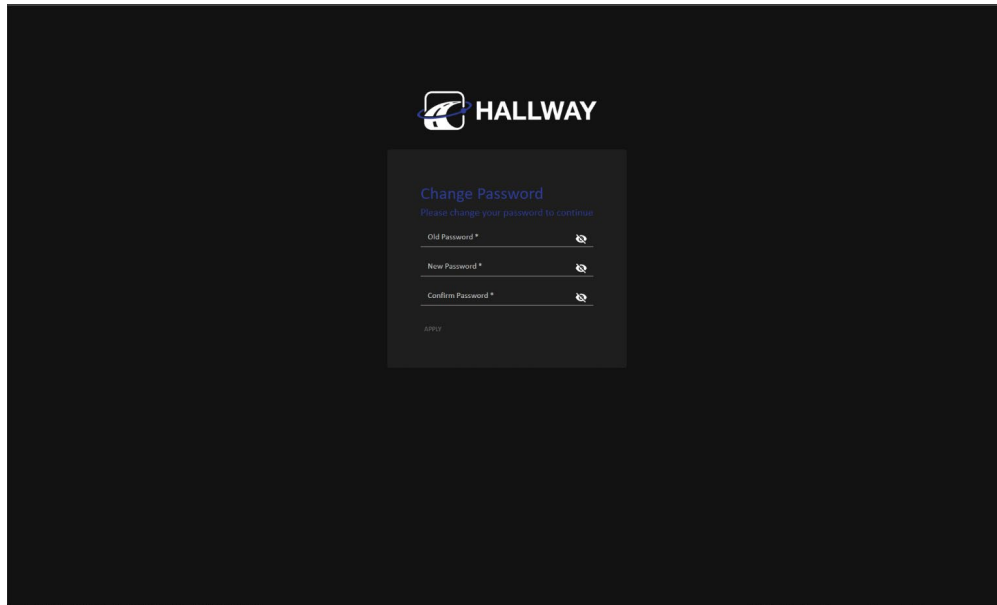


Figure: Change Password prompt

22. Enter the current password (password) in the Old Password field.
23. Enter a new password in the New Password field.
24. Re-enter the new password in the Confirm Password field.
25. Click APPLY to save, then log in using the new password.

Web Interface Pages

The web interface is organized into the following pages. Navigate using the left-hand menu.

Info Page

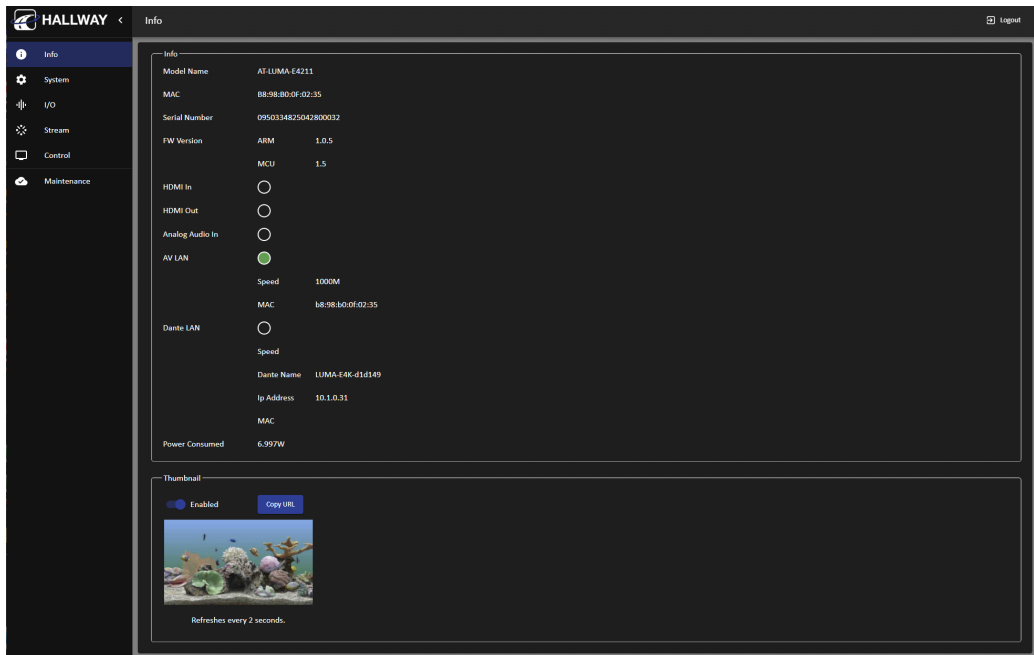


Figure: Info Page web interface

Model Name — Displays the model number of the encoder.

MAC — Displays the MAC address of the encoder.

Serial Number — Displays the serial number of the encoder.

FW Version — Displays the current firmware versions for both the ARM and MCU.

HDMI In — Green when an active source is connected. Also shows video, audio, and HDCP signal status.

HDMI Out — Green when a display is connected to the HDMI OUT port.

Analog Audio In — Green when an external audio source is connected to the AUDIO IN port.

AV LAN — Green when the input signal is being transmitted over the LAN. Port speed and MAC address are displayed.

Dante LAN — Green when connected to a Dante network. Port speed and MAC address are displayed when in use.

Power Consumed — Displays current power consumption of the encoder.

Thumbnail > Enabled — Toggle to enable or disable thumbnail preview of the input stream. Updated every 2 seconds when enabled.

Thumbnail > Copy URL — Copies the thumbnail URL to the clipboard. Format: `http://<encoder IP>/thumbnail/<thumbnail[n]>.jpg`

System > Device

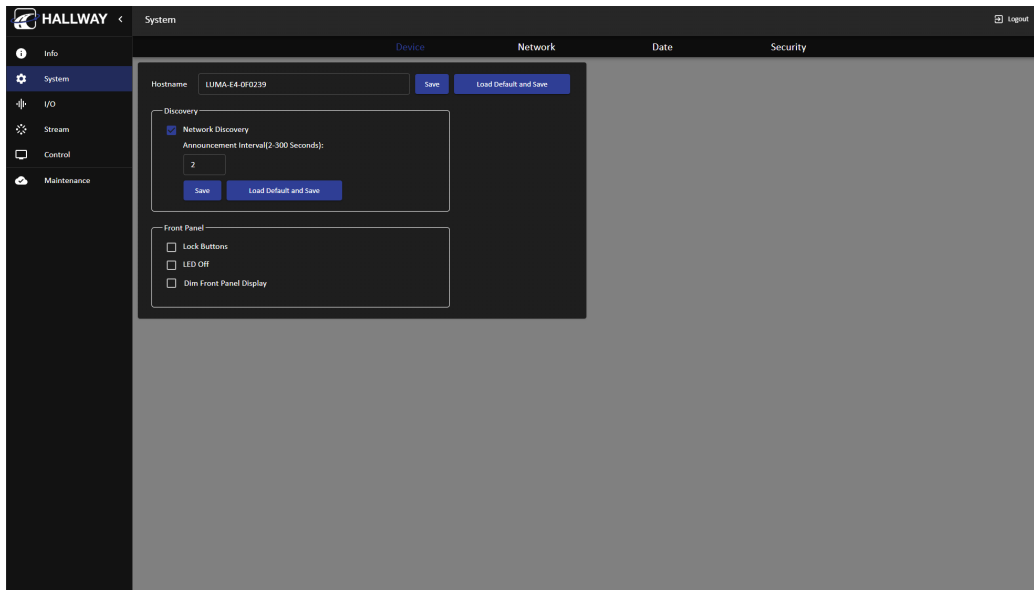


Figure: System > Device web interface

Hostname — Displays the encoder hostname. Default format: LUMA-E4-[last 7 digits of MAC]. To change, click the field and enter a new name, then click Save. Click Load Default and Save to restore the default hostname.

Network Discovery — Checkbox to enable/disable network discovery (enabled by default). Set the announcement interval (default: 2 seconds). Click Save, or Load Default and Save to restore defaults.

Lock Buttons — Checkbox to lock the front-panel buttons — prevents accidental presses.

LED Off — Checkbox to turn off the front-panel LED indicators.

Dim Front Panel Display — Checkbox to reduce the brightness of the front-panel LCD display.

System > Network

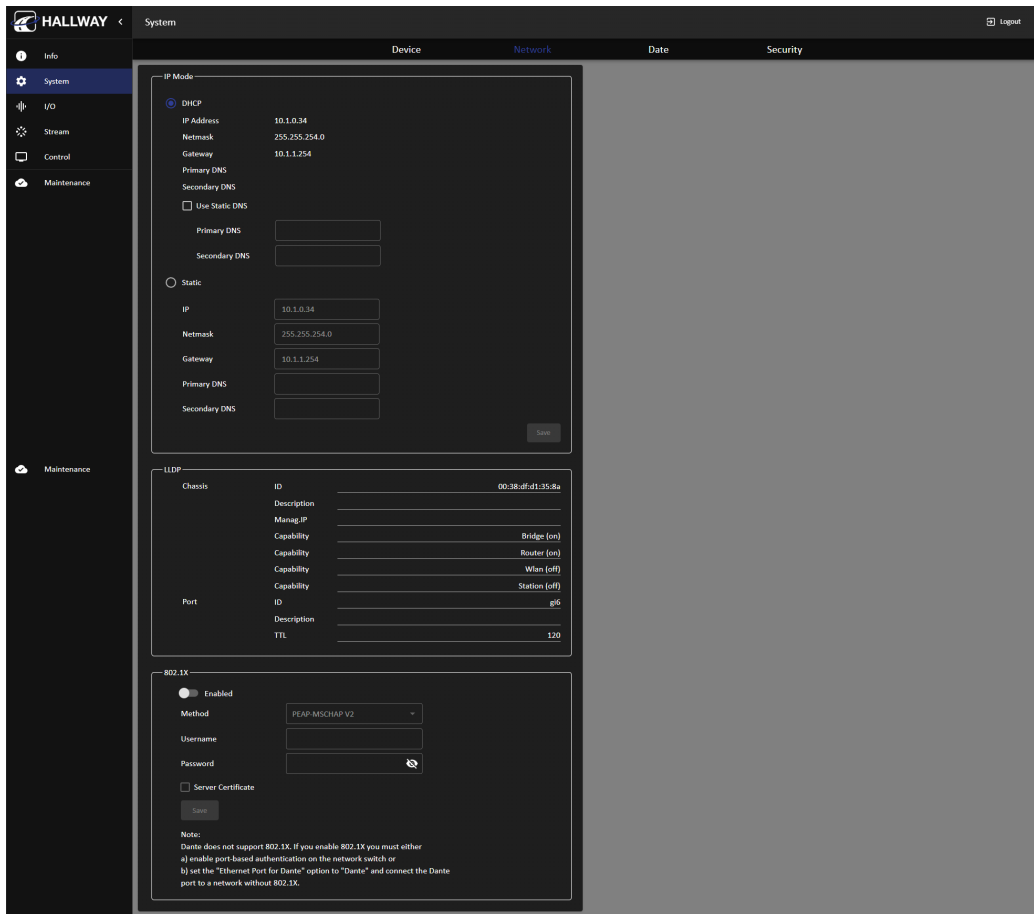


Figure: System > Network web interface

IP Mode > DHCP — Select to configure the encoder for DHCP. The assigned IP address, netmask, and gateway are displayed.

Use Static DNS — Checkbox to specify primary and secondary DNS addresses manually. Disabled by default.

IP Mode > Static — Select to configure the encoder for static IP. Enter IP address, netmask, and gateway manually.

Save — Click to apply and save network changes.

LLDP — Link Layer Discovery Protocol — displays information about the connected network switch.

802.1X > Enabled — Toggle to enable or disable 802.1X port-based authentication.

802.1X > Method — Select PEAP-MSCHAP V2 (requires user credentials + CA certificate) or EAP-TLS (requires client certificate, private key, and CA certificate).

802.1X > Username / Password — Enter network authentication credentials.

802.1X > Server Certificate — Checkbox to validate the server certificate. CA certificate files may also be required.

NOTE: Dante does not support 802.1X. If 802.1X is enabled, either port-based authentication must also be enabled on the network switch, or the Ethernet Port for Dante option (on the I/O page) must be set to Dante and that port connected to a non-802.1X network.

System > Date

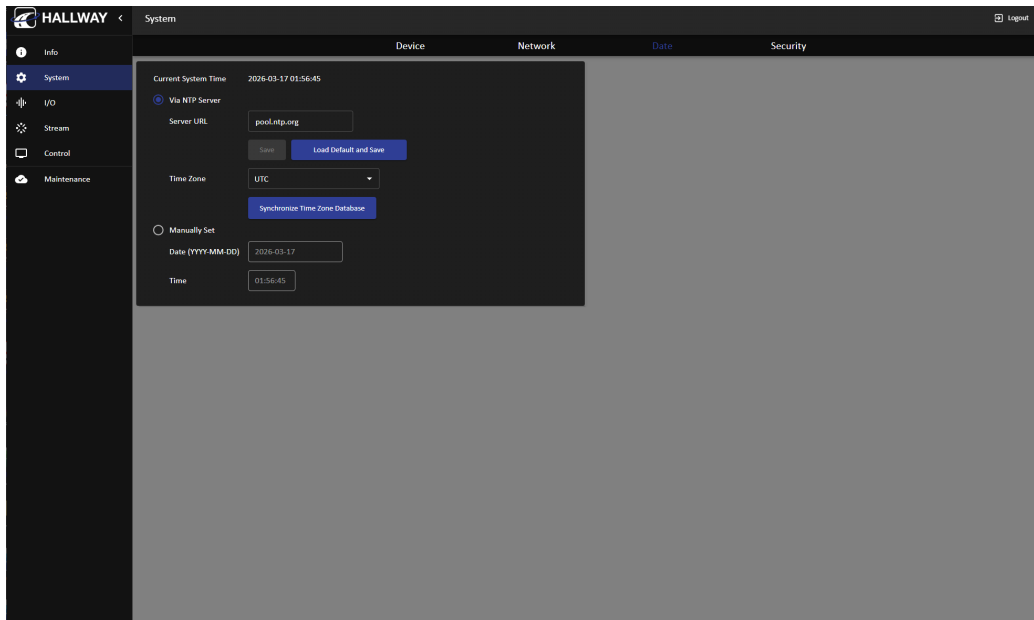


Figure: System > Date web interface

Current System Time — Displays the current system time.

Via NTP Server — Select to synchronize the clock with an NTP server.

Server URL — Enter the NTP server URL. Default: pool.ntp.org. Click Load Default and Save to restore.

Time Zone — Select the time zone from the drop-down list. Default: UTC.

Manually Set — Select to manually set the date and time — useful when the switch is not connected to the Internet.

System > Security

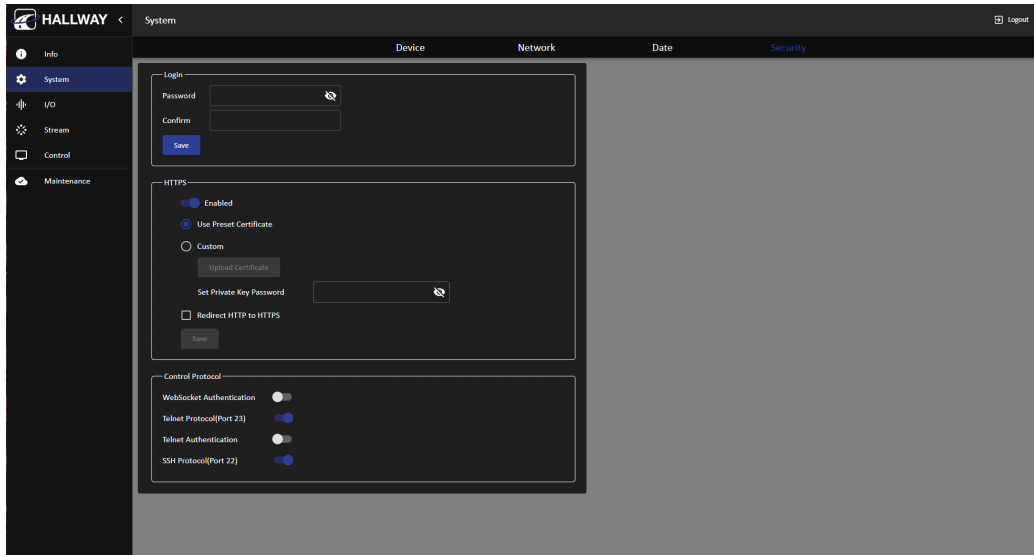


Figure: System > Security web interface

Password / Confirm — Enter and confirm a new login password. Click Save to apply.

HTTPS > Enabled — Toggle to enable or disable HTTPS. When enabled, browser communication is encrypted. Enabled by default.

Use Preset Certificate — Use the encoder's default certificate for HTTPS. Suitable for general use.

Custom — Use a custom HTTPS certificate. Click Upload Certificate to upload; enter the Private Key Password. Reduces browser warnings and meets IT security policies.

Redirect HTTP to HTTPS — Checkbox to automatically redirect HTTP requests to HTTPS.

WebSocket Authentication — Enable or disable authentication for WebSocket connections.

Telnet Protocol (Port 23) — Enable or disable the Telnet control protocol on port 23.

Telnet Authentication — When enabled, Telnet login credentials match the web server credentials.

SSH Protocol (Port 22) — Enable or disable the SSH control protocol on port 22.

I/O

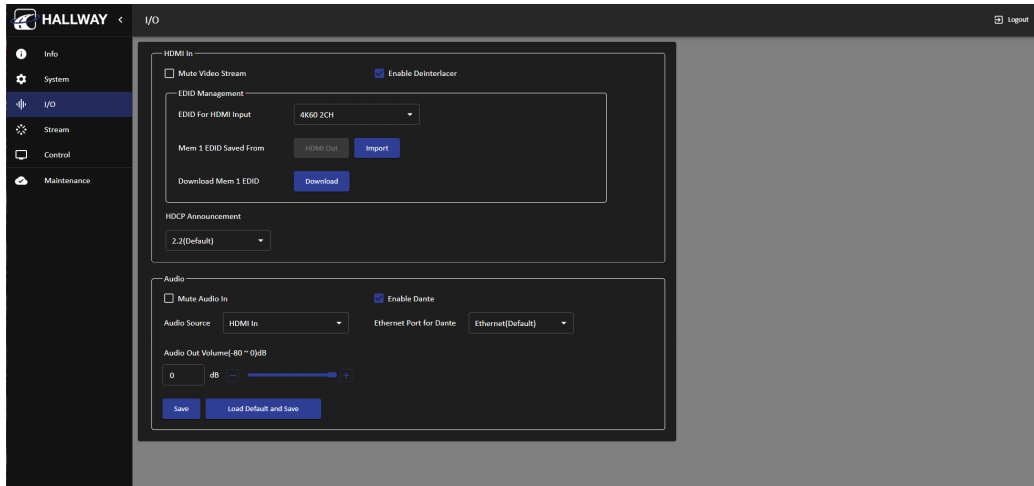


Figure: I/O web interface

Mute Video Stream — Checkbox to mute or unmute the video stream. Disabled by default.

Enable Deinterlacer — Checkbox to enable or disable deinterlacing for interlaced input signals. Enabled by default.

EDID For HDMI Input — Drop-down to select the EDID for the HDMI input.

Mem 1 EDID Saved From — Click HDMI Out to copy the EDID from the connected confidence monitor to the input. Click Import to import a .bin EDID file.

Download Mem 1 EDID — Click Download to download the EDID from the display connected to HDMI OUT in .bin format.

HDCP Announcement — Drop-down to select HDCP version. Default: 2.2.

Mute Audio In — Checkbox to mute or unmute audio input (affects embedded and analog audio). Disabled by default.

Enable Dante — Checkbox to enable or disable Dante audio.

Audio Source — Drop-down to select the audio source.

Ethernet Port for Dante — Drop-down to select the Dante port: Ethernet or Dante. Default: Ethernet.

Audio Out Volume (-80 ~ 0) dB — Enter value or drag the slider to adjust audio output volume (-80 to 0 dB).

Stream > Main Stream > Video

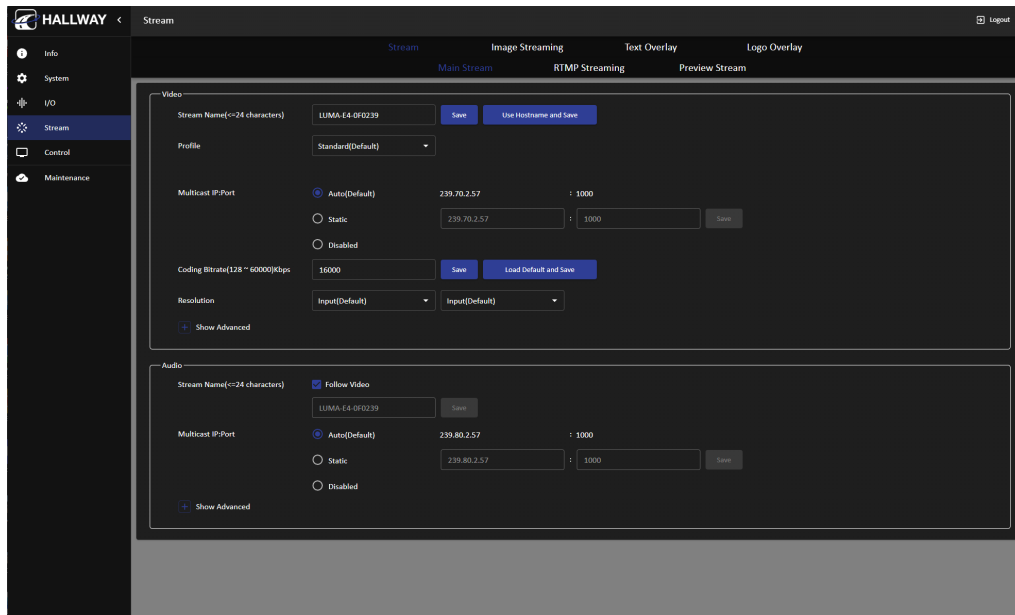


Figure: Main Stream configuration page

Stream Name — Enter the stream name (max 24 characters). Click Save or Use Hostname and Save.

Profile — Select the stream profile: Standard (default), AT-OME-CS31 Compatible, RTMP, or Custom.

Multicast IP:Port — Auto (default), Static, or Disabled.

Coding Bitrate (128 – 60000) Kbps — Enter bitrate in Kbps. Default: 16000.

Resolution — Select resolution and refresh rate from the drop-down lists.

Advanced Settings (click + icon to expand):

- Coding Protocol: H.265 (default — better bandwidth efficiency) or H.264 (broader compatibility).
- Coding Rate Control: VBR (Variable Bit Rate — adapts to scene complexity) or CBR (Constant Bit Rate — predictable network load).
- QP (Quantization Parameter): Set minimum/maximum range. Min 0 = near-lossless; Max 51 = high compression.
- GOP (1 – 300): Group of Pictures length. Default: 60. Lower values = more keyframes; higher = better compression.
- DSCP: Differentiated Services Code Point for QoS marking. Default: 32. Consult the network administrator for the correct value.
- Key: Encryption key for the stream — Use Factory Default or Custom. AES-128 encryption.
- Enable even if Content is not HDCP Protected: Apply stream encryption regardless of HDCP status.
- AV LAN Speed: Select LAN port speed. Default: 1000 Mbps.

Stream > Main Stream > Audio

- **Stream Name:** Enter the audio stream name (max 24 characters). Available only when Follow Video is unchecked.
- **Follow Video:** Checkbox to use the same stream name as the video stream.
- **Multicast IP:Port:** Auto (default), Static, or Disabled.
- **Coding Bitrate:** Enter bitrate in Kbps. Default: 16000.
- **Coding Algorithm (Advanced):** PCM (uncompressed, full quality, default) or MPEG4 AAC LC (compressed, lower bandwidth). When AAC is selected, set Bitrate (8 – 240 Kbps); default: 128 Kbps.
- **DSCP (Advanced):** QoS marking for the audio stream (0 – 63). Consult the IT administrator.
- **Key (Advanced):** Encryption key — Use Factory Default or Custom (AES-128).

Stream > RTMP Streaming

Figure: Stream > RTMP Streaming web interface

Enable — Toggle to enable or disable RTMP streaming to an external server or platform.

Current Status — Displays the current RTMP streaming status (e.g., connected, disconnected, unavailable).

Server URL — Enter the URL of the target RTMP server (e.g., `rtmp://a.rtmp.youtube.com/live2/`).

Stream Name or Key — Enter the stream name or stream key provided by the RTMP platform.

RTMP Server Port — Enter the RTMP server port. Default: 1935.

User Name / Password — Enter authentication credentials if required by the RTMP server.

Save — Click to apply and save RTMP streaming settings.

NOTE: The RTMP stream uses the same coding parameters as the Main Stream. Configure Main Stream settings to meet the requirements of the target streaming platform before enabling RTMP.

Stream > Preview Stream

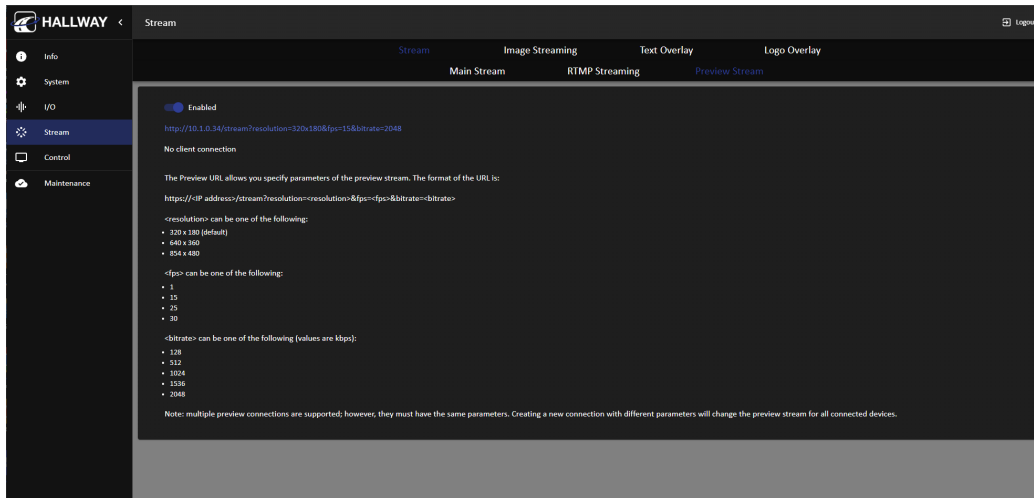


Figure: Stream > Preview Stream web interface

Enabled — Toggle to enable or disable the low-bandwidth preview stream. When enabled, the stream is accessible from a browser using the Preview URL.

Preview URL Format — `https://<IP address>/stream?resolution=<resolution>&fps=<fps>&bitrate=<bitrate>`

Notes — Multiple clients can connect to the preview stream simultaneously. All clients must use the same stream parameters; connecting with different parameters updates settings for all clients.

Stream > Image Streaming

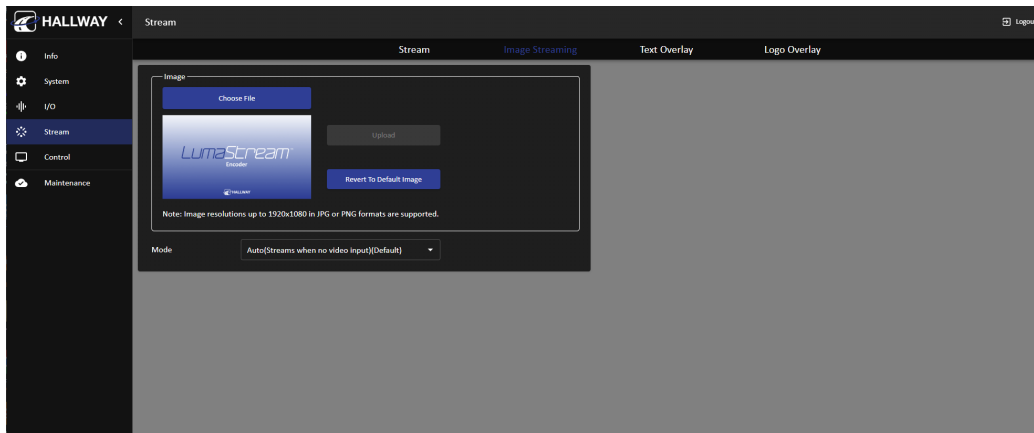


Figure: Stream > Image Streaming web interface

Choose File / Upload — Browse and upload a custom JPG or PNG image (max 1920×1080) to use as a streaming slate.

Revert To Default Image — Restores the default LumaStream slate image.

Mode > Auto (default) — Streams the image only when no video input is present.

Mode > On — Always streams the selected image instead of live video.

Mode > Off — Never displays the image.

Stream > Text Overlay

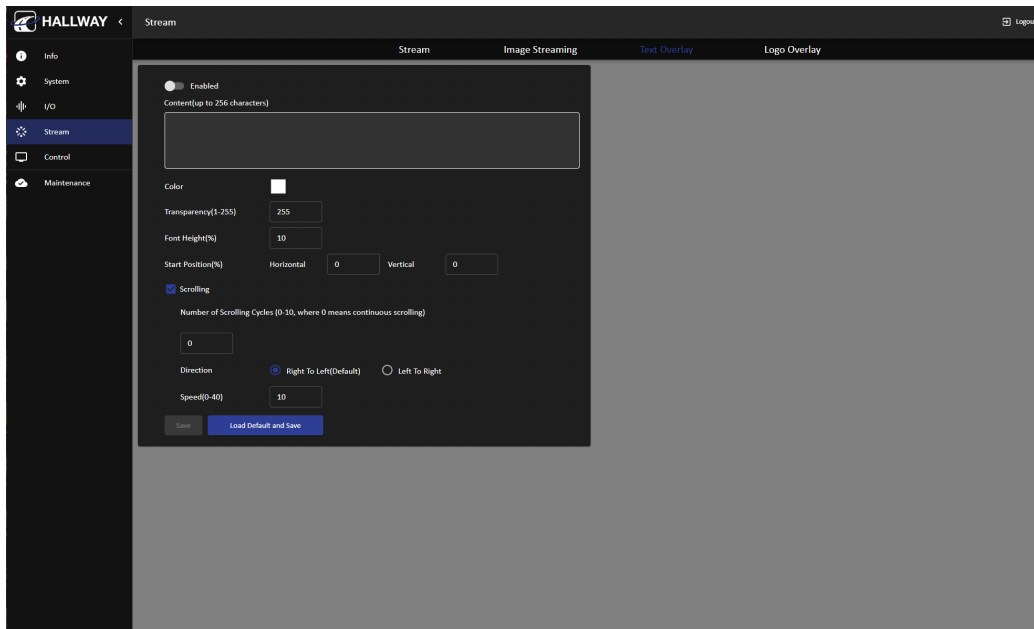


Figure: Stream > Text Overlay web interface

Enabled — Toggle to enable or disable the text overlay on the stream.

Content — Enter overlay text (up to 256 characters).

Color — Select the text color.

Transparency — Set text transparency (1 – 255).

Font Height — Set text height as a percentage of the display area.

Start Position — **Horizontal / Vertical** — Set the overlay start position as a percentage.

Scrolling — Checkbox to enable scrolling text. When unchecked, text is static.

Number of Scrolling Cycles — Number of scroll passes (0 – 10). 0 = continuous scrolling.

Direction — Right To Left (default) or Left To Right.

Speed — Scroll speed (0 – 40).

Stream > Logo Overlay

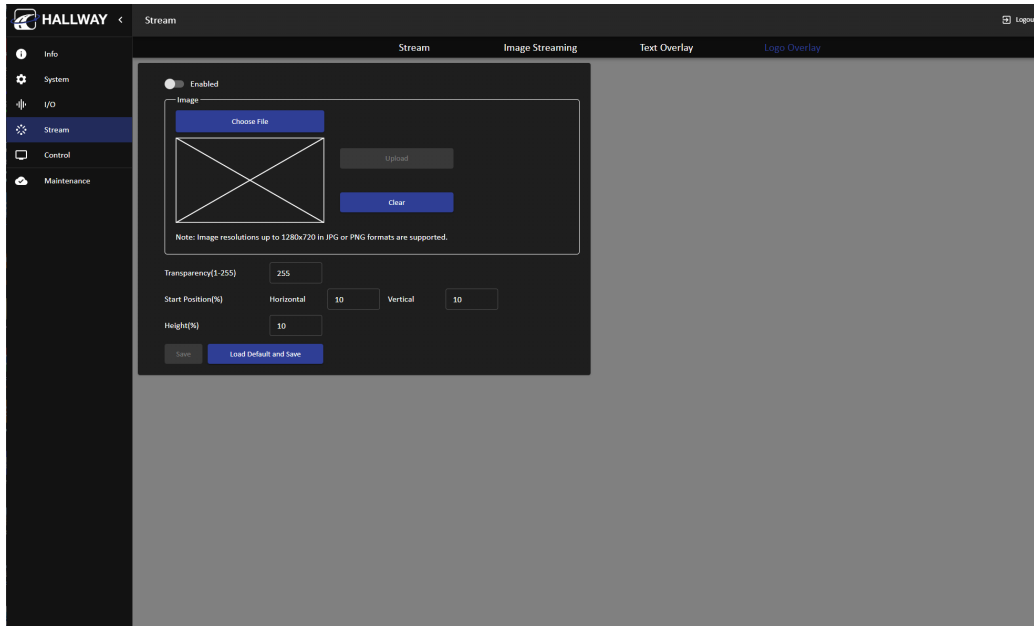


Figure: Stream > Logo Overlay web interface

Enabled — Toggle to enable or disable the logo overlay.

Choose File / Upload — Browse and upload a JPG or PNG logo image (max 1280×720).

Clear — Remove the currently uploaded logo image.

Transparency — Set logo transparency (1 – 255).

Start Position — **Horizontal / Vertical** — Set logo position as a percentage of the resolution.

Height — Set the logo height as a percentage of the screen height.

Control > Serial (RS-232)

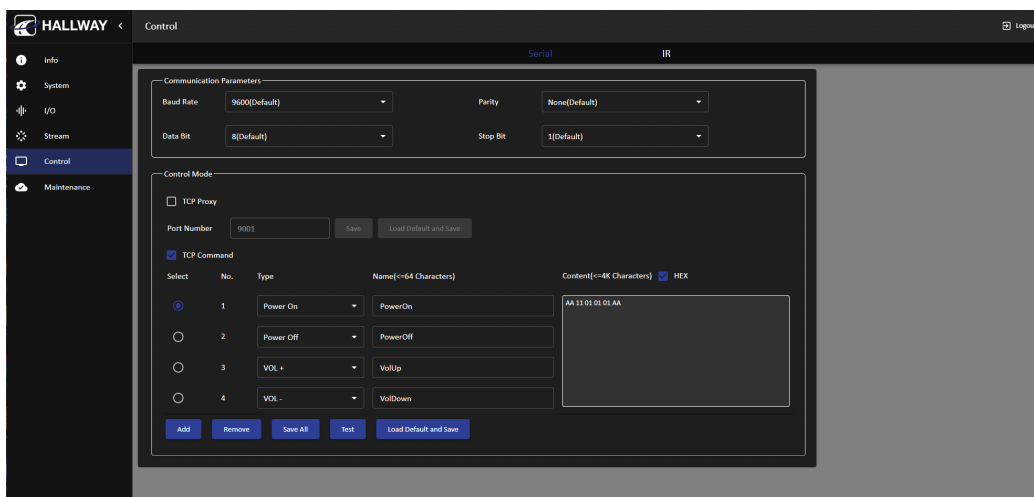


Figure: Control > Serial (RS-232) web interface

Baud Rate — Select the RS-232 baud rate. Default: 9600.

Parity — Select parity bit setting. Default: None.

Data Bit — Select number of data bits. Default: 8.

Stop Bit — Select number of stop bits. Default: 1.

TCP Proxy — Checkbox to enable TCP proxy mode for RS-232 — bridges serial data over a TCP connection.

Port Number — Sets the TCP port for proxy communication. Default: 9001.

TCP Command — Checkbox to enable TCP command mode (enabled by default). Create, save, and test named RS-232 commands. Command types: Power On, Power Off, VOL+, VOL–, Custom. Up to 4000 characters per command.

Control > IR

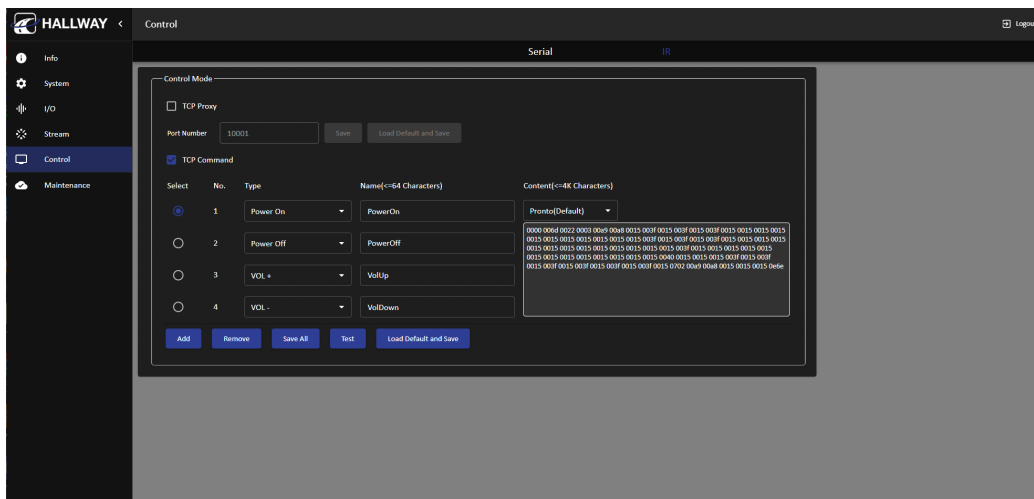


Figure: Control > IR web interface

TCP Proxy — Checkbox to enable TCP proxy mode for IR control. Default port: 10001.

TCP Command — Checkbox to enable TCP command mode for IR control. Create named IR commands with Type, Name, Protocol (default: Pronto or Global Cache), and Command Content (up to 4000 characters).

Maintenance > System

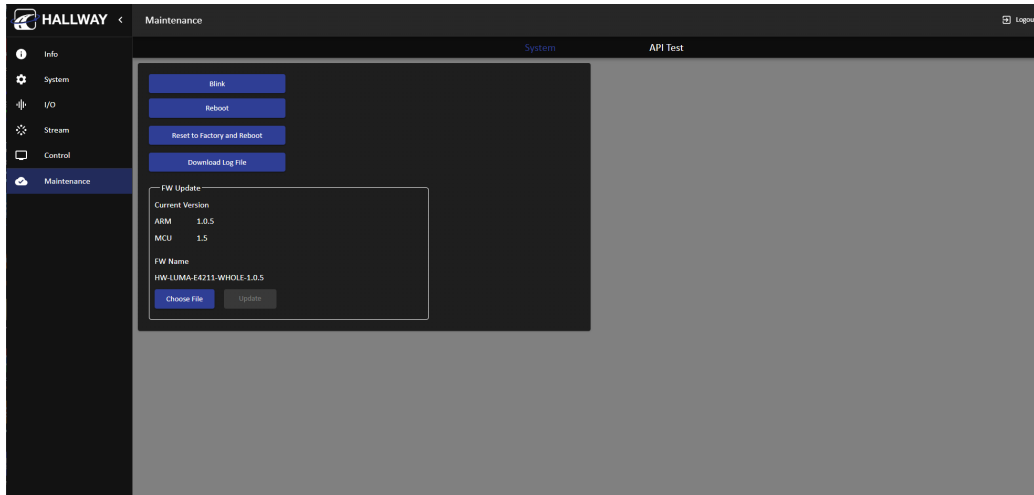


Figure: Maintenance > System web interface

Blink — Click to make all front-panel LEDs blink — useful for identifying the unit on the network.

Reboot — Click to perform a warm reboot (all settings are preserved).

Reset to Factory and Reboot — Click to restore all settings to factory defaults and reboot the unit.

Download Log File — Click to download the device log file for diagnostics and troubleshooting.

Current Version — ARM / MCU — Displays the currently installed firmware versions.

FW Name — Displays the name of the currently installed firmware package.

Choose File / Update — Browse for a firmware update file and click Update to upload and apply it.

Maintenance > API Test

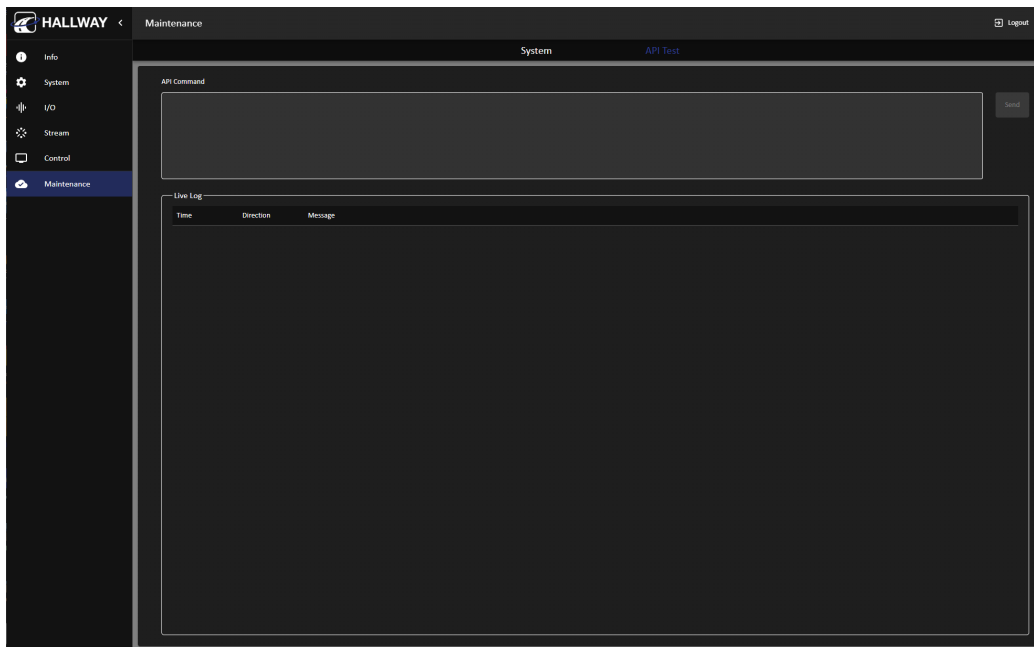


Figure: Maintenance > API Test web interface

API Command — Enter the API command to send to the device.

Send — Click to send the command entered in the API Command field.

Live Log — Time — Displays the time each message was logged.

Live Log — Direction — Indicates whether the message was sent to or received from the device.

Live Log — Message — Displays the API command or response message.

Troubleshooting

If an issue persists after following these steps, contact Hall Research technical support at hallresearch.com.

Symptom	Possible Solution
No image on the confidence monitor	Verify the HDMI OUT port is connected. Check the HDMI source is active and connected to HDMI IN. Ensure the cable and source device are functioning.
Encoder's IP address is unknown	Press the MENU button on the front panel and navigate to the Network Status screen to display the IP address. Alternatively, use IP scanner software on the same network.
PWR LED is not lit	Check that the PoE+ switch is powered and the Ethernet cable is connected to the PoE+ port, or verify that the 48 V DC power supply is connected and functioning.
ENC LED is not lit (stream not active)	Verify that the HDMI IN source is active (HDMI IN LED should be green). Check network connectivity (ETH LED should be green). Check web server stream settings.
ETH LED is not lit or blinking	Check the Ethernet cable connection between the PoE+ port and the network switch. Try a different cable or switch port.
Decoder cannot find the encoder stream	Confirm the encoder and decoder are on the same network / VLAN. Verify the multicast IP and UDP port settings match between encoder and decoder. Ensure the network switch supports IGMP snooping.
Web server is inaccessible	Confirm the encoder's IP address. Ensure the computer and encoder are on the same network. Try accessing via http:// if HTTPS redirect is causing issues.
Password has been forgotten	Press and hold the RESET button on the rear panel to restore factory defaults (password will reset to: password). Note: this also resets all other settings.
Audio is not being transmitted	Check AUDIO IN wiring (correct L+/L-/R+/R-/G connections). On the I/O web page, ensure Mute Audio In is unchecked and the Audio Source is correctly selected.
RTMP stream not connecting	Verify the Server URL, Stream Name/Key, and port (default: 1935) on the RTMP Streaming page. Confirm the encoder has outbound internet access. Check RTMP platform credentials.
Dante audio not functioning	Ensure the Dante port is connected to a Dante-enabled network. On the I/O page, confirm Enable Dante is checked and Ethernet Port for Dante is set correctly.

Specifications

Video

Signal Input	HDMI
Signal Output	HDMI (loop-through), Network (encoded)
Copy Protection	HDCP 1.4 / 2.2
Pixel Clock	600 MHz
Input Resolutions — UHD/HD	4096×2160 @ 30/29.97/25/24/23.98 Hz; 3840×2160 @ 60/59.94/50/30/29.97/25/24/23.98 Hz; 1920×1080p @ 60/59.94/50/30/29.97/25/24/23.98 Hz; 1920×1080i @ 60/59.94/50 Hz; 1280×720p @ 60/59.94/50 Hz
Input Resolutions — SD	720×576p/i @ 50 Hz; 720×480p/i @ 59.96 Hz
Input Resolutions — VESA	2560×1600, 1920×1200, 1600×1200, 1440×900, 1280×1024, 1280×800, 1024×768, 800×600, 640×480
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0

Encoding

Video Compression	H.265, H.264 (main stream); MJPEG up to 854×480 @ 30 fps (preview stream)
Encoded Chroma	4:2:0
Bit Rate	128 kbps – 60 Mbps (main); 128 – 2048 kbps (preview)
Downscale Options	1920×1080, 1280×720, 854×480, 640×360
Max Latency	150 ms end-to-end

Audio

Input	HDMI, Balanced Analog (5-pin captive screw)
Output	HDMI, Balanced Analog (5-pin captive screw), Network
HDMI Format	LPCM 2.0 up to 16-bit, 32/44.1/48 kHz
Analog Level	+20 dBu max.
Analog Frequency Response	20 Hz – 20 kHz ±0.5 dB

Analog THD+N	< 0.025% (20 Hz – 20 kHz)
Network Audio	2-channel LPCM or AAC, 8 – 240 kbps
Dante® Audio	2-channel on main LAN or Dante LAN port

Network

Port	2 × RJ45, 10/100/1000 Mbps
Streaming Protocols	RTP, RTSP, RTMP
Addressing	DHCP, Static
Encryption	AES-128
Management	HTTP, HTTPS, SSH, Telnet, WebSocket, LLDP
Authentication	IEEE 802.1X (PEAP-MSCHAPv2, EAP-TLS)
IP Multicast	IGMPv3

Control

RS-232/IR Port	1 × 4-pin captive screw
Baud Rates	9600, 19200, 38400, 57600, 115200
IR Protocols	Pronto, Global Cache

Connectors

HDMI IN	1 × Type A, 19-pin female
HDMI OUT	1 × Type A, 19-pin female (loop-through)
LAN (PoE+ / AV)	1 × RJ45
Dante LAN	1 × RJ45
RS-232/IR	1 × 4-pin captive screw
Audio IN	1 × 5-pin captive screw
Audio OUT	1 × 5-pin captive screw
DC 48V	1 × 2-pin captive screw

Indicators & Controls

Buttons	MENU, UP, DOWN, ENTER — 4× momentary, tact-type
LEDs	PWR, HDMI IN, ENC, ETH, DANTE — 5× red/green
Display	OLED, 128×64 matrix

Power

PoE+	IEEE 802.3at
Consumption	Up to 13.5 W
External Power Supply	AT-PS-48083-C (optional, sold separately, 48 V DC)

Environmental & Physical

Operating Temperature	+32°F to +104°F (0°C to +40°C)
Storage Temperature	-4°F to +140°F (-20°C to +60°C)
Operating Humidity	20% to 90%, non-condensing
Dimensions (H × W × D)	0.98 × 7.48 × 7.09 in.
Weight	1.98 lbs
Certifications	CE, FCC
NDAA-889 Compliance	Yes
Warranty	hallresearch.com/warranty

Appendix

Updating the Firmware

Firmware updates are performed through the web server Maintenance > System page.

26. Obtain the latest firmware file from the Firmware tab on the product page at hallresearch.com/product/HW-LUMA-E4211.
27. Open a web browser and navigate to the encoder's web server.
28. Log in and go to Maintenance > System.
29. Click Choose File and browse to the downloaded firmware file.
30. Click Update to upload and apply the firmware. Do not power off the unit during the update.
31. The encoder will reboot automatically after the update completes.
32. Verify the new firmware version is displayed under Current Version on the Maintenance > System page.

RS-232 Default Settings

Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
TCP Proxy Port	9001 (default)
IR TCP Proxy Port	10001 (default)

Supported Telnet / SSH / API Control

The encoder supports the following control interfaces for integration with third-party control systems:

- Telnet (Port 23) — enable/disable on Security page.
- SSH (Port 22) — enable/disable on Security page.
- WebSocket — enable/disable authentication on Security page.
- HTTP/HTTPS REST API — use the Maintenance > API Test page to test commands interactively.
- RS-232 TCP Proxy — bridge serial commands over TCP (port 9001 default).

Warranty & Certifications

Warranty	hallresearch.com/warranty
FCC / CE Certifications	CE, FCC Part 15 Class A
NDAA-889 Compliance	Yes
Technical Support	hallresearch.com

