MultiDyne®

Video & Fiber Optic Systems

CONFIGURATION AND INSTALLATION MANUAL

MD9200-ENC
&
MD9200-ENC-OG

OTT Streaming Media Encoders

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MultiDyne
Video & Fiber Optic Systems

MD9200-ENC Software Manual

Table of Contents

Logging into the User Interface

The MD9200-ENC uses a modern HTML5-embedded Web server for user configuration. Users can connect to the MULTIDYNE device via Gigabit Ethernet (GigE) port 1 or GigE port 2. GigE port 1 is factory defaulted to DHCP and GigE port 2 is factory defaulted to 192.168.2.7.

Gigabit Ethernet (GigE) port values

Gigabit Ethernet Port	Configuration
GigE 1	DHCP
GigE 2	192.168.2.7

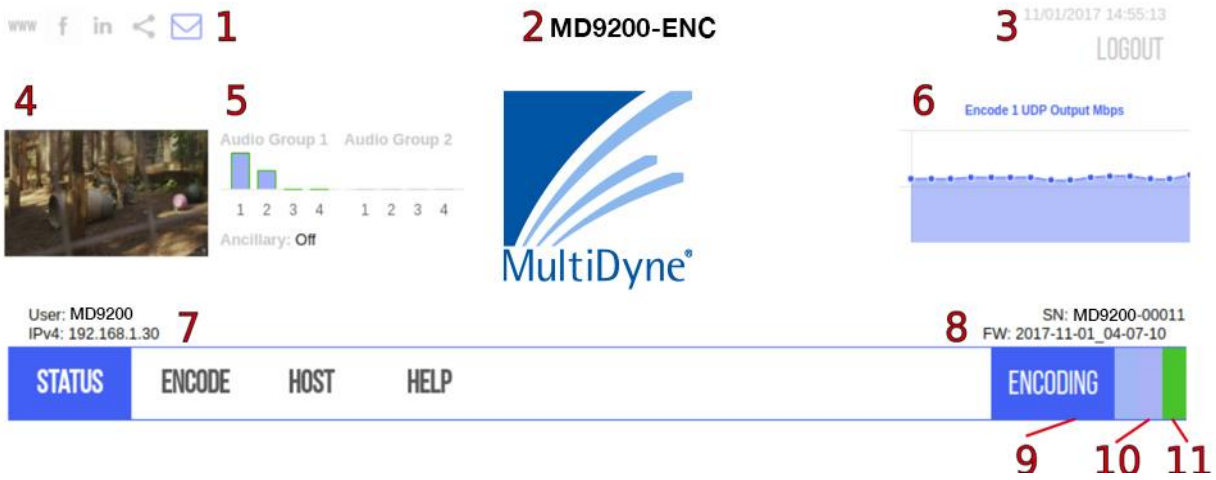
Users are presented with the MULTIDYNE login screen when accessing the User interface, to which the **username** and **password** may be entered **(3)**. Currently usernames cannot be modified.

Username: 9200
Password: ENC

LEFT: The **unit serial number (1)** is displayed along the top of the login modal, and the current **firmware version** for the unit **(4)** is displayed along the bottom. To the right of the unit serial number, a **Help** link **(2)** may be accessed. This link will take users to the Help page, which provides more information about connecting to the UI, as well as unit technical information about the unit.

Once logged in, the MULTIDYNE unit UI is divided into two sections: the header, which is visible on all tabs, and the body, where the content depends on which tab is in use.

MD9200-ENC Header



ABOVE: The current tab in use is emboldened in **blue**.
Along the top left of the page are links to publicly accessible MULTIDYNE web pages, including the main website, Facebook, LinkedIn, MULTIDYNE Finder application in the Chrome store, and a **message envelope (1)**.

The **product type** is displayed in the top center **(2)**.

A **thumbnail (4)** is generated every five seconds to reflect the media being decoded by the unit.

The **Audio Group graph (5)** reflects levels of the channels as they update.

The **mini statistics graphs (6)** to the right display the rate of Mbps outputting. Clicking the graph will resolve to the **STATISTICS** sub tab.

Along the top right of the page, **system time (3)** is displayed and updated per second, directly above a logout link.

The serial number and current **firmware version** of the unit **(8)** are displayed along the bottom right of the header, and the current **IPv4 address** of the unit on the left **(7)**.
When an encoder is running a blinking status bar will be visible for each one **(10)**.

The **status** of the encoder is displayed in the menu **(9)** and will change color as conditions change.

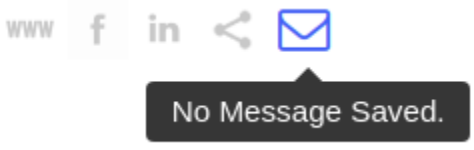
- When the unit *does not have a valid SDI, source connected* the status will be **red** and **NO SIGNAL**.

- When the unit has *no destinations set* in the **Outputs** tab, and a *valid SDI source is connected* the status will be **yellow** and **READY**.

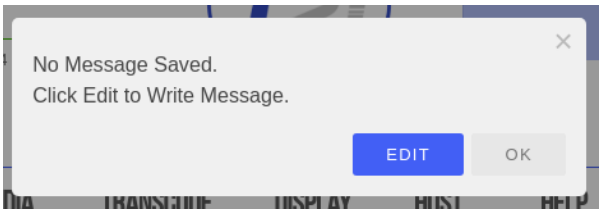
- When the unit has a valid SDI source and has a successful destination path set the status will be **blue** and **ENCODING** accompanied by a blinking bar for each destination.

Message Envelope

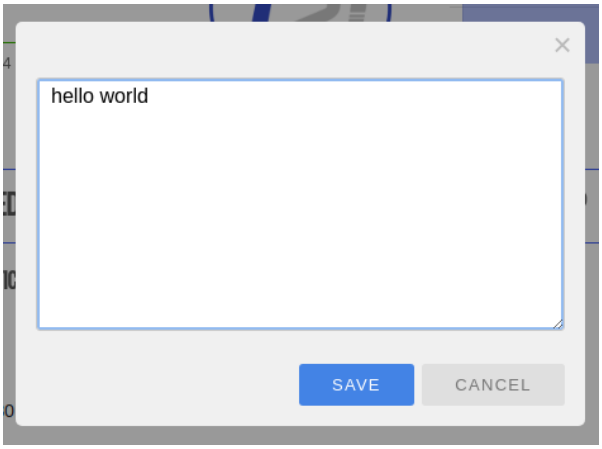
The envelope icon can be used to leave messages specific to how the unit is set up or what the unit is doing.



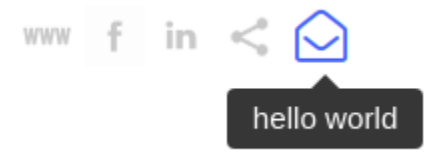
Hovering over the message icon when nothing has been saved will show this message or simply "message." Click to save a message.



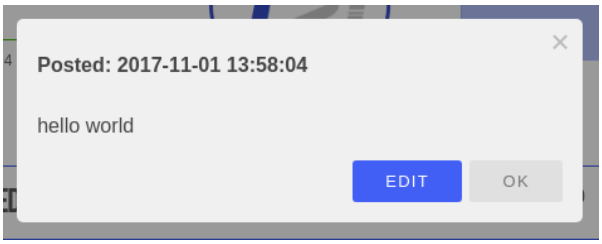
The first modal usually is a preview or will give direction on how to add your message.



Enter your message and click save to apply your changes.



Now hovering over the message icon will preview your message.

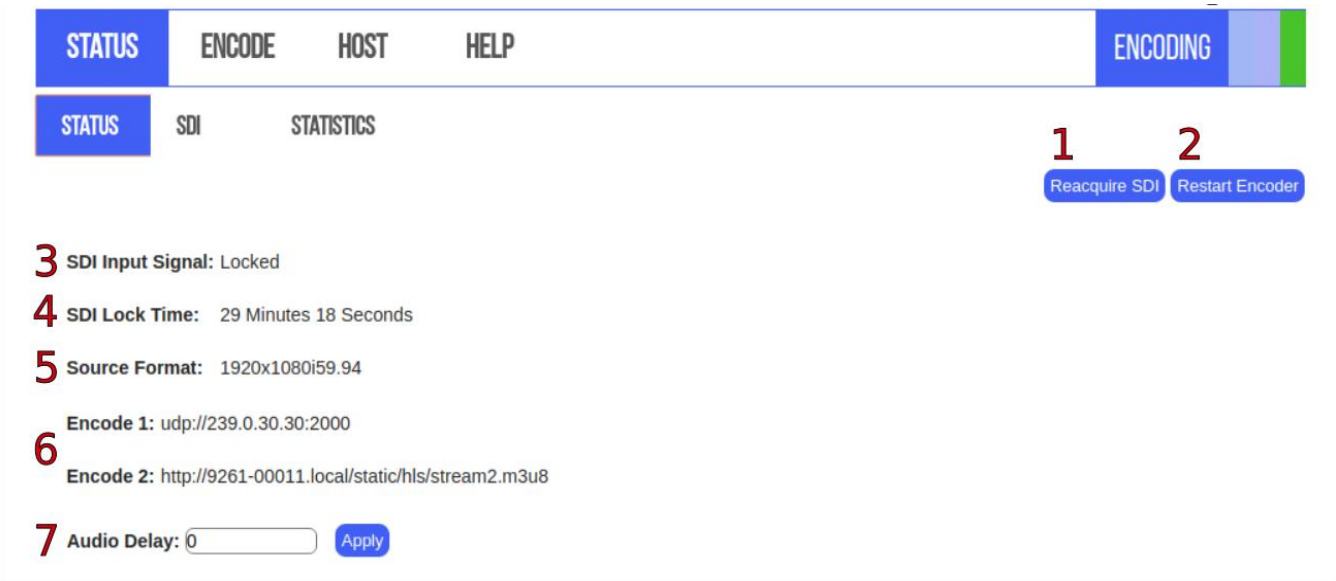


Clicking on the envelope will show the message and a timestamp of when it was posted.

STATUS

The STATUS Sub Tab

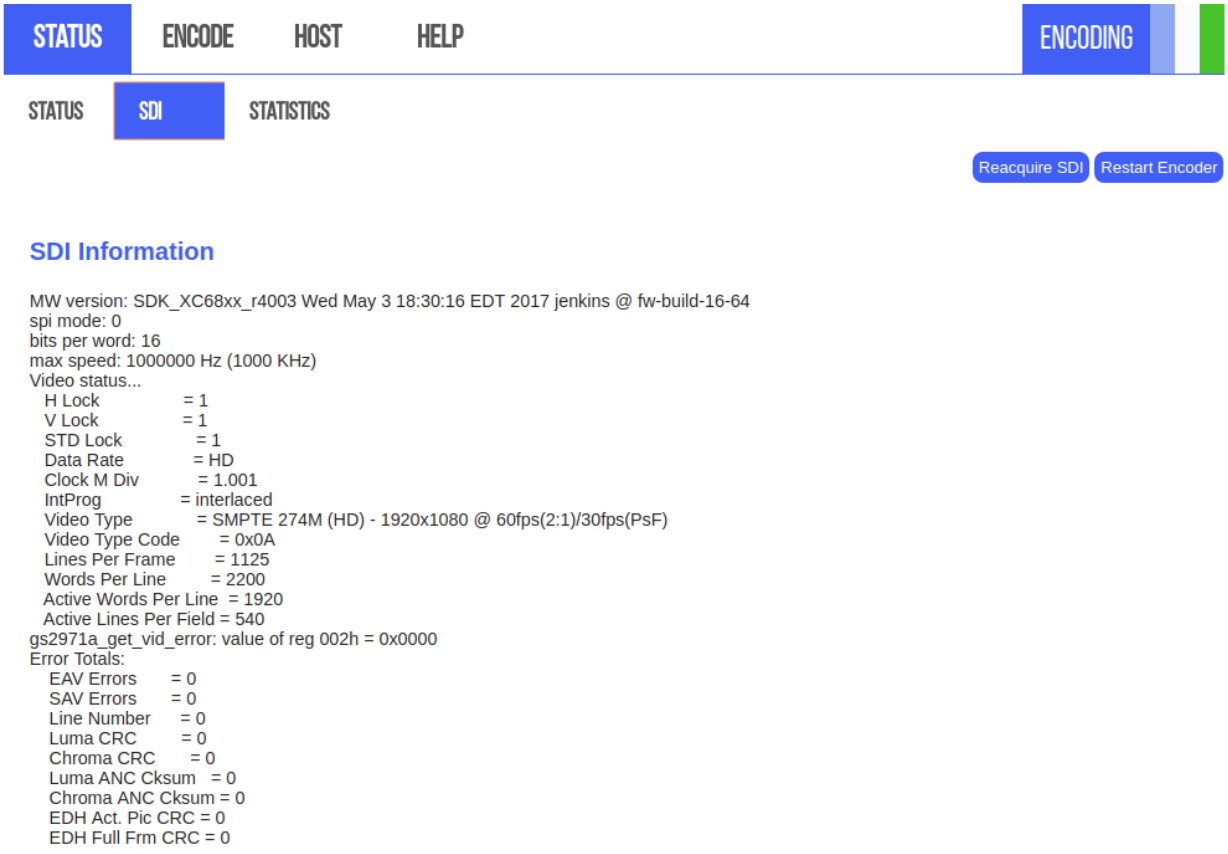
After successfully logging in to a unit, users are brought to the **STATUS** tab. Within the **STATUS** tab, information about the unit's current status is displayed.



ABOVE: The **Reacquire SDI** button **(1)** restarts the mechanism listening to the SDI input.
The **Restart Encoder** button **(2)** will restart the encoder process without rebooting the system.

The **SDI Input Signal** **(3)** indicates whether there is a valid SDI signal being received.
The **SDI Lock Time** **(4)** indicates the period of time the signal has been received.
The **Source Format** **(5)** indicates the video resolution and framerate of the input signal.
The **Encode #** **(6)** displays the output path of any active encoders.
The **Audio Delay** **(7)**

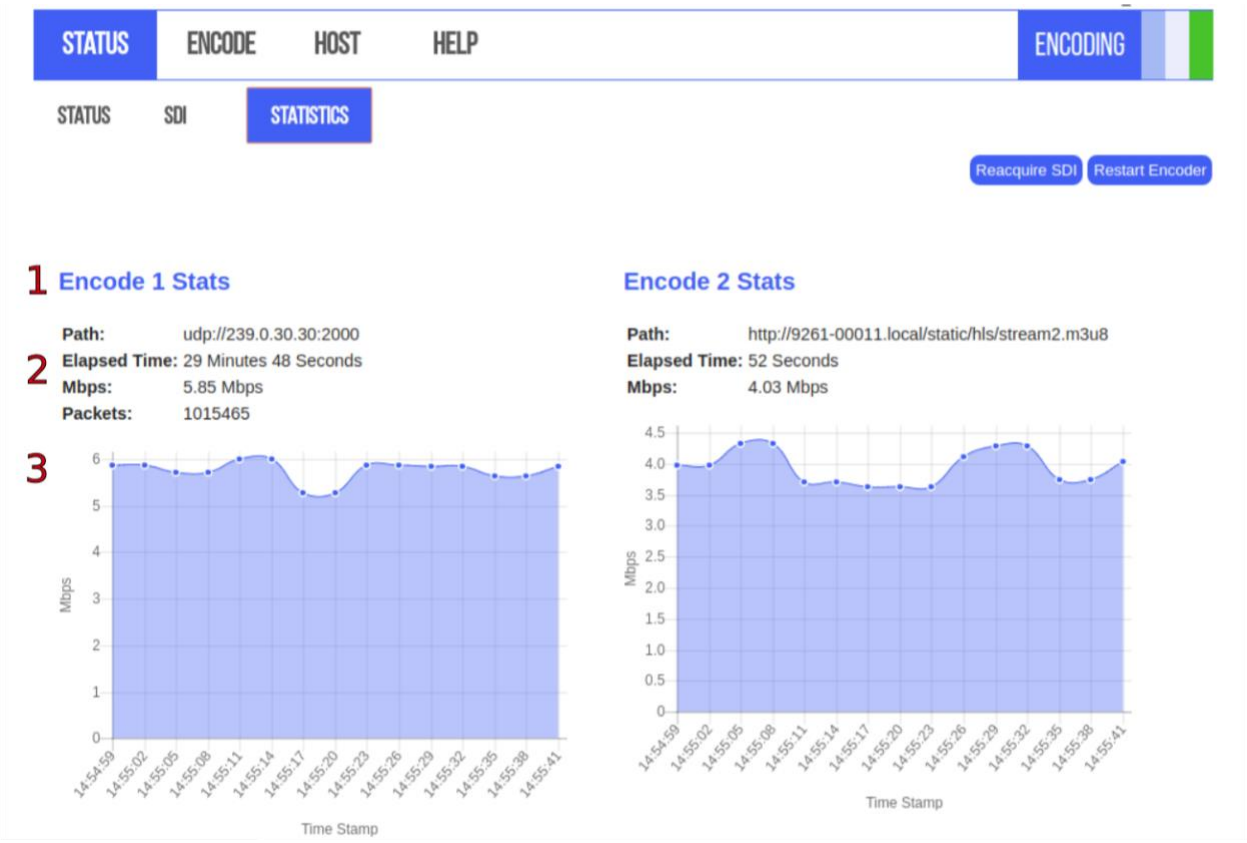
The SDI Sub Tab



The STATISTICS Sub Tab

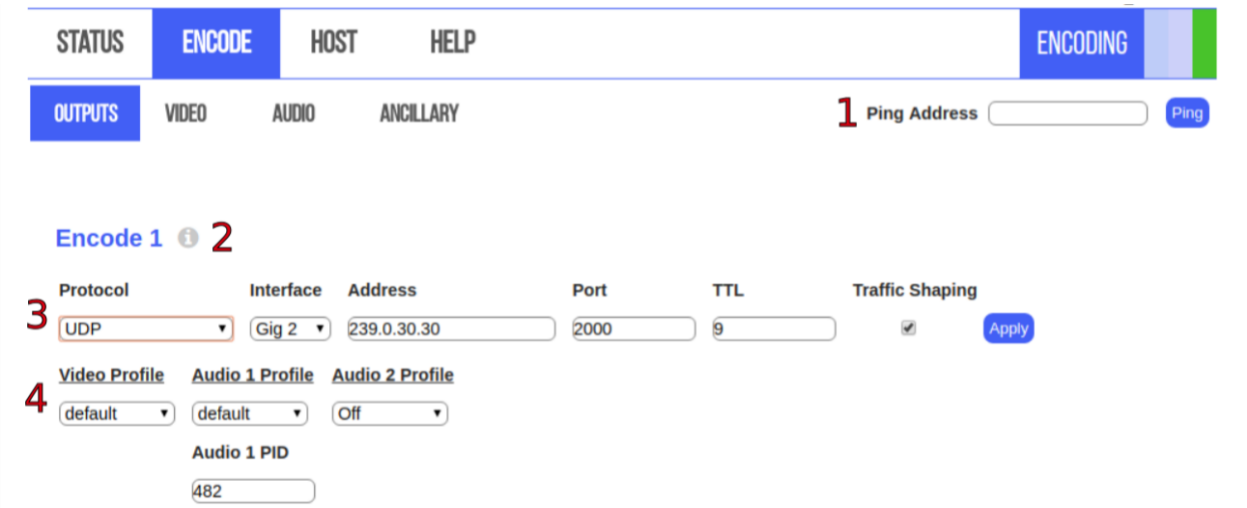
The **STATISTICS** sub tab contains information about each encode stream **(1)** updated in intervals. The information available **(2)** depends on what protocol is being decoded. All streams yield Mbps for the **Mbps graph (3)** but the **Packets** information will be available for certain

protocols like UDP/RTP and Zixi streams.

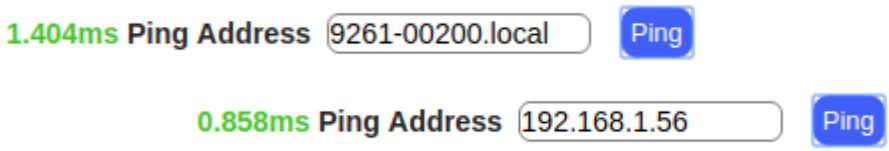


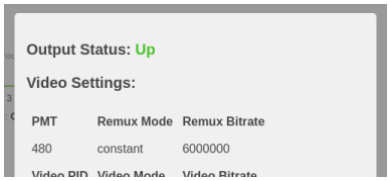
ENCODE

The OUTPUTS Sub Tab



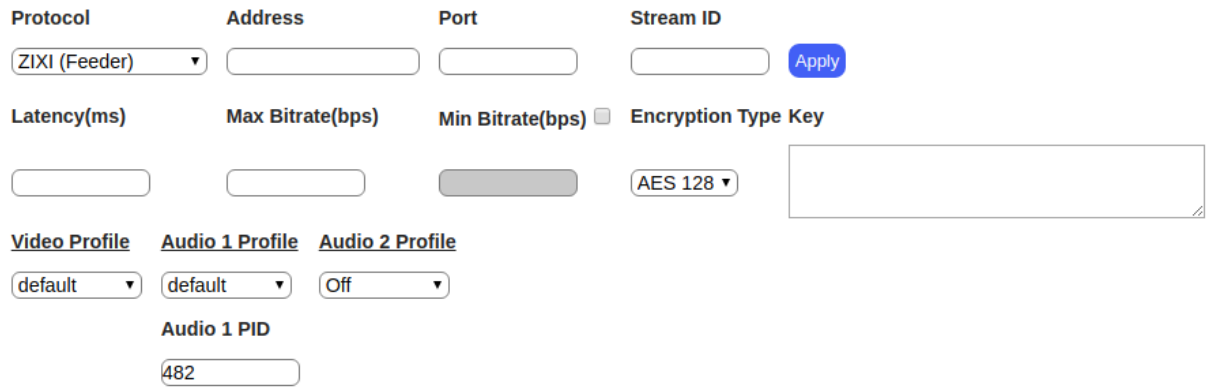
ABOVE: The **Ping Address (1)** may be used to determine whether or not a device, such as a source encoder, is on the same network as the MD9200-ENC. To use it, enter the IP address of the device in question. An Up or Down will be displayed next to this field indicating the status of the device.



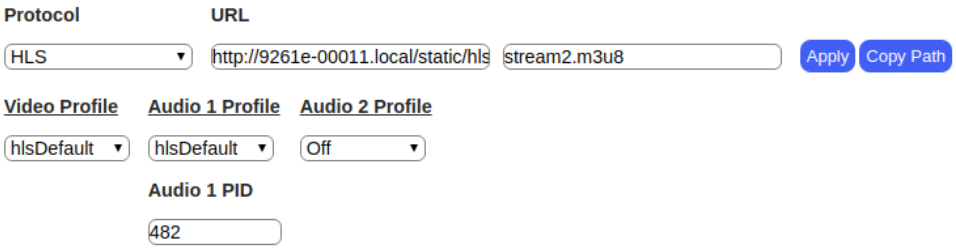


Each encode has a link **(2)** to a modal that will display what the current settings are. Use this to make sure your changes are being applied.

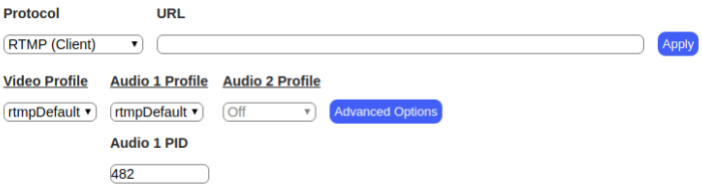
Choosing a different **protocol** will generate an appropriate form **(3)**. Make your changes and then click **Apply**.
Profiles (4) can be applied to each encode from the dropdowns. Default profiles are provided for general, hls, and rtmp. Create **custom profiles** in the **Video** and **Audio** tabs. **Audio Pids** are set in the Outputs tab on



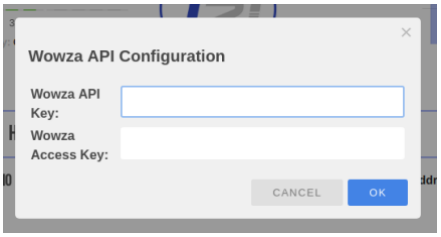
Click the **checkbox** next to **Min Bitrate** to enable the input.
Will be enabling ABR by doing so.



Click the **Copy Path** button to open a modal with the full HLS path.



Click Advanced Options to bring up the Wowza modal.
Contact Wowza for information on purchasing keys.



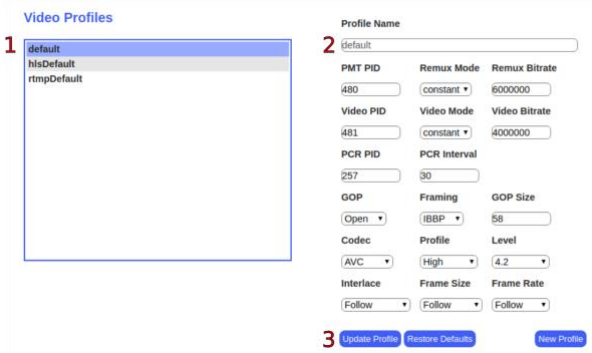
Stream Fields

FIELD NAME	DESCRIPTION	USE CASE
Protocol:	This determines the type of stream network protocol to transmit and/or receive. Each field is named for its given type, with some exceptions; the **Custom** protocol allows users to enter their own form of address, which will be parsed and utilized by the player. **Custom** is used with **HLS** and **RTSP**.	This field appears for every Protocol type.
Interface:	This field represents the physical ethernet port streams are received or transmitted on. The available options are Gig 1 and Gig 2.	UDP, RTP, TCP
Address:	This field represents the IP address the stream will be decoding. No leading zeros in IPv4 addresses as we are not constrained to octals.	UDP/RTP, SRT (Caller, Rendezvous), TCP, ZIXI (Pull, Feeder)
Port:	This field represents the ethernet port number for the stream.	UDP/RTP, SRT (Caller, Listener, Rendezvous), TCP, ZIXI (Port, Accept, Feeder)
MTU:	**Maximum Transmission Unit** is the size of the largest network layer protocol data unit that can be communicated in a single network transaction.	SRT (Caller, Listener, Rendezvous)
Encryption / Password or Key:	Choose the encryption type, AES 128 (32 char) or AES 256 (64 char).	SRT (Caller, Listener, Rendezvous), ZIXI Feeder
Timeout:	Period in seconds that the connection will try before it hangs up. If left blank factory default is 10 seconds.	SRT (Caller, Listener, Rendezvous)
Latency:	This field represents the specified latency time for sending packets of data, given in milliseconds. The default latency value is 3000 milliseconds.	SRT (Caller, Listener, Rendezvous), ZIXI (Pull, Feeder)
Stream ID:	This field represents the stream ID of a Zixi broadcaster and an **RTMP Server**. Clicking the **Regenerate** button will create a new RTMP **Stream ID** and replace the content in the field if there is any.	ZIXI (Pull, Feeder), RTMP Server

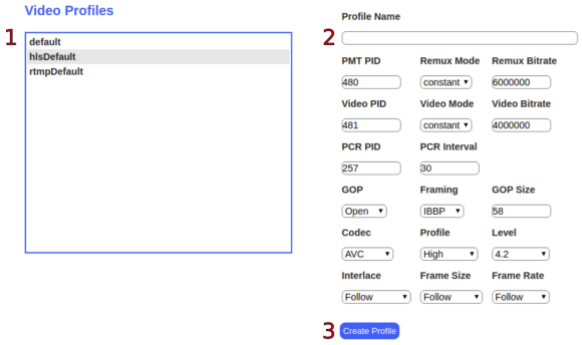
URL:	This field represents the URL address of a stream. The **RTMP** fields is tied to its respective Protocol, while the **Custom** field allows users to enter an unspecified stream address that the decoder will parse. The **HLS** second field can be changed to a personalized **Stream ID**. Copy the whole path to receive the stream.	HLS
TTL:	**Time to Live** default number of hops between devices, default value is 64.	UDP/RTP, SRT (Caller, Rendezvous)
Traffic Shaping:	Buffers the output data to ensure constant intervals between packets.	UDP/RTP
Bandwidth Overhead:	Percentage used for forward error correction.	SRT (Caller, Rendezvous)
ToS:	**Type of Service** is the payload type for prioritizing traffic through routers.	SRT (Caller, Rendezvous)
Max Bitrate:	The rate of the transport output should be set equal or greater than the total output of the device. Recommended to set 20% higher.	ZIXI Feeder
Min Bitrate:	Setting a value enables Adaptive Bitrate.	ZIXI Feeder
Output Location:	List of available directories.	File

See the **MultiDyne MD9200-ENC Stream Configuration Guide** for more information.

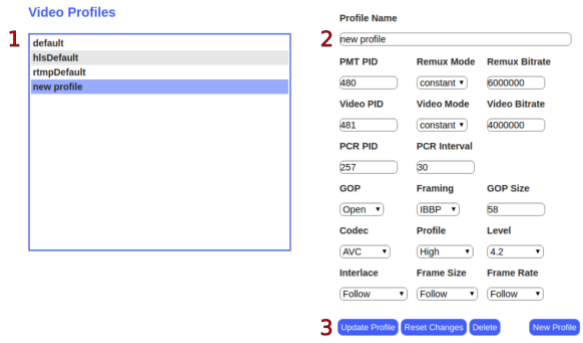
The VIDEO Sub Tab



The **Video** tab has the list **(1)** of profile settings and the form **(2)** to make changes. Clicking on the name **(1)** will highlight it in **blue** and populate its values into the form **(2)**. When looking at a default profile you and make changes and save them **(3)** with the **Update Profile** button. To return to the factory settings click the **Restore Defaults** button. To create a new profile, click the **New Profile** button.



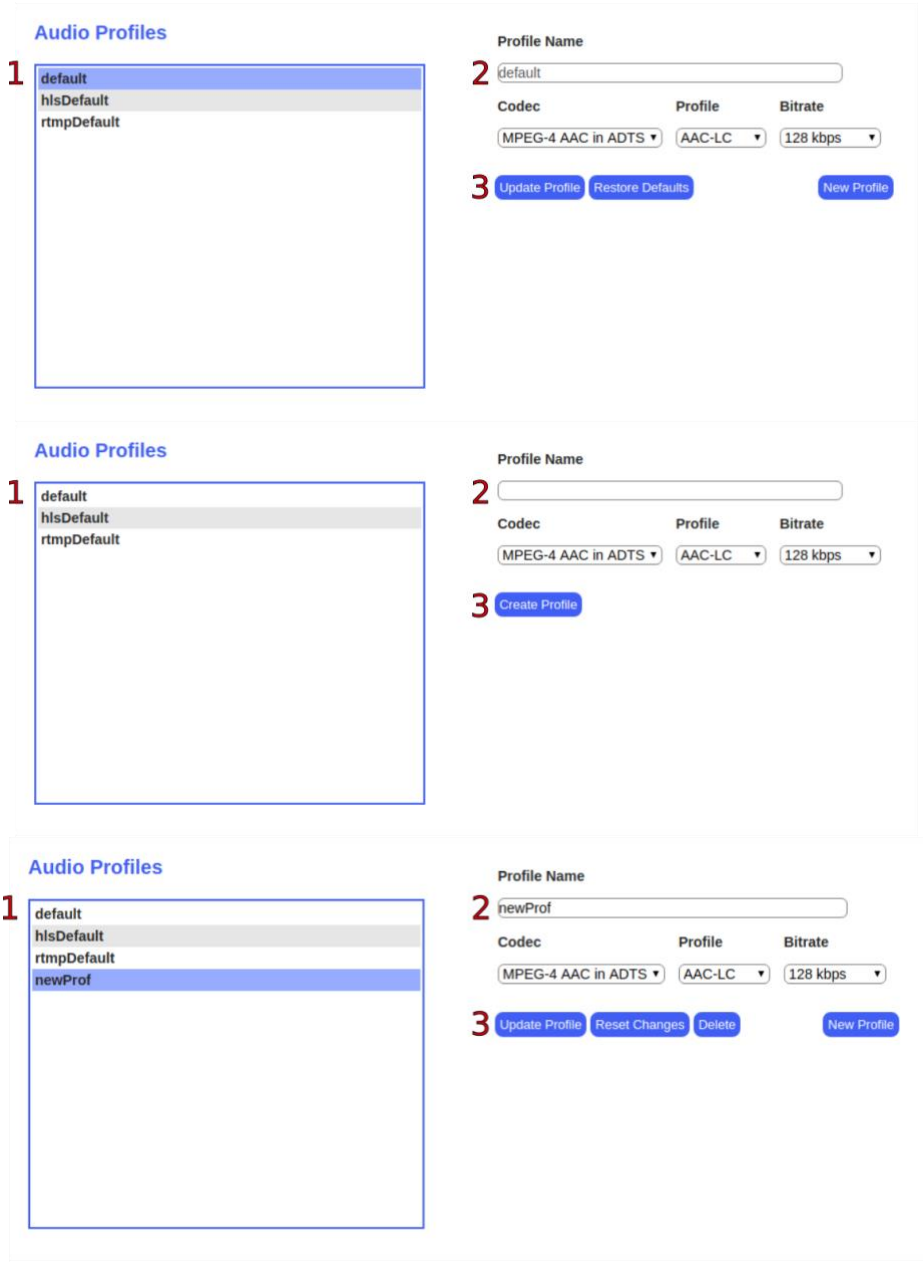
When creating a new profile, the **Profile Name** field will be enabled. No profile should be highlighted **(1)** when creating a new one. Click the **Create Profile** **(3)** button to save the new profile.



When highlighting a **custom profile,** the name is editable. **(3)** Click the **Update Profile** button to save changes. If you make changes that you don't want to save click the **Reset Changes** button to populate the values from the last time you saved. Click the **Delete** button to delete the profile. Click **New Profile** to make a new profile.

The AUDIO Sub Tab

See the **Video** tab above for form functionality.



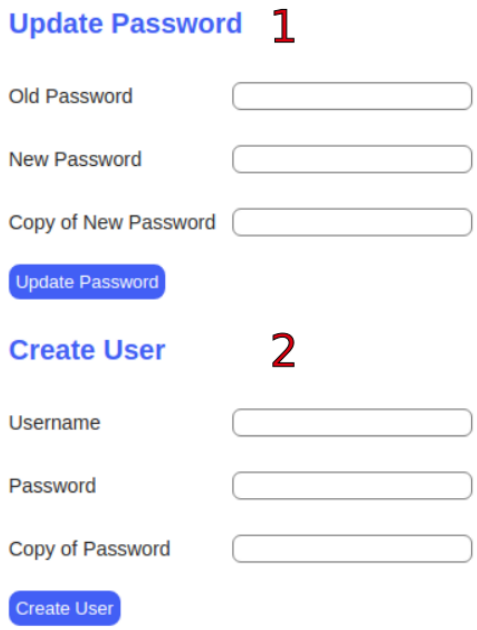
The ANCILLARY Sub Tab

(1) **Ancillary Passthrough** indicates whether you will pass any Ancillary Data through the encodes.

HOST

The SYSTEM Sub Tab

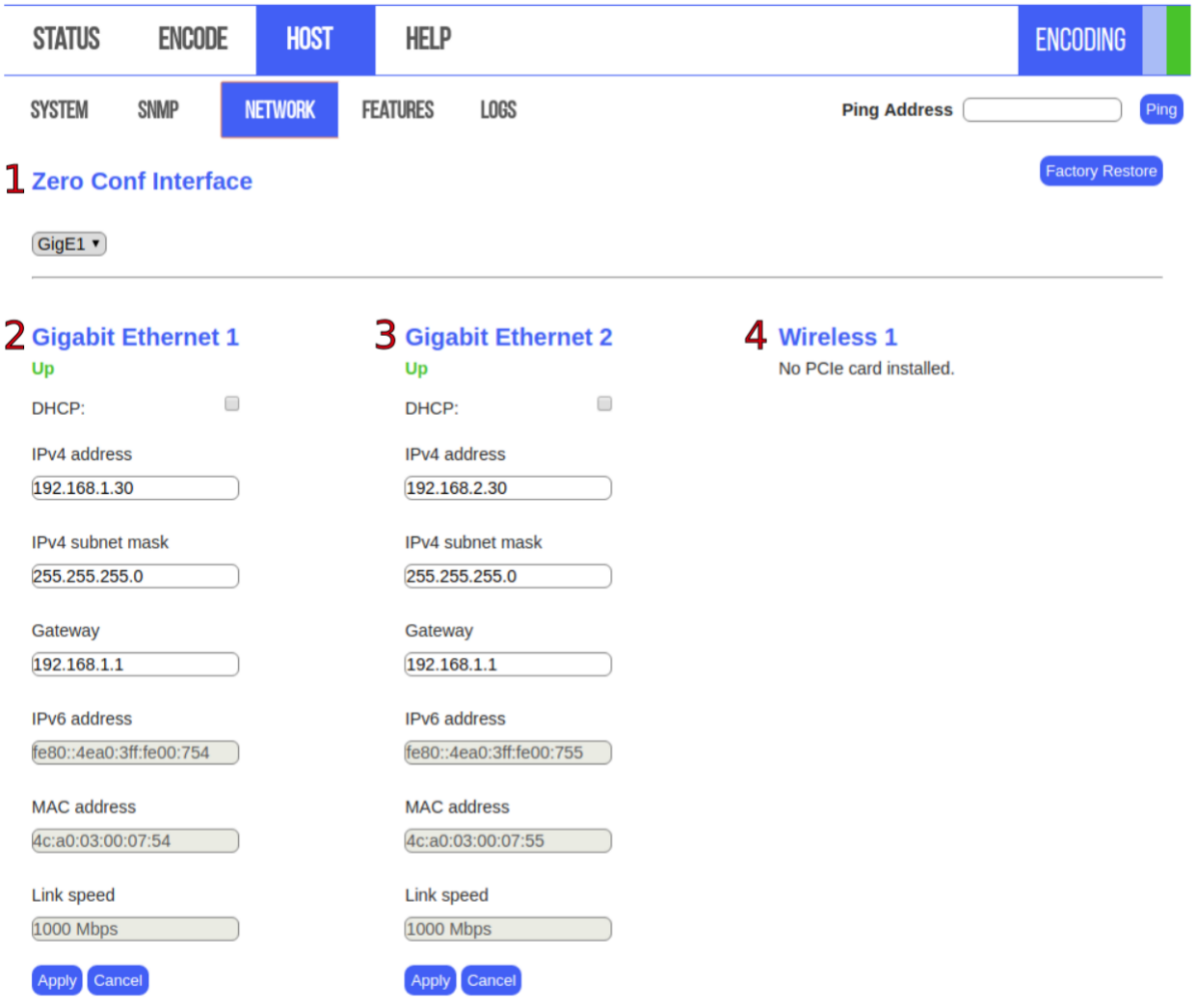
ABOVE: When a user elects to **Reboot System (1)** cycles the unit off and back on. **Factory Reset (2)** restores the encoder configuration to default settings. Beneath the 'System Stats' header, system information may be obtained. **System Location (3)** sets the current physical location of the unit for later aid in locating. **Serial Number (4)**, **Firmware Version (5)**, and **SDK Version (6)** of the unit may also be viewed. **System Uptime (7)** displays the length of time the unit has been powered on since the last reboot or firmware update. Beneath the **Update Firmware** header **(8)**, users can update the current firmware version in use by the unit. To begin, choose a file for upload. After uploading the firmware, the user has ten seconds to cancel before the update automatically begins. The **Samba Server (9)** idk. The **HTTP** dropdown **(10)** changes the domain to a secure server. **Disk Information (11)** displays to total amount of disk memory, the amount used, and the amount of free memory. This information is displayed both via image and in text for the user. Within the **Timezone** heading **(12)**, the user may update the unit's current time zone location and the NTP server address. Here, the time zones are divided into larger categories by region. Choosing a regional category will provide the user with options specific to their category to choose from.



LEFT: (Bottom of the **SYSTEM** tab) **(1)** Update the password of the user currently signed in as. **(2)** Create a new user for that unit.

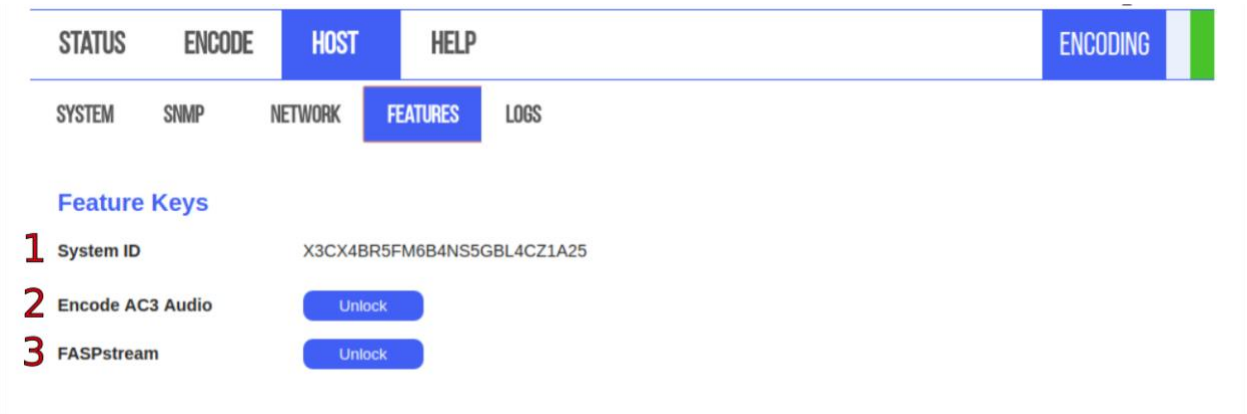
The NETWORK Sub Tab

(1) Zero Conf Interface specifies the GigE interface the localhost will resolve to. Network interface configurations may be modified in the **Gigabit Ethernet (2/3)** sections. **Connection status** is marked by **Up** or **Down**, depending on availability. **DHCP** may also be toggled. **IPv4 Address**, **IPv4 Subnet Mask**, **Gateway**, **IPv6 Address**, **MAC Address** may also be set in this subtab. **Link Speed** is also displayed. **(4) Wireless** can be configured to DHCP or Static if one has been installed.



DNS settings **(1)** of the unit may be viewed. **Route** settings **(2)** for the network may also be set; available interface options are Gig 1 and Gig 2. For most uses, however, the default route is used. 'Zero Conf' interface may be set to GigE1 or GigE2.

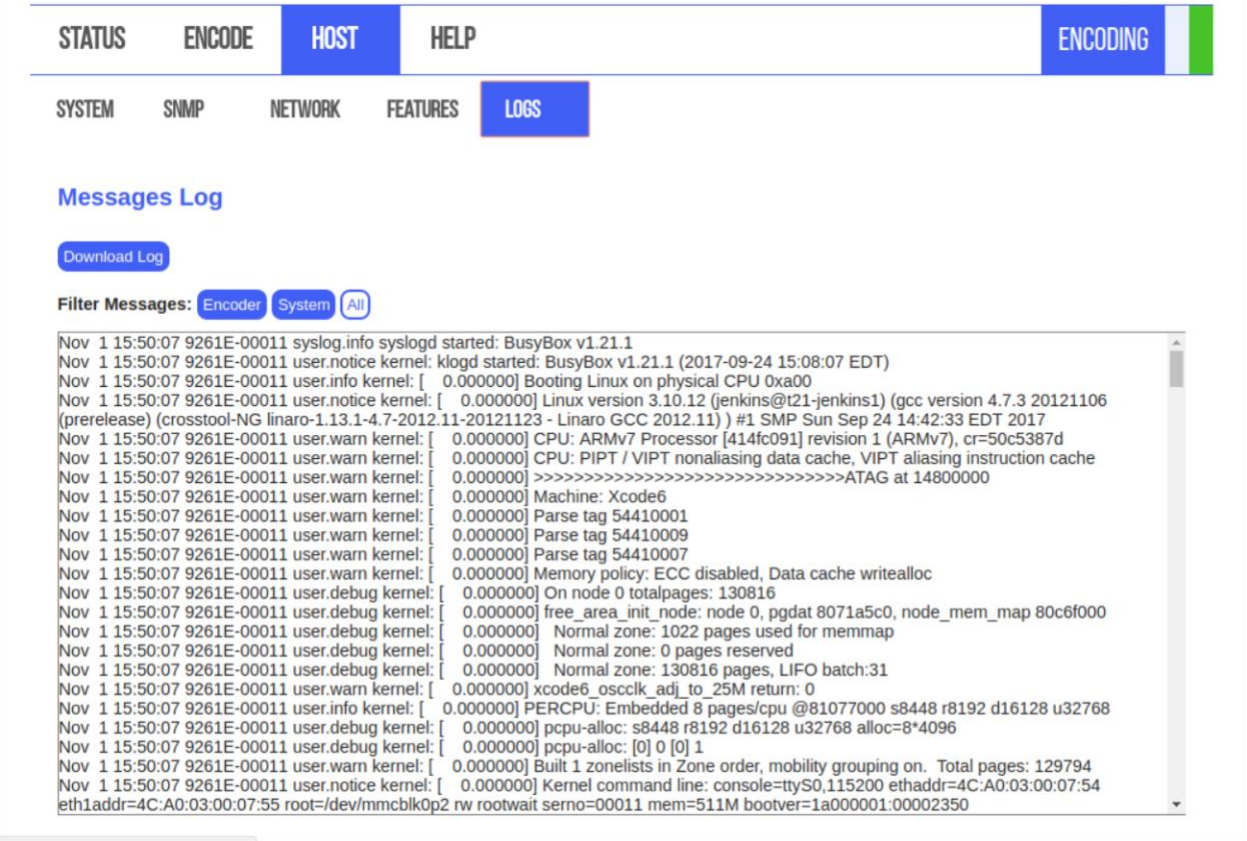
The FEATURES Sub Tab



ABOVE: To unlock a Feature users need to provide the **System ID (1)**. **(2) Encode AC3 Audio** allows for encoding to Dolby AC3 Audio Codec. **FASPstream (3)** unlocks the FASP protocol from ASPERA.

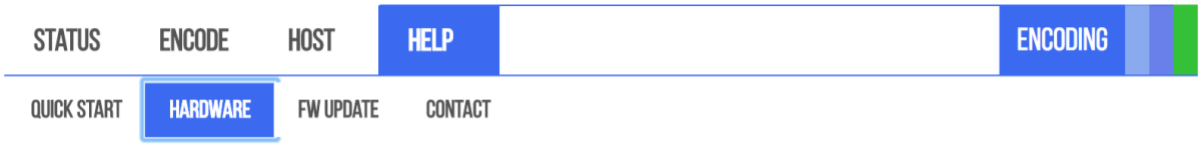
The LOGS Sub Tab

BELOW: **Download Log button** will download a tar file to user's computer. **Encoder** button will show logs from the encoder. **System** button will show all logs from the system. **All** button will show all logs. The selected **Filter** button will be white with a **blue** border. Scroll to the bottom of the logs to see most recent.



The HARDWARE Sub Tab

Information about the encoder hardware.



Front Panel

Rear Panel

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ENCODER STREAM CONFIGURATION GUIDE

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Table of Contents

This document is based off firmware version 2018-05-16_05-07-48, UI screens and operations are subject to change.

Stream Fields

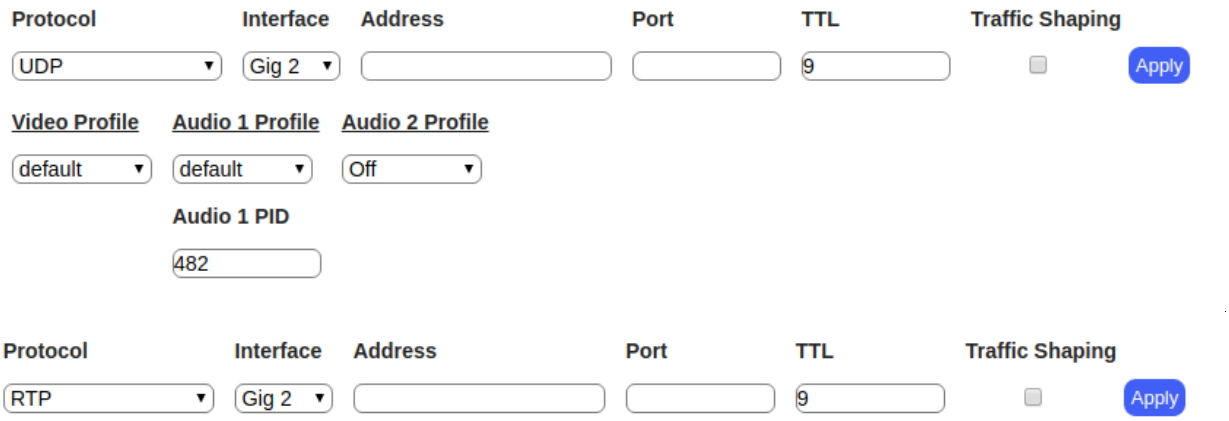
FIELD NAME	DESCRIPTION	USE CASE
Protocol:	This determines the type of stream network protocol to transmit. Each option is named for its given type.	This field appears for every Protocol type.
Interface:	This field represents the physical ethernet port streams are transmitted on. The available options are Gig 1 and Gig 2.	UDP, RTP
Address:	This field represents the IP address the stream will be sending the encoded stream to. No leading zeros in IPv4 addresses as we are not constrained to octals.	UDP/RTP, SRT (Caller, Rendezvous), ZIXI Feeder
Port:	This field represents the ethernet port number for the stream.	UDP/RTP, SRT (Caller, Listener, Rendezvous), TCP, ZIXI Feeder
MTU:	**Maximum Transmission Unit** is the maximum segment size to be transmitted, with a maximum possible value of 1500.	SRT (Caller, Listener, Rendezvous)
Encryption / Password or Key:	Choose the encryption type, AES 128 (32 char) or AES 256 (64 char), which will be used on an entered password.	SRT (Caller, Listener, Rendezvous), ZIXI Feeder
Timeout:	Period in seconds that the connection will try before it hangs up. If left blank factory default is 10 seconds.	SRT (Caller, Listener, Rendezvous)
Latency:	This field represents the specified latency time for sending packets of data, given in milliseconds. The default latency value is 3000 milliseconds.	SRT (Caller, Listener, Rendezvous), ZIXI Feeder
Bandwidth Overhead:	Bandwidth % used for SRT error correction and retransmitting packets.	SRT (Caller, Listener, Rendezvous)
Input BW:	The current input bitrate of the SRT stream to send. Used by Bandwidth Overhead to determine the percentage of extra bandwidth to be allowed for error correction.	SRT (Caller, Listener, Rendezvous)
Max BW:	Sets a hard target value for the total bandwidth limit, comprised of bandwidth	SRT (Caller, Listener, Rendezvous)

	used for the A/V bitrate as well as any error correction and SRT overhead.	
Stream ID:	This field represents the configured stream ID of an expecting Zixi broadcaster stream.	ZIXI Feeder
URL:	This field represents the URL address of a stream. The **RTMP** fields are tied to their respective Host. The **HLS** second field can be changed to a personalized **Stream ID**. Copy the whole path to receive the stream.	HLS, RTMP Client
TTL:	**Time to Live** default number of hops between devices, default value is 64.	UDP/RTP, SRT (Caller, Listener, Rendezvous)
Traffic Shaping:	Buffers the output data to ensure constant intervals between packets.	UDP/RTP
ToS:	**Type of Service** is the payload type for prioritizing traffic through routers.	SRT (Caller, Listener, Rendezvous)
Max Bitrate:	The rate of the transport output should be set equal or greater than the total output of the device. Recommended to set 20% higher.	ZIXI Feeder
Min Bitrate:	Setting a value enables Adaptive Bitrate.	ZIXI Feeder
FEC Overhead:	Sets the percentage of additional bandwidth to be allotted for FEC use, for use with Zixi Broadcasters to retransmit dropped or corrupted packets..	ZIXI Feeder
FEC Block:	The maximum time given to the FEC to correct an issue. This should not be higher than half of the Latency setting.	ZIXI Feeder
FEC Aware:	Allocates the FEC packets based on content.	ZIXI Feeder
Output Location:	List of available directories.	File
Filename:	The name of the file which will be created.	File

OUTPUTS

UDP and RTP

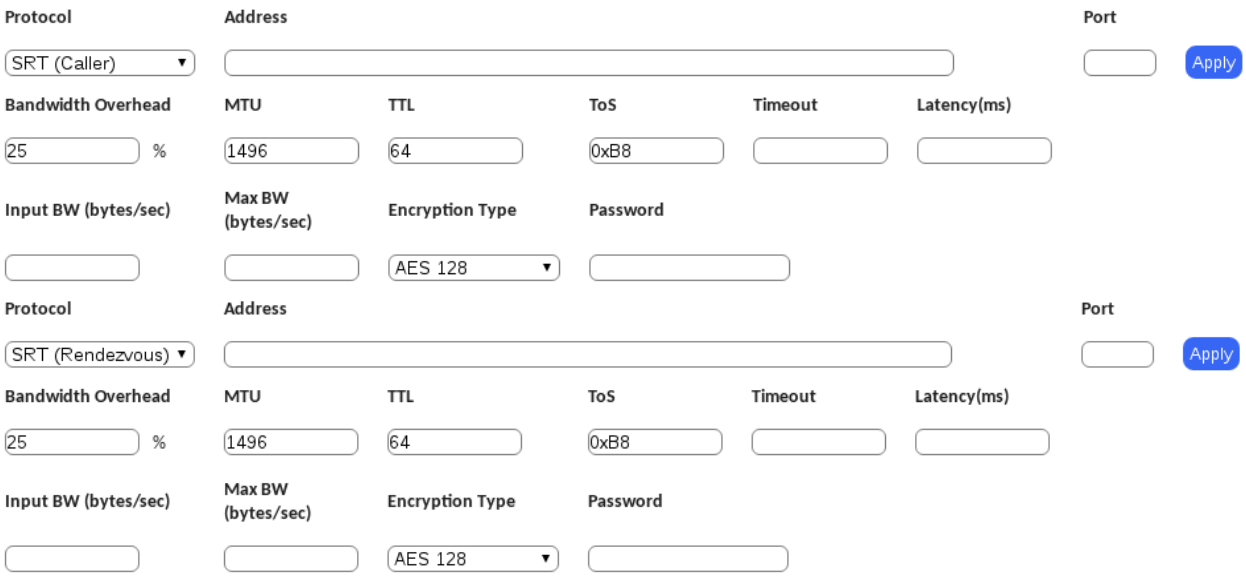
User datagram protocol used to send data over a network. RTP protocol adds packet numbering headers to UDP. The numbered headers enables the decoder to reorder the packets before decoding the stream. RTP is considered more reliable than UDP. Supports unicast and multicast.



Configuration Information	
Interface:	Select the GigE interface you wish to stream from.
Address:	For multicast, enter the streams multicast address. Example: 239.0.24.24:2000. For unicast, enter the IP address of the device you are streaming to. Example: 192.168.2.7:2000 if the interface is MultiDyne default IP address for Gige2. The device streaming to the MultiDyne decoder must be configured to stream to 192.168.2.7 on port 2000. Unicasts are much friendlier to corporate networks. Multicast can take corporate networks down if they are not configured to support Multicast and IGMP.
Port:	The port the stream is carried on.
TTL:	Time To Live, which specifies the number of hops a packet can make between devices before it is considered stale and destroyed.
Traffic Shaping:	Turns on the traffic rate shaping for your output stream. This is more resource-intensive, but produces a smooth bitrate stream.

SRT (Caller and Rendezvous)

SRT Caller requires the **Address** and **Port** of the device receiving at **SRT Listener**. SRT Rendezvous requires the the **Address** and the mutually agreed on **Port** of the device rendezvousing at **SRT Rendezvous**.

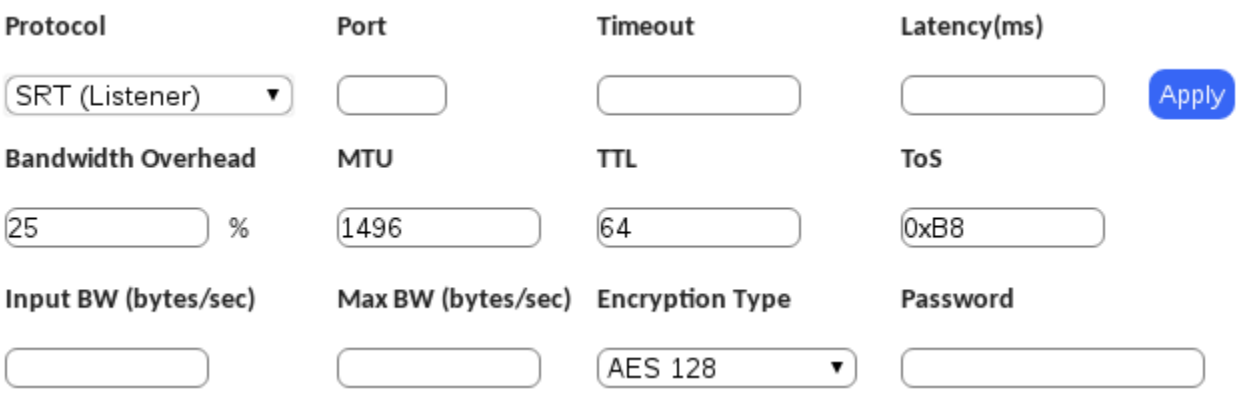


Configuration Information	
Address:	SRT is a single connection protocol. The address is the IP address of the destination device.
Port:	Match the port the stream is being output to.
Encryption Type and Password:	Set an encryption type on a password. The password can be 10-79 characters.
Bandwidth Overhead:	SRT Bandwidth Overhead is calculated as a percentage of the A/V bit rate, such that the sum of the two represents a threshold bit rate, which is the maximum bandwidth the SRT stream is expected to use. The default is 25%, the maximum is 50%. This represents the maximum allotted bandwidth which can be used for stream correction on noisy networks.
Input BW:	The current input bitrate of the SRT stream to send. When transcoding, this is the configured video bitrate. This is used by Bandwidth Overhead to determine the percentage of extra bandwidth to be allowed for error

	correction. If left empty, the input bitrate will be evaluated internally by the SRT library. If using Max BW to set a target bandwidth, leave empty.
Max BW:	An alternative method for setting a hard target value for the total bandwidth limit, comprised of bandwidth used for the A/V bitrate as well as any error correction and SRT overhead. When using this, Input BW and Bandwidth Overhead can be left empty. Setting a -1 here represents 'infinite', and allows up to the maximum SRT bandwidth (roughly 30mbps).
MTU:	Maximum packet size of the UDP-based packet. Maximum possible is 1500, default is 1496.
TTL:	Time to Live, the maximum number of hops a packet can make between devices before it is considered stale and destroyed.
ToS:	The Type of Service field in the IPv4 header, which sets a priority value on the packet.
Timeout:	Amount of time to wait before connection experiences timeout. When left blank, factory default is 10 seconds.
Latency:	A fixed value (from 20 to 8000 ms) representing the maximum buffer size available for managing SRT packets. When left blank, factory default value is 3000 milliseconds. The larger value of the two (set by source and destination) will be used during the connection.

SRT Listener

SRT Listener specifies the **Port** which the device will listen at for an **SRT Caller** connection.

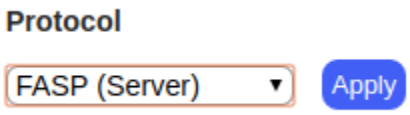


Configuration Information	
Port:	Match the port the stream is being output to.
Encryption Type and Password:	Set an encryption type on a password. The password can be 10-79 characters.
Timeout:	Amount of time to wait before connection experiences timeout. When left blank, factory default is 10 seconds.
Latency:	A fixed value (from 20 to 8000 ms) representing the maximum buffer size available for managing SRT packets. When left blank, factory default value is 3000 milliseconds. The larger value of the two (set by source and destination) will be used during the connection.
Bandwidth Overhead:	SRT Bandwidth Overhead is calculated as a percentage of the A/V bit rate, such that the sum of the two represents a threshold bit rate, which is the maximum bandwidth the SRT stream is expected to use. The default is 25%, the maximum is 50%. This represents the maximum allotted bandwidth which can be used for stream correction on noisy networks.
Input BW:	The current input bitrate of the SRT stream to send. When transcoding, this is the configured video bitrate. This is used by Bandwidth Overhead to determine the percentage of extra bandwidth to be allowed for error correction. If left empty, the input bitrate will be evaluated internally by the SRT library. If using Max BW to set a target bandwidth, leave empty.
Max BW:	An alternative method for setting a hard target value for the total bandwidth limit, comprised of bandwidth used for the A/V bitrate as well as any error correction and SRT overhead. When using this, Input BW and Bandwidth Overhead can be left empty. Setting a -1 here represents 'infinite', and allows up to the maximum SRT bandwidth (roughly 30mbps).

MTU:	Maximum packet size of the UDP-based packet. Maximum possible is 1500, default is 1496.
TTL:	Time to Live, the maximum number of hops a packet can make between devices before it is considered stale and destroyed.

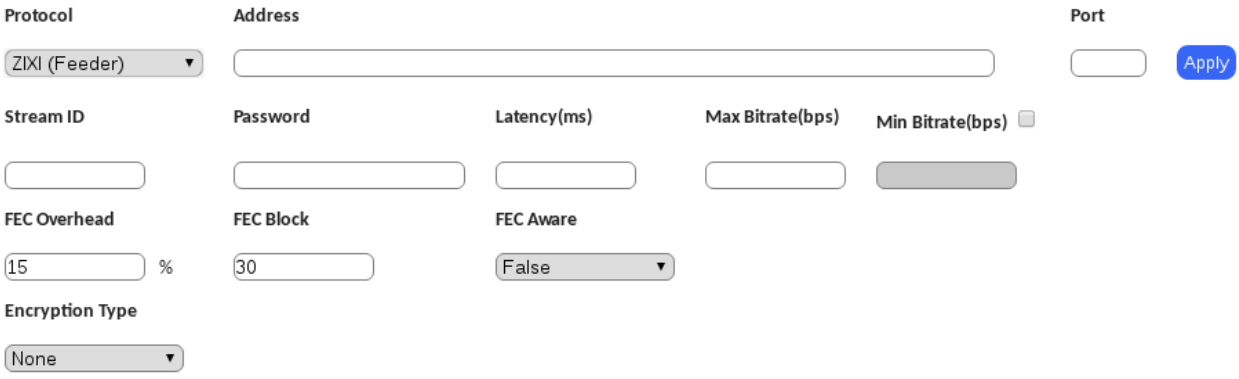
FASP Server

For Encoding, no additional options need to be set when using **FASP Server**. The **FASP Client** will specify the address of the device to receive from, the data port, and the target bitrate. No port or interface need to be specified here as it is a one-to-one device connection.



ZIXI Feeder

ZIXI Feeder requires the **Address** and **Port** of the Zixi Broadcaster which will receive the stream as its input, as well as any authentication parameters required by the particular Broadcaster stream connection.

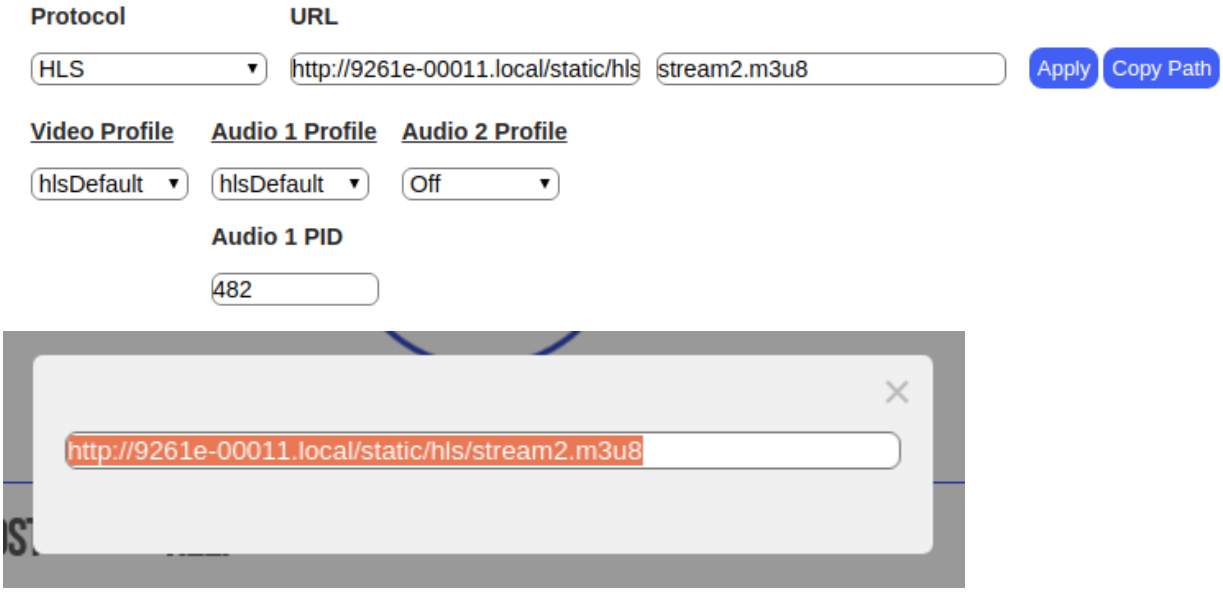


Configuration Information	
Address:	The address of the Zixi Broadcaster, which may be an IP address or a domain name (proper DNS settings must be set on your device).
Port:	The input port of the Zixi Broadcaster. Default is 2088.

Stream ID:	The ID used by the Zixi Broadcaster to identify the stream. This must be set up on the Broadcaster before the Zixi Feeder is started.
Password:	The password specified on the Zixi Broadcaster.
Latency:	Increasing latency will improve stream quality in poor network scenarios. When left blank, the default value is 3000 milliseconds.
Max Bitrate:	Set the maximum bitrate to be sent to the Zixi Broadcaster.
Min Bitrate:	Setting a minimum bitrate is used an adaptive bitrate output stream is desired. Checking the box will enable the field to enter a bitrate.
FEC Overhead:	Sets the percentage of additional bandwidth to be allotted for FEC use (Forward Error Correction, for retransmitting dropped or corrupted packets). The default value is 15%.
FEC Block:	The maximum time given to the FEC to correct an issue. This should not be higher than half of the Latency setting.
FEC Aware:	Allocates the FEC packets based on content.

HLS

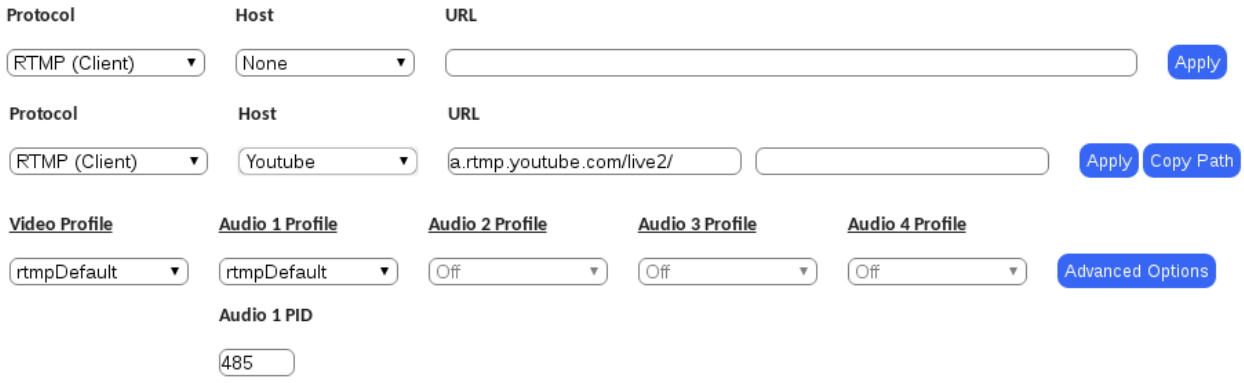
HLS generates .ts file segments and a manifest file, and the URL signifies the address of the device and the location at which the manifest file can be accessed.

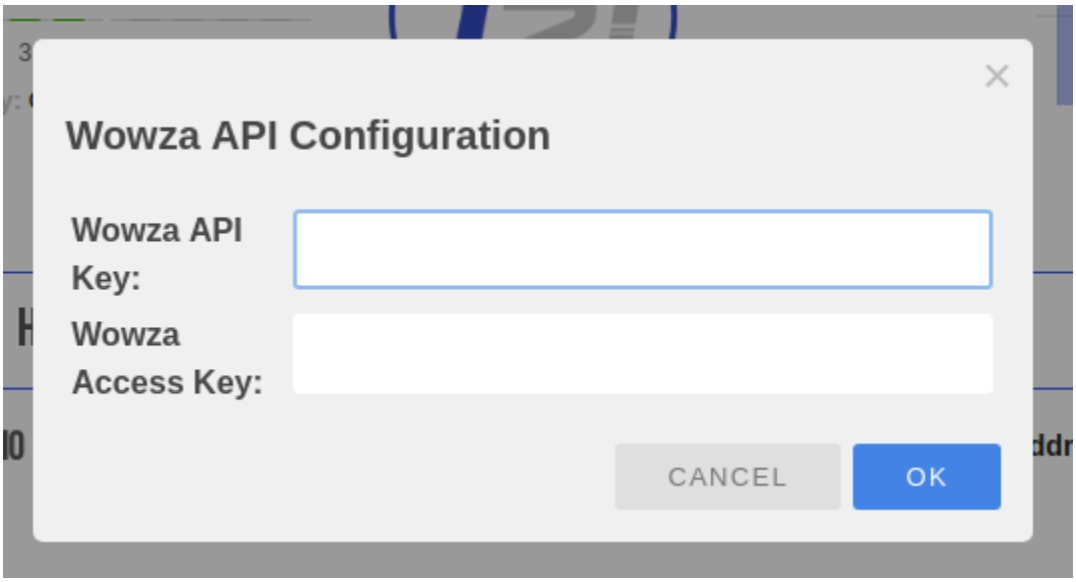


Configuration Information	
URL:	The first field cannot be edited, but shows the URL at which the stream can be accessed; this is a URL to your device, and as such, this can be an IP address (public or local), or a name such as the device's Zero Conf interface address shown above. The second field can be edited to a personalized stream ID.
Copy Path:	For easy access to entire path for copying purposes click this button.

RTMP Client

Typically used to livestream to sites like Youtube or Twitch, this can also be used to output to other MULTIDYNE devices. The URL is manufactured with a key unique to your account provided by the site.





Configuration Information	
URL:	This is the full path to the RTMP server. For Wowza, it is the address of the Wowza server, provided by Wowza. In the second field, you will provide the key specific to your account as given by the site.
Advanced Options	
Wowza API Key:	Provided by the Wowza user credentials on the Wowza server.
Wowza Access Key:	Provided by the Wowza user credentials on the Wowza server.

File

Use this feature to record the encoded stream to disk.

Configuration Information	
Output Location:	Disk mount where the file will be recorded.
Filename:	User defined file name.

TCP (Server)

TCP requires the **Port** where the device will listen for incoming connections.

Configuration Information	
Port:	Port value where the device will listen for connections.