

ULTRA ENCODE

User Manual, Reference and FAQ



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Preface



Introduction

Our Ultra Encode family of universal live media encoders offers systems integrators, streaming professionals, and OEM partners a flexible and affordable encoding solution for applications including live streaming, AV over IP, remote contribution, IP production workflows and much more. Available in HDMI and SDI models, it builds on the functionality of the Ultra Encode family with expanded features including 4K encoding and streaming from the HDMI input; simultaneous multi-protocol streaming; higher streaming bitrates; file recording; and much more. This device is ideal for high-quality live streaming of content including sports, education, and live events as well as IP-based production and AV-over-IP.

Encoder supports multiple video encoding formats – including H.264, H.265 (HEVC), and NDI®|HX2 – and a wide array of delivery protocols including RTMP, RTMPS, SRT, RTSP, RTP, HLS, TS over UDP, TS over RTP, and TVU's ISSP technology. Up to eight channels of audio can be encoded in AAC format.

Encoder is ideal for broadcast video and audio, natively support live broadcast for Facebook, YouTube, and Twitch, as well as your own site, with multi-platform distribution. To customize encoder perfectly for your session, we have Web UI, where device work status, a thumbnail preview window and tabs for streaming settings, analytics, and stream health monitoring are provided.

Key Features

- Support RTSP/RTMP/RTMPS/SRT Caller/SRT Listener/NDI®|HX2/HLS/TS over UDP/TS over RTP/TVU ISSP streaming protocols
- Dual stream encoding - main-stream and sub-stream
- 8 overlays for main and sub streams each
- Specify main stream or sub stream for each streaming session
- Multi-streaming to various video platforms simultaneously
- H.264 and H.265 (HEVC) Video encoders
- AAC Audio encoder
- Web UI - a remote network management system - provides webpage configuration with kinds of customization for device functions

System Requirements

Network

- 10/100/1000Mbps Ethernet
- Wi-Fi 802.11 a/b/g/n/ac
- USB 4G/5G mobile broadband modem (not included)
- USB Net

Web UI Supported Web Browser

- Microsoft Edge
- Mozilla Firefox version 61 and above
- Google Chrome version 49 and above
- Apple Safari 11.1 and above
- Opera 55.0.2994.44 and above

Ultra Encode Family

- Ultra Encode HDMI
- Ultra Encode SDI

Tutorial

Let's learn by example.

Throughout this tutorial, we'll walk you through the creation of a basic YouTube live streaming with Ultra Encode.

It'll consist of two parts:

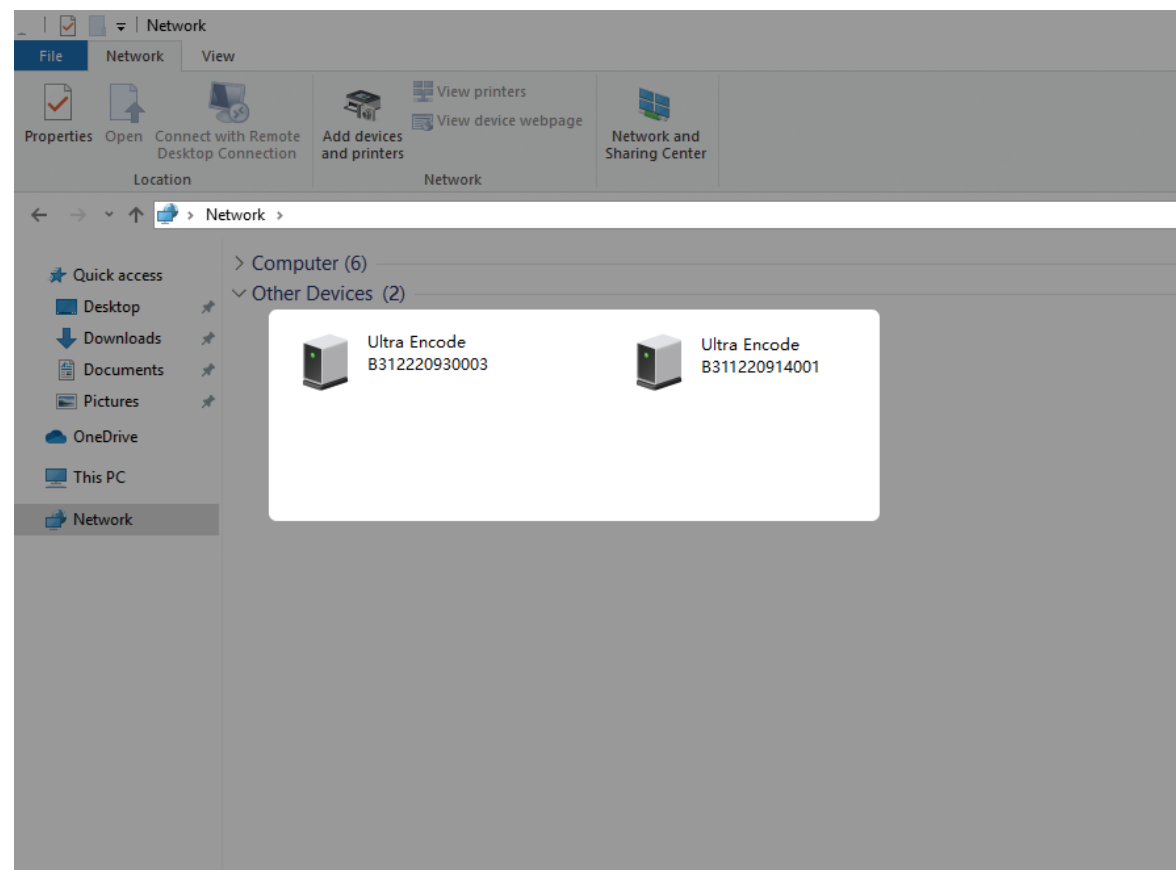
[Part 1. Ultra Encode setup](#)

[Part 2. YouTube setup](#)

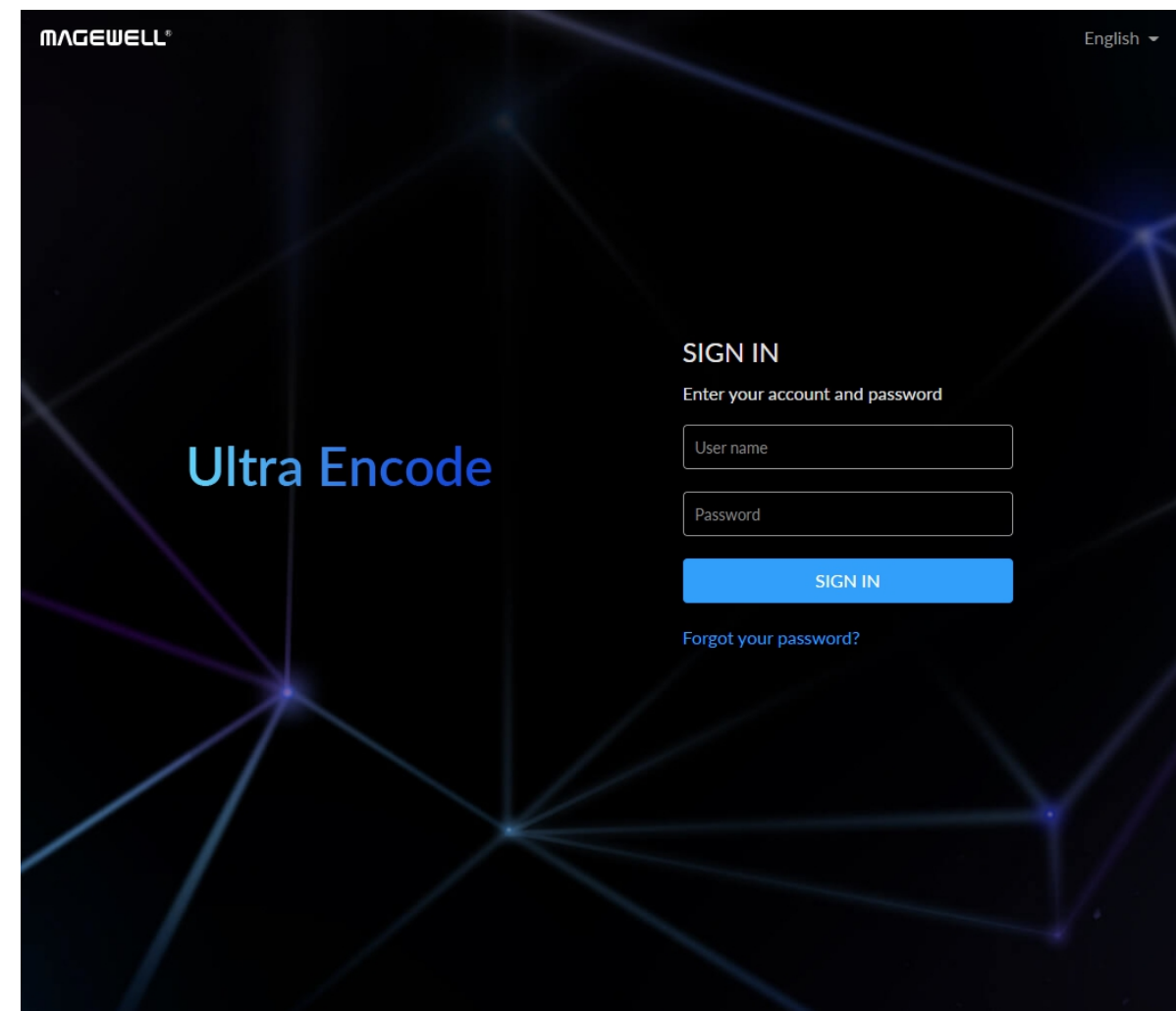
Part 1. Ultra Encode Setup

1. Find Ultra Encode

1. Connect the encoder to a LAN and power it up.
2. Connect input signal.
3. Access Web UI
 - i. In Windows 10, open a File Explorer window, find the encoder in **Network > Other Devices**.
 - ii. Double click a encoder icon to open the Web UI of the device in your default web browser.
4. Log in with your username and password.



Find your Device



Sign In

2. Add YouTube streaming session

1. In the left control pane, go to **Live** tab. Click **Add Destination** and choose **YouTube RTMP**.
2. Go to YouTube <https://www.google.com/device>, and paste the code prompted.

YouTube RTMP



Next, visit
<https://www.google.com/device> on
your smartphone or computer and
enter this code:

YQFG-TGWL 

Go to YouTube



Connect a device

Enter the code displayed on your device

Enter code

YQFG-TGWL

Next

3. Follow the page instructions to log in and trust your device.

YouTube RTMP



Next, visit
<https://www.google.com/device> on
your smartphone or computer and
enter this code:

YQFG-TGWL

Go to YouTube

Sign in with Google



Choose an account
to continue to **Ultra Streamer**



Use another account

To continue, Google will share your name, email address, language preference, and profile picture with Ultra Streamer. Before using this app, you can review Ultra Streamer's [privacy policy](#) and terms of service.

4. Choose the **Event** where you want to show your video clips.
Then you can simply save the server with default parameters for streaming.
5. Go back to the **Live** tab and turn on the switch before YouTube icon to start the streaming session.
Now the encoder is ready to bring your content to YouTube directly with all these settings.

Part 2. YouTube Setup

Create a live stream task in YouTube Studio to go live, and specify the Title, Category, Privacy, etc.

The screenshot shows the YouTube Studio interface for setting up a live stream. The top navigation bar includes the YouTube logo, a menu icon, and user profile settings. The left sidebar contains icons for the live stream, camera, and calendar.

The main content area is divided into two sections. The top section, titled "Live Stream", displays the stream title "Live Stream", category "Gaming", and privacy setting "Private". It also shows "Viewers waiting" and "Likes" counts, both at 0. An "EDIT" button is visible. Below this, a progress indicator shows "Start sending us your video from your streaming software to go live".

The bottom section, titled "STREAM SETTINGS", is divided into three tabs: "STREAM SETTINGS", "ANALYTICS", and "STREAM HEALTH". The "STREAM SETTINGS" tab is active, showing the following options:

- Stream key:** Select stream key (Default stream key (Variable)). Stream key (paste in encoder) is masked with dots. Buttons for "RESET" and "COPY" are present.
- Stream URL:** rtmp:// [masked]. Button for "COPY" is present.
- Backup server URL:** rtmp:// [masked]. Button for "COPY" is present.
- Stream latency:** Three radio buttons are shown: "Normal latency", "Low-latency" (selected), and "Ultra low-latency".
- Additional settings:** Includes "Enable DVR" (toggle on), "360° video" (toggle off), "Added delay" (set to "None"), "Closed captions" (toggle off), and "Unlist live replay once stream ends" (toggle off).

The right sidebar contains a "Live chat" section with a welcome message and a "LEARN MORE" link. At the bottom of the sidebar, there is a chat input field with a placeholder "Say something..." and a character count "0/200".

Installation

Safety Information

Electrical Safety

- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that you are using the correct power adapter for the local voltage. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power adapter is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer for help.

Operation Safety

- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you notice any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- If you encounter technical problems with the product, contact your dealer or the Magewell Support Team via support@magewell.net.

FCC Compliance Statement

This 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 cause undesired operation
- (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Statement

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and 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 device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement

The antennas used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located for operating in conjunction with any other antenna or transmitter.

Interfaces & Indicators

Ultra Encode HDMI

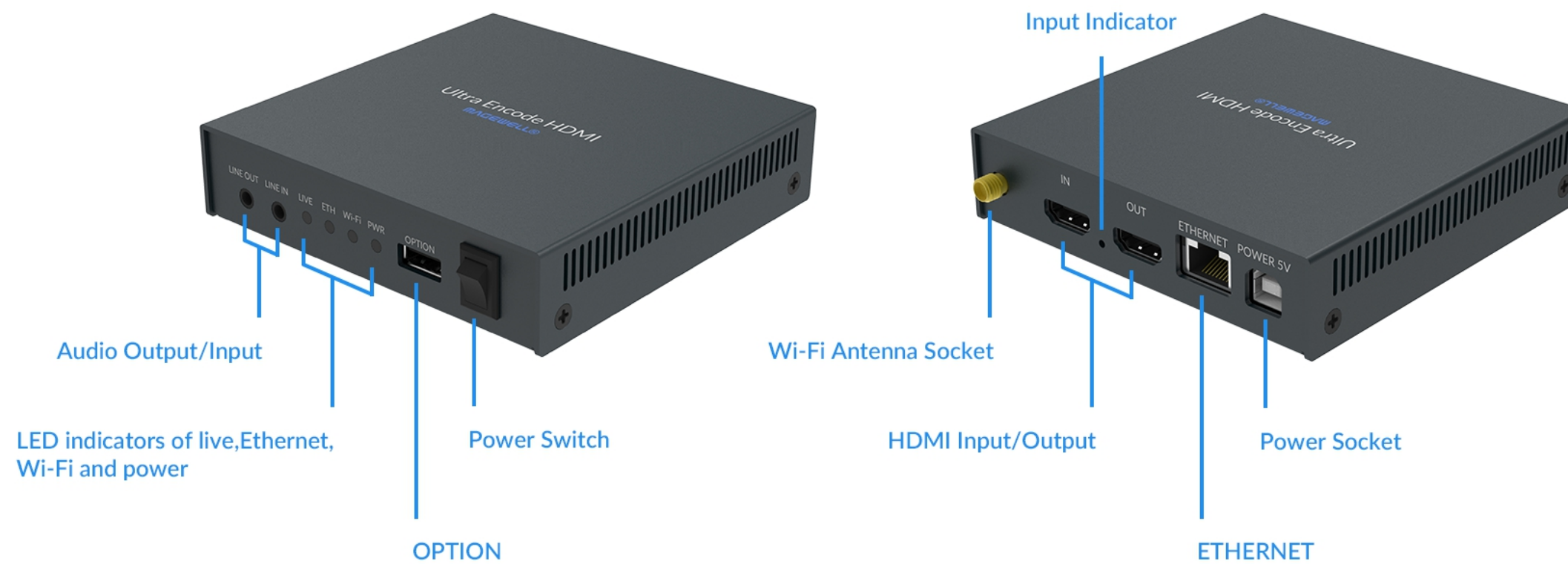


Figure 1 Ultra Encode HDMI

⚠ Plug included Wi-Fi antenna when you want to connect to a wireless network.

Ultra Encode SDI

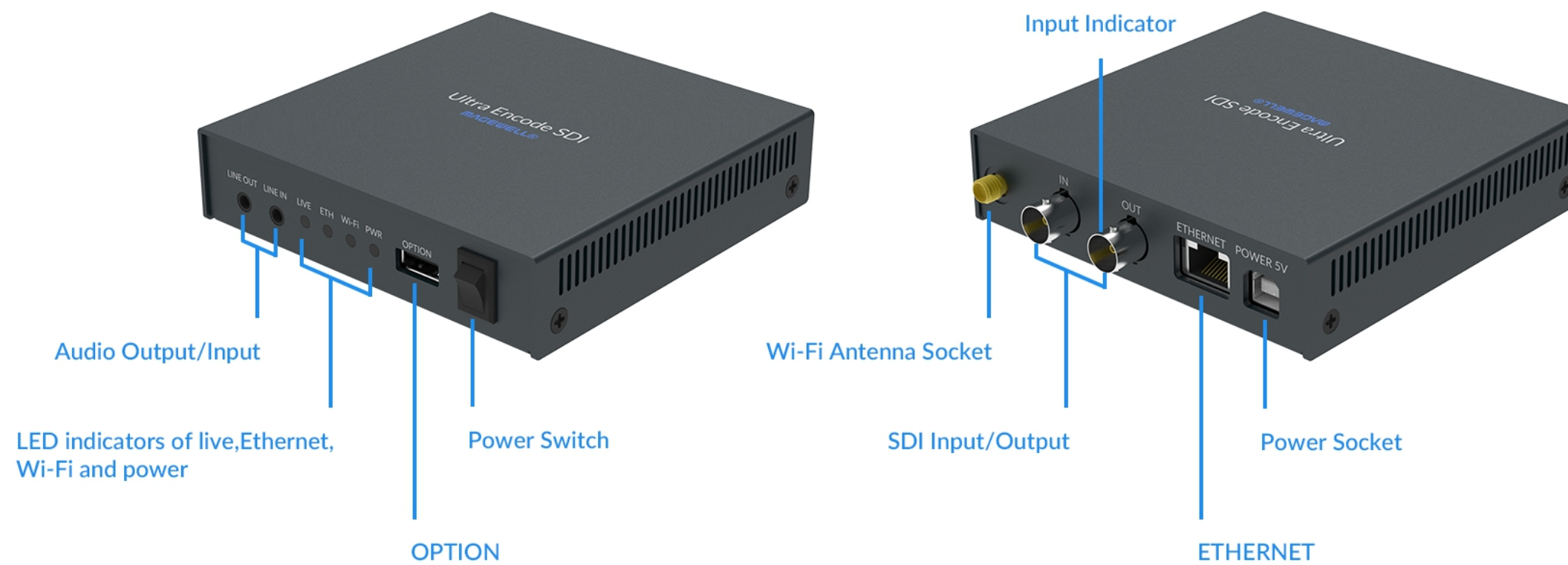


Figure 2 Ultra Encode SDI

⚠ Plug included Wi-Fi antenna when you want to connect to a wireless network.

Indicators

Indicators status is as follows.

PWR (Power)

- On: power on.
- Off: power off.

IN (HDMI/SDI)

- On: input signal detected.
- Breathing: input signal undetected.

LIVE

- On: the encoder is streaming to at least one streaming address.
- Breathing: none of the live sessions is enabled.

ETH

- On: Ethernet connected.
- Off: Ethernet unconnected.

Wi-Fi

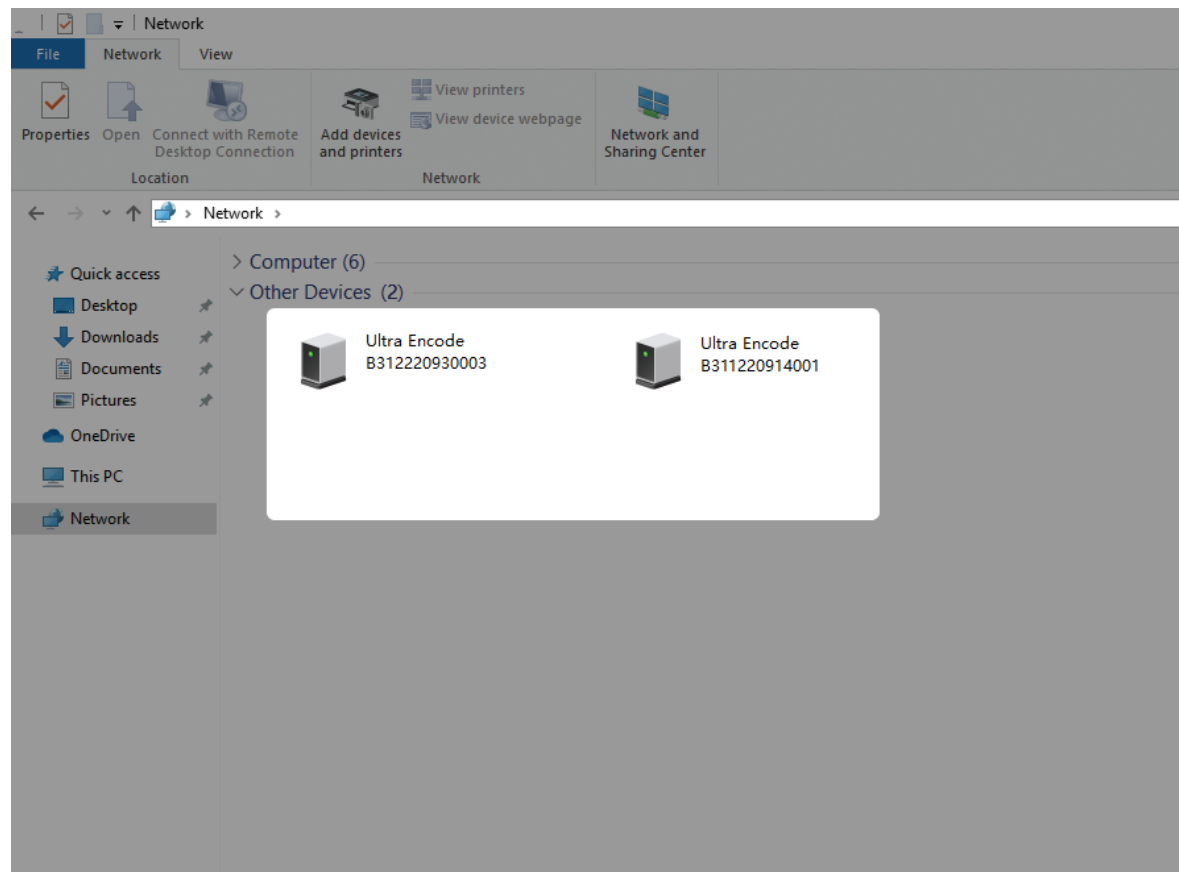
- On: Wi-Fi connected.
- Breath: Wi-Fi not connected or connecting.

Multiple indicators flash:

- All but PWR indicator lights flash once simultaneously: system is booting up or rebooting.
- The indicator lights flash in turn from IN, Live to Wi-Fi: firmware is updating.

⚠ If any other status appear, please try to unplug and re-plug in the power cable to recover your encoder.

Get Started With Ultra Encode



Access Web UI

Manage your device via wired networks, USB NET, or Wi-Fi.

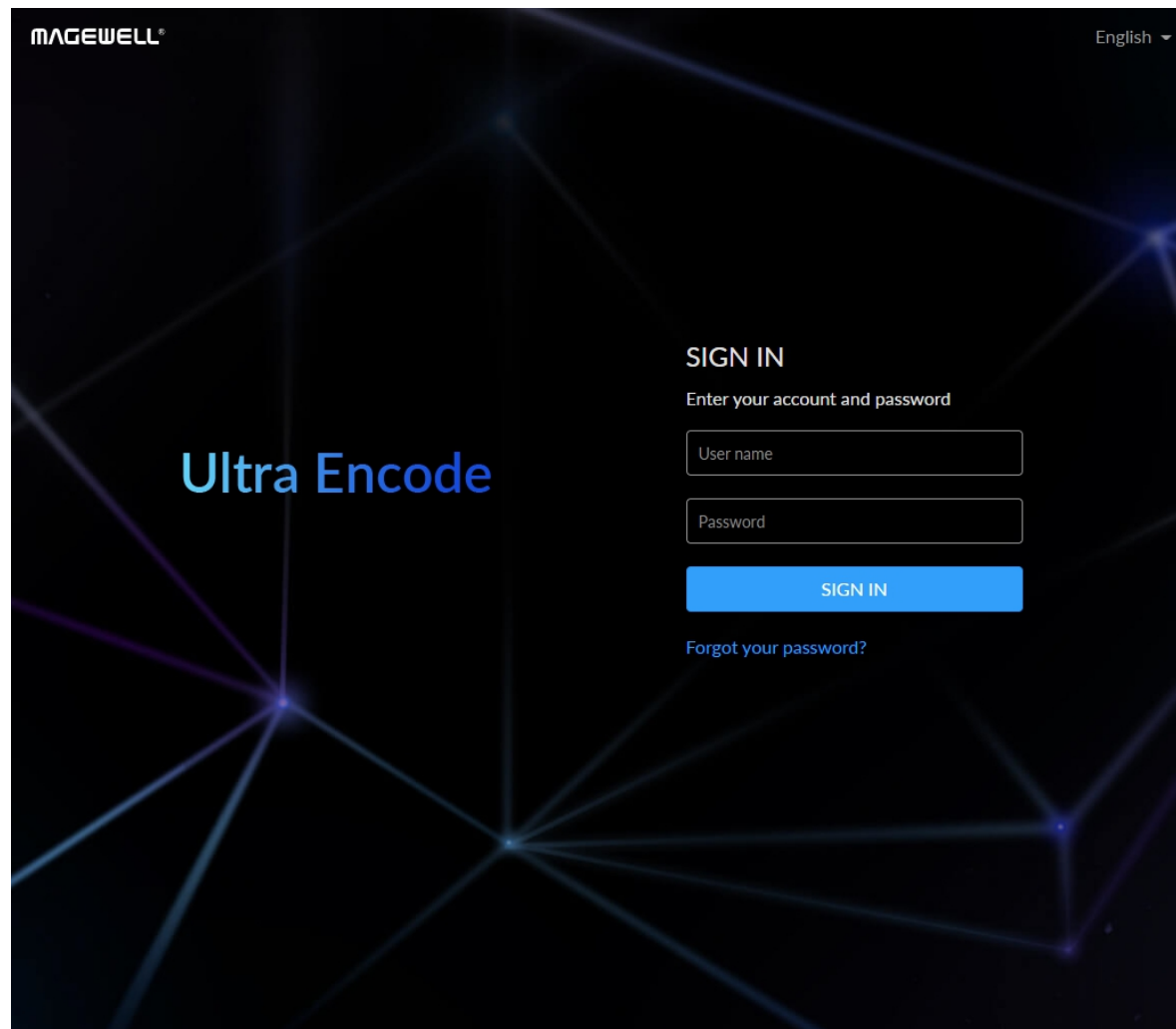
1. Connect your device to your LAN and power it up.

⚠ To ensure a smooth video, you are recommended to connect to a wired network.

2. Open Web UI:
 - Via File Explorer on Windows 7 and above
 - i. Open File Explorer in your PC, then locate your device in **Network > Other Devices**.
 - ii. Double click the device icon, open the sign page of Web GUI.
 - Via USB NET, IP Address: 192.168.66.1
 - i. Connect the device to your computer using provided USB cable.
 - ii. Type the USB NET IP address 192.168.66.1 in your web browser to access the Web UI.
 - Via device Wi-Fi AP, IP Address: 192.168.48.1

⚠ Plug included Wi-Fi antenna when you want to connect to a wireless network.

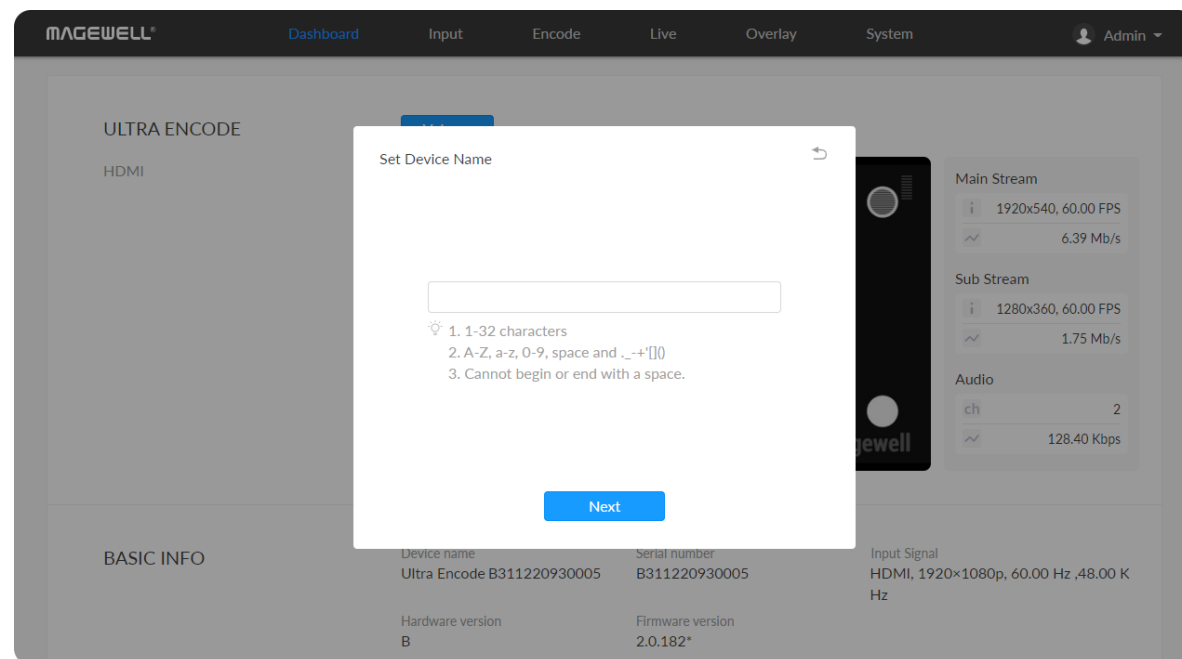
- i. In your smartphone/tablet/laptop, turn on WLAN, search for and join the device AP named **Ultra Encode + (Serial number)**.



The AP names after your gear's **Serial number**, and the password is the last 8-number of the serial number. For example, a serial number 311210101001 indicates the initial AP password is 10101001.

We recommend that the distance between the Web UI and the encoder should be within 10m.

- ii. In your web browser, enter 192.168.48.1 to open the Web UI.
3. Input your username and password.
 - The default administrator name and password are both Admin.
 - We recommend you to modify the admin password after initial logging-in.



Initialization

Follow the instructions of the Web UI to perform the device initialization and set a new device name.

Web UI Configuration

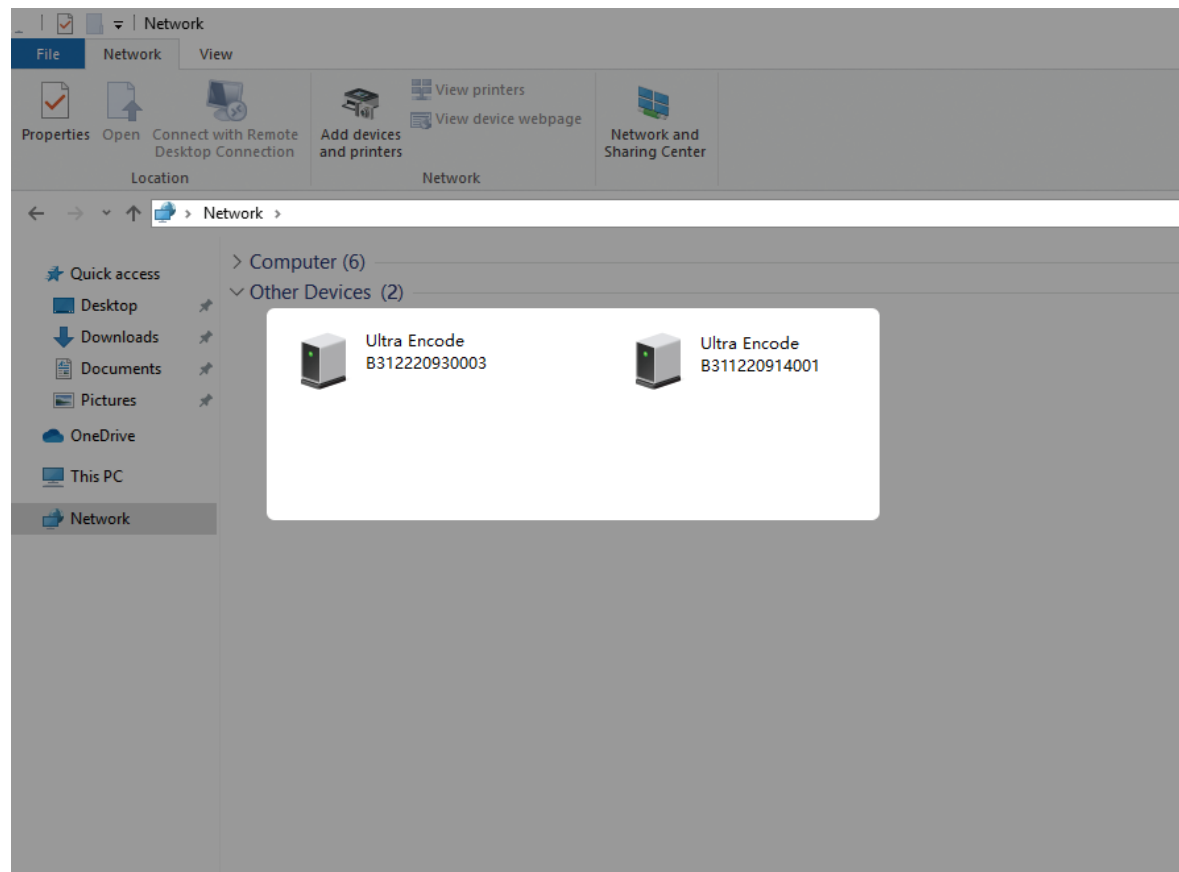


Fig1 Find your device in Windows > Network

Accessing the Web UI

A free tool, Web UI, is provided to monitor and manage device status and configuration. If you know your device's IP address, type it into your web browser to access the Web UI. Alternatively, you can access the Web UI via wired Ethernet, USB NET, or Wi-Fi following the steps below.

1. Connect your device to your LAN and power it up.

⚠ To ensure a smooth video, you are recommended to connect to a wired network.

2. Access Web UI:

- Via File Explorer on Windows 7 and above
 - i. Open File Explorer in your PC, then locate your device in **Network > Other Devices**.
 - ii. Double click the device icon to open the sign page of Web UI.
- Via USB NET, IP Address: 192.168.66.1
 - i. Connect the device to your computer using provided USB cable.
 - ii. Type the USB NET IP address 192.168.66.1 in your web browser to access the Web UI.
- Via device Wi-Fi AP, IP Address: 192.168.48.1

⚠ Plug included Wi-Fi antenna when you want to connect to a wireless network.

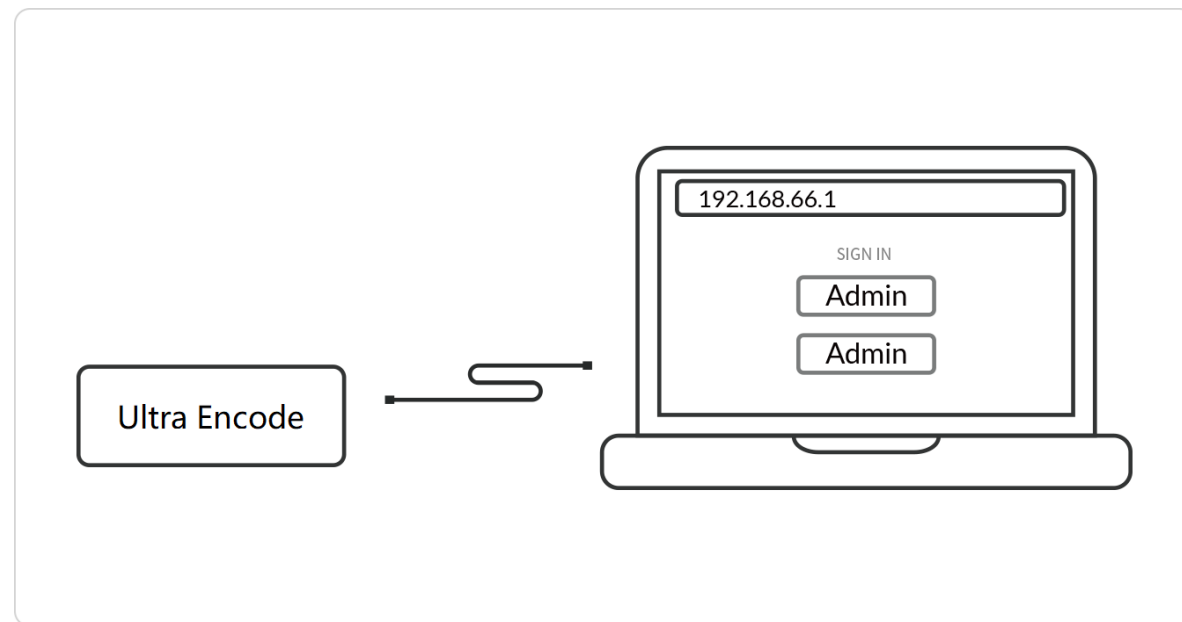


Fig2 USB NET connection

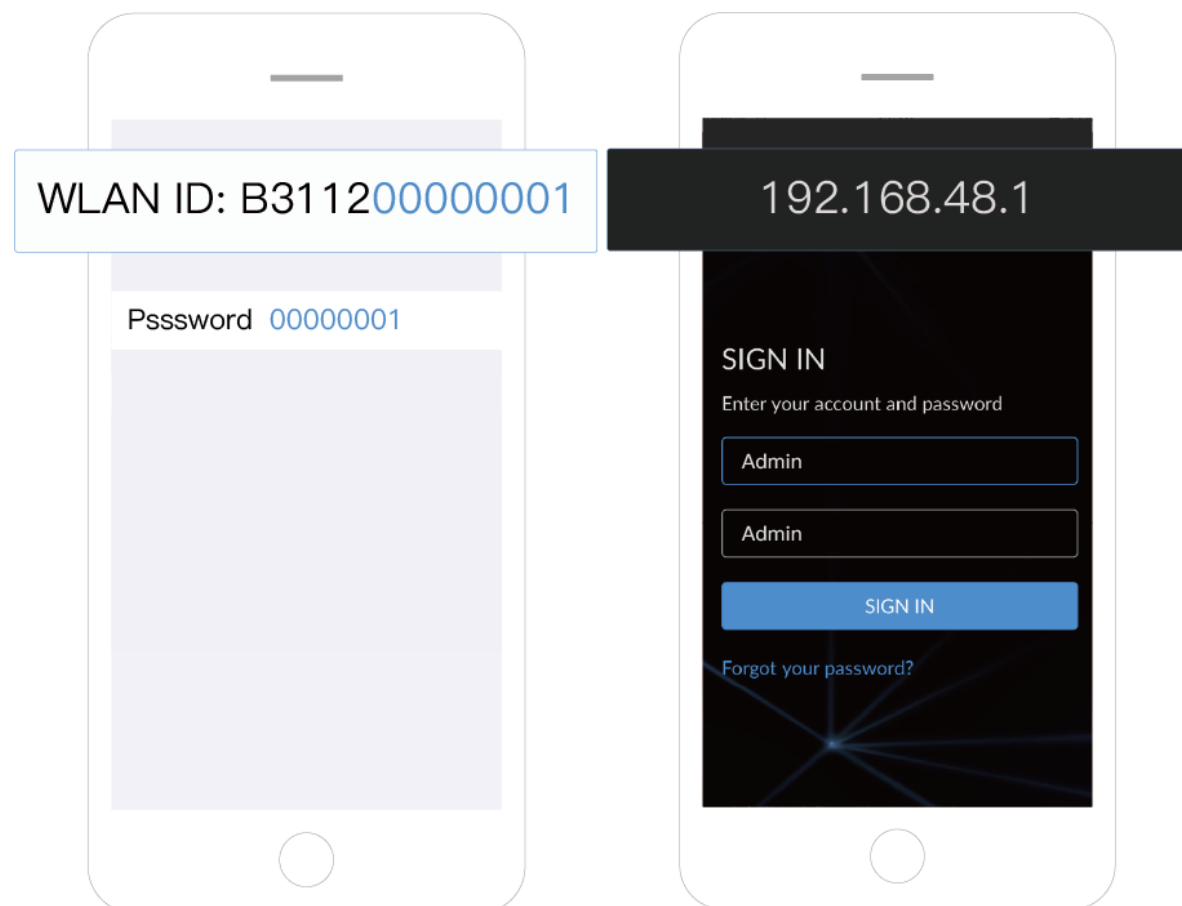
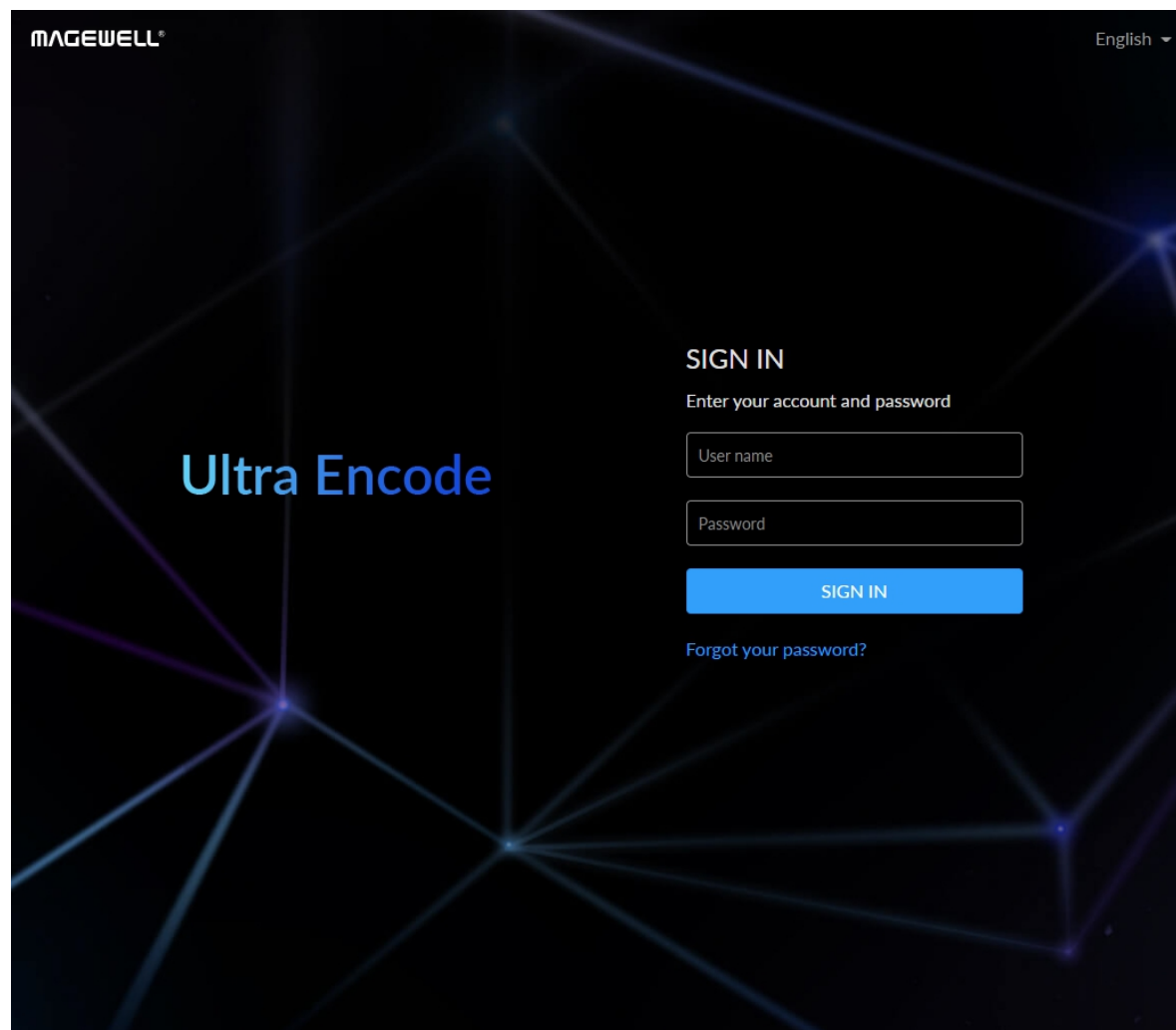


Fig3 AP connection

- i. In your smartphone/tablet/laptop, turn on WLAN, search for and join the device AP named **Ultra Encode + (Serial number)**.
The AP names after your gear's **Serial number**, and the password is the last 8-number of the serial number by default. For example, a serial number 311210101001 indicates the initial AP password is 10101001.
We recommend that the distance between the Web UI and the encoder should be within 10m.
- ii. In your web browser, enter 192.168.48.1 to open the Web UI.



Signing In/Out

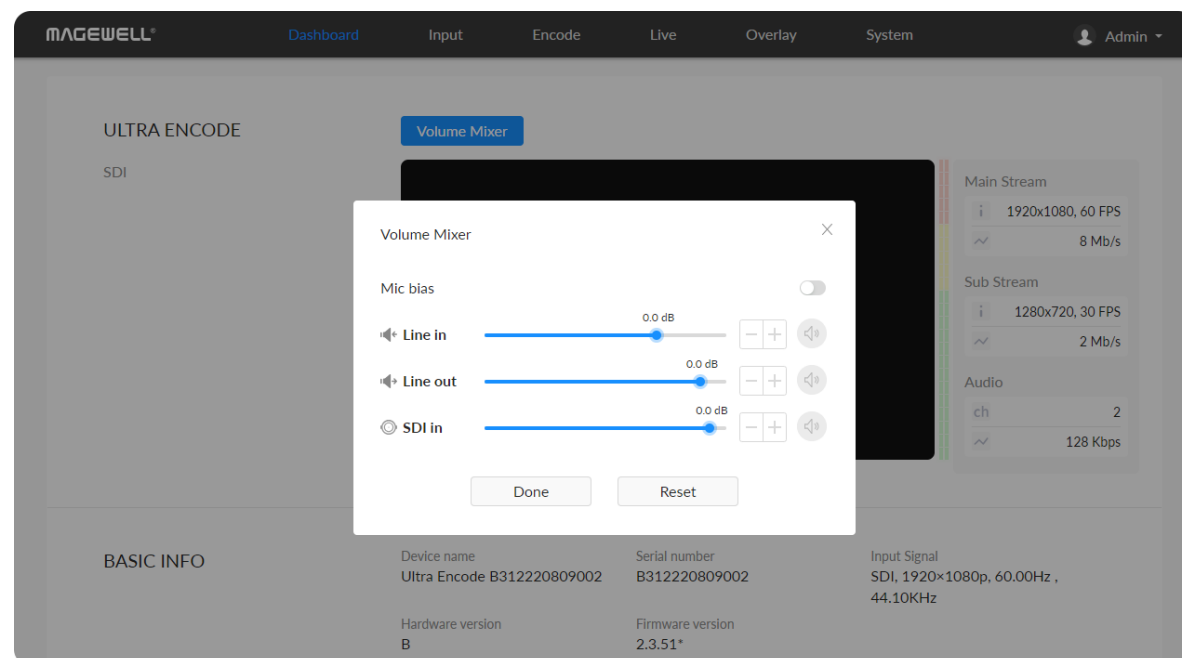
The Web UI allows multiple users to have read/write access to make configuration settings at the same time after logging-in. However, to avoid configuration conflicts, we do not recommend you to operate one device simultaneously.

1. Sign In: enter your account and password in the **SIGN IN** page.
 - The default administrator name and password are both Admin.
 - We recommend you to modify the admin password after initial logging-in.
2. Sign Out: click the down arrow symbol  behind the logging-in username at the top-right of the Web UI, and select **Sign out**.

Dashboard

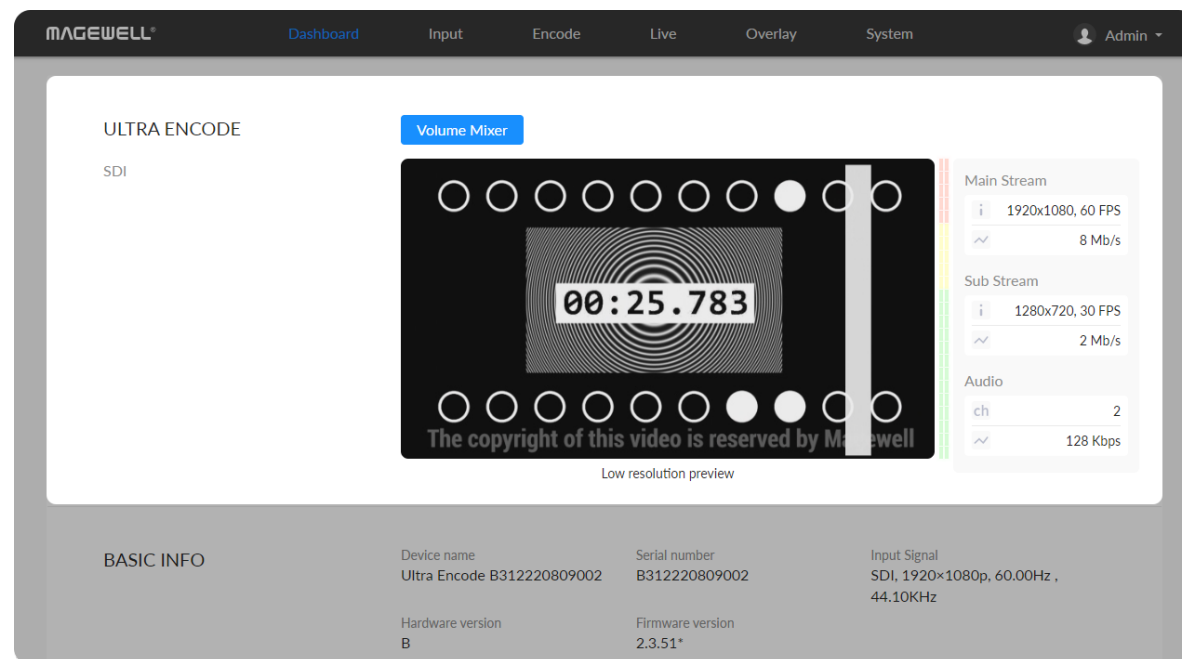
On **Dashboard** page, you can

- preview the thumbnail of the encoded video
- check device hardware information
- check system status
- set global volume mixer
- check product module at the upper left corner



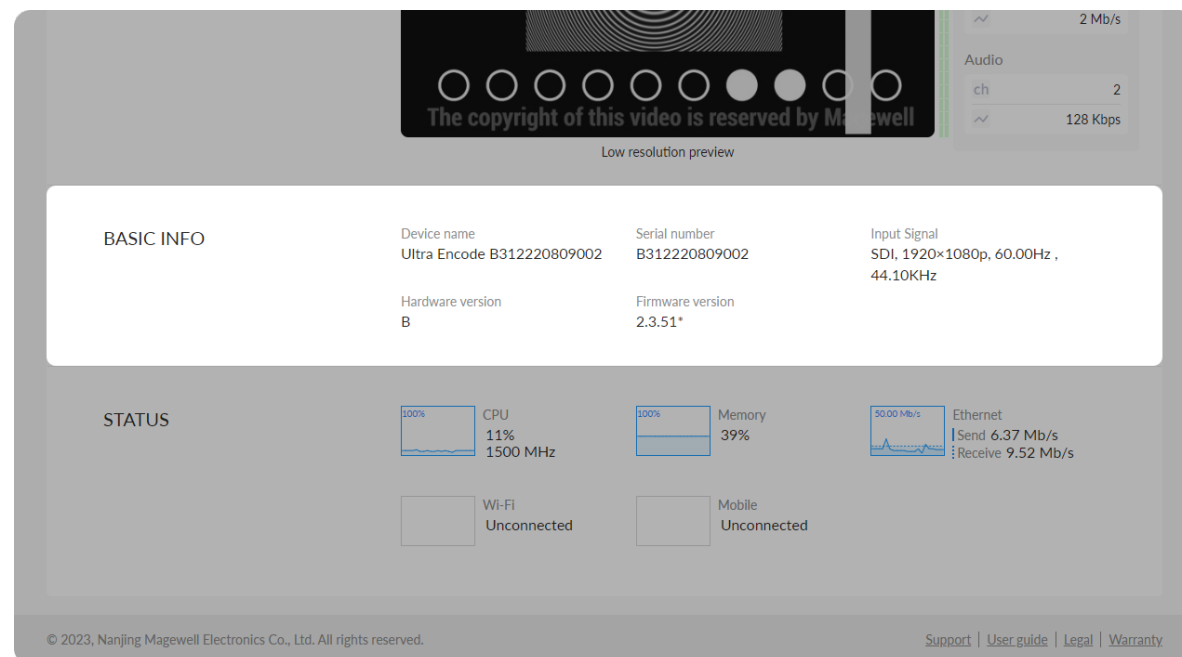
Setting Volume Mixer

- **Mic Bias:** turn it on when connecting a microphone via line in. It allows flowing way power (around 2.3V) to the jack which makes the microphone sound. It is off by default.
- **LINE IN:** adjust the audio connected to the LINE IN. Click to fine tune the volume at 0.1dB.
- **LINE OUT:** adjust the LINE OUT audio which remixes audio embedded in input signal and LINE IN. Click to fine tune the volume at 0.1dB.
- **HDMI/SDI IN:** adjust input signal volume
- : mute current channel. Click to fine tune the volume at 0.1dB.
- : restore current channel to default value
- **Reset:** restore all settings of the volume to default settings
- **Done:** click to save your configuration



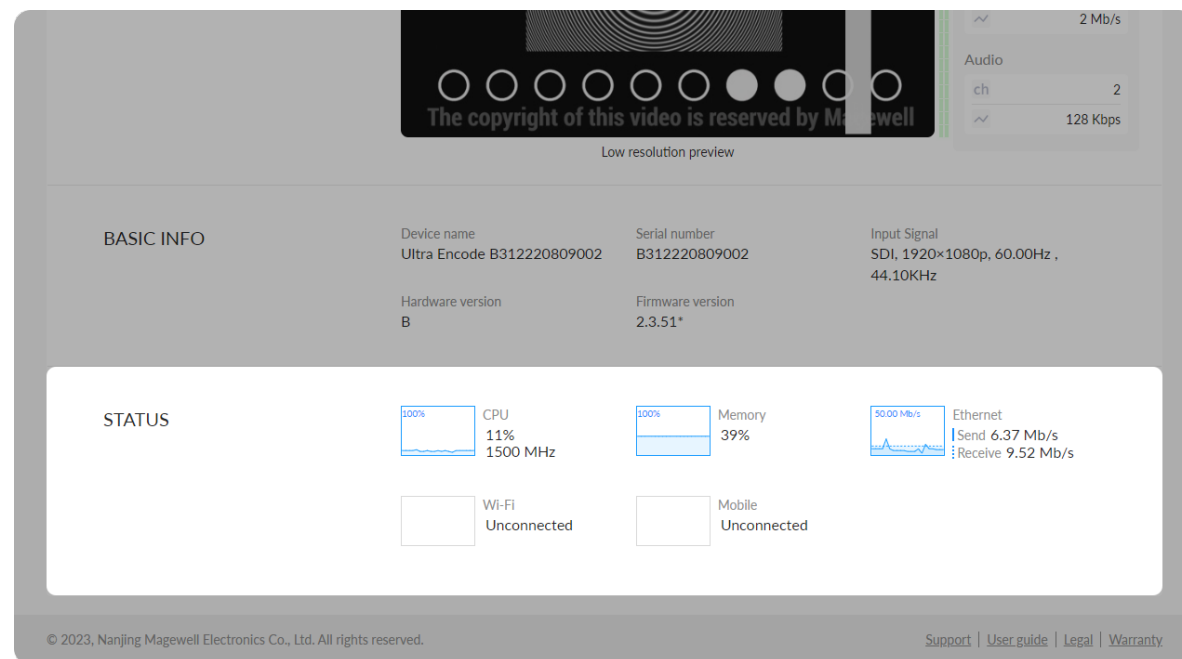
Previewing Thumbnails

Thumbnails, with a low resolution of 640x360, give you a quick snapshot of video being encoded.



Checking BASIC INFO

- **Device name:** device name of your unit. You can modify the device name in the [System > General > Device name](#) section.
- **Serial number:** serial number of your unit, which is also marked on your device.
- **Input Signal:** current input signal format.
- **Hardware version:** hardware version of your unit.
- **Firmware version:** current firmware version that is installed in your unit. You can update the firmware, via the **System > Firmware** tab.

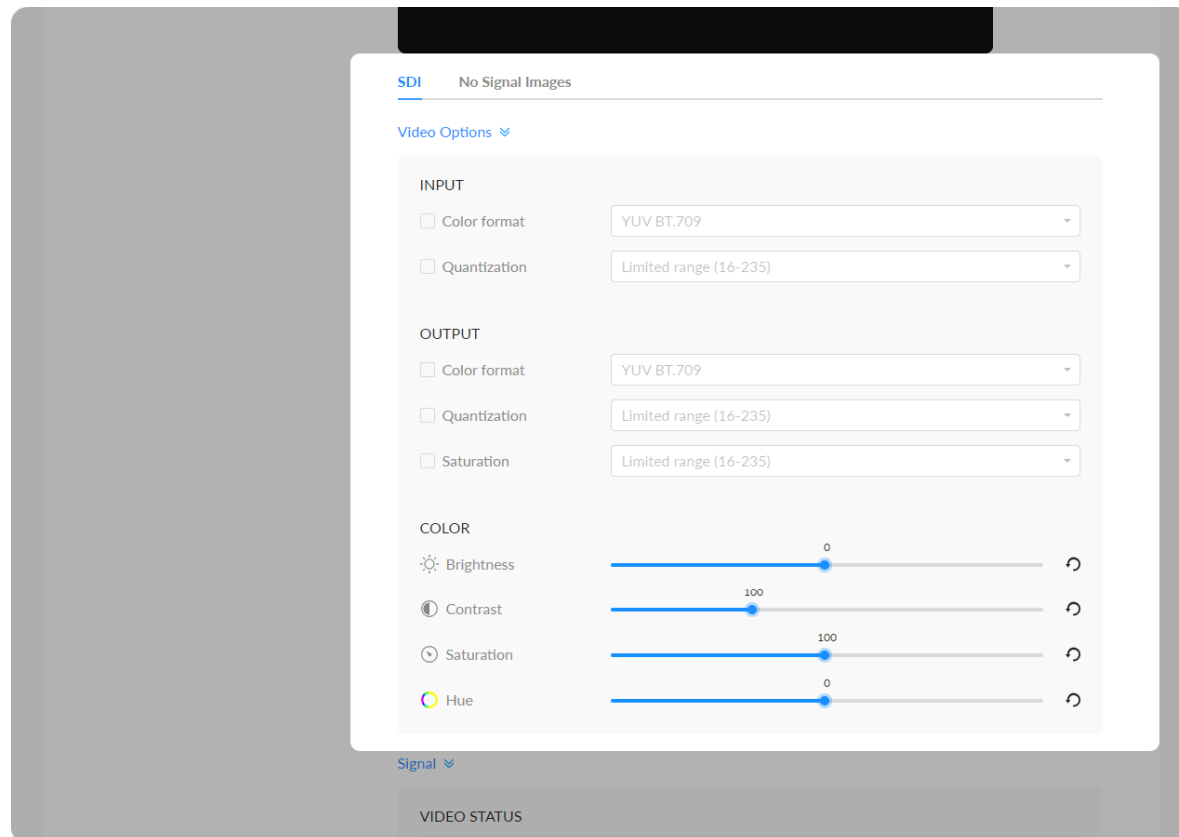


Checking STATUS

- Gives you an overview of your system CPU, memory usage, network usage in real-time in order to evaluate the device performance & health.

Input

Click and enter the **Input** tab to check the input signal information detected by the device.



Setting INPUT

- **Color format:** input video color format. Check the box to select other options, including RGB, YUV BT.601, YUV BT.709, YUV BT.2020.
- **Quantization:** input quantization range. Check the box to select other options, including Full range(0-255), Limited range(16-235).
- **Save:** save current configuration.

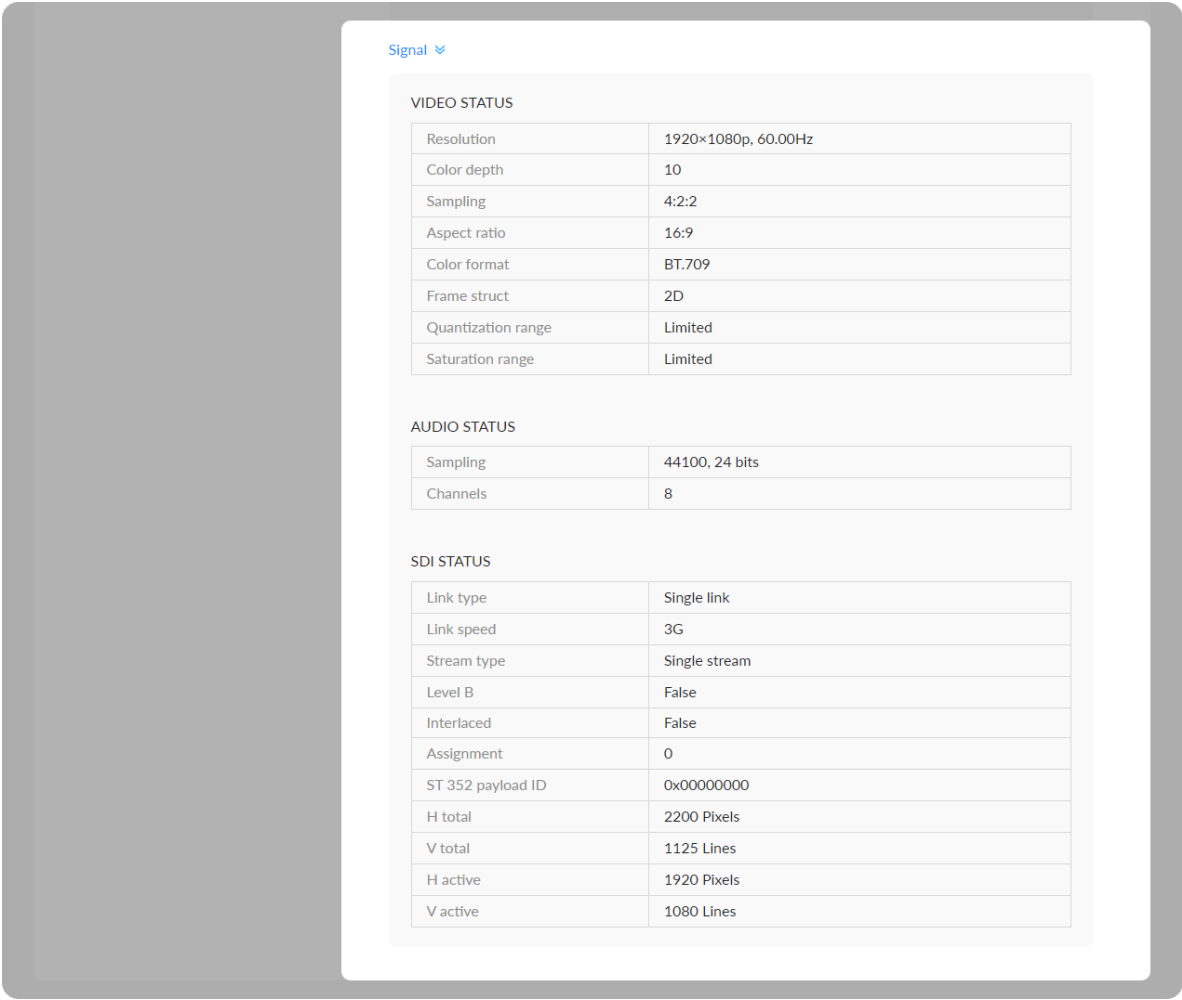
Setting OUTPUT

- **Color format:** check the box to select other options, including YUV BT.601, YUV BT.709.
- **Quantization:** check the box to select other options, including Full range(0-255), Limited range(16-235).
- **Saturation:** check the box to select other options, including Full range(0-255), Limited range(16-235), Extended GAMUT range(1-254).
- **Save:** save current configuration.

Setting Color

Set color format of preview and stream video.

- **Brightness:** range from -100 to 100, the default value is 0.
- **Contrast:** range from 50 to 200, the default value is 100.
- **Saturation:** range from 0 to 200, the default value is 100.



- **Hue:** range from -90 to 90, the default value is 0.
- **Reset:** Click  icon to restore the current setting to default value.

Checking VIDEO STATUS

- **Resolution** shows the input video pixel resolution & frame rate.
- **Color depth** shows the input video color depth, in bits.
- **Sampling** shows the input video color sampling format.
- **Aspect ratio** shows the input video aspect ratio.
- **Color format** shows the input video color encoding format.
- **Frame struct** shows the input video frame type, 2D or 3D.
- **Quantization range** shows the quantization range, Full or Limited.
- **Saturation range** shows the saturation range, e.g. Full or Limited.

Checking AUDIO STATUS

- **Sampling** shows the input audio sampling rate and bit depth.
- **Channels** shows the number of input audio channels detected.

Checking SDI STATUS

NOTE: This parameter is available for SDI products.

- **Link type** shows link type of input SDI signal, including single link, dual link, quad link.
- **Link speed** shows the current data speed.
- **Stream type** shows the number of streams that is contained in the data

source.

- **Level B** shows whether the input signal is level B format.
- **Interlaced** shows whether the input signal is interlaced.
- **Assignment** shows the link number, especially when be fed into a source of multi-link interfaces.
- **ST 352 payload ID** shows the SMPTE ST 352 video payload identification code for SDI.
- **H total** shows the total number of pixels, horizontally.
- **V total** shows the total number of pixels, vertically.
- **H active** shows the number of active pixels, horizontally.
- **V active** shows the number of active pixels, vertically.

HDMI STATUS	
Mode	HDMI
HDCP encrypted	False
VIC	100
IT content	False
Pixel rate	297 MHz
Timing-H total	4400 Pixels
Timing-H active	4096 Pixels
Timing-H front porch	88 Pixels
Timing-H sync width	88 Pixels
Timing-H back porch	128 Pixels
Timing-V total	2250 Pixels
Timing-V active	2160 Pixels
Timing-V front porch	8 Pixels
Timing-V sync width	10 Pixels
Timing-V back porch	72 Pixels

INFO FRAME

Checking HDMI STATUS

NOTE: This parameter is available for HDMI products.

- **Mode** shows the signal type (which is always HDMI for the HDMI product).
- **HDCP encrypted** shows whether the signal source is HDCP encrypted. In accordance with the related laws and regulations, the device doesn't process HDCP encrypted signals, so the value is None.
- **VIC** Video Identification Code, which is defined for CEA formats.
- **IT content** shows whether the transmission package is content.
- **Pixel rate** shows the maximum number of pixels the unit could possibly write to the local memory in one second.

- **Timing-H total** shows the total number of pixels, horizontally.
- **Timing-H active** shows the number of active pixels, horizontally.
- **Timing-H front porch** shows the Front Porch width in pixels.
- **Timing-H sync width** shows the Sync Pulse width in pixels.
- **Timing-H back porch** shows Back Porch width in pixels.
- **Timing-V total** shows the total number of pixels, vertically.
- **Timing-V active** shows the number of active pixels, vertically.
- **Timing-V front porch** shows the size of the vertical Front Porch in pixels.
- **Timing-V sync width** shows the width of the vertical Sync Pulse in pixels.
- **Timing-V back porch** shows the size of the vertical Back Porch in pixels.

INFO FRAME

AVI

Type	0x82
Version	0x02
Length	13 bytes
Checksum	0x13
Data	50 A8 00 64 00 00 00 00 00 00 00 00 00

AUDIO

Type	0x84
Version	0x01
Length	10 bytes
Checksum	0x70
Data	01 00 00 00 00 00 00 00 00 00

SPD

Type	0x83
Version	0x01
Length	25 bytes
Checksum	0x63
Data	00 00

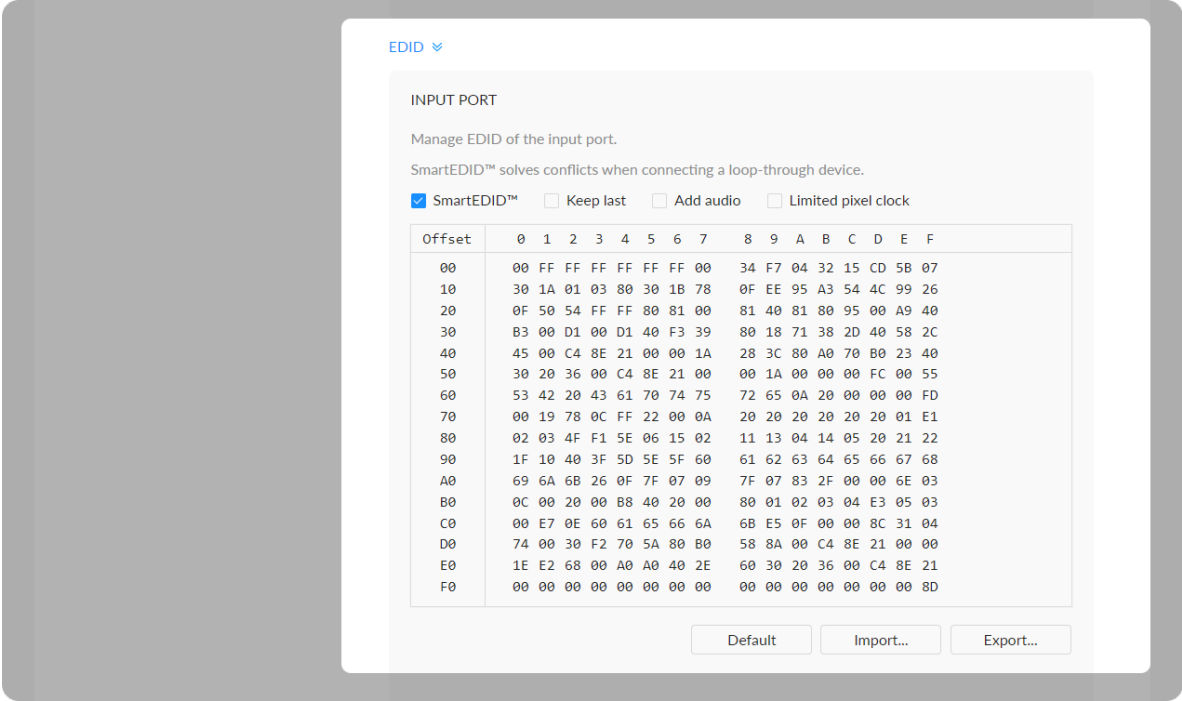
VS

Type	0x81
Version	0x01
Length	27 bytes
Checksum	0x54
Data	03 0C 00

Checking INFO FRAME

The info frames vary from different signal sources, AVI/AUDIO/SPD/VS may be included.

- **Type** shows the packet type.
- **Version** shows the packet Version.
- **Length** shows the length of the AVI InfoFrame payload.
- **Checksum** shows the packet checksum.
- **Data** shows the InfoFrame payload.



EDID

Click the **EDID** to check the EDID information. By clicking **Reset to Default**, you can cancel your settings.

EDID is only available for products supporting HDMI signal.

Setting SmartEDID™

NOTE: This function is available for HDMI products.

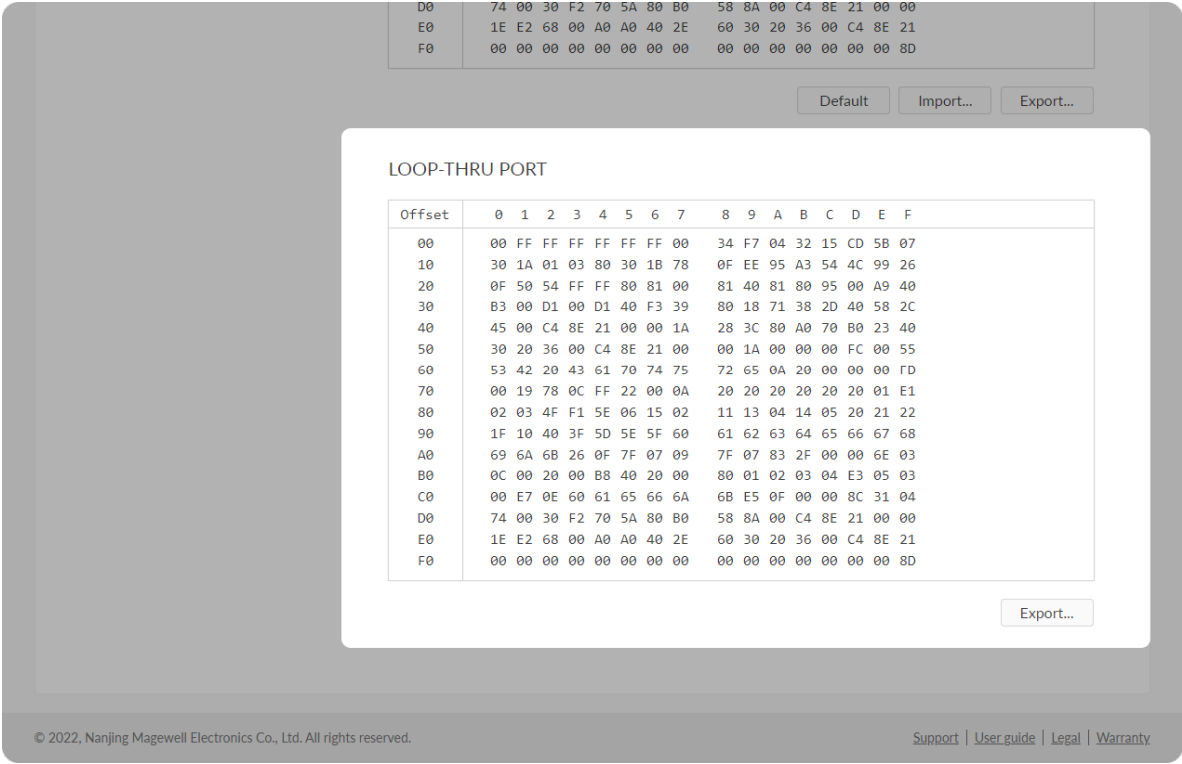
- **SmartEDID™**
 - SmartEDID™ is enabled by default. When it is disabled, other related functions can not be set.
 - Depending on the input capability of the encoder and that of the device connected to the loop-through interface, the encoder will smartly select to send the EDID to the video source device, to ensure both the encoder and the loop-through device can obtain the signal they support.
- **Keep last**
 - Keep the last EDID value used.
 - This function is disabled by default. To enable it, the SmartEDID function should also be enabled. When Keep Last is enabled and the loop-through device is disconnected, the current EDID will still be used. The encoder will continue receiving signal so the video capture and encoding continues. Otherwise, the encoder will resend its EDID to the source device for it to redetermine what format of signal to send. As a result, there could be an interruption to the source signal for a short time.
- **Add audio**
 - Force the source device to output audio.

- If users connect a monitor which doesn't support audio to the loop-through output, the source device will decide not to output audio. As a result, the device will not get any audio input. If **Add Audio** is enabled, the device will communicate with the video source device, forcing it to output audio.
- **Limited pixel clock**
 - If enabled, when the pixel resolution of the loop-through device is beyond the capability of the device, a lower pixel resolution will be used in order to avoid the output producing a blank screen.

Setting INPUT EDID

Any of the following actions can be performed on the input EDID of the device.

- **Default:** Click **Default** to reset the current EDID to default values.
- **Import:** Click and select an EDID file to import a local EDID file.
- **Export:** Click and set the file name to export the current EDID as a .bin file.

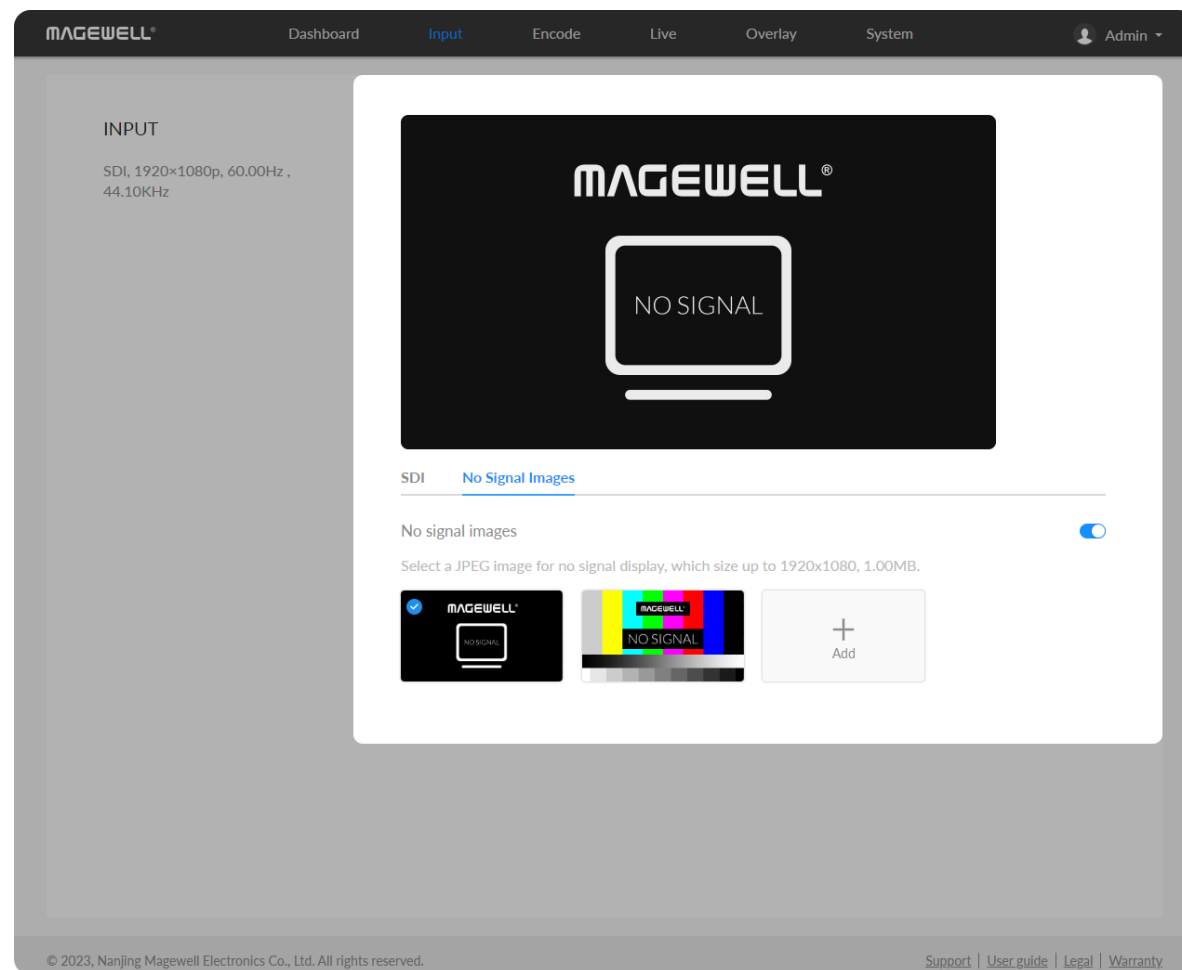


Checking Loop-through EDID

Loop-through EDID shows the EDID of the connected loop-through device.

NOTE: This section is available for HDMI products.

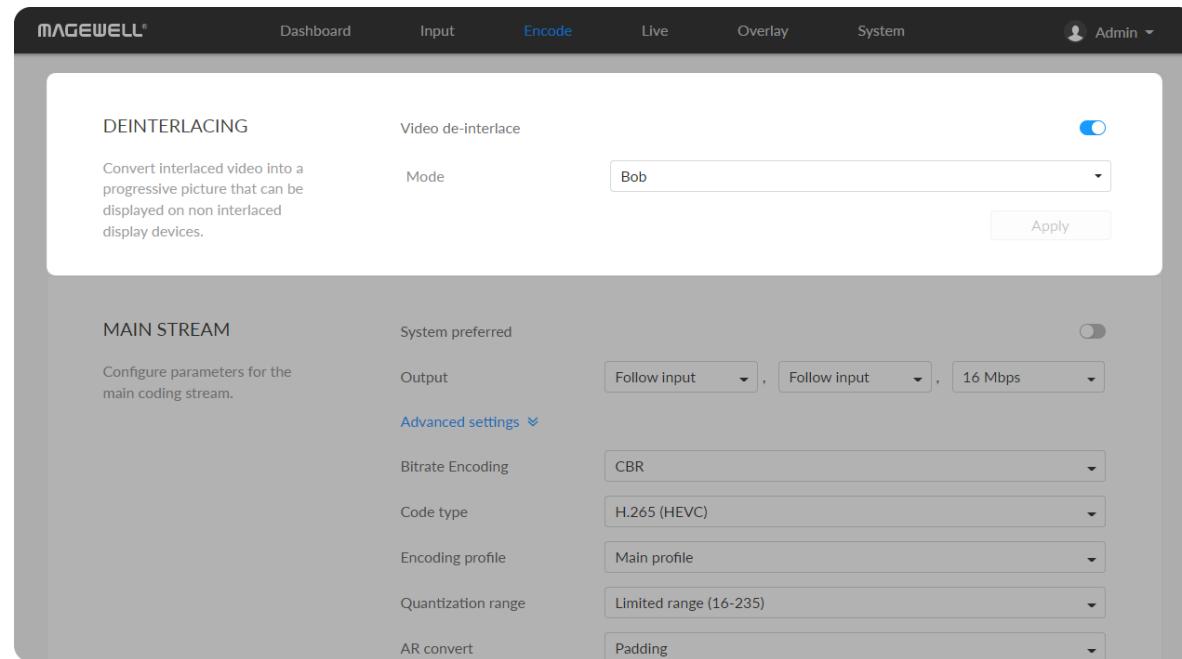
- **Export:** Click and set the file name to export the current EDID as a .bin file.



NO SIGNAL IMAGES

- Select a JPEG image for no signal display, which size up to 1920x1080, 1MB. The device provided 2 pictures can not be deleted. By default, the switch is on.
- **Add:** You can add 2 more JPEG photos sizing up to 1920x1080, 1.00 MB.
- **Delete:** click the delete icon  to remove the uploaded image from your device.

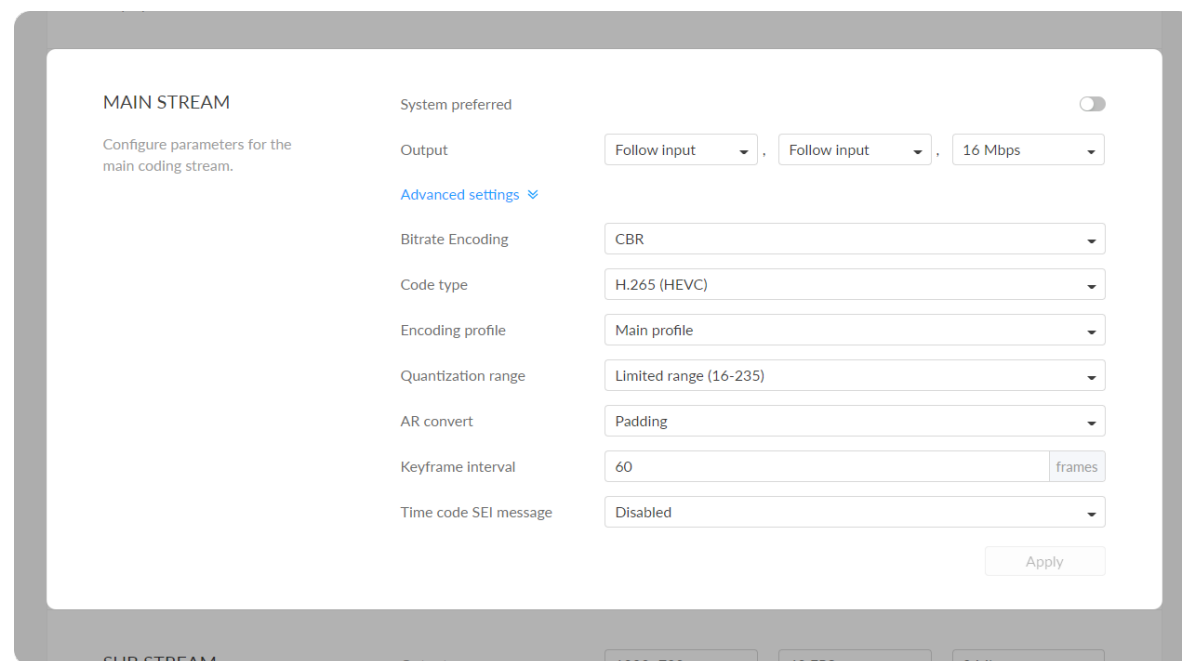
Encode



Deinterlacing

For interlaced signals, the output can be interlaced HEVC stream, if de-interlace function is turned off, and the stream encoders both are HEVC.

- **Video de-interlace:** by default, the switch is on. The dual streams must be HEVC(H.265) for turning off de-interlace. After turning off, only HEVC is available for the code type of the dual streams.
- **Mode:** when the Video de-interlace switch is on, it can be set to Blend or Bob, with Bob as the default.
- **Apply:** click Apply after configuration.



Setting MAIN STREAM

- **System preferred:** by default, it is off. Turn on the switch, and the output format would be consistent with the input signal. You can check the format on the right side of the thumbnail of the device status.
- **Output:** by default, it follows input resolution, frame rate, bitrate.
- **Bitrate Encoding:** options are CBR (default) and VBR. Live stream at CBR (Constant Bitrate) for bandwidth stability. VBR(Variable Bitrate) files vary the amount of output data per time segment. And you need to set quantization parameters for VBR. The quantization parameter controls the amount of compression for every macroblock in a frame. Large values mean that there will be more compression, lower quality, and lower bandwidth. Lower values mean the opposite.

- **Min QP:** available when **Bitrate Encoding** is VBR. The range of values is 0 to 50. The default value is 4. And we recommend you use the default value and do fine adjustment if needed.
- **Max QP:** available when **Bitrate Encoding** is VBR. The range of values is 1 to 51. The default value is 40. And the value must be larger than the Min QP value. We recommend you use the default value and do fine adjustment if needed.
- **Code type:** options are H.264 (default) and H.265(HEVC) encoders.
- **Encoding profile:** for H.264 encoder, the profiles can be High (default)/Main profile/Baseline. For H.265 (HEVC), it can be Main profile.
- **Quantization range:** options are Full range(0-255) and Limited range(16-235) (default).
- **AR convert:** options are Ignore, Cropping and Padding (default).
- **Keyframe interval:** options are 0.5, 15-300 frames, the default is 60. A smaller number will result in a larger file size and less buffer time for seeing the first frame. To ensure a clear and smooth live broadcast, it is recommended that the key frame interval be less than or equal to 60 frames.
- **Time code SEI message:** options are off (default), system clock, and embedded. Turn on the switch to get A/V sync between multiple devices which support this SEI message as well.
- **Closed caption SEI message:** turn on the switch to encode closed captions (if present in the input signal) into H.264/H.265 (HEVC) SEI message. Native CEA-608 and 608 over 708 captions are both supported. It is off by default.
Note that it is only supported by SDI product.

SUB STREAM ☒

Configure parameters for the sub coding stream.

Output

1280x720 , 60 FPS , 2 Mbps

Advanced settings

Bitrate Encoding

CBR

Code type

H.265 (HEVC)

Encoding profile

Main profile

Quantization range

Limited range (16-235)

AR convert

Padding

Keyframe interval

60 frames

Time code SEI message

Disabled

Apply

Setting SUB STREAM

- The device transmits SUB STREAM data by default, and it can not be switched off when the sub stream data is being recording or streaming. You can turn it off to lower bandwidth usage.
- Output:** by default, it is 1280x720, follow input frame, 2Mbps.
- Bitrate Encoding:** options are CBR (default) and VBR. Live stream at CBR (Constant Bitrate) for bandwidth stability. VBR(Variable Bitrate) files vary the amount of output data per time segment. And you need to set quantization parameters for VBR. The quantization parameter controls the amount of compression for every macroblock in a frame. Large values mean that there will be more compression, lower quality, and lower bandwidth. Lower values mean the opposite.
 - Min QP:** available when **Bitrate Encoding** is VBR. The range of values is 0 to 50. The default value is 4. And we recommend you use the default value and do fine adjustment if needed.
 - Max QP:** available when **Bitrate Encoding** is VBR. The range of values is 1 to 51. The default value is 40. And the value must be larger than the Min QP value. We recommend you use the default value and do fine adjustment if needed.
- Code type:** options are H.264 (default) and H.265(HEVC) encoders.
- Encoding profile:** for H.264 encoder, the profiles can be High (default)/Main profile/Baseline. For H.265 (HEVC), it can be Main profile.
- Quantization range:** options are Full range(0-255) and Limited range(16-235) (default).
- AR convert:** options are Ignore, Cropping and Padding (default).

- **Keyframe interval:** options are 15-300 frames. The default value is 60. A less number will result in a larger file size and less buffer time for seeing the first frame. To ensure a clear and smooth live broadcast, it is recommended that the key frame interval be less than or equal to 60 frames.
- **Time code SEI message:** options are off (default), system clock, and embedded. Turn on the switch to get A/V sync between multiple devices which support this SEI message as well.

The screenshot displays a web-based configuration interface for audio settings. At the top, there are two settings: 'Keyframe interval' set to '60' with a 'frames' unit button, and 'Time code SEI message' set to 'Disabled' with a dropdown arrow. An 'Apply' button is located to the right of these settings. Below this is a white-bordered box titled 'AUDIO' with the subtitle 'Configure parameters for the audio streams.' Inside this box, the 'AAC' codec is selected, and the bitrate is set to '128 Kbps' with a dropdown arrow. An 'Apply' button is also present at the bottom right of the 'AUDIO' box. The footer of the interface contains the copyright notice '© 2022, Nanjing Magewell Electronics Co., Ltd. All rights reserved.' and a series of links: 'Support', 'User guide', 'Legal', and 'Warranty'.

Keyframe interval	Time code SEI message
60 frames	Disabled

Apply

AUDIO

Configure parameters for the audio streams.

AAC

128 Kbps

Apply

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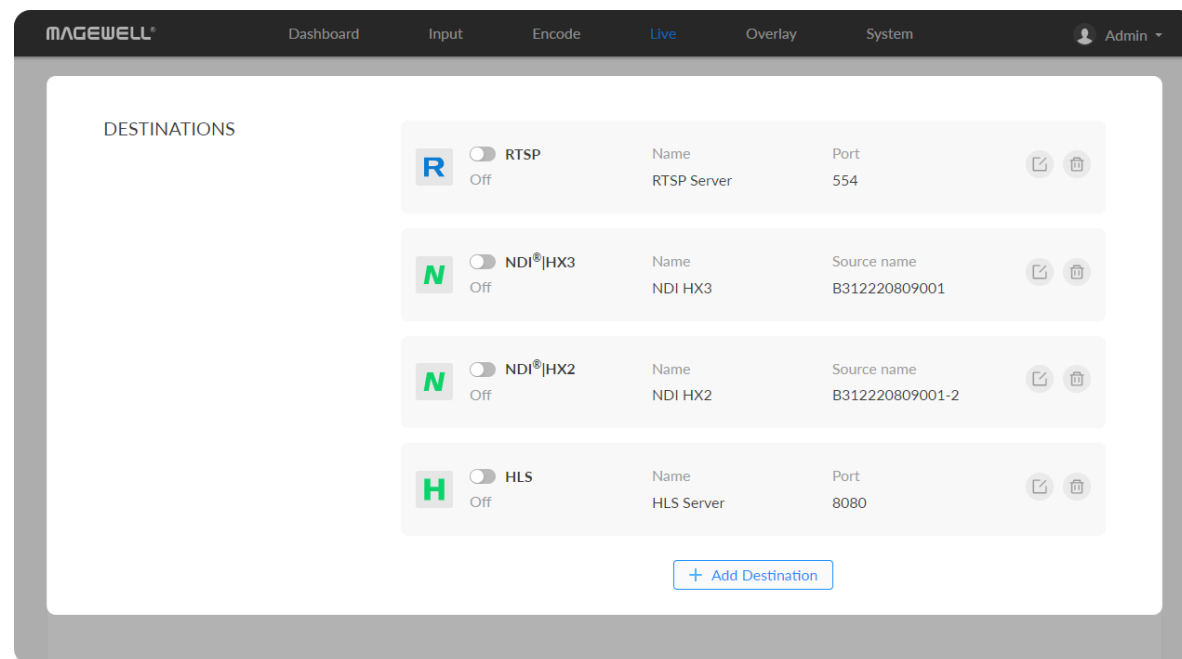
Setting AUDIO

All audio streams will be affected with modification.

- AAC: all audio streams will be affected by modifying the AAC bitrate. It ranges from 16 to 256 Kbps, and the default value is 128 Kbps.

Live

The encoder natively supports streaming to YouTube, Facebook, Twitch, as well as self-defined servers.



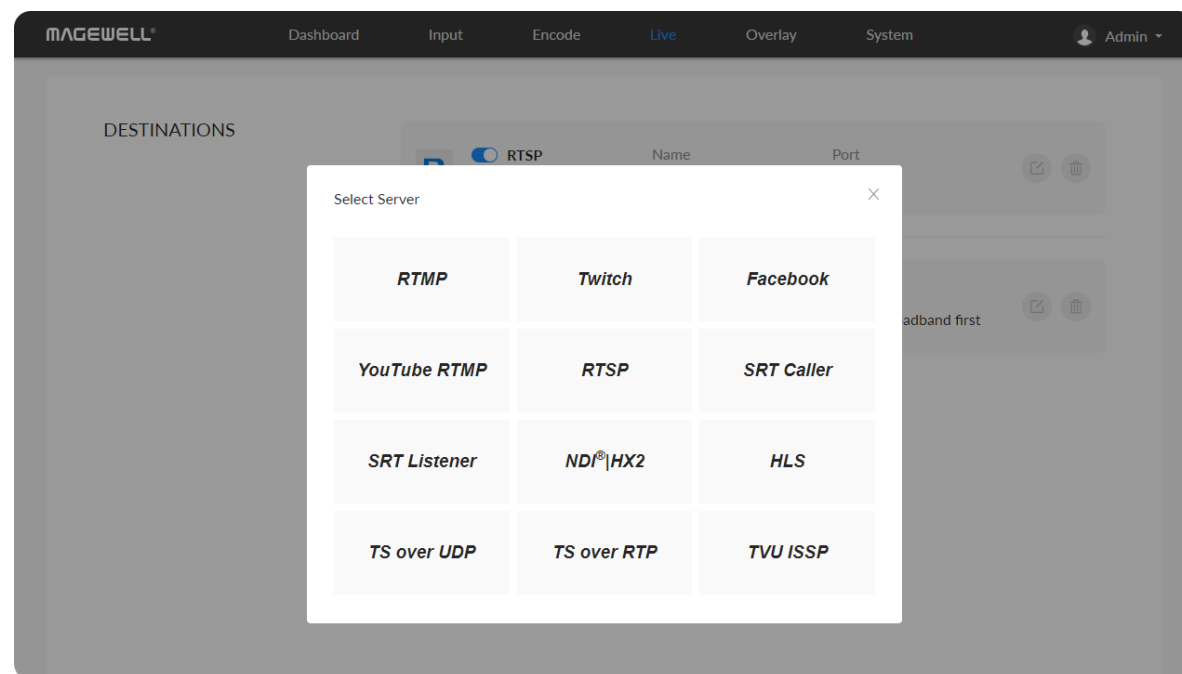
Managing Live Streaming Sessions

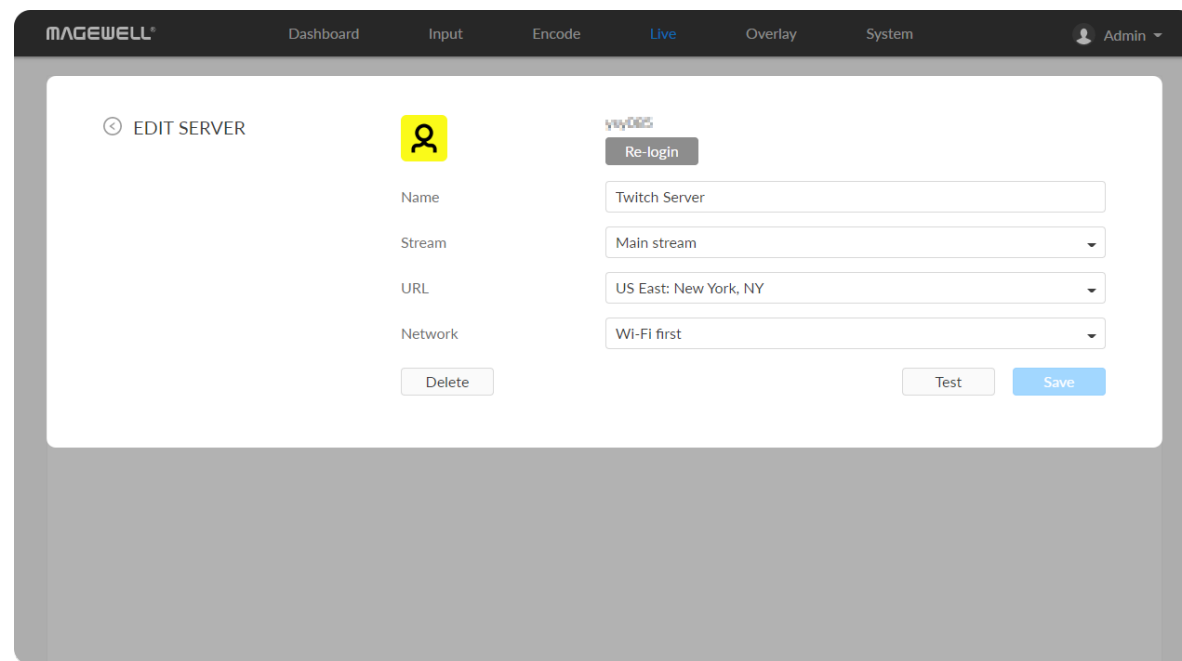
You can manually added, modify, or delete any of streaming sessions listed in the **Live** tab.

- Click **Edit** to modify the parameters of the stream.
- Click **Delete** to remove the source from the list.
- Turn on/off the switch  to start/stop streaming.
- Click **Add** and select an RTMP, RTMPS, RTSP, SRT Caller/Listener, NDI®|HX2, HLS, TS over UDP/RTP, or TVU ISSP server to stream to.

Notes

- Supported streaming protocols - RTSP, RTMP, RTMPS, SRT Caller, SRT Listener, NDI®|HX2, HLS, TS over UDP, TS over RTP, and TVU ISSP.
- Supports sessions over the same streaming protocol, such as
 - Up to 6 sessions of TS over RTP and TS over UDP simultaneously
 - Up to 6 sessions of SRT Caller and SRT Listener simultaneously, containing one SRT Listener session at most (max 8 clients simultaneously)
 - Up to 6 sessions of RTMP and RTMPS simultaneously
 - Supports streaming only 1 session of HLS, RTSP, or NDI|HX2
- Specify the main stream or sub stream for each session.





Live Streaming to Twitch

You can stream to Twitch if you have a Twitch account.

⚠ To ensure smooth live streaming experience, connecting to a wired Ethernet network is recommended.

1. Click **+ Add Destination** in the **Live** tab, select **Twitch**, follow the on-screen instructions to log in and select a server.
Your avatar will be displayed after a successful logging-in.
2. Choose the prime network for streaming.
By default, the network connection priority is: Mobile Broadband > Ethernet > Wi-Fi.
The device scans for the available network according to the connection priority and connect to it for streaming. If the current network is disconnected, the unit automatically re-scans according to the priority. Plug a USB modem into your encoder while using mobile network to stream.
3. Click **Test** to check the connection between the server and encoder.
4. When prompted, click **OK**.
5. Go back to **Live** page, turn on  before streaming.

The screenshot shows the MAGEWELL Live Streaming configuration page. The top navigation bar includes Dashboard, Input, Encode, Live (selected), Overlay, System, and Admin. The main content area is titled 'EDIT SERVER' and contains the following fields:

- Name:** Facebook Server
- Stream:** Main stream (dropdown)
- URL:** rtmps://live-api-s.facebook.com:443/rtmp
- Network:** Wi-Fi first (dropdown)
- Backup stream:** (toggle switch, currently on)
- Stream key:** Master stream key (dropdown)
- Publish settings:**
 - Publish to:** Timeline (dropdown)
 - Title:** aio11
 - Description:** 0-127 characters
 - Privacy:** Only me (dropdown)
 - Stream ID:** Master stream (dropdown)

At the bottom, there are buttons for 'Delete', 'Test', and 'Save'. A 'Log In' button is located at the top right of the configuration area.

Live Streaming to Facebook

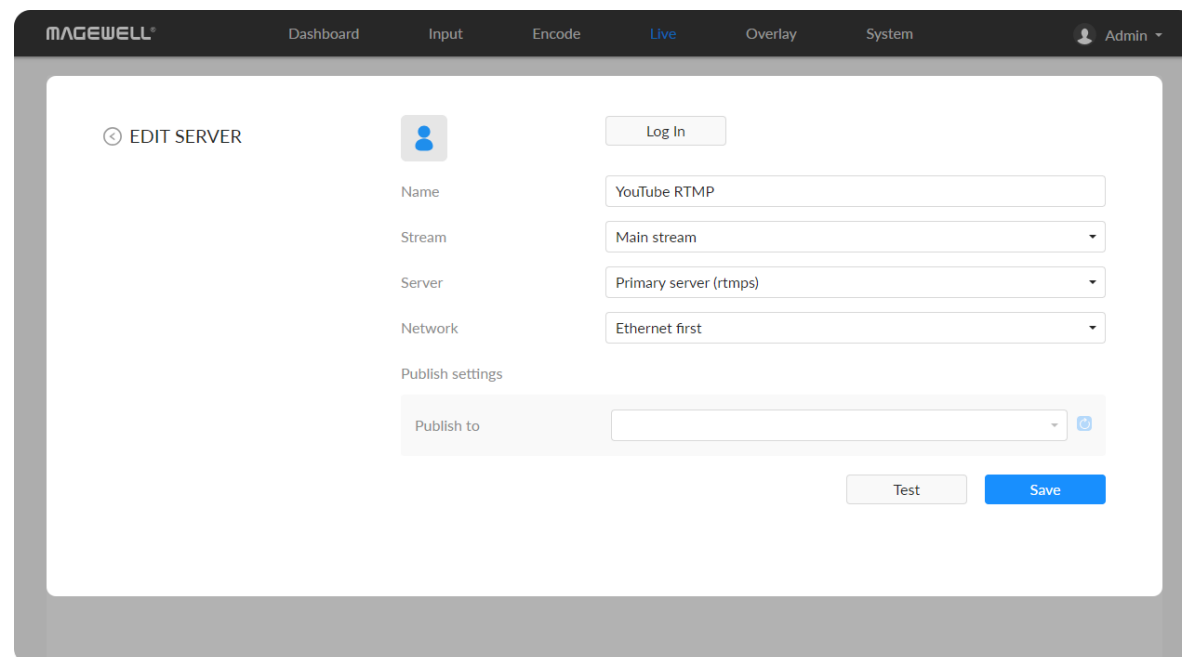
You can live broadcast to Facebook if you have a Facebook account.

⚠ To ensure smooth live streaming experience, connecting to a wired Ethernet network is recommended.

1. Click **+ Add Destination** in the **Live** tab, select **Facebook**, enter the **Stream Name**.
2. Click **Log In**. Follow the on-screen instructions to open Facebook, enter the code prompt, and log in.

⚠ Your avatar will be displayed after a successful logging-in.

3. Choose the prime network for streaming.
By default, the network connection priority is: Mobile Broadband > Ethernet > Wi-Fi.
The device scans for the available network according to the connection priority and connect to it for streaming. If the current network is disconnected, the unit automatically re-scans according to the priority. Plug a USB modem into your encoder while using mobile network to stream.
4. (Optional) Turn on the **Backup stream** and specify the **Stream key**.
5. Specify **Publish settings** including **Publish to**, **Title** (0-63 characters), **Description** (0-127 characters), **Privacy** and **Stream ID**.
6. Click **Save**.
7. Click **Test** to check the network connection.
8. After passing the test, click **OK**.



9. (Optional) Click **Delete** to clear the session.
10. Go back to **Live** page, turn on  before streaming.

Live Streaming to YouTube

You can stream to YouTube if you have a YouTube account, and you have enabled the Live streaming feature of your channel at least 24 hours before your streaming.

⚠ To ensure smooth live streaming experience, connecting to a wired Ethernet network is recommended.

⚠ To enable the Live streaming feature, refer to [YouTube Help](#).

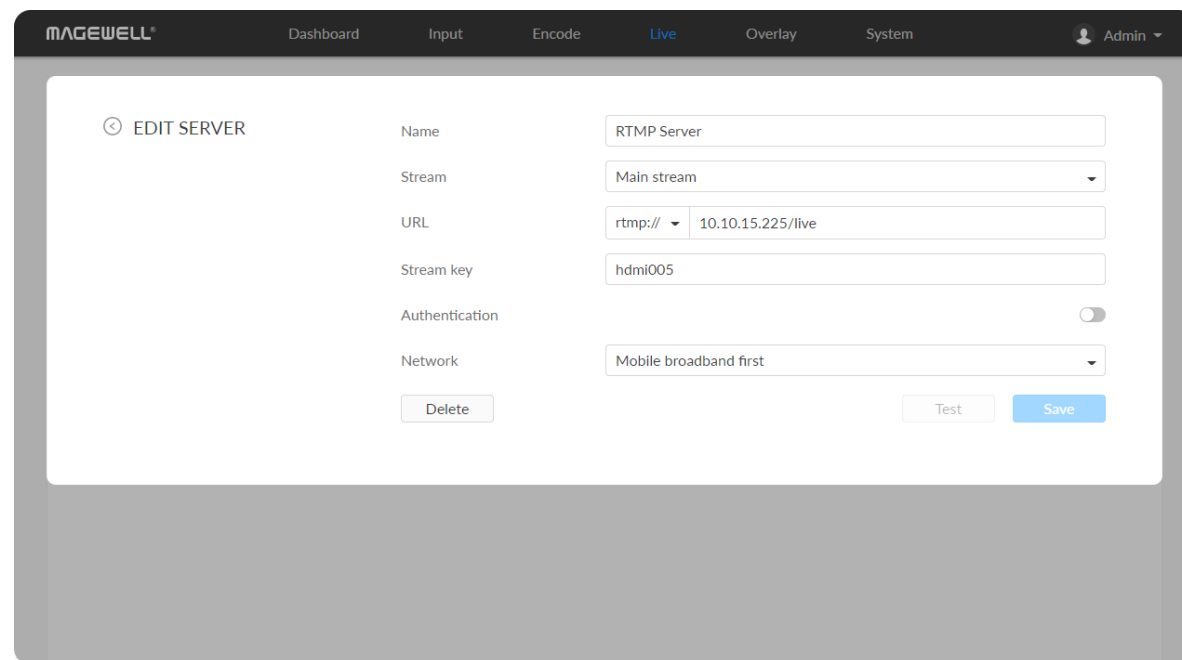
1. Click **+ Add Destination** in the **Live** tab, select **YouTube RTMP**, enter the **Stream Name**, follow the on-screen instructions to log in and select a server.
2. Click **Log In**. Follow the on-screen instructions to open YouTube, enter the code displayed on your device, and log in.
Your avatar will be displayed after a successful logging-in.
3. Choose the prime network for streaming.
By default, the network connection priority is: Mobile Broadband > Ethernet > Wi-Fi.
The device scans for the available network according to the connection priority and connect to it for streaming. If the current network is disconnected, the unit automatically re-scans according to the priority.

Plug a USB modem into your encoder while using mobile network to stream.

4. Tap **Publish to** and select a channel or event for your session.
Choose **Add a new stream** and enter title, description and privacy. Then a new live event would be added to your logging-in account automatically.
And you can stream to YouTube using streamer without clicking on **go live** in YouTube Studio.

Choose a channel or event. Then **go live** in YouTube studio to ensure a successful live broadcast.

5. Click **Test** to check the connection between the server and encoder.
6. When prompted, click **OK**.
7. Go back to the **Live** page, and turn on  before streaming.



RTMP/RTMPS

- **Name:** specify a name for current task to facilitate server management, which will be displayed in the server list. The name can be 1~30 character.
- **Stream:** choose to deliver a main or sub stream, which can be customized in [Encode](#) tab.
- **URL:** enter the RTMP URL address, or an RTMP address you have obtained from the live stream platform. Full address example: **rtmp://192.168.1.136:1935/live**. The port number part **:1935** can be omitted, and the value range is 1 to 65535. If the RTMP address is a domain name, live can be omitted. If the RTMP address is an IP address, The part **live** cannot be omitted.

- **Stream key:** enter the stream key obtained from the live stream platform. If none, leave it empty. The key can be string of 0-512 characters.
- **Authentication:** turn on if your live streaming service provider requires. Obtain the User Name and Password from your live streaming service provider.
- **Network:** The device scans for the available network according to the connection priority and connect to it for streaming. If the current network is disconnected, the unit automatically re-scans according to the priority. By default, the network connection priority is: Mobile Broadband > Ethernet > Wi-Fi.
Plug a USB modem into your encoder while using mobile network to stream.
- **Test:** check the connection between the server and encoder.
- **Save:** save current configuration.

MAGEWELL Dashboard Input Encode **Live** Overlay System Admin

⌂ EDIT SERVER

Name	RTSP Server
Port	554
Connections	5
Main stream	☒
Main key	mainstream
Sub stream	☒
Sub key	substream
Audio	☒
Authentication	☒
User name	1-32 characters
Password	1-32 characters

Main Stream URL: `rtsp://<User name>:<Password>@10.10.9.153:554/mainstream`
 Sub Stream URL: `rtsp://<User name>:<Password>@10.10.9.153:554/substream`

RTSP

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The name can be 1~30 character.
- **Port:** specify RTSP stream port, the value range is 554 (default), 10000-65535.
- **Connections:** set number of clients for each RTSP stream, 8 clients are supported at most. And you can check the client (session) number at the server list.
- **Main stream:** turn on to push main stream. Specify parameters in [Encode](#) tab. By default, it is on.
- **Main key:** specify stream key for main stream. The main key should be different from sub key.
- **Sub stream:** turn on to push sub stream. Specify parameters in [Encode](#) tab. By default, it is off.
- **Sub key:** specify stream key for sub stream. The sub key should be different from main key.
- **Audio:** turn on to stream audio signal, otherwise audio will not be delivered. The audio signal consists of audio embedded in input signal and LINE IN. By default, it is on.
- **Authentication:** turn on if your live streaming service provider requires. Type your user name and password for the streaming service.
- **Save:** save current configuration.
- The encoder can stream 1 RTSP session with other protocol streams.
- After configuration, the stream URLs display at the end of the page. If you have multiple network connections, there would be multiple stream URLs.

The screenshot shows the 'EDIT SERVER' configuration page in the MAGEWELL Live interface. The page is titled 'EDIT SERVER' and contains the following fields and options:

- Name:** SRT Caller
- Stream:** Main stream (dropdown)
- Address:** 10.10.15.225
- Port:** 8000
- Connect timeout:** 3000 ms
- Retry duration:** 10000 ms
- Latency:** 120 ms
- Bandwidth:** 25 %
- MTU:** 1496 (range 232 to 1500)
- Stream ID:** upload.srt/live/hdmi005
- Encryption:** Not Used (dropdown)
- Network:** Mobile broadband first (dropdown)

At the bottom of the form are three buttons: 'Delete', 'Test', and 'Save'.

SRT Caller

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The name can be 1~30 character.
- **Stream:** choose to stream main or sub stream, which can be customized in [Encode](#) tab.
- **Address:** enter the Listener address when **Mode** is set to **Caller**. If the SRT listener and caller are on the same LAN, enter the private IP address of the SRT listener on the LAN. If the SRT listener and caller are in different network environments, enter the public IP address of the SRT listener.
- **Port:** enter the port number specified by the encoder, which ranges from 1 to 65535.
- **Connect timeout:** specify SRT connection timeout in milliseconds, which ranges from 1000 to 30000ms. The default value is 3000.
- **Retry duration:** specify retry duration when SRT SRT connection timeout in milliseconds, which ranges from 0 to 10000. The default value is 10000ms.
- **Latency:** possible values are 30 ~ 8000ms. The default value is 120ms. We recommend that you set the same latency for SRT caller and listener.
- **Bandwidth:** indicate the portion of the total bandwidth of a stream required for the exchange of SRT control and recovery packets. Available values are 5 ~ 100%, and the default value is 25%. A worse network condition requires more bandwidth for overhead to ensure normal transmission.
- **MTU:** specify maximum transmission unit (MTU) in bytes, ranging from 232 to 1500. The default size is 1496.

- **Stream ID:** specify Stream ID of 0 to 256 characters which should be consistent with that of its sender.
- **Encryption:** specify the stream encryption algorithm to ensure the data security, options are not used, AES-128/192/256.
- **Passphrase:** specify stream key of 10 to 79 characters, which is the same as the SRT listener.
- **Network:** The device scans for the available network according to the connection priority and connect to it for streaming. If the current network is disconnected, the unit automatically re-scans according to the priority. By default, the network connection priority is: Mobile Broadband > Ethernet > Wi-Fi.
Plug a USB modem into your encoder while using mobile network to stream.
- **Test:** check the connection between the server and encoder.
- **Save:** save current configuration.

The screenshot shows the 'EDIT SERVER' configuration page in the MAGEWELL Live interface. The page has a dark header with navigation tabs: Dashboard, Input, Encode, Live (selected), Overlay, and System. A user profile 'Admin' is in the top right. The main content area is titled 'EDIT SERVER' and contains a form for configuring an SRT Listener. The form fields are: Name (SRT Listener), Stream (Main stream), Port (8000), Latency (120 ms), Bandwidth (25 %), MTU (1496), Connections (7), and Encryption (Not Used). There are 'Delete' and 'Save' buttons at the bottom. Below the form, the FFmpeg URL is displayed as 'srt://10.10.9.153:8000'.

Field	Value
Name	SRT Listener
Stream	Main stream
Port	8000
Latency	120 ms
Bandwidth	25 %
MTU	1496
Connections	7
Encryption	Not Used

FFmpeg URL: srt://10.10.9.153:8000

SRT Listener

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The name can be 1~30 character.
- **Stream:** choose to stream main or sub stream, which can be customized in [Encode](#) tab.
- **Port:** specify the service port of the encoder, ranging from 8000, and 10000 to 65535. The default value is 8000.
- **Latency:** options are 30 ~ 8000ms and the default value is 120ms. We recommend that you set the same latency for SRT caller and listener.
- **Bandwidth:** indicate the portion of the total bandwidth of a stream required for the exchange of SRT control and recovered packets. Available values are 5 ~ 100% and the default value is 25%. A worse network condition requires more bandwidth for overhead to ensure normal transmission.
- **MTU:** specify maximum transmission unit (MTU) in bytes, ranging from 232 to 1500. The default size is 1496.
- **Connections:** 8 connections at most.
- **Encryption:** specify encryption algorithm for stream data security. Options are not used (default), AES-128/192/256.
- **Passphrase:** specify stream key of 10 to 79 characters, which is the same as the SRT caller.
- **Save:** save current configuration.
- The encoder can stream up to 6 SRT sessions simultaneously, containing one SRT Listener session at most.
- After configuration, the play URL and passphrase are shown in the page below.

The screenshot shows the 'EDIT SERVER' configuration page in the MAGEWELL NDI interface. The page has a dark header with the MAGEWELL logo and navigation tabs: Dashboard, Input, Encode, Live (selected), Overlay, and System. A user profile 'Admin' is in the top right. The main content area is titled 'EDIT SERVER' and contains the following fields and controls:

- Name:** Text input field containing 'NDI HX2'.
- Program stream:** Dropdown menu set to 'Main stream'.
- Preview stream:** Dropdown menu set to 'Sub stream'.
- Source video:** A section containing:
 - Machine name:** Text input field containing 'Ultra Encode'.
 - Group name:** Text input field containing 'public'.
 - Source name:** Text input field containing '#serial-no#-2'. Below it, a note states: '#serial-no# indicates the serial number of the device. The current source name is: B311220919058-2'.
- Transport Mode:** Dropdown menu set to 'TCP (Uni-connection)'.
- Discovery Server:** Toggle switch, currently off.
- Failover:** Toggle switch, currently off.
- Receiver control:** A section containing:
 - Web control:** Toggle switch, currently off.

At the bottom of the form are two buttons: 'Delete' and 'Save'.

- After configuration, the stream URLs display at the end of the page. If you have multiple network connections, there would be multiple stream URLs.

NDI

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The name can be 1~30 character.
- **Program stream:** Options are Main stream, Sub stream, and full black video stream (640x360@30FPS).
- **Preview stream:** Options are Main stream, Sub stream, and full black video stream (640x360@30FPS). Both width and height of the stream resolution must be no greater than 640.

Source Video

- **Machine name**

It is case-insensitive, and should be a combination of A to Z, a to z, 0 to 9 and special characters like _-#().

By default, it is Ultra Encode.

- **Group name**

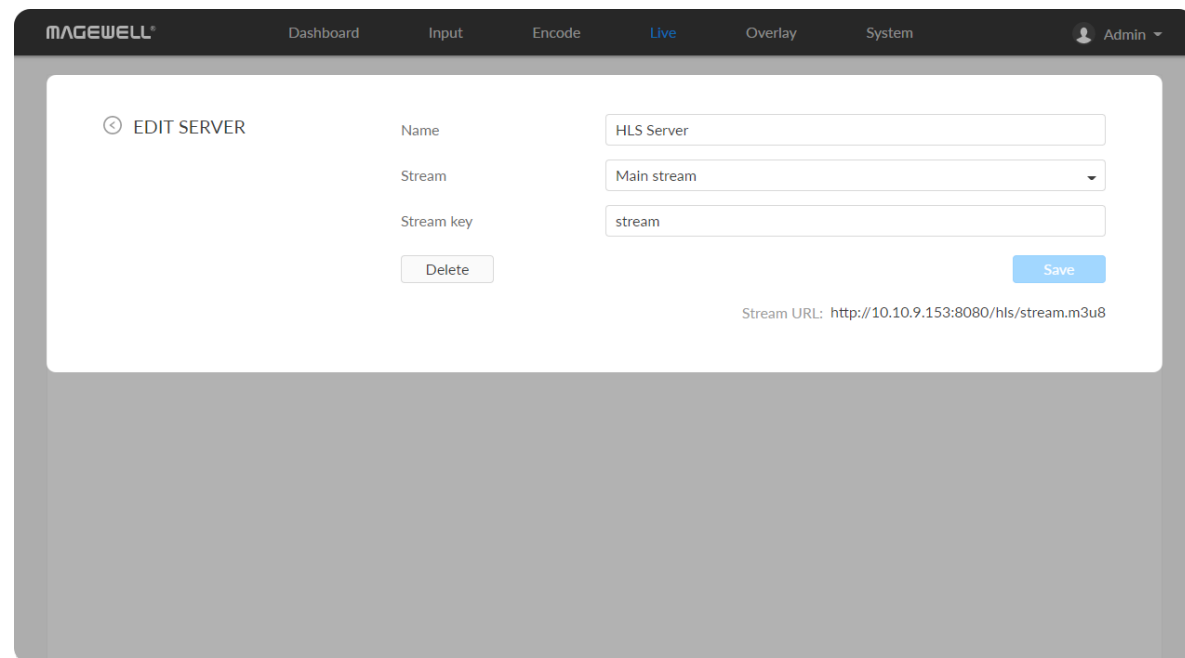
Specify the **Group name** which the source belongs to. It is case-insensitive, and should be a combination of A to Z, a to z, 0 to 9 and special characters like _-. Multiple groups are supported, which should be comma-separated.

By default, it is public.

- **Source name**

By default, it is #serial-no#, serial number.

- **Transport Mode**
 - **UDP (Unicast)** indicates that the encoder sends a UDP stream directly to the receiver. It is used where lower latency matters. And multiple simultaneous streams will work independently for multiple receivers.
 - **UDP (Multicast)** indicates that the encoder sends the UDP stream to a multicast group. It is used for one-to-many broadcast for lower CPU utilization. Parameters in a multicast configuration include:
 - **Multicast IP** ranges from 224.0.0.0 to 239.255.255.255.
 - **Subnet Mask** can be legitimate value ranging from 255.0.0.0 to 255.255.255.0.
 - **Time To Live** ranges from 1 to 255. The default value is 4.
 - **RUDP (Unicast)** indicates that the encoder sends the reliable UDP stream directly to the receiver.
 - **TCP (Uni-connection)** indicates that the encoder sends the TCP stream directly to the receiver.
 - **TCP (Multi-connection)** indicates that the encoder sends the TCP stream to more than one receiver.
- **Discovery Server:** turn on the switch to auto-detect a source sender in different network segment and ping the sender. And the **Server IP** should be the IP address of the server running discovery server software. By default, the switch is off.
- **Failover:** turn on to protect your NDI transmission from failure. If the initial source video fails, the backup device begins to provide a service. The initial source will be automatically switched back to after it recovers. This function is disabled by default.



- **Source name** shows the backup NDI channel name.
Click **Change...** and select the failover (backup) video device within the same NDI group as the initial source.
 - **IP Address** shows the IP Address of the backup NDI channel which is automatically obtained after you select the backup NDI source.
- **Receiver Control:** turn on Web control to enable you to open the Web UI by clicking the gear icon in the NDI Studio Monitor application.
 - When streaming NDI®|HX2, the encoder would send dual streams simultaneously.
 - The encoder can stream 2 NDI®|HX2 sessions with other protocol streams.

HLS

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The name can be 1~30 character.
- **stream:** options are main stream, and sub stream. Modify the stream profile in **Encode** tab.
- **Stream key:** set key for your chosen stream. The keys of dual streams should be different.
- **Save:** save current server configuration.
- The encoder can stream 1 HLS session with other protocol streams.
- After configuration, the stream URLs will display at the end of the setting page. If you have multiple network connections, there would be multiple stream URLs.

The screenshot shows the 'EDIT SERVER' configuration page for 'TS over UDP'. The interface includes a top navigation bar with 'Dashboard', 'Input', 'Encode', 'Live', 'Overlay', and 'System' tabs, and an 'Admin' user profile. The main form contains the following fields:

- Name:** TS over UDP
- Stream:** Main stream (dropdown)
- Address:** 10.10.14.183
- Port:** 50000
- Custom PID:** Toggled on (blue switch)
- PMT PID:** 256 (range 16 to 8190)
- Video PID:** 257 (range 16 to 8190)
- Audio PID:** 258 (range 16 to 8190)
- PCR PID:** 45 (range 16 to 8190)
- Network:** Mobile broadband first (dropdown)

Buttons for 'Delete' and 'Save' are located at the bottom of the form.

The screenshot shows the 'EDIT SERVER' configuration page for 'TS over RTP'. The interface is identical to the previous one, with the following fields:

- Name:** TS over RTP
- Stream:** Main stream (dropdown)
- Address:** 10.10.15.255
- Port:** 6000
- Custom PID:** Toggled on (blue switch)
- PMT PID:** 256 (range 16 to 8190)
- Video PID:** 257 (range 16 to 8190)
- Audio PID:** 258 (range 16 to 8190)
- PCR PID:** 45 (range 16 to 8190)
- Network:** Ethernet first (dropdown)

Buttons for 'Delete' and 'Save' are located at the bottom of the form.

TS over UDP/RTP

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The name can be 1~30 character.
- **Stream:** options are main stream and sub stream, which can be customized in [Encode](#) tab.
- **Address:** specify the destination address.
- **Port:** specify the stream port. The value ranges from 1 to 65535.
- **Custom PID:** PID stands for packet ID. Toggle it on to set the PIDs. PMT PID (program map table) should be different from Video PID, Audio PID and PCR (program clock reference) PID.
 - PMT PID: the default value is 256. The value ranges from 16 to 8190.
 - Video PID: the default value is 257. The value ranges from 16 to 8190.
 - Audio PID: the default value is 258 to 265 for channel 1 to channel 8. The value ranges from 16 to 8190.
 - PCR PID: it is used to sync the audio and video. The default value is 45. The value ranges from 16 to 8190.
- **Network:** The device scans for the available network according to the connection priority and connect to it for streaming. If the current network is disconnected, the unit automatically re-scans according to the priority. By default, the network connection priority is: Mobile Broadband > Ethernet > Wi-Fi.
Plug a USB modem into your encoder while using mobile network to stream.
- **Save:** save current configuration.
- You can set TS over UDP/RTP MTU at the System > General > LIVE part.

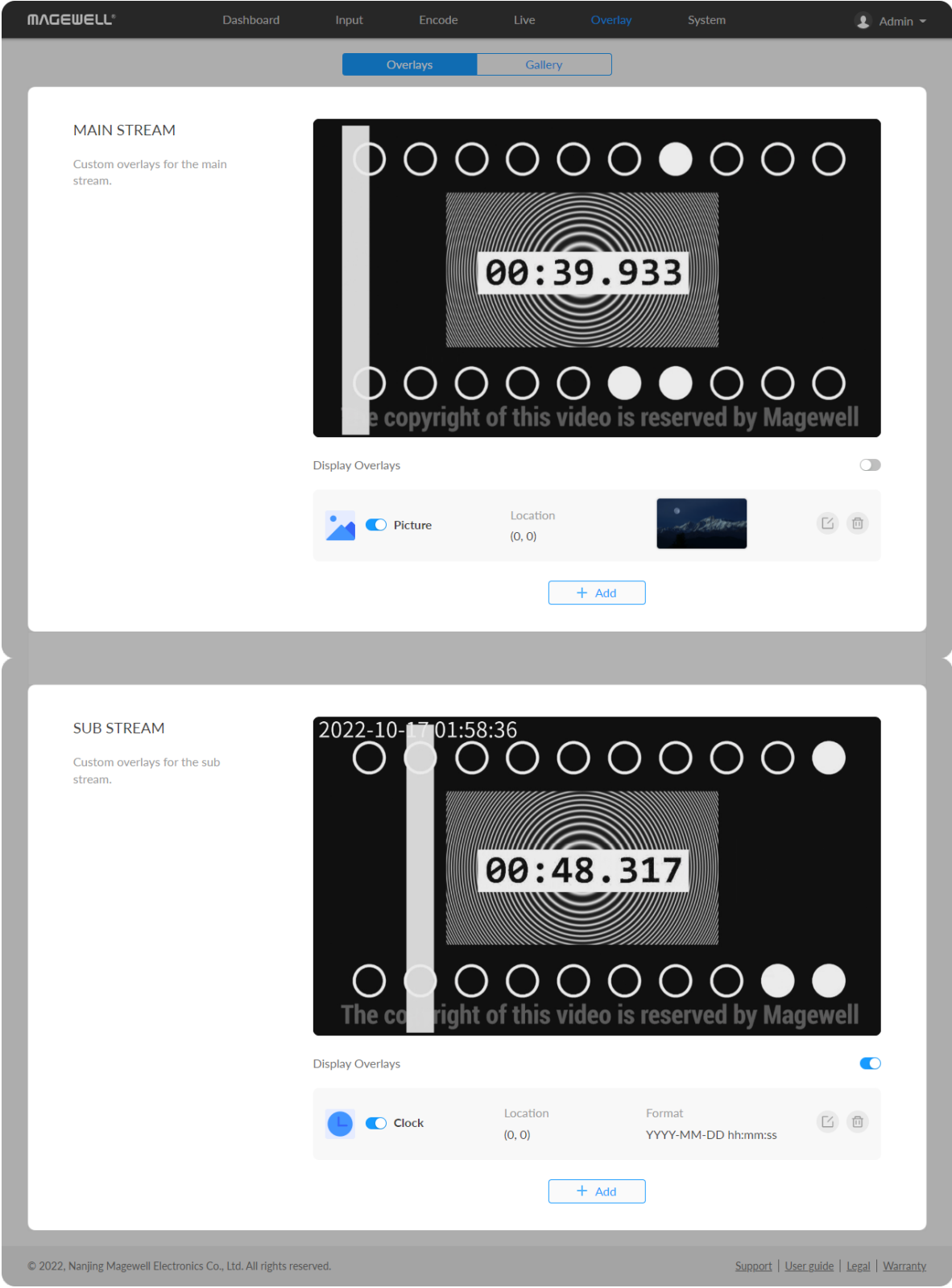
The screenshot shows the MAGEWELL Live configuration interface. The top navigation bar includes Dashboard, Input, Encode, Live (selected), Overlay, and System. A user profile icon labeled 'Admin' is in the top right. The main content area is titled 'EDIT SERVER' with a back arrow icon. It contains three input fields: 'Name' with the value 'TVU ISSP', 'Stream' with a dropdown menu showing 'Main stream', and 'Port' with the value '6539'. A blue 'Save' button is located to the right of the Port field. Below the fields, the 'Stream URL' is displayed as 'issp://10.10.9.153:6539'.

TVU ISSP

- **Name:** specify a name for current task to facilitate server management, which will be displayed in server list. The value can be 1 to 30 characters, including A-Z, a-z, 0-9, spaces, ._-+'[]() and can not begin or end with a space.
- **Stream:** options are main stream and sub stream, which can be customized in [Encode](#) tab.
- **Port:** specify the stream port. The value can be 6539 (default), 10000-65535.
- **Save:** save current configuration.
- The encoder can stream 1 TVU ISSP session with other protocol streams.
- After configuration, the stream URLs display at the end of the page. If you have multiple network connections, there would be multiple stream URLs.

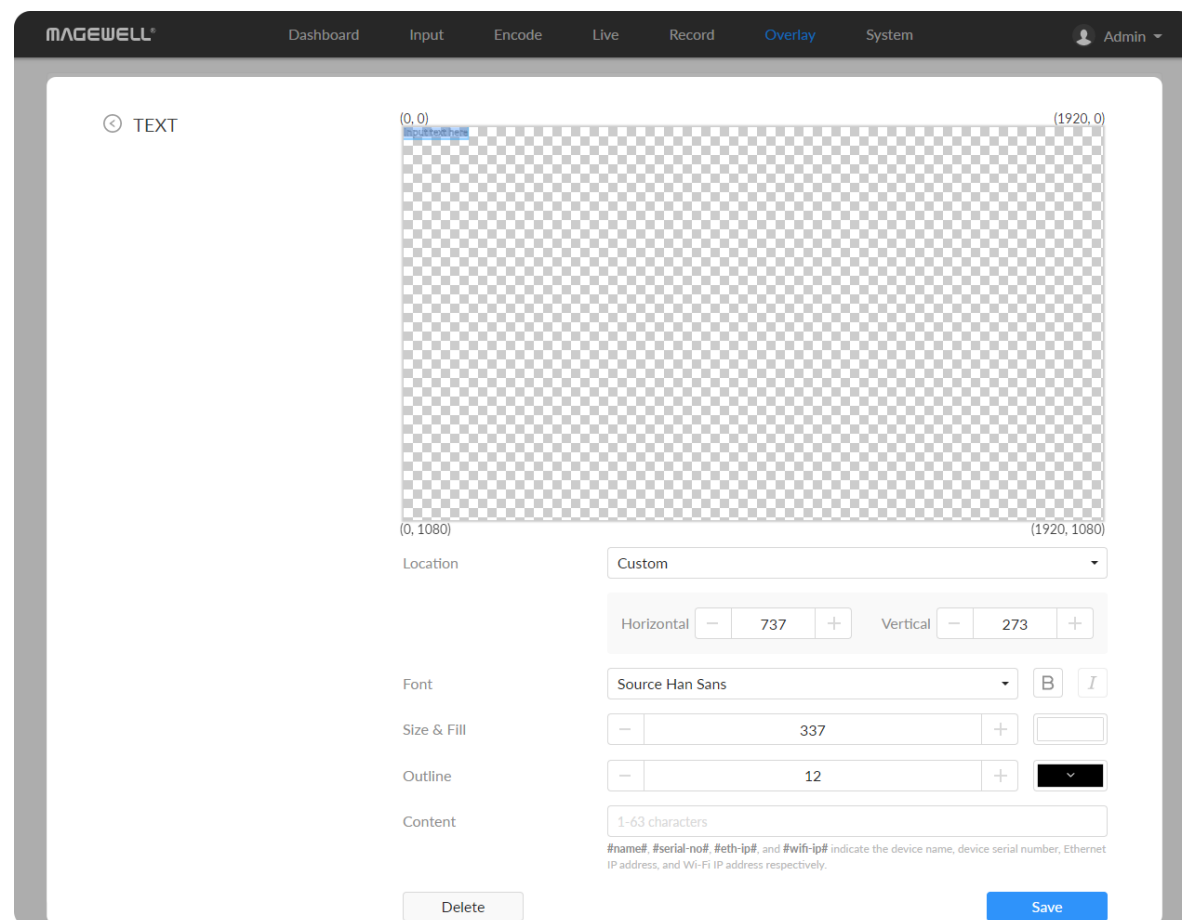
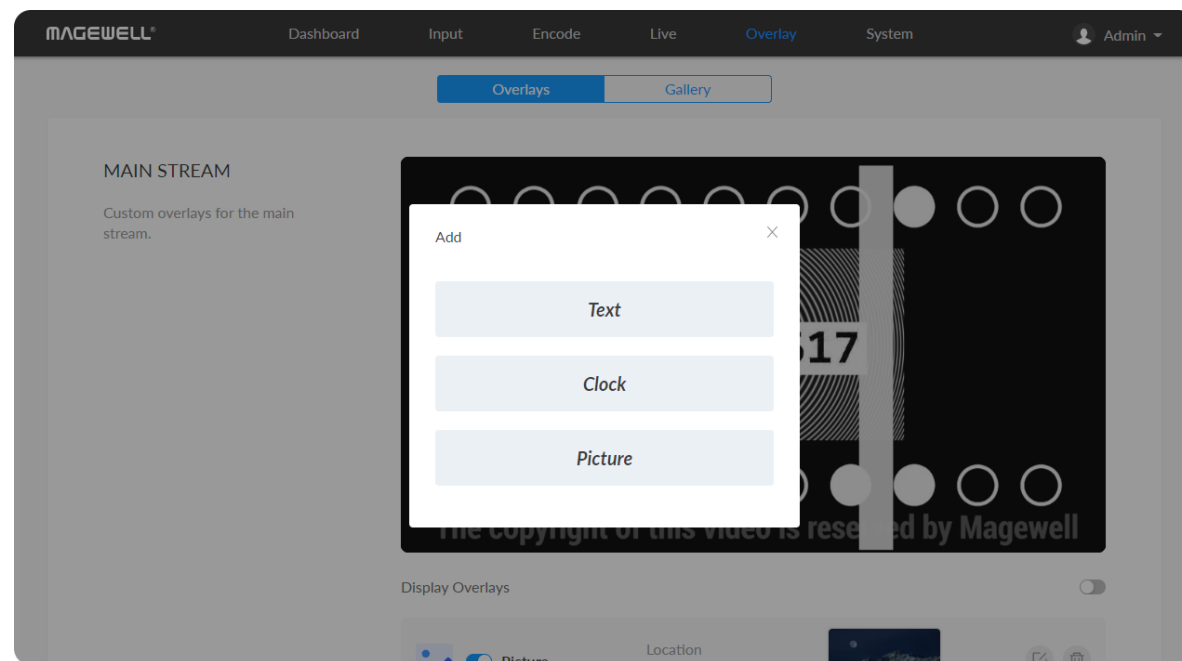
Overlay

The overlay function is available when the resolutions of the input signal and the mainstream are no greater than 2048x1080.



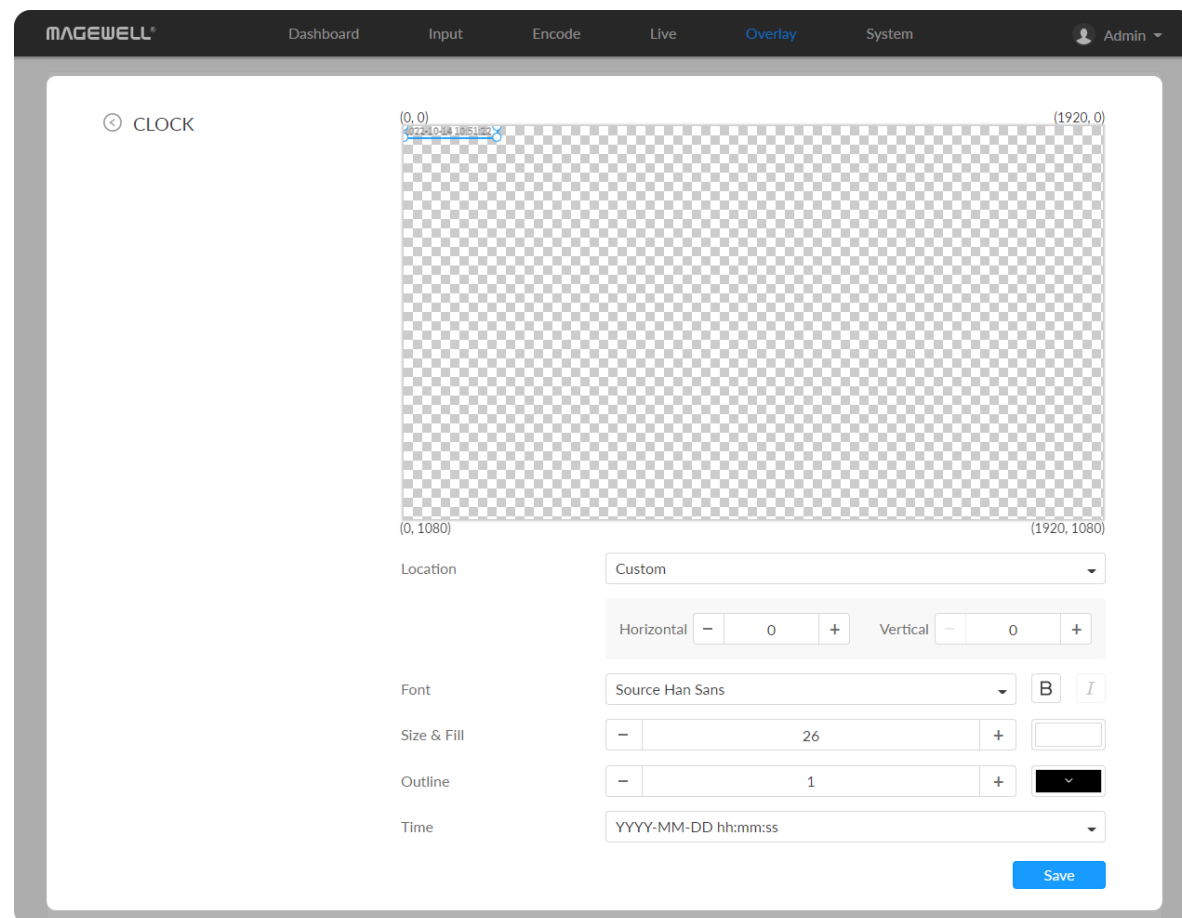
Setting Overlays for the Main and Sub Streams

Display Overlays is off by default. You can preview thumbnails with overlays after turning it on.



Adding Text

- **Location:** options are Custom(default), Top left, Top right, Top center, Bottom left, Bottom right, Bottom center, and Center. Or just drag the item on the 1920x1080 canvas and place it at your desired location.
- **Horizontal:** specify the horizontal coordinates manually when location is Custom.
- **Vertical:** specify the vertical coordinates manually when location is Custom.
- **Font:** options are Source Han Sans (default), and Lato. Bold and Tilt are also provided.
- **Size & Fill:** font size is 26px by default. You can set from 6 to 400px. The default fill color is rgba(255, 255, 255, 1), and you can click the color-picker to custom your desired color.
- **Outline:** the default width of outline is 1px. You can set from 0 to 100px. And the default outline color is rgba(0, 0, 0, 1), and you can click the color-



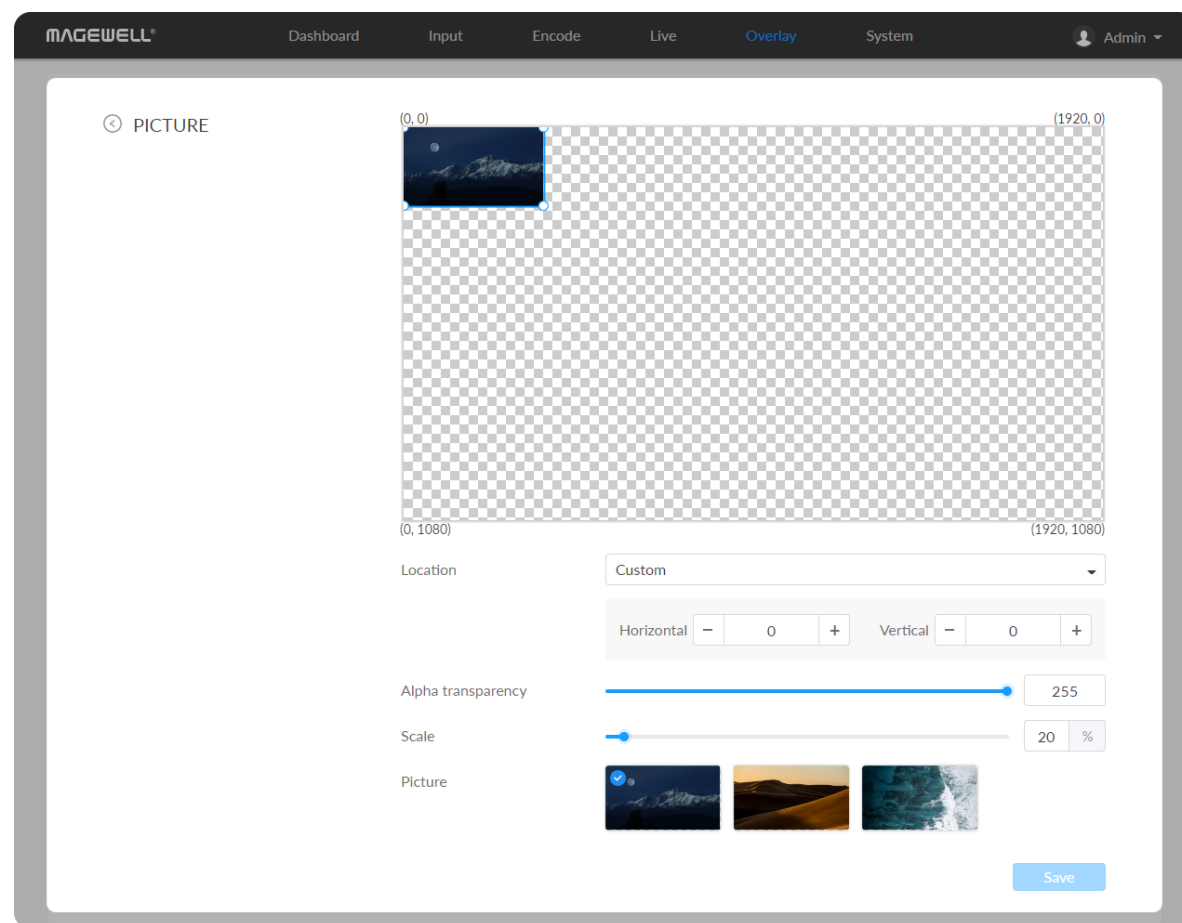
picker to custom your desired color.

- **Content:** 1 to 63 characters are supported to display.
- **Save:** save current configuration.

Adding Clocks

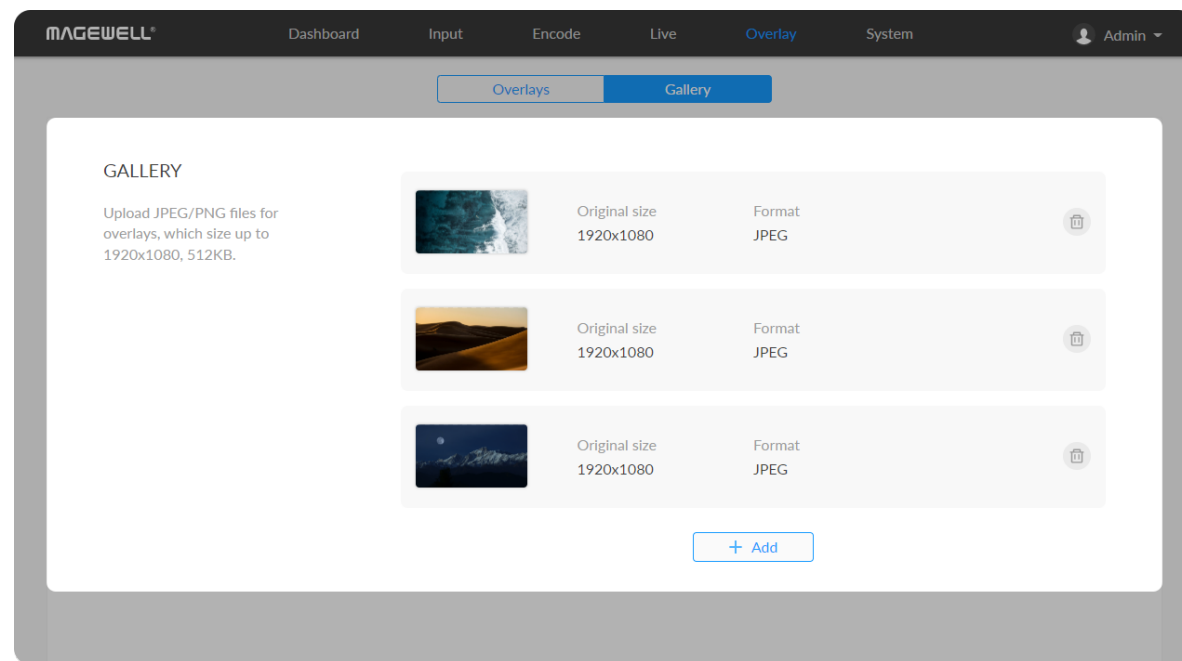
- **Location:** options are Custom(default), Top left, Top right, Top center, Bottom left, Bottom right, Bottom center, and Center. Or just drag the item on the 1920x1080 canvas and place it at your desired location.
- **Horizontal:** specify the horizontal coordinates manually when location is Custom.
- **Vertical:** specify the vertical coordinates manually when location is Custom.
- **Font:** options are Source Han Sans (default), and Lato. Bold and Tilt are also provided.
- **Size & Fill:** font size is 26px by default. You can set from 6 to 400px. The default fill color is `rgba(255, 255, 255, 1)`, and you can click the color-picker to custom your desired color.
- **Outline:** the default width of outline is 1px. You can set from 0 to 100px. And the default outline color is `rgba(0, 0, 0, 1)`, and you can click the color-picker to custom your desired color.
- **Time:** options are as follows.
 - YYYY-MM-DD hh:mm:ss
 - MM/DD/YYYY hh:mm:ss
 - DD/MM/YYYY hh:mm:ss
 - YYYY-MM-DD

- MM/DD/YYYY
- DD/MM/YYYY
- hh:mm:ss
- hh:mm
- **Save:** save current configuration.



Adding Pictures

- **Location:** options are Custom(default), Top left, Top right, Top center, Bottom left, Bottom right, Bottom center, and Center. Or just drag the item on the 1920x1080 canvas and place it at your desired location.
- **Horizontal:** specify the horizontal coordinates manually when location is Custom.
- **Vertical:** specify the vertical coordinates manually when location is Custom.
- **Alpha transparency:** it can have a value from 0 (0%) to 255 (100%) in opacity.
- **Scale:** resize your picture between 1% to 400%. By default it is 100%.
- **Picture:** choose a picture from Overlay > Gallery. There is no picture by default.
- **Save:** save current configuration.



Gallery

- Upload JPEG/PNG files for overlays, up to 1920x1080, 1 M. And you can add 8 pictures at most.
- You can choose the picture in Overlay > Picture after uploading successfully.
- Click delete button  to delete current picture from your device.

General

MAGEWELL® Dashboard Input Encode Live Overlay **System** Admin

General Network User Admin Firmware Control Hub About

DEVICE NAME

Ultra Encode B312220809002

Change the device name to any other name you like.

Save

SECURITY

HTTP

Port 80

HTTPS

Port 443

- **DEVICE NAME:** value range is from 1 to 32 characters, including A-Z, a-z, 0-9, space ._- + ' [] () and cannot begin or end with a space.
- **Save:** save current configuration.

SECURITY

HTTP

Port 80

HTTPS

Port 443

CA Certificate

Drag & drop a certificate or click to upload

CA Private Key

Drag & drop a key or click to upload

Save

Modify SECURITY settings

1. Modify HTTP port.
The default port is 80. Modify the port number ranging from 1 to 65535, based on your network condition, then click **Save**.
2. Secure the Control Hub with HTTPS.
Turn on HTTPS, then specify the port number ranging from 1 to 65535 for HTTPS. The default port is 443.
 - Modify HTTPS port.
The default port is 443. Modify the port number ranging from 1 to 65535, based on your network condition, then click **Save**.
 - Import a CA certificate and private key into Control Hub.

Renew certificates by uploading the new files that you want to, without removing existing ones. Then click **Save**.

3. Re-log into Web UI.

Open your Web browser and type `http://IPaddress:new-port`, or `https://IPaddress` to access the SIGN IN page.

The screenshot displays a web interface for configuring streaming parameters. It is divided into three main sections: A/V SYNC, LIVE, and DATE & TIME.

- A/V SYNC:** This section is highlighted with a white background. It contains a title "A/V SYNC", a descriptive paragraph: "To match up the audio and video tracks, set a positive value to delay the start of the audio track, set a negative value to reduce the delay.", a slider for "Audio offset" currently set at "0 ms", and "Save" and "Reset" buttons.
- LIVE:** This section has a grey background. It contains a title "LIVE", a descriptive paragraph: "Set Live parameters.", and a "TS Over UDP/RTP" subsection. The subsection includes an "MTU" input field with a value of "1496" and minus/plus adjustment buttons, along with "Save" and "Reset" buttons.
- DATE & TIME:** This section also has a grey background. It contains a title "DATE & TIME", a descriptive paragraph: "Set proper time for your streamer to live and record.", a "Time zone" dropdown menu currently set to "UTC", a "Save" button, and a "Set time automatically" toggle switch which is currently turned on.

A/V Sync

- **Audio offset** ranges from -200 to 200ms.

To match up the audio and video tracks, set a positive value to delay the start of the audio track, or set a negative value to reduce the delay.

We recommend that you start your live after this configuration to enjoy the A/V sync adjustment.

- **Save:** save current configuration.
- **Reset:** reset parameters to default values.

A/V SYNC

To match up the audio and video tracks, set a positive value to delay the start of the audio track, set a negative value to reduce the delay.

Audio offset

0 ms

Save Reset

LIVE

Set Live parameters.

TS Over UDP/RTP

MTU

1496

Save Reset

DATE & TIME

Set proper time for your streamer to live and record.

Time zone

UTC

Save

Set time automatically

☒

Live

- **TS over UDP/RTP MTU:** specify maximum transmission unit (MTU) in bytes, ranging from 228 to 1500. The default size is 1496.
- **Save:** save current configuration.
- **Reset:** reset parameters to default values.

DATE & TIME

Set proper time for your streamer to live and record.

Time zone

UTC

Save

Set time automatically

☒

NTP server 1

0.pool.ntp.org

NTP server 2

1.pool.ntp.org

Save

RESET

Reset all settings will cause all configurations to return to the default value.

Reset all settings

Import settings...

Export settings...

REBOOT

Reboot the device

Date & Time

- **Time zone:** specify a time zone for your device.
- **Set time automatically:** turn on **Set Time Automatically**. Then the device's time will synchronized to the world-time servers depending on the timezone you set. Otherwise, you can set time manually.
- **NTP server 1:** the default server is 0.pool.ntp.org.
- **NTP server 2:** the default server is 1.pool.ntp.org.
- **Save:** save current configuration.

DATE & TIME

Set proper time for your streamer to live and record.

Time zone: UTC

Save

Set time automatically: ☒

NTP server 1: 0.pool.ntp.org

NTP server 2: 1.pool.ntp.org

Save

RESET

Reset all settings will cause all configurations to return to the default value.

Reset all settings

Import settings...

Export settings...

REBOOT

Reboot the device

Resetting Your Device

- **Reset all settings:** be cautious that resetting your device would restore configurations to defaults.
 - You can **Reset all settings** on the "SIGN IN" page, when the device is connected to PC via USB NET.
- **Reboot the device:** power off the device and restart it when it does not work.

RESET

Reset all settings will cause all configurations to return to the default value.

Reset all settings

Import settings...

Export settings...

REBOOT

Reboot will shut device down and then start it again immediately.

Reboot the device

Auto reboot: ☒

Reboot time: 2023-09-15 11:17:32

Repeat event: No-repeat

Save

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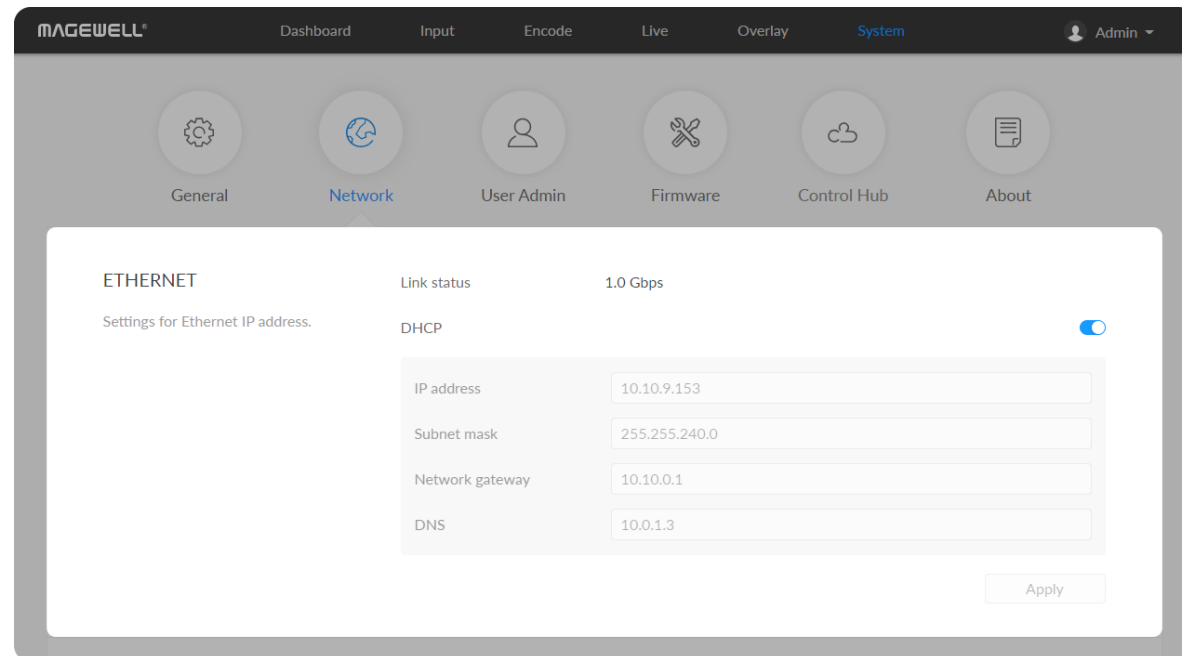
Reboot

- **Reboot the device:** power off the device and restart it when it does not work.
- **Auto reboot:** off by default. Turn it on to set Reboot time (YYYY-MM-DD HH-MM-SS), Reboot time, and click Save.
 - **Repeat event:** Support no-repeat (default), daily, weekly, monthly, yearly.
 - **Daily:** The repeat mode can be repeated every N days, or every workday.
 - **Weekly:** The repeat mode can be Repeat every 1 week next days: multiple choices are available.
 - **Monthly:** The repeating pattern may be repeat N days every N month, or on weekday every N month.
 - **Yearly:** The repeating pattern can be every N day N month, or on N

weekday of N month.

Network

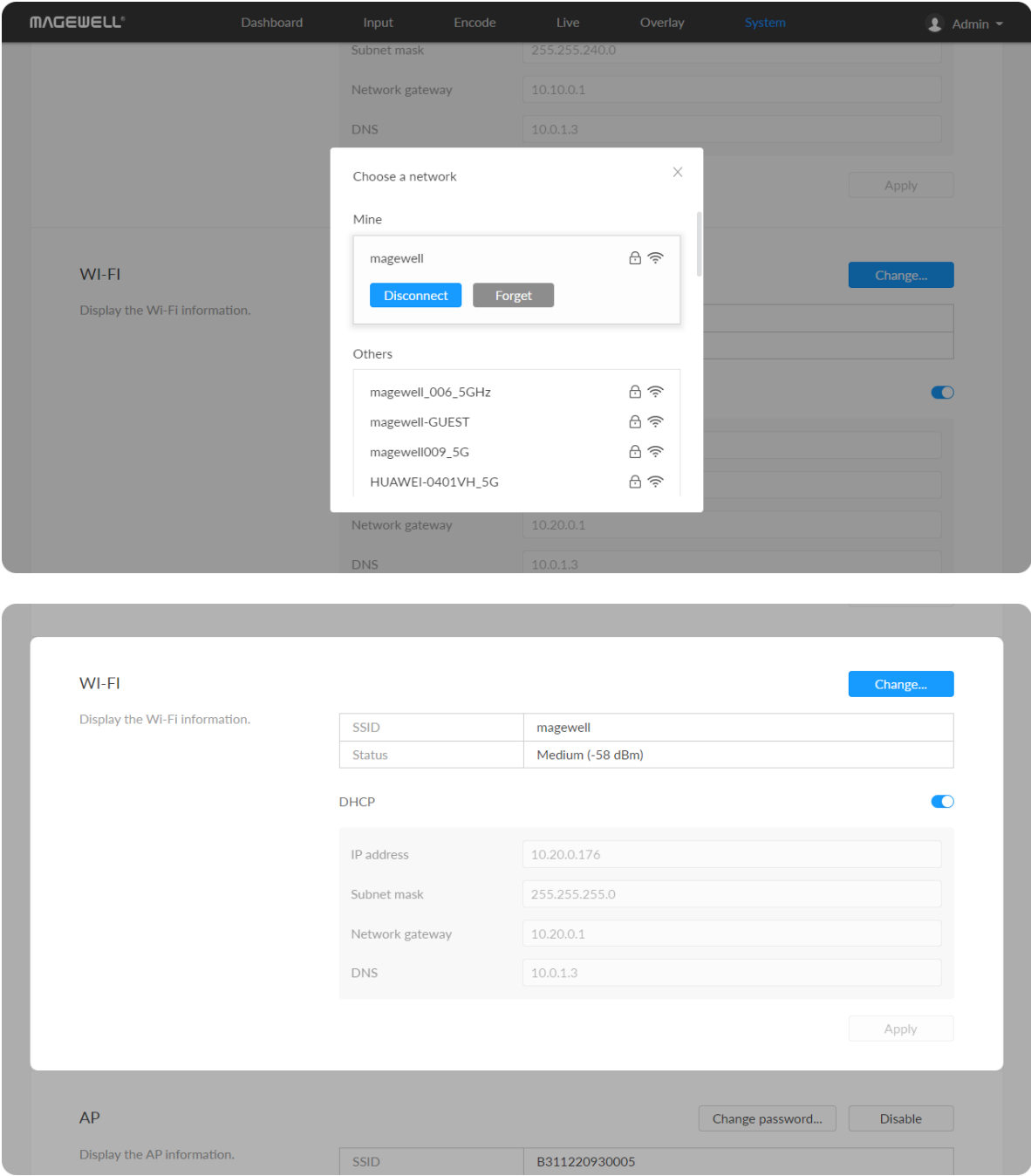
Networking information, including Ethernet, USB NET, mobile network, Wi-Fi and AP, can be set in the **Network** tab.



Setting ETHERNET

The device automatically detects and connects to the Ethernet when networking to a DHCP-enabled LAN. Or you can set the IP address manually for a fixed IP address or an auto-networking failure.

- **DHCP:** it is on by default. Turn off the switch to modify current network setting or when being connected to a non-DHCP network.
 - **IP address:** device IP address.
 - **Subnet mask:** device subnet mask.
 - **Network gateway:** device gateway.
 - **DNS:** DNS server IP address.
- **Apply:** make current configuration effective. When prompted, click **Yes**.
- **Verify:** input new IP address to open the Web UI.



Setting Wi-Fi

16 Wi-Fi network information can be saved for auto-detection.

- **Disconnect:** click to cut off current Wi-Fi network.
- **Change...** click to choose a different WLAN to connect to.
- **SSID:** named after device serial number.
- **Status:** Wi-Fi signal strength.
- **IP address:** WLAN IP address.
- **Subnet mask:** WLAN subnet mask.
- **Network gateway:** WLAN gateway.
- **DNS:** WLAN DNS server IP address.

Searching Wi-Fi Network manually

1. Click **Change...** to choose a different WLAN to connect to, and **Enter the network security key**.
2. (Optional) Check **Connect automatically**, then the Wi-Fi network will be joined automatically.
3. Click **connect**.

Setting Wi-Fi manually

- **Set IP address manually:** turn on the switch to modify current network setting or when being connected to a non-DHCP network.
- **IP address:** device IP address.
- **Subnet mask:** device subnet mask.
- **Network gateway:** device gateway.
- **DNS:** DNS server IP address.

AP

Change password...

Disable

Display the AP Information.

SSID	B311220930005
IP address	192.168.48.1
Subnet mask	255.255.255.0

USB NET

Edit...

Settings for IP address of USB NET.

Link status	High Speed
IP address	192.168.66.1
Subnet mask	255.255.255.0

MOBILE NETWORK

Display the mobile broadband information.

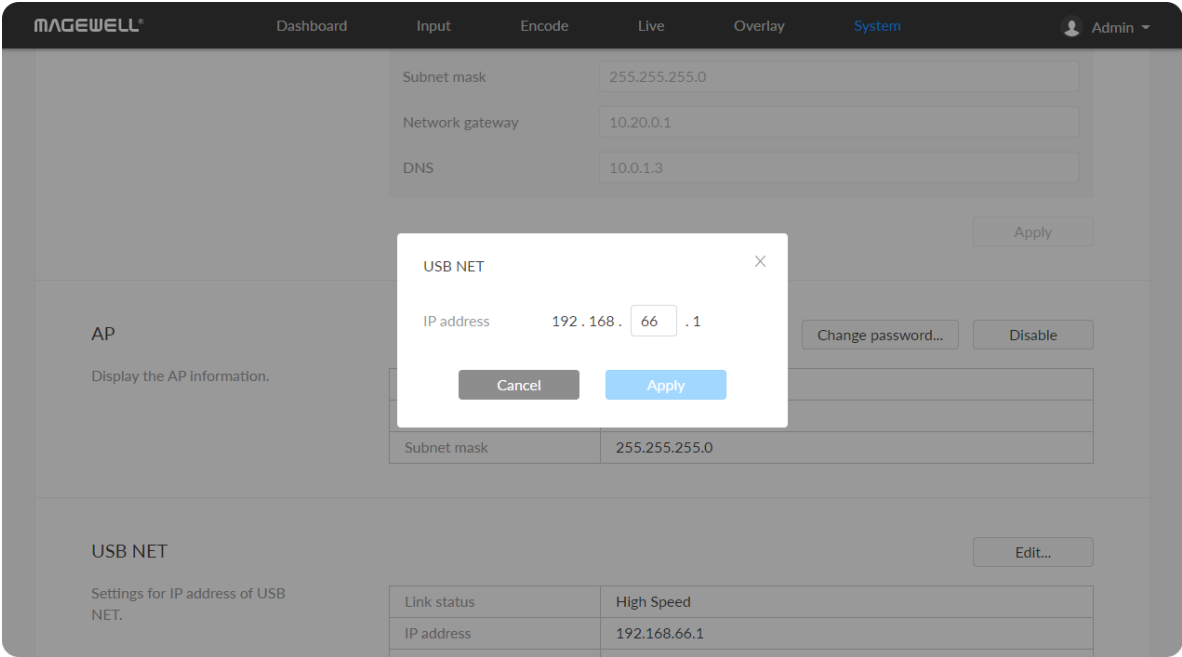
IP address	192.168.8.161
Subnet mask	255.255.255.0
Network gateway	192.168.8.1
DNS	192.168.8.1

- **Apply:** make current configuration effective. When prompted, click **Yes**.
- **Verify:** input new IP address to open the Web UI.

Setting AP

You device can work as an AP to be joined to for remote web control.

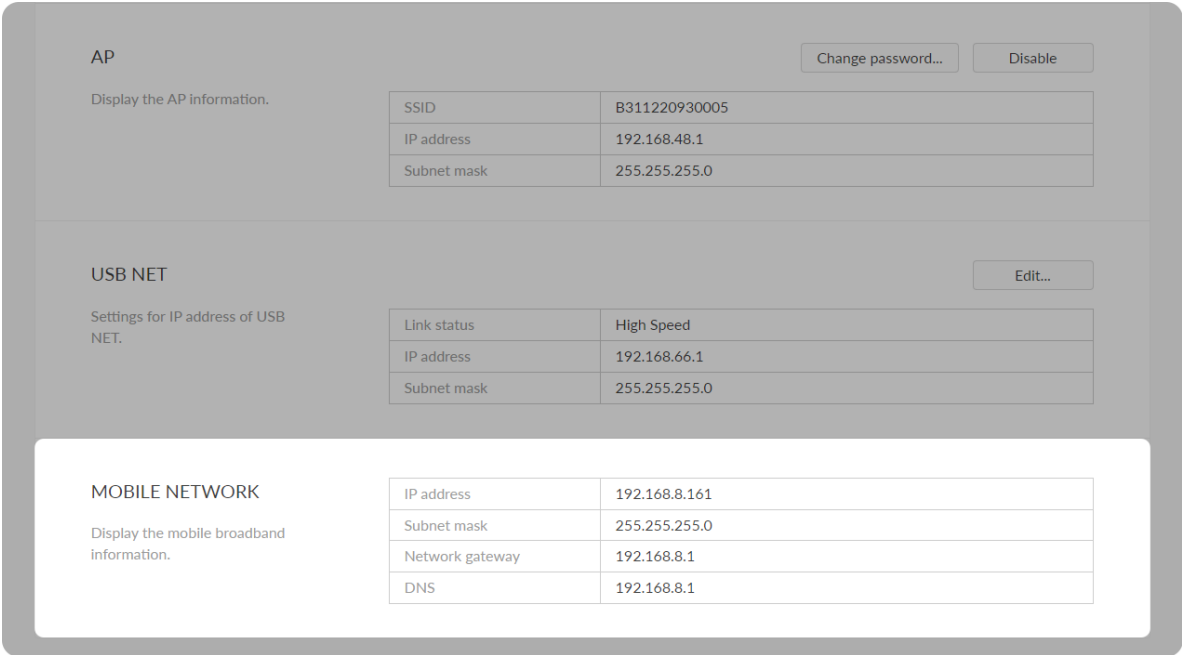
- **SSID:** by default, it is named after the device serial number.
- **IP address:** fixed as 192.168.48.1.
- **Subnet mask:** fixed as 255.255.255.0.
- **Change password...**
 - **AP password:** the default AP password is the last 8-number of the serial number. For example, a serial number 311210101001 indicates the initial AP password is 10101001. It ranges from 8 to 16 characters including A-Z, a-z, 0-9, space . _ - + ' [] () and cannot begin or end with a space.
- **Disable:** click to turn off AP mode. This renders you unable to manage the device over AP, which is not recommended, especially when you are using wireless network or linux/mac OS.



Setting USB NET

You can connect your device to a PC via USB NET for remote control.

- **Link status:** USB NET connection status.
- **IP address:** USB NET IP address, 192.168.66.1 by default. You can click **Edit...** to change it.
- **Subnet mask:** Subnet mask of USB NET.
- **Edit...:** enter a new address and click **Apply** in the prompt window. The **IP address** will show the changed IP address after modification.



Setting Mobile Network

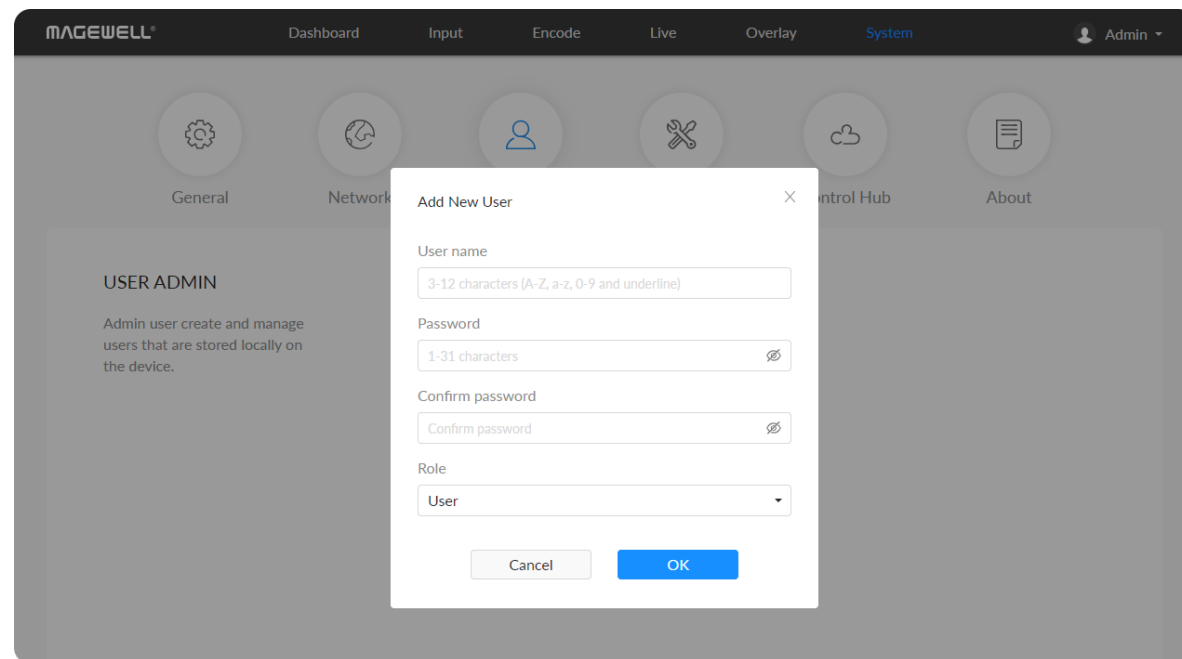
The encoder supports streaming via a USB modem.

- **IP address:** IP address assigned by the USB modem.
- **Subnet mask:** subnet mask.
- **Network gateway:** gateway.
- **DNS:** DNS server IP address.

User Admin

Administrator is allowed to perform the following tasks. The **User Admin** tab is invisible when you log in as a general user.

- [Creating/Removing General User Accounts](#)
- [Modifying User Password](#)



Creating/Removing General User Accounts

After signing in with default admin account, you may need to add general users to give them permissions to do basic operations, like monitoring the device, or setting some of the parameters.

1. Access the Web UI, and sign in as administrator.
2. Go to **User Admin** tab.
3. Click **Add user**.
4. Enter username, password, and confirm your password.
 - The username is a string of 3 to 12 characters, which contains the letters A-Z, a-z, numbers 0-9 and underline.
 - The password is a string of 1 to 32 characters, which contains the letters A-Z, a-z, numbers 0-9 and special characters _~!@#\$%^&*~+=.
5. Assign the user to an Administrator role or a general User role.
 - Administrators have the highest level of access to an account.
 - A general user will have limited access to the account as per the permissions given by the Admin. You may not get access to the "User Admin" function.
 - The user role can not be changed. You might need to recreate a new

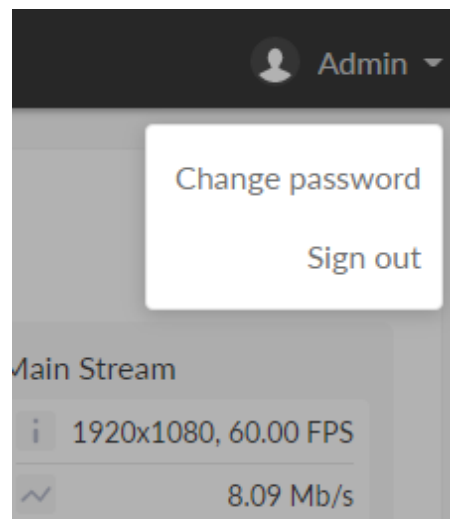
user.

6. Click **OK**.
7. Repeat step 3~5 to add multiple users. You can add up to 15 users.
8. To delete a user: Click **Delete** in the username card. When prompted, click **Yes**.

Modifying User Password

Set Password in the following ways.

1. [Modify user password logged-in](#) via drop-list beside your avatar at the top right
2. [Modify a specified user password](#) in **User Admin** tab with admin account



Modifying current logged-in user password

1. Log in Web UI.
2. Click the drop-list icon  beside your avatar icon, and click **Change password**.
3. In the pop up window, type in your old password, the new password, and confirm your new password.
The password is a string of 1 to 32 characters, which contains letters A-Z, a-z, numbers 0-9 and special characters _~!@#\$%^&*~+=.
4. Click **OK**.

Change Password

Old password

1-31 characters

New password

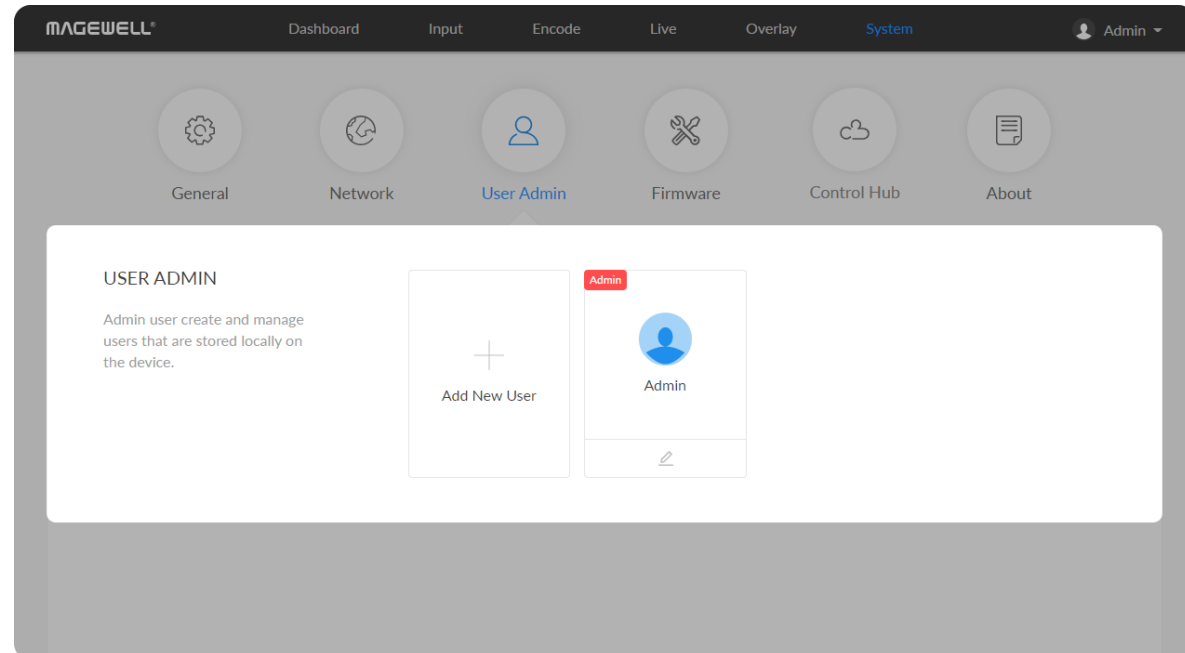
1-31 characters

Confirm password

Verify your new passcode

Cancel

OK



Modifying a specified user password

1. Access the Web UI and sign in with the administrator account.
2. Go to **User Admin** tab, then you can change any user's password.
3. Click the  **Set password**.
4. In the pop up window, type in and confirm your new password.
The password is a string of 1 to 32 characters, which contains letters A-Z, a-z, numbers 0-9 and special characters _~!@#\$%^&*~+=.
5. Click **OK**.

Set Password



New password

1-32 characters (A-Z, a-z, 0-9 and _~!@#\$%^&*~+=) 

Confirm password

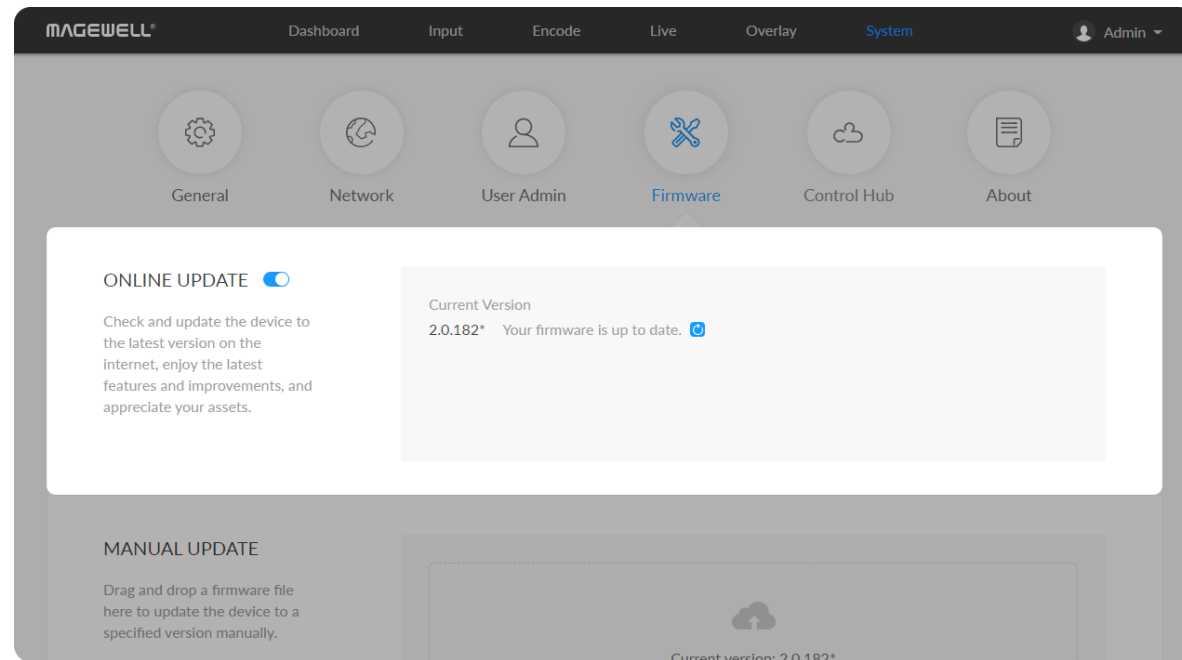
Verify your new passcode 

Cancel

OK

Firmware

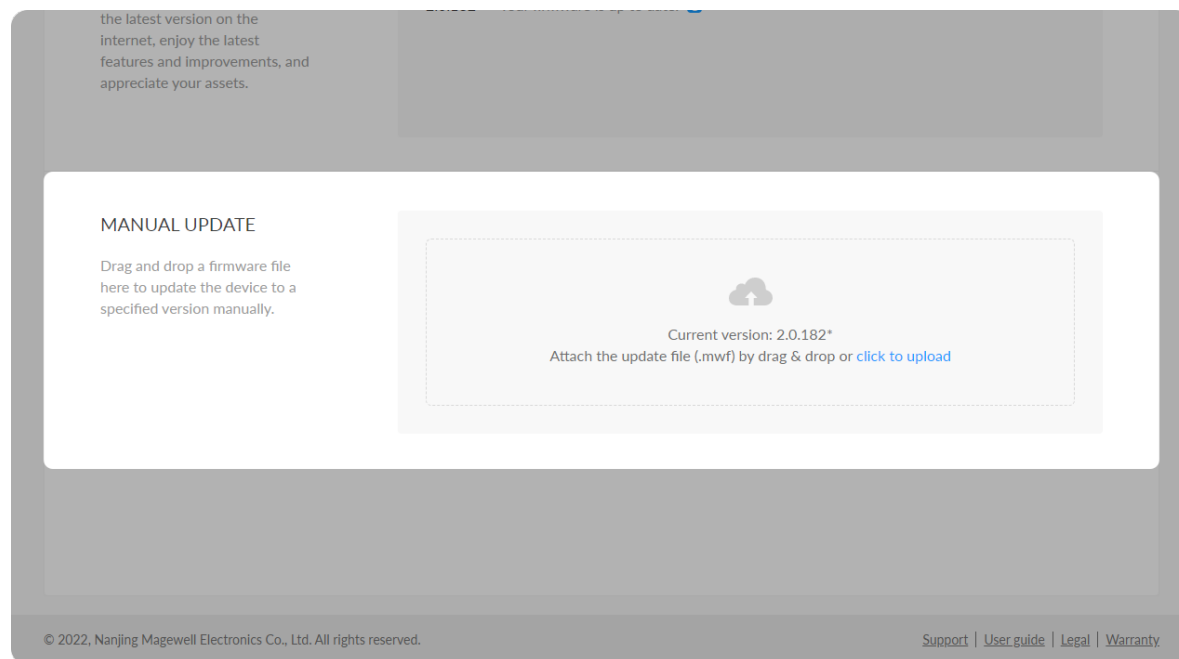
Detect and update firmware to the latest version online, or you can manually add a firmware file to update the unit to specified version.



Online Update

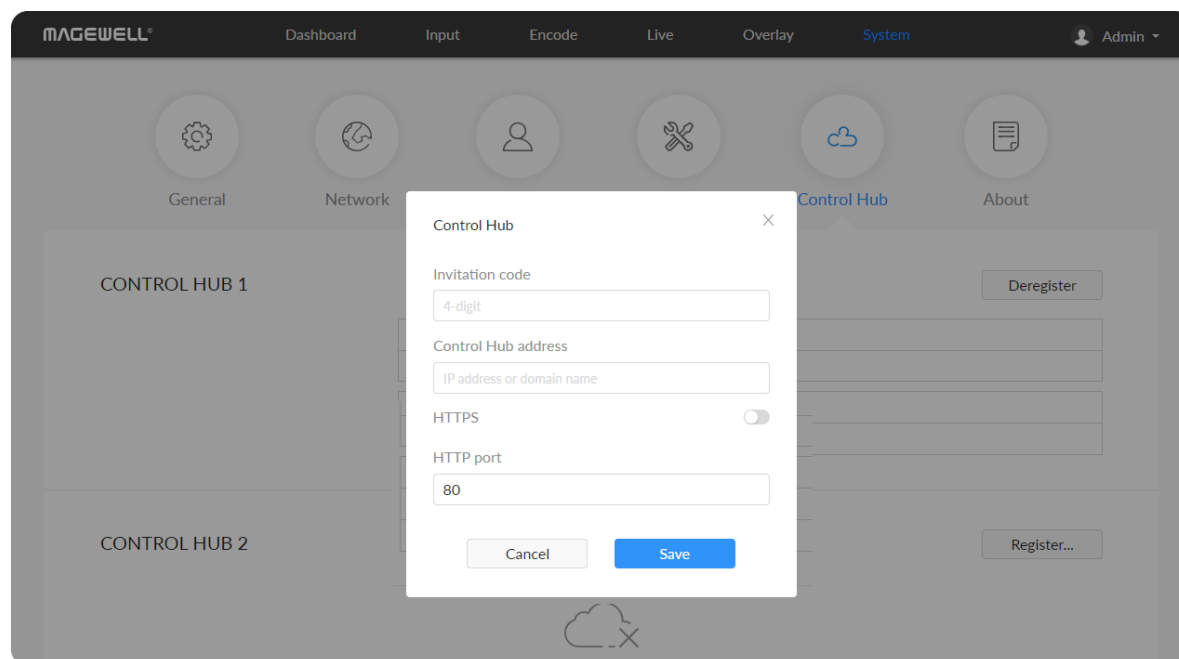
By default, the function is on. When a new version is detected, a **Firmware** icon will flow on the control pane.

1. Turn on  switch, and the online update function is on. The unit would detect the latest released firmware automatically when connecting to the Ethernet.
2. Click  icon to check for the latest firmware manually.
3. Click **Update** button to download and install the new version file if any. Do not disconnect from the power source or perform any operation while updating the firmware as this could damage your gear. After a successful update, the device will restart automatically.
4. Verify: click  checking for updates again.



Manual Update

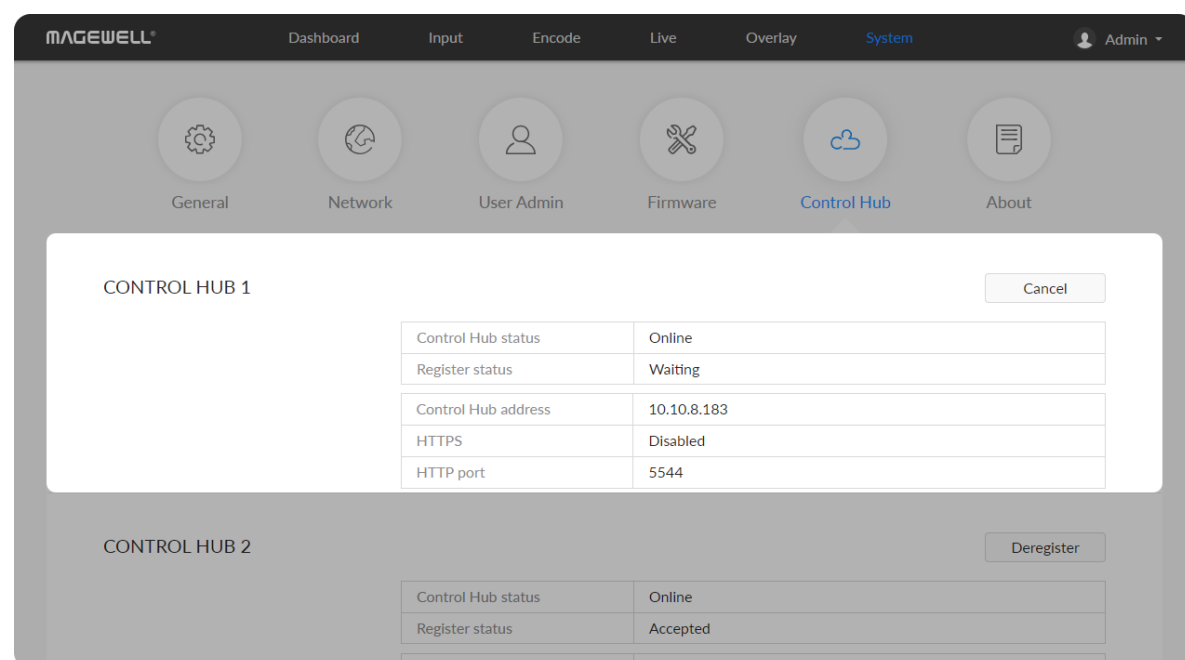
1. Click on **click to update** to select the **.mwf** firmware update file from your local storage, or just drag and drop the file from your computer into the upload zone.
Download firmware file from [our official website](#).
The device will automatically verify the update file and upload the file after the file verification is passed.
2. Click **Update** to download and install the new version file. Then the device will reboot to complete the update.
Do not disconnect from the power source or perform any operation while updating the firmware as this could damage your gear.
3. Verify: check the **Firmware version** in **Dashboard** or **Firmware** tab. It should be the same as your target version number.



Control Hub

You can apply for remotely control using Magewell Control Hub. 2 platforms are supported simultaneously, Control Hub 1 and Control Hub 2.

- Click **Register...** and input parameters in the prompted window. And save after configuration.
 - **Invitation code:** a 4-digital numbers security code obtained from Magewell Control Hub. If not leave it empty.
 - **Control Hub address:** input IP address or domain name of Control Hub.
 - **HTTPS:** Control Hub supports HTTPS access, you can enable it to set the HTTPS port number.

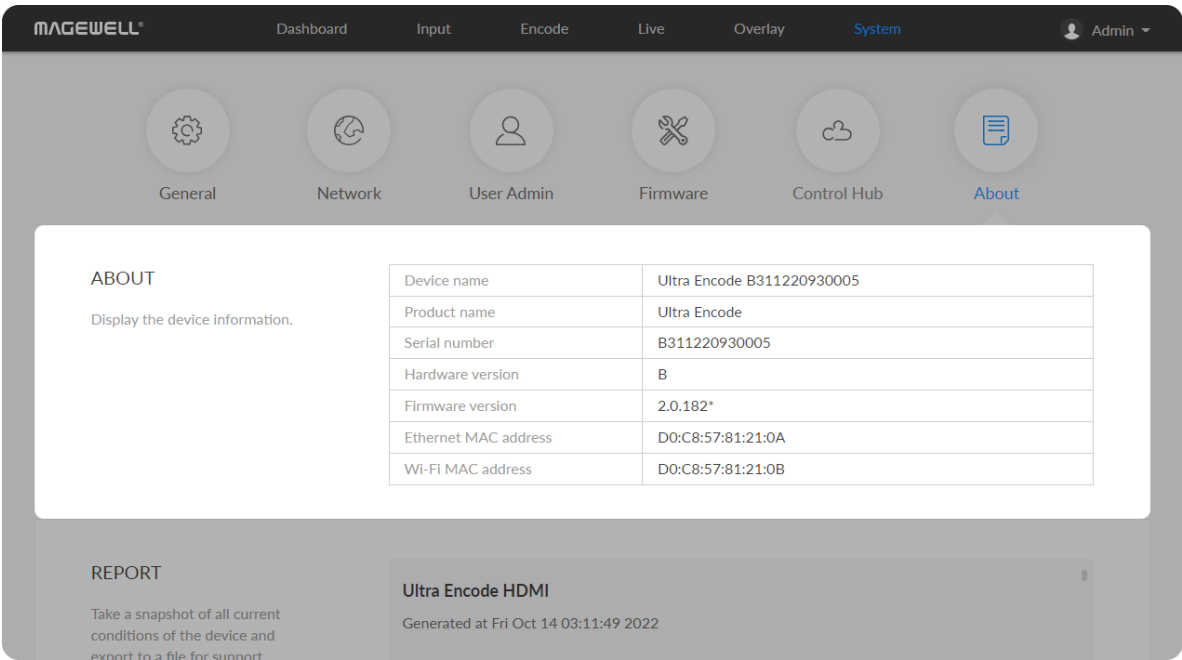


- **HTTPS port:** enter HTTP port number, which should be consist with that of Control Hub. 443 is the default port, and the port number ranges from 1 to 65535.
- **HTTP port:** input HTTP port number, which should be consist with that of Control Hub.
- Click **Deregister** to stop the remote control from Control Hub.
- Check parameters of Control Hub management.
 - **Control Hub status: Online or Offline.** Online indicates that the communication between device and Control Hub platform goes well. On the other hand, Offline indicates the communication is interrupted.
 - **Register status:** shows current status of join permission, including
 - Incorrect invitation code: you need to change your registration with correct code.
 - Waiting: registration is successfully submitted to Control Hub platform.
 - Approved: registration is approved. This device can be remotely controlled.
 - Rejected: Registration is denied.
 - Deleted: Registration is deleted, you can re-apply for joining the Control Hub.
 - **Control Hub address:** shows the IP address of Control Hub.
 - **HTTPS:** shows the enable status of HTTPS.

- **HTTPS/HTTP port:** shows the HTTPS/HTTP port of device used to communicate with Control Hub.

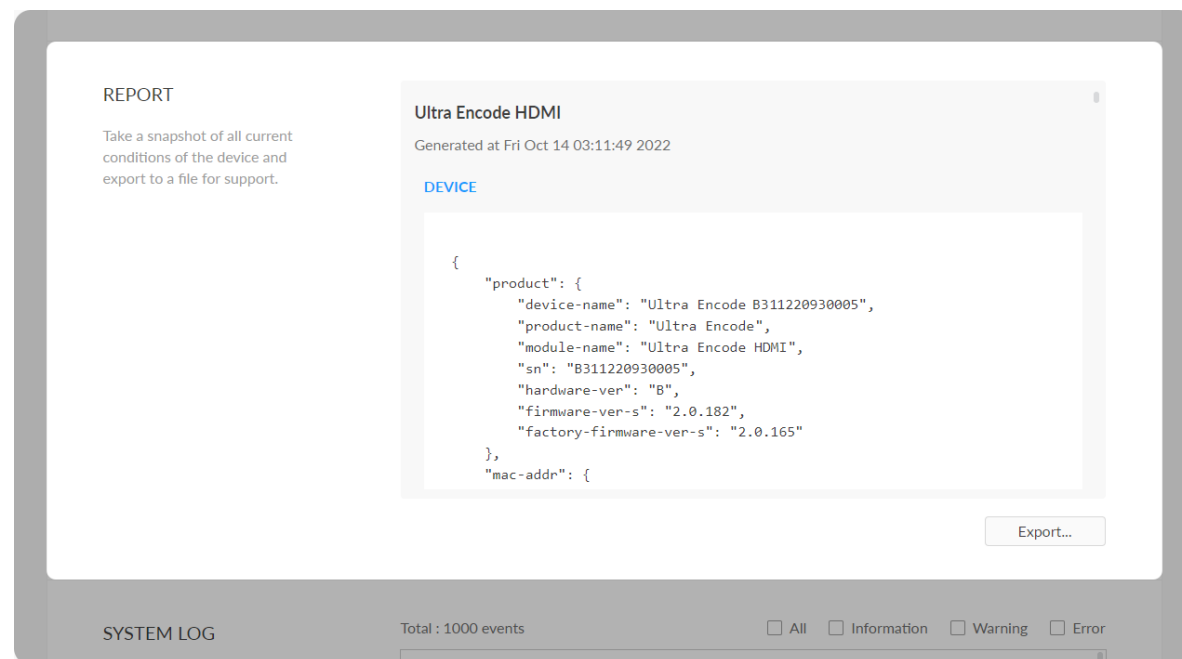
About

Obtain basic data for device maintenance in **About** tab.



Checking Device Information

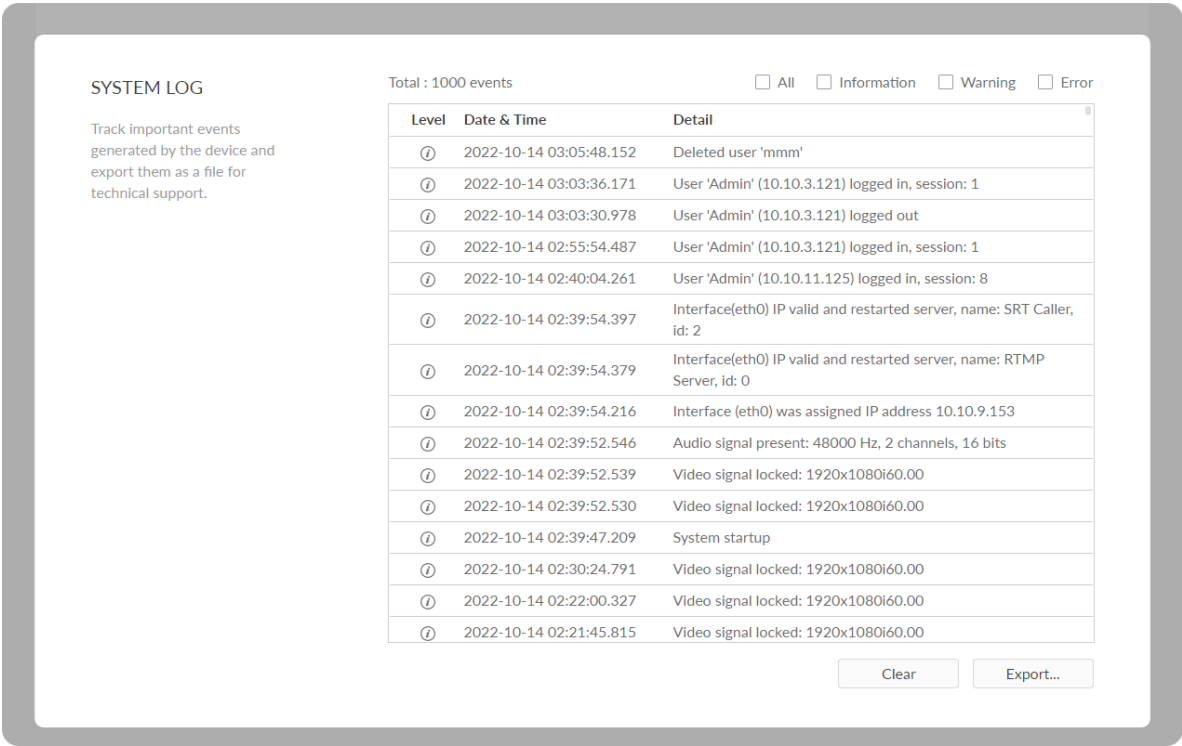
- **Device name:** device name, which can be modified in the [System > General > Device name](#) area.
- **Product name:** device family name.
- **Serial number:** device serial number.
- **Hardware version:** device hardware version.
- **Firmware version:** device firmware version, which can be update in the [Firmware](#) tab.
- **Ethernet MAC address:** device Ethernet MAC address.
- **Wi-Fi MAC address:** device Wi-Fi MAC address.



Exporting Reports

Export reports from your encoder when you want to get help from the Magewell Support team. These files will help our support engineers get a better understanding of your device status and other related information.

1. Go to **About > Report**.
2. Click **Export...** to generate a .html file.
3. When prompted, click **Export**.



Clearing/Exporting All Logs

1. Access the Web UI and sign in.
2. Click and enter the **System** tab, then select **Log**.
3. (Optional) Filter current logs.

By default, all logs are displayed in the table. Log entries can be categorized as "error", "warning", and "information".

- **Total** shows the total number of filtered events.
- **All:** Check to show all logs.
The device can store up to 1000 local log entries. After 1000 entries have been recorded, the oldest entry will be deleted before a new one can be added.
- **Information:** Check to show information logs - which record user actions or significant system events, e.g. login and signal locked.
- **Warning:** Check to show warning logs - which mean something has not worked as it should. e.g. Ethernet is disconnected or signal is unlocked.
- **Error:** Check to show error logs - which mean some serious error has happened.

4. (Optional) Click **Export...** to get a .html file of all logs.
When prompted in the window, click **Export**.
5. (Optional) Click **Clear** to delete all logs.
When prompted in the window, click **Yes**.

FAQ

How to turn on/off AP mode

AP mode is on by default. Administrator can go to **System > Network > AP** section to turn on/off the AP mode and change AP password.

Can I set one live stream server to use the main stream and the other to use the sub stream?

Yes. You can select the main stream or sub stream for each session.

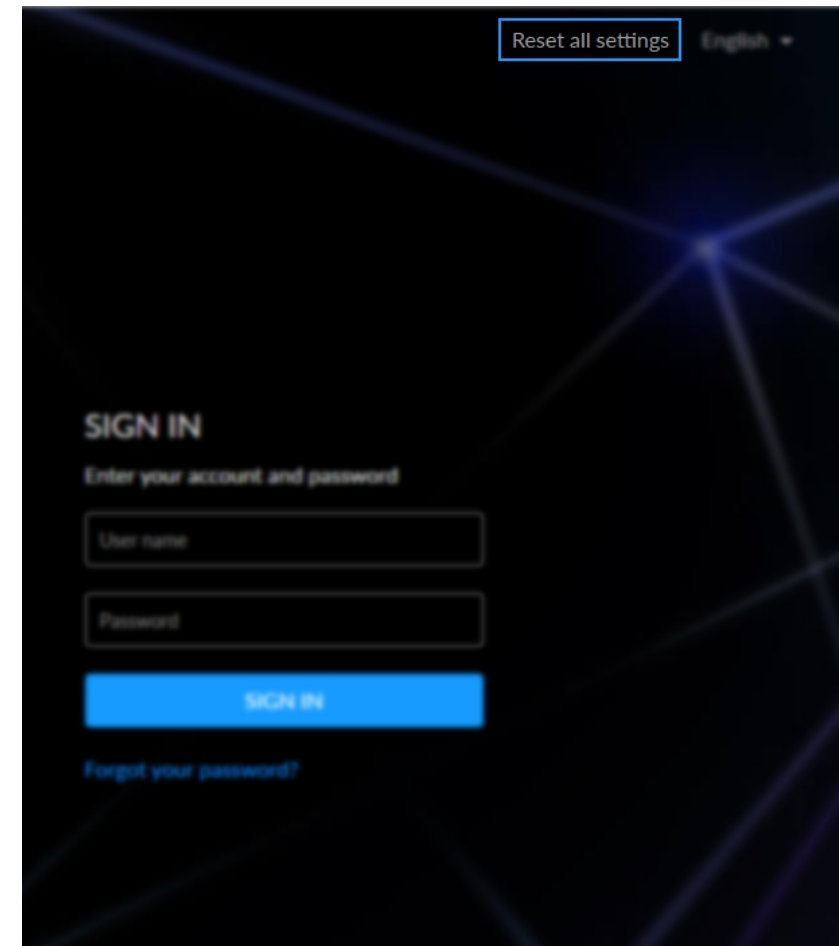
Can Ultra Encode stream to multiple destinations at the same time?

- Supports sessions over the same streaming protocol, such as
 - Up to 6 sessions of TS over RTP and TS over UDP simultaneously
 - Up to 6 sessions of SRT Caller and SRT Listener simultaneously, containing one SRT Listener session at most (max 8 clients simultaneously)
 - Up to 6 sessions of RTMP and RTMPS simultaneously
 - Supports streaming only 1 session of HLS, RTSP, or NDI|HX2

What to do if I forget the Web UI password?

- Forgot admin password:
 1. Connect the device to your computer using provided USB cable.
 2. Type the USB NET IP address 192.168.66.1 in your web browser to access the Web UI.
- At top right of the "SIGN IN" page, click "Reset all settings" to restore all configurations to defaults, and the "Admin" password will be "Admin" again. Be cautious that resetting your device would restore configurations to defaults.
- Forgot a general user's password:

Sign in Web UI with the administrator account, then go to **System > User Admin** tab, then you can change the specific user's password.



Support

Get the Latest Information

If you have any problems using Magewell products or need more technical information, please visit the following.

- Tutorial video: [Magewell TV](#)
- YouTube channel: [Magewell Video Capture Device](#)
- Knowledge base: [Ultra Encode Support](#)

Technical Support

Ticket System: If you have any questions using Magewell products or need technical assistance, please submit and track your inquiries by clicking [here](#).

Warranty

Limited Warranty

Except otherwise set between you and Magewell in advance in a written form, the free limited warranty service starts from the date on your proof of purchase. The proof can be: sales contract, formal sales receipt, invoice or delivery note. The earliest date of these proofs is the starting date of the free limited warranty.

The period of free limited warranty goes as below:

- Ultra Encode Family: two (2) years;
- The power adapter provided as accessories: one (1) year;

How to get the limited warranty

1. Please contact the Magewell support team by email (support@magewell.net) first, to determine whether your problem can only be solved by returning it to Magewell for repair. Magewell might ask you to take photos of the front and back of the defective products.
2. Magewell will issue an RMA letter to you if it is confirmed that you need to return the faulty product for further examination or repair. Please fill in the RMA with necessary information as required.
If it is regular repair, you will be responsible for the shipping cost, duties and insurance cost (if applicable); if the product is DOA, Magewell will be responsible for the shipping cost.
3. If some components need to be replaced, Magewell will decide to repair, renovate or replace the components by itself. Magewell may use new or repaired component to repair the product. The repaired product can be expected to work normally and the performance to remain the same. Repaired products can work in a good working condition and at least function the same as the original unit. The original replaced component will become the property of Magewell and components which are replaced for the client will become his/her property.
4. If the product is within warranty, Magewell will repair or replace the faulty units at its own discretion. In circumstances where the faulty unit is replaced by another one, Magewell may use new, repaired or renovated units. The faulty unit will then become the property of Magewell while the replacement unit will become the property of the purchaser.
5. If the warranty expires, Magewell will inform the purchaser whether the products can be repaired and the maintenance costs they need to pay. If purchasers

decide to repair, Magewell will repair, renovate, or replace the components after receiving the maintenance costs. If purchasers give up repairing, Magewell will dispose of the faulty unit if the purchaser chooses that option.

6. The repaired or replaced product assumes 1) the remaining term of the Warranty of the replaced unit or faulty unit; 2) ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. The extended warranty is only valid for repaired/replaced components.
7. The period of service depends on the client's location (country and area) and the product.

To view the complete warranty policy, please visit www.magewell.com/quality-assurance.

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