



**NETWORK
TECHNOLOGIES
INCORPORATED**

1275 Danner Dr Tel:330-562-7070
Aurora, OH 44202 Fax:330-562-1999
www.networktechinc.com

HD-ENC-H264

H.264 Video Encoder

User Manual



Introduction

The H.264 HDMI Video Encoder streams 1080p video from an HDMI video source to a media streaming server (Wowza, Xtreme Codes, Nginx, etc) or online live broadcast platform (YouTube Live, FaceBook Live, IBM Cloud Video (Ustream), etc) over IP in real time. It encodes video using H.264 compression and AAC/MP3 audio.

Features:

- Accepts 1080p HD video at 60 frames per second and produces IP streams that can be sent on a standard Ethernet cable.
- Encode the same HDMI video source in two different formats and resolutions - unicast and multicast.
- Supports RTMP, RTSP, UDP, HTTP, HLS, FLV and ONVIF protocols
- Compatible with most Internet live broadcast platforms, such as YouTube Live, Facebook Live, Twitter Live, Twitch, and IBM Upstream.
- Broadcast to SmartTVs using a media streaming sever, such as Wowza, Xtreme Codes, Nginx, etc.
- Easy-to-use HTTP-based web interface.
 - Modify network and video quality settings such as IP address, bit rate, and fps.
- Add text and logos to the video stream.
- Supports 100Base-T Ethernet connection.
- Linux inside.
- Ideal solution for many applications, including:
 - Digital signage
 - IPTV/SmartTV
 - Hotel TV systems
 - Live broadcast
 - Classrooms - teaching online
 - IP video surveillance
 - Video conference

Factory Default Settings:

IP: 192.168.1.168

Username and Password: admin

When you first login, if the display is in Chinese, select English (lowermost choice) from the pull down menu located at the top right of the window.

Settings:

Upon Initial Login to the User Interface through your browser, you will be provided with a Status Display providing the following information:

Input Status : shows the type of input signals that are attached

Running Time: Indicates how long the Encoder has been connected to the Input Source

CPU Usage: Typically 25% (if this value is more than 85%, there may be an excess drain on the resources of the source)

Input Size: 1920x1080p@60Hz (Default configuration for the source)

Collected Video Frames: 65116 (Indicates how many frames of video have been encoded from the source)

Lost Video Frames: Indicates how many frames have dropped by the encoder

Audio Sample Rate: 48000

Click on the "Network Settings" tab to view the current network settings and MAC address for the Encoder.

The screenshot displays a web interface for network configuration, divided into three sections: Internet access, DNS, and PORT. Each section has a blue header with a white downward-pointing arrow.

- Internet access:** Contains fields for DHCP (set to 'Disable'), IP (192.168.1.168), Netmask (255.255.255.0), Gateway (192.168.1.1), and MAC (00:13:14:15:3C:F0).
- DNS:** Contains fields for DNS1 (192.168.1.1) and DNS2 (8.8.8.8).
- PORT:** Contains fields for HTTP Port (8080) and RTSP Port (8554), both with a range indicator [1-65500].

A 'Set up' button is located at the bottom of the PORT section.

Be sure to enter the proper DNS server and Gateway address. Otherwise the Encoder will not be able to connect with the internet and stream video to your desired destination.

To set the destination, configure the video settings for one or more Mainstream addresses:

Main stream

FPS:	<input type="text" value="30"/>	[5-60]
GOP:	<input type="text" value="30"/>	[5-300]
Bitrate (kbit):	<input type="text" value="3500"/>	[32-32000]
Encoded size:	<input type="text" value="1920x1080"/>	
H.264 Level:	<input type="text" value="high profile"/>	
Bitrate control:	<input type="text" value="vbr"/>	
MIN_QP:	<input type="text" value="5"/>	[1-35]
MAX_QP:	<input type="text" value="42"/>	[MIN_QP-50]
TS URL:	<input type="text" value="/0.ts"/>	Disable ▾
HLS URL:	<input type="text" value="/0.m3u8"/>	Disable ▾
FLV URL:	<input type="text" value="/0.flv"/>	Disable ▾
RTSP URL:	<input type="text" value="/0"/>	Disable ▾
Multicast IP:	<input type="text" value="238.0.0.1"/>	Disable ▾
Multicast port:	<input type="text" value="1234"/>	[1-65535]
RTMP PUBLISH URL:	<input type="text" value="rtmp://192.168.1.50/live/1"/>	Enable ▾

rtmp://ip/xxx/xxx or rtmp://user:pass@ip/xxx/xxx

Set up

Field	Description
FPS	Max. is 60fps, but when input is 1080i, fps will be halved (for deinterlacing)
GOP	Group of pictures (recommend using the same value as the FPS)
BITRATE (kbit)	Value depends on the video quality needed (suggestions: 1080p@3500kbs, 720p@2800kbs, SD@1500kbs)
Encoded size	Encoded Output Resolution.
H.264 Level:	Profile-baseline / main / high Profile High Profile is recommended
Bitrate control:	Vbr (Variable Bitrate) or Cbr (Constant bitrate)

MIN_QP	Minimum Quantization Parameter (Typically between 1-35) The larger the value, the more stable the bandwidth will be, but video quality will decrease. Recommend using the default value (5))
MAX_QP	Maximum allowable is 50, default is 42
TS URL	/0.ts Select to Enable or Disable
HLS URL	/0.m3u8 Select to Enable or Disable
FLV URL	/0.flv Select to Enable or Disable
RTSP URL	/0 Select to Enable or Disable
Multicast IP	238.0.0.1 Select to Enable or Disable
Multicast port	Port to use for multicasting video/audio (1-65535)
RTMP PUBLISH URL	Address of the real time media player to broadcast encoded video to.

RTMP Settings:

Wowza- `rtmp://serverIP:port/Application/stream name`
i.e. - `rtmp://192.168.1.50P:1935/live/oupre`

If Wowza requires Source Authentication, the source is username **oupre**, password is **123456**, so the address will be:
`rtmp://oupre:123456@192.168.1.50P:1935/live/oupre`

Xtream Codes- on its panel, write address as `rtmp://127.0.0.1:8001/live/stream name`

OSD- to display the transparent logo, set the background color as 0xF1F1F1 or R-177 G-204 B-233,

See examples on pages 7 and 8.

Audio Encoding Settings:

Generally, leave these set at the default (as shown below), but if you feel comfortable changing the settings, set as needed.

The image shows a configuration interface for audio encoding. It is divided into two main sections: 'Audio encoder' and 'ONVIF Audio'.
In the 'Audio encoder' section, there are three settings: 'Samplerate' is a dropdown menu set to '44100', 'Encoder' is a dropdown menu set to 'AAC+', and 'Bitrate' is a text input field set to '48000' with a range indicator '[24000~48000]' to its right. Below these settings is a dark grey 'Set up' button.
The 'ONVIF Audio' section has a blue header. Below it, the text 'G711A Over' is displayed. Underneath, 'RTSP:' is followed by a dropdown menu set to 'Disable'. At the bottom of this section is another dark grey 'Set up' button.

System Settings:

In this window you can change the password if desired.

Upgrade Firmware:

The screenshot displays a web interface with two main sections. The top section, titled "Upgrade settings", features a text input field labeled "Upgrade:" with a placeholder "(Upgrade file name)". Below the input field is a dark grey button labeled "Upload". The bottom section, titled "System settings", contains two buttons: a dark grey button labeled "Reboot" and an orange button labeled "Reset".

If new firmware becomes available, we will provide a link to it on our website. As of this publication, no new firmware is available. If new firmware is available, browse for it, select the file, click "Upload", when you get the message "Upload Success", click "Reboot".

Example of HD-ENC-H264 Encoder Settings to connect to YouTube Live Stream

(YouTube Live Dashboard)

The screenshot shows the YouTube Live Dashboard interface. The status is 'OFFLINE'. The 'BASIC INFO' section includes the stream title 'Oupree - Test', a description field, a 'Schedule next stream' checkbox, a category dropdown set to 'Nonprofits & Activism', and a privacy dropdown set to 'Private'. The 'ENCODER SETUP' section shows the 'Server URL' as 'rtmp://a.rtmp.youtube.com/live2', the 'Stream name/key' as '2x9a-y4d6-k8ep-er2u', and a warning that the key is public. There are 'Hide (10)' and 'Reset' buttons next to the stream name.

Based on the window above, the encoder input address for rtmp is
`rtmp://a.rtmp.youtube.com/live2/2x9a-y4d6-k8ep-er2u`

`192.168.1.168/OutputP1MainE.html`

The screenshot shows an encoder configuration window with the following fields and values:

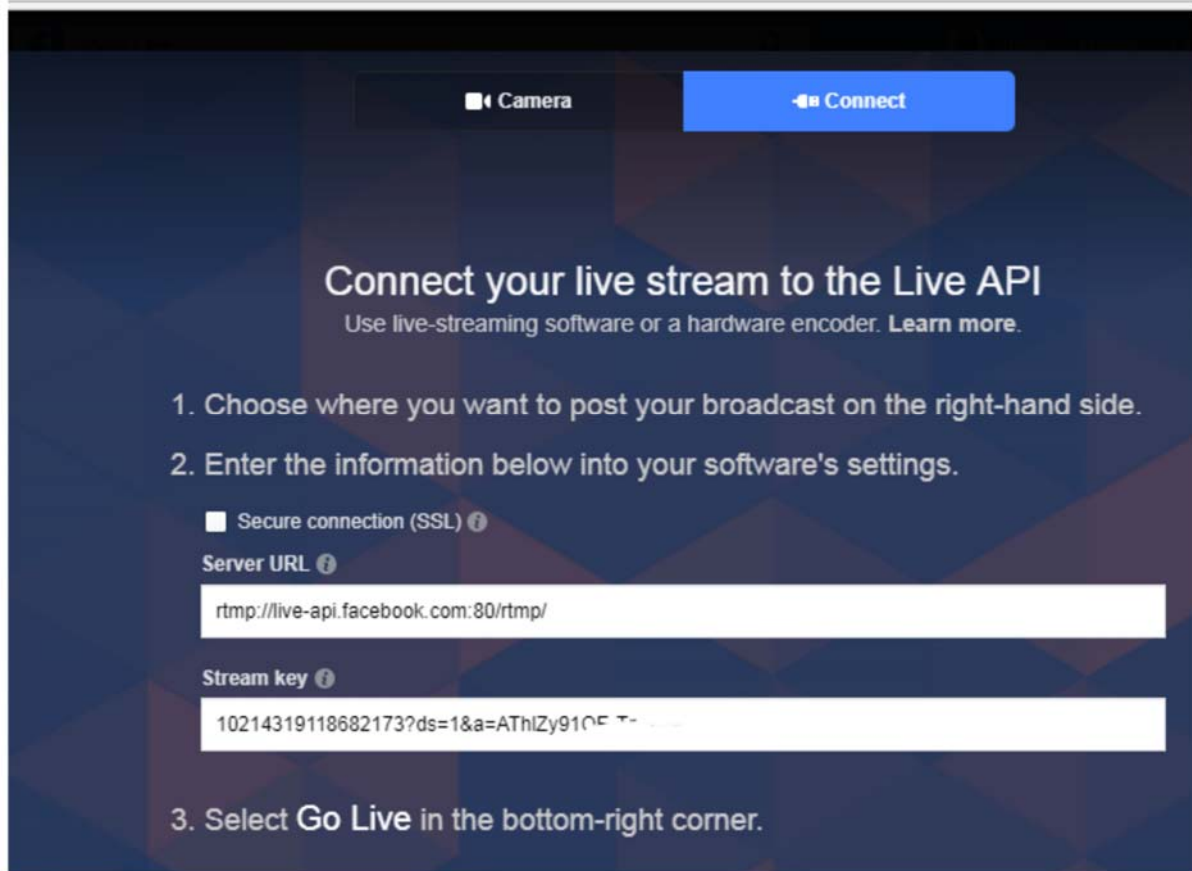
RTSP URL:	/0	Enable ▾
Multicast IP:	238.0.0.1	Disable ▾
Multicast port:	1234	[1-65535]
Multicast type:	UDP ▾	
RTMP PUBLISH URL:	rtmp://a.rtmp.youtube.com/live2/2x9a-y4	Enable ▾

Below the RTMP PUBLISH URL field, there is a note: `rtmp://ip/xxx/xxx or rtmp://user:pass@ip/xxx/xxx`

A large 'Set up' button is located at the bottom of the configuration area.

Example of HD-ENC-H264 Encoder Settings to connect to Facebook Live Stream


https://www.facebook.com/oupree



The screenshot shows the Facebook Live API connection interface. At the top, there are two buttons: "Camera" and "Connect". Below the buttons, the text reads "Connect your live stream to the Live API" and "Use live-streaming software or a hardware encoder. Learn more." There are three numbered steps: 1. Choose where you want to post your broadcast on the right-hand side. 2. Enter the information below into your software's settings. 3. Select Go Live in the bottom-right corner. Under step 2, there is a checkbox for "Secure connection (SSL)" and two input fields: "Server URL" with the value "rtmp://live-api.facebook.com:80/rtmp/" and "Stream key" with the value "10214319118682173?ds=1&a=AThZy91O..."

Based on the window above, the encoder input address for rtmp is
rtmp://live-api.facebook.com:80/rtmp/10214319118682173?ds=....

192.168.1.168/OutputP1MainE.html



The screenshot shows the encoder settings interface. It has several fields: "RTSP URL:" with value "/0" and a dropdown menu set to "Enable"; "Multicast IP:" with value "238.0.0.1" and a dropdown menu set to "Disable"; "Multicast port:" with value "1234" and a link "[1-65535]"; "Multicast type:" with a dropdown menu set to "UDP"; and "RTMP PUBLISH URL:" with value "rtmp://live-api.facebook.com:80/rtmp/102" and a dropdown menu set to "Enable". Below these fields is a link "rtmp://ip/xxx/xxx or rtmp://user:pass@ip/xxx/xxx" and a "Set up" button.

SPECIFICATIONS

Video

- One female HDMI-A port for source connection.
- Supported resolutions: 720p/1080i/1080p @50/60Hz and below.
- Codec: H.264/AVC High/Main/Baseline
- Bit rate: 0.1 to 32 Mbps, adjustable
 - Bit rate control: VBR/CBR
- Frames per second: 5 to 60 FPS

Audio

- HDMI embedded audio.
- Sample rates: 44.1 kHz, 48.0 kHz
- Codec: AAC/AAC+/AAC++/MP3
- Bit rate: 0.1 to 32 Mbps, adjustable

Ethernet Port

- One female RJ45 connector.
- 100 Base-T Ethernet interface.

Protocols

- HTTP, HLS, FLV, RTSP, UDP, RTMP, ONVIF
 - ONVIF: G.711

Dimensions

WxDxH: 5.16x6.57x1.14 in. (131x167x29mm)

Power

- Input: 110 or 240 VAC at 50 or 60 Hz via AC adapter (US AC adapter included).
- Optional universal power plug adapters available (not included).
- Output: 12VDC, 1A

Environmental

- Operating temperature: 32 to 104°F (0 to 40°C).
- Storage temperature: -4 to 158°F (-20 to 70°C).
- Operating and storage relative humidity: 5 to 90% non-condensing RH.

Regulatory Approvals

CE, FCC, RoHS

Warranty

Two years.

Cables

- Use HD-xx-MM cable to connect an HDMI video source (not included).
- Use CAT5e/6 solid or stranded straight through cable for TIA/EIA-568B wiring terminated with standard RJ45 connectors (not included).