

Wednesday, 20 May 2015

10:38



VINGTOR STENTOFON
by ZENITEL GROUP



HDMI Encoder 1000 Vingtorg-Stentofon IPTV System

Configuration Manual

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1 Introduction

1.1 Document Scope

This document describes the installation and configuration of the HDMI Encoder 1000 for the Vingtor-Stentofon IPTV System.

Item Number	Item Name	Description
2320005048	HDMI Encoder 1000	HDMI Encoder 1000 with 1x HDMI or 1x Audio Input

1.2 Publication Log

Revision	Date	Author	Status/Comments
1.0	2.5.2018	BC/HKL	Published

2 HDMI Encoder 1000 Overview

This section provides an overview of the HDMI Encoder 1000 and demonstrates its main functions. The HDMI Encoder 1000 can be used with 1x HDMI or 1x audio input. It is ideal for encoding signals from DVB receivers, DVD & Blu-ray players, ECDIS, and AM/FM/DAB tuners, etc. The device supports HDMI/audio input and encodes it in H.264 format, after which, the IP signal output is sent over UDP (multicast), RTP/RTSP, HTTP, HLS.



HDMI Input		
Video	Resolution	1920x1080, 1680x1050, 1280x720, 1600x1200, 960x540, 720x576, 704x576
	Encoding	H.264
	Bitrate	Up to 12 Mbit
Audio Input	Encoding	AAC/MP3
	Sampling rate	32,44,48 KHz
	Bitrate	Up to 384 Kbit
Stream Out	IP out over	UDP(Unicast/Multicast), RTSP,HTTP,HLS

General	
Weight	1 Kg
Operation temperature	-20 °C to +60 °C
Power Supply	DC 12V
Dimensions	183*110*45mm



NOTE

Before proceeding, please ensure that the encoder is set up correctly and all necessary connections are established.

3 Installation

3.1 Installation Flow Chart



3.2 Acquisition Check

When opening the package, it is necessary to check the items according to the packing list. Normally, it should contain the following items:

- HDMI Encoder 1000
- HDMI Cable
- Power Adapter

Check that no components are missing or damaged during shipping

If any item is missing or mismatching with the list above, please contact your local supplier.

3.3 Installation Procedure

To install the device, please follow the steps below:

- Prepare relevant environment for installation
- Install the HDMI Encoder 1000
- Connect power cord
- Connect signal cables
- Connect communication port

4 Accessing the HDMI Encoder 1000

To access the HDMI Encoder 1000:

1. Open a standard web browser on your PC
2. Enter the HDMI Encoder 1000 IP address in the address field (for example http://10.1.20.200/hdmi_ext)



NOTE

To be able to log into the encoder's user interface, your PC has to be in the same IP address range (subnet). You may have to change your computer's IP address to that of the same subnet as the encoder.

3. In the login window: Enter **username** (Default username: **admin**) and **password** (Default password: **Zenitel!**)
4. Click **Login**

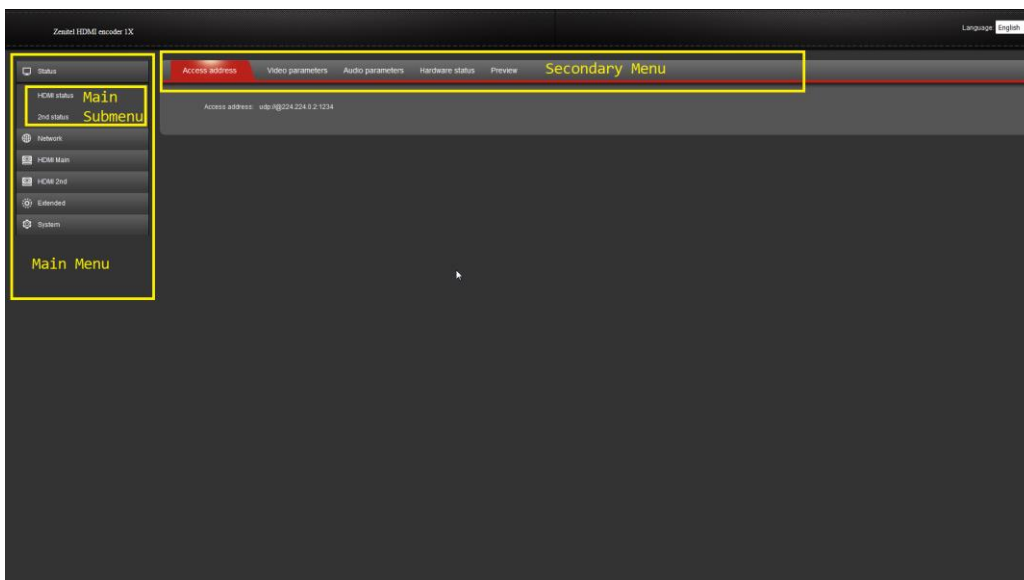
4.1 HDMI Encoder 1000 Navigational Menus

After login, you will have access to the configuration interface of the HDMI Encoder 1000. All settings can be adjusted via the web browser.

Main Menu - The main menu items comprise: **Status**, **Network**, **HDMI Main**, **HDMI 2nd**, **Extended**, **System**.

Main Submenu - The main menu could have nested submenus that contain properties and/or information for the chosen item.

Secondary Menu - After selecting the desired menu item from the main menu and/or submenu, choose an item tab for configuration from the secondary menu, which resides on the top bar.



Apply Button

A change or multiple changes will only take effect after the **Apply** button is clicked. The new parameters will then be saved to the encoder and become operative.

4.2 Status

Status shows current information about the HDMI Encoder 1000.

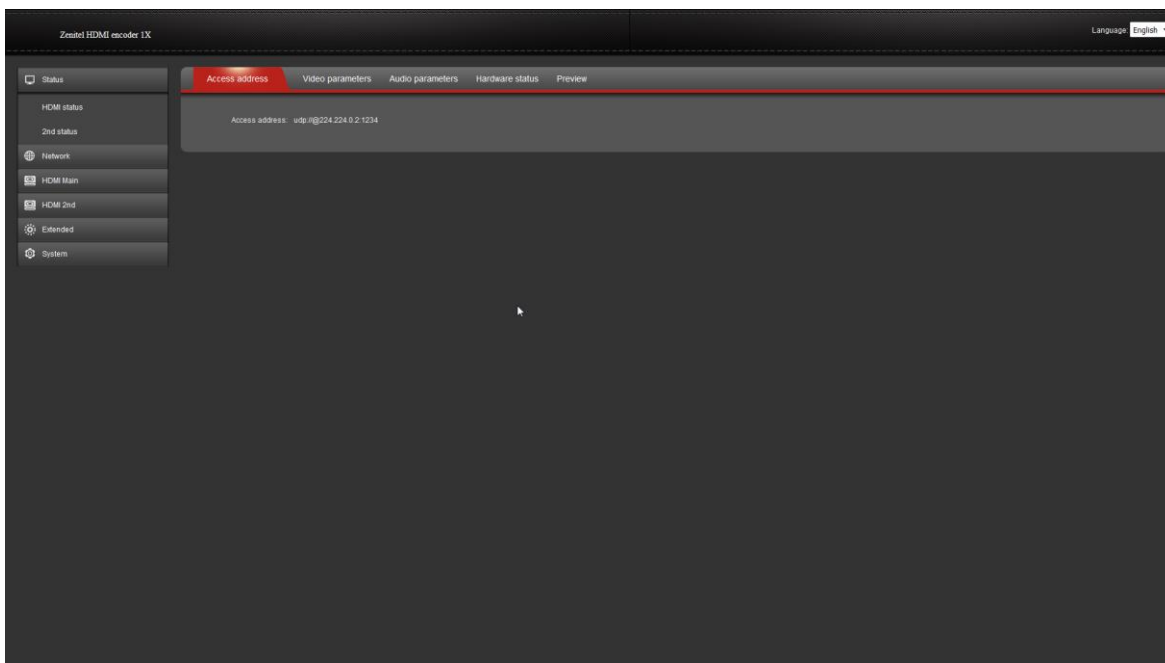
Status submenu items are:

- **HDMI status**
- **2nd status**

The top bar has a selection of secondary menu item tabs:

4.2.1 Access Address

To deliver encoded video streams within an IP environment, the media stream should be sent directly from the media source to the endpoints. To receive a multicast stream, the endpoint should know the multicast IP address and port you want to join. Access address shows the multicast IP address and port from which you can access the desired encoded stream.



4.2.2 Video parameters

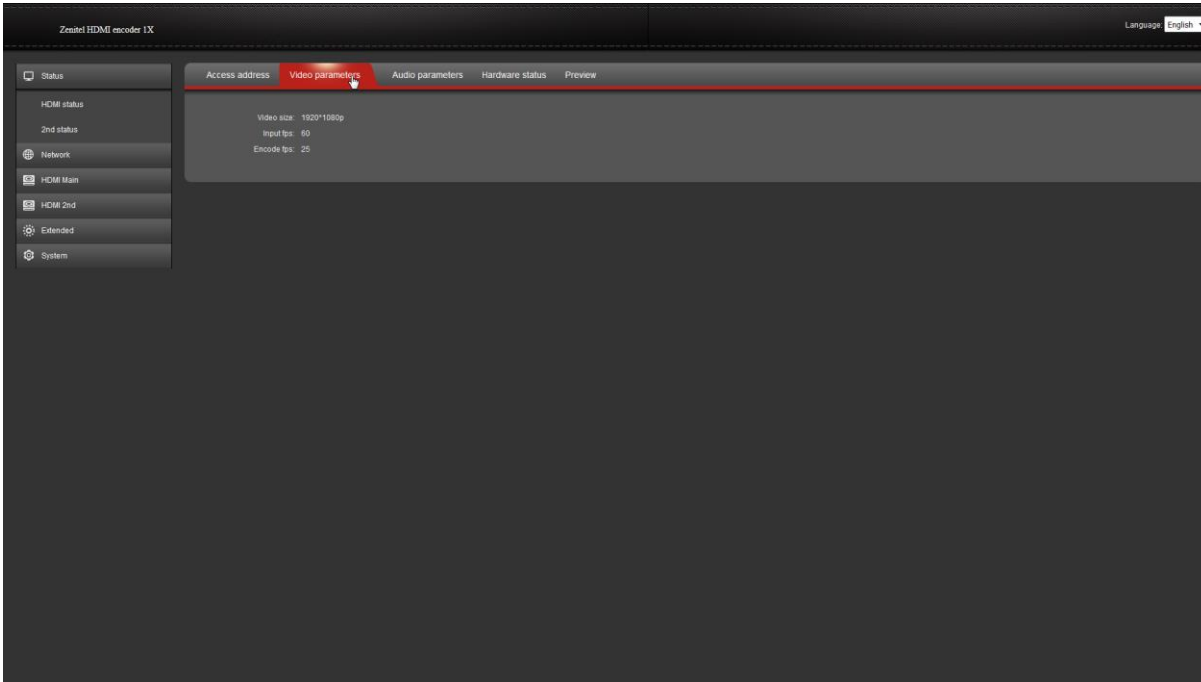
This shows the video encoding settings for each HDMI input interface.

- **Video size:** Encoded stream display resolution
- **Input fps:** Original (input) frame rate
- **Encode fps:** Encoded (output) frame rate



NOTE

The encoder is configured with factory default settings to automatically start the encoding process and stream the video with the multicast address 224.224.0.2:1234 when a video input is connected and a network link is established.



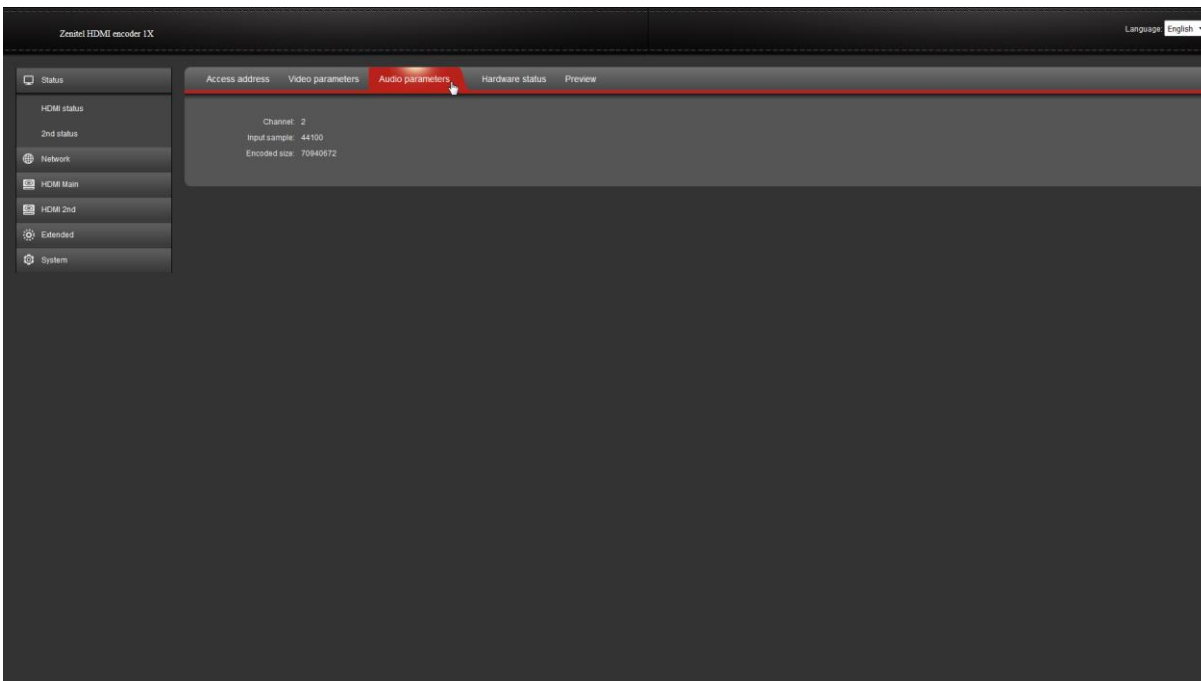
4.2.3 Audio parameters

This shows the audio encoding settings for each HDMI input interface.

Channel: Number of channels (1/2) in input signal

Input sample: Sampling rate of input signal (Hz)

Encoded size: The amount of output data per time segment

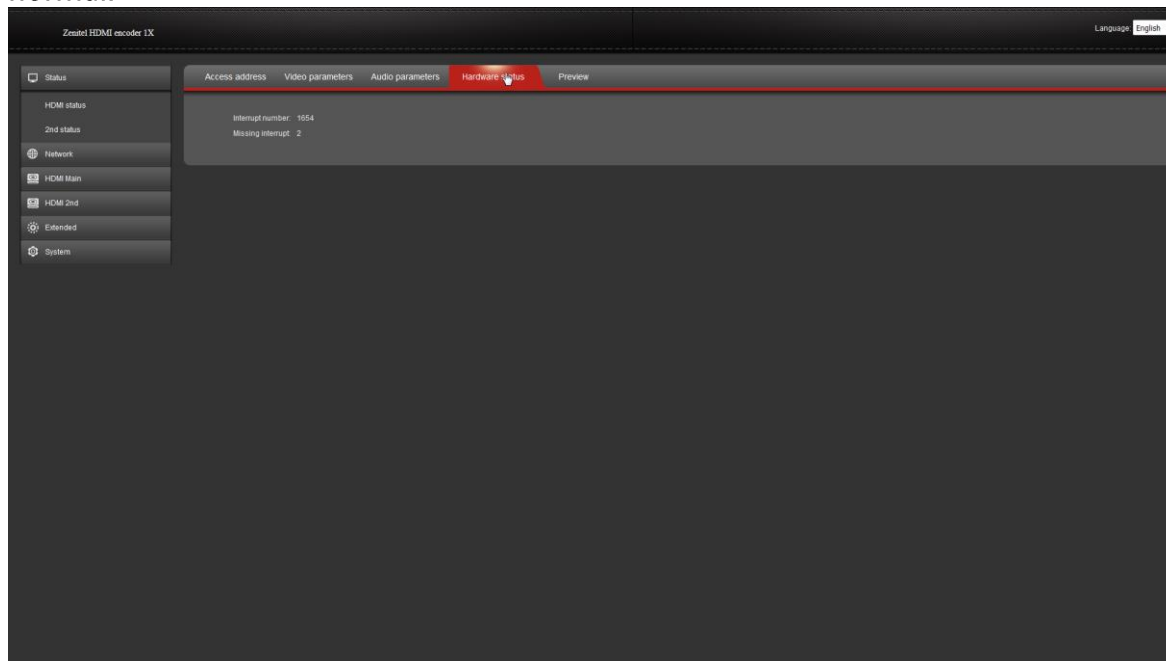


4.2.4 Hardware status

This shows the settings for the input video signal.

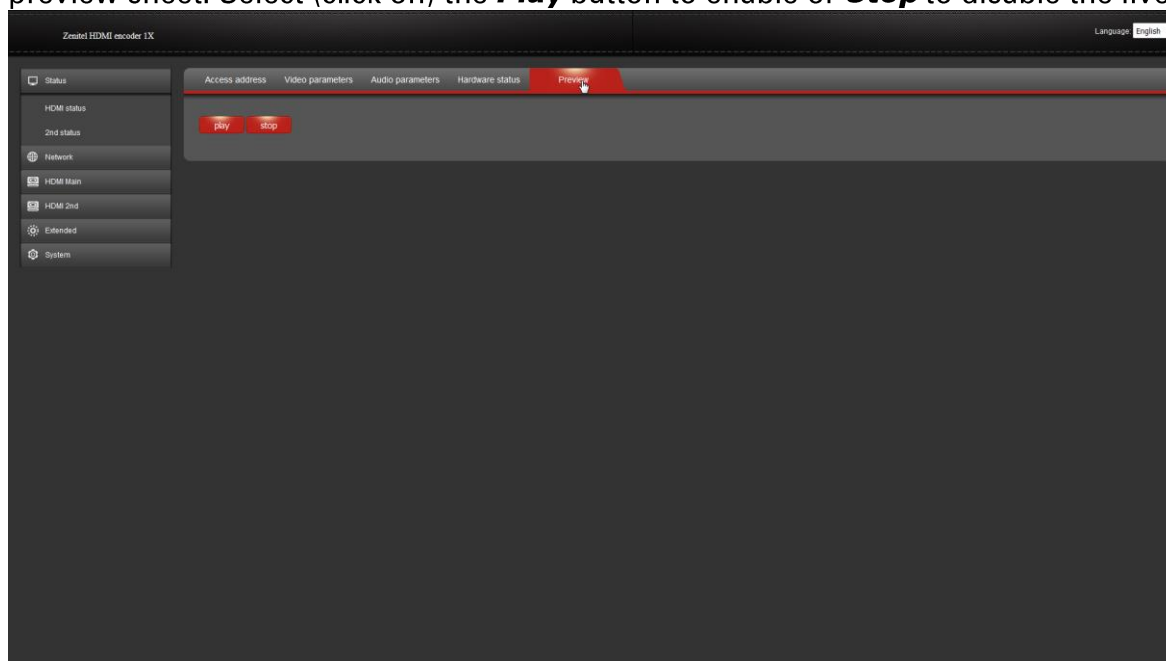
Interrupt number: When the interrupt number rises, it means there is video inputting. When the number is "0", it means there is no video input. The input signal should then be checked.

Missing interrupt: This figure is generally very small. A large number of lost frames indicates problems with the source video card, and it is necessary to check that the input program source is normal.



4.2.5 Preview

It has purpose of Web Video Preview. This area provides a small live stream view of the output video so you know what is being streamed. The encoding and output streams continue to be streamed when this preview is disabled. The control to play and stop the live feed to this page is located within the preview sheet. Select (click on) the **Play** button to enable or **Stop** to disable the live feed.



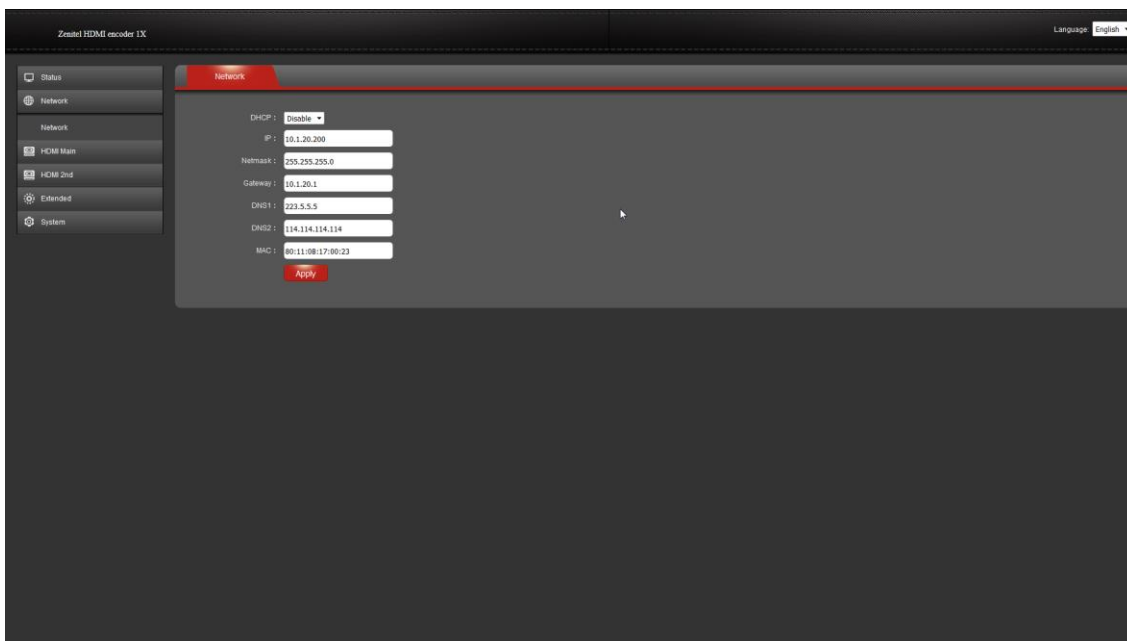
4.3 Network

The **Network** page displays the network address and related parameters for configuration. The front panel LAN connector on the device can be connected to an Ethernet LAN for communication between the devices and the PC. The table below shows the settings and values that can be modified.



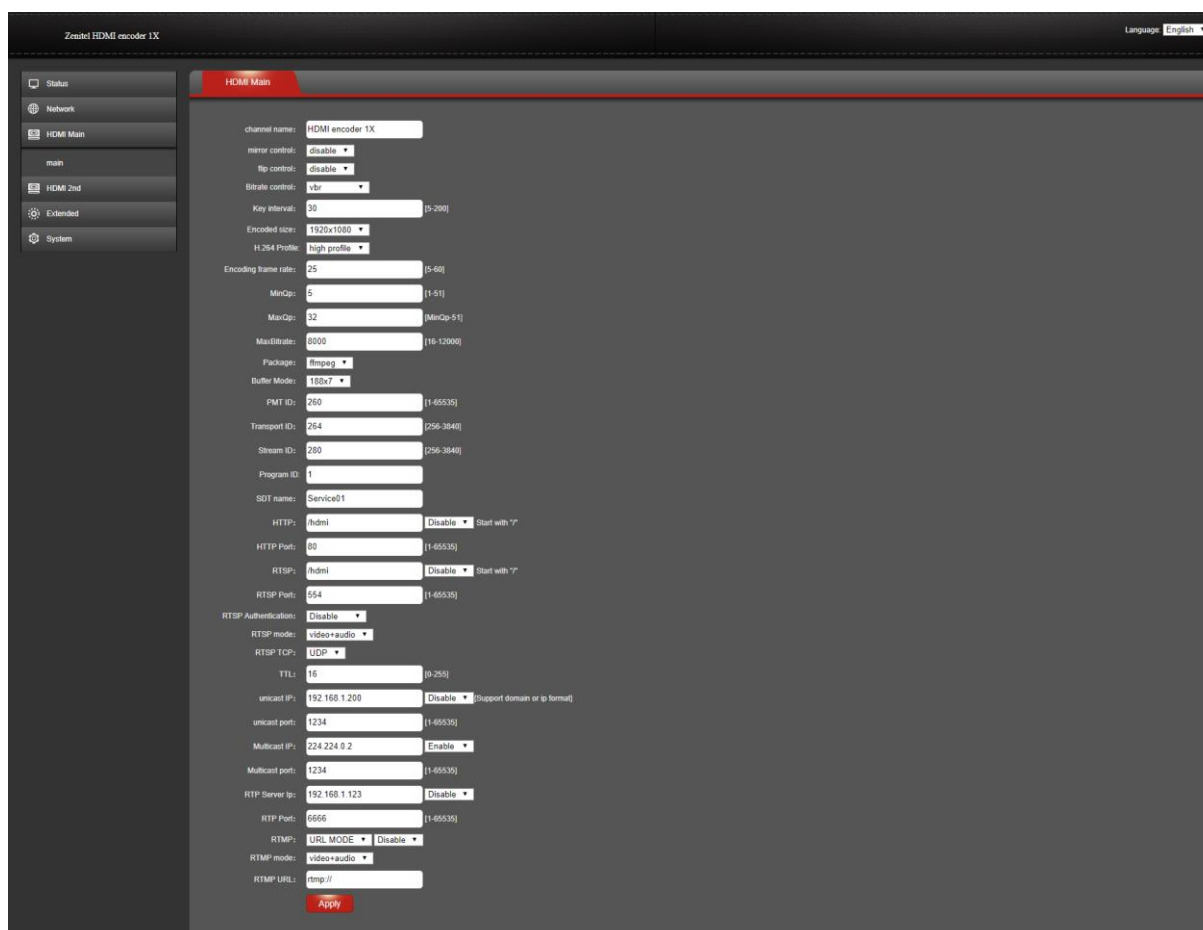
IP addressing schemes vary according to how your network is configured, they're normally assigned based on a particular network segment. For correct configuration, contact your company network administrator or IT personnel.

PARAMETER	DESCRIPTION	VALUE
DHCP	The IP address of the device can be assigned dynamically or by manually.	Enable or Disable
IP	IP address of device	Any valid IP address that is in the form xxx.xxx.xxx.xxx where xxx is a number from 0-255. There are a few reserved addresses (RFC 1918) that cannot be used.
Netmask	A number that defines a range of IP addresses that can be used in a network.	Any valid 32-bit number in the form xxx.xxx.xxx.xxx that divides IP network address into a network portion and a host portion.
Gateway	Address of node in a computer network using the IP suite that serves as the forwarding host (router) to other networks when no other route specification matches the destination IP address of a packet.	Any valid IP address within the subnet that is defined as a network default gateway. Must be in the form xxx.xxx.xxx.xxx where xxx is a number from 0-255.
DNS1 & DNS2	The Internet's system for converting alphabetic names into numeric IP addresses.	Any DNS IP address accessible locally or globally. Must be in the form xxx.xxx.xxx.xxx where xxx is a number from 0-255.
MAC	Hardware information comprising unique identifying addresses so that the device can operate on a TCP/IP network.	Valid MAC address are from a 48-bit address space.



4.4 HDMI Main & HDMI 2nd Stream

The HDMI Encoder 1000 supports H.264 (MPEG-4 AVC) video format that has a very broad application range covering all forms of digital compressed video, from low bit-rate Internet streaming applications to HDTV broadcast and Digital Cinema applications with nearly lossless coding. The relative parameters can be set based on your practical application. Protocols supported are HTTP, RTSP, Unicast IP, Multicast IP, RTP and RTMP. It's possible to choose any of them according to the desired device applications.



The screenshot displays the configuration interface for the Zte HDMI encoder 1X, specifically the 'HDMI Main' settings page. The interface is dark-themed with a sidebar on the left containing navigation options: Status, Network, HDMI Main (selected), main, HDMI 2nd, Extended, and System. The main content area is titled 'HDMI Main' and contains numerous configuration fields. Key settings include: channel name (HDMI encoder 1X), minor control (disable), flip control (disable), bitrate control (vbr), key interval (88), encoded size (1920x1080), H.264 Profile (high profile), encoding frame rate (25), MinQp (5), MaxQp (32), MaxGbrate (8000), Package (ffmpeg), Buffer Mode (180x7), PMT ID (280), Transport ID (264), Stream ID (280), Program ID (1), SDT name (Service01), HTTP (fdmi), HTTP Port (80), RTSP (fdmi), RTSP Port (654), RTSP Authentication (Disable), RTSP mode (video+audio), RTSP TCP (UDP), TTL (16), unicast IP (192.168.1.200), unicast port (1234), Multicast IP (224.224.0.2), Multicast port (1234), RTP Server Ip (192.168.1.123), RTP Port (6666), RTMP (URL MODE), RTMP mode (video+audio), and RTMP URL (rtmp://). An 'Apply' button is located at the bottom of the configuration area.

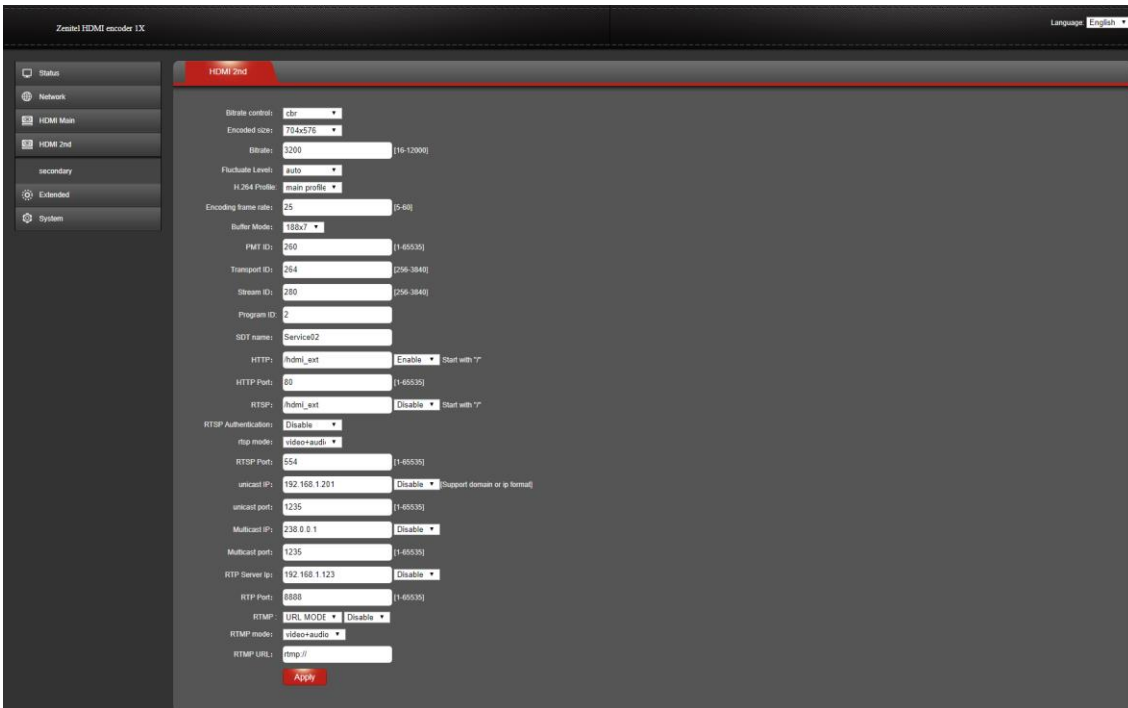
More detailed parameter explanations and values can be found in *Appendix A*.

With the HDMI 2nd Stream of the HDMI Encoder 1000 device, the user can leverage multiple stream configurations. For example, the user can set the main encoder to a high resolution stream (e.g. 1920x1080 or "auto" at 30 fps) and the secondary stream to a different resolution (e.g. 1280x720 at 60fps).

To accomplish streaming, the transmission process packages encoded frames together with audio in a network-friendly container. During the transmission process, the multiplexed streams are traversing network nodes, such as switches and routers, which requires the allocation of transmission resources.



Setting higher values for encoder resolution settings could create congestion problems within the multiservice network and has a high impact on the quality of service when a network node or link is carrying more data than it can handle. When choosing your encoding settings, you should take into account your upload bandwidth.



4.4.1 Network Transmission Protocol Settings

Live streaming videos are sent via a number of protocols that evolve over time. To broadcast a stream over the network, video can be encapsulated in the Real-time Transport Protocol or RTP. HDMI Main and 2nd stream supports the protocols HTTP, RTSP, Unicast IP, Multicast IP, RTP, and RTMP. Depending on the device application, any of them can be chosen, but only one can remain active when applying the settings. The following configuration examples below could be applied either on HDMI Main or 2nd stream.

4.4.1.1 RTP Settings

Real-time Transport Protocol provides real-time transmission of data over IP networks. RTP supports real-time end-to-end streaming and delivery services such as payload type identification, sequence numbering, and timestamping of packets. RTP is used for trivial raw UDP streams where there is no need to control media transmission over RTP. It can use both unicast and multicast addresses.

For configuration of the RTP stream, the parameters below should be defined:

- **IP address** – enter a valid IP address of the RTP server [any valid unicast or multicast IP address]
- **RTP Port** – enter port number of the service that is listening - [1-65535]
- **RTP server status** – select **Enable/Disable** from the dropdown
- Click **Apply** to save the configuration



Multicast IP addresses and ports need to be considered in the IANNA recommended range to avoid conflicts within your local network and router/switches. Best practice for streaming is to use the range from 234.0.0.0 to 239.255.255.255, unless there is a specific reason to use other addressing.

The screenshot shows a configuration interface for RTSP settings. The fields are as follows:

- unicast IP: 192.168.1.200 (Disable) [Support domain or ip format]
- unicast port: 1234 [1-65535]
- Multicast IP: 224.224.0.2 (Disable)
- Multicast port: 1234 [1-65535]
- RTP Server Ip: 192.168.1.123 (Enable)**
- RTP Port: 6666 [1-65535]**
- RTMP: URL MODE (Disable)
- RTMP mode: video+audio
- RTMP URL: rtmp://

An 'Apply' button is located at the bottom of the form.

4.4.1.2 RTSP Settings

The Real Time Streaming Protocol, or RTSP, is an application-level protocol for managing the delivery of data with real-time properties. RTSP provides an extensible framework to enable controlled, on-demand delivery of real-time data, such as audio and video.

For configuration of the RTSP stream the parameters below should be defined:

- **RTSP** – enter the value of the stream URI – [/hdm]i
- **RTSP server status** – select **Enable/Disable**
- **RTSP Port** - enter the port number on which the service is listening - [1-65535]
- **RTSP Authentication** - select **Enable/Disable**
- **RSTP mode** – choose mode Audio, Video or Video+Audio
- **RSTP TCP** – Force streaming RTSP via UDP or TCP
- **TTL** - The multicast TTL (Time To Live) is the value that tells the router the range a packet can be forwarded.

For each protocol, encapsulated within RTP are defined profiles that specify any codec-specific details of mapping data from the codec into RTP packets. Profiles are defined for H.264, MPEG-4 video and audio, and many more.

4.4.1.3 HTTP Settings

The HTTP streaming is used to simulate Adaptive Streaming over HTTP. Adaptive Streaming refers to the ability to shift between different bitrates of the media to compensate for changes in the available bandwidth.

For configuration of the HTTP stream, the parameters below should be defined:

- **HTTP** – enter the value of the stream URI – [/hdm]i
- **HTTP server status** – select **Enable/Disable**
- **HTTP Port** – enter the port number on which the service is listening - [1-65535]

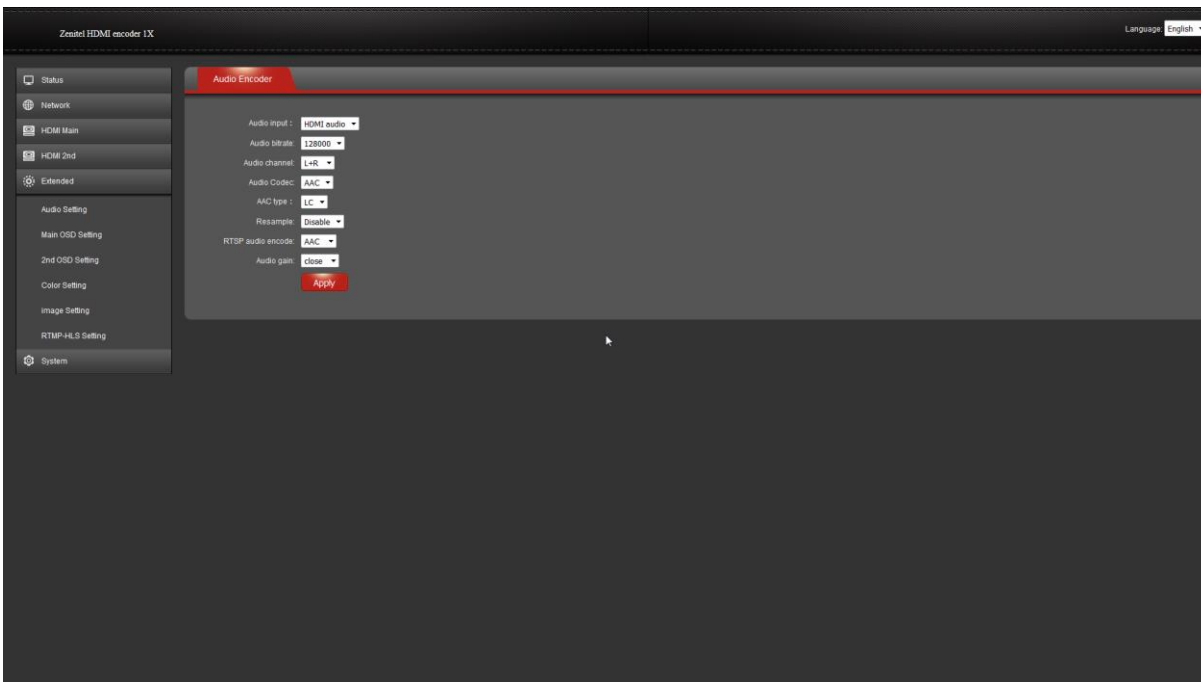
4.5 Extended

On the lefthand main menu of the HDMI encoder 1000, following submenus can be found: Audio settings, Main OSD settings, 2nd OSD settings, Color settings, Image and RTMP-HLS Settings. Each of them and its parameters are described below.

4.5.1 Audio Setting

Audio settings section allows to modify following parameters:

- Audio input – from dropdown menu is possible to choose audio input source – [HDMI audio/Line in]
- Audio bitrate - the amount of data an audio file contains per second.
- Audio channel – defines how channels of the input stereo stream will be downmixed into the output stream [L+R,L or R]
- Audio codec – select preferred codec [AAC,MP3]
- AAC Type – select profile related to sound quality [LC,HE]
- Resample – Sample Rate Conversion, usually done when you need to convert a digital audio file from a given sample rate into a different sample rate [32000/44100/Disable]
- RTSP audio encode – select audio codec [AAC, G711]
- Audio gain – used to dynamically adjust the input-to-output gain to a suitable value [Close/-20dB/-10dB/5dB/10dB]

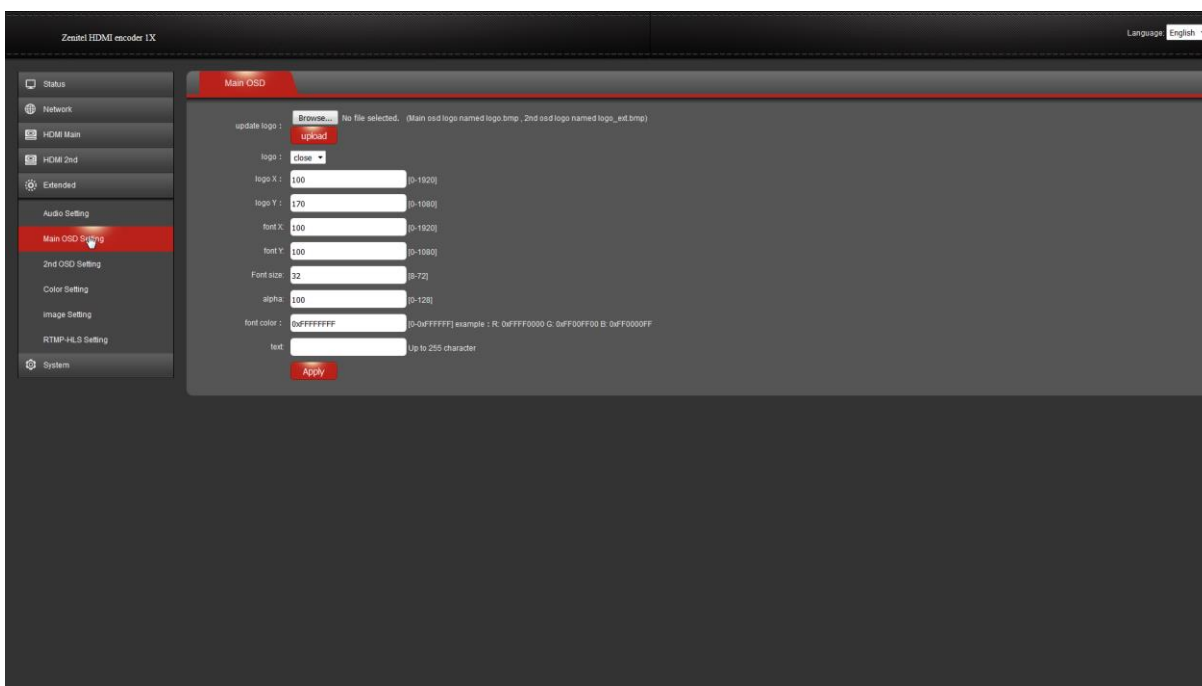


4.5.2 Main and 2nd OSD Settings

OSD (On Screen Display) is a feature for uploading and displaying graphics. The following parameters are as follows:

- **Logo**: - enable or disable graphics on screen – [open/close]

- **Logo X:** - graphics in horizontal position – [0-1920]
- **Logo Y:** - graphics in vertical position – [0-1080]
- **Font X:** - text in horizontal position – [0-1920]
- **Font Y:** - text in vertical position – [0-1080]
- **Font size:** - choose font size – [8-72]
- **Alpha:** - alpha compositing is the process of combining an image with a background to create the appearance of partial or full transparency – [0-128]
- **Font color:** - choose font color in hex value – [0-0xFFFFFFFF]
- **Text:** - insert text message that is shown on display – [up to 255 characters]



*Recommended file format for graphics is .bmp.
Font colors may be specified as an RGB triplet or in hexadecimal format (a hex triplet).
Popular color palettes can be found on <http://www.color-hex.com/>.*

4.5.3 Color Setting

On screen displays vary between monitors. The **Color Setting** submenu allows one to customize brightness, contrast, hue and saturation. For each of these parameters, the values can be in the range 0-100 (default value = 50).

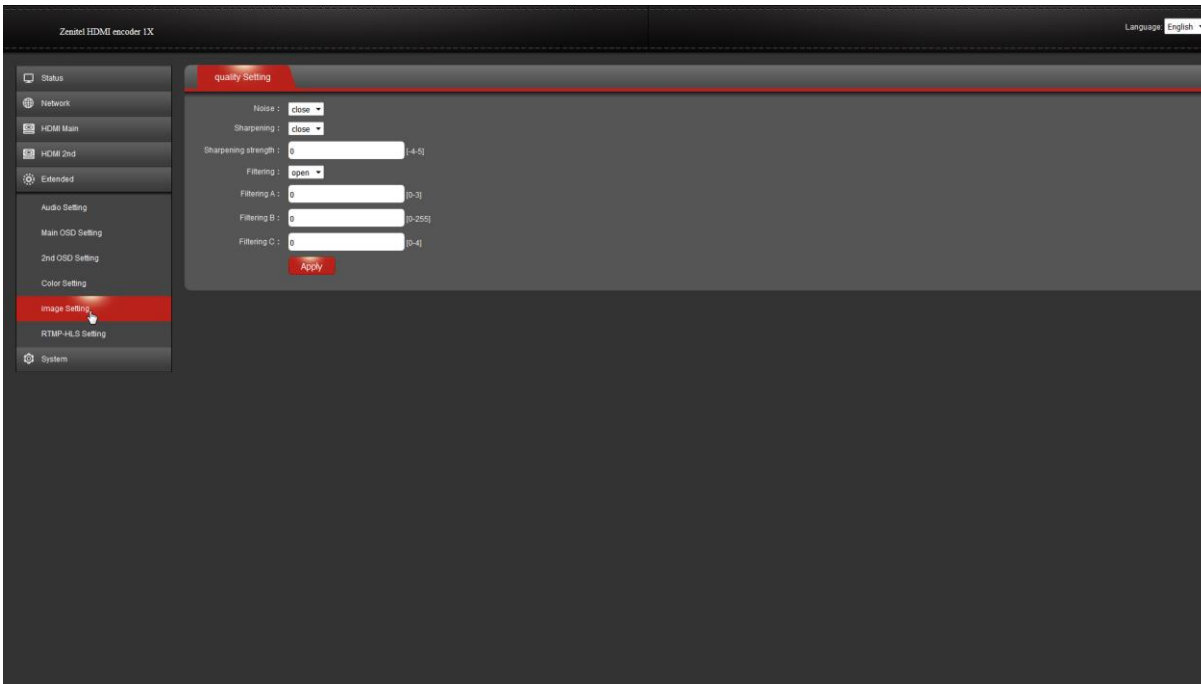
4.5.4 Image Setting

Image Setting allows one to adjust the uploaded image with additional options. When used correctly, Image Setting can make the uploaded image look more crisp and clear.

Image setting options are:

- Noise
- Sharpening

- Sharpening Strength
- Filtering



4.5.5 RTMP-HLS Setting

The HLS streaming protocol works by chopping MP4 video content into short, 10 second chunks. These short clips are delivered via HTTP, which makes HLS compatible with a wide range of devices and firewalls. Latency for HLS live streams with the specification tends to be in the 15-30 second range.

Parameters that can be set are:

- **RTMP-HLS stream:** Enable or disable HLS stream – [open/close]
- **RTMP-HLS mode:** Choose streaming mode [video+audio,audio]



HLS stands for HTTP Live Streaming. Essentially, HLS is a media streaming protocol that is used for delivering visual and audio media over the Internet.

4.6 System

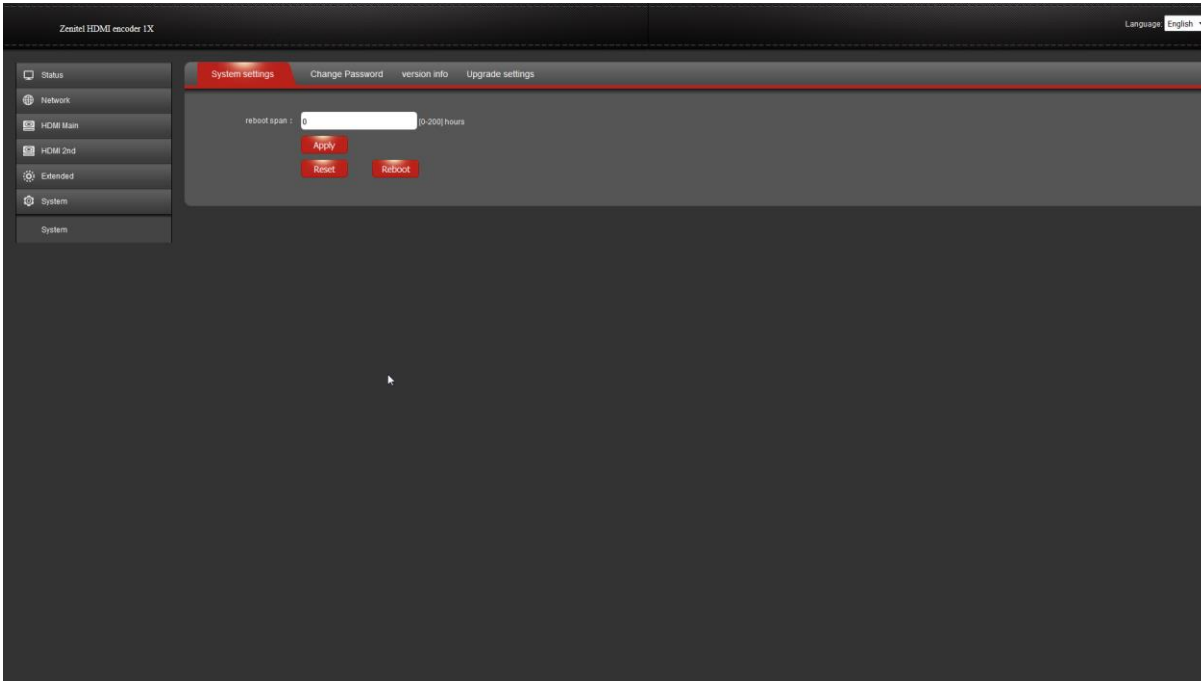
System menu contains the following submenu tabs:

- System settings
- Change password
- Version info
- Upgrade settings

4.6.1 System settings

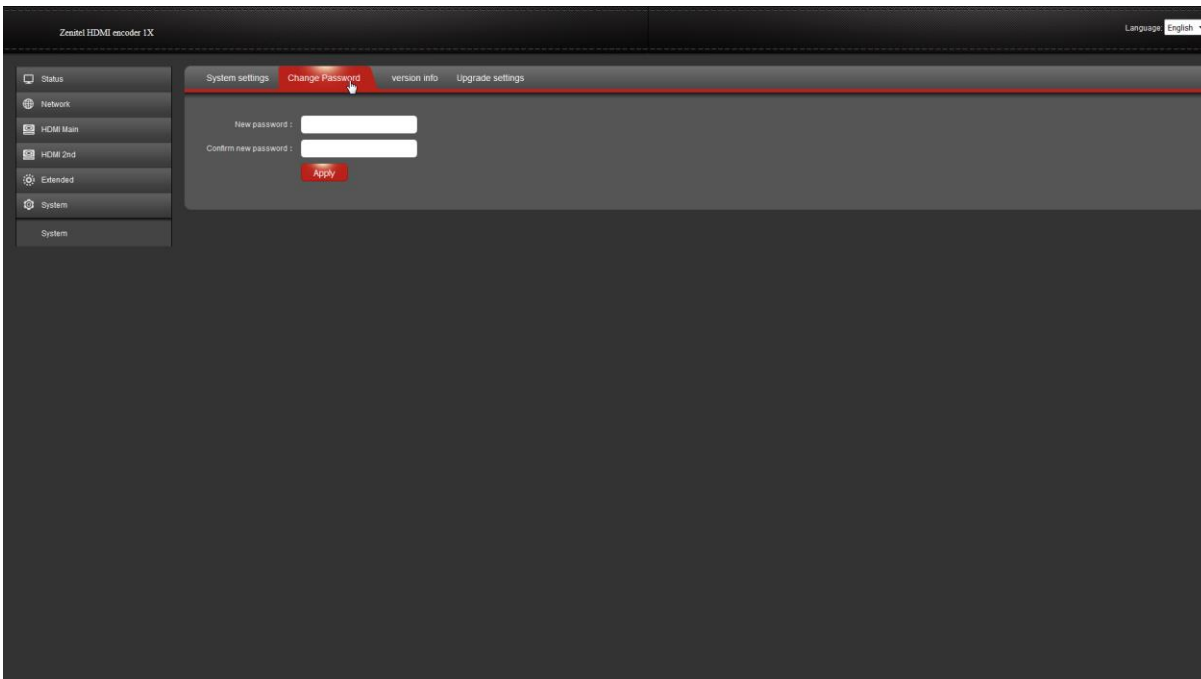
It is possible to define the **reboot span** with values in the range 0-200 hours.

- The **Reset** button returns the HDMI Encoder device to its factory default settings
- The **Reboot** button immediately restarts the device



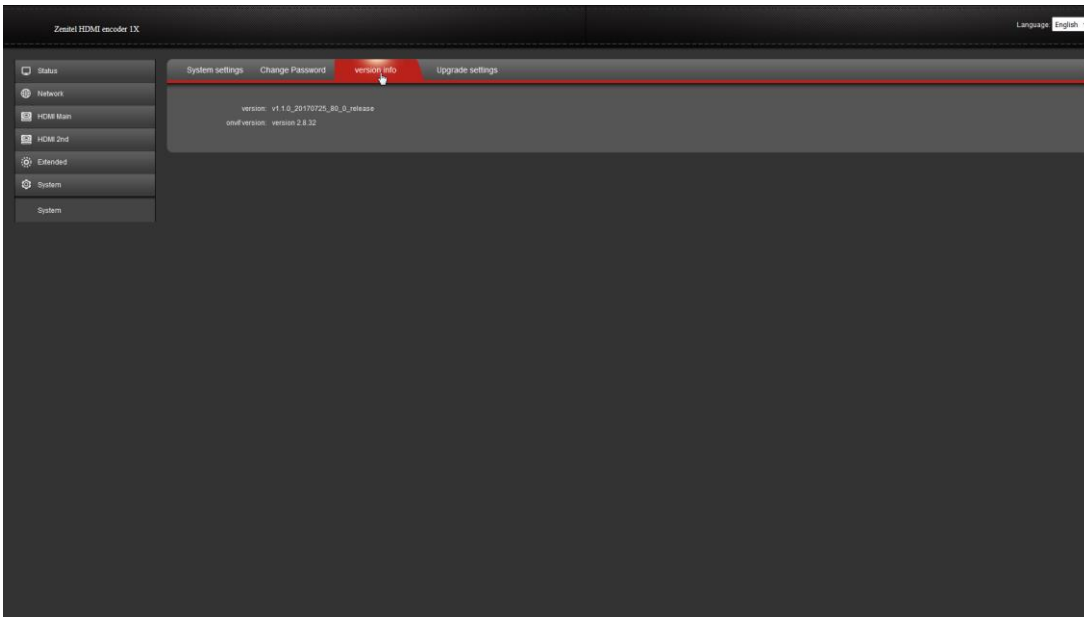
4.6.2 Change Password

Here, it is possible to change the web user interface access password by entering a new password.



4.6.3 Version info

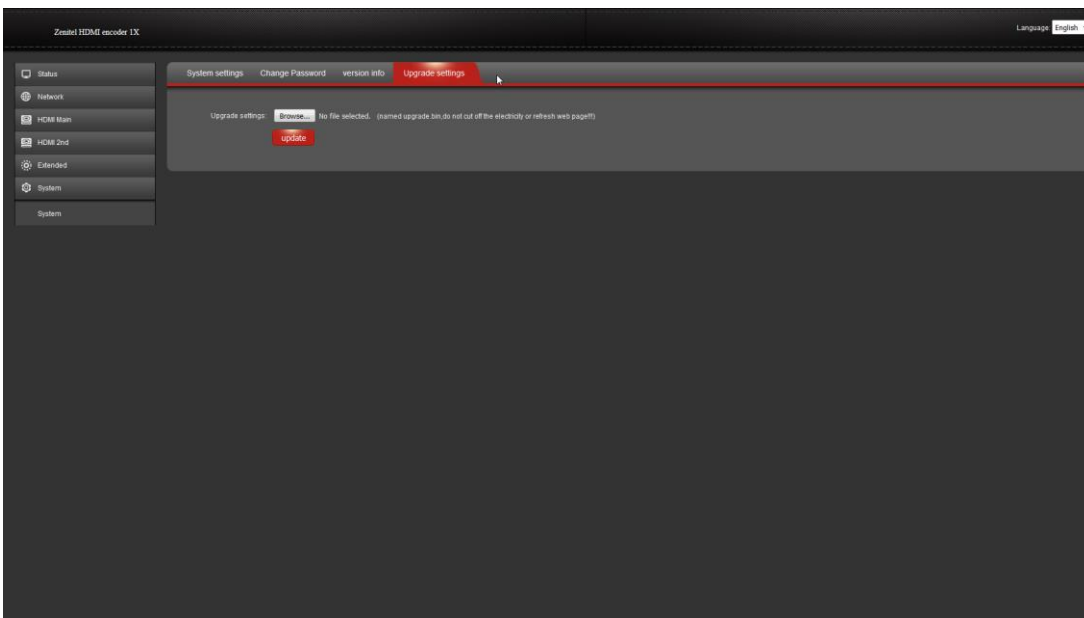
Information about the current firmware version is displayed here.



4.6.4 Upgrade settings

Here, you can upgrade the firmware to the desired version.

- Click **Browse** to select the upgrade file version
- Click **update** to upgrade the firmware



**Valid firmware has the .bin extension.
During the firmware upgrade process, DO NOT refresh the page or switch off the electric power!**

Appendix A – HDMI Encoder 1000 Parameters List

Parameter	Value	Description
Channel name	[text]	Channel name
Mirror control	'Enable/Disable'	Change the projection mode to a reflected duplication of an object that appears almost identical, but is reversed in the direction perpendicular to the mirror surface.
Flip Control	'Enable/Disable'	Change the projection mode to flip the image over top-to-bottom.
Bitrate control	'cbr/vbr'	CBR stands for constant bit rate that aims for a constant or unvarying bandwidth level with video quality allowed to vary. VBR stands for variable bit rate and allows the bit rate to vary but maintains a constant video quality level.
Key Interval	[5-200]	Specifies the interval of intra frames. Intra frames (= I-Frames) are independently coded and used as references frames.
Encoded size	1920x1080; 1680x1056; 1280x720; 960x540; 850x480; 720x576; 720x540; 720x480; 720x404; 720x400; 704x576; 640x480; 640x360	Resolution is the number of pixels spread across a monitor screen, and is usually written as horizontal x vertical. The resolution of your monitor has a huge effect on the type of stream you are able to watch.

Parameter	Value	Description
H.264 Profile	'high profile/main/baseline'	Use the maximum profile supported by the target playback platform. High Profile: Best for big screens with a good decoder. Main: Good for more modern smartphones and tablets. Baseline: Compatible with most smartphones and tablets, including older mobiles.
Encoding frame rate	[5-60]	Content should be encoded and uploaded in the same frame rate it was recorded. Common frame rates include: 24, 25, 30, 48, 50, 60 frames per second (other frame rates are also acceptable).
MinQp	[1-51]	Specifies the minimum Quality settings, where Q1 is best and Q51 is worst. E.g. change the 'MaxQP' from 30 to 50 to reduce the video quality and the

		average bitrate. Recommended to leave the standard value (5) unchanged. Only available with "Bitrate control=vbr".
MaxQp	[MinQp-51]	Specifies the maximum Quality settings, where Q1 is best and Q51 is worst. E.g. change the 'MinQP' from 5 to 20 to reduce the video quality and the average bitrate. Recommended to leave the standard value (32) unchanged. Only available with "Bitrate control=vbr".
Max Bitrate	[16-12000]	Specifies the average Video Bitrate.

Parameter	Value	Description
Package	ffmpeg/vlc	Specifies different Multiplexer Mode for Decoder compatibility.
Buffer Mode	188x7 = 7 TS Packets/Ethernet packet = 7 x 188 = 1316bit 188x6 = 6 TS Packets/Ethernet packet = 6 x 188 = 1128bit	Specifies the buffer size.
PMT ID	[1-65535]	Specifies the 'Program Map Table' ID.
Transport ID	[256-3840]	Specifies the 'Transport Stream' ID.
Stream ID	[256-3840]	Specifies the 'Video and PCR (program clock reference)' ID.
Program ID	[1-65535]	Enter the desired program number for this encoder channel. Valid program numbers are always entered in decimal.
SDT name	[text]	Enter the desired SDT service name for this encoder channel.



The WEEE Directive does not legislate that Zenitel, as a 'producer', shall collect 'end of life' WEEE.

This 'end of life' WEEE should be recycled appropriately by the owner who should use proper treatment and recycling measures. It should not be disposed to landfill.

Many electrical items that we throw away can be repaired or recycled. Recycling items helps to save our natural finite resources and also reduces the environmental and health risks associated with sending electrical goods to landfill.



Under the WEEE Regulations, all new electrical goods should now be marked with the crossed-out wheeled bin symbol shown.

Goods are marked with this symbol to show that they were produced after 13th August 2005, and should be disposed of separately from normal household waste so that they can be recycled.

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