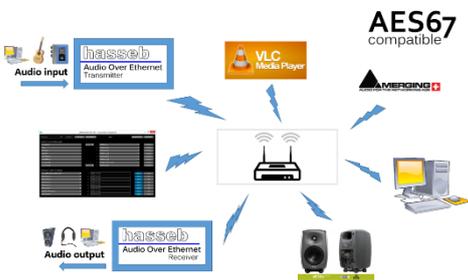## HASSEB AUDIO OVER ETHERNET

hasseb Audio over Ethernet is an easy to use and portable device used to send and receive lossless, realtime audio using Ethenet network. The device is compatible with AES67 standard and can be used as a standalone device or together with other AES67 compatible devices.

The device can operate as a stream sender or receiver. Standard 3.5 mm audio plug is used to convert any external speaker or audio source to a network audio receiver or source. The device is configured using a web user interface and mDNS (multicast Domain Name System) protocol is supported to easily find the device IP addresses from the network. For professional grade network audio systems PTP (Precision Time Protocol) based time synchronization is required. The device can act as IEEE1588 grand master to provide synchronization clock signal to the network.

INSTALLATION

The device is powered through the USB connector using a 5 volts USB power supply.

DHCP (Dynamic Host Configuration Protocol) support is enabled by default, so the device will assign an IP address automatically. All Ravenna devices and their names and IP addresses connected to the network can be found using any software, capable of searching the network for mDNS supported devices. If you have normal domestic network router, the web user interface of you router can also be used to find the IP addresses of the connected devices.

WEB USER INTERFACE

The device can be configured for network, audio, and stream settings using any web browser. Writing the IP address of the device to the address field of your web browser, the configuration page will be opened. You can find the IP address of the device from your network router or using free third party software such as *Bonjour Browser* or *MT Discovery.*
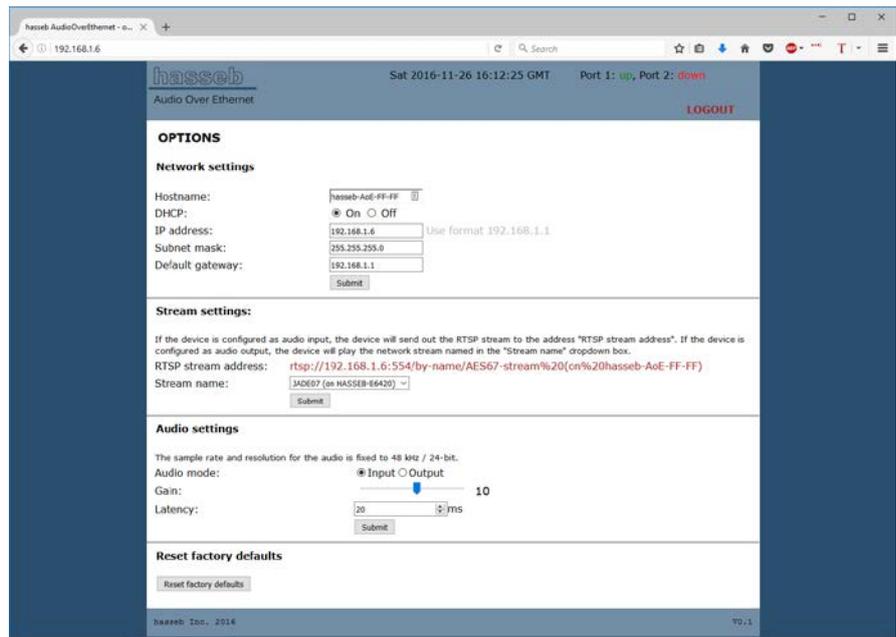
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info@hasseb.fi
www.hasseb.fi

Figure 1: A web browser is used to configure the device.

NETWORK SETTINGS

The hostname, IP address, subnet mask, and default gateway can be set using the web interface. The DHCP can also be enabled or disabled. By default the device uses DHCP to assign the network settings. The default hostname for the device is *hasseb-AoE-XX-XX*, where *XX-XX* are the last two octets of the device MAC address. After configuration of new network settings, the device will reboot automatically.

STREAM SETTINGS

Stream settings are used to choose the AES67 stream received from the network. The chosen stream name is stored to the internal memory of the device and will be used by default after power down. The streams sent by *hasseb Audio Over Ethernet* device will be named as *AES67-stream (on 'network_hostname')*, where *'network_hostname'* is the hostname of the device as defined in network settings (for example *AES67-stream (on hasseb-AoE-AB-CD)*).

AES67 standard defines the audio stream following RTSP (Real Time Streaming Protocol) used also for example in internet radio stations. The address of the output stream is visible on the "RTSP stream address" field. In addition to another *hasseb Audio Over Ethernet* device, the output stream can be listened using any media player supporting RTSP protocol, such as VLC media player.

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info@hasseb.fi
www.hasseb.fi

AUDIO SETTINGS

The audio settings are used to configure the analog audio signal as input or output.

When the audio mode is configured as input, the device will convert the analog audio signal to a 24-bit digital signal at a sampling rate of 48 kHz and send it out as an AES67 stream. The name of the stream is shown in stream settings in the "RTSP stream address" field.

When the audio mode is configured as output, the device will receive the AES67 stream as defined in stream settings, in the "Stream name" drop down box. The input stream should be a 24-bit digital signal sampled at a sampling rate of 48 kHz.

The "Gain" slider can be used to adjust the gain of the input/output analog signal between -100 and 100, where a gain of -100 means full attenuation and a gain of 100 means maximum amplification. If the gain is set to 0, the analog signal is not amplifier or attenuated.

STATUS LED

There is an LED inside the device to indicate the status of the device. The LED will blink once a second when the device is operating properly.

RESET FACTORY DEFAULTS

If something goes wrong with the network settings and you cannot access the device anymore through the network, you can reset the factory defaults using the push button on the circuit board. To access the button you need to open the enclosure.

To reset the factory default settings, press the push button and power up the device. Keep the push button pressed for 10 seconds. This will reset the setting to factory defaults. The default network configuration is DHCP on.

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info@hasseb.fi
www.hasseb.fi

Specifications	
Input voltage	5 VDC
Input current	300 mA
Input audio voltage	2.1 V_{RMS}
Output audio voltage (1 kΩ load)	2.1 V_{RMS}
Operating temperature	$0 - 50\,°C$
Dimensions	65 mm x 65 mm x 30 mm
Weight	100 g

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