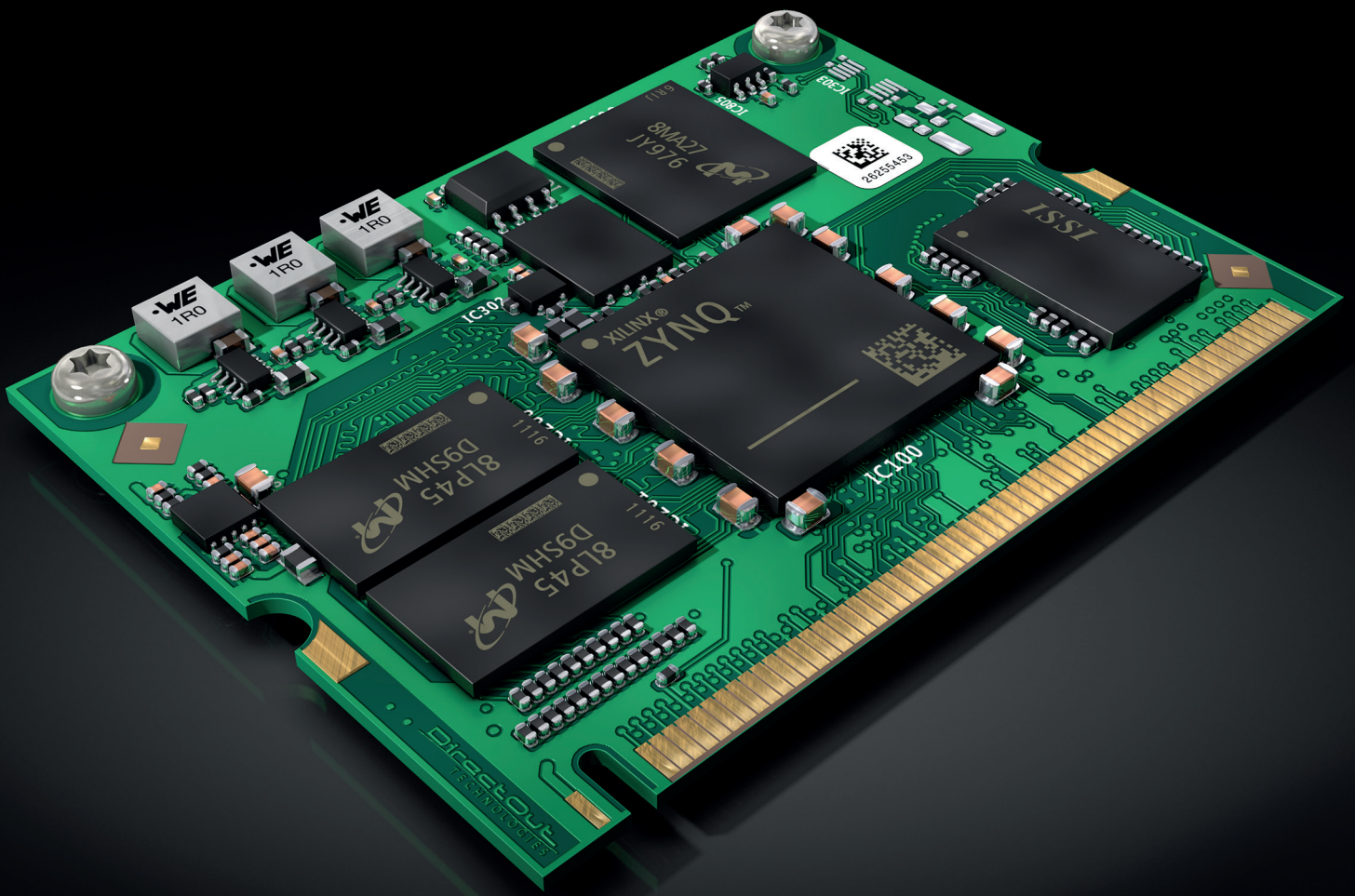




# AVT RAVENNA Module

# Software Manual



Version 1.0

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A publication of  
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## AVT System Software

### Introduction

If equipped, the MAGIC RAVENNA Module shows in the System configuration of the MAGIC Telephone Hybrids and MAGIC DAB Encoders. The next 10 pages specify the system specific configuration within the AVT MAGIC System user interface.

The configuration of the Ravenna module is performed via a HTML5 webbrowser. The configuration PC must have access to the network the Ravenna interface is connected to. This guide addresses the configuration of the Ravenna Interface itself from page 14.

### Telephone Hybrids

#### Registration

Find information about the installed Ravenna module in the THipPro PC Software under **Menu » Administration » Registration**.

Select the RAVENNA tab at the top.

|                  |   |
|------------------|---|
| SUBJECT NUMBER   | The AVT ID of the Ravenna module                                |
| FACTORY NUMBER   | The AVT serial number of the Ravenna module                     |
| YEAR             | Manufacturing Year  |
| HARDWARE VERSION | Version of the complete Ravenna module                          |
| SOFTWARE VERSION | Version of the DirectOut Ravenna software                       |
| DEVICE VERSION   | Version of the DirectOut Ravenna module                         |
| MAC ADDRESS      | Hardware addresses of LAN 1 and LAN 2 of the Ravenna module     |
| IP ADDRESS       | IP addresses of the LAN interface 1 and 2 of the Ravenna module |

## Mode & Audio Line

Audio signals of the THipPro are assigned to Ravenna channels in the RAVENNA tab of the MODE & AUDIO LINE configuration page of the THipPro.

The RAVENNA tab is only displayed if the THipPro is equipped with a Ravenna module and the built-in AES67 feature is disabled.

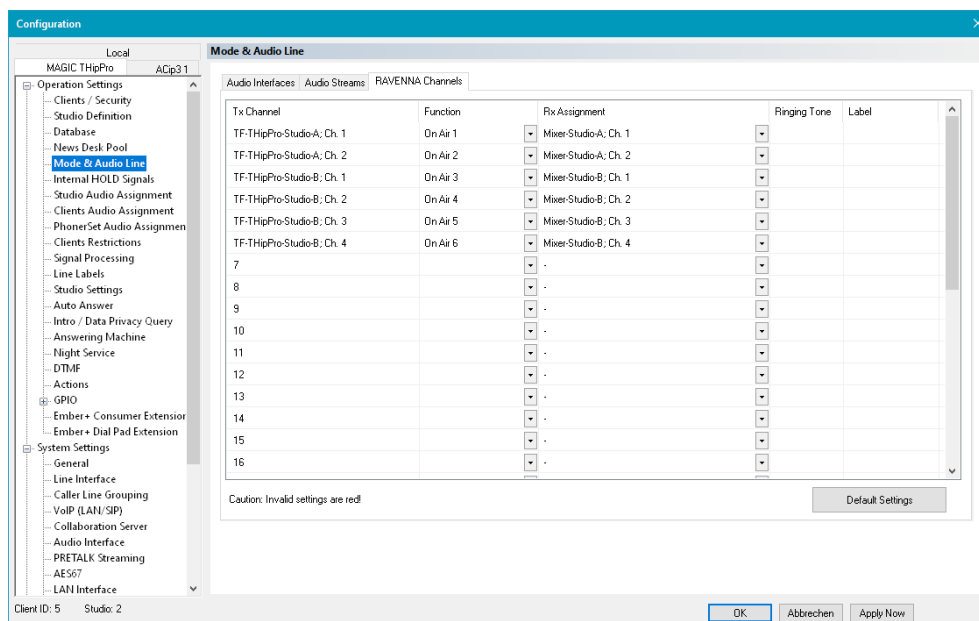
The THipPro can utilize 32 channels of the Ravenna module for both directions (input and output).

It is recommended to configure the input and output streams in the Ravenna web interface first. The channels and stream names are then available in the THipPro configuration.

Remark: It can take up to a minute until the streams are available to the configuration dialog. Try to switch to another configuration page and back to Mode & Audio Line to update the table.

## NOTE

- The IP address of the Ravenna module can be found under **Menu » Administration » Registration**. Then, select **RAVENNA** at the top.
- An overview of Ravenna streams and channels used by the THipPro can be found in the System Monitor under **Menu » System Monitor » Ravenna State » Show Streams**.
- Find the Ravenna stream status in the web interface of the Ravenna module.



|               |  |
|---------------|--|
| TX CHANNEL    | Displays the Ravenna stream names and channel numbers if the output  |
| FUNCTION      | Select an audio line   |
| RX ASSIGNMENT | Select a channel from a stream which is currently received by the Ravenna module to assign it to the audio line<br><br>Note: Configure the Input streams in the Ravenna web interface first. Only then are they available in the configuration |

### Ravenna Input Streams

In the Ravenna web interface, up to 32 input streams can be configured. The Ravenna module can send up to 32 mono audio channels to the THipPro base board. For each stream a START CHANNEL needs to be set in the Ravenna web interface. This channel number refers to the internal channel number of the THipPro. The Ravenna module can only receive a whole stream. There is no way of selecting a single channel or a part of a stream. This means if a stream with 8 channels is received and START CHANNEL is set to 1, Ravenna audio channels 1-8 of the THipPro are occupied. For the next stream the START CHANNEL must be set to 9 or higher to avoid overlapping audio signals.

### Ravenna Output Streams

In the Ravenna web interface, up to 32 output streams can be configured. For each stream a START CHANNEL and NUMBER OF CHANNELS must be set in the Ravenna web interface. These channel numbers refer to the Ravenna Tx channels of the THipPro. Example: THipPro Ravenna Tx channels 1-6 should be transmitted via one Ravenna stream, the START CHANNEL should be set to 1 and NUMBER OF CHANNELS should be set to 6.

## System Monitor

Open **Menu » System Monitor** to get an overview of the system status.

The status is displayed as text as well as LEDs:

- : Alarm is active. There is an error.
- : Alarm is active but not relevant for the current configuration.
- : Status is OK.

Find alarm counters next to the LEDs which indicate how often the alarm occurred since the Alarm Counter was reset.

**System Monitor - TF-ThipPro**

☒ Keep window on top

**System alarms**

|                           |                          |
|---------------------------|--------------------------|
| ● 0 LCA                   | ● 0 Overheated           |
| ● 0 Time Keeper           | ● 0 MAIN EEPROM          |
| ● 0 Temperature Sensor    | ● 0 Display Contrast DAC |
| ● 0 FLASH EPROM           |                          |
| ● 0 VCXO                  | ● 0 I/O Port             |
| ● 0 DSP 2 Boot            | ● 0 DSP 2 Access         |
| ● 0 Slot 1 Access         | ● 0 Slot 2 Access        |
| ● 0 Slot 3 Access         | ● 0 Module Assembly      |
| ● 0 Ethernet MAC 1        | ● 0 Ethernet MAC 2       |
| ● 0 Ethernet MAC 3        | ● 0 Ethernet MAC 4       |
| ● 0 RAVENNA Module Access |                          |

**Application alarms**

|                       |                            |
|-----------------------|----------------------------|
| ● 1 AES/EBU Input 1   | Professional (48 kHz)      |
| ● 1 AES/EBU Input 2   | No AES signal available    |
| ● 1 AES/EBU Input 3   | No AES signal available    |
| ● 1 AES/EBU Input 4   | No AES signal available    |
| ● 0 Ravenna TX Stream | ● 2 Ravenna RX Stream      |
| ● 1 AConnect Stream 1 | ● 1 AConnect Stream 2      |
| ● 1 SIP Registration  | ● 0 Col. Srv. Registration |
| ● 0 DHD Audio Matrix  |                            |
| ● 0 Ember+ Consumer 1 |                            |

**Ethernet state**

|             |                      |                                   |
|-------------|----------------------|-----------------------------------|
| LAN 1       | ● 0 100 MBit/s, full | TX: 912,0 kBit/s RX: 741,2 kBit/s |
| LAN 2       | ● 0 100 MBit/s, full | TX: 0 Bit/s RX: 390 Bit/s         |
| DHCP: bound |                      | IP address: 192.168.178.24        |
| LAN 3       | ● 0 100 MBit/s, full | TX: 195 Bit/s RX: 4,6 kBit/s      |
| LAN 4       | ● 0 100 MBit/s, full | TX: 0 Bit/s RX: 4,6 kBit/s        |
| RAV 1       | ● 0 100 MBit/s       |                                   |
| RAV 2       | ● 0                  |                                   |

**Abs. data rates**

TX: 912,0 kBit/s RX: 741,2 kBit/s  
TX: 0 Bit/s RX: 390 Bit/s  
IP address: 192.168.178.24  
TX: 195 Bit/s RX: 4,6 kBit/s  
TX: 0 Bit/s RX: 4,6 kBit/s

**System State**

System Temperatur: 51 °C DSP Load: 34 %

**Connected Ember+ Consumer**

1: 172.20.75.5 2: 172.20.30.15  
4: 172.20.30.5

**DHD Core Connections**

● 1: 172.20.75.6

**Connected PhonerSets**

| Audio stream  | Status | Version           |
|---------------|--------|-------------------|
| 172.20.100.16 | ●      | Workplace 1 0.010 |

**IP Transmission Jitter**

Current Max. last 60 sec

OFF

**Ravenna state**

Audio engine: ● TX ● RX  
Streams: ● TX ● RX [Show Streams](#)  
PTP State: Warning

**IP Audio Streams**

|               |                |
|---------------|----------------|
| ● IP Stream 1 | ● PS           |
| ● IP Stream 3 | ● IP Stream 4  |
| ● AVT-DT2     | ● IP Stream 6  |
| ● IP Stream 7 | ● IP Stream 8  |
| ● IP Stream 9 | ● IP Stream 10 |

**Connected MAGIC ACip3**

|                |          |          |                           |
|----------------|----------|----------|---------------------------|
| ● 172.20.40.25 | ● Stream | ● Alarms | <a href="#">Sys. Mon.</a> |
| ● 172.20.40.25 | ● Stream | ● Alarms | <a href="#">Sys. Mon.</a> |

**Connected PCs**

**1: AZEINER-DT1:LAN**

**Database**

● 1: AVT-DT-S1\SQLXPRESS.CallerThipPro

**Master PC**

PC 1

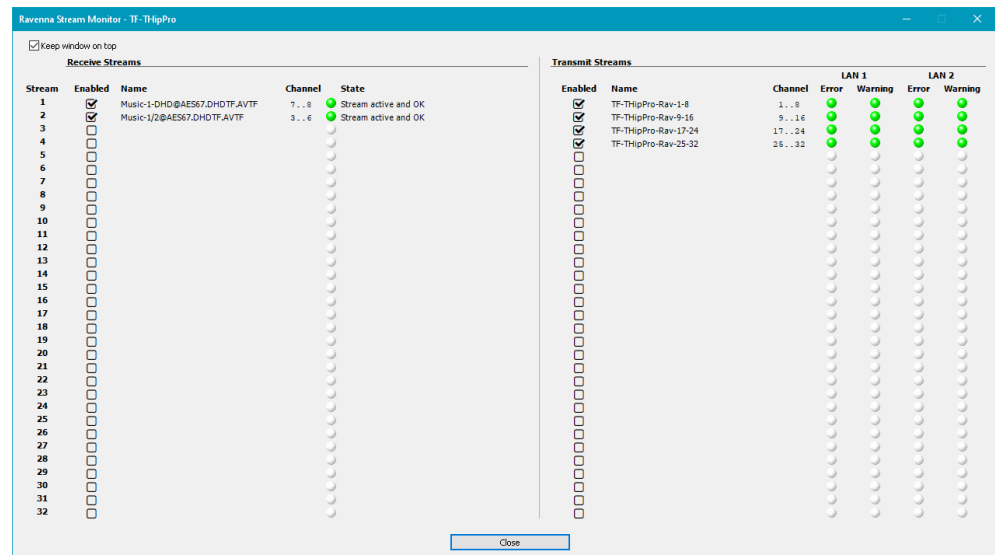
Last Counter Reset: 16.11.2022 06:22:08

[Alarm Counter Reset](#) [Audio Interface Monitor](#) [Line State Monitor](#) [Close](#)

|                    |  |
|--------------------|--|
| KEEP WINDOW ON TOP | Activate to keep the windows always on top of the screen   |
| RAVENNA STATE      | Displays the state of the optional Ravenna module  |
| AUDIO ENGINE       | Internal state of the Ravenna module for RX and TX. Refer to the Ravenna web interface for more information              |
| STREAMS            | State of the configured Rx and Tx streams. Refer to the Ravenna web interface or press SHOW STREAMS for more information |
| PTP STATE          | State of the audio clocks of the Ravenna module. Refer to the Ravenna web interface for more information                 |
| SHOW STREAMS       | Shows an overview of the configured streams and their status   |

## Ravenna Streams

Open **Menu » System Monitor » Ravenna State » Show Streams** to get an overview of the configured Ravenna streams.



|                    |  |
|--------------------|--|
| KEEP WINDOW ON TOP | Activate to keep the windows always on top of the screen   |
| STREAM             | The stream number as displayed in the Ravenna web interface  |
| RECEIVE STREAMS    | <p>Shows the configured Ravenna input streams</p> <p><b>ENABLED:</b><br/>Shows whether the input stream is activated in the Ravenna web interface.</p> <p><b>NAME:</b><br/>The name of the Ravenna stream.</p> <p><b>CHANNEL:</b><br/>Shows which audio channels the Ravenna module uses to transmit the audio signal to the THipPro base board.</p> <p><b>STATE:</b><br/>Shows whether the stream is currently being received.</p>  |
| TRANSMIT STREAMS   | <p>Shows the configured Ravenna output streams</p> <p><b>ENABLED:</b><br/>Shows whether the output stream is activated in the Ravenna web interface.</p> <p><b>NAME:</b><br/>The name of the Ravenna stream.</p> <p><b>CHANNEL:</b><br/>Shows which Ravenna Tx channels of the THipPro are included in that stream.</p> <p><b>LAN 1 /2, ERROR, WARNING:</b><br/>Shows if there are any problems on any of the LAN interfaces of the Ravenna module. Get more information in the Ravenna web interface.</p> |



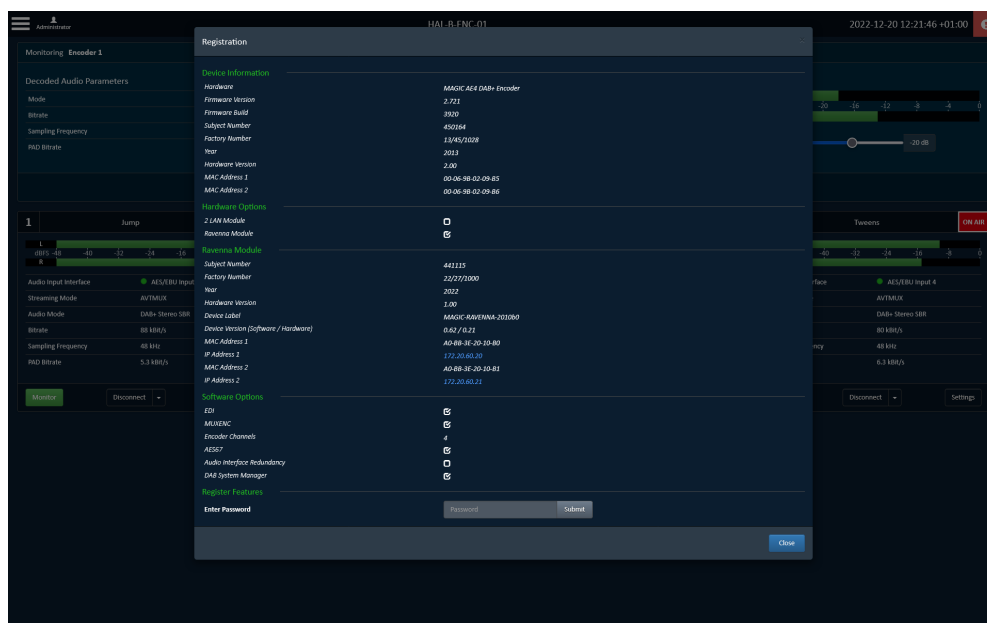


|                     |  |
|---------------------|--|
| KEEP WINDOW ON TOP  | Activate to keep the windows always on top of the screen   |
| TEST TONE GENERATOR | Select an audio interface from the drop-down box to generate a sine test signal on the respective audio output   |
| AUDIO INTERFACE     | <p>Name of the audio channel</p> <p><b>AES/EBU:</b><br/>Digital audio interfaces at the back of the device.</p> <p><b>XLR ANALOGUE:</b><br/>Analogue audio interfaces at the back of the device.</p> <p><b>HANDSET:</b><br/>Handset audio interfaces at the front of the device.</p> <p><b>IP AUDIO STREAM:</b><br/>Pretalk streams over IP.</p> <p><b>PHONERSET:</b><br/>PhonerSet audio streams over IP.</p> <p><b>AES67:</b><br/>AES67 audio channels of the AES67 software module.</p> <p><b>DANTE:</b><br/>Audio channels of the Dante hardware module.</p> <p><b>RAVENNA:</b><br/>Audio channels of the Ravenna hardware module.</p> |
| INPUT               | Audio level of the signal fed to the THipPro   |
| OUTPUT              | Audio level of the signal Audio level of the signal emitted by the THipPro   |

## DAB

### Registration

Find information about the installed RAVENNA module in the MAGIC AE4 Web Interface under **Menu » Administration » Registration » Module Slot 2**.



|                  |   |
|------------------|---|
| SUBJECT NUMBER   | The AVT ID of the RAVENNA module                                |
| FACTORY NUMBER   | The AVT serial number of the RAVENNA module                     |
| YEAR             | Manufacturing Year  |
| HARDWARE VERSION | Version of the complete RAVENNA module                          |
| SOFTWARE VERSION | Version of the DirectOut RAVENNA software                       |
| DEVICE VERSION   | Version of the DirectOut RAVENNA module                         |
| MAC ADDRESS      | Hardware addresses of LAN 1 and LAN 2 of the RAVENNA module     |
| IP ADDRESS       | IP addresses of the LAN interface 1 and 2 of the RAVENNA module |

## Audio

To enable RAVENNA functionality the corresponding option has to be set in **Menu » Settings » Audio**.

The RAVENNA option is only visible if the module is equipped and enabled by software license.

Only one of RAVENNA and AES67 functionality can be enabled simultaneously. Make sure to disable the other option first.

The MAGIC AE4 can utilize the first 4 stereo channels of the RAVENNA module for audio input.

It is recommended to configure the input and output streams in the Ravenna web interface first. The channels and stream names are then available in the MAGIC AE4 configuration.



## NOTE

The IP addresses of the Ravenna module can be found under **Menu » Administration » Registration** and in the Audio settings page under **Menu » Settings » Audio** once RAVENNA is enabled.

The screenshot shows the 'Audio' settings window with the following configuration:

- General** tab is selected.
- Audio Monitoring** section:
  - Monitoring Decoder**: Enabled (green button)
- Analogue Audio Interface** section:
  - Nominal Input Level**: Slider set to 6 dBu
  - Nominal Output Level**: Slider set to 6 dBu
  - Headroom**: Slider set to 9 dB
- Ravenna** section:
  - Status: Enabled (green button)
  - IP Address 1**: 172.20.60.20
  - IP Address 2**: 172.20.60.21
- AES67** section:
  - Status: Disabled (grey button)
- Output Interfaces** section:
  - Output Interface**: Source dropdown menu
  - AES/EBU 1**: Monitor (dropdown)
  - Analogue**: Monitor (dropdown)
  - Headphones**: Monitor (dropdown)

Buttons at the bottom: Cancel, Apply, OK.

## Encoder

To allocate RAVENNA channels the corresponding option has to be set in **Menu » Settings » Encoder**.

The Input Interface dropdown displays all available RAVENNA inputs.

Encoder 1

Audio Output PAD UECF

Encoder Name SPUTNIK

Input Interface AES/EBU 1

Streaming Mode AES/EBU 1 ✓

Audio Level Amplification

Audio Level Alarm On

Threshold

Alarm after

Output Stream Behaviour

Auto Disconnect on Audio Error (Silence / AES missing)

Encoder Control

Multiplexer Control Port LAN 2: 172.20.67.101 6001

Codec Parameters

Codec DAB+

Subchannel Data Rate 96 kBit/s

Audio Mode Stereo SBR

Sampling Rate 48 kHz (24 kHz with SBR)

Bandwidth Extension Off

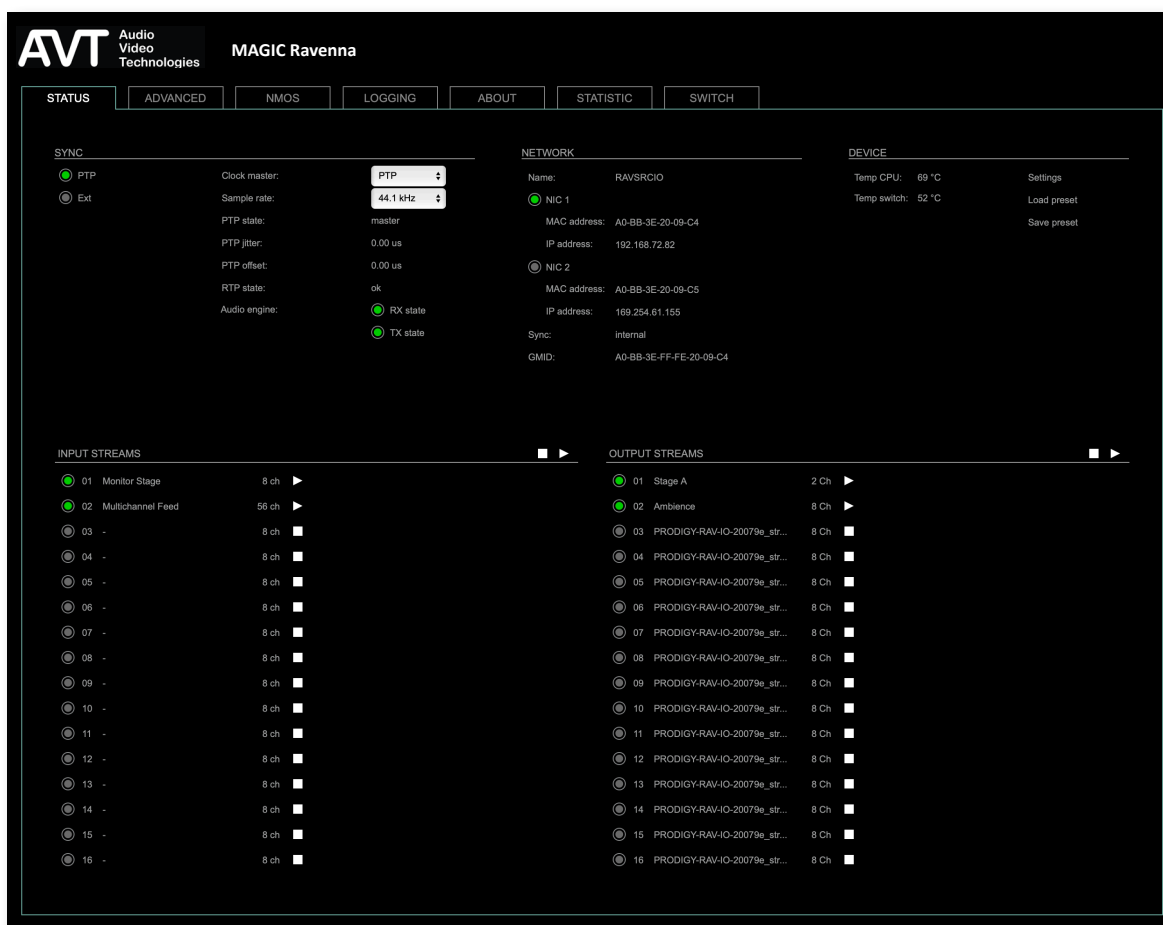
Cancel Apply OK

## RAVENNA Module Software

### Introduction

The AVT RAVENNA Module is an audio network module for RAVENNA / AES67 based on the RAV2 module.

All functions of the device are accessible through a browser based interface (html5 / javascript). The size of the window and the zoom level can be varied. The page is organized in tabs, pulldown menus or hyperlinks offer access to the values of a parameter. Some values use an input field (e.g. IP address).



## Connecting Audio Network

To access the control page:

- connect the network with one port
- enter `http://<IP Address>` (default IP @ PORT 1: 192.168.96.111) in the navigation bar of your browser

Two independent network interfaces (NICs) can be configured in the switch configuration. Port 1 is fixed assigned to NIC 1.

## Status - Overview

The tab 'STATUS' is divided into several sections:

- SYNC - monitoring sync state, clock selection, links to I/O settings
- NETWORK - display network info, link to network settings
- DEVICE - monitoring device info, link to device settings, phones level control
- INPUT STREAMS - monitoring and control input streams, link to input stream settings
- OUTPUT STREAMS - monitoring and control output streams, link to output stream settings

Hyperlinks open a popup window to adjust related settings. Most settings are updated immediately without further notification. To exit a popup window click the button in the top right corner.

Mouse overs are used to display further information (e.g. connection speed of network link).

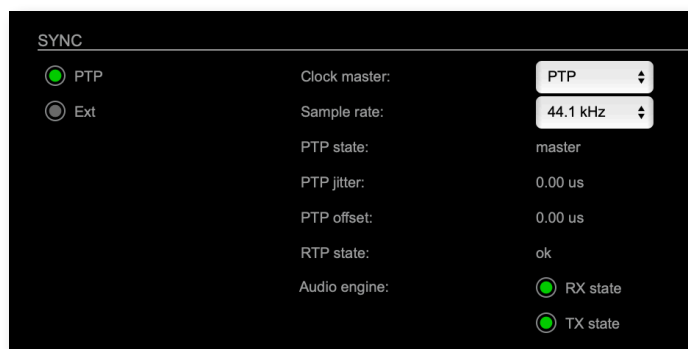
### NOTE

---

The web user interface updates itself when changes are applied by other instances (other browsers, external control commands).



## Status - Sync



|                          |  |
|--------------------------|--|
| PTP, Ext                 | Displays clock source and state for the main frame:<br><input type="radio"/> (OFF) = not locked<br><input checked="" type="radio"/> (ON) = locked and in sync with clock master<br><input type="radio"/> (blinking) = locked but not in sync with clock master |
| Clock master             | Pulldown menu to select clock source of the main frame (PTP, extern)   |
| Sample rate              | Pulldown menu to adjust sample rate of the main frame (44.1 / 48 / 88.2 / 96 / 176.4 / 192 kHz).   |
| PTP state                | State of PTP (Master / Slave).   |
| PTP jitter               | PTP-clock jitter per second  |
| PTP offset               | Offset relative to PTP-clock master  |
| RTP state                | Status of packet processing (OK, Error*)   |
| Audio engine<br>RX state | State of module's audio engine - receiving<br><input checked="" type="radio"/> (ON) = ok, receiving data<br><input type="radio"/> (blinking) = not all received packets can be processed   |
| Audio engine<br>TX state | State of module's audio engine - sending<br><input checked="" type="radio"/> (ON) = ok, sending data<br><input type="radio"/> (blinking) = not all packets can be sent to the network  |

\* Error: packet time stamps are out of bounds.

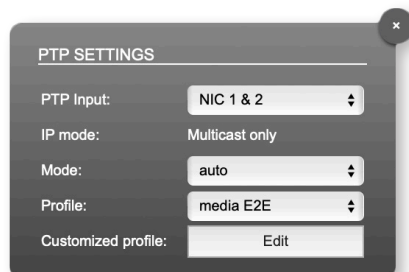
Possible reasons: stream offset may be too small or transmitter or receiver are not synced properly to the Grandmaster.

## Hyperlinks:

- PTP / PTP state (p 17)



## PTP Settings

A screenshot of a 'PTP SETTINGS' dialog box. It has a title bar with a close button (X). The settings are as follows: PTP Input: NIC 1 & 2 (dropdown); IP mode: Multicast only (text); Mode: auto (dropdown); Profile: media E2E (dropdown); Customized profile: Edit (button).

| PTP SETTINGS        |                |
|---------------------|----------------|
| PTP Input:          | NIC 1 & 2      |
| IP mode:            | Multicast only |
| Mode:               | auto           |
| Profile:            | media E2E      |
| Customized profile: | Edit           |

|                    |   |
|--------------------|---|
| PTP Input          | NIC selection for PTP clock input. 'NIC 1 & 2' means input redundancy.  |
| IP Mode            | PTP via multicast, unicast or in hybrid mode. *   |
| Mode               | PTP-clock master / slave configuration is auto negotiated between devices in the network. Module's master / slave state may change automatically. |
| Profile            | PTP profile selection (default E2E, default P2P, media E2E, media P2P, customized)  |
| Customized profile | Edit opens the tab 'ADVANCED' to adjust the custom profile.   |

See „Advanced - PTP Clock Setting“ on page 43 for more details.

## Status - Network

**NETWORK**

Name: RAVERCIO

☒ NIC 1  
 MAC address: A0-BB-3E-20-09-C4  
 IP address: 192.168.72.82

☐ NIC 2  
 MAC address: A0-BB-3E-20-09-C5  
 IP address: 169.254.61.155

Sync: internal

GMID: A0-BB-3E-FF-FE-20-09-C4

|               |   |
|---------------|---|
| Name          | Module's name in the network. Used e.g. for mDNS service. The name needs to be unique throughout the network.   |
| NIC 1 / NIC 2 | Monitoring state of network interface controller<br><input type="radio"/> (OFF) = not connected<br><input checked="" type="radio"/> (ON) = connected with the network |
| MAC address   | Hardware identification of network interface controller.  |
| IP address    | IP address of device  |
| Sync          | Selected NIC for PTP sync   |
| GMID          | Grand Master ID (PTP)   |

### Hyperlinks

- Name / IP address (p 19)

### Mouse over:

- LED NIC 1 - indicating link state and connection speed
- LED NIC 2 - indicating link state and connection speed



## NOTE

If NIC 1 and NIC 2 are connected to the same switch, they must be configured to different subnets - see "Network Settings" on page 19.

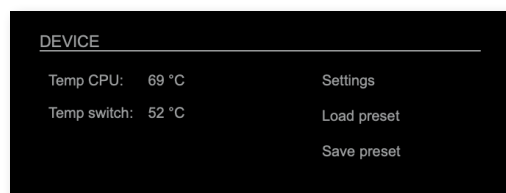
## Network Settings

The two network interface controllers (NIC 1 / NIC 2) are configured individually.

The screenshot shows a configuration window with two main sections: NIC 1 and NIC 2. Each section has a 'Dynamic IP address (IPv4)' radio button and a 'Static IP address (IPv4)' radio button. For NIC 1, the 'Static IP address (IPv4)' is selected, and the IP address is 192.168.72.82. For NIC 2, the 'Dynamic IP address (IPv4)' is selected, and the IP address is 169.254.61.155. Both sections have fields for Subnet mask (IPv4), Gateway (IPv4), and DNS server (IPv4). Below these fields is a section for 'Direct routing (multicast transfer only)' with checkboxes for Host IP address 1 through 10. An 'Apply' button is located at the bottom center of the window.

|                           |  |
|---------------------------|--|
| Device name               | Input field - Module's name in the network. Used e.g. for mDNS service. The name needs to be unique throughout the network.                          |
| Dynamic IP address (IPv4) | Switch to enable the device's DHCP client. IP address is assigned by DHCP server. If no DHCP is available the IP address is determined via Zeroconf. |
| Static IP address (IPv4)  | Switch to disable the device's DHCP client. Manual configuration of network parameters.  |
| IP address (IPv4)         | Module's IP Address  |
| Subnet mask (IPv4)        | Module's subnet mask   |
| Gateway (IPv4)            | IP address of gateway  |
| DNS server (IPv4)         | IP address of DNS server   |
| Apply                     | Button to confirm changes. Another popup window will appear to confirm a reboot of the module.   |
| Direct routing            | IP addresses of devices outside the subnet, to enable multicast traffic; e.g. Grandmaster or IGMP querier. Mark checkbox to activate.                |

## Status - Device

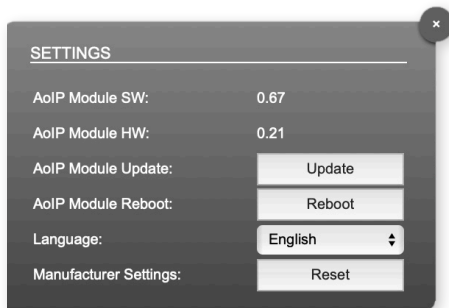


|             |   |
|-------------|---|
| Temp CPU    | Display temperature of CPU core in degree Celsius. It may reach 110 °C without effecting the performance of the device. |
| Temp switch | Display temperature of network switch in degree Celsius   |
| Settings    | Opens a popup window to configure the device.   |
| Load preset | Opens a dialog to store the device settings to a file.<br>Filetype: .rps  |
| Save preset | Opens a dialog to restore the device settings from a file.<br>Filetype: .rps  |

### Hyperlinks:

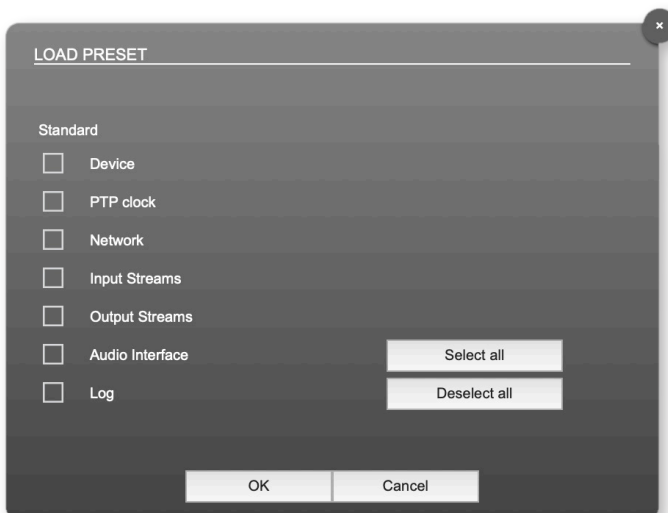
- [Settings \(p 20\)](#)
- [Load preset \(p 21\)](#)
- [Save preset](#)

## Settings



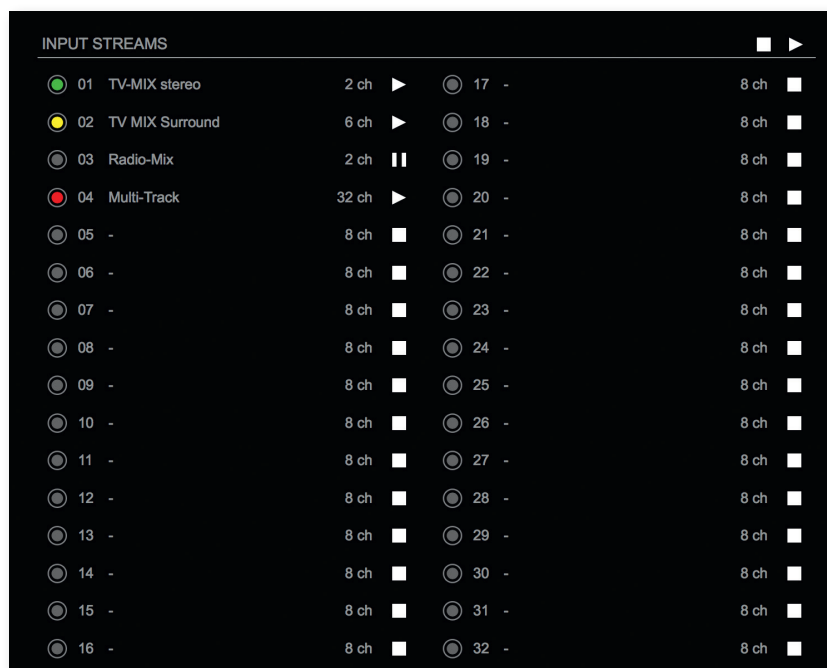
|                             |  |
|-----------------------------|--|
| AoIP Module SW              | Module's software version. It is updated together with hardware version via network.       |
| AoIP Module HW              | Module's bitstream version. It is updated together with software version via network.      |
| AoIP Module Update          | Opens a dialog for selection of the update file - see "RAV2 - Firmware Update" on page 53. |
| AoIP Module Reboot          | Restart of the AoIP module. Confirmation required. Audio transmission will be interrupted. |
| Language                    | Menu language (english, german).   |
| Manufacturer Settings Reset | Restore device settings to factory defaults. Confirmation required.                        |

## Load Preset



The device configuration can be stored to a single file (.rps). Restoring the configuration a dialog prompts for selection of individual settings. This enhances flexibility at setup changes when a particular adjustment shall be preserved or just a single adjustment shall be restored.

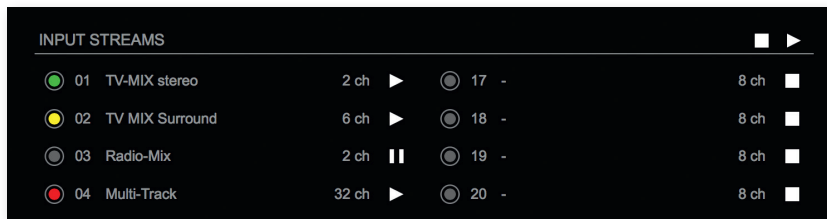
## Status - Input Streams



The module can subscribe up to 32 streams. The overview displays the basic information of each stream. The input stream name can be set manually (discovery protocol: manually, see page p 30) overriding the SDP's stream name information.

A backup stream can be defined as source after an adjustable timeout. A central active / inactive switch allows to toggle the stream state of all input streams at once.

|                   |  |
|-------------------|--|
| 01 to 32          | <b>State of incoming streams</b><br><input type="radio"/> (OFF) = stream not activated<br><input checked="" type="radio"/> (ON) = stream activated, receiving data<br><input checked="" type="radio"/> (ON) = stream activated, receiving data via one NIC only (input redundancy)<br><input checked="" type="radio"/> (blinking) = stream activated, not receiving data (unicast, connection not established) |
| 01 to 32<br>Name  | Name of stream gathered from SDP or set manually in the stream settings dialog.  |
| 01 to 32<br>xx ch | Number of audio channels transported by the stream   |



|                      |   |
|----------------------|---|
| 01 to 32<br>▶ ▶ ▶    | Click to activate or deactivate single stream.<br>▶ = stream activated<br>■ = stream deactivated<br>⏸ = stream not active, defined as backup-stream |
| INPUT STREAMS<br>■ ▶ | Click to activate or deactivate all streams.<br>▶ = activate all streams<br>■ = deactivate all streams (requires confirmation)                      |

## Backup Streams

### Example:

Backup stream (input 3) that will act as source in the audio matrix if the current session (input 1) fails. Switch-over occurs after the defined timeout (1s).

Stream 3 is marked accordingly in the status view

INPUT STREAMS

01

TV-MIX stereo

2 ch

02

TV MIX Surround

6 ch

03

Radio-Mix

2 ch

04

Multi-Track

32 ch

17

-

18

-

19

-

20

-

8 ch

8 ch

8 ch

8 ch

Input 1 failed and Input 3 becomes active after the timeout.



## NOTE

In case the main input fails the main stream is stopped (IGMP LEAVE) before the backup stream is being activated. This behaviour ensures that the required network bandwidth does not increase in case of a failure.





#### Hyperlinks:

- Name (p 26)

#### Mouse over:

- LED - indicating stream state

#### NOTE



Source-Specific Multicast (SSM) support for IGMP v3, v2 and v1 (SSM via protocol only in IGMP v3, SSM via internal filtering is applied for IGMP v2 and v1) - see "Source Specific Multicast" on page 30.

## Input Stream Settings

**01 - INPUT STREAM SETTINGS**

Activate Stream: ☐

Stream Input: NIC 2

Backup Stream: disabled

Backup Stream Timeout: 1s

Stream name: Stage A

Stream state: not connected

Stream state messages:

Stream state offset max (samples): 50

Stream state offset min (samples): 2

Stream state ip address src NIC 1: -

Stream state ip address src NIC 2: -

Offset fine: ☐

Offset in samples: 128 (2.67 ms)

Start channel: 1

Discovery protocol: RTSP (RAVENNA Session)

Session NIC 1:

Session NIC 2: Stage A@NIC 2

Up to 32 input streams can be subscribed. Each stream is organized in a 'RAVENNA session' (SDP = Session Description Protocol) that describes the stream parameters (audio channels, audio format, etc.).

The stream settings allow to adjust the processing of the received audio data (offset, signal routing). The receiving of stream data starts once the stream has been enabled.

The settings displayed vary depending on the selected discovery protocol.



## TIP

A sample offset of at least doubled packet time (samples per frame) is recommended

Example: Samples per frame = 16 (0.333 ms)    Offset  $\geq$  32 (0.667 ms)

It may be helpful to alter the stream discovery protocol if an expected stream can't be discovered by the device.

|                                   |   |
|-----------------------------------|---|
| Activate stream                   | Stores parameters and activates or deactivates the receiving of audio data. (Unicast: additionally the negotiation of the connection)                             |
| Stream input                      | Selects one or both NICs used for stream input. Both NICs means input redundancy.   |
| Backup Stream                     | Selects a backup stream that will act as source in the audio matrix if the current session fails. Switch-over occurs after the defined timeout.                   |
| Backup Stream Timeout             | Defines timeout [1 s to 120 s] before switch-over to backup stream.   |
| Stream name                       | Name of stream gathered from SDP  |
| Stream state                      | Information about stream state:<br>connected<br>not connected<br>receiving data<br>read successfull<br>error  |
| Stream state message              | Status info related to stream state.  |
| Stream state offset max           | Measured value (maximum). A high value indicates that the media offset of the source might not match the adjusted media offset of the device.                     |
| Stream state offset min           | Measured value (minimum). The offset should not become negative.  |
| Stream state ip address src NIC 1 | Multicast address of input stream subscribed at NIC 1. Unicast transmission: IP address of sender.  |
| Stream state ip address src NIC 2 | Multicast address of input stream subscribed at NIC 2. Unicast transmission: IP address of sender.  |
| Offset fine                       | Enables adjustment of offset in increments of one sample.   |
| Offset in samples                 | Modules output delay of received audio data (input buffer).   |
| Start channel                     | Assignment of first stream channel in the audio matrix. E.g. stream with two channels, starting at channel 3 is available at channel 3 & 4 of the routing matrix. |
| Discovery protocol                | Connection protocol or manual setup.<br>RTSP = Real Time Streaming Protocol<br>SAP = Session Announcement Protocol  |
| Session NIC 1                     | Selection of discovered streams at NIC 1  |
| Session NIC 2                     | Selection of discovered streams at NIC 2  |

Stream Discovery in AoIP environments is a colorful mixture of different mechanisms. To serve a successful stream management RAV2 provides a bunch of options, not making operation easier but effective.

#### Discovery RTSP (Session)

#### Discovery RTSP (URL)

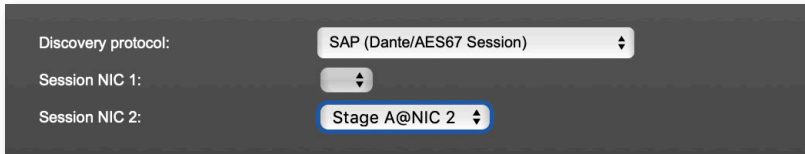
|             |  |
|-------------|--|
| URL         | URL (Uniform Ressource Locator) of the session of the device that is serving streams.<br>Examples:<br>rtsp://192.168.74.44/by-id/1<br>or<br>rtsp://PRODIGY-RAV-IO.local:80/by-name/Stage_A |
| Receive SDP | Recalls the stream configuration of the defined session(s).  |



#### NOTE

In case the automatic stream announcement and discovery of RAVENNA streams fails or cannot be used in a given network, the stream's SDP file can also be obtained via an RTSP URL.

## Discovery SAP



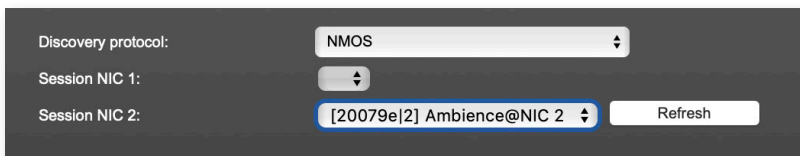
Discovery protocol: SAP (Dante/AES67 Session) ▾

Session NIC 1: ▾

Session NIC 2: Stage A@NIC 2 ▾

SAP is used in Dante environments.

## Discovery NMOS



Discovery protocol: NMOS ▾

Session NIC 1: ▾

Session NIC 2: [20079e|2] Ambience@NIC 2 ▾ Refresh

|         |  |
|---------|--|
| Session | [MAC Address of sender] stream name @NIC |
| Refresh | Initiates a scan for available streams.  |

NMOS is suited for use in SMPTE ST 2110 environments.

## Manual Setup

Discovery protocol: Manual configuration

Stream name (manual): Stage A

Number of channels: 8

RTP payload ID: 98

Audio format: L24

Media offset: 0

**NIC 1**

Dst IP address: 239.1.0.1

SSM (Source Specific Multicast): ☐

Src IP address: 0.0.0.0

RTP dst port: 5004

RTCP dst port: 5005

**NIC 2**

Dst IP address: 239.69.1.1

SSM (Source Specific Multicast): ☐

Src IP address: 192.168.7.4

RTP dst port: 5004

RTCP dst port: 5005

|                      |  |
|----------------------|--|
| Stream name (manual) | Stream name for display in status view and matrix. Can be specified individually, different than the name gathered from the SDP. |
| Number of channels   | Number of audio channels in the stream   |
| RTP-Payload-ID       | RTP-Payload-ID of the audio stream (Real-Time Transport Protocol). Describes the format of the transported content.              |
| Audio Format         | Stream's audio format (L16 / L24 / L32 / AM824)  |
| Media Offset         | Offset between stream's timestamp and PTP-clock  |
| Dst IP address       | Multicast IP address of audio stream   |
| SSM                  | Activate Source Specific Multicast filter for this stream.*  |
| Src IP address       | IP address of sending device.*   |
| RTP dst port         | Stream's destination port for RTP  |
| RTCP dst port        | Stream's destination port for RTCP (Real-Time Control Protocol)  |

\* An RTP packet contains the IP address of the sender (source IP) and the stream's multicast address (destination IP). With SSM activated the receiver only accepts RTP packets of a certain destination IP that are originated by a sender with the specified source IP.

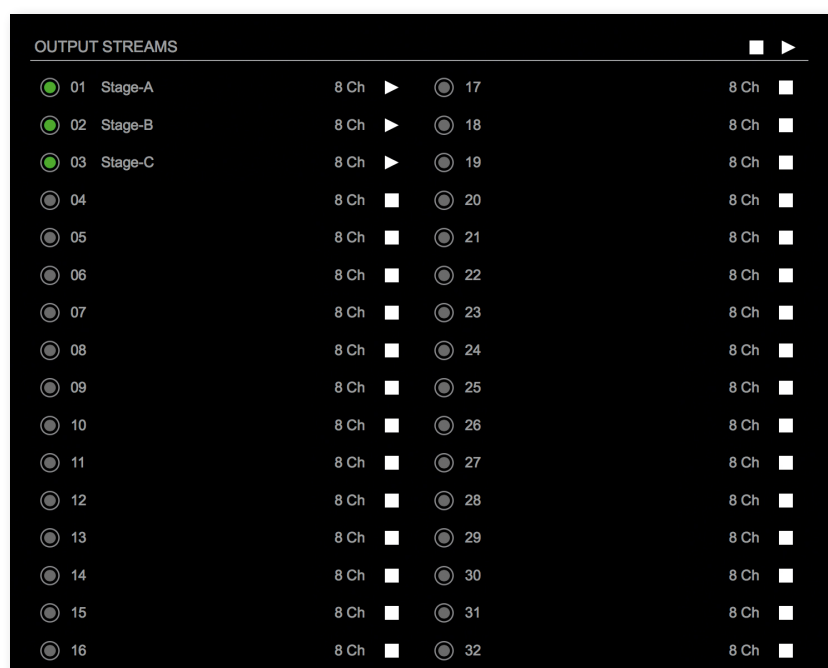


## NOTE

RTP Payload ID must match between sender and receiver.

This page is left blank intentionally.

## Status - Output Streams



The device can send up to 32 streams. The overview displays the basic information of each stream.

|                       |  |
|-----------------------|--|
| 01 to 32              | State of outgoing streams<br><input type="radio"/> (OFF) = stream not activated<br><input checked="" type="radio"/> (ON) = stream activated, sending data<br><input checked="" type="radio"/> (ON) = stream activated, stream output via both NICs selected, but one NIC is not linked to the network. |
| 01 to 32<br>Name      | Name of stream defined in the settings   |
| 01 to 32<br>xx ch     | Number of audio channels transported by the stream   |
| 01 to 32<br>■ ▶       | Activate or deactivate stream.<br>▶ = stream activated<br>■ = stream deactivated   |
| OUTPUT STREAMS<br>■ ▶ | Click to activate or deactivate all streams.<br>▶ = activate all streams<br>■ = deactivate all streams (requires confirmation)   |

Hyperlinks:

- Name (p 34)

Mouse over:

- LED - indicating stream state



## TIP

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### AES67 Streams

To create output streams for interoperability in AES67 environments please consult the information document of our partner DirectOut: [Info - AES67 Streams](#).

## TIP

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### SMPTE 2110-30 / -31 Streams

To create output streams for interoperability in SMPTE ST 2110 environments please consult the information document of our partner DirectOut: [Info - ST2110-30 Streams](#).

Both documents are available at our partner DirectOut: <http://academy.directout.eu>.

## Output Stream Settings

02 - OUTPUT STREAM SETTINGS

Activate Stream:

☐

Stream Output:

NIC 2

Stream name (ASCII):

Ambience

RTSP URL (HTTP tunnel) (by-name):

rtsp://PRODIGY-RAV-IO-20079e.local:80/by-name/Ambience

RTSP URL (HTTP tunnel) (by-id):

rtsp://PRODIGY-RAV-IO-20079e.local:80/by-id/2

RTSP URL (by-name):

rtsp://PRODIGY-RAV-IO-20079e.local/by-name/Ambience

RTSP URL (by-id):

rtsp://PRODIGY-RAV-IO-20079e.local/by-id/2

SDP:

v=0  
o=- 2 2482002937 IN IP4 192.168.74.44  
s=Ambience  
t=0 0  
m=audio 5004 RTP/AVP 98

Unicast:

☐

RTP payload ID:

98

Samples per Frame (packet time):

45 (0.94 ms)

Audio format:

AM824

Start channel:

9

Number of channels:

8

NIC 1

RTP dst port:

5004

RTCP dst port:

5005

Dst IP address (IPv4):

239.69.1.3

NIC 2

RTP dst port:

5004

RTCP dst port:

5005

Dst IP address (IPv4):

239.69.1.4

Up to 32 output streams can be sent to the network. Each stream is organized in a session (SDP = Session Description Protocol) that describes the stream parameters (audio channels, audio format, etc.).

Each stream may be labelled with an individual stream name (ASCII) which is useful for enhanced comfort at organizing the setup.

The stream settings allow to adjust the processing of the sent audio data (blocks per frame, format, signal routing, ...). The sending of stream data starts once the stream has been enabled.

Once the stream is active, the SDP data is displayed and may be copied from the window or downloaded via <http://<rav-io>/sdp.html?ID=<stream no.>>.

|  |   |
|--|---|
| Activate stream                            | Stores parameters and activates or deactivates the receiving of audio data. (Unicast: additionally the negotiation of the connection)                               |
| Stream Output                              | Selects one or both NICs used for stream output. Both NICs means output redundancy.   |
| Stream name (ASCII)                        | Individually defined name of an output stream. It is used in the URL which is indicated in different ways below.*   |
| RTSP URL (HTTP tunnel) (by-name) / (by id) | Current used RTSP -URL of stream with HTTP port used for RTSP, stream name or stream id.  |
| RTSP URL (by-name) / (by id)               | Current used RTSP -URL of stream with stream name or stream id.   |
| SDP  | SDP data of the active stream.  |
| Unicast                                    | If activated, the stream is sent in unicast mode.**   |
| RTP payload ID                             | Stream's payload id   |
| Samples per Frame                          | Number of blocks containing payload (audio) per ethernet frame - see packet time on p 26.   |
| Audio format                               | Stream's audio format (L16 / L24 / L32 / AM824) ***   |
| Start channel                              | Assignment of first stream channel from the audio matrix. E.g. stream with eight channels, starting at channel 3 is fed from channel 3 to 10 of the routing matrix. |
| Number of channels                         | Number of audio channels in the stream.   |
| RTP dst port                               | Stream's destination port for RTP   |
| RTCP dst port                              | Stream's destination port for RTCP (Real-Time Control Protocol)   |
| Dst IP address (IPv4)                      | Stream's IP address for multicast (should be unique for each stream).   |

\* Only ASCII characters are allowed.

\*\* A unicast stream can only be received by one device. If a device is already receiving the stream, further connection calls by other clients are answered with 'service unavailable' (503). The release time after disconnect or interruption of the client's connection amounts to about 2 minutes.

\*\*\* L16 = 16 bit audio / L24 = 24 bit audio / L32 = 32 bit audio /  
AM824 = standardized according to IEC 61883, allows AES3 transparent transmission (SMPTE ST 2110-31).

## Advanced - Overview

STATUS

ADVANCED

NMOS

LOGGING

ABOUT

STATISTIC

SWITCH

PTP SETTINGS

PTP Input:

NIC 2

IP mode:

Multicast

Mode:

auto

Profile:

media E2E

PTP CURRENT SETTINGS

Clock class:

248

Accuracy:

254

Clock domain NIC 1:

0

Clock domain NIC 2:

1

Priority 1:

128

Priority 2:

128

Announce:

2 s (1)

Sync:

125 ms (-3)

Min delay request:

1 s (0)

Min pdelay request:

1 s (0)

Announce receipt timeout:

3

One step clock:

no

Slave only:

no

Delay mechanism:

E2E

PTP UNICAST

Auto Detect GM:

on

Grant duration (sec):

30

Grandmaster IP:

0.0.0.0

CURRENT PTP MASTER

Clock class:

248

Accuracy:

254

Clock domain:

1

Priority 1:

64

Priority 2:

64

GMID:

A0-BB-3E-FF-FE-20-0B-86

Sync:

NIC 2

IPv4:

192.168.74.58

PTP STATISTIC

PTP state:

slave

PTP jitter:

0.46 us

PTP offset:

-0.08 us

PTP master to slave:

0s 4148ns

PTP slave to master:

0s 4240ns

Current PTP time (TAI):

1970-01-01 00:30:39

Current PTP time (TAI) (RAW):

1839s 254134455ns

PTP CLOCK SETTINGS

No PTP switch 1 Gbit/s:

0

No PTP switch 100 Mbit/s:

0

NETWORK ADVANCED SETTINGS

IGMP NIC 1:

auto

IGMP NIC 2:

auto

TCP port HTTP:

80

TCP port RTSP:

554

TTL RTP packets:

128

DSCP RTP packets:

AF41 (0x22)

DSCP PTP packets:

CS6 (0x30)

Multi stream rx:

yes

MDNS announcement:

RX/TX

SAP announcement:

RX/TX

Network settings:

Apply

PTP JITTER

The tab 'ADVANCED' is divided into several sections:

- PTP SETTINGS - definition of PTP source, mode and profile
- PTP PROFILE CURRENT SETTINGS - definition of a customized PTP profile
- CURRENT PTP MASTER - monitoring PTP characteristics
- PTP STATISTIC - monitoring device's PTP state, jitter and delay
- PTP CLOCK SETTINGS - definition of adaption algorithms to reduce jitter
- NETWORK ADVANCED SETTINGS - definition of network and QoS characteristics
- PTP JITTER - graphical display of measured PTP jitter

## Advanced - PTP Settings



PTP SETTINGS

PTP Input: NIC 2

IP mode: Multicast

Mode: auto

Profile: media E2E

|           |  |   |   |
|-----------|--|---|---|
| PTP Input | Selects one or both network ports used for PTP input. Both ports means input redundancy. * |   |   |
| IP Mode   | Multicast  | = | Sync messages and delay request are sent as multicast message to every node within the network.                                   |
|           | Hybrid   | = | Sync messages are sent as multicast, delay requests are sent as unicast messages directly to the Grandmaster or Boundary Clock.** |
|           | Unicast  | = | Sync messages are sent as unicast, delay requests are sent as unicast messages directly to the Grandmaster or Boundary Clock.***  |

\* Using redundant PTP-operation a switch-over is triggered not only at signal loss of the Grandmaster but depends on the quality of the PTP clock. Changes (e.g. clock class) are observed permanently and the algorithm decides for the best signal present.

\*\* Hybrid Mode reduces the workload for all nodes in the network as they do not receive the (unnecessary) delay requests from other devices anymore.

\*\*\* Unicast Mode may help when multicast routing is not possible within the network. As an opposite to the Hybrid Mode it increases the workload of the grandmaster since sync messages must be sent to each single slave individually.

PTP SETTINGS

PTP Input: NIC 2

IP mode: Multicast

Mode: auto

Profile: media E2E

|         |  |   |
|---------|--|---|
| Mode    | auto   | = PTP-clock master / slave configuration is auto negotiated between devices in the network. Module's master / slave state may change automatically.           |
|         | slave only   | = PTP-clock slave configuration is preferred. Module clocks to another device in the network  |
|         | preferred master   | = PTP-clock master configuration is preferred. Module acts as network grandmaster. Priority values are adjusted automatically to ensure Grandmaster status. * |
|         | master only  | = PTP-clock master is forced. **  |
| Profile | Selects predefined PTP profile (default E2E, default P2P, media E2E, media P2P) or activates customized PTP profile. |   |

\* If more than one device announces as PTP-clock master the network Grandmaster is determined following the Best Master Clock Algorithm (BMCA).

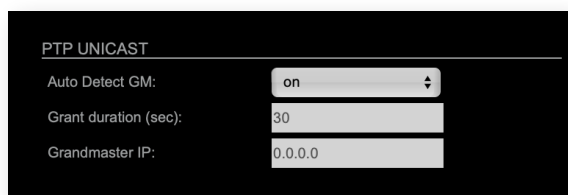
\*\* 'Master only' configures the device to act as Unicast Grandmaster. This setting is available only with PTP Mode set to 'unicast'



## NOTE

PTP profile, 'customized' allows for individual adjustment of the PTP parameters. If profile is set to, 'media' or, 'default' the PTP parameters cannot be altered and are displayed only. Factory default setting is PTP Media Profile E2E.

## Advanced - PTP Unicast



PTP UNICAST

Auto Detect GM: on

Grant duration (sec): 30

Grandmaster IP: 0.0.0.0

|                      |   |
|----------------------|---|
| Auto Detect GM       | on = enables the automatic detection of the grandmaster *<br>off = IP address of grandmaster needs to be defined manually |
| Grant duration (sec) | Time period during which the slave receives sync messages from the grandmaster.**   |
| Grandmaster IP       | IP address of the grandmaster. ***  |

\* 'Auto Detect GM' is a proprietary function and might not be supported by 3rd party GMs.

\*\* Depending on the temporary workload of the grandmaster the negotiation may fail.

\*\*\* This value is used only with 'Auto Detect GM' set to <off>.

### About PTP Unicast

Since the BMCA is not available with PTP unicast, the PTP properties of the devices require some extra configuration.

Example:

|             |   |
|-------------|---|
| Grandmaster | IP Mode Unicast, Mode Master only   |
| Slave(s)    | IP Mode Unicast, Mode Slave Only,<br>Auto Detect GM ON, Grant Duration 30 sec |

## Advanced - PTP Profile Customized Settings

| PTP CURRENT SETTINGS      |             |
|---------------------------|-------------|
| Clock class:              | 248         |
| Accuracy:                 | 254         |
| Clock domain NIC 1:       | 0           |
| Clock domain NIC 2:       | 1           |
| Priority 1:               | 128         |
| Priority 2:               | 128         |
| Announce:                 | 2 s (1)     |
| Sync:                     | 125 ms (-3) |
| Min delay request:        | 1 s (0)     |
| Min pdelay request:       | 1 s (0)     |
| Announce receipt timeout: | 3           |
| One step clock:           | no          |
| Slave only:               | no          |
| Delay mechanism:          | E2E         |

The settings become available with PTP profile set to 'customized'.

|                          |   |
|--------------------------|---|
| Clock class              | PTP-clock's class according to IEEE 1588 [read only]  |
| Accuracy                 | PTP-clock's accuracy according to IEEE 1588 [read only]   |
| Clock domain NIC 1       | PTP-clock's domain at NIC 1   |
| Clock domain NIC 2       | PTP-clock's domain at NIC 2   |
| Priority 1               | Priority setting for master announcement (the smaller the value the higher the priority)  |
| Priority 2               | If value 'Priority1' (and other PTP-clock parameters) of more than one device in the network match:<br>Priority setting for master announcement (the smaller the value the higher the priority) |
| Announce                 | Intervall of sending announce-packets for auto-negotiation.   |
| Sync                     | Intervall of sending sync-packets to the PTP-clock slaves in the network.   |
| Min delay request        | Intervall of sending End-To-End packets of PTP-clock slave to PTP-clock master. To determine the offset slave-to-master.  |
| Min pdelay request       | Intervall of sending Peer-To-Peer packets between two PTP-clocks. To determine the offset master-to-slave and slave-to-master.  |
| Announce receipt timeout | Number of missed announce-packets (threshold) to reinitialize the negotiation of PTP-clock master.  |



|                 |  |
|-----------------|--|
| One step clock  | Timestamp of PTP-clock is integrated in PTP-sync-packets. No follow-up packets are sent.<br>No = Two step clock is used                                      |
| Slave only      | Yes = PTP-clock is always slave.   |
| Delay mechanism | E2E - Offset slave-to-master is determined by End-To-End packets.<br>P2P - Offset master-to-slave and slave-to-master is determined by Peer-To-Peer packets. |

### Advanced - Current PTP Master

| CURRENT PTP MASTER |                         |
|--------------------|-------------------------|
| Clock class:       | 248                     |
| Accuracy:          | 254                     |
| Clock domain:      | 1                       |
| Priority 1:        | 64                      |
| Priority 2:        | 64                      |
| GMID:              | A0-BB-3E-FF-FE-20-0B-86 |
| Sync:              | NIC 2                   |
| IPv4:              | 192.168.74.58           |

Monitoring display only.

|              |   |
|--------------|---|
| Clock class  | PTP-clock's class according to IEEE 1588  |
| Accuracy     | PTP-clock's accuracy according to IEEE 1588   |
| Clock domain | PTP-clock's domain at selected NIC  |
| Priority 1   | Priority setting for master announcement (the smaller the value the higher the priority)  |
| Priority 2   | If value 'Priority1' (and other PTP-clock parameters) of more than one device in the network match:<br>Priority setting for master announcement (the smaller the value the higher the priority) |
| GMID         | ID of current Grandmaster   |
| Sync         | Selected NIC for PTP clock  |
| IPv4         | IP address of Grandmaster   |

## Advanced - PTP Statistic

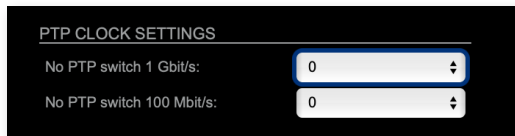
| PTP STATISTIC                 |                     |
|-------------------------------|---------------------|
| PTP state:                    | slave               |
| PTP jitter:                   | 0.46 us             |
| PTP offset:                   | -0.08 us            |
| PTP master to slave:          | 0s 4148ns           |
| PTP slave to master:          | 0s 4240ns           |
| Current PTP time (TAI):       | 1970-01-01 00:30:39 |
| Current PTP time (TAI) (RAW): | 1839s 254134455ns   |

Monitoring display only.

|                               |  |
|-------------------------------|--|
| PTP state                     | Information about current PTP-clock state:<br>initialize<br>error<br>deactivated<br>receiving data<br>pre master<br>master<br>passive<br>not calibrated<br>slave |
| PTP jitter                    | PTP-clock jitter in microseconds (µs)  |
| PTP offset                    | Offset relative to PTP-clock master  |
| PTP master to slave           | Absolute offset master-to-slave in nanoseconds   |
| PTP slave to master           | Absolute offset slave-to-master in nanoseconds   |
| Current PTP time (TAI):       | Date and time information from GPS source*   |
| Current PTP time (TAI) (RAW): | RAW TAI from GPS source*   |

\* Temps Atomique International - if no GPS source is available for PTP time-stamping, the date / time display starts at 1970-01-01 / 00:00:00 after every reboot of the device.

## Advanced - PTP Clock Setting



PTP CLOCK SETTINGS

No PTP switch 1 Gbit/s: 0

No PTP switch 100 Mbit/s: 0

|                             |  |
|-----------------------------|--|
| No PTP Switch<br>1 Gbit/s   | Adapted PTP-clock algorithm to reduce clock jitter using<br>1 GB network switches without PTP support.<br>Max. number of 1 Gbit/s switches: less than 10 |
| No PTP Switch<br>100 Mbit/s | Adapted PTP-clock algorithm to reduce clock jitter using<br>100 MB network switches without PTP support.<br>Max. number of 100 Mbit/s switches: 1        |

## Advanced - Network Advanced Settings

| NETWORK ADVANCED SETTINGS |             |
|---------------------------|-------------|
| IGMP NIC 1:               | auto        |
| IGMP NIC 2:               | auto        |
| TCP port HTTP:            | 80          |
| TCP port RTSP:            | 554         |
| TTL RTP packets:          | 128         |
| DSCP RTP packets:         | AF41 (0x22) |
| DSCP PTP packets:         | CS6 (0x30)  |
| Multi stream rx:          | yes         |
| MDNS announcement:        | RX/TX       |
| SAP announcement:         | RX/TX       |
| Network settings:         | Apply       |

|                        |  |
|------------------------|--|
| IGMP NIC 1             | Definition or auto-select of IGMP version used to connect to a multicast router at NIC 1.                                      |
| IGMP NIC 2             | Definition or auto-select of IGMP version used to connect to a multicast router at NIC 2                                       |
| TCP port HTTP          | TCP port for HTTP  |
| TCP port RTSP          | TCP port for RTSP  |
| TTL RTP packets        | Time-To-Live of RTP packets - default: 128   |
| DSCP RTP packets       | DSCP marking of QoS of RTP packets - default: AF41   |
| DSCP PTP packets       | DSCP marking for QoS of PTP packets - default: CS6*  |
| Multi stream rx        | If activated, the device allows to subscribe to the same multicast stream more than one time - default: off                    |
| MDNS announcement      | Announcement of streams via MDNS can be controlled to optimize network traffic or CPU load.<br>Values: Off, RX, TX or RX/TX ** |
| SAP announcement       | Announcement of streams via SAP can be controlled to optimize network traffic or CPU load.<br>Values: Off, RX , TX or RX/TX ** |
| Network settings Apply | Confirms and saves changes being made.<br>Reboot required.   |

\* AES67 specifies EF, but some implementations use EF for Audio streaming. To avoid overlapping of RTP and PTP packets in the same queue CS6 has been chosen as default.

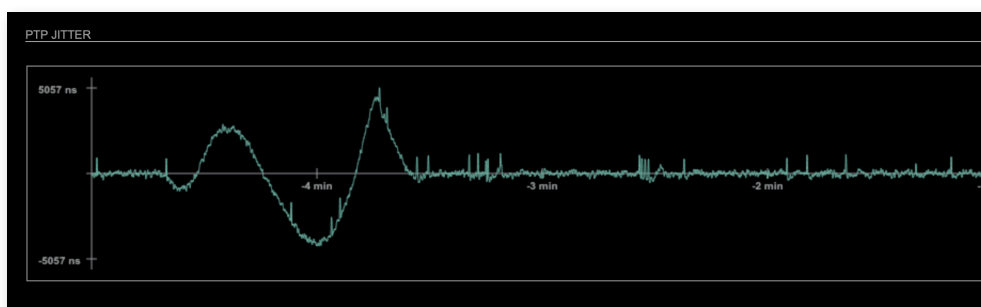
\*\* RX = receive, TX = transmit, RX/TX = receive and transmit

## NOTE



Source-Specific Multicast (SSM) support for IGMP v3, v2 and v1 (SSM via protocol only in IGMP v3, SSM via internal filtering is applied for IGMP v2 and v1) - see "Source Specific Multicast" on page 30.

## Advanced - PTP Jitter



Graphical display of measured PTP jitter.

## NOTE



An error message next to Jitter measurement is displayed if delay requests are not being answered by Grandmaster.

## NMOS - Overview

The screenshot displays the NMOS configuration page within a software interface. At the top, there is a navigation bar with tabs: STATUS, ADVANCED, NMOS (selected), LOGGING, ABOUT, STATISTIC, and SWITCH. The main content area is divided into three sections:

- NIC1:**
  - NMOS port: 3210
  - Search mode NMOS registry: Multicast (checked)
  - Unicast: (unchecked)
  - Registry domain name: (empty)
  - Manually: (unchecked)
  - Registry IP address: 0.0.0.0
  - Registry port: 3210
  - Version: v1.3
- NIC2:**
  - NMOS port: 3212
  - Search mode NMOS registry: Multicast (checked)
  - Unicast: (unchecked)
  - Registry domain name: (empty)
  - Manually: (unchecked)
  - Registry IP address: 0.0.0.0
  - Registry port: 3210
  - Version: v1.3
- ADDITIONAL SETTINGS:**
  - Disable stream during config: (unchecked)
  - Seed id: d8368e8b-5b74-4508-a007-652dac4f7790
  - Generate new seed id: (button labeled 'Generate')
  - Settings (NIC1 + NIC2): (button labeled 'Apply')
  - Manufacturer Settings NMOS Ports: (button labeled 'Reset')

NMOS provides a family of specifications related to networked media for professional applications. It is produced by the Advanced Media Workflow Association (AMWA).

Support for NMOS is introduced with the AoIP Module version SW 0.17 / HW 0.46 according to the specifications:

- IS-04 Discovery & Registration
- IS-05 Device Connection Management

IS-04 allows control and monitoring applications to find the resources on a network. Resources include Nodes, Devices, Senders, Receivers, Sources, Flows...

IS-05 provides a transport-independent way of connecting Media Nodes.

More information: <https://specs.amwa.tv/nmos/>

## NMOS port - NIC1 & NIC2

The port entries for NIC1 and NIC2 are pre-configured by default.  
Modifications are possible but not necessary.

| NIC1   | NIC2   |
|--|--|
| NMOS port: <input type="text" value="3210"/> | NMOS port: <input type="text" value="3212"/> |

|                            |   |
|----------------------------|---|
| NMOS port<br>(NIC1 + NIC2) | Port address. Reboot required after modification. |
|----------------------------|---|

## Search mode NMOS registry

| Search mode NMOS registry: |                                      | Search mode NMOS registry: |                                      |
|----------------------------|--------------------------------------|----------------------------|--------------------------------------|
| Multicast:                 | <input type="checkbox"/>             | Multicast:                 | <input type="checkbox"/>             |
| Unicast:                   | <input type="checkbox"/>             | Unicast:                   | <input type="checkbox"/>             |
| Registry domain name:      | <input type="text"/>                 | Registry domain name:      | <input type="text"/>                 |
| Manually:                  | <input type="checkbox"/>             | Manually:                  | <input type="checkbox"/>             |
| Registry IP address:       | <input type="text" value="0.0.0.0"/> | Registry IP address:       | <input type="text" value="0.0.0.0"/> |
| Registry port:             | <input type="text" value="3210"/>    | Registry port:             | <input type="text" value="3210"/>    |
| Version:                   | <input type="text" value="v1.3"/>    | Version:                   | <input type="text" value="v1.3"/>    |

|                      |  |
|----------------------|--|
| Multicast            | use mDNS to determine and connect to the registry server |
| Unicast              | use DNS-SD to connect to the registry server             |
| Registry domain name | DNS resolvable domain name of the registry server        |
| Manually             |  |
| Registry IP address  |  |
| Registry port        |  |
| Version              | Support of NMOS API version                              |

## NMOS - Additional Settings



ADDITIONAL SETTINGS

Disable stream during config: ☐

Seed id: d6368ef8-5b74-4508-ad07-652dac4f7796

Generate new seed id:

|                                  |  |
|----------------------------------|--|
| Disable stream during config     | Automatically disable and re-enable streams when settings are changed via NMOS (recommended) |
| Seed id                          | Unique identifier, subordered entities are derived from the seed id.                         |
| Generate new seed id<br>Generate | Generates a new unique identifier. Reboot required.  |

NMOS uses a logical data model based on the JT-NM Reference Architecture to add identity, relationships and time-based information to content and broadcast equipment. Hierarchical relationships group related entities, with each entity having its own identifier.

The identifiers are persisted across restarts of the device in order to make them useful over a period of time longer than a single production deployment.

New identifiers may be generated manually if required.



This page is left blank intentionally.

## Logging



The tab 'LOGGING' displays logging depending on the 'Log Settings'. The logging can be enabled individually for different protocols, each of with an adjustable filter. An adjustable log level specifies the information detail of each entry.

To save a log the content of the view can be copied and pasted to a text document.

### Log Level

|   |  |
|---|--|
| 0 | log data   |
| 1 | level and log data   |
| 2 | protocol, level and log data   |
| 3 | protocol, process-id of requesting process, process-id of running process, level and log data  |
| 4 | protocol, process-id of requesting process, process-id of running process, level, processor time in ticks and log data                     |
| 5 | protocol, process-id of requesting process, process-id of running process, level, processor time in ticks, file name and line and log data |

## Protocol Types

|          |                                     |
|----------|-------------------------------------|
| ARP      | Address Resolution Protocol         |
| BASE     | Basic operation of module           |
| DHCP     | Dynamic Host Configuration Protocol |
| DNS      | Domain Name System                  |
| FLASH    | Process for updating the module     |
| IGMP     | Internet Group Management Protocol  |
| MDNS     | Multicast Domain Name System        |
| NMOS     | Network Media Open Specification    |
| PTP      | Precision Time Protocol             |
| RS232    | Serial Protocol                     |
| RTCP     | Real Time Control Protocol          |
| SAP      | Session Announcement Protocol       |
| TCP      | Transmission Control Protocol       |
| Zeroconf | Zero Configuration Protocol         |

## Log Filter

|         |   |
|---------|---|
| NONE    | logging disabled  |
| ERROR   | error occurred  |
| WARNING | warnings - condition that may lead to unwanted behavior or an error |
| INFO 1  | log info* + warning + error   |
| INFO 2  | log info* + warning + error   |
| INFO 3  | log info* + warning + error   |
| INFO 4  | log info* + warning + error   |

\* increasing amount of log info starting from 'INFO 1'

## Log Operation

|             |   |
|-------------|---|
| Save log    | Downloads the current log entries to a text-file (log.txt).   |
| Clear log   | Deletes all log entries without further prompt.   |
| Scroll lock | Interrupts automatic scrolling of the list view to allow copying the content to a text file via copy & paste. If scrolling is stopped for a longer period of time the display may not list all entries. |

## Statistic



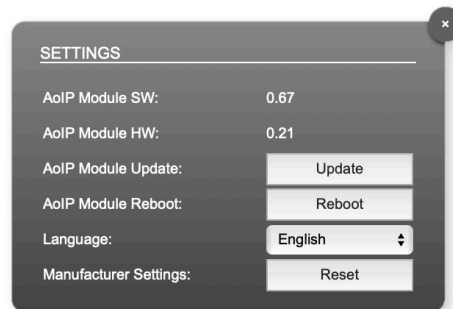
The tab 'STATISTIC' displays an overview of the CPU load of the particular processes, an error counter and a monitor display to indicate the incoming (RX) and outgoing (TX) network traffic on both network ports individually.

See "Protocol Types" on page 51.

## RAV2 - Firmware Update

The RAV2 module is updated via network.

Open the control page of the module and navigate to the tab STATUS and click SETTINGS in the top right corner (p 20).



Click 'Update' and browse to the update file after unzipping first.

Example: rav\_io\_hw\_0\_21\_sw\_0\_62.update

Follow the instructions displayed.



---

### WARNING!

It is strongly recommended to backup the device configuration (Save Preset) before running any update.

## Service Information

### 1. Software and firmware updates

Download software updates from our website. No registration required.

<http://www.avt-nbg.de>

Navigate to      Downloads > Software.

### 2. Support

Our support is available on working days:

Monday to Friday from 09:00 - 16:30 CET.

Support portal:            <https://avt-nbg.zammad.com>

Email:                      [support@avt-nbg.de](mailto:support@avt-nbg.de)

Phone number:            +49 911 5271-110



To deal with your problem efficiently please note down the factory number of the unit as well as the software version that you use.

The factory number is visible in the software under Administration > Registration.

If you bought the system via your local dealer, please contact them first.

### 3. Repairs

If your unit is defective, please contact us before sending in the device.

To send in the system please fill in the included Service Request and send the unit to the following address:

AVT Audio Video Technologies GmbH

- Repairs -

Nordostpark 91

90411 NÜRNBERG

GERMANY

#### 4. WEEE (Directive on Waste Electrical and Electronic Equipment)

Due to Directive 2012/19/EU on waste disposal, this device must be recycled. All electrical and electronic equipment must be disposed of separately from general household waste via approved collection points or disposal companies. The proper disposal and separate collection of old electrical and electronic equipment serves to prevent possible damage to the environment and health. The device contains valuable raw materials that can be recycled.



For proper recycling, send the device to us:

AVT Audio Video Technologies GmbH  
- Recycling -  
Nordostpark 91  
90411 NÜRNBERG  
GERMANY

WEEE Reg. No. DE83099164

Only prepaid parcels will be accepted!

These instructions only apply to appliances installed and sold in countries of the European Union. In countries outside the European Union, other regulations may apply to the disposal of electrical and electronic equipment. Always recycle packaging material and electrical appliances or their components through authorised collection points or disposal companies.





# CE - Konformitätserklärung

## CE - Declaration of Conformity

Das Erzeugnis entspricht den grundlegenden Anforderungen der zutreffenden EG-Richtlinien. Ein in den Richtlinien vorgesehenes Konformitätsbewertungsverfahren wurde durchgeführt.

The product conforms to the basic requirements of the relevant EC directives. A conformity assessment method as provided for in the directives has been performed.

**Hersteller:**  
**Manufacturer:**

DirectOut GmbH  
Leipziger Str. 32  
09648 Mittweida  
Germany

**Gerätebezeichnung:**  
**Device designation:**

**RAV2**

Zum Nachweis entsprechend  
For verification in accordance with

**RL2014/30/EU**  
**RL2011/65/EU**  
**RL2015/863EU**

wurden folgende harmonisierte Normen herangezogen:  
the following standards were applied:

**EN 62368-1:2021**  
**EN 50581:2012 (RoHS)**

Die oben genannte Firma hält die folgende technische Dokumentation zur Einsicht bereit:

- Bedienungsanleitung
- Konstruktionspläne
- Prüfunterlagen
- sonstige technische Dokumentation

The company mentioned above keeps the following technical documentation ready for inspection:

- operating instructions
- design diagrams
- test documents
- other technical documentation

Diese Erklärung wird verantwortlich für den Hersteller abgegeben durch  
This declaration is given for the manufacturer by

Claudio Becker-Foss, CEO/CTO DirectOut GmbH  
Mittweida, 31.07.2022

 **DirectOut**  
TECHNOLOGIES

|                   |                      |
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