D*AP8 MAP Edition

Monitoring Audio Processor

Manual

Status: OK
D*AP 8 studio C1, 03
IP: 10.110.78.123

Hardware features

• **D*AP8 unit**	1RU / 19" generic compact 8 channel processing unit
• **X*AP RM1**	**optional** 1RU detachable remote panel
• **Dolby decoder**	**optional** built in Dolby D/D+/E decoder incl. metadata emulation
• **Dolby encoder**	**optional** built in Dolby D/D+/AAC/HE-AAC **or** Dolby E encoder
• **Dolby metadata I/O**	two 9-pin D-Sub connectors (RS485)
• **4x AES (BNC) I/O + SRC**	on board AES I/Os with relay bypass and (selectable) SRC per input
• **Two interface slots**	expansion slots for optional I/O boards: 3-G/HD/SD-SDI, MADI, DANTE, 4x AES I/O, 4Ch Analog I/O, 8Ch Analog (speaker) Out
• **RJ45 network connector**	100BaseT full duplex Ethernet interface
• **USB connector**	built in USB < > serial adapter to access the service port
• **8x GPI/O**	balanced inputs and relay contacts on a 25pin Sub-D
• **Aux power supply**	isolated 5V supply for external GPI/O wiring
• **External sync IN**	BNC input (Word Clock, AES, Black Burst, Tri-Level)
• **Sync OUT**	BNC Word Clock output

Software features

• **TP limiter**	Junger Audio true peak limiter control algorithm for speaker protection
• **Speaker alignment**	delay, level and frequency response compensation, speaker identification
• **Bas management**	for subwoofer and satellite speaker installations
• **Solo- / In Place / Defeat**	individual speaker control
• **Mute / DIM**	mutes / dims all speaker channels
• **Delay, gain, polarity**	for input signal correction
• **Downmix**	separate downmix circuits for program and AUX feed
• **Dolby metadata generator**	generates RDD6 compliant metadata
• **Dolby metadata emulation**	shows the effect of metadata for decoded Dolby (E, D, D-D plus) or PCM signals
• **Loudness measurement**	ITUBS.1770-1/ -2/ -3, EBU R128
• **Loudness / level display**	X*AP RM1 display, J*AM Junger Application Manager
• **SNMP agent**	SNMP v1 get (no set) and configurable traps (see MAP-MIB)
• **Remote control**	**X*AP RM1** remote panel, l-s-b EmBER+ protocol and legacy GPI/Os

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Introduction

The **MAP** is a monitoring processor, assembled from the generic digital audio processor **D*AP8** that runs the **MAP firmware** and an optional **X*AP RM1** remote panel. The bundle is designed to ease the quality monitoring of surround and stereo signals for producers, editorial staff and engineers especially when it comes to **Dolby** encoded signals.

For level and loudness measurement and logging applications the **D*AP8 unit** may be used as a measurement box that sits close to the signal sources while measurement data will be streamed over the network to a PC for live display and/or storing of such data.

A sophisticated audio processor at the heart of the **MAP** works. It renders the monitoring facility, audio delays, speaker bass management as well as level and loudness measurements.

A **Dolby metadata generator** is provided for emulation of the influence of metadata on PCM audio signals directly from the monitoring section of a mixing console. For live and post production it allows you to hear how the metadata will influence the listening experience on the customers side without introduction of an encoder / decoder. The emulation part incorporates a **Dolby** stream decoder. An optional **Dolby** consumer format or a Dolby-E encoder can be added to the device.

The four AES3id I/Os on the motherboard may be complemented by a variety of interface modules that can be installed as an option into the **D*AP8** interface slots. For the **MAP** standalone application normally one slot will be fitted with the 8 channel analog speaker interface card.

Comprehensive routing set-ups allow almost every signal flow from hardware inputs, from and to optional **Dolby** decoder / encoder, from the audio processor itself to the speakers, to hardware outputs as well as the metadata I/Os, the metadata generator and the metadata emulator.

Routing paths, the enabling and disabling of audio processing blocks and the setting of processing parameters can be pre-configured by individual **presets** dedicated to each function block. The content of the **presets** can be displayed and edited off-line while the device is in use. These **presets** may either be recalled on demand by the operator via the GUI, the **X*AP RM1** remote panel hot keys or external systems, but may also be part of complex scenarios defined by the administrator and automatically executed by the event manager of the device or by operator intervention.

The **MAP** provides a web based setup GUI and can be controlled by an **X*AP RM1** remote panel that displays status and metering information and allows user intervention.

Junger Audios application manager **J*AM** is available as an add on and can be attached with a few simple clicks to the **MAP** so that users can log loudness data as well as display it as a live plot on a PC screen in real time or simply display level bar graphs. For production / post-production needs a built-in LTC reader will be available in the near future. So loudness logging may then be performed in regard to relative time as well as to time of day.

Completing the feature set of the **MAP** is the availability of an **SNMP** agent, which provides traps and status polling.

As with most advanced tools, the **MAP** can be driven in a variety of ways, depending on requirements and ideas of the user. These can range from simple and straightforward to quite complex set ups.
Although this manual explains the functions and general operation of the **MAP**, it does not give detailed scenarios because the operational needs of today's broadcasters vary so widely between organizations and their work flows and cover so many different parameters – from ingest to studio operation, from master control rooms to play-out, or even rebroadcast applications.

Junger Audio is more than happy to discuss your particular requirements with you and to convey your ideas and solutions to other users of the **Junger Audio Processors** community.

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Hardware concept

The **MAP** consists of a **D*AP8 unit** with MAP firmware that carries all relevant connectors and an optional **X*AP RM1** remote panel both in 19" 1RU format.

D*AP8 unit front panel view

The front panel of the **D*AP8 MAP** has a 3 line status display and two hidden touch buttons ~ 2.5cm left of the display. **Button 1** = Home will switch back to the power up display no matter which display level you are in. **Button 2** controls the multi level display:

Level 1	Power up display [Device type, firmware version]
Level 2	Status [OK / Error] / Device Name / IP address
Level 3	IN peak meter (10x)
Level 4	OUT peak meter (10x)

The total number of display levels depends on the number of programs. For 5.1 + 2 mode (2 programs) we will have 4 more levels while for 4 x 2 (4 programs) we will have 8 more levels:

Level 5 - 8	Program 1 - 4 Out - short term loudness
Level 9 - 12	Program 1 - 4 Out - integrated loudness and integration time

The measures of the loudness displays depend on the setup of the respective loudness mode (see AUDIO PROCESSOR > SETUP > Loudness Mode).

Display background	Green	= hardware status OK
color	Red	= hardware status ERROR

X*AP RM1 front panel view

The **X*AP RM1** remote panel is powered by POE (Power Over Ethernet) or external wall plug PS and designed to control multiple **D*AP8 unit**s one at a time. For details of operation see extra manual "XAP_manual_EN_140328.pdf" or later.

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D*AP8 unit rear view
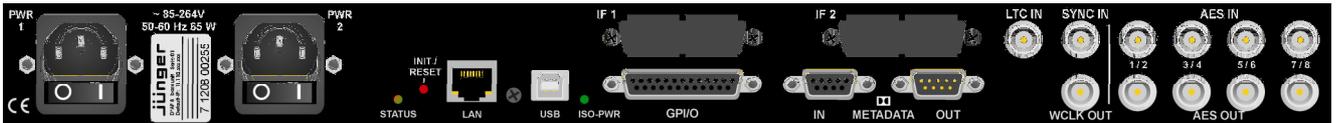
For fail safe operation the **D*AP8 unit** provides two independent power supplies. These power supplies operate in load balance. The status of both PS are displayed on the **D*AP8 unit** front panel as well as on the **X*AP RM1** remote panel.

STATUS	LED indicates the status of the device controller. It becomes green at the end of a successful boot process
INIT / RESET	pressing the **INIT / RESET** button briefly will warm start the device controller. Holding down the button and release it until the **STATUS** LED did flash: 3 times initiates a cold start 4 times the device will be cold started with the previous firmware image 5 times will initialize the **D*AP8 unit** to factory default and will be cold started Be patient it takes about 20 sec. Until the flashing starts.
LAN	RJ45 socket for Ethernet connection to a LAN
USB	USB 2.0 type B socket to connect the built in **USB >> serial** converter with an external PC to reach the console interface of the system controller
ISO-PWR	LED indicates that the isolated 5V power supply for GPI/O application is active
GPI/O	25pin Sub-D female connector to interface with the 8 optical isolated general purpose inputs and with the 8 switch over relay general purpose outputs
Interface 1	slot to mount one of the optional interface boards (SDI, AES, analog)
Interface 2	slot to mount one of the optional interface boards (SDI, AES, analog)
METADATA IN	9pin Sub-D female connector to receive and send Dolby® serial metadata
METADATA OUT	9pin Sub-D male connector to send Dolby® serial metadata
LTC IN	*LTC timecode input not activated jet*
SYNC IN	75Ohm BNC connector to connect with external sync sources
WCKL-OUT	75Ohm BNC connector to synchronize external devices to the **D*AP8 unit** internal word clock
AES IN 1/2 – 7/8	AES3id inputs
AES OUT 1/2 – 7/8	AES3id outputs

Block diagram
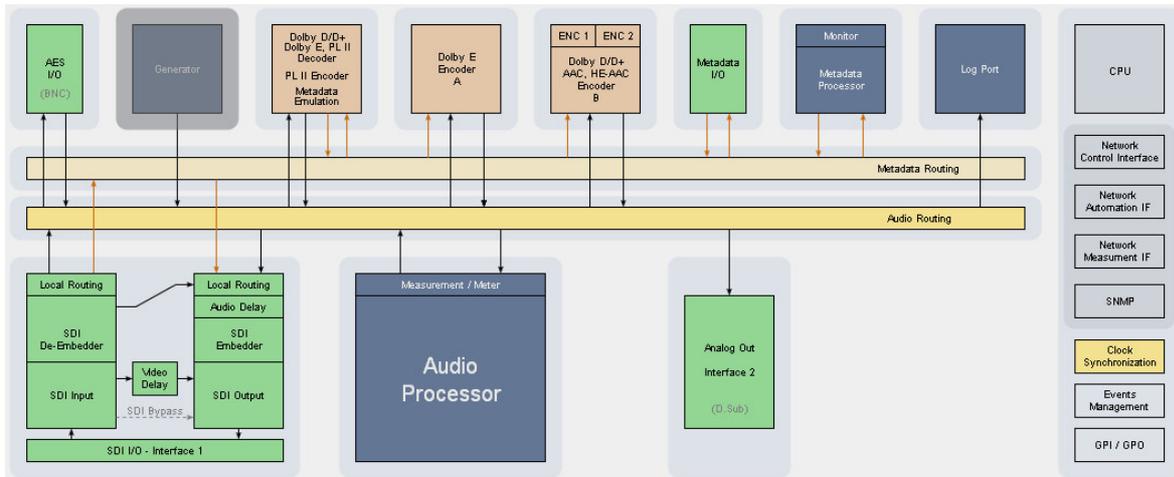
The above schematic shows the principal blocks of a fully loaded **MAP**.

The core of the unit is the audio processor. It has 2x 8 inputs, 8 outputs and a 2ch downmix AUX output.
It controls the speaker setup and settings during the monitoring session.

The device also provides the **measurement data** (true peak, level, loudness) for external applications like the **J*AM** (Junger Application Manager) for logging and/or display on a PC or tablett screen via the **Log Port**s.

The **Dolby Metadata Emulation** is a hardware option that comes with the **Dolby** decoder. It is a functional block that may be connected to the respective audio input / output signals via the device router.
Same applies for the metadata pathes that must be routed separately.

A **Dolby** encoder may be fitted as an option as well to provide encoded output to save the customers rack space and installation cost.

On the motherboard you will find **4x AES3id** I/Os which are bridged by relays in case of a power failure.
This hardware fail-over may be disabled for each I/O pair by internal jumpers.

Two interface slots which may carry option boards allow for extremely flexible interfacing of the **MAP**.
One of the interface slots will normally be equipped with an 8-channel analog line output board for direct speaker connection while the other willl normally hold a **3G**/**HD**/**SD-SDI** option board for TV production applications.

For comprehensive metadata processing the unit has serial metadata I/O connectors. All metadata functions are centralized in a metadata generator. Furthermore you will have the possibility to emulate the influence of **Dolby** metadata on the audio signals for stereo or surround signals and down mixes, without the need to involve an encoder and decoder.

The sync circuit can deal with all formats to integrate the device into digital facilities. Other devices may be synchronized via the word clock output of the **MAP**. The frame reference for D-E encoding, may be shifted to align the D-E guard band.

The **MAP** has 8 balanced GPIs and 8 SSR closure GPOs. This enables the user to simply recall presets or call events, change device configurations and report general status information.

D*AP8 MAP

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Control concept

   The communication between the **X*AP RM1** remote panel, the **D*AP8 unit**, setup and operating tools, is
   based on **TCP/IP** over **Ethernet**.

   The setup GUI utilizes web technology. At the time of editing this manual the functionality of the web GUI is
   optimized for Firefox 30.x and higher.

   The setup GUI can be complemented by other application programs running on MS Windows® XP, W7
   like the J.A. **Application Manager J*AM**.

   An **SNMP** agent is also available on the device and may be explored via a SNMP monitoring system.

   For **3rd party** remote control **Junger Audio** highly recommends using the l-s-b **EmBER+** protocol which is
   widely distributed in the European broadcast industry where the user community is rapidly increasing
   world wide. By the way, the **X*AP RM1** remote panel and the **D*AP8 unit** "talk" Ember natively.

Operating concept

   Further below you will see that the setup GUI for the device is grouped into several parameter areas.
   You can reach the parameters via a 3-tier navigation via tabs which may have sub tabs and sub tabs may
   have page embedded tabs or extra soft buttons for groups of parameters.

   Each function block (parameter area) has dedicated presets. The presets can be recalled at any time during
   operation, either by manual intervention via the web technology based GUI, automatically by the internal
   event manager or by external applications.

   For all relevant settings an **ON AIR** and a **PRESET** part exists. I.e. you may either edit the parameters
   ON AIR or **offline** for the respective function block of the **D*AP8**.

   The presets of the **D*AP8 MAP** are persistent by nature. You are working directly on the preset memory, i.e.
   you must not worry about storing such presets. The **D*AP8 MAP** does it for you.

Event concept

   The **D*AP8 MAP** incorporates a sophisticated event management system.
   Events may be combined to perform actions. The **D*AP8 MAP** offers these event types:

   * **Preset Events** for System set-up, Interfaces, Routing, Audio Processing, Dolby related settings etc.
   * **I/O Events** for GPOs
   * **Measurement Events** for pre-configured measurement scenarios

   These events may be combined with **Actions** which are fired by **Triggers.**

   Triggers are defined by a logical combination (AND, OR, XOR) of two random trigger sources.
   A trigger source may be GPIs, hotkeys of the **X*AP RM1** remote panel, network commands, parameters,
   other active events, other active triggers (nested trigger), or device status information (e.g. sync lost).

Getting started – IP setup in general

The process of installing a **D*AP8 MAP** into an **IP network** is as follows:
1. Ask the system service IT people for two unique IP addresses of the network, for the netmask and if a gateway address is necessary
2. Assign the **D*AP8 unit** an unique IP address

   You have two choices to assign the **D*AP8** an **IP address**:
   * From the serial console interface
   * Via Web browser

3. Assign the **X*AP RM1** remote panel a unique IP address configuration
4. Attach the **D*AP8 unit** to the **X*AP RM1** remote panel

Important Note! If you are not familiar with setting up devices for IP communication, we highly recommend you consult your system service or IT department to assist you.

Getting started – IP setup – **via console interface**

The tool to change the IP configuration of the **D*AP8 unit** can be selected via the console interface. You must connect it with the PC via an **USB A to B** cable. This will install the driver for the built-in **USB to serial converter**. Now you can open a terminal program. Here you must select the virtual **COM port** assigned by the OS. The communication parameters are:

115200kBaud, 8, N, 1 no hand shake. Pressing **<ENTER>** will open the console menu:

```
COM10:115200baud - Tera Term VT
File  Edit  Setup  Control  Window  Help

IP Address........: 10.110.92.133
Software revision : rel_exhibit_ibc_2014_26956
Date, Time, Uptime: 2014-09-12 13:52 UTC, 00d 07:10:05

Please choose:

    1: Manage passwords (passwords currently disabled)
    2: Change network configuration
    5: Set date and time
    6: Restore factory defaults
    7: Restart interface modules
    8: Reboot
    9: Print system statistics
   11: Toggle web server logging (currently off)
   12: Toggle CPU load monitoring
   38: Thorough Reboot (Audio will be interrupted)
    0: Exit to CLI

[2014-09-12 13:52] Your choice:
```

Select item **2:**

> **"[2014-08-22 12:01] Your choice: 2"** **<ENTER>**
> **"Current network configuration"**
>
> **IP Address: 10.110.24.128**
> **Netmask ...:   255.255.0.0**
> **Gateway ...:   10.110.0.1**

You must enter the IP address and the netmask.

> **Enter new IP address, press ENTER to cancel: "192.168.176.78" <Enter>**
> **Enter new netmask, press ENTER to cancel: "255.255.255.0"   <Enter>**

Important Note! The gateway entry is optional but you must take care that the gateway address matches the network mask related to the device IP address!
If you are not sure simply enter **0.0.0.0**. or leave it without an entry.

> **Enter new gateway, press ENTER to configure without gateway: <Enter>**
> **Changing Network configuration**
> **Network configuration has been changed. Please reboot the device**
> **to activate the new settings.**

Select item 8:

Do you want to reboot the device ? <ENTER>

Press small **"y":**

Do you want to reboot the device ? y <ENTER>

Rebooting the device ……..

After reboot has finished, the new IP configuration is active and will be displayed at the top of the configuration menu.

Getting started – IP setup of the **D*AP8 unit** – **via web browser**

* Read the **default IP address** printed on a label at the rear of the device.
* Set up network parameters of your PC to fit the default IP address of the **D*AP8 unit** (e.g. default IP + 1 and net mask = 255.255.0.0).
* Connect the **D*AP8 unit** with the PC either via an Ethernet patch cable (if the PC supports Auto-MDI(X) or an Ethernet cross over cable.
* Open a browser and type the IP address of the **D*AP8 unit** into the URL field and press **<ENTER>**. This will open the **AUDIO PROCESSOR** tab sheet of the GUI.
* Click on **<SYSTEM>** and afterwards the **<Admin>** tab:
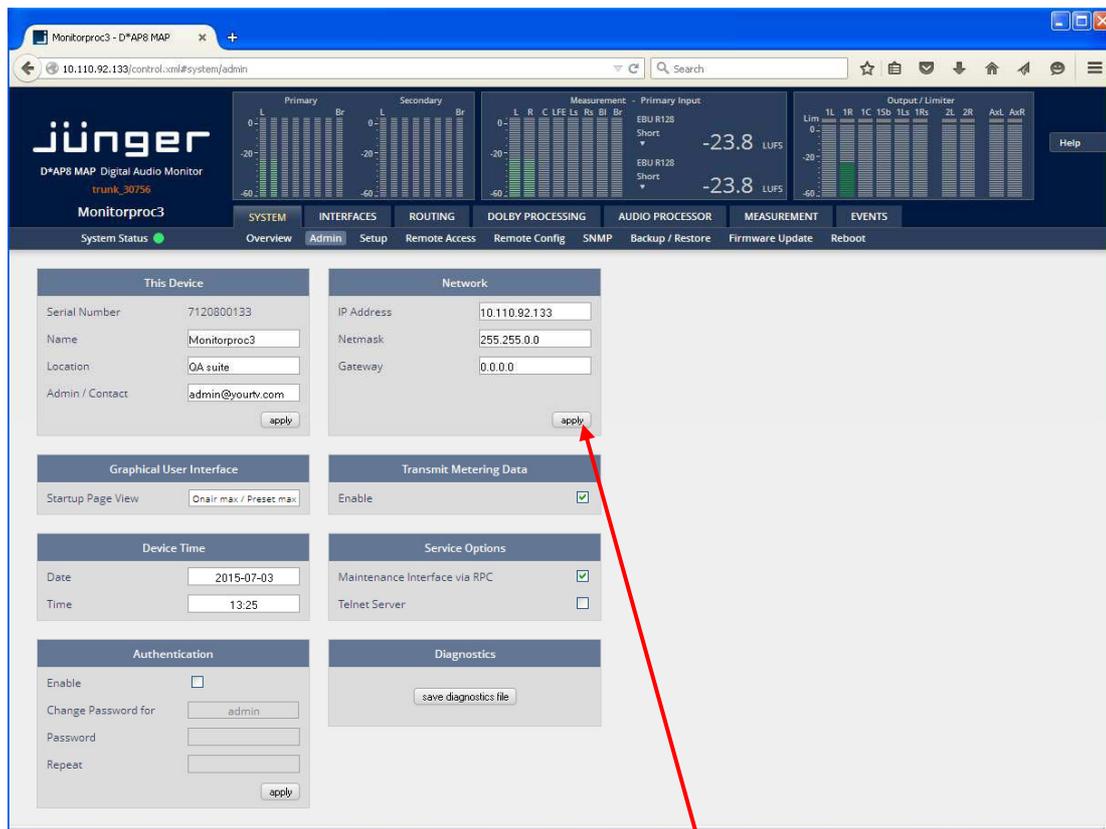
Enter the desired network configuration and press **<apply>**

Afterwards you must reboot the **D*AP8 unit** in order to activate the new IP configuration.

Important Note! After reboot neither the **web browser** nor the **X*AP RM1** remote panel will be able to communicate with the **D*AP8 device**. You must fill in the new IP address in the URL field and change the **X*AP RM1** remote panel settings to attach this device with its new IP address.

Getting started – basic **X*AP RM1** remote panel operation

Power up display – may show up to four **D*AP4 MAPs** enabled for remote control for this **X*AP RM1** remote panel**.** This example has just one **D*AP8 unit** named "MonitorProc 3" attached for remote control while the status is "connect" (i.e. you may connect with that device). See **X*AP RM1** manual for details.

```
Remote Panel   select device to control


      MonitorProc3
      10.110.1.55                                           MENU
       connect

                                                            ESC
```
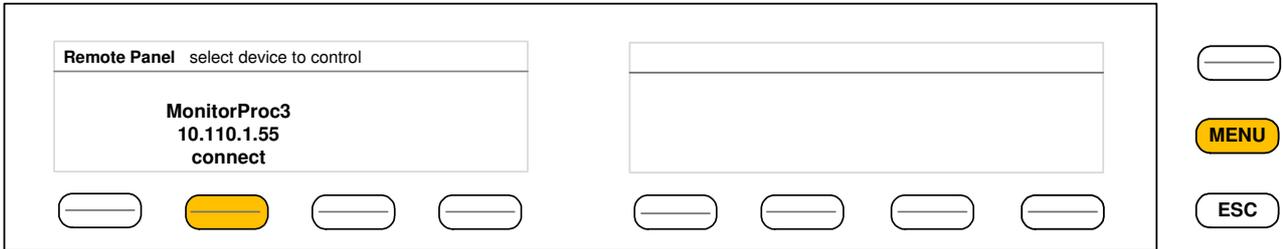
Pressing one of these buttons will connect with the respective **D*AP8 MAP.**
Now the **X*AP RM1** remote panel will gather all necessary information from that **D*AP8 MAP** (may take a few seconds) and open up the **main operating display**:

```
Primary              10.110.64.128                  -6dB



AutoDec    PL2Dec    MDOvr    MDOvr    PL2Conf                MENU


                                                             ESC
```
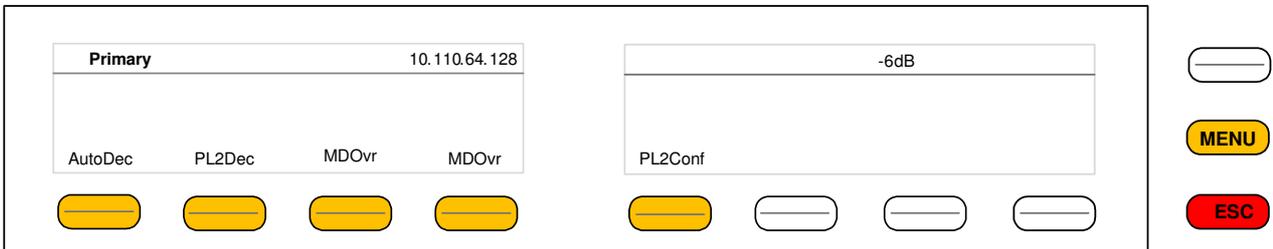
From here you may fire pre-defined hotkeys and observe the status of the volume setting.
Because this is the main operating display, the **escape** button will light up **red** to indicate that the **power up display** is below the **main operating display**. Pressing **<ESC>** returns you back to the **power up display** (device selection).

The hot keys may be programmed by the administrator of the device to recall global settings (see EVENT management for details) and therefore may have dedicated names.

Operating – menu structure of the **X*AP RM1** remote panel – **operating display**

Important Note! The functions described below expect a proper routing of the signal from hardware interfaces to the audio processor and back (see ROUTING pane).

When pressing the **<MENU>** button, the first page of the operating menu opens up:

```
Primary              10.110.64.128

                       L/R      Ls/Rs     MUTE      DIM
EBU R128    Input                         ALL       -20dB
Meter       Primary    Mono     Mono                      -26 dB    MENU


                                                                    ESC
```
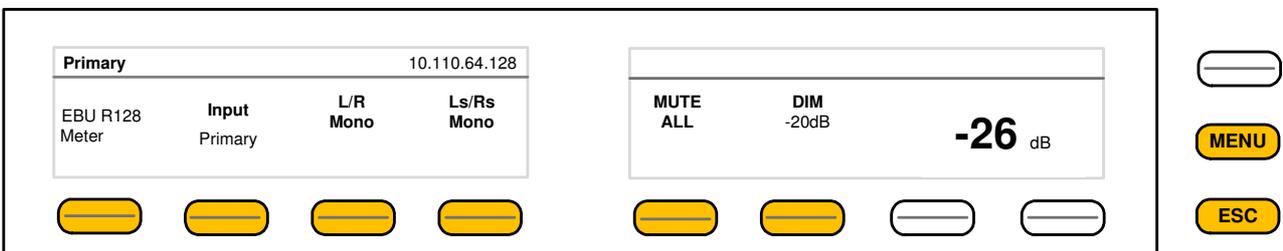
This menu allows for high level settings like the selection of the input (Primary / Secondary), converting signal pairs to mono mute all speaker channels or **DIM** them by a pre-configured value.

The bold face number [**-26** dB] on the right hand side show the actual value of the master volume setting. This may be changed by turning the rotary encoder.

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Important Note! Pressing on the rotary encoder will activate the **MUTE ALL** function.

The first key <**EBU R128 Meter**> opens the loudness measurement display:

EBU R128 [LUFS]	Integrated	LRA [LU]	Time hh:mm:ss		Short Term	Max TPL [dBTP]	Momentary Max
	-22,3	6,4	▶ 00:12:15		-19,7	-6.6	-12.0
		reset	pause			reset max	

MENU

ESC

The highlighted keys will control the measurement process. The display represents the measurements of **Integrated-** / **Short Term**- and **Momentary-Loudness** as well as **LRA** [LU] - the loudness range and **Max TPL** [dBTP] - the maximum true peak level.

The measure for the EBU meter display is **[LUFS]** (Loudness Units Full Scale) as long as not defined differently. For details pls. refer to the EBU-Tech 3341 document.
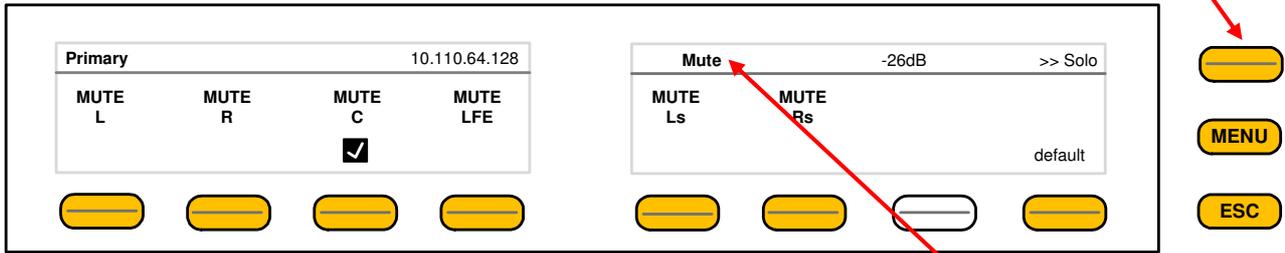You may leave this display by pressing <ESC>. This will bring you back to the first page of the operating display.

The second key <**Input Primary / Secondary**> switches between the primary and secondary inputs of the audio processor (see block diagram AUDIO PROCESSOR > Overview).
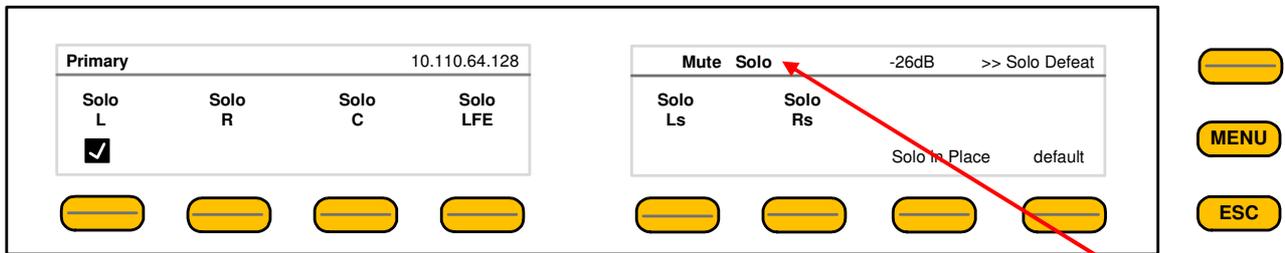
The other keys will do what is written above tem.

Pressing **<MENU>** again will open the **"Mute"** page.
It is the first of the 3 control pages. You will reach the others by pressing the **<select>** key here:

Primary			10.110.64.128
MUTE L	MUTE R	MUTE C	MUTE LFE
		☑	

Mute		-26dB	>> Solo
MUTE Ls	MUTE Rs		
			default

MENU

ESC

When you press one of the keys the respective speaker channel will be muted.
This will be indicated in the check box above that key. In addition the word "Mute" will be displayed. It indicates on all 3 pages that one or all channels are muted.
<default> resets the selected function (MUTE C = OFF in the above example).

The next page is the **"Solo"** page:

Primary			10.110.64.128
Solo L	Solo R	Solo C	Solo LFE
☑			

Mute Solo		-26dB	>> Solo Defeat
Solo Ls	Solo Rs		
		Solo in Place	default

MENU

ESC

When you press one of the keys the respective speaker channel will be put into solo mode.
This will be indicated in the check box above that key. In addition the word "Solo" will be displayed.
It indicates on all 3 pages that one or more channels are put into solo mode.
The way of listening in solo mode is set by **key #7**. It will change between:
    Solo in Place
    Solo to C
    Solo to L/R
<default> resets the selected function (Solo L = OFF in the above example).

Page 3 finally offers the "Solo Defeat" settings:

Primary			10.110.64.128
Solo Def. L	Solo Def. R	Solo Def. C	Solo Def. LFE
			☑

Mute Solo		-26dB	>> Mute
Solo Def. Ls	Solo Def. Rs		
			default

MENU

ESC
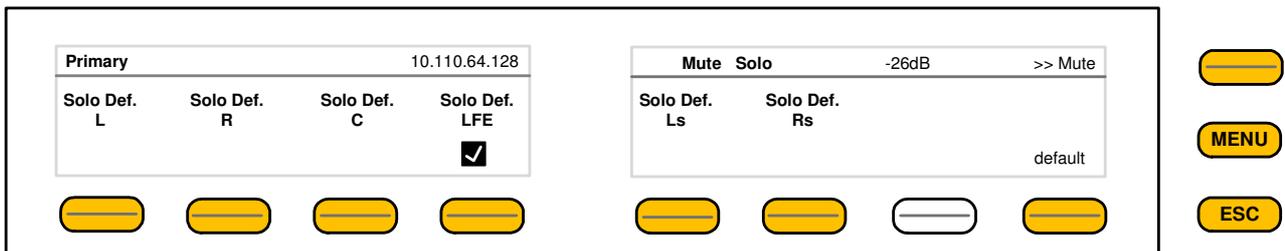
The channel(s) indicated in the check box will not be turned off if another channel is put into solo mode.
<default> resets the selected function (Solo Def. LFE = OFF in the above example).

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Operating – menu structure of the **X*AP RM1** remote panel – **menu tree**

Power Up Display
    <MENU> opens **X*AP RM1** remote panel IP setup menu. See extra manual for details.
        <Address> Setup
        <Netmask> Setup
        <Gateway> Setup
        < empty >
        Device 1   Setup IP & ON / OFF
        Device 2   Setup IP & ON / OFF
        Device 3   Setup IP & ON / OFF
        Device 4   Setup IP & ON / OFF
<ESC> back to **power up** display

    <connect> will connect with that particular **D*AP8 unit** and opens the **main operating** display:
        <u>Hotkey #</u>
        1 user defined
        2 user defined
        3 user defined
        4 user defined
        5 user defined
        6 user defined
        7 user defined
        8 user defined
<ESC> will jump back to **power up** display

    <MENU> opens o**perating** displays:
        <u>Hotkey #</u>
        1 <EBU R128 Meter>
        2 <Input>
               Primary / Secondary
        3 <L/R Mono>
        4 <Ls/Rs Mono>
        5 <Mute All>
        6 <Dim>
        7 <empty>
        8 <empty>
    <ESC> back to **main operating** display

        <MENU> opens 3 more operating / setup pages:

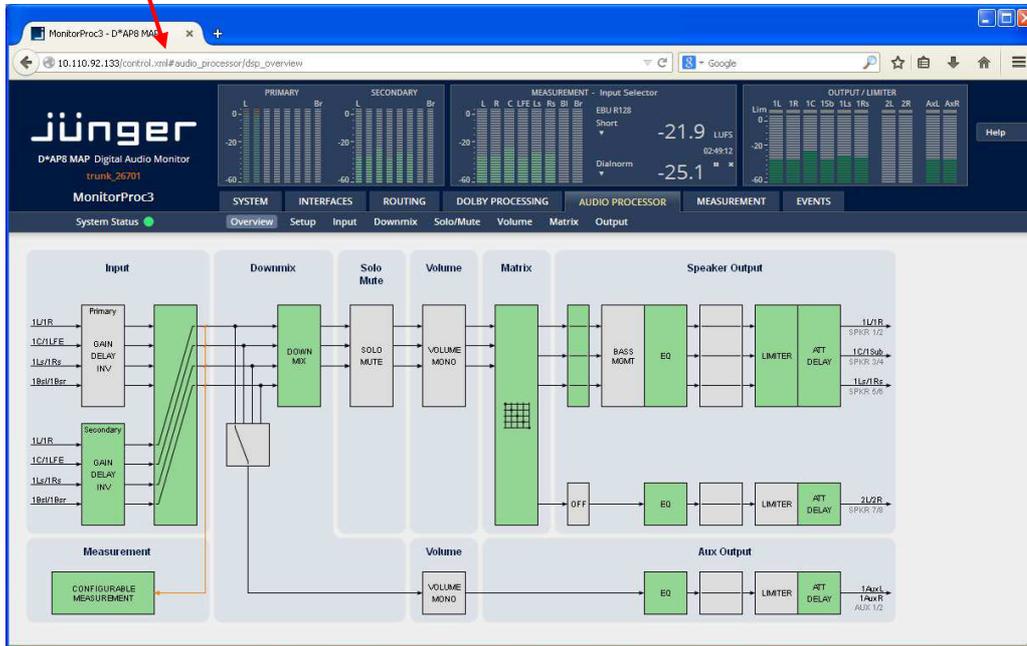| < select>	Mute	Solo	Solo Defeat
	1 <Mute L	<Solo L>	<Solo Def. L>
	2 <Mute R>	<Solo R>	<Solo Def. R>
	3 <Mute C>	<Solo C>	<Solo Def. C>
	4 <Mute LFE	<Solo LFE>	<Solo Def. LFE>
	5 <Mute Ls>	<Solo Ls>	<Solo Def. Ls>
	6 <Mute Rs>	<Solo Rs>	<Solo Def. Rs>
	7 <empty>	<Solo in Place>	<empty>
		<Solo to 1L+1L>	
		<Solo to 1C>	
	8 <default>	<default>	<default>

        <MENU> back to o**perating** display
        <ESC> back to **main operating** display

Setup GUI – connecting with the **D*AP8** unit – AUDIO PROCESSOR > **Overview**

You must open a browser and enter the **IP address** of the **D*AP8** unit
into the **URL** field ● and press **<Enter>**. The browser will fetch the necessary information and open the
entrance page:

The entrance page is the **AUDIO PROCESSOR** pane with its sub pane **Overview.** If you are returning from other pages or if you reload your browser content by pressing **<F5>** it may show a different page due to caching of the browser.

In the top area you have several bar graph displays for the two inputs (Primary / Secondary) of the audio processor, the measurement block and on the right hand side the level display of the audio processor outputs which in fact feed the speakers most of the time.

The display is rounded up by two numeric representations for loudness measurement.

On the following pages we will go through the various panes to perform the basic setup of the device.

You must setup the synchronization source. You may also give the device a name, tell it its location and define an administrative contact which may be used by monitoring systems of your company (e.g. via SNMP).

You must setup the installed interface modules and finally set the signal routing
You will find those settings under the **SYSTEM** link.

D*AP8 MAP

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Setup GUI – SYSTEM – **System Status**
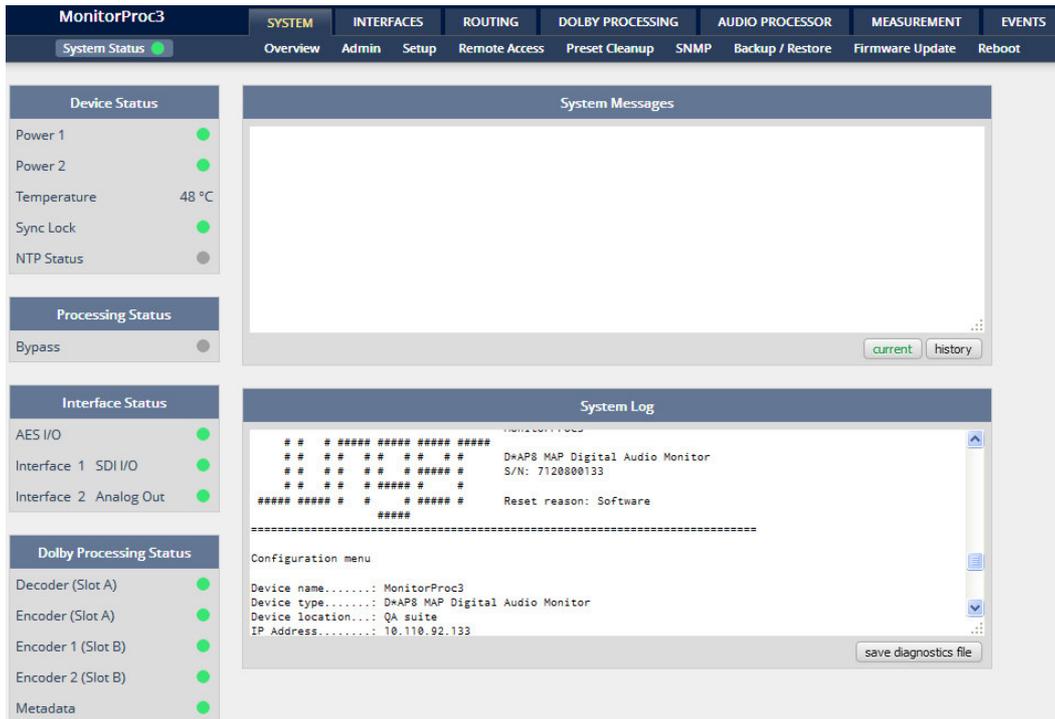
The **System Status** page provides a top level view of the various status information available for the device.

Device Status	provides the hardware status of the **D*AP8 unit**
Power 1	status of the first power supply (left hand side from rear)
Power 2	status of second power supply (right hand side from rear)
Temperature	measured on the surface of the main PCB
Sync Lock	turns red if the external sync source is removed or unstable

Processing Status	
Bypass	for the MAP is no bypass function implemented

Interface Status	display depends on the number of installed interface modules
AES I/O	turns red if an AES input that is internally in use (i.e. you have routed it to an input of a function block) has detected an error
SDI I/O Interface	turns red if the SDI input is not locked (not present or bad SDI signal)
Analog Out Interface	turns red if the analog output card does not communicate with the system controller

Dolby Processing Status	
Decoder	turns orange if the input signal is **not** Dolby encoded (PCM)
Encoder A	status of the first D-E encoder (if license is installed)
Encoder B1	status of the first D-D/D-D+/AAC encoder (if optional CAT561 is installed) status of the D-E encoder (if optional CAT569 is installed)
Encoder B2	status of the second D-D/D-D+/AAC encoder (if optional CAT561 is installed)
Metadata	status of the metadata

System Messages   \<current\> / \<history\>
Displays a list of messages produced by the system controller.

System Log   The system controller activities will be logged. If there is a suspicious behavior we recommend to warm-start the D*AP8 by pressing the rear **\<INIT / RESET\>** button briefly. This will keep the log information for later investigation. If you do a power cycle instead the previous
log information get lost.

\<get diagnostics file\>   Pressing this soft button will start the assembly of files to help with diagnostics. The packed **.tar** archive contains 3 files:

The console log from the System Status pane, the license file and the status XML If you experience unexpected behavior of the device you may be asked by the Junger service team to send such file by e-mail for analysis.

Setup GUI – SYSTEM – **Overview**
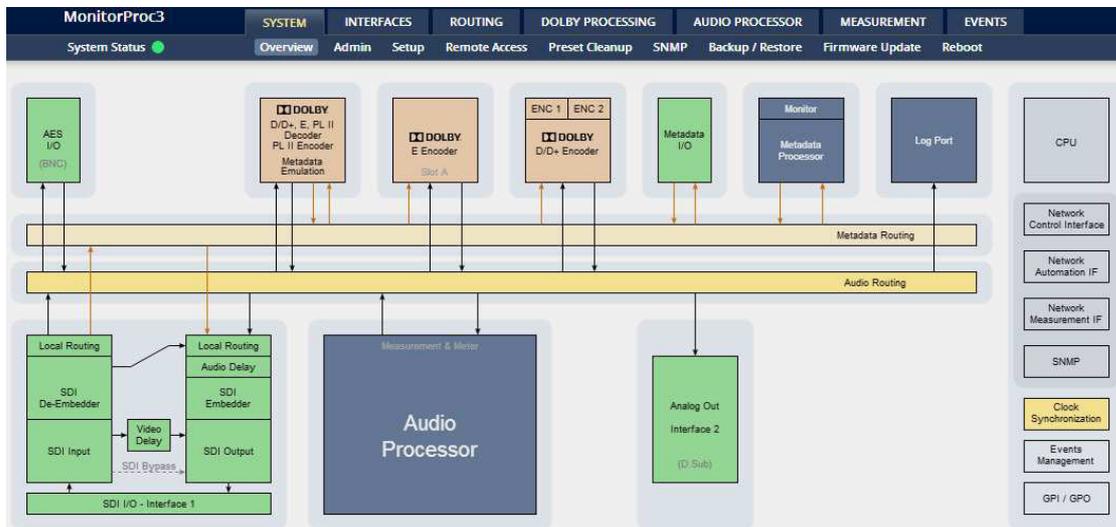
The graphic overview shows the main building blocks of the device including the options actually installed such as a **SDI** interface module and the **8 channel analog output** module.

You may click into the boxes and the respective page will open. The navigation is based on URLs so you may use the **\<Back\>** navigation button of the browser to return to this page.

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Setup GUI – SYSTEM – **Admin**

This Device   Input fields for information utilized by higher level services.

    Serial Number   The electronic serial number. Printed on a label at rear of the device.

    Name   Give the device a meaningful name that may be used by name services and SNMP management.

    Location   The place where the **MAP** is located (used by SNMP).

    Admin / **Contact**   e-mail address of a person in charge (used by SNMP).

Graphical User Interface

    Startup Page View   Defines the appearance of the parameter panes regarding preset editor and on air parameter visibility (see below – for preset concept).

Authentication   To prevent non authorized people from changing **D*AP8 MAP** settings the administrator may assign passwords for either the admin and/or an operator (same applies for talent/artist). While the admin is allowed to set everything, an operator is just allowed to load presets. Parameters will be reset if there was an attempt from the operator to change it.

    Enable   [enable / disable]
The administrator may turn authentication off.

    Change Password for   [admin / operator]
Select which password you will set / change

    Password   enter a password
Default passwords are: admin (for admin) and operator (for operator).

    Repeat   repeat that password

Important Note! The authentication may be enabled / disabled from the **console** interface via USB connection as well (see page 8 "1: Manage Password") but also via Telnet! If you have higher security demands you should turn the Telnet server off. Authentication will be turned off and passwords will be reset if one initializes the device to factory default (see Reboot - page 19, INIT/RESET rear button - page 4).

If there was an authentication failure, the **admin** will be notified on next proper login about such conditions The pop up appears as often as a login failed. It shows the IP address of the device that caused the authentication failure.

After a correct login the status "who" (e.g. admin) and a **<Log Out>** button are available from the GUI:
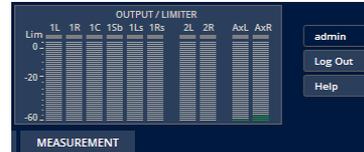
Network	IP address setup, see above: getting started – IP setup of the **MAP** – **via web browser**
IP Address	The address of your choice – default [10.110.xxx.yyy]
Netmask	The net mask of your network – default [255.255.0.0]
Gateway	The optional gateway address – default [0.0.0.0]
Transmit Metering Data	[ON / OFF] Metering data will be streamed via UDP protocol. In order to receive such data by external applications and the GUI, you must enable it.

Service Options

Maintenance Interface via RPC	[ON / OFF] For administrative use to enable communication with factory tools.
Telnet Server	[ON / OFF] Enables a telnet server to connect to the consol interface via TCP (port 23). You must be aware about the security risks if you do that over the internet!

Diagnostics

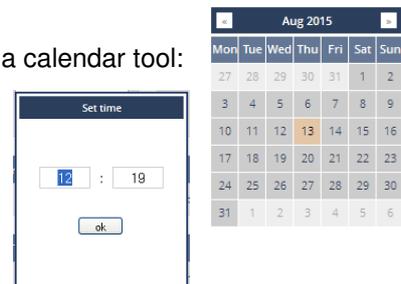|	
<save diagnostics file>	Pressing this soft button will start the assembly of a diagnostics file. The file will be presented in XML format for download. If you experience unexpected behavior of the device you may be asked by the Junger service team to send such file by e-mail for analysis.
Device Time	Allows you to set the device clock. At the factory it will be set to UTC (Coordinated Universal Time).
Date (Local)	If you click into the **Date (local)** input field, a calendar tool: appears to select month and year.
Time (Local)	If you click into the **Time (local)** input field, you will be able to set the device time.
Date (UTC)	Similar as above for local date setting.
Time (UTC)	Similar as above for local time setting.
Get Time from	[Manual Setting / Browser / NTP Server] If set to **NTP Server** the D*AP4 will look for the below servers to synchronize the internal clock.
Primary NTP Server	[5.9.110.236] default set to a publicly accessible NTP server via internet. This is used for device testing an may be overwritten at any time.
Secondary NTP Server	[10.110.2.7] default set to an internal NTP server from Junger Audio. This is used for device testing and may be overwritten at any time. If no secondary NTP server is available set the address to 0:0:0:0 to avoid an error message regarding duplicated NTP server address setting.

Important Note! If it is impossible to synchronize the internal clock to one of the two NTP servers an **SNMP** "ntpStatusTrap" will be issued by the SNMP agent (if enabled SYSTEM > SNMP > Enable = ON).

Update Rate (min)	[1 … 1440]
	Interval of synchronizing the internal clock of the **MAP**.

Setup GUI – SYSTEM – **Setup**
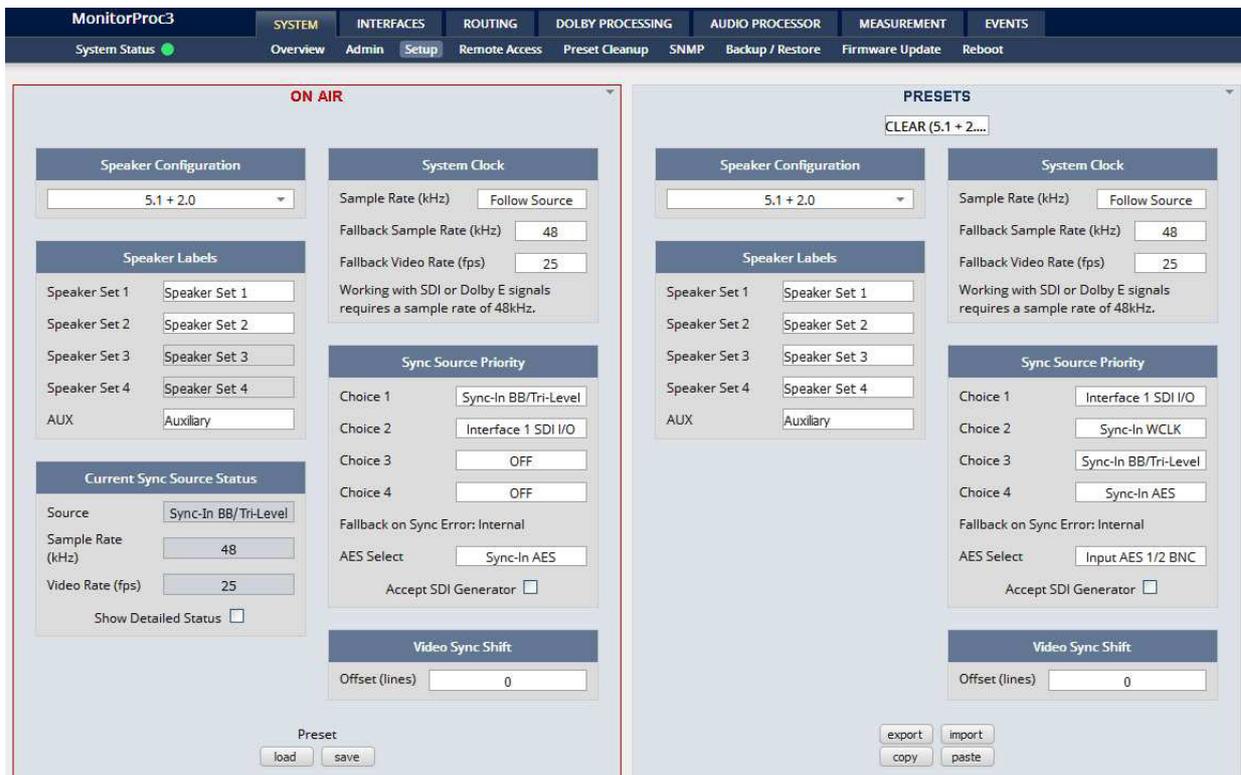
|	
Speaker Configuration	[4 x 2.0 / 5.1 + 2.0 / 7.1 / 2 x 2.1 + 2.0] the MAP may drive up to 8 speakers. Here you may select between possible speaker configurations. This will automatically configure the bar graph display and relevant audio processing blocks.
Speaker Labels	here you can set the label for the audio processor speaker outputs.
Speaker Set 1 - 4	depending on the speaker configuration you may assign up to 4 independent labels.
AUX	label box for the AUX output
Current Sync Source Status	shows the status of the five tier sync priority circuit
Source	active sync source
Sample Rate	measured sample rate
Video Rate	measured frame rate of the video sync
Show Detailed Status	[ON / OFF] If you enable the checkbox you will get extra information (see below).

| Sync Source Information | Appears if <Show Detailed Status> check box is checked |
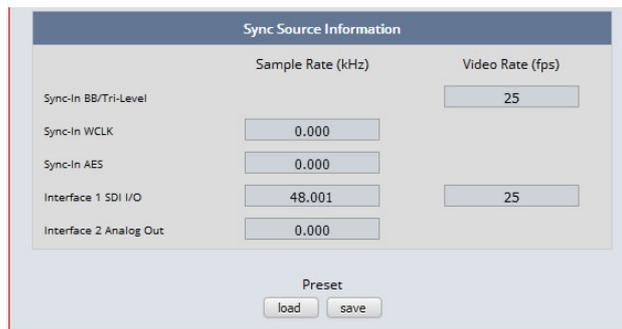
System Clock

Sample Rate	[Follow Input / 44.1 / 48]
Fallback Sample Rate	[44.1 / 48]
Fallback Video rate	[25 / 29,97 / 30] Working with SDI or Dolby E signals, requires a sample rate of 48kHz.

Sync Source Priority

Choice 1 – 4	[OFF / Internal / Sync-In WCLK / Input AES / Interface 1 SDI I/O (if fitted) / Sync-In Black Burst/Tri-Level]
Fallback on Sync Error: Internal	If a sync error happens the sync circuit will automatically fall back to internal.
AES Select	[Sync-In AES / Input AES 1/2 BNC … AES 7/8 BNC] Select from which physical input the AES sync must be taken.
Accept SDI Generator	[ON / OFF] If you run the SDI interface in generator mode and you want to synchronize the **MAP** to the SDI generator.

Important note! It is **not** possible to gen lock the SDI generator. The generator will run on its own internal 27MHz crystal clock.

| Video Sync Shift | For applications like Dolby E encoding it might be necessary to move the timing reference point. |
| Offset (lines) | [-1023 … 0 …. 1023]
The number of lines the reference point can be moved in either direction. |

D*AP8 MAP

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The **X*AP** can control multiple **D*APs** one by one and a single **D*AP** may be controlled from multiple **X*AP**s. This requires a flexible remote concept that allows you to recall pre-set configurations via the **X*AP** panel or via the **Mobile UI**. You can control pre-settings of the **EVENTS** system via remote access from the **X*AP** remote panel or from a **Mobile UI** on a tablet, a smart phone or even via a browser session from any PC in the network.

To better understand the possibilities of these settings it is recommended you study the comprehensive **EVENTS** system of the **MAP**.

At the moment of connecting a particular **X*AP** with a **MAP** the **X*AP** configuration will be transferred to that **X*AP**. I.e. configuration must take place at the **MAP.** You will decide here which feature set a particular **X*AP** is allowed to control:

For each **X*AP** you will be able to pre-set a **Feature Set**:

X*AP Remote

IP Address	In the first line: [Default / Not listed] you define the access policy for an "unknown" **X*AP** that connects with this **D*AP8** for the first time. The other lines are used to pre-define features for known **X*APs**. When connecting from an unknown **X*AP**, the respective **IP address** will be inserted automatically into the next empty line.
X*AP Remote Feature Set	You can select between a "Standard Set" that is full access for now and the access to "Metering and Hotkeys".

Setup GUI – SYSTEM - the **preset concept** in detail

The example above shows the **preset concept** of the **D*AP8 MAP.** It is a general feature of the device and you will come across it in almost every area. For all relevant setting one set of **ON AIR** parameters and a practically unlimited number of presets are available. The count depends on the NV memory space left.
If you want to load parameters from a preset to the **ON AIR** area or save parameters from the **ON AIR** area to a preset, you must press **<load>**:   or **<save>**:
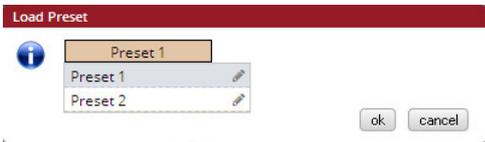
A dialog opens to select the desired preset. When you press **<ok>** the selected action will be executed. When you press on the little pencil icon the preset name turns *italic* and you may edit it.

To generate a new preset offline, you must click into the preset name box below the **PRESET** headline:

The pull down offers **"Add Preset"**. If you click on that option a new entry to the list will be generated. Clicking on the small trash bin symbol will delete that preset. You may change the default name "Preset x" by clicking on the small pencil icon. Now the default name becomes *italic* and you may edit that name.
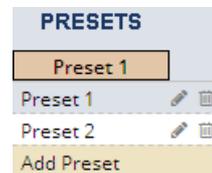
If you have selected the new preset or one of the existing presets indicated by the name displayed at the top, you may edit the parameter values.

Important Note! The presets of the **D*AP8 MAP** are persistent by nature. You are working directly on the preset memory, i.e. you need not worry about storing such presets. The **D*AP8 MAP** does it for you.
On the other hand you must be aware that you are **overwriting the actual preset settings!** If you want to keep the original values (e.g. from a factory preset) you must simply **copy** the content of the existing one to the clip board, add a new preset, name it differently and **paste** the clip board to it.

At the bottom of the **PRESET** part you will find the soft buttons to **<copy>** the content of that preset to the clip board or to **<paste>** the content of the clip board into an other preset which you have selected before pasting.

You may also **<export>** or **<import>** the preset content to / from a file.

Setup GUI – SYSTEM – **Preset Cleanup**

It is sometimes desirable to delete presets which are used by multiple events without stepping through all processing blocks and deleting the respective presets one by one. This pane offers you a tool to delete presets from a central access point:

You can sort the table by pressing on one of the column headlines. You can qualify your selection by the "Type" selector and / or the "Preset Block", "Linked to Event", "Last Modified" column headlines.
The pull down lists allow to reduce the number of presets displayed:
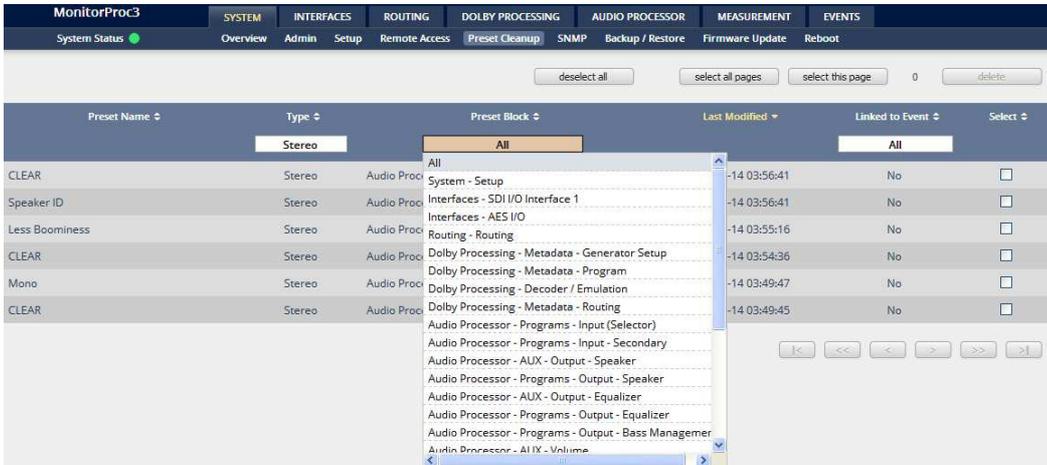
The soft buttons at the bottom left hand side may also be used to search through the table by sorting it by the first letter or leading number. The arrow buttons at the bottom right hand side can be used to scroll through the table if the selection is too big for one page:

A selection is made by clicking on a line to activate the check box. Once you have made ● your selection (highlighted lines), you can press the **<delete>** soft button to execute the process. This will remove the selected presets permanently from the device.

Setup GUI – SYSTEM – **SNMP**
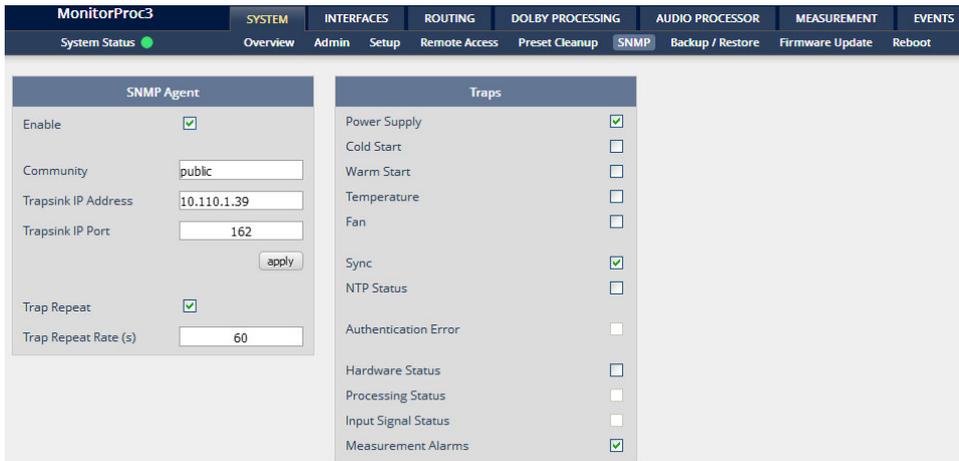
This pane is meant for basic settings of the **SNMP Agent** of the device. If you don't use SNMP based system monitoring, you must not enable the SNMP agent.

Setup GUI – SYSTEM – **Backup / Restore**
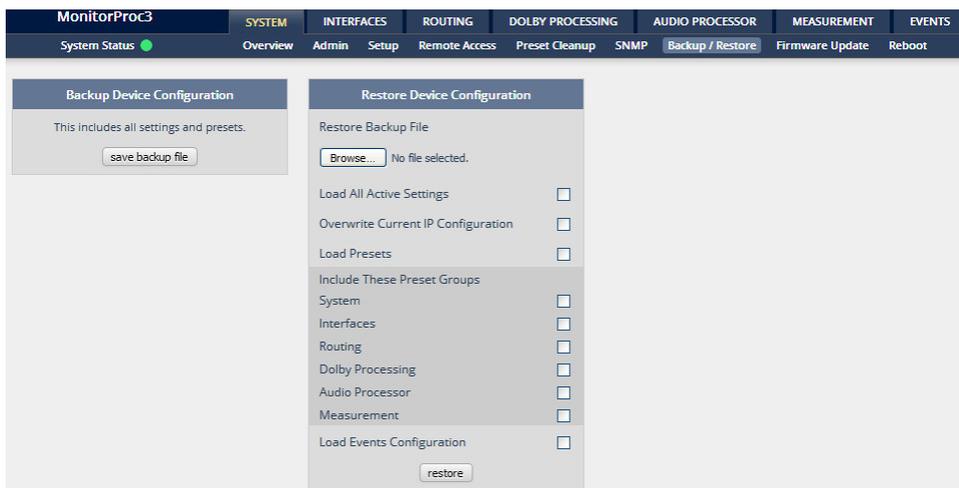
Here you can **backup** the complete **device** and **restore** parts or all of it .If you press **<save back up file>** the device controller will collect all necessary data and assemble it to an XML file.
Finally you will get a pop up message:
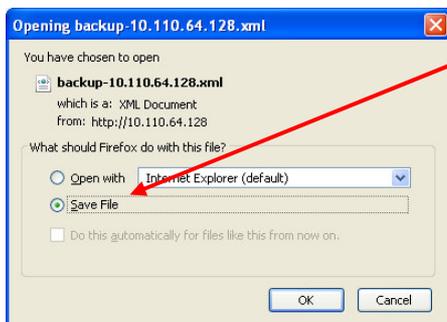
You must select:
  <Save File>.
After pressing **<OK>**, the system file dialog opens:

Select a folder and alter the default file name if needed.
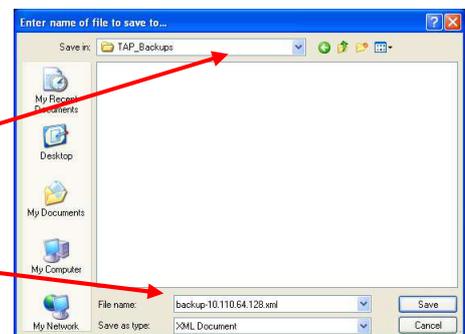
Similar applies to the restore process. You must <Browse …> for the desired backup file which you want to restore and check the necessary option(s) under "Restore Device Configuration".

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Setup GUI – SYSTEM – **Firmware Update**

The file to update the **D*AP8** comes in **ZIP** format. You must unpack it to your PC's hard drive.
It contains also the manual a quick start guide the version history and a folder with the firmware for the
X*AP remote panel. The folder /base_unit_image contains the so called "image" file for the **D*AP8**. Here
an example: "rel_map_1_2_3-45678.img". It is a bundle that brings the latest firmware versions for all
interfaces and Dolby modules with it.
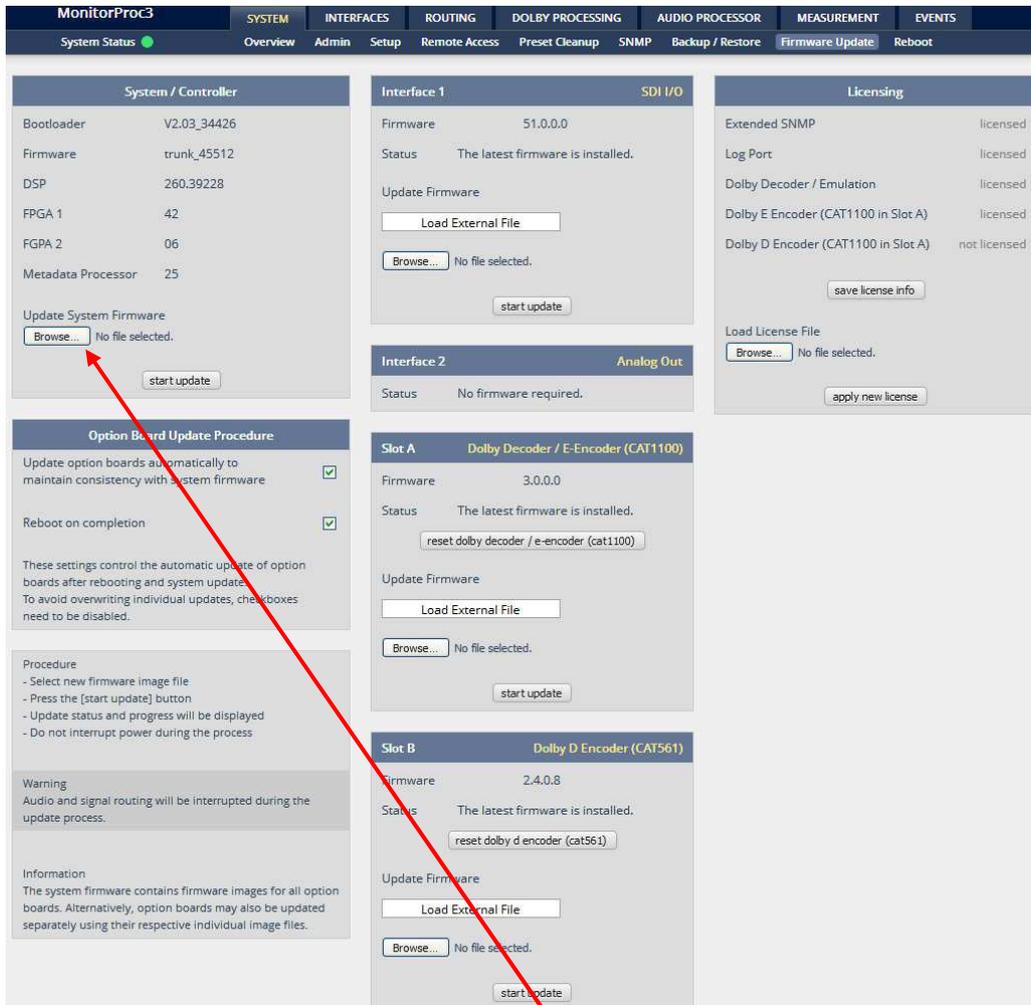
To update the **D*AP8 MAP**, you must **<Browse …>** ● for the respective firmware file (which you have
unzipped before) and press **<start update>**. If you do not want to upload all individual module firmware
files for any reason, you may take the "rel_map_1_2_3-basic-45678.img" file.
After finishing the update the device will automatically reboot

Important Note! After the update of the latest firmware image you must observe the **Status** messages
below the firmware version displays. If it indicates that you don't have the latest firmware installed you
should select the respective file via the drop down box and press the **<start update>** soft button
afterwards. But you can also upload an external file in case you need a specialized version for any reason
that is not contained in the uploaded firmware image.

Interface 1	You may also update the firmware of an optionally installed SDI board or other interface boards.
Firmware	Display of actual installed firmware.
Status	[The latest firmware is installed / A firmware update is available]
Update Firmware	[Load External File / x.y.z.] You can decide if you want to upload it manually or take the latest module firmware "x.y.z" that came with the release image (recommended). You may **<Browse…>** the file system and select a file of your choice.
Interface 2	*If you have two interface boards installed, similar applies to the second one.*
Dolby Decoder / E-Encoder (CAT1100)	For the example above we have the optional Dolby decoder installed. It is based on the Dolby OEM board CAT1100. The status says: "The latest firmware is installed".
<reset dolby decoder (cat1100)>	Pressing this soft button will warm start that module.
Dolby D Encoder (CAT561)	For the example above we have installed the optional Dolby E encoder. It is based on the Dolby OEM module CAT559.
<reset dolby d encoder (cat561)>	Pressing this soft button will warm start that module - depending on the Dolby module you may have installed.
Licensing	Here you can see a list of the licensed options of your device.
<save license info>	When you buy a license you must provide the "**license info**" file which you may obtain here.
Load License File	In return you will get a "**license**" file which you must apply to the device here. You must **<Browse …>** to find the respective license file (which you have unzipped before) and press **<apply new license>**.

Setup GUI – SYSTEM – **Reboot**
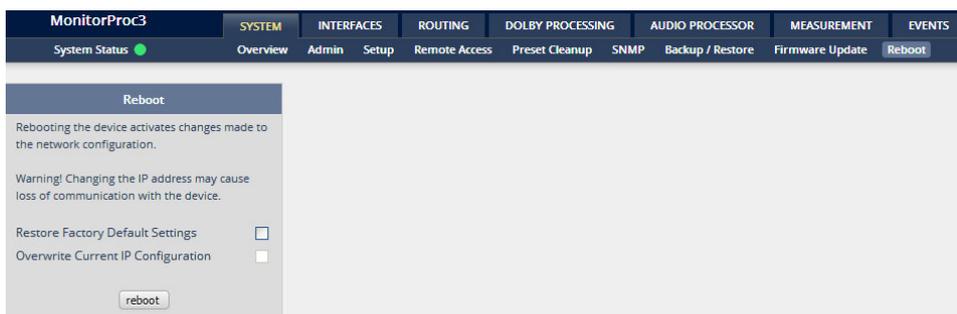
Restore Factory defaults	Will clean up the parameter and preset memory and will initialize all parameters to their factory default values and will reset passwords and turn authentication off.
Overwrite Current IP IP Configuration	You may exclude the current IP settings from this process to keep your local settings.

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Setup GUI – INTERFACES – **AES I/O**

Status

Input Signal Status	[OK / Fail] Each AES input has a status detection that may show **OK** or **Fail** (no carrier, unlock, cranky [too much jitter]). This corresponds to the color of the soft LED (green / red).
Input Signal Type	[Mute / PCM / Non PCM] The **Non PCM** (e.g. Dolby encoded signal) status will be retrieved from a logical combination of the Validity flag and the channel status.

Important Note! The input signal status is logically combined and represented as part of the System Status. If one of the inputs is not assigned by the ROUTING matrix, its status will not be incorporated into the System Status. If non of the inputs is routed the Interface Status > AES I/O status soft LED becomes grey.

Settings

Input Sample Rate Converter	For asynchronous sources it is possible to turn a **SRC** on per input. For asynchronous sources it is possible to turn a **SRC** on. If an **SRC** is turned on and the input status becomes **Non-PCM**, the **SCR** will be turned OFF automatically in order to maintain the original data structure of the encoded bit stream (e.g. Dolby E).
Output Channel Status	[Transparent / Prof. PCM / Prof. Non-PCM / Cons. PCM / Cons. Non-PCM] The channel status can either be transparent from the input source of the **D*AP8** or may be overwritten.
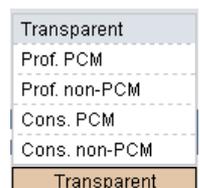
Setup GUI – INTERFACES – SDI I/O interface – **Overview**

If the **D*AP8** is equipped with an optional **SDI** interface the following settings will be available.
This pane has five sub panes imbedded:

The overview pane shows all relevant information of that interface:

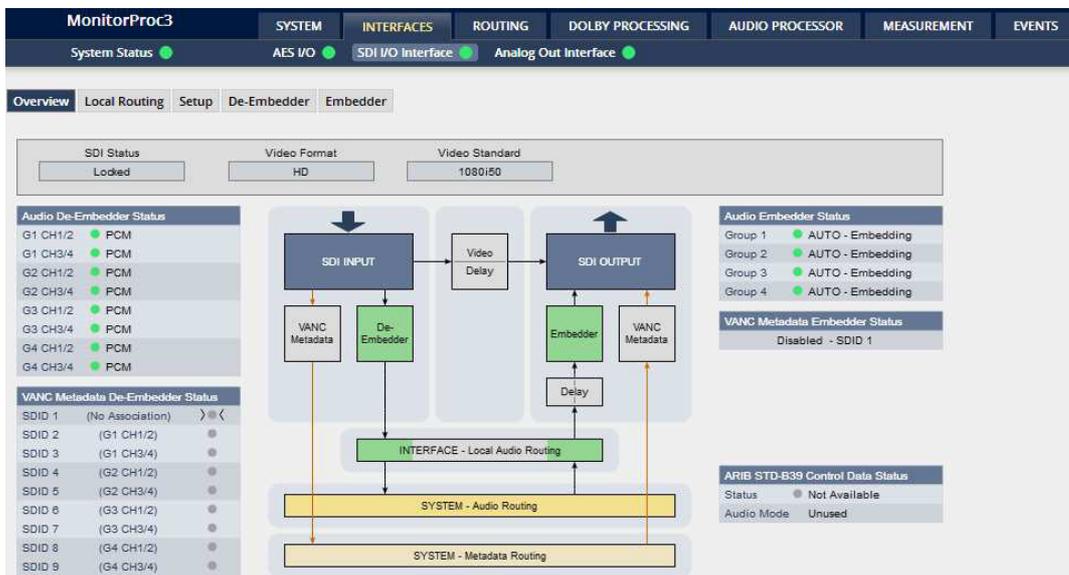|	
SDI Status	[Locked / Unlocked]
Video Format	[SD / HD /3G / N/A]
Video Standard	[actual decoded standard (e.g. 1080i50) / No SDI Lock]
Audio De-Embedder Status	[PCM / Dolby E / Dolby Digital / Dolby Digital Plus / MPEG-4 HE AAC / MPEG-4 AAC / N/A]
VANC Metadata De-Embedder Status	The respective soft LED will turn green to indicate the SDID found in the stream while the angle brackets indicate the SDID one has selected in the de-embedder set-up as a pre-selected stream.
Audio Embedder Status	[AUTO – Embedding / AUTO – Replace Audio / OFF / Delete]
Group 1 – 4	The embedding process distinguishes between 4 different modes for each group independently: **Embedding –** a new group will be built **Replace –** the structure of the group from the input is kept and the audio content is simple replaced **Delete –** the group from the input is deleted **OFF –** the embedder fro that group is turned off
VANC Metadata Embedder Status	[Enabled / Disabled & selected SDID#] For details see **SMPTE 2020-2** standard.
ARIB STD-B39 Control Data Status	Meta information standard
Status	[Available / Not Available]
Audio Mode	See **ARIB** Japanese standard "Structure of Inter-Stationary Control Data Conveyed by Ancillary Data Packets" http://www.arib.or.jp/english/html/overview/doc/2-STD-B39v1_2.pdf

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Setup GUI – INTERFACES – SDI I/O interface – **Local Routing**

The SDI interface comes with a local routing matrix to shuffle audio signals from and to the system (device) (i.e. to and from the central device router) and from and to the physical de-embedders / embedders.
The example below shows the default routing that sends all signals 1:1 from the physical de-embedders [INTERFACE – SDI IN G1 CH1 … SDI IN G4 CH4] to the internal device matrix [SYSTEM – SDI De-Embedder DEM 1 … DEM 16].
The signals from the device router [SYSTEM – SDI Embedder EMB 1 … EMB 16] are routed by default 1:1 to the physical embedders [INTERFACE – SDI OUT G1 CH1 … G4 CH4].
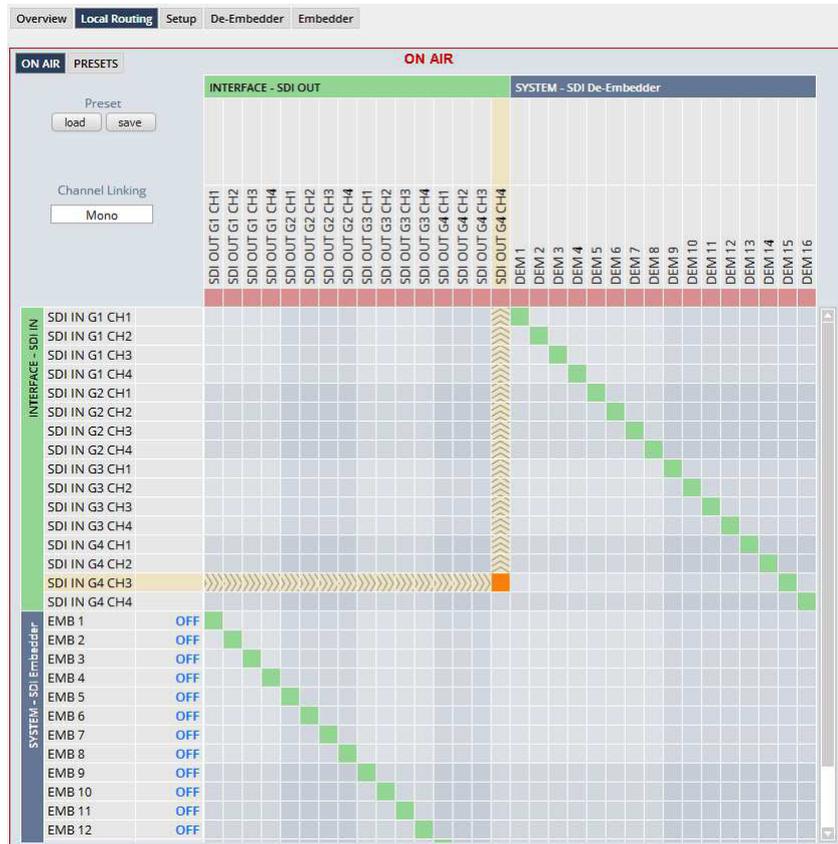
You must use the scroll bar to navigate through the matrix. In the upper left corner you can select between the **ONAIR** and the **PRESETS** view of the matrix.

On the **ON AIR** page you will also see the device signal labels (see ROUTING section further below for details).

Channel Linking	[mono / stereo] You can decide if the routing must be performed in mono or stereo mode (where adjacent odd/even channels are routed at once).

You may select cross points by hovering with the mouse over the little squares and select / deselect cross points with a left mouse button click. A trace that symbolizes the signal flow is shown.
The color of the respective squares changes:

| **Mouse over**	Color codes of cross points:
dark blue	Possible new cross point.
orange	You are about to reconnect a cross point.
grey	Cross point is not allowed (i.e. routing will cause a loop and will not therefore be performed) or dedicated input is not activated.
red	You are about to disable a cross point

An animated signal flow 〉〉〉〉〉〉▮ will help you when navigating through the matrix.

Setup GUI – INTERFACES – SDI I/O interface – **Setup**
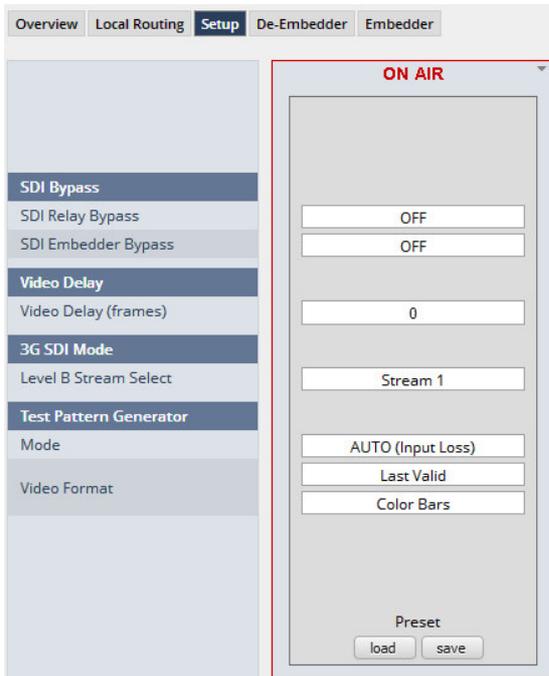
SDI Bypass

SDI Relay Bypass — Will deactivate the **Bypass Relay**. It provides a shortcut from **SDI-IN** to **SDI-OUT1** and disconnects the de-embedder from the SDI input. This relay also serves as a **fail bypass** if the power is off. This feature maintains the SDI signal for downstream equipment.

SDI Embedder Bypass — Will pass the embedded audio data from the de-embedder to the embedder 1:1. This function preserves the original Ancillary Data structure.

Video Delay

Video Delay (frames) — [0 … 15] For compensation of any kind of audio processing delay within the chain of devices you may use a **Video Delay**. Position "0" turns off the delay function.

3G SDI Mode

Level B Stream Select — A 3G-SDI signal may have two HD sub streams (e.g. for 3-D TV), AKN as 3G-B standard select between stream 1 or 2 for embedded audio. See SMPTE 425M for details.

Test Pattern Generator — The interface offers a test generator to either check downstream connections during installation or for use in case of an input fail but you may also use it to move 16 independent audio channels over a single coax cable from point to point

Mode — [OFF / AUTO (Input Loss) / Always ON]

Video Format — [Last valid / one of the defined SD / HD 3G formats (see specs)] [Color Bars / Black Frame]

Setup GUI – INTERFACES – SDI I/O interface – **De-Embedder**
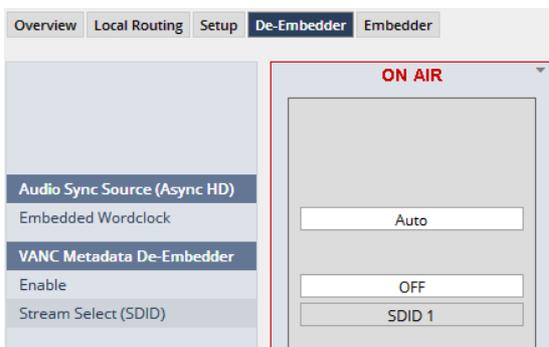
Audio Sync Source (Async HD) — The HD SDI standard allows for asynchronous audio. This critical if you have decided to synchronize the device on such signal. Here you find a solution. You may either use the embedded word clock

Embedded Word Clock — [Auto / De-Embedder CH1 (DEM 1) / OFF
OFF = synchronized to the SDI carrier

Auto = In case of a-sync audio it is synchronized automatically to the SDI carrier
DEM1= from de-embedder channel 1

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Setup GUI – INTERFACES – SDI I/O interface – **Embedder**

| Overview | Local Routing | Setup | De-Embedder | Embedder |

ON AIR

Audio Embedder
Delete Existing Data	OFF
Group 1 Mode	AUTO - Embedding
Group 2 Mode	AUTO - Embedding
Group 3 Mode	AUTO - Embedding
Group 4 Mode	AUTO - Embedding
AES Channel Status (All)	Professional

VANC Metadata Embedder
Enable	OFF
Delete Existing Metadata	OFF
Stream Select (SDID)	SDID 1
Video Line	AUTO

Embedder Audio Delay
SDI OUT G1 CH1 (ms)	0.0000
SDI OUT G1 CH2 (ms)	0.0000
SDI OUT G1 CH3 (ms)	0.0000
SDI OUT G1 CH4 (ms)	0.0000
SDI OUT G2 CH1 (ms)	0.0000
SDI OUT G2 CH2 (ms)	0.0000
SDI OUT G2 CH3 (ms)	0.0000
SDI OUT G2 CH4 (ms)	0.0000
SDI OUT G3 CH1 (ms)	0.0000
SDI OUT G3 CH2 (ms)	0.0000
SDI OUT G3 CH3 (ms)	0.0000
SDI OUT G3 CH4 (ms)	0.0000
SDI OUT G4 CH1 (ms)	0.0000
SDI OUT G4 CH2 (ms)	0.0000
SDI OUT G4 CH3 (ms)	0.0000
SDI OUT G4 CH4 (ms)	0.0000

Preset load save

Audio Embedder — Here you set the general functions of the embedder

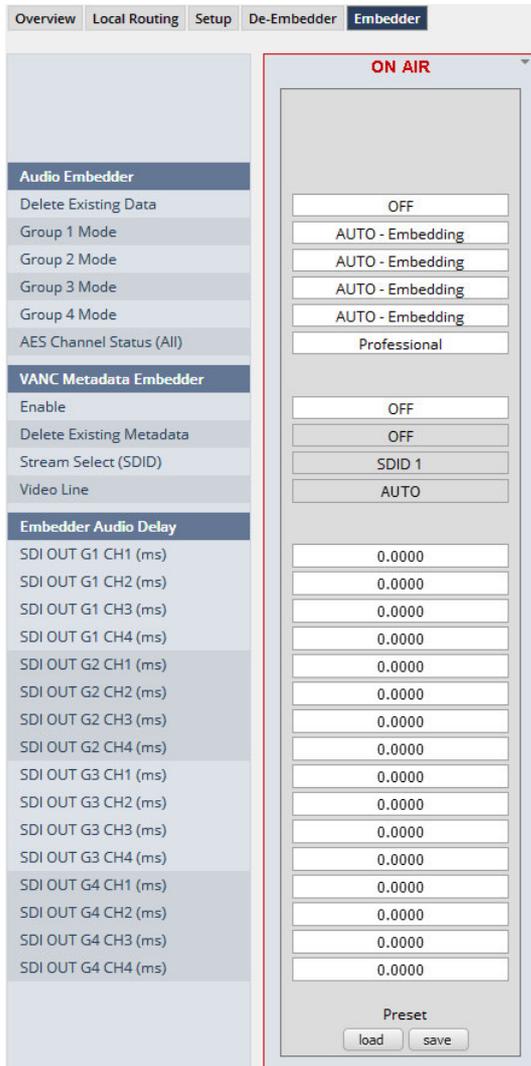**Delete Existing Data** [ALL – New HANC Structure / OFF]

Group 1 – 4 Mode [OFF / AUTO – Embedding / AUTO – Replace Audio / Delete]
See SDI I/O Interface > Overview For details

AES Channel Status [Transparent / Professional]
In case of Professional these values are used:

Format:	Professional
Audio Mode:	[Audio / Non Audio]
Emphasis:	None
Freq. Mode:	Locked
Sample Freq.:	48kHz
Channel Mode:	Not Indicated
User Bits:	None
Auxiliary Bits:	24Bit
Audio Word Length:	Not indicated

Important note! If you generate a new AES channel status the **Audio Mode** will be automatically set to **Non Audio** (AKA "other") for both channels, if an adjacent pair (1/2, 3/4 …..) carries a Dolby E stream for example.

VANC Metadata Embedder — The embedder can insert one Dolby metadata stream into the Vertical Ancillary Data

Enable [ON / OFF]

Delete Existing Metadata [All / OFF]

Stream Select (SDID) [SDID 1 … SDID 9]

Video Line [Auto / 9 … 44]
The line number depends on the actual video standard 8how many VAN lines are available for data insertion.

Embedder Audio Delay — Each embedder signal may be delayed independently. This may be useful for Lips Sync alignment if a video delay is used.

Important Note! You must take care that for Dolby encoded signals the adjacent pairs must be set to the same delay values not to destroy the data structure.

SDI OUT G1 CH1 (ms) [0.0000 … 340.000]

to

SDI OUT G4 CH16 (ms) [0.0000 … 340.000]

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Setup GUI – INTERFACES – MADI Interface – **Status** / **Setup**

The implementation of MADI for the **D*AP8** is based on the option module O_DAP_MB (BNC) or
O_DAP_MO_MM (MADI optical multi mode fiber) or O_DAP_MO_SM (MADI optical single mode fiber).
Since the **MAP** is an eight channel processing device not all 64 MADI channels are available for device I/O.
The first 16 channels are available via the MADI local router to the device router.
They appear at the device router pane as MDIN 1 .. 16 and MDOUT 1 … 16.
These channels can be routed to and from any of the local routing sources MADIRX 1 … 64
and MADITX 1 … 64 respectively.
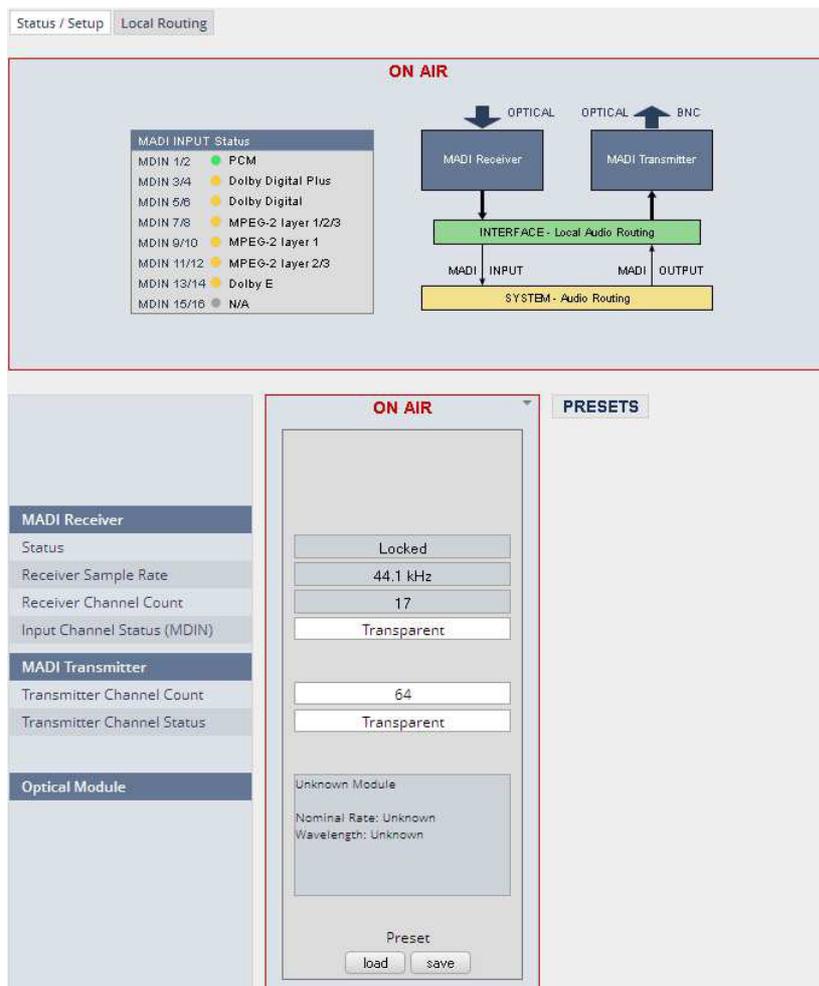
MADI Receiver

Status	[Locked / Locked-Async / Error] The timing of the audio decoding is locked to the MADI clock. If the internal timing of the **D*AP8** is different "Locked-Async" is displayed.
Receiver Sample Rate	[44.1 / 32 / 48 / 88.2 / 96kHz / Unknown] The measured sample rate from the received MADI stream.
Receiver Channel Count	[32 / 56 / 64] Depends on the upstream MADI transmitter settings.
Input Channel Status (MDIN)	[Transparent / Professional] One may overwrite the input channel status by a set of professional ones.
Channel Mapping @ 96 kHz	[Normal]

D*AP8 MAP

MADI Transmitter

Transmitter Channel Count	[64 (32) / 56 (28)] Depends on the internal sample rate and the desired number of MADI channels. The numbers in brackets are valid for 96kHz.
Transmitter Channel Status	[Transparent / Professional]
Channel Mapping @ 96 kHz	[Normal]

Setup GUI – INTERFACES – MADI Interface – **Local Routing**

Below are some excerpts from the local routing pane. Single channels from or to the **D*AP8** may be connected with the MADI transmitter or MADI receiver respectively.
The example below shows the first eight MADI channels from the receiver (MADI RX 1 … MADI RX 8) connected with the device inputs **SYSTEM - MADI INPUT** (MDIN 1 … MDIN 8):
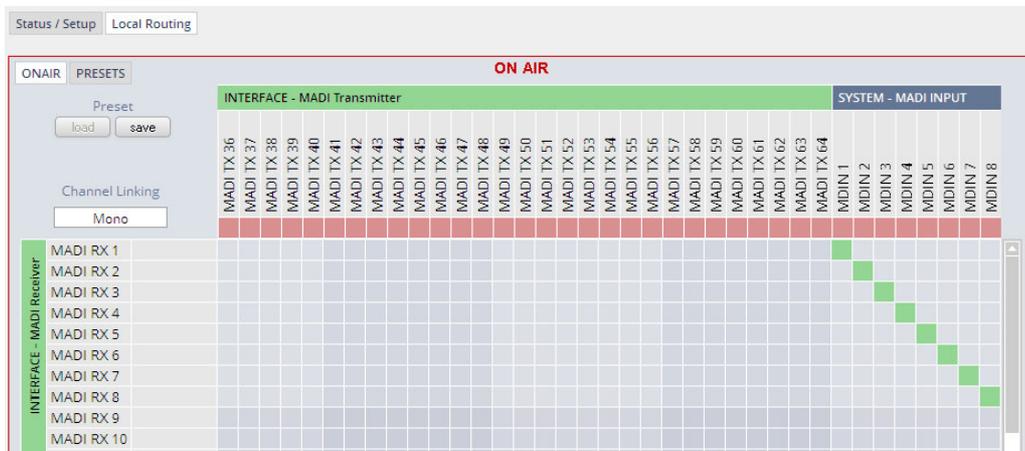
The **Local Routing** pane can also be used to route MADI signals from the receiver directly to the transmitter and vice versa:

You can also assign device outputs (MAOUT 1 … MDOUT 16) to MADI transmitter channels
For better visibility the matrix has been divided by cutting off the middle part:
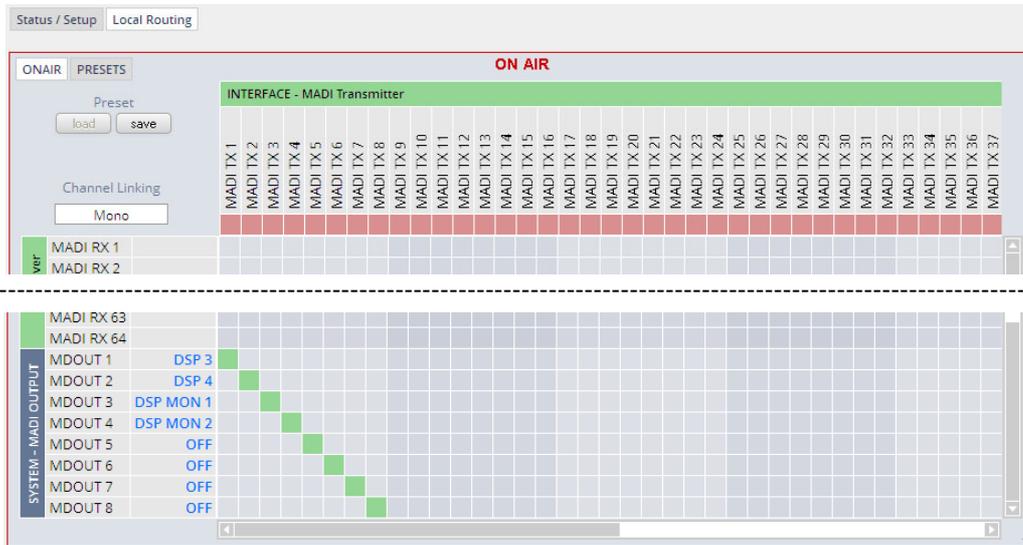
You must use the scroll bars to navigate through the huge matrix.

Setup GUI – INTERFACES – Dante I/O Interface – **Status**

The DANTE interface connects a **D*AP8** to an audio over IP (AoIP) network. Junger Audio has committed itself to the quasi industry standard **DANTE** developed by the company **Audinate**.

"Based on industry standards, Audinate created Dante, an uncompressed, multi-channel digital media networking technology, with near-zero latency and synchronization … One cable does it all. Dante does away with heavy, expensive analog or multicore cabling, replacing it with low-cost, easily-available CAT5e, CAT6, or fiber optic cable for a simple, lightweight, and economical solution. Dante integrates media and control for your entire system over a single, standard IP network."

The network infrastructure for AoIP must be able to handle the IP multicast. The recommendation is to separate the control network from the audio network.

For details pls. refer to the Audinate web-site: https://www.audinate.com. Here you will find many useful application videos and FAQs.

To configure such an audio network you need the **DanteController** software. You can download it from the **Audinate** web site. People who want to interface a PC or MAC to such an audio network can use the **VirtualSoundcard** software from **Audinate**. It provides standard audio drivers to connect with common sound tools.

We highly recommend to read the **Audinate** documents to understand how to set-up and operate a real-time **AoIP** network.

Looking at the rear panel the RJ45 connector on the left is the primary port while the second connector acts either as a redundant or as a switch port. Both RJ45s have built in LEDs. The left one shows network activities (flashing green) while the right one indicates the interface speed, with **green=1Gbit/s** and **off=100MBit/s**.

Below is the Status page of the **DANTE** interface board:

The parameters you see here must be set via the **DanteController** software.

Dante

Device Name	The name you gave the interface board via the **DanteController**.
Primary Network Status	[Offline / Connected + bandwidth]
Secondary Network Status	[Offline / Connected + bandwidth]

Clock Synchronization

Mute Status	[OK (Unmuted) / Muted]
Sync Source	[Dante Network / DA*P is Master] Here you define the reference clock for this **DANTE** module.

Important Note! If this parameter is set to "Dante Network", the **MAP** must be synchronized to the same clock as the network clock master (whoever it is). It **must** be set to "Dante Network" if this module is to become the "Preferred Master" of the network.

Sync Status	[Unlocked / Locked / Locked-Async] The sync source for the **DANTE** interface is the **DANTE** network. If no network cable is connected the interface is "Unlocked". If it is connected to a network it will be "Locked". If the **D*AP8** is set to synchronize to other than the **DANTE** interface it will show "Locked-Async".
Preferred Master	[No / Yes] The Dante algorithm automatically looks for the best clock master inside the network but one may force a **DANTE** module to become the clock master.
Network Audio Sample Rate	[44.1 kHz / 48 kHz / 88.2 kHz / 96 kHz] Depending on the A*P device type the sample rate is limited to the device specification.
Device Latency Setting	[1000 µs] You can allow for a certain transmission latency if you face network problems of any kind.

Setup GUI – INTERFACES – Dante I/O Interface – **Inputs**

The **DanteController** software gives you an overview of all members of such a **DANTE** network.
You can assign channel labels for the inputs (from the network to the device interface). Those labels will automatically appear in the **D*AP8** and will be displayed there.

Here is a glimpse on the GUI of the **DanteController**:
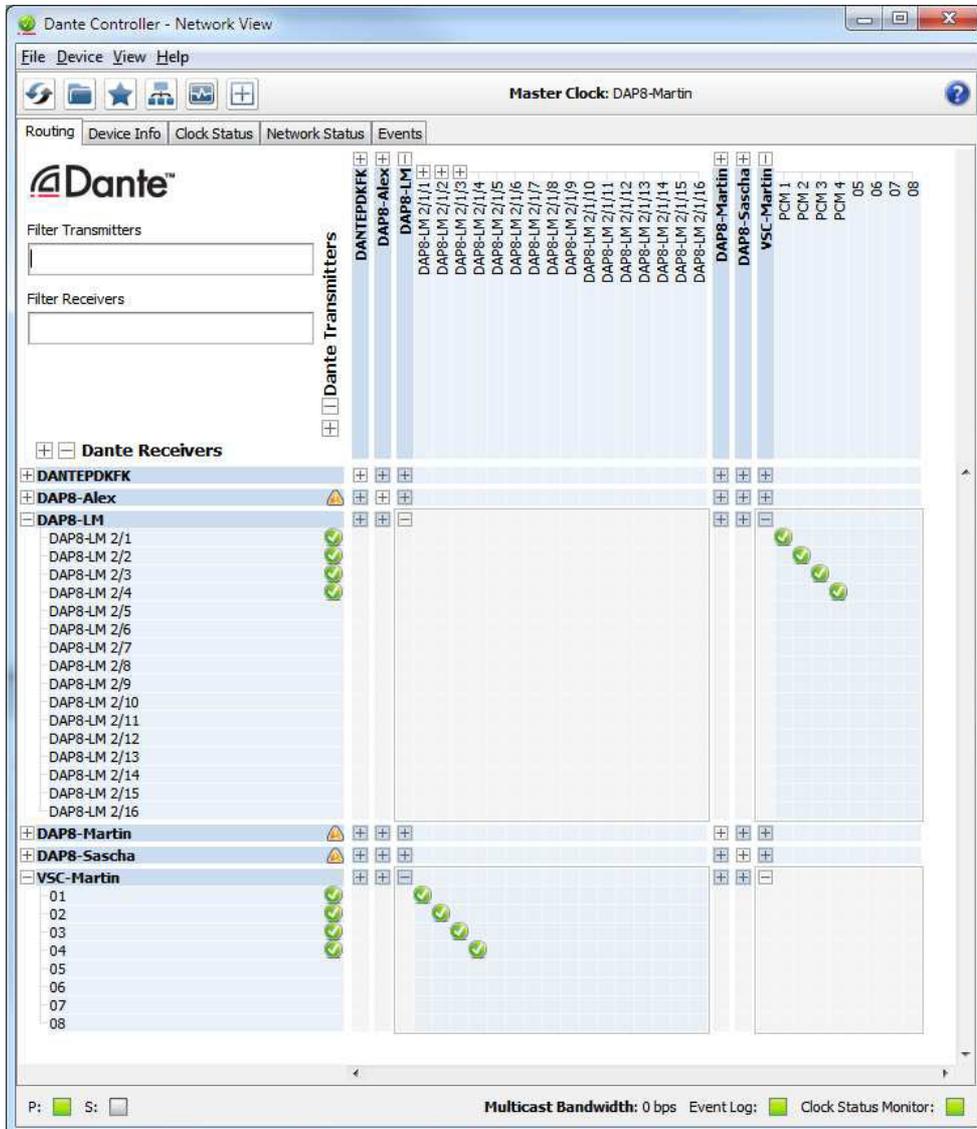
As an example you see here a "DAP8-LM" (name given by the Dante Controller) that has assigned the labels DAP8-LM 2/1 … 2/16 for the inputs and DAP8-LM 2/1/1 … 2/1/16 for the outputs.
For the outputs you can assign up to 16 different labels used for multi layer routing.

Beside a few more devices on that network, we see the unfolded outputs of a **DanteVirtualSoundcard** (VSC) named **"VSC-MARTIN"** on the upper right hand side. The top horizontal area shows the transmitters while the receivers are shown vertically on the left hand side.

The outputs PCM 1 … PCM 4 from the VCS are assigned to the **D*AP8** inputs DAP8-LM 2/1 … 2/4 while four outputs DAP-8 LM 2/1/1 … 2/1/4 are assigned to the VSC inputs 01 … 04.

D*AP8 MAP

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We see the labels assigned by the DanteController software in the "Channel" column:

Inputs	16 inputs are pre-defined for the **DANTE** interface installed in a **D*AP8**. They are organized in pairs and the input status is shown by soft LEDs (green = PCM audio / yellow = non audio/ grey no audio).
Channel	The labels assigned to that channel by the **DanteController.**
Connected	The source of the audio signal.
Status	[No Subscription / Subcription Unresolved / Wait / Naming Problem / Loopback / Idle / Subscription in Progress / Connected (Unicast) / Connected (Multicast) / Manual Config / Format Problem / QoS Problem / Latency Problem / Clock Domain Problem / Link Down / Fail / Unknown] The DANTE module provides very detailed status information. In regular operation one will not see much of it.

Setup GUI – INTERFACES – Dante I/O Interface – **Outputs**

Outputs	The signals from the **DANTE** board to the network. They will also appear in the device **ROUTING** section.
Channel	Numeric count of the channels.
Channel Label	Up to 16 labels can be assigned for each stream from the interface to the network.
	When you hover with the mouse over the channel labels, you will get a tool tip that that shows the other (if any) labels assigned to the same outputs assigned fro multi layer routing.

Setup GUI – INTERFACES – Dante I/O Interface – **Network**

Dante Redundancy   The DANTE interface allows redundant network operation. Pls. refer to manufacturer's documentations of your Ethernet equipment on supported switching configuration and redundant operation.

Mode [Switched / Redundant]

Redundant – The interface will duplicate the audio traffic to both Ethernet ports. Both ports must have different IP addresses.

Switched – The secondary port behaves like an Ethernet switch port allowing daisy-chaining through the interface. I.e. IP configuration of the second port is only available for redundant mode.

Important Note! When set to switched mode, do **not** connect both ports to the same network (same Ethernet switch) if it does not support STP (Spanning Tree Protocol). This is the case for most of the off-the-shelf (office) switches. Doing so will cause a race condition where IP packets are circling around from the external switch to the second DANTE (switch) port and back via the first port. This will tear down your network and may create a bunch of new "friends" in your facility.

Primary Address Setup Setup of the primary network interface

   Network Status [Offline / Connected + bandwidth]

   DHCP – Automatic IP Config. [OFF / ON]

   IP-Address

   Netmask

   DNS Server

   Gateway

   MAC Address

Secondary Address Setup Setup of the secondary network interface

   Network Status [Offline / Connected + bandwidth]

   DHCP – Automatic IP Config. [OFF / ON]

   IP-Address

   Netmask

   DNS Server

   Gateway

   MAC Address [unknown / address]

Setup GUI – INTERFACES – **8 Ch Analog Out Interface**
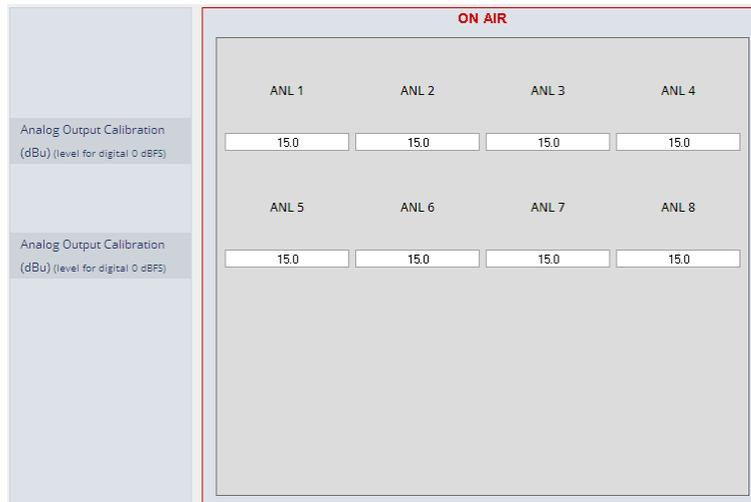
|	
Analog Output Calibration (dBu) (level for digital 0 dBFS)	sets the factor for D/A conversion
ANLx (dBu)	[0.0 … 15.0 … 24.0] output level for output "x" at 0dBFS. The default setting of 15.0dBu correlates to the 6dBu = -9dBFS conversion.

Setup GUI – INTERFACES – **4 Ch Analog I/O Interface**

An additional analog interface can be installed in the **Interface** slot.
It provides 4 additional analog line inputs and outputs on a 25pin D-Sub connector:
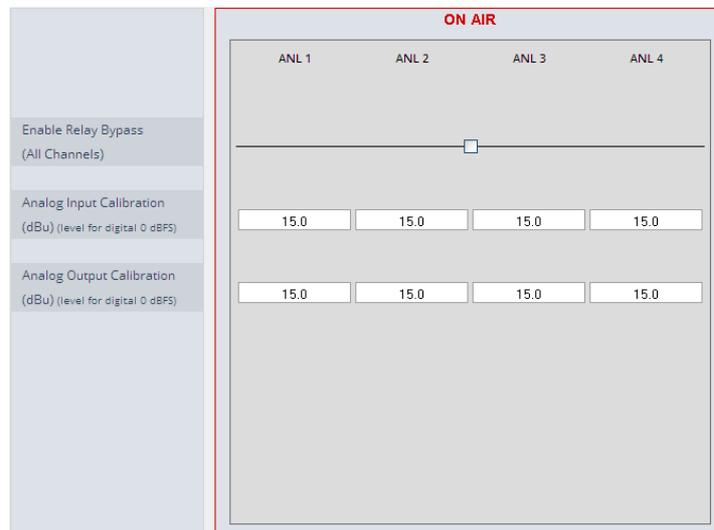
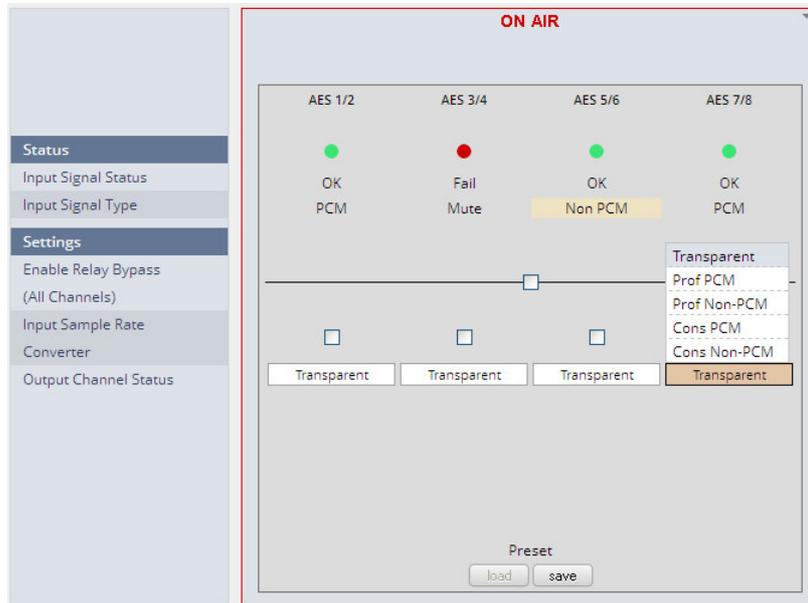|	
Enable Relay Bypass (All Channels)	[ON / OFF] Power fail bypass relay that may be activated from the GUI
Analog Input Calibration (dBu) (level for digital 0 dBFS)	[0 … 15.0 … 24.0] A/D conversion parameter. It defines the analog input level in dBu to reach a digital full scale signal.
Analog Output Calibration (dBu) (level for digital 0 dBFS)	[0 … 15.0 … 24] D/A conversion parameter. It defines the analog output level in dBU for a digital full scale signal.

D*AP8 MAP

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Setup GUI – INTERFACES – AES Interface – **Status** / **Setup**

An additional AES3 interface can be installed in the **Interface** slot.
It provides 4 additional AES3 inputs and outputs on a 25pin D-Sub connector:

Status

Input Signal Status	green [OK] / red [Fail]
Input Signal Type	[Mute / PCM / Non PCM]}

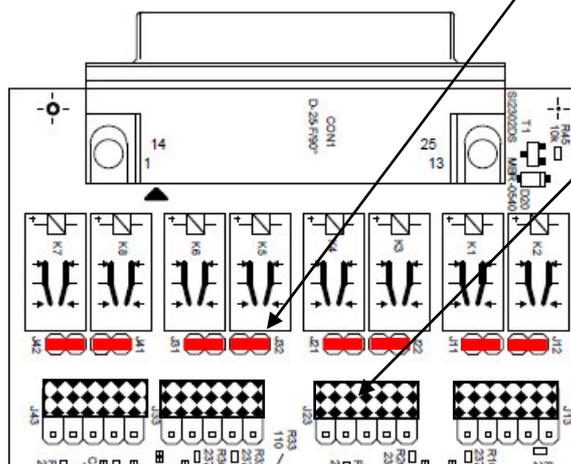**Settings**

Enable Relay Bypass (All Channels)	[ON / OFF] Power fail bypass relay that may be activated from the GUI
Input Sample Rate Converter	[ON / OFF]
Output Channel Status	[Transparent / Prof PCM / Prof Non-PCM / Cons PCM / Cons Non-PCM] Controls the channel status for the AES output. It provides a set of useful channel status information (e.g. to prevent non audio signals to be fed to speakers).

Important note! The AES relay bypass circuit of the I/Os is activated on the option board. It is possible to deactivate it if necessary. You must open the cover plate from the **D*AP8** unit and locate the jumper shown in the schematic below. You must remove the jumpers ● to de-activate the AES I/O relay power fail circuit.

The bulk jumpers J13, 23, 33, 43 at the bottom of the picture are meant for setting the I/Os to unbalanced operation.

Putting them into the lower position will turn to unbalanced.
Factory default setting is balanced.

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Setup GUI – **ROUTING**

This is the core of the **D*AP8 MAP** because it defines the audio signal flow inside the device:

Each functional block of the device has a source- and a destination-label.
Vertically at the left hand side you will find the outputs of function blocks / hardware interfaces.
The labels are organized hierarchically. I.e. we have source group names like SPEAKER OUTPUT, AES INPUT etc. and single channel (AKA mono) signal labels like **DEMx** [x=1 … 16] for the SDI de-embedder or **SPKRx** [x=1 … 8] for the speaker outputs of the audio processor**.**

Horizontally at the top of the ROUTING pane you will find the group names for destinations like PRIMARY INPUT, AES OUTPUT etc. and their respective single channel labels like **PRIMx** [x=1 … 8] for the first 8 audio processor inputs or feeds to the hardware interfaces, like **AESx** [x=1 … 8] for the AES outputs.

If applicable the labels have bluish dynamical signal descriptors [e.g. **1L / 1R / 1C** and so forth].

Green quads show active cross points. Due to the number of I/Os in total one must scroll through the matrix to set or disable cross points. To give you an indication while scrolling of which outputs have an active connection, red quads are shown in the top of the matrix beneath the output labels .

The matrix is organized for single channel (AKA mono) routing but it may also be controlled in 2-channel (AKA stereo) mode:

Cannel Linking   [mono / stereo]
You may set cross points either in mono mode or pair wise for stereo routing

D*AP8 MAP

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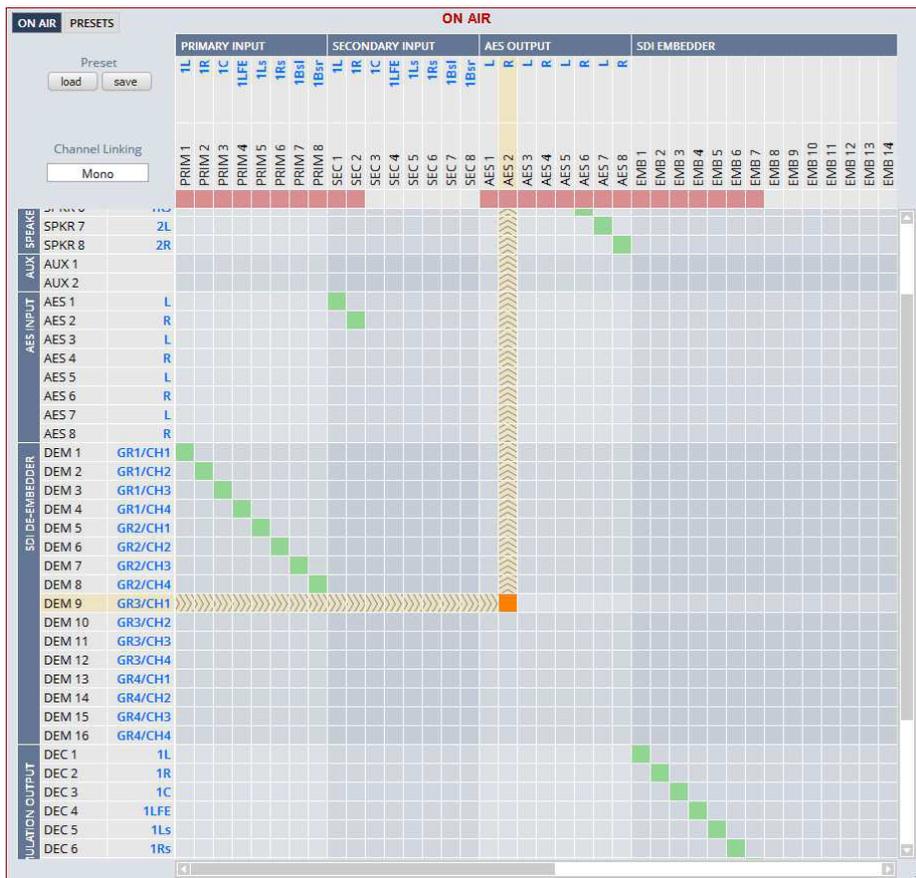
Due to the size of the graphic you must select between **<ONAIR>** and **<PRESET>** view in the upper left corner.

Important Note! If a different optional interface board is installed the matrix will be expanded by the pre-defined number of I/Os for the **D*AP8 platform** with their labels:

Signal:	Option board:	Input label:	Output label:
SDI	[O_DAP_SDI_a]	**DEM 1 … DEM 16**	**EMB 1… EMB 16**
MADI	[O_DAP_MB_a / O_MO_MM_a / _MS_a]	**MDIN 1 … MDIN 16**	**MDOUT 1 … MDOUT 16**
Dante	[O_DAP_Dante_a]	**DTIN 1 ... DTIN 16**	**DTOUT 1 ... DTOUT 16**
4 Ch ANALOG I/O	[O_DAP_ADDA_a]	**ANL 1 … ANL 4**	**ANL 1 … ANL 4**
8 Ch ANALOG out	[O_DAP_8DA_a]		**ANL 1 ... ANL 8**
AES	[O_DAP_AES_a]	**AES 1 … AES 8**	**AES 1 … AES 8**
Dolby Decoder	[O_DAP_Dolby_DEC_b]	**DEC 1 … DEC 10**	**DEC 1 … DEC 8**
Dolby E Encoder (A)	[O_DAP_Dolby_EENC_b]	**ENC 1 … ENC 8**	**ENC 1/ENC 2**
Dolby D Encoder (B)	[O_DAP_Dolby_DENC_a]	**ENC 1 … ENC 8**	**ENC 1 … ENC 4**
Dolby E Encoder (B)	[O_DAP_Dolby_EENC_a]	**ENC 1 … ENC 8**	**ENC 1/ENC 2**

Source label

SPKR x	Outputs of the audio processor (DSP)
AES x	Outputs from the hardware AES receiver on the motherboard
DEM x	Outputs of the SDI local routing matrix
MDIN x	Outputs of the MADI local routing matrix
DTIN x	Outputs of the Dante Interface
DEC x	Output of the optional Dolby decoder / emulation board
ENC x	Output of the Dolby encoders

Destination label

PRIM x	Primary inputs of the audio processor (DSP)
SEC x	Secondary inputs of the audio processor (DSP)
AES x	Inputs of the AES transmitters on the motherboard
EMB x	Inputs of the SDI Local Routing matrix
MDOUT x	Inputs of the MADI local routing matrix
DTOUT x	Inputs of the Dante Interface
DEC x	Input of the optional Dolby decoder / emulation board
ENC x	Inputs of the optional Dolby encoders

Mouse over	Pls. see "Setup GUI – INTERFACES – SDI I/O interface – **Local Routing"** for details.

Setup GUI – **DOLBY PROCESSING** in general

The Dolby metadata system is quite complex to describe in detail in a product manual such as this.
If you are not familiar with it, we recommend you study the many publications from **Dolby Inc.**
Especially the **Dolby Metadata Guide** is essential for understanding the parameters.
For details please visit the Dolby web site:

http://www.dolby.com/gb/en/professional/technology/landing.html

We cannot guarantee that the link is active forever so you may browse other Dolby resources as well.
Specifically concerning metadata we also recommend the SMPTE document RDD6-2008.

So we must assume that you are familiar with this topic.

Metadata emulation means that Dolby metadata will be applied to listen to the effect of it without the need
for encoding / decoding that may become a costly setup and introduces a lot of latency.

The aim is to check the influence of the **Dialnorm** (dialog normalization) value and the **DRC**
(dynamic range control) settings.

Important Note! The **D*AP8** platform is designed to operate an "all Dolby format" decoder and two
independent encoders **A** and **B**. Encoder **B** can be consumer format (D-D, D-D+, AAC) **or** Dolby E
professional while encoder **A** can be a second Dolby E. All solutions are based on the **D*AP8** options
model and require extra hardware and/or licenses.

Setup GUI – DOLBY PROCESSING – **Decoder/Emulation**

The Decoder/Emulation functions are built from the Dolby OEM board **CAT1100.**
The graphic below illustrates the signal flow through it.

Important Note! The module **must** be routed into both the audio- **and** the metadata-signal paths.
In order to decode a Dolby stream you **must** feed it to input **DEC1/2**.
The metadata must be routed by the metadata router: **DOLBY PROCESSING > Metadata > Routing**.

The page embedded graphic shows the building blocks of the CAT1100 module. On the left hand side
you have the decoding blocks, a signal router in the middle, and on the right hand side you have the
downmix and the emulation part. You also can see the actual signal flow and their labels depending on
the input signal status.
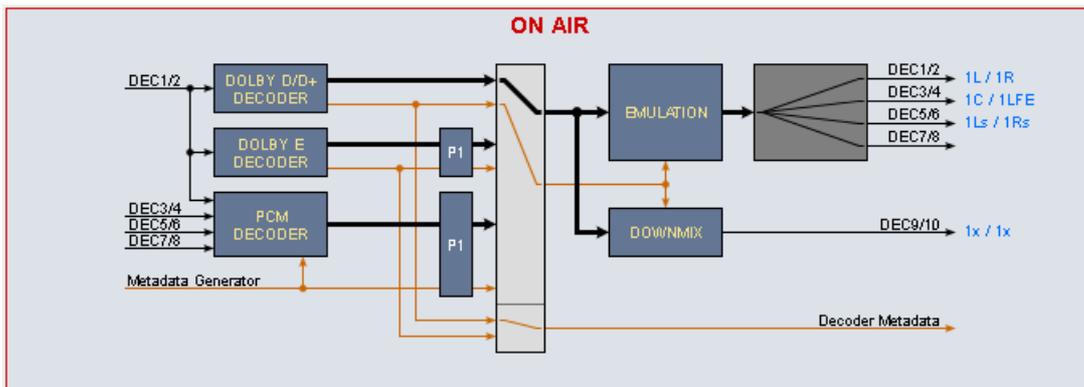
The emulation of the influence of metadata can be performed only on one program at a time.
In the above case program 1 **"P1"** is pre-selected for emulation. But the signal is actually coming from
the D/D+ decoder because a **D+** signal is present at DEC 1/2 input and will be decoded automatically.
The metadata set of the **D+** stream has a channel mode of **3/2.** Therefore the output labels show a
surround signal **1L/1R**, **1C/1LFE**, **1Ls/1Rs**, while the downmix output label is **Lx/Rx**.

If you feed PCM signals you have the setup mostly used for live or post pro mixing. The **MAP** may be
connected to a monitoring insert of the mixing desk. The sound engineer can now switch between his
mix and the emulated version of his surround mix or the downmix of it. He may now change DRC and
downmix metadata by the generator to see how it would sound at home.

But he can also use external metadata from 9-pin input or from a SDI VANC stream which are routed to the metadata generator.
(see DOLBY PROCESSING > Metadata > Routing > Metadata Destination = D.Sub In).

Similar applies if one wants to listen to the influence of metadata from encoded streams.
A professional decoder would normally not apply metadata to the decoded audio as a TV set or a STB implementation would do. With emulation you can listen to it. This example shows a **Dolby E** decoding situation with **metadata** for **emulation** coming from
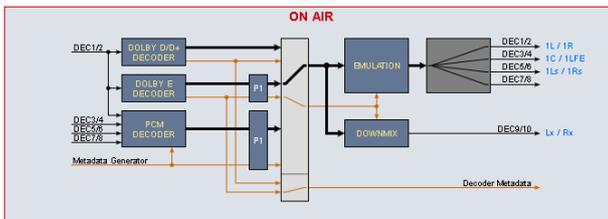
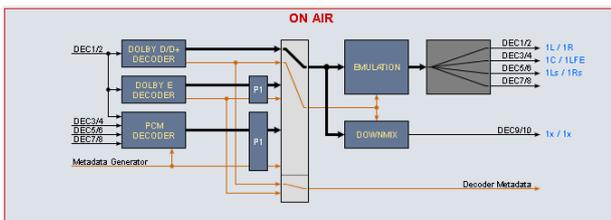the decoder: and alternatively from the generator:
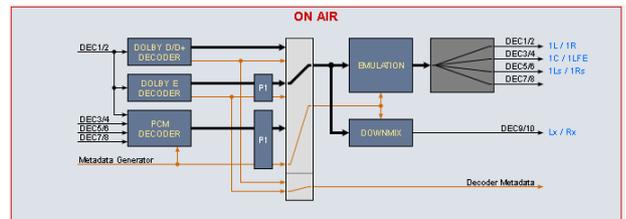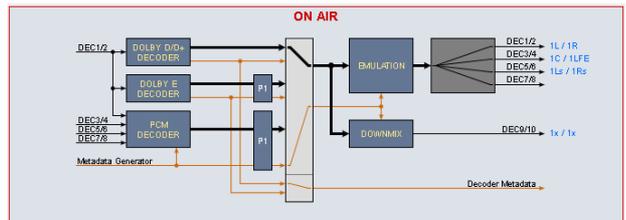

The right hand scenario allows for partially or fully overwriting the encoded metadata
(see DOLBY PROCESSING > DECODER/ EMULATION > Emulation > MD Generator overwrites encoded Metadata = ON)

Same applies to Dolby D / D+ decoding.

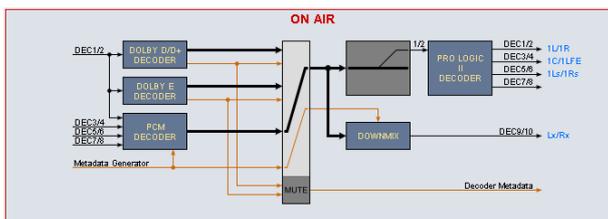Metadata from decoder: metadata from generator:


A special application is **Dolby Pro Logic** decoding. The **Pro Logic** technology does not have metadata like its younger digital family members. So in case a **Dolby Pro Logic** signal must be evaluated it will be passed straight through to the **Pro Logic** decoder.
But you may also listen to the Lt/Rt downmix (the Pro Logic format) by decoding it.

Decoding of **Pro Logic** from PCM input: Pro Logic decoding from a D-E stream:
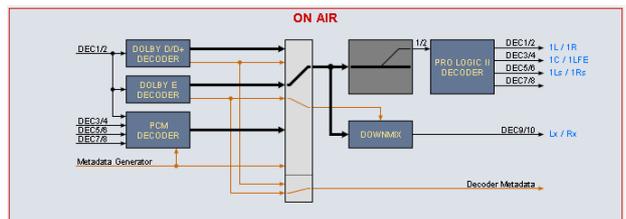
The configuration at the right hand side will only work if the channel mode of the selected program is 2/0. It will be used if the **Dolby Surround Mode** is set to **"Dolby surround encoded"** and one wants to listen to the decoded surround signals.

The **D*AP8** distinguishes between two major modes: **Decoding** (only) and **Decoding/Emulation**.
For the decoding part we have pre-settings for each decoding type. The format detection is automatic so the desired general settings like DRC modes must be set manually prior to decoding.

Important Note! For parameter consistency reasons the preset editor can only be used for the respective active mode of the ON AIR area. If the preset active mode does not match the one from ON AIR, preset set-up is disabled and you will get the message **"Setup not available for this mode"**.

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Setup GUI – DOLBY PROCESSING – Decoder/Emulation - **Decoder**
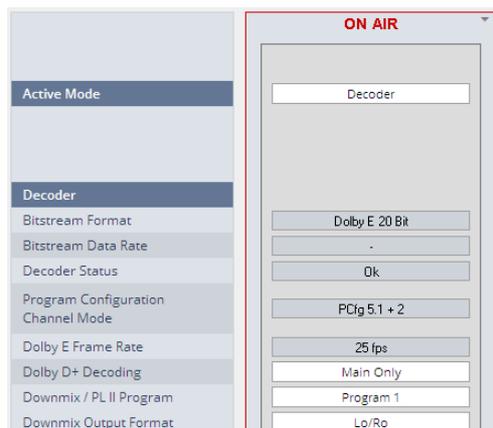
Active Mode	**= Decoder**
Decoder	
Bitstream Format	[PCM / Dolby E 16/20/24 Bit Dolby Digital / Dolby Digital plus (I0, I0D0, I0I1, I0D0I1)] where Ix and Dx stands for independent and dependent sub stream IDs
Bitstream Datarate	[of a D-D or D-D+ stream]

|	
Decoder Status	[OK / Fail]
Program Configuration Channel Mode	[in case of D-E] [in case of D-D / D-D plus]
Dolby E Frame Rate	[detected by the D-E decoder]
Dolby D+ Decoding	[Main Only, Mixed Main & AD, AD Only] Dolby Digital plus supports associated services like the provision of extra **dialog** or sending an audio descriptive (AD) track for **visually impaired** people or allows for separate **commentary** etc. that may be mixed automatically or by user intervention (depending on the consumer decoder implementation). This selection allows you to listen to the main program only, the main and the associated audio description (AD) signals mixed together or the associated audio descriptive (AD) signal only. It works only for streams where two **Dolby Digital plus** elementary streams are multiplexed (AKA single PID operation). For dual PID streams you may listen to the main and the associated signals independently only, because the Dolby OEM module has only one decoder input.
Downmix / PL II Program	[Program 1 / Program 2] Selects the program for downmix or PL II decoding. The drop down field becomes red colored if there is no second program available (e.g. PL II decoding from a D-D / D-D+ stream).
Downmix Output Format	[AUTO / Lt/Rt / Lo/Ro / Pro Logic II] AUTO=from Metadata, Lt/Rt (Pro Logic encoded), Lo/Ro (Stereo), Pro Logic II encoded.

The decoding functions of the **D*AP8** are implemented to meet all possible applications in the field. Besides monitoring for QA, broadcasters use decoded consumer format (D-D/D+) streams for turn around or backup applications. On the one hand they receive it from suppliers to add content to their bouquet and on the other hand they must maintain older distribution systems (cable head ends) which are based on AC3 encoding but (e.g.) are fed by D-D+. So often they can not / will not rely on the received Dialnorm / DRC settings because they prefer to add automatic levelling and standard DRC settings to all signals to have seamless loudness across their bouquet. That's why we offer to skip DRC & Dialnorm if it makes sense for the application.

Important Note! Metadata will be applied to the downmix output at any time. Either from the decoder or from the MD Generator (if input format is PCM). The selection is only regarding the DRC profile which will be used.

D*AP8 MAP

General settings are available for each of the possible input signal types (Dolby D/D+ / Dolby E / PCM):
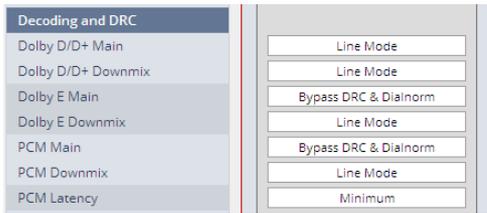
Decoding and DRC

    Dolby D/D+ Main   [Bypass DRC & Dialnorm, Apply Dialnorm Only Line Mode, RF Mode, Mute Dolby D/D+] This is a common setting for both D-D or D-D+.

D/D+ Downmix	[Line Mode, RF Mode]
Dolby E Main	[Bypass DRC & Dialnorm / Mute Dolby E]
Dolby E Downmix	[Line Mode / RF Mode]
PCM Main	[Mute PCM / Bypass DRC & Dialnorm]

Mute PCM is useful if one expects corrupted Dolby E blocks (if one runs a VTR or a switching device upstream is expected not to switch within the Dolby E guard band). In this case other than decoded Dolby E will not be audible.
**Bypass DRC & Dialnorm** must be used as an alternative setting (Mute PCM=OFF).

PCM Downmix	[Line Mode / RF Mode]
PCM Latency	[Matched, Minimum]

ProLogic II Decoding

There are a lot of **Pro Logic** / **Pro Logic II** consumer decoders installed and a lot of archived footage still has this sound track format. If you either must check such existing tracks or eventually produce such a sound track using the **Dolby DP563** (Pro Logic II encoder), you may also listen to the decoded signal via the **D*AP8**.
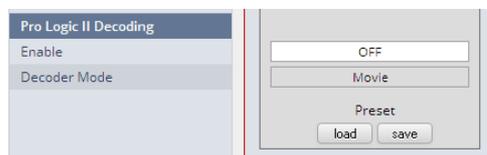
Pro Logic II Decoding

    Enable   [OFF / ON]
When you hover with the mouse over that pull down, a hint will be displayed:

Pro Logic II decoding requires an input signal with Channel Mode 2/0

    Decoder Mode   [Movie / ProLogic Emulation]

Setup GUI – DOLBY PROCESSING – Decoder/Emulation – **Decoder & Emulation**

For emulation five more parameters are available:

    Active Mode   = Decoder & Emulation

    Program Select   [Program 1 … Program 8]
SMPTE RDD6 standard defines up to 8 independent programs. For the emulation process you must select one program at a time.

Pls. refer to the **Decoder > Program Configuration** to see how many programs belong to an actual Dolby E stream.

Emulation

Unity Gain Mode
[OFF / ON]
For applications like live mixing or others where the level must not be changed but listening to the influence of DRC is desired.

MD Generator overwrites encoded Metadata
[OFF / ON]
If you want to see how different metadata will "sound" for already encoded signals you may decode it and apply different ones to it.

Decoding and DRC
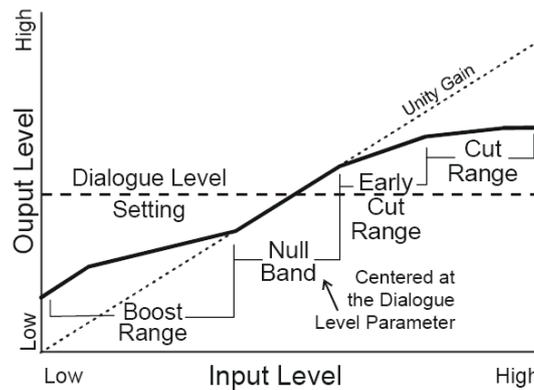
Custom Mode Boost Factor
[0 … 0.5 … 1]
If you want to check out different DRC behaviour from the defined profiles you may set the lover level boost factor here.

Custom Mode Cut Factor
[0 … 0.5 … 1]
If you want to check out different DRC behaviour from the defined profiles you may set the higher level cut factor here.

Here a simplified DRC characteristic curve, published by Dolby®:

Important Note! Dolby Digital and Digital plus encoded streams do **not** contain metadata for DRC but pre-calculated gain words which may be applied to the decoded audio to decrease dynamic range for home reproduction. That's why you will **not** get a display of such metadata from the **Input** if consumer format streams are decoded. Similar applies to the professional metadata which is used to setup consumer format encoders (e.g. filters) and which is not present in the metadata stream as well.

Status display of **Decoder/Emulation** / **Encoder A** / **Encoder B** / **Metadata** (soft LEDs)

Green	* Dolby encoded stream at the input * Metadata valid from the generator
Orange	* Dolby E frame rate mismatch * MD generator has entered the reversion mode * Dolby E encoder has entered the reversion mode
Red	* If the decoder receives corrupted (e.g. asynchronous) or no metadata * Internal error

Important Note! If no input metadata is available for PCM emulation and you tick a **<Follow Input>** checkbox, the generator enters the reversion mode as well.

D*AP8 MAP

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Setup GUI – DOLBY PROCESSING – Metadata – **Routing**

The center of the **D*AP8** Dolby processing is the **Metadata Processor**. It can be the point of origin of metadata but it may also modify existing metadata from available sources:
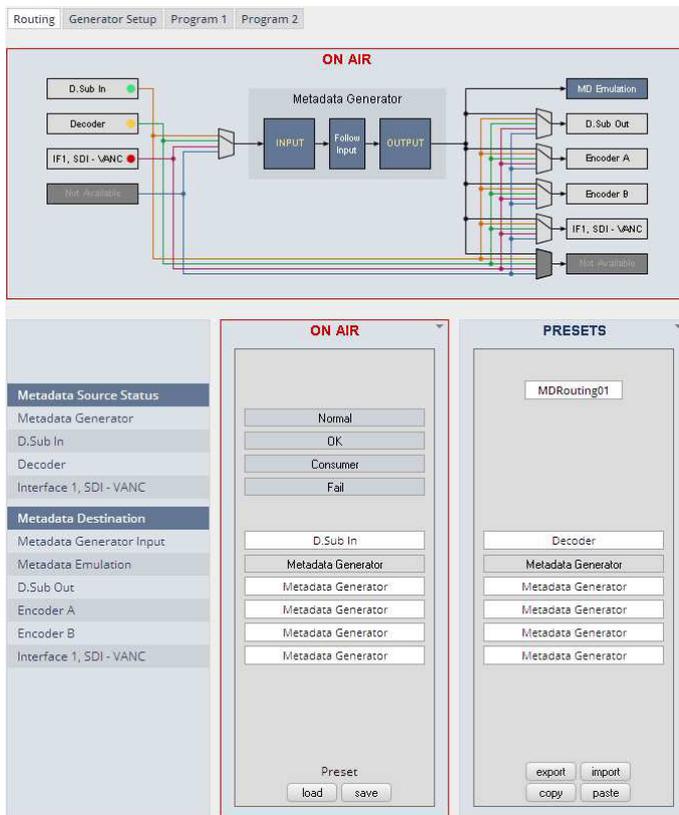
The metadata processor of the **D*AP8** has a maximum of seven metadata destinations and four sources which can be routed individually.

The **Metadata Generator** in the middle can run independently but may take metadata from an available source at the **"Input"**, may select some or all of it in the "**Follow Input**" section and present a complete set of metadata at the "**Output**".

Metadata Source Status - colors
The respective soft LED turns **red** if **no** metadata is present or the metadata are corrupted.
It turns **green** if a **RDD 6** compliant metadata stream is detected.
It turns **yellow** if an AC3 or similar (D-D+) signal is decoded.

Metadata Source Status
[OK / Consumer / Fail / Not Available]
The word "**CONSUMER"** will be displayed to indicate that only a metadata subset is provided.

Metadata Destination	[OFF / D.Sub In / SDIx - VANC (if present) / DECODER (if present)] The destinations can have any of the system sources assigned except of the emulation engine [MD Emulation].

Setup GUI – DOLBY PROCESSING – Metadata – **Generator Setup**

The metadata processor generates **SMPTE RDD 6** standard compliant metadata. It supports the most relevant program configurations for broadcast applications (5.1 / 5.1+2 / 3x2 / 4x2) used with Dolby E 16 or 20Bit bit depth. Since the number of programs from an external RDD 6 stream may differ from the generator setup, "off-size" program configurations will be handled this way:

If the input program configuration has more programs (e.g. 4x2) than the generator setup (e.g. 5.1+2) and you click on a "surplus" program (Program 3 or Program 4), only an Input table will be displayed while for the other programs an input and an output table is shown.

If the input program configuration has less programs (e.g. 3x2) than the generator setup (e.g. 4 x 2) and you click on a "surplus" program (e.g. Program 4), an empty input table will be shown.

If the metadata generator is set up for "Follow Input" and the input program configuration does not match the possible ones of the metadata generator it enters the reversion mode.

The output from the **metadata generator** is the source for the **emulator engine** but may also be selected for optional built-in encoders and for metadata transport interfaces like **9-pin** (RS485) or **VANC** (SMPTE 2020).
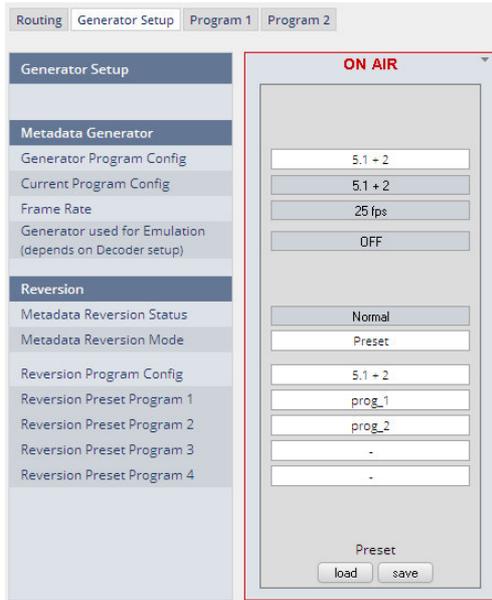
Metadata Generator

Generator Program Config.	[Follow Input / 5.1+2 / 4 x 2 / 5.1 / 3 x 2]
Current Program Config.	displays the actual program configuration used by the generator.
Frame Rate	display of the frame rate SYSTEM > Setup > Video Rate (fps).
Generator used for Emulation (depends on Decoder Setup)	[OFF / ON] shows if the generator is used for emulation or not.

Reversion

Metadata Reversion Status	[Normal / Reversion] Display of the reversion mode status.
Metadata Reversion Mode	[Last Valid / Preset] Selection of what happens in case of input metadata failure.

Reversion Program Program Config.	[5.1+2, 4 x 2, 3 x 2] Pre-selection of the program configuration for reversion mode.
Reversion Preset Program x	You can select a preset for **Program x** to become the Reversion preset for that program.

Important Note! There is only one set of reversion presets for all programs. You must be careful when you assign reversion presets to programs. It may be a good idea to name the presets used for reversion mode after the program number it is meant for.

Setup GUI – DOLBY PROCESSING **–** Metadata – **Program x**
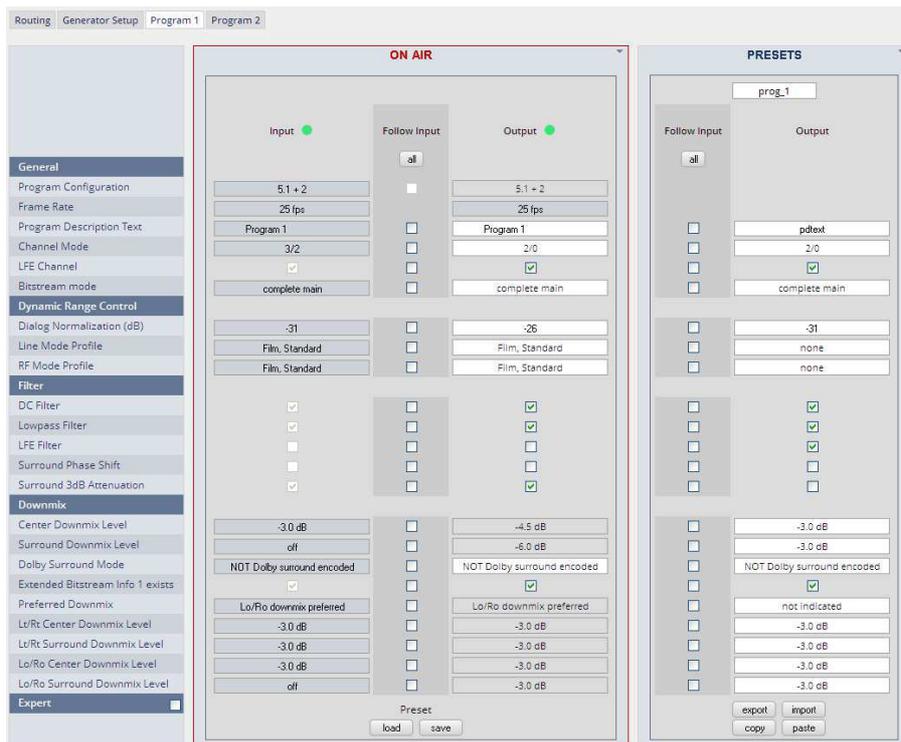
Above you can see the input metadata of the processor and you can decide about the metadata output. You may set it to follow the input or you may overwrite it. The table shows the most relevant metadata.
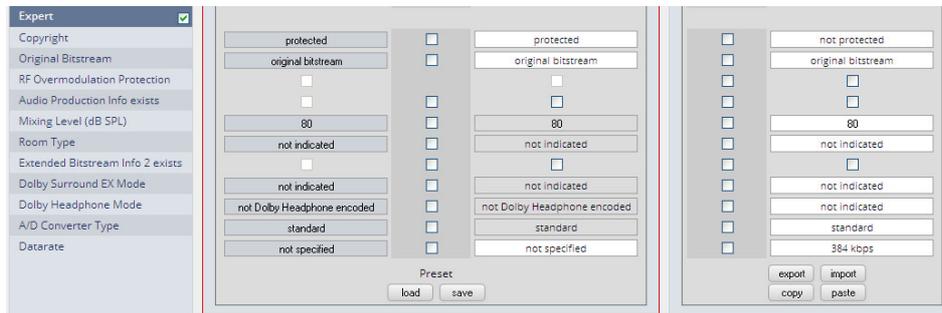
The Expert checkbox gives you access to more specific metadata:

Important Note! Dolby advises that the **RF Overmodulation Protection must be off**. Therefore Junger automatically turns it off. You are not able to set this parameter and no <Follow Input> check box exists, except for the preset parameters which will be ignored when loading it.

If **Emulation** is active and the option **"MD Generator overwrites encoded Metadata"** is turned on, the metadata are used for emulation are highlighted by a yellowish background:
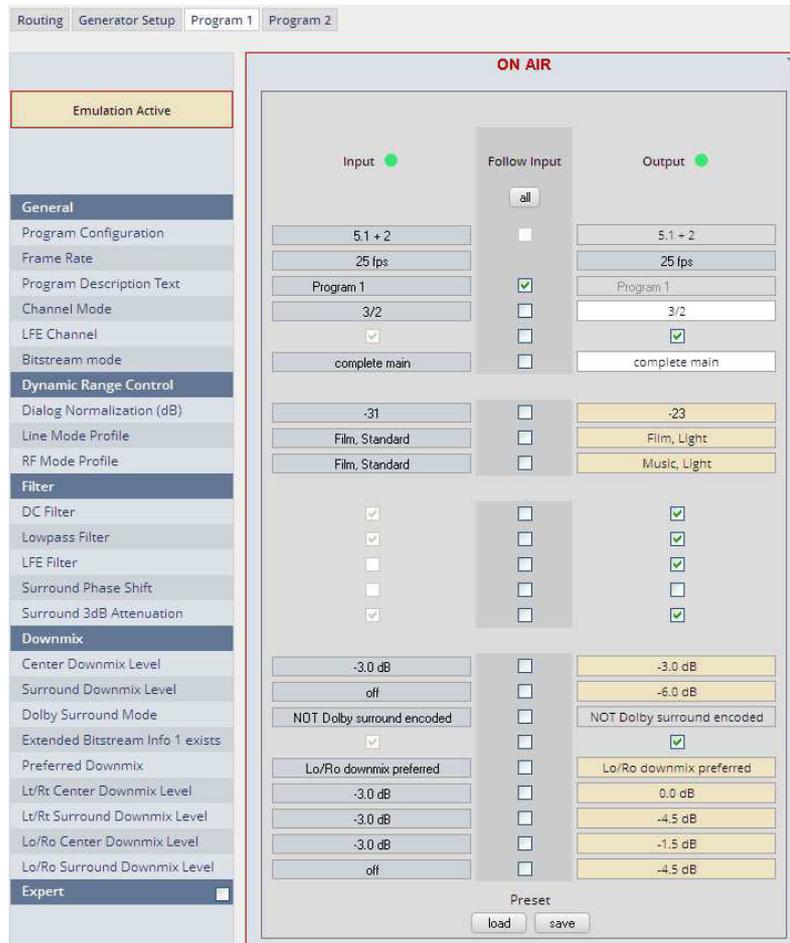
This example shows the metadata from **Program 1** of a Dolby E encoded stream.

Setup GUI – DOLBY PROCESSING – optional Dolby E encoder – **Encoder A**

If the optional Dolby E **encoder** is **licensed** (see SYSTEM > Firmware Update > Licensing)
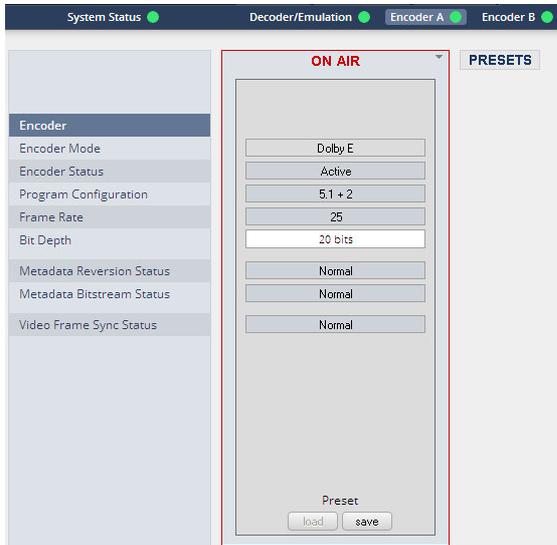the UI shows it as Encoder A:

Encoder

Encoder Mode	[Dolby E]
Encoder Status	[Active / Metadata Reversion / Fail]
Program Configuration	[3x2 / 4x2 / 5.1 / 5.1 +2] Set by the generator
Frame Rate	[25 / 30 / 29,97 / Unknown]
Bit Depth	[20 bits / 16 bits]
Metadata Reversion Status	[Normal / Reversion]
Metadata Bitstream Status	[Normal / Fail]
Video Frame Sync Status	[present at Dolby E frame rate]

Setup GUI – DOLBY PROCESSING – optional consumer format encoder – **Encoder B**

The **D*AP8** offers the option to install a consumer format (Dolby Digital / Dolby Digital plus / HE-AAC (v1/v2) / AAC) or another optional Dolby E encoder. If an encoder is installed it shows up under **DOLBY PROCESSING**. This example has a consumer format encoder installed:
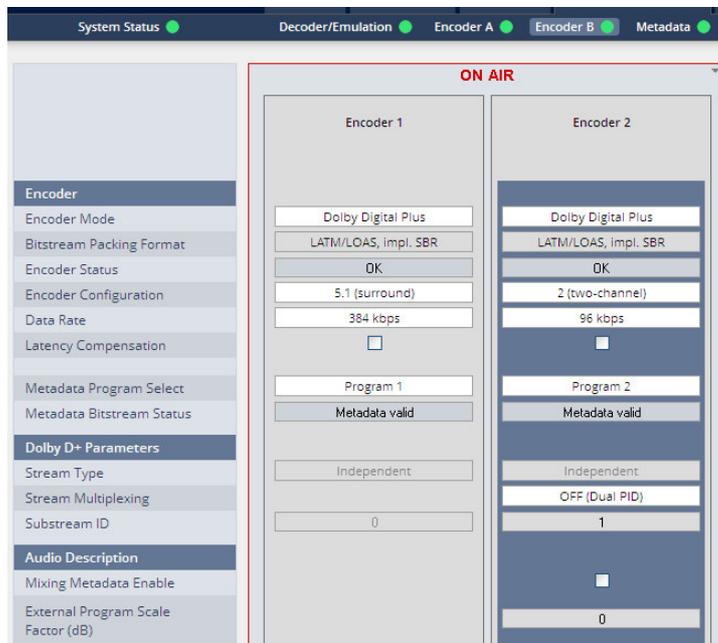
The **OEM** module from Dolby called **CAT561**. The implementation for the **D*AP8** platform provides two encoded outputs. Both outputs may have independent consumer formats. If both encoders are set for **Dolby Digital plus** encoding special features like providing associated services (e.g. an extra audio track for visually impaired people, AKA audio descriptive service - AD) are available.

D*AP8 MAP

Encoder	**Encoder 1** (similar applies to **Encoder 2** accept from setup where both encoders are used for associated services).
Encoder Mode	[Dolby Digital plus, Dolby Digital, Dolby Digital Puls HE-AAC v1, Dolby Digital Pulse HE-AAV v2, Dolby Digital pulse AAC] Here you may select the encoding format for the respective encoder
Bitstream Packing Format	AAC encoded bit-streams may be packed in different container formats. This parameter allows you to select one from the many possible formats.
Encoder Status	[OK, Fail]
Encoder Configuration	[2 (two-channel), 5.1 (surround)]
Data Rate	The data rate that is used for encoding
Latency compensation	[ON / OFF] For parallel encoding of different formats the same latency may be desirable. In this case both encoders will have the same latency of 305ms. If you turn latency compensation OFF, latency will be reduced to 135ms for Dolby Digital.
Metadata Program Select	[Program 1 … Program 8] Here you can select a program number of the RDD6 metadata set that shall be used for consumer encoding. If you are about to encode a 5.1 program that comes with a Dolby E stream as program 1, you must select Program 1 here.
Metadata Bitstream Status	[Metadata valid, Metadata not present]
Dolby D+ Parameters	
Stream Type	[Independent, Dependent] The streams which are encoded by both encoders can either be independent (i.e. there is no signal relationship of the audio signals) or dependent (if you use both encoders to encode 8 audio channels for 7.1 encoding).
Stream Multiplexing	[OFF (Dual PID) / ON /Single PID]]
Substream ID	[1, 2, 3] Since the encoded streams can be multiplexed by an on-board multiplexer they must have individual (sub-) stream IDs, so a de-multiplexer "knows" which data belong to which stream. If there is no intention to multiplex them together, the MAP sets both IDs to "0".
Audio Description	Audio description service employs both encoders to allow for the so called **receiver mix**. I.e. the mix between the program sound and the narrator who performs the audible scene description can be done in the decoder. This saves a lot of audio bandwidth compared to the so called broadcast mix, where two independent audio mixes are transmitted to the receiver at home.
Mixing Metadata Enable	[ON / OFF]
External Program Scale Factor	[-50 … 0 … 12] To remote control the mixing of associated services you can change the level of the main program with this parameter.
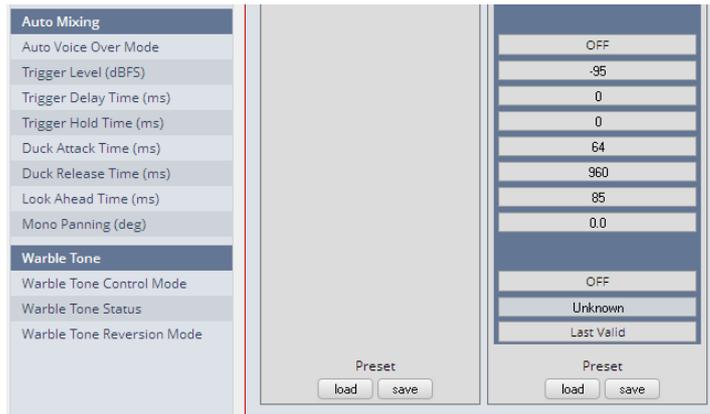
Audio Mixing

Auto Voice Over Mode
[OFF / ON]
In case of ON, the ducking parameter below will be used by the receiver to perform the mixing.

Trigger Level (dBFS)
[-96 … 0]
Level of the associated audio channel that will turn on the ducking.

Trigger Delay Time (ms)
[0 … 4992]
Time that must elapse before ducking becomes active after the trigger detects a signal that is above the trigger level.

Trigger Hold Time (ms)
[0 … 4992]
Time the ducker stays open after trigger becomes active.

Duck Attack Time (ms)
[0 … 4992]
Time the ducker needs to fully open up.

Duck Release Time (ms)
[0 … 4992]
Time the ducker needs to fully close.

Look Ahead Time (ms)
[0 … 85]
Time to look in advance for the level in the associated channel.

Warble Tone
Warble tone is a BBC invention to encode the volume and PAN values into one audio track while the other track carries the narrators voice signal.

Warble Ton Control Mode   [OFF / ON]

Warble Tone Status   [Unknown / Not Available / Not Valid / Valid]

Warble Tone Reversion Mode [Last Valid / Internal / Automatic]

D*AP8 MAP

Setup GUI – AUDIO PROCESSOR - **Overview**

The overview shows the active signal blocks of the audio processor, rendered by the DSPs.
This overview depends on the actual speaker configuration of the **MAP**.

Below an example for **5.1 + 2.0** (see SYSTEM > Setup > Speaker Configuration):
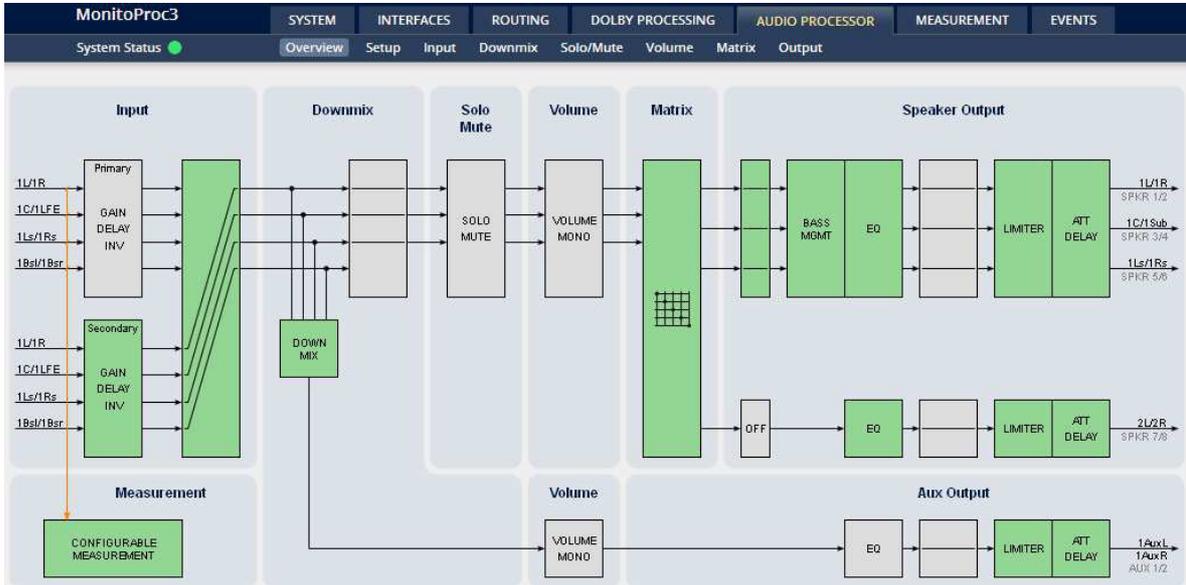
The processing blocks in use, which may be activated from their individual setup panes,
will be indicated in green. Blocks shown in grey are not activated by the user.

To navigate through the various processing blocks you may either use the mouse over function and
click on the respective block or use the tabs provides in the navigation bars below the bar graph
displays. The navigation is based on URLs so you may use the **<Back>** button of the browser to return
to this page.

Important Note! Don't be confused by the difference between speaker configuration and
the channel mode of a program. Both can be set differently and must not necessarily match.
E.g. you may configure the speaker set for 5.1 but listen to a stereo program via the left & right surround
speakers. On the other hand it makes no sense to listen to a 3/2L signal via a pair of stereo speakers
(except when you have selected the downmix ;-). You must always be careful to setup the router properly
to connect the correct audio channels with the primary or secondary input of the **AUDIO PROCESOR**.

Setup GUI – AUDIO PROCESSOR - **Setup**

Mono Attenuation

    Mono Attenuation (dB) [0 / -3 / -4.5 / -6]
If a processing block is
turned into mono operation
this gain reduction will be
used.

Setup GUI – AUDIO PROCESSOR - **Input**

Input Selector

Switch Over Mode	[Fade-Out / Fade-In, Seamless]
Select	[Primary, Secondary]
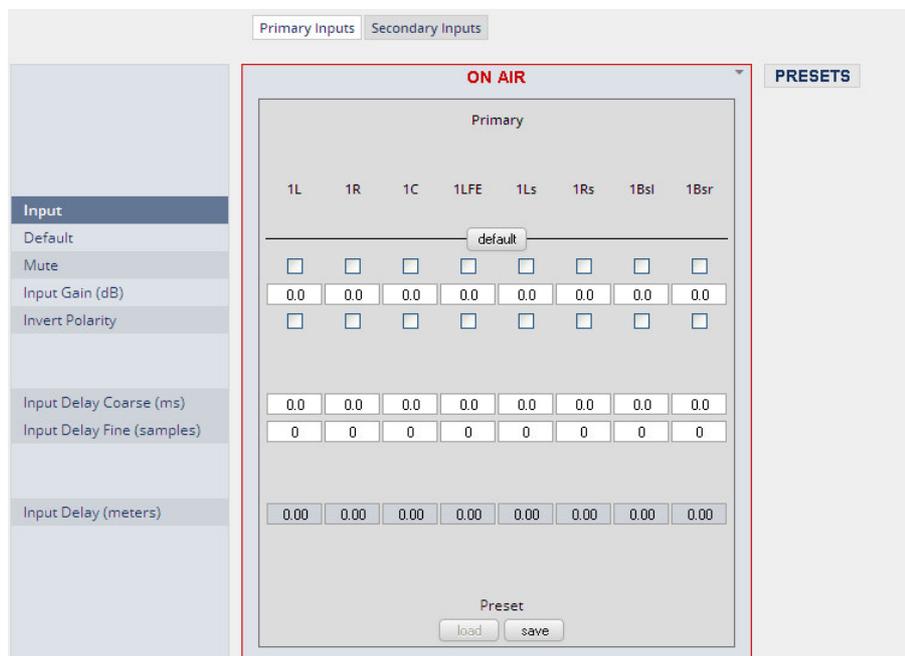
INPUT

Default	pressing the **<default>** soft button will reset all values to "0" as shown above
Mute	[ON / OFF] Turns the respective input channel off
Input Gain (dB)	[-80.0 … 0.0 … 20.0]
Invert Polarity	[ON / OFF]
Input Delay Coarse (ms)	[0.0 … 2000.0]
Input Delay Fine (samples)	[0 … 2000]
Input Delay (meters)	shows the calculated distance in meters for a selected delay (dry air, 20ºC ~ 343m/s).

Primary Inputs

D*AP8 MAP

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Setup GUI – AUDIO PROCESSOR – **Downnmix**

The **MAP** offers two independent downmix blocks (see AUDIO PORCESSOR > Overview).
The one in the top is part of the main signal path and maybe configured for 5.1 (if 7.1 is applied) or 2.0
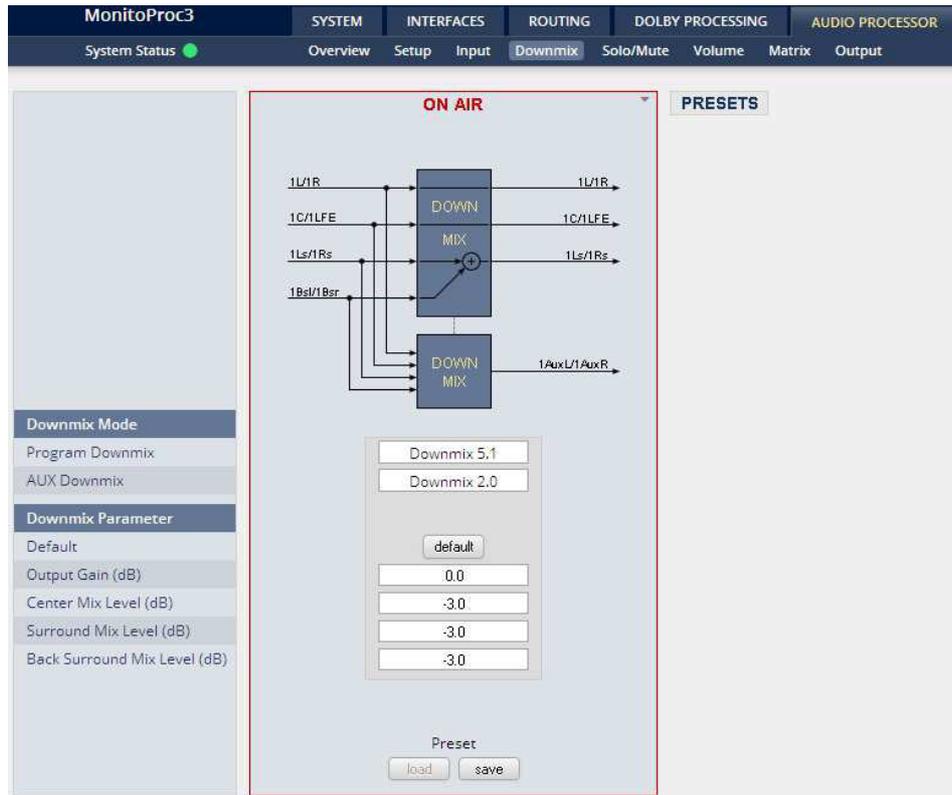Or it may be put into transparent mode. The one in the bottom always feeds the AUX output of the audio processor.

Downmix Mode

Program Downmix	[Transparent, Downmix 5.1, Downmix 2.0]
AUX Downmix	[Transparent, Downmix 2.0]

Downmix Paramete

Default	press **<default>** soft button to reset values
Output Gain (dB)	[-20.0 … 0.0 … 20.0]
Center Mix Level (dB)	[-12.0 … -3.0 … 0.0]
Surround Mix Level (dB)	[-12.0 … -3.0 … 0.0]
Back Surround Mix Level (dB)	[-12.0 … -3.0 … 0.0]

Setup GUI – AUDIO PROCESSOR – **Solo/Mute**
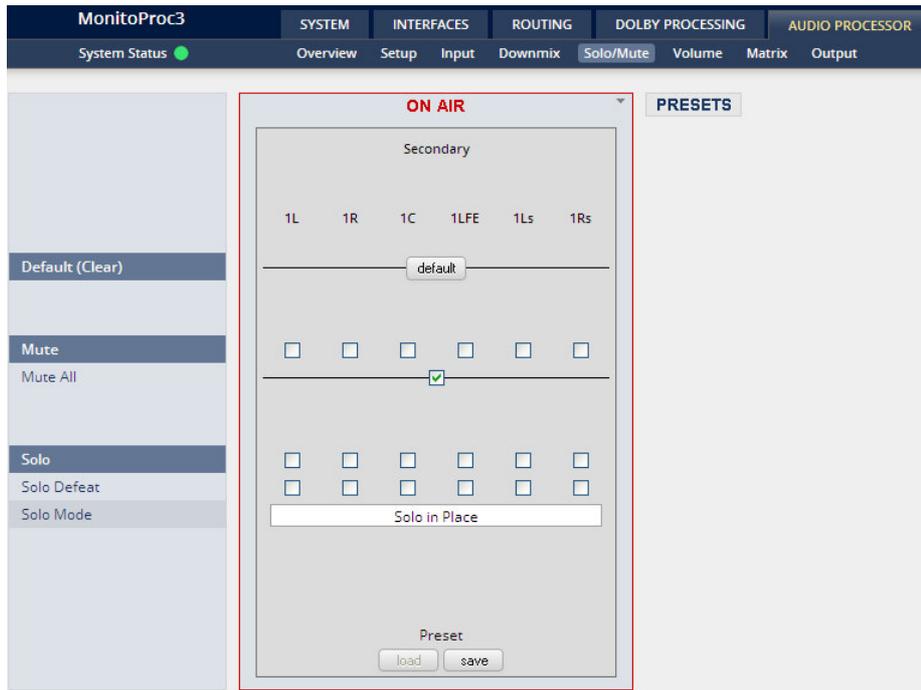
Default (Clear)	press the soft button **<default>** to turn all solo and mute settings off
Mute	[ON / OFF] Tick check box to enable individual speaker mute.
Mute All	Mutes all active speakers.
Solo	[ON / OFF] Tick check box to enable individual speaker solo.
Solo Defeat	defeats respective speakers from solo
Solo Mode	[Solo in Place, Solo to 1L+1R, Solo to C]

D*AP8 MAP

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Setup GUI – AUDIO PROCESSOR – **Volume**
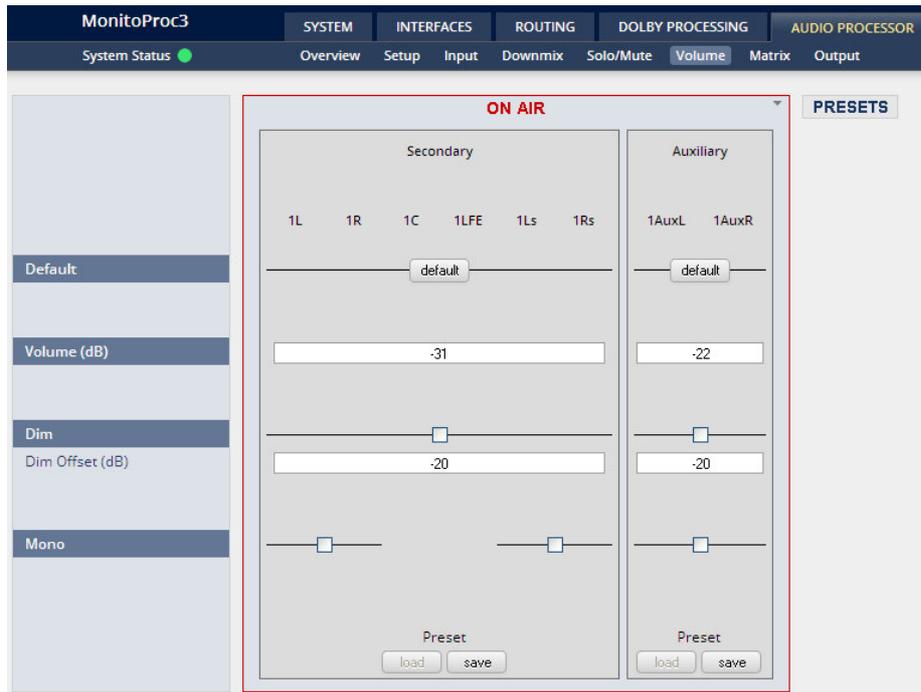
Default	Soft button <default> turns master volume to -50dB and DIM level to -20dB
Volume (dB)	[-100 … -50 … 0] This setting maybe overwritten by the rotary encoder of the X*AP RM1 remote panel.
Dim	[OFF / ON] Tick checkbox to enable the dim function.
Dim Offset (dB)	[-40 … -3]
Mono	tick check box to turn mono circuit on.

Setup GUI – AUDIO PROCESSOR – **Matrix**

Here you may change the relationship between inputs and connected speakers. The appearance depends on the speaker configuration (SYSTEM > Setup > MAP Speaker Configuration).
Here an example for 5.1 + 2.0:
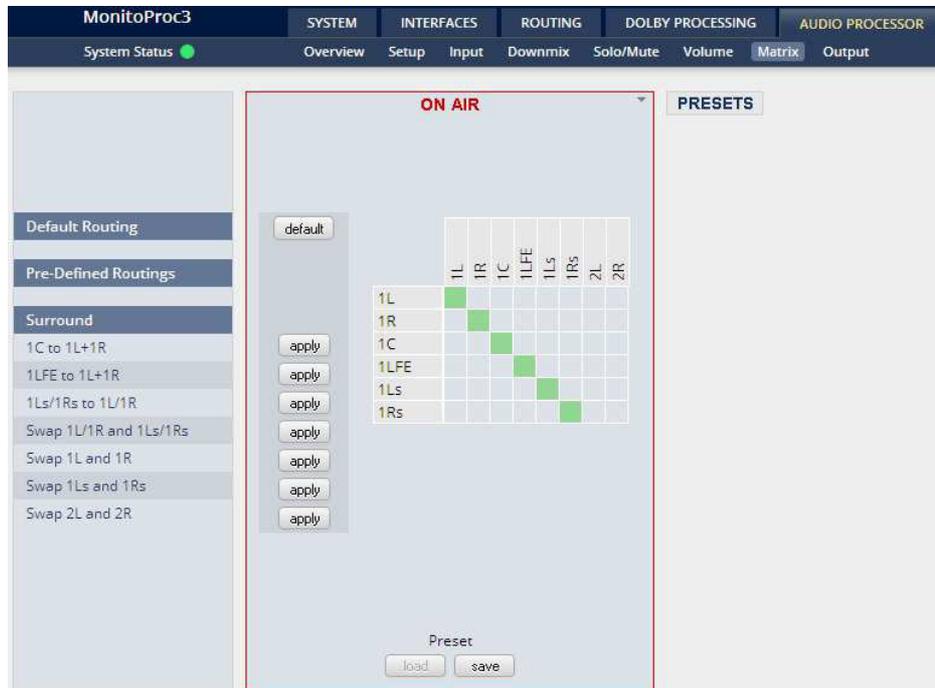
The speaker routing matrix works similarly to the central routing matrix of the device. You may set (CONNECT) or DISCONNECT cross points by use of the mouse-over function.

Default Routing   Press the **<default>** soft button to reset the matrix to 1:1 connection

Pre Defined Routings   Provides a set of useful cases

Surround

    Center to L+R

    LFE to L+R

    Ls/Rs to L/R

    Swap Lefts and Rights

    Swap L and R

    Swap Ls and Rs

    Swap 2L and 2R

D*AP8 MAP

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Setup GUI – AUDIO PROCESSOR – Output – **Bass Management**

The **Output** block allows you to control the bass management, the speaker EQs and the speaker delay as well as individual speaker gain settings, to adapt the speaker set to a given listening situation.

For a 5.1-channel monitor system with full-range speakers on every channel and a subwoofer, you may not need bass management, and disable this feature. If no bass management is enabled, only the LFE channel is sent to the subwoofer. But if your system consists of five satellite speakers and a subwoofer, you can redirect the low frequencies from the five main channels to the subwoofer output:
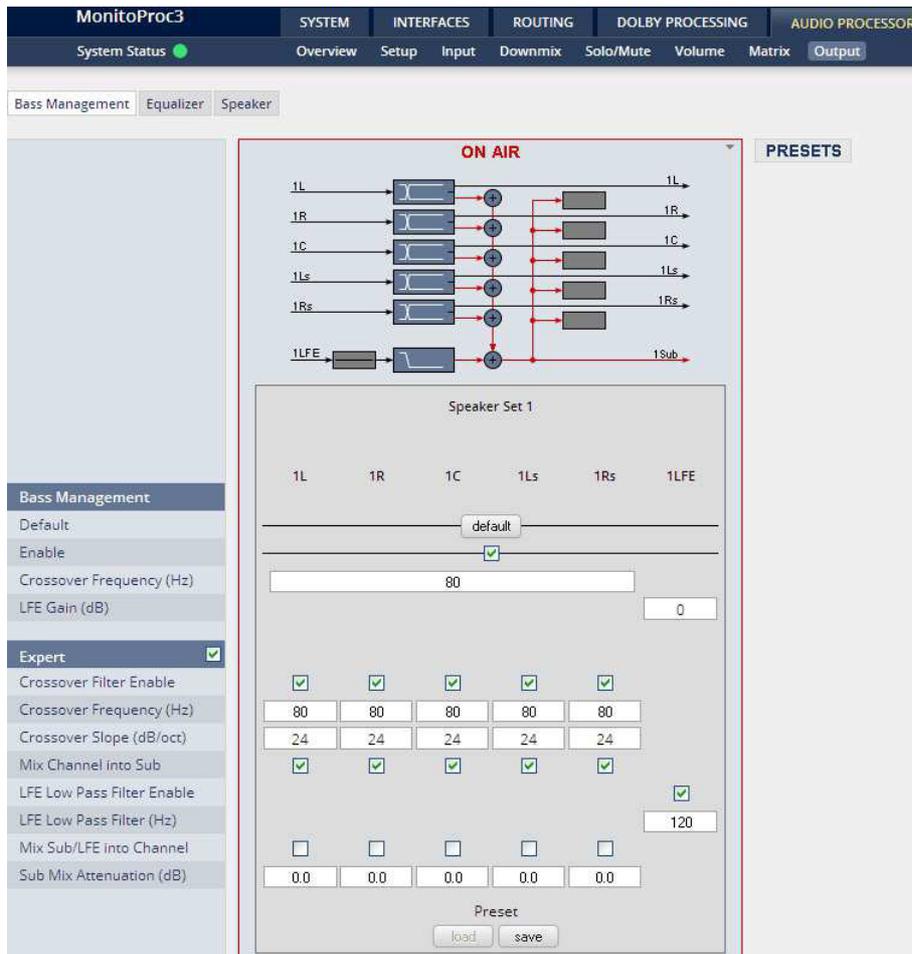
Bass Management

Default	Pressing the soft button **<default>** will reset all settings to factory default.
Enable	[ON / OFF] Turns the bass management on.
Crossover Frequency (Hz)	[20 … 80 … 200]
LFE Gain (dB)	[0, 10]

Expert	Tick check box to gain further access to specialized parameters.

Crossover Filter Enable   [ON / OFF]
You may change from a crossover filter to a high pass filter

Crossover Frequency (Hz)   [20 … 80 … 200]

Crossover Slope (db/oct)   [12, 24]

Mix Cannels   [ON / OFF]
You may individually (depending on full-range speakers or not) mix channels into the subwoofer channel:
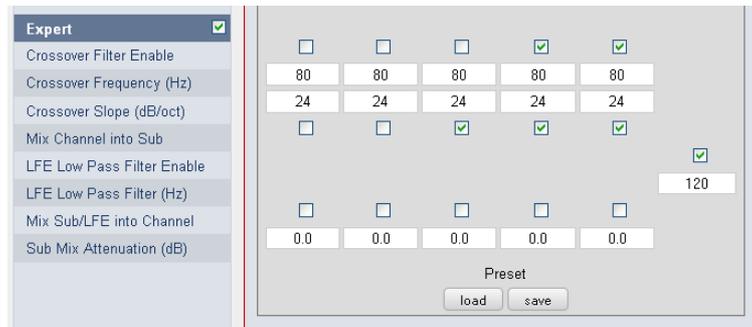
This will result in the following example wiring diagram:
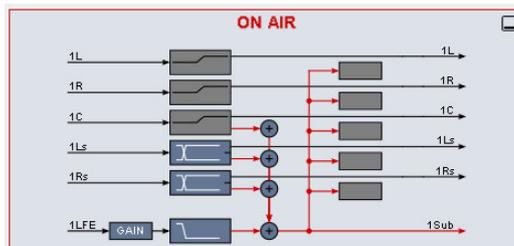
LFE Low Pass Filter Enable   [ON / OFF]

LFE Low Pass Filter (Hz)   [60 … 120 … 200]

Mix Sub/LFE into Channel   [ON / OFF]
You can decide if the LFE signal shall be mixed into one or multiple speakers (e.g. if no sub speaker is connected).
Here is an example for mixing it to all 5 channels:
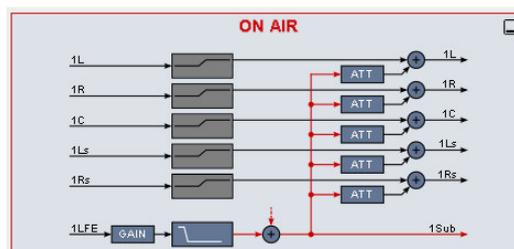
Sub Mix Attenuation (dB)   [-20.0 … 0.0]
The amount of LFE signal for the above mix may be set here.

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Setup GUI – AUDIO PROCESSOR – Output – **Equalizer**

The EQ section provides 5 fully parametric EQs for each speaker channel. The parameters may be linked for set-up purpose only to ease settings of multiple speakers. The EQ setup may be either done by numerical inputs and/or the graphical elements overlay above the frequency curve that results from the combination of multiple filters. The below example has 3 filters involved:

Program / Section   [Speaker, AUX, Preset Speaker, Preset AUX]
Which section of the audio processor will be represented in the graphical window above.

Speaker Set   [1L/1R/1Ls/1Rs, 1C, 1Sub, 2L/2R]
Depending on the global speaker configuration (5.1+2 in this case) and the link mode, you can make a selection here, to show and control the EQ settings for groups of speakers of a particular speaker set. You can also make the selection below by clicking and as a consequence, highlighting a different set (or single speakers).

Enable   [ON / OFF]

Here an example: The **Link** soft button shows the link set to **<QUAD>** for which the parameters are the same. The column is highlighted (bluish) to show the coincidence between graphic window and numeric parameters. Clicking on a different row (e.g. C) will highlight that column:

Important Note! For numeric input double click into the parameter field. You must use the period as a decimal separator. For graphical input use the left mouse button and drag it horizontally to change frequency and vertical to change gain while the mouse wheel will change the Q value.

Graph Permanently Visible	[ON / OFF] The color code of the column headers in the display will change depending on the selected speaker / speaker set. **White** color represents the actual selected speaker set while all others have the color of the display curve (**pink** represents Speaker set 2 in the example above).

Link
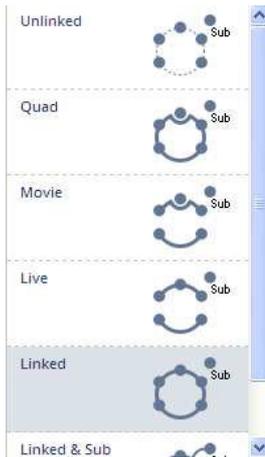
[Unlinked, Quad, Movie, Live, Linked, Linked & Sub]
If you press the **Link** mode soft button that has the label of the actual link mode ("Quad" in the example above), the following options will be displayed:

Quad	4 speakers are linked
Movie	2 pairs of speakers are linked
Live	L/C/R and Ls/Rs are linked
Linked	All 5 speakers are linked except the LFE
Linked & Sub	All 6 speakers are linked

Equalizer	[ON / OFF] Enables / Disables the EQs for the highlighted section.
Band x	[1 ... 5] Each speaker feed has five filters. Parameters and ranges are the same for all 5 bands.
Filter Type	[OFF, Peak 1, Peak 2, Lo Shelf, Hi Shelf, Lo Cut, Hi Cut]
Frequency (Hz)	[20 … 20000]
Gain (dB)	[-20.0 … 0.0 … 20.0]
Q	[0.4 … 1.0 … 10.0]

Setup GUI – AUDIO PROCESSOR – Output – **Speaker**

D*AP8 MAP

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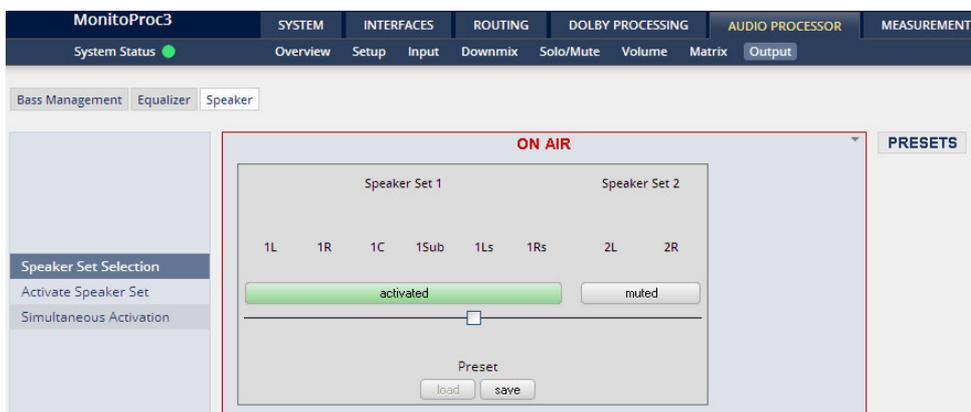
Speaker Set Selection   Here you may select which set of speakers is active.

    Activate Speaker Set   [activated, muted]

    Simultaneous Activation   Tick the checkbox if you want to allow both sets of speakers to be activated together.

Speaker Identification   a taped description of the respective speaker / set of speakers.

    Active Test Tone   If you click on the dedicated soft button you will hear a verbal description which set of speakers and which speaker of that set is driven. Multiple selections will cause the test signal to go round in a row through all activated speakers.

Limiter   The individual feeds are equipped with a true peak limiter for speaker protection.

    Enable   [ON / OFF]

    Max True Peak (dBTP)   [-20.0 … -1.0 … 0.0]

Output

    Default   The soft button will reset the values to default

    Speaker Mute   [ON / OFF]

    Attenuation (dB)   [-80.0 … 0.0]

    Output Delay Coarse (ms)   [0.0 … 2000.]

    Output Delay fine (samples)   [0 … 2000]

    Output Delay (meters)   displays the calculated distance in meters for a selected delay (dry air, 20ºC ~ 343m/s).

Setup GUI – **MEASUREMENT**

The MAP has an independent measurement block (see AUDIO PROCESSOR > Overview) that offers a comprehensive loudness meter. The measurement data are available for external applications like the Junger Audio Application Manager **J*AM** for bar graph level display or loudness over time plot or for logging of such data.

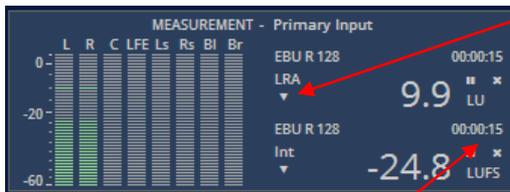In the top of the GUI you can read these metering data of a preselected source:

When you click on the little triangle over here you will get a selection of the measurement formats available:

This display also shows the duration of the measurement. If the **Speech Gate** is active for the **Dialogue Intelligence™** algorithm, the numbers become yellowish when the measurement has paused because there is no speech detected for the moment.

The other two buttons will control the measurement:
|| **<start>** / **<pause>** / **<continue>**
x <reset>.

Setup GUI – MEASUREMENT – **Setup**

Dialog Level (Dialnorm) Measurement:

Beside the ability to measure loudness by above standards, the MAP offers the feature to measure the long-term A-weighted average level of dialogue within a presentation. A Dolby Digital / Digital plus consumer decoder (e.g. a Set Top Box) will normalize the output level to -31dBFS by applying a shift based on the Dialog Normalization (AKS Dialnorm) metadata setting.
The rule is: -31 - (dialog level value) = shift applied.

Example (Dialnorm = -23dB): -31 - (-23) = -8dB shift applied in the consumer decoder.
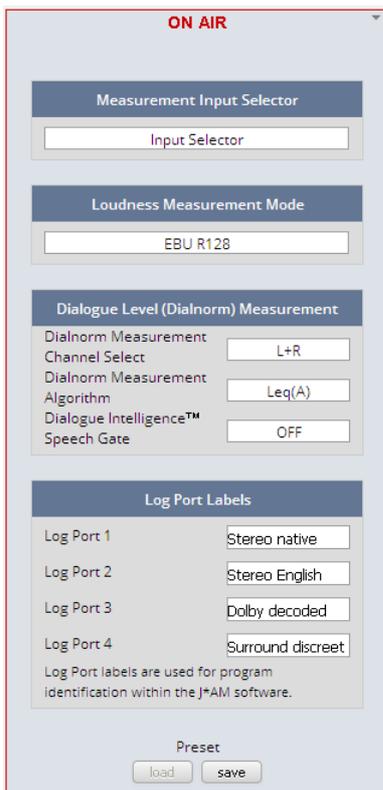
Measurement Input Selector	[Primary Input / Secondary Input / Primary Input Cond. /Secondary Input Cond. / Input Selcetor / Downmix]
Loudness Measurement Mode	[ITU BS.1770-2,3,4 / EBU R128 / ARIB TR-B32 / ATSC A/85 (2011 / 2013) / Free TV OP-59 / Portaria 354]
Dialogue Level (Dialnorm) Measurement	
Dialnorm Measurement Channel Select	[L / R / C / L+R / L+R+C]
Dialnorm Measurement Algorithm	[Leq(A)] / ITU-BS.1770]
Dialog Intelligence™ Speech Gate	[OFF / Active] The **Dialog Intelligence™** algorithm developed by **Dolby® Inc.** searches for portions of the audio content where speech is present. Such portions may trigger the loudness measurement. If it is activated and no speech is detected, the number display becomes yellowish.
Log Port Labels **Log Port 1 … 4**	Text field to name the Log Ports. The names appear in the J*AM

D*AP8 MAP

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Setup GUI **–** MEASUREMENT – Loudness – **Main**

The **D*AP8 LM** offers a sophisticated loudness measurement tool for the input and output of the program path of the device. The three control buttons **<pause>**, **<reset>**, **<reset max>** may be used to manually control the actual measurement.
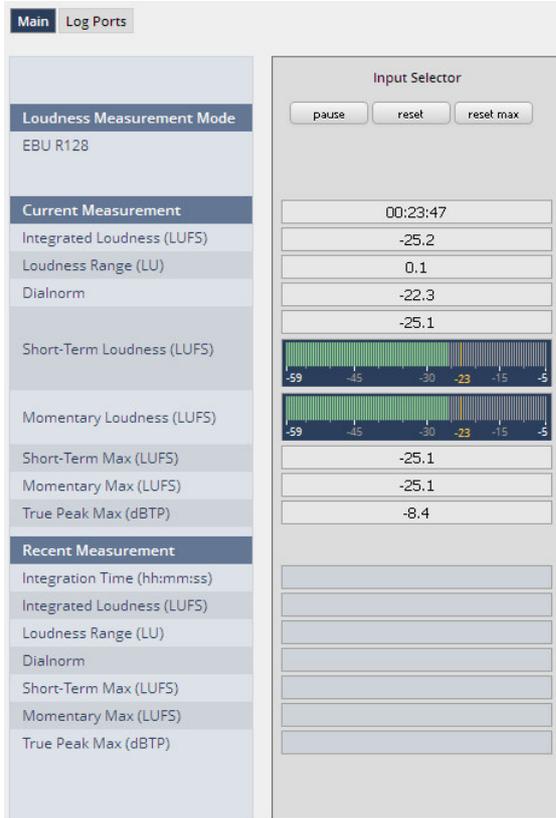
Loudness Measuremant Mode	Setting from MEASUREMENT > Setup > Loudness Measurement Mode
Current Measurement	[hh:mm:ss] Time elapsed since measurement started (excluding pauses).
Integrated Loudness (LUFS)	
Loudness Range (LU)	
Dialnorm	-70.0 indicates that no speech has been detected. If it is activated in the setup but no speech is recognized by the algorithm, the background of the display box turns yellowish.
Short-Term Loudness (LUFS)	Numeric and convenient bar graph display.
Momentary Loudness (LUFS)	Convenient bar graph display.
Short Term Max (LUFS)	
Momentary Max (LUFS)	
True Peak Max (dBTP)	

Resent Measurement	Values of the recent measurement are listed here for comparison.
Integration time	[hh:mm:ss] Total time of the recent measurement.

Important Note! The measures of the parameters above depend on the loudness mode selected at AUDIO PROCESSOR > Setup pane.

The measurement data may also be streamed to the PC based **J*AM** (Junger Application Manager). The **J*AM** is a graph display and logging tool that one can download from the Jungeraudio.com web site. To perform loudness measurement and loudness logging one must buy a hardware (USB) dongle.

Setup GUI **–** MEASUREMENT – Loudness – **Log Ports**

The four Log Ports are independent measurement blocks. They are designed to measure up to 7.1 audio channels per program. The audio channels must be routed via the Log Port Routing pane. You must take care that the audio channels match the respective program. No plausibility check is performed here.

Main | Log Ports

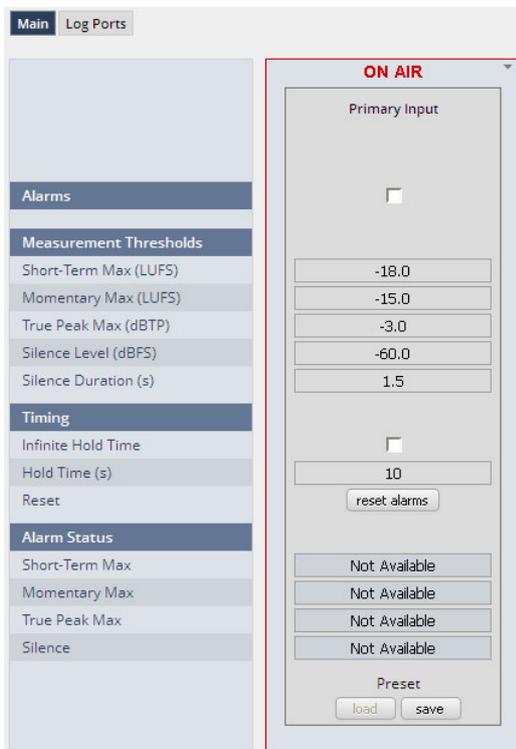|	Stereo native	Stereo English	Dolby decoded	Surround discreet
	pause reset reset max	pause reset reset max	pause reset reset max	pause reset reset max
Loudness Measurement Mode EBU R128				
Current Measurement	00:00:44	00:00:42	00:00:40	00:00:32
Integrated Loudness (LUFS)	-25.1	-23.6	-23.0	-23.0
Loudness Range (LU)	0.0	0.0	0.0	0.0
Short-Term Loudness (LUFS)	-25.1	-23.6	-23.0	-23.0
Momentary Loudness (LUFS)				
Short-Term Max (LUFS)	-25.1	-23.6	-23.0	-23.0
Momentary Max (LUFS)	-25.1	-23.6	-23.0	-23.0
True Peak Max (dBTP)	-23.6	-23.4	-25.1	-25.1
Recent Measurement				
Integration Time (hh:mm:ss)	00:34:04	00:34:06	00:34:08	00:00:06
Integrated Loudness (LUFS)	-25.2	-23.6	-23.0	
Loudness Range (LU)	0.0	0.0	0.0	
Short-Term Max (LUFS)	-25.1	-23.6	-23.0	-23.0
Momentary Max (LUFS)	-25.1	-23.6	-23.0	-23.0
True Peak Max (dBTP)	-3.6	-23.4	-25.1	-25.1

For the description of the parameters pls. refer to the previous page.

Setup GUI **–** MEASUREMENT – Alarms – **Main**

Here you can set Alarm related parameters. These values will be used by the SNMP agent to sent respective traps.

Main | Log Ports

ON AIR

Primary Input

Alarms	
Measurement Thresholds	
Short-Term Max (LUFS)	-18.0
Momentary Max (LUFS)	-15.0
True Peak Max (dBTP)	-3.0
Silence Level (dBFS)	-60.0
Silence Duration (s)	1.5
Timing	
Infinite Hold Time	
Hold Time (s)	10
Reset	reset alarms
Alarm Status	
Short-Term Max	Not Available
Momentary Max	Not Available
True Peak Max	Not Available
Silence	Not Available

Preset: load save

Alarms [OFF / ON]

Measuremant Thresholds

Short-Term Max (LUFS) [-30.0 … -18.0 … 0.0]

Momantary Max (LUFS) [-30.0 … -15.0 … 0.0]

True Peak Max (dBTP) [-30.0 … -3.0 … 0.0]

Silence Level (dBFS) [-80.0 … -60.0 … -40.0]

Silence Duration (s) [1.5 … 120.0]

Timing

Infinite Hold Time [OFF / ON]
The Alarm condition will be kept until the current measurement will be reset

Hold Time (s) [1 … 10 … 300]
The Alarm condition but **not** the current measurement will be reset

Reset press to reset Alarm condition

Alarm Status Gives you an overview over the actual measurement alarm status

Short-Term Max [Not Available / Normal / Alarm]
"Not Available" will be shown if the respective alarm is not enabled.
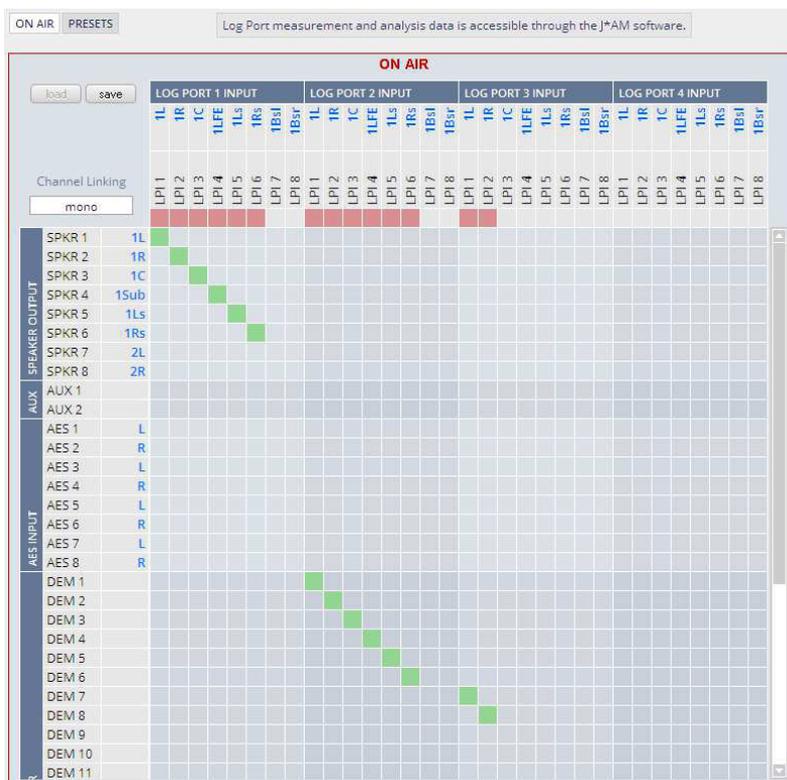"Normal" = No alarm condition

Momentary Max	[Not Available / Normal / Alarm]
True Peak Max	[Not Available / Normal / Alarm]
Silence	[Not Available / Normal / Alarm]

Setup GUI **–** MEASUREMENT – Alarms – **Log Ports**
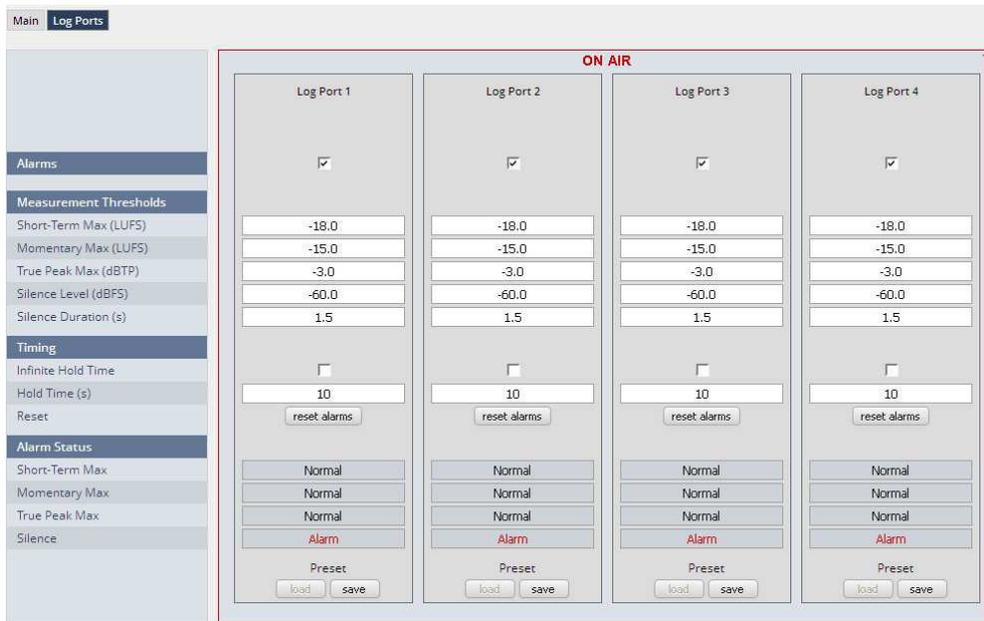
For the description of the parameters pls. refer to the previous page.

Setup GUI **–** MEASUREMENT **– Log Port Routing**

The **MAP** has four more measurement facilities for dedicated logging which you will reach from the **J*AM**. The sources you select for logging will be measured, the measurement values will be calculated and will be provided for streaming over the network to the **J*AM**.
Compared to other solutions this saves a lot of bandwidth because only measurement data are transmitted and not the audio samples themselves.

Similar to the general **ROUTING** all relevant internal sources are available for a **Log Port**:

You must keep in mind the loudness measurement must be performed over all audio channels belonging to a program.

Setup GUI – EVENTS **- Overview**

As mentioned previously, the **D*AP8 MAP** offers a sophisticated **event management** system.
The event management system performs a**ctions.** These a**ctions** are built from e**vents**.
Actions may be triggered manually (via the **X*AP RM1** remote panel **Hotkeys)**, remotely (over the network or via GPIs) and automatically (via changes of device parameters or internal status information) or via a combination of all three.

The overview shows the building blocks of the **EVENTS** system of the **MAP**:
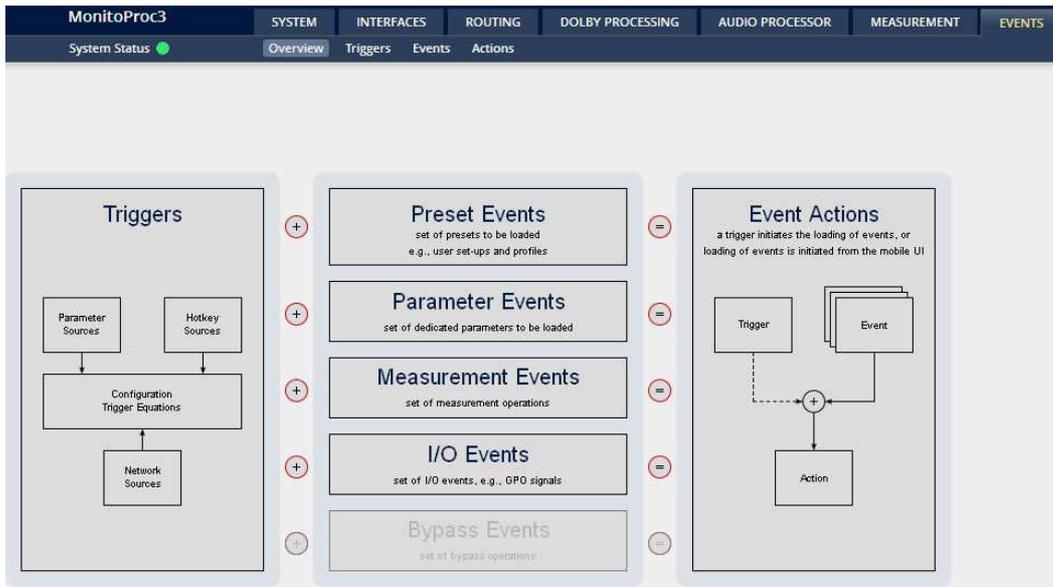
A **trigger** may be configured via a trigger equation (logically combined) from up to two sources. For both sources you can define a trigger type and a specific source that is bound to the type. E.g. a **GPI** is a trigger type while the hardware input (its input number) represents the trigger source. Other sources of specific types like the **X*AP RM1 Hotkeys** must be configured before using it:

Remote Hotkeys	You may assign hotkeys of the **X*AP RM1** remote to become a trigger source.
Network	Received via the **EmBER+** protocol designed by Co. l-s-b.
Parameters	Device parameters / status information grouped into system and Interfaces.

The **MAP** offers four different **event types**:

Preset Events	for the System / Interfaces / Routing / Dolby Processing / Audio Processor / Programs / AUX / Measurement
Parameter Events	to control (external) measurements of the J*AM
Measurement Events	to control the measurement block of the MAP
I/O Events	for GPOs

D*AP8 MAP

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The **MAP** has the **action type** – "Event Actions"

An action runs like a flip-book inside the **MAP**. This powerful technology spans from simply recalling a certain system parameter over speaker or Dolby specific parameter combinations (household name: "Preset") to the complete reconfiguration of the device including all signal routing, processing parameters and so forth. It allows you to create your own **snap shots** where you decide what is part of it and what is not! But it also enables several **fail over** scenarios where the **MAP** will automatically react to the system and/or parameter status.

The steps to set up the **EVENTS** system are as follows:
1. Define   - trigger sources
2. Configure   - triggers by logical combination of the pre-defined trigger sources
3. Set up events - by selecting presets for function blocks
4. Create actions - which trigger will launch which event or what will happen in case someone presses a function key at the **X*AP RM1** or engages the **<Force Trigger Active>** check box (see EVENTS > Actions > Event Actions).

Setup GUI – EVENTS – Triggers – Sources – **Remote Hotkeys**

The **Triggers** tab opens the trigger setup pane that has 4 embedded sub tabs:
Sources: "Remote Hotkeys" / "Network" / "Parameters" and **Configuration:** "Trigger Equation":
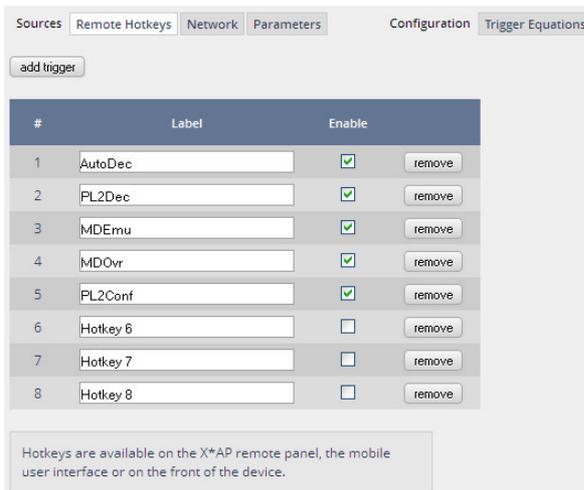
<add trigger>	You can add lines here.	
#	The number of the Hotkey on the **X*AP RM1** remote panel, counting from left to right.	
Label	Each Hotkey may have a label that appears in the display of the **X*AP RM1** remote panel above that button.	
Enable	[ON / OFF] If you turn it off the respective Hotkey on the **X*AP RM1** remote panel becomes inactive - no label is displayed and the button background light turns off.	
<remove>	will remove a line from the list. This will automatically disable the respective front panel button.	

The number of hotkey triggers is not limited. You may also add virtual hotkeys which can be used by a graphical UI for example that may have more than 8 compared to the **X*AP RM$_1$**.

Setup GUI – EVENTS – Triggers – Sources – **Network**

Network triggers are based on the **EmBER+** protocol from Co. l-s-b http://www.l-s-b.de/uk
The **MAP** receives such triggers over the TCP/IP network. The triggers are issued by a device that has implemented the **EmBER+** protocol (e.g. VSM server, broadcast automation system). You may assign these triggers to virtual panels as well as physical (e.g. LBP) buttons of a VSM installation. But also a broadcast automation system may have an **EmBER+** server running that will trigger events in the **MAP**.
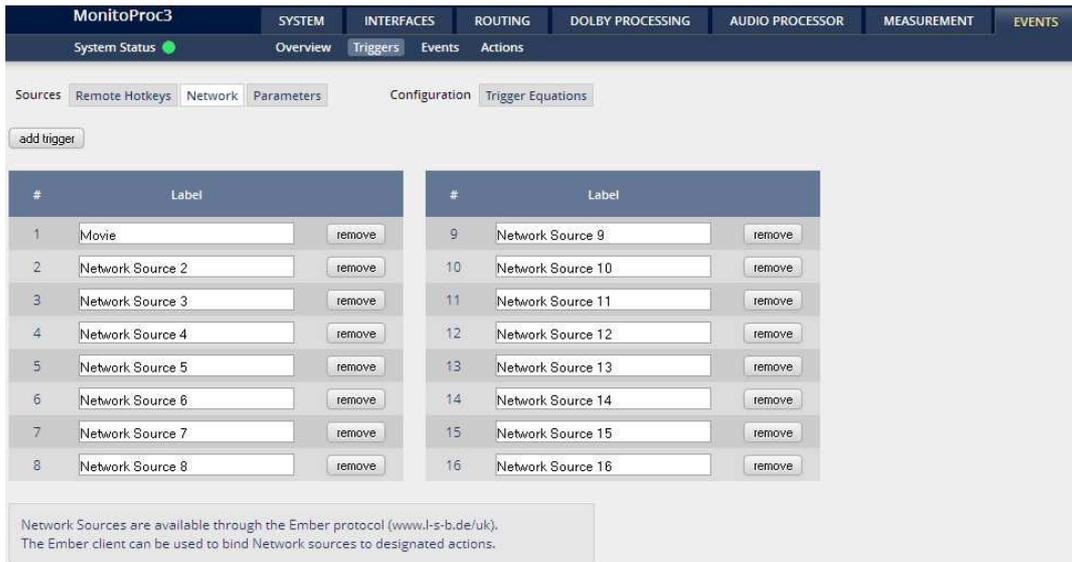
#		Number of a network trigger.
Label		Label of that network trigger. It will be used on the **Configuration** pane and serves as a reference for 3rd party software implementation (e.g. broadcast automation systems). As an example you see the name of the first Trigger **"Movie".**
<remove>		will remove a line from the list.

The name of the respective trigger may be selected via an **EmBER+** enabled device to fire that trigger. By means of a setup tool you must configure such network triggers in order to remote control the **D*AP8 MAP**. You will find the Ember+ protocol details, the implementation guidelines as well as an example here: code.google.com/p/**ember**-plus/

Below is a screen shot of the **EmBER+** viewer tool:
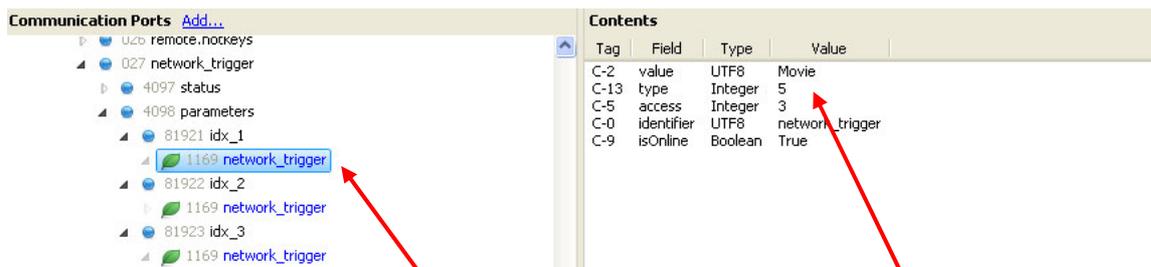
In the EmBER tree you go to:
"Device" > controller_dsp > network_trigger > parameters > e.g. "idx_1"
As a value you will receive the trigger name ● from the **MAP**.
In this example it is the trigger named: "Movie".

D*AP8 MAP

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Setup GUI – EVENTS – Triggers – Sources – **Parameters**
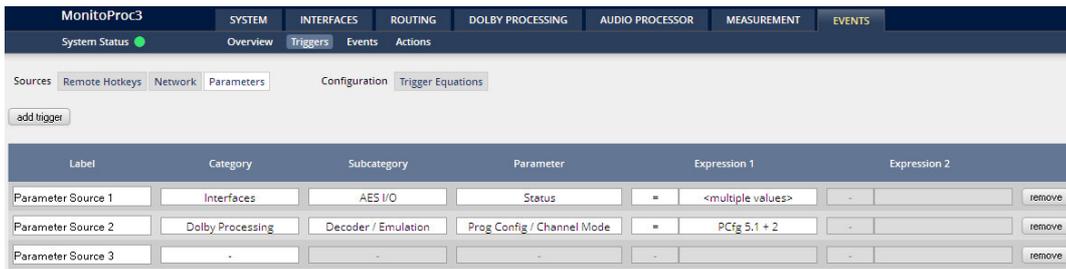
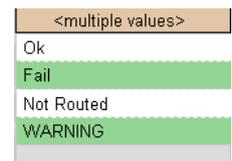Above is an example of parameter trigger sources. The phrase **<multiple values>** indicates that more than one value of the parameter "Status" is bound to that trigger source:
If you click into the "Expression 1" box you see two greenish marked entries.
I.e. if one of these values is true, "Expression 1" is true.

Setup GUI – EVENTS – Triggers – Configuration – **Trigger Equation**

To form a trigger you may logically combine two trigger sources:
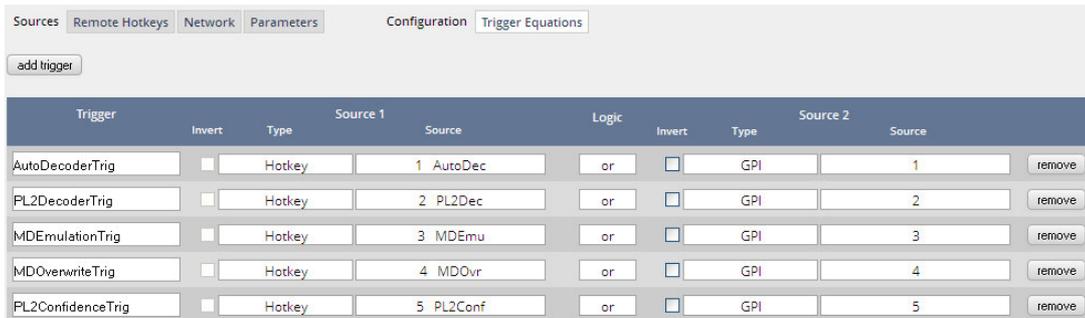
|	
Trigger	Here you define a name for the trigger ("Trigger 1").
Source 1	The first source of a logical combination of two trigger sources.
Invert	[ON / OFF] If the type of trigger allows an inverted operation it can be defined here.
Type	[GPI / Hot Key, Network / Parameter / Event active / Trigger effective/ Bypass / Sync Lock]
Source	[1 … 8] It acts like an index for the trigger type (In case of GPI it is the physical GPI number or in case of X*AP RM1 Hotkeys it is the key number ….
Logic	[and / or / xor] The kind of logical operation.
Source 2	Second source for the logical combination of two trigger sources. If only one source exists, you may leave it unassigned [-].

Setup GUI – EVENTS – Events – **Preset Events**

A **Preset Event** is a group of presets you may load on one occasion to the On Air parameters of function blocks. When executing such an event you may for example change the routing, the Dolby processing, the metadata set-up etc. by simply assigning the individual preset of your choice to the system, to an interface, to the routing, to the program path or even to the measurement. This picture shows an excerpt from the Preset Events pane where a few presets are pre-selected for the event: "AutoDecPstE". Due to the number of function blocks the screen shot is split in two columns:
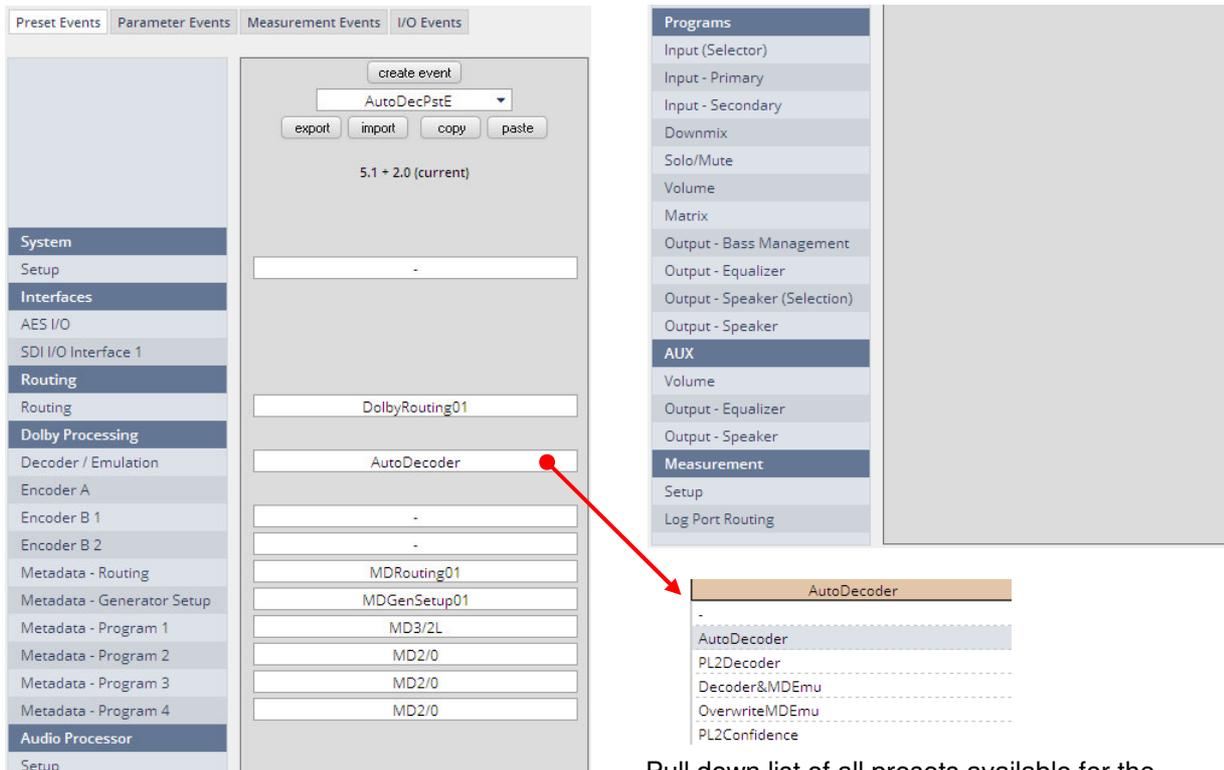
Pull down list of all presets available for the Decoder / Emulation function block.

If no preset is selected you will get a dash in the drop down field. Some function blocks (e.g. AES I/O) even have no preset assigned at all at the moment so there is no drop down box.

D*AP8 MAP

The **Preset Events** allow you to reconfigure the **MAP** completely, partially or to change a few audio parameters marginally.

You are also able to create a new preset event semi-automatically by pressing **<create event>**:
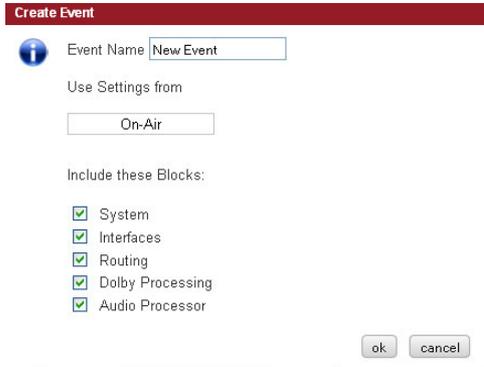
Event name	[New Event] default A unique name to address this preset event later in the action manager.
Use Settings from	[On Air / Existing Event / Empty]
"On Air"	The events manager will copy all On Air parameters to new presets for the function blocks, depending on the **"Include these Blocks"** check boxes.
"Existing Event"	The presets of the selected event will be copied to the new event and may be tuned afterwards to form a different event.
"Empty"	Creates a set of empty boxes where you may select the preset of your choice for the respective function block or leave it empty if no changes are needed …
Include these Blocks:	[System / Interface / Routing / Dolby Processing /Audio Processor] Defines which blocks will be part of the creating process.

Important Note! This is the way to create a **snap shot**. The automatically created presets in all respective function blocks will be given the (same) name of this event. So you must be careful when selecting names!

Setup GUI – EVENTS – Events – **Parameter Events**

Right now the **MAP** supports parameter events to remote control the measurement / logging related features of the **J*AM**:
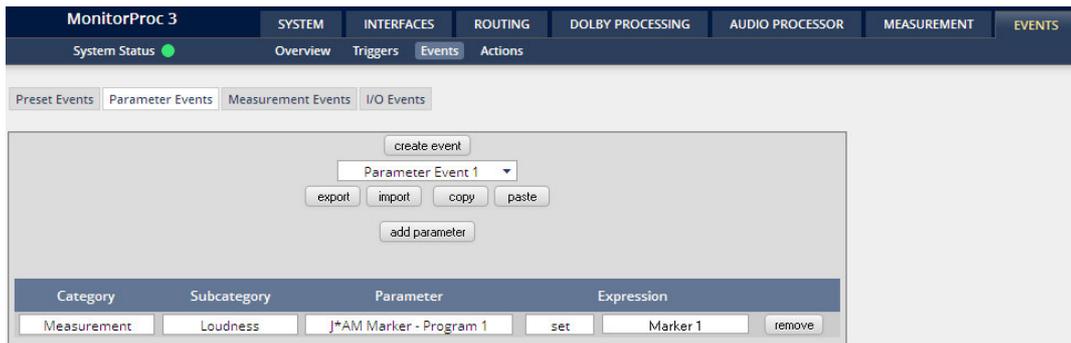
The above example selects the category **"Measurement"** with its sub category **"Loudness"**.
From the list of possible parameters, the setting of a marker **"J*AM Marker – Log Port1"** has been selected. This marker will appear in the log file if that preset event is executed. When you press **<create event>** these choices are provided:
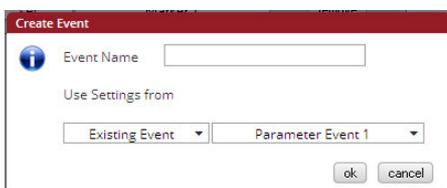
Event Name	your choice
Use settings from	[Existing Event / Defaults / Empty]

Setup GUI – EVENTS – Events – **Measurement Events**

A measurement event is used to control the **MAP** internal loudness meter.
(See MEASUREMENT > Loudness). For the example below **"Reset Max"** has been selected:

Setup GUI – EVENTS – Events – **I/O Events**

I/O Events at the moment control the **GPO**s of the **MAP**:

Each GPO (when enabled for that I/O event) can be set to one of these actions:

Clear	Turns a GPO off that was previously turned on.
Set	Turns a GPO on.
Follow	The GPO follows the state of the trigger.
Toggle	The trigger will toggle that GPO.

Setup GUI – EVENTS – Actions – **Event Actions**

This is the point where all previously created sub-functions are combined. Here you create **the action!**


You should give the action a meaningful name, select a trigger (from one of the trigger equations) and select the respective event(s) you need to perform the desired action.

Setup GUI – EVENTS – Actions – Event Actions – **Factory Defaults**

Above you see the factory default **EVENTS > Actions** that come with the **D*AP8 MAP** from firmware 3.0.x onwards.

They are prepared to ease the handling of **Dolby PROCESSING** functionalities of the device and support the operator UI that you recall when pressing the **<accessDP>** button in the upper right corner.

Five pre-configured Actions may be triggered manually from the **X*AP RM1** remote panel.
See the **"Remote Hotkeys"** settings below #4 - #8:
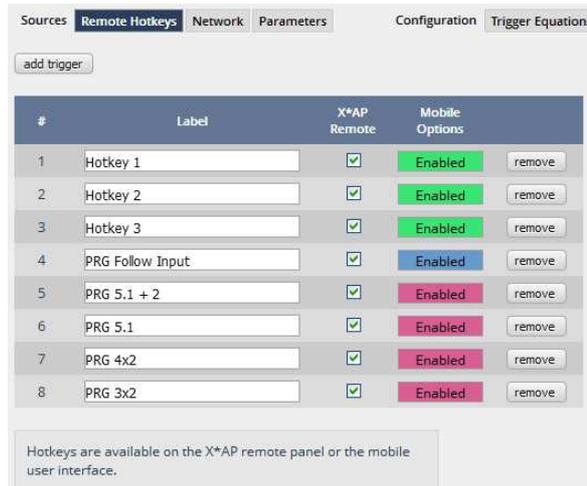
#	Label	X*AP Remote	Mobile Options	
1	Hotkey 1	☑	Enabled	remove
2	Hotkey 2	☑	Enabled	remove
3	Hotkey 3	☑	Enabled	remove
4	PRG Follow Input	☑	Enabled	remove
5	PRG 5.1 + 2	☑	Enabled	remove
6	PRG 5.1	☑	Enabled	remove
7	PRG 4x2	☑	Enabled	remove
8	PRG 3x2	☑	Enabled	remove

Hotkeys are available on the X*AP remote panel or the mobile user interface.

The remote hotkeys are used by the following **"Trigger Equations"** (Trigger four to eight):
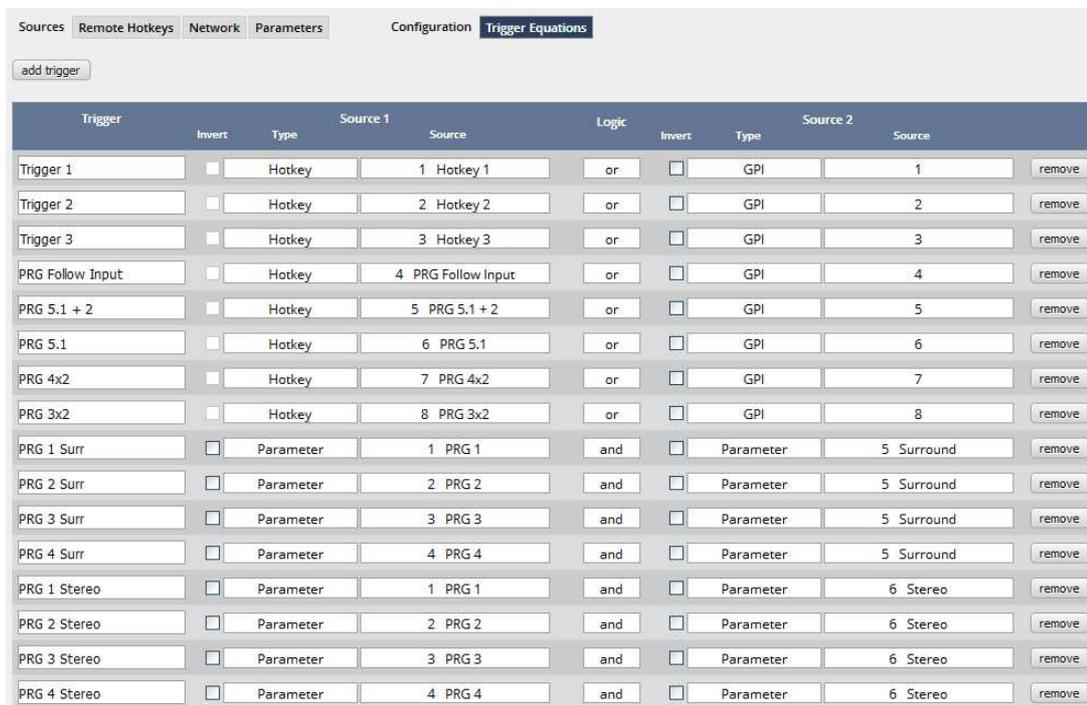
Trigger	Invert	Type	Source 1 Source	Logic	Invert	Type	Source 2 Source	
Trigger 1	☐	Hotkey	1 Hotkey 1	or	☐	GPI	1	remove
Trigger 2	☐	Hotkey	2 Hotkey 2	or	☐	GPI	2	remove
Trigger 3	☐	Hotkey	3 Hotkey 3	or	☐	GPI	3	remove
PRG Follow Input	☐	Hotkey	4 PRG Follow Input	or	☐	GPI	4	remove
PRG 5.1 + 2	☐	Hotkey	5 PRG 5.1 + 2	or	☐	GPI	5	remove
PRG 5.1	☐	Hotkey	6 PRG 5.1	or	☐	GPI	6	remove
PRG 4x2	☐	Hotkey	7 PRG 4x2	or	☐	GPI	7	remove
PRG 3x2	☐	Hotkey	8 PRG 3x2	or	☐	GPI	8	remove
PRG 1 Surr	☐	Parameter	1 PRG 1	and	☐	Parameter	5 Surround	remove
PRG 2 Surr	☐	Parameter	2 PRG 2	and	☐	Parameter	5 Surround	remove
PRG 3 Surr	☐	Parameter	3 PRG 3	and	☐	Parameter	5 Surround	remove
PRG 4 Surr	☐	Parameter	4 PRG 4	and	☐	Parameter	5 Surround	remove
PRG 1 Stereo	☐	Parameter	1 PRG 1	and	☐	Parameter	6 Stereo	remove
PRG 2 Stereo	☐	Parameter	2 PRG 2	and	☐	Parameter	6 Stereo	remove
PRG 3 Stereo	☐	Parameter	3 PRG 3	and	☐	Parameter	6 Stereo	remove
PRG 4 Stereo	☐	Parameter	4 PRG 4	and	☐	Parameter	6 Stereo	remove

I.e. the trigger named **"PRG FollowInput"** will be fired if one depresses the **hotkey # 4** that is named **"PRG Follow Input"** or one activates GPI #4. It is also available as an action key on the operator UI.

On the page **EVENTS > Events > Preset Events** you see a list of combinations of individual presets for each of the factory default **Preset Events**. The line below the <export> / <import> etc. buttons reminds you of the pre selected speaker configuration [SYSTEM > Setup > Speaker Configuration = 5.1 + 2.0]. Below are two examples of such preset events:

"**AutoDecPstE**" (automatic decoding)   "**MDOvrPstE**" (metadata overwrite)
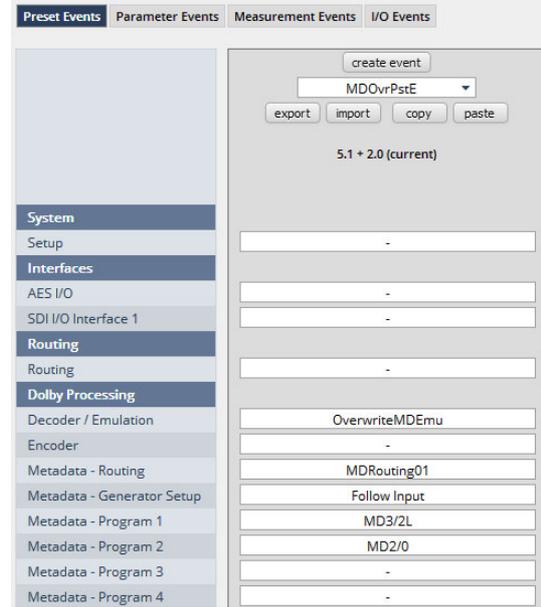
You can see the difference is the respective Decoder / Emulation preset.
The metadata routing: **"MDRouting01"**, the metadata generator setup: **"MDGenSetup01"** and the metadata presets for program 1: **"MD3/2L"** and program 2: **"MD2/0"** are the same in both cases:

> **Routing > Routing** has no preset selected here. It assumes that you connect the **D*AP8 MAP** via the AES inputs AES1/2 to a Dolby E source. If you have connected analog speakers for a QA room, the outputs are also routed to the analog interface card and the AES outputs. If you have installed an SDI module, the speaker outputs are sent to the SDI embedder. The SDI de-embedder outputs are not connected.

Important Note! If you receive the encoded audio via SDI instead of AES you should use routing preset, especially if you change the physical inputs frequently.
Pls. don't forget to adjust the SDI embedder / de-embedder routing accordingly so audio channels appear in the correct position (e.g. encoded Dolby E must end up at decoder input 1/2 for decoding).

> **Metadata routing** (see DOLBY PROCESSING > Metadata > Routing) connects the 9-pin input by default. If you decode D-E the metadata output of the decoder must be connected to the metadata generator input. The metadata generator output is connected to the **"D Sub Out"** and **"SDI1 – VANC"** (for embedding) or any encoder (if one is installed).

> **Metadata generator setup** (see DOLBY PORCESSING > Metadata > Generator Setup).
> The generator program configuration is set to "Follow Input", reversion mode to "preset" and the reversion program configuration to **"5.1 + 2"**.

> **Metadata presets Program 1/Program 2** (see DOLBY PROCESSING > Metadata > Program 1 / 2) are set to the values recommended by FIFA World Cup 2014 for the international sound track that was used by HBS.

As an example you see two of the five parameter sets that may be loaded by their presets for the Decoder / Emulation processing block. The respective preset name is displayed in grayish above the active mode display:

"AutoDecoder"	**"OverwriteMDEmu"**

"AutoDecoder"

ON AIR

AutoDecoder

Active Mode	Decoder

Decoder	
Bitstream Format	Dolby E 20 Bit
Bitstream Data Rate	.
Decoder Status	Ok
Program Configuration Channel Mode	PCfg 5.1 + 2
Dolby E Frame Rate	25 fps
Dolby D+ Decoding	Mixed Main & AD
Downmix Output Format	AUTO

Decoding and DRC	
Dolby D/D+ Main	Line Mode
Dolby D/D+ Downmix	Line Mode
Dolby E Main	Bypass DRC & Dialnorm
Dolby E Downmix (Progr 1)	Line Mode
PCM Main	Bypass DRC & Dialnorm
PCM Downmix (Progr 1)	Line Mode
PCM Latency	Matched

Pro Logic II Decoding	
Enable	OFF
Decoder Mode	Movie

Preset load save

"OverwriteMDEmu"

ON AIR

OverwriteMDEmu

Active Mode	Decoder & Emulation
Program Select	Program 1

Decoder	
Bitstream Format	Dolby E 20 Bit
Bitstream Data Rate	.
Decoder Status	Ok
Program Configuration Channel Mode	PCfg 5.1 + 2
Dolby E Frame Rate	25 fps
Dolby D+ Decoding	Mixed Main & AD
Downmix Output Format	AUTO

Emulation	
Unity Gain Mode	ON
MD Generator overwrites encoded Metadata	ON

Decoding and DRC	
Dolby D/D+ Main	Line Mode
Dolby D/D+ Downmix	RF Mode
Dolby E Main	Line Mode
Dolby E Downmix	RF Mode
PCM Main	Line Mode
PCM Downmix	RF Mode
Custom Mode Boost Factor	1
Custom Mode Cut Factor	1

Pro Logic II Decoding	
Enable	OFF
PL II Decoder Input Source	Emulation Output
Decoder Mode	Movie

Preset load save

To round up the explanation of the factory default actions settings, here is the content of the metadata preset **"MD3/2L"** (DOLBY PROCESSING > Metadata > Program 1). The greyish letters like **MD3/2L** above the "Follow Input" column shows the name of the active preset:
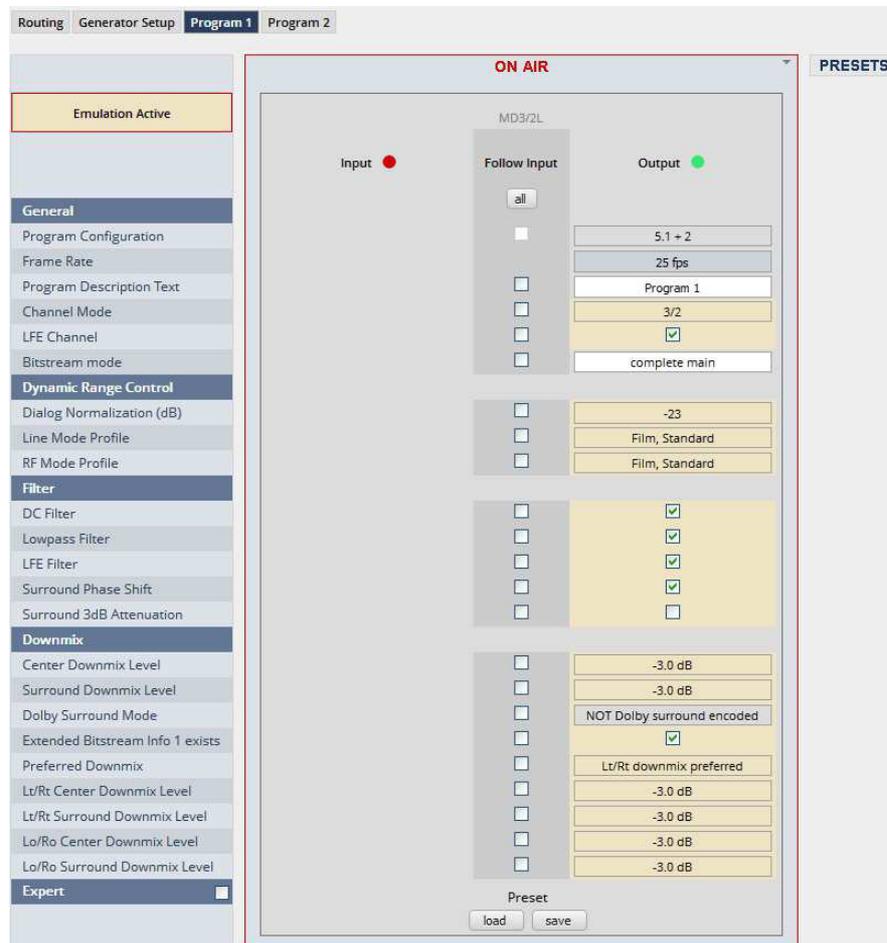
Setup GUI – **accessDP**

The link in the upper right corner will launch the operator UI in a separate tab.
You may also use the URL: **<IP address>/mobile.xml** in a new browser on the same PC or an independent one.

This UI gives an operator direct access to relevant settings and controls. Its functionality is designed close to the well known UI of the Dolby DP570 but enhanced by the options provided by the built-in module CAT110. I.e. the decoding of D-E or D-D / D-D+ does not need an external decoder.
The MAP can be used to emulate the audio path of a Set Top Box. But it may also generate metadata from scratch when mixing a 5.1 sound track. If you want a highly compact solution, you may also install an optional encoder to encode D-E or consumer formats right after emulating the metadata.

The MAP has a measurement section that can measure Dialnorm, Integrated Loudness, Loudness Range, True Peak, Short Term and Momentary Loudness. Loudness measurement will be controlled from the UI (start / pause / reset), i.e. one may save the cost for external meters like the DM100.

The UI makes use of the auto detect function of the decoder / emulator.
The status of the decoder (PCM, D-E, D-D, D-D+) will trigger actions which will control the routing of audio signals and metadata.

By factory default, the physical inputs and outputs are set to the following sources and destinations:

AES Input 1/2 – Dolby D / D+ / E or stereo PCM input.
AES Input 3/4 – 7/8 PCM audio (e.g. from a mixing desk or from an external decoder).
AES Output 1/2 – 7/8 carry the 7.1 monitoring output signals.

The Dolby Decoder output feeds the primary monitoring path.
The Decoder Downmix output feeds the secondary monitoring path.
If the system is in 4x2 mode the **Program Select** buttons will route the respective signal pair from the decoder output to Primary Input **PRIM1** and **PRIM2**.
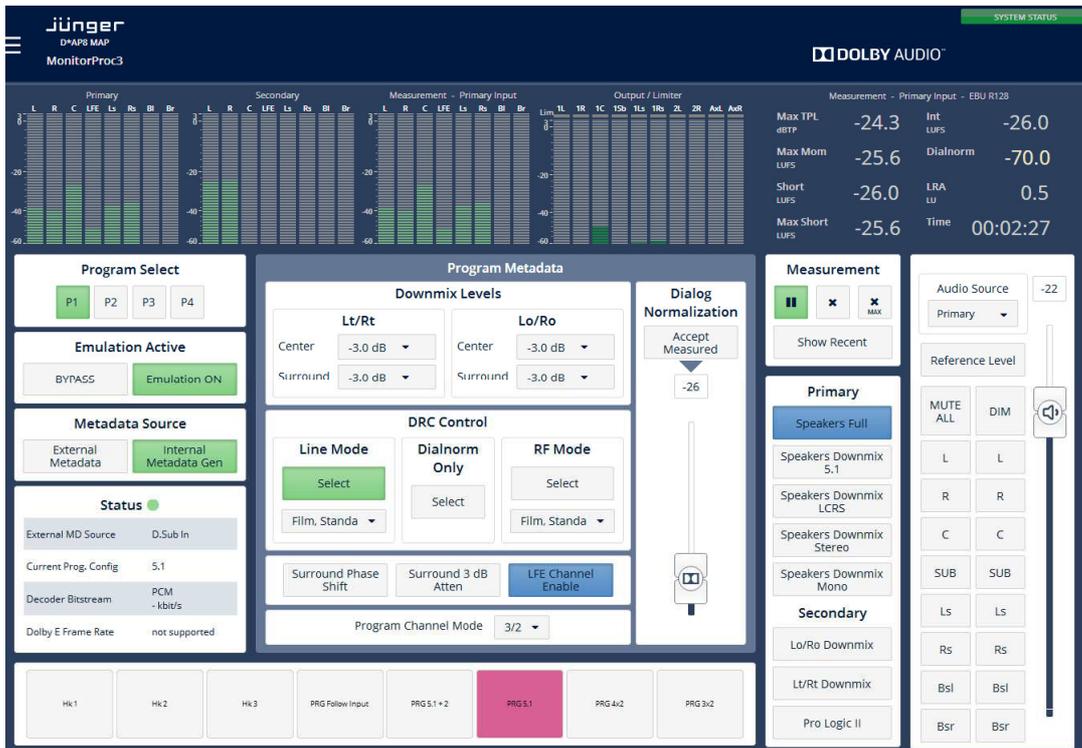
Program Select	depending on the system setup (5.1 / 5.1+2 / 4x2 / 3x2) you select the respective program of interest here.
Emulation Active	[Bypass / Emulation ON]
Metadata Source	The emulation circuit can use external metadata (9-pin, VANC, Decoder) or internal metadata from the built-in generator.
Status	Display of high level system information. The soft LED turns brownish when the metadata system is in reversion mode, i.e. the pre-selected metadata source is not available or there is a mismatch between settings and detected metadata. Normally the generator will load a reversion preset.
Program Metadata	Selection of the most important metadata. Other metadata must be set in the metadata section of the device.

Important Note! Dialnorm Only is not available for the down mixes, thus will be ignored when listening to a down mix.

D*AP8 MAP

Measurement	[Pause & Play / Reset / Reset MAX] The soft buttons control the time depending measurement (see also MEASUREMENT tab of the evice). Pls. keep in mind that Dialnorm measurement uses a Dolby algorithm that detects a real dialogue. [Show Recent] recalls the recent measurement values.
Primary	Selection of the audio sources for the primary input of the speaker control section of the **MAP**. In standard routing the "native" loudspeaker formats are assigned to the primary input
Secondary	Selection of the audio sources for the primary input of the speaker control section of the **MAP**. All Dolby metadata related downmix formats are sent to the secondary input.
Monitor Section	This is a standard monitor control interface with solo and mute functions for all playback channels. A 'Reference Level' and 'DIM' can be recalled. Their values are configured in the **MAP** UI.

Technical Data - 8 Channel Surround Monitoring Audio Processor **[D*AP8 MAP EDITION]**

General	8 channel monitoring audio processor (1 program, program configuration 1.0 … 7.1) 2 channel (1 stereo) auxiliary output 4 additional programs can be logged over network using dedicated software tools - Expandable by hard and software options	
Audio Sample Rate	44.1, 48kHz, (32 … 196kHz @ input with SRC) ±150ppm sync input capture, ±25ppm master-sync stability	
AES/EBU Inputs	Relevant specifications comply with AES3-X-2009, IEC 60985 and AES11-2009	
	8 channels (4 stereo inputs), 4 BNC connectors	
	24bits, transparent forwarding of PCM and compressed audio (w/o SRC) 24bits, PCM, sample rate converter (SRC) activated	
	Impedance	75Ohm single-ended
	Input level	0.3 … 5Vpp @ 75Ohm single-ended
	Sample Rate Converter (SRC)	THD+N -120dB @ 0dBFS, 1kHz Latency < 0.3ms
AES/EBU Outputs	Relevant specifications comply with AES3-X-2009, IEC 60985 and AES11-2009	
	8 channels (4 stereo outputs), 4 BNC connectors	
	24bits, transparent forwarding of PCM and compressed audio	
	Impedance	75Ohm single-ended
	Output voltage	1Vpp (typ.) @ 75Ohm single-ended
Sync Input	Multi-standard synchronization interface for AES/EBU, wordclock or video-sync (black burst, tri level), complies with AES11-2009 and relevant audio or video standards	
	Connector type	BNC
	AES/EBU input	0.3 … 5Vpp @ 75Ohm single-ended
	Wordclock input	1 … 5Vpp @ 75Ohm single-ended
	Video-sync input	1Vpp (nom.) @ 75Ohm single-ended
		Rates supported: 23.975, 24, 24.975, 25, 29.97, 30, 49.95, 50, 59.94, 60fps (SD and HD)
	On-board audio ports and master-sync capable option boards may also be selectable as sync source.	
Sync Output	Word clock output, complies with AES11-2009	
	Connector type	BNC
	Wordclock output	2.4V (typ.) @ 75Ohm single-ended
Metadata Input	Relevant specifications comply with SMPTE RDD6-2008 (Dolby Metadata).	

	Connector type	D-Sub9 connector female
	Input conditions	110Ohm RS485, 0.2 … 5Vpp differential
Metadata Output	Relevant specifications comply with SMPTE RDD6-2008 (Dolby Metadata).	
	Connector type	D-Sub9 connector female, same conn. as input, D-Sub9 connector male, output only Both connectors carry the same signal.
	Output conditions	3Vpp (typ.) @ 110Ohm differential, RS485
Timecode Input	LTC timecode input, BNC, currently not supported (TBD)	
Network Interface	RJ45 connector, 10/100Mbit Ethernet auto sense, full duplex, auto MDI/X	
USB Interface	USB 2.0 connector to internal console interface	
GPI Signals	8 general purpose inputs (GPI), divided into 2 groups with separate common signal, isolated	
	Connector type	D-Sub25 connector female, same for GPO
	Input conditions	3 … 24Vdc, < 5mA
	Auxiliary supply	5V (nom.), 200mA (max.), isolated
GPO Signals	8 general purpose outputs (GPO), SPST, divided into 2 groups with separate common signal, isolated	
	Connector type	D-Sub25 connector female, same for GPI
	Output conditions	24Vac/dc (max.), 120mA (max.)
Expansion Slots	2 general purpose expansion slots for option boards, 2 internal expansion slots for Dolby encoding, decoding and emulation	
Power Supply	Dual power supply, automatic fail over, 85 … 264Vac, 50 … 60Hz, 58W (max.)	
Environmental	Operating temperature 0 … 50ºC, fan cooled (dual fan), Non-operating -20 … 70ºC, Humidity < 90%, non-condensing	
Physical	19", 1RU, 27cm depth, net weight ca. 5kg, shipping weight ca. 7.5kg	

Technical Data – Option Board SDI I/O (3G/HD/SD) **[O_DAP_SDI_a]**

Standards	Video complies with SMPTE 424/425M (3G, Level A and B), SMPTE 292M (HD) or SMPTE 259M (SD). Automatic format detection. Audio embedding and de-embedding complies with SMPTE 299M (3G, HD) or SMPTE 272M-AC (SD). Metadata embedding and de-embedding complies with SMPTE 2020-2.
Video Data Rate	2970/2967Mbps (3G), 1485/1483.5Mbps (HD), 270Mbps (SD)
Video Formats	1080p23.975, 24, 25, 29.97, 30, 50, 59.94, 60 1080i50, 59.94, 60 720p23.975, 24, 25, 29.97, 30, 50, 59.94, 60 625i50, 525i59.94, …
Video Delay	User selectable 0 …15frames, can be disabled
Audio	24bits, transparent forwarding of PCM and compressed audio
Audio Channels	16 inputs and 16 outputs (4 groups with 4 channels each)
Audio Sample Rate	48kHz (SDI compliant)
Audio Delay	Embedder audio delay selectable 0 … 320ms per channel

Metadata (RDD6)	1 channel input and 1 channel output, SDID selectable	
BNC Input	Impedance	75Ohm
	Return loss	> 15dB, 5 … 1485MHz > 10dB, 1485 … 2970MHz
	Cable length (max.)	250m @ SD for Belden 1694A cable 230m @ HD for Belden 1694A cable 140m @ 3G for Belden 1694A cable
	Jitter tolerance	> 0.7UI (Alignment)
BNC Output	Impedance	75Ohm
	Output voltage	0.8Vpp (typ.)
	Return loss	> 15dB, 5 … 1485MHz > 10dB, 1485 … 2970MHz
	Output jitter	< 0.2UI (Alignment), < 0.5UI (Timing)
Audio Latency	Input to Output	Embedder and de-embedder combined HD, 3G < 0.6ms SD typ. 1.5ms (< 2ms)
Video Latency	Input to Output	120 … 200pixel, depends on video standard
General Features	• Power fail relay bypass (may be activated via GUI) • Lip-Sync compensation for processed and non-processed audio signals • Dedicated routing for non-processed channels, all channels (max. 16) can be routed to/from the device or looped through • Test pattern generator • Master-sync capable • ITU-R BT.1685 / ARIB STD-B39 metadata support	

Technical Data – Option Board 8 Ch Analog Out **[O_DAP_8DA_a]**

Audio	24bit D/A-converter	
Audio Channels	8 output channels (e.g. for speakers)	
Audio Sample Rate	44.1, 48, 88.2, 96kHz	
Analog Outputs	8 channels	
	Connector type	D-Sub25 connector female
	Output Level (max.) (0dBFS equiv.)	0 … 24dBu, adjustable in 0.5dB steps
	Impedance	50Ohm (typ.), differential
	THD+N	-91dB @ 0dBFS = 15dBu, 1kHz
	Dynamic range	> 103dB (RMS)
	Crosstalk attenuation	> 103dB @ 0dBFS = 15dBu, 1kHz
	Frequency response	20Hz … 22kHz (< ±0.3dB) @ 48kHz 20Hz … 43kHz (< ±0.3dB) @ 96kHz
General Features	• Power fail glitch prevention • Balanced analog outputs • Electrical isolation between outputs and device	

D*AP8 MAP

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Technical Data – Option Board 4 Ch Analog I/O **[O_DAP_ADDA_a]**

Audio	24bit sigma-delta A/D-converter, 24bit D/A-converter	
Audio Channels	4 input channels, 4 output channels	
Audio Sample Rate	44.1, 48, 88.2, 96kHz	
Analog Inputs	4 channels	
	Connector type	D-Sub25 connector female, same for outputs
	Input Level (max.) (0dBFS equiv.)	0 … 24dBu, adjustable in 0.5dB steps
	Impedance	20kOhm (typ.), differential
	THD+N	-93dB @ 0dBFS = 15dBu, 1kHz
	Dynamic range	> 110dB (RMS)
	Crosstalk attenuation	> 93dB @ 0dBFS = 15dBu, 1kHz
	CMRR	> 71dB @ 0dBFS = 15dBu, 1kHz
	Frequency response	20Hz … 22kHz (< ±0.1dB) @ 48kHz 20Hz … 43kHz (< ±0.1dB) @ 96kHz
Analog Outputs	4 channels	
	Connector type	D-Sub25 connector female, same for inputs
	Output Level (max.) (0dBFS equiv.)	0 … 24dBu, adjustable in 0.5dB steps
	Impedance	50Ohm (typ.), differential
	THD+N	-91dB @ 0dBFS = 15dBu, 1kHz
	Dynamic range	> 103dB (RMS)
	Crosstalk attenuation	> 103dB @ 0dBFS = 15dBu, 1kHz
	Frequency response	20Hz … 22kHz (< ±0.3dB) @ 48kHz 20Hz … 43kHz (< ±0.3dB) @ 96kHz
General Features	• Power fail relay bypass between inputs and outputs • Balanced analog inputs and outputs • Electrical isolation between inputs, outputs and device	

Technical Data – Option Board AES/EBU I/O **[O_DAP_AES_a]**

Standards	Relevant specifications comply with AES3-X-2009, IEC 60985 and AES11-2009	
Audio	24bits, transparent forwarding of PCM and compressed audio (w/o SRC) 24bits, PCM, sample rate converter (SRC) activated	
Audio Sample Rate	44.1, 48, 88.2, 96kHz, (32 … 196kHz @ inputs with SRC)	
Inputs	8 channels (4 stereo inputs)	
	Connector type	D-Sub25 connector female, same for outputs
	Impedance	110Ohm or 75Ohm, jumper selectable (110Ohm default)
	Input level	0.3 … 5Vpp @ 110Ohm differential 0.3 … 5Vpp @ 75Ohm single-ended
	Sample Rate Converter (SRC)	THD+N -120dB @ 0dBFS, 1kHz Latency < 0.3ms
Outputs	8 channels (4 stereo outputs)	
	Connector type	D-Sub25 connector female, same for inputs
	Impedance	110Ohm or 75Ohm, jumper selectable (110Ohm default)
	Output voltage	3Vpp (typ.) @ 110Ohm differential 1Vpp (typ.) @ 75Ohm single-ended
General Features	• Power fail relay bypass (can be deactivated by jumper) • Input sample rate converters (SRC) • Electrical isolation between inputs, outputs and device (if configured for differential mode, 110Ohm) • AES3 channel status management, non-audio detection • Master-sync capable	

Technical Data – Option Board MADI I/O, BNC **[O_DAP_MB_a]**

Standards	Relevant specifications comply with AES10-2008 and AES11-2009.	
Audio	24bits, transparent forwarding of PCM and compressed audio	
Audio Sample Rate	44.1, 48, 88.2, 96kHz, (88.2, 96kHz short framing)	
BNC Input	64/56 channels @ 44.1 and 48kHz, 32/28 @ 88.2 and 96kHz Processable by D*AP8: 16 channels @ 44.1, 48kHz Processable by D*AP4: 8 channels @ 44.1, 48, 88.2, 96kHz	
	Impedance	75Ohm
	Input level	0.15 … 0.8Vpp @ 75Ohm
	Cable length (max.)	150m (Belden 1694A)
BNC Output	64/56 channels @ 44.1 and 48kHz, 32/28 @ 88.2 and 96kHz Processable by D*AP8: 16 channels @ 44.1, 48kHz Processable by D*AP4: 8 channels @ 44.1, 48, 88.2, 96kHz	
	Impedance	75Ohm

	Output voltage	0.6Vpp (typ.) @ 75Ohm
General Features	• Input cable equalizer for extended range and robustness • Reference grade word clock recovery, master-sync capable • Dedicated routing for non-processed channels, all channels (max. 64) can be routed to/from the device or looped through • AES3 channel status management, non-audio detection	

Technical Data – Option Board MADI I/O, Optical **[O_DAP_MO_MM_a, O_DAP_MO_SM_a]**

Standards	Relevant specifications comply with AES10-2008 and AES11-2009.	
Audio	24bits, transparent forwarding of PCM and compressed audio	
Audio Sample Rate	44.1, 48, 88.2, 96kHz, (88.2, 96kHz short framing)	
Optical Input, LC	64/56 channels @ 44.1 and 48kHz, 32/28 @ 88.2 and 96kHz Processable by D*AP8: 16 channels @ 44.1, 48kHz Processable by D*AP4: 8 channels @ 44.1, 48, 88.2, 96kHz	
	Connector type	LC (IEC 61754-20)
	Center wavelength	1310nm (typ.), 1270 … 1360nm
	Input optical power	[O_DAP_MO_MM_a]: -31 … -8dBm, OM2 multimode (50/125µm) [O_DAP_MO_SM_a]: -23 … -8dBm, singlemode (9/125µm) (standard values, others on request)
	Cable length (max.)	[O_DAP_MO_MM_a]: 1.5km, OM2 multimode [O_DAP_MO_SM_a]: 2km, singlemode (standard values, others on request)
Optical Output, LC	64/56 channels @ 44.1 and 48kHz, 32/28 @ 88.2 and 96kHz Processable by D*AP8: 16 channels @ 44.1, 48kHz Processable by D*AP4: 8 channels @ 44.1, 48, 88.2, 96kHz	
	Connector type	LC (IEC 61754-20)
	Center wavelength	1310nm (typ.), 1270 … 1360nm
	Output optical power	[O_DAP_MO_MM_a]: -23 … -14dBm, OM2 multimode (50/125µm) [O_DAP_MO_SM_a]: -15 … -8dBm, singlemode (9/125µm) (standard values, others on request)
BNC Output	Optical and BNC output carry the same signal.	
	Impedance	75Ohm
	Output voltage	0.6Vpp (typ.) @ 75Ohm
General Features	• Field-replaceable optical module (SFP) • Reference grade word clock recovery, master-sync capable • Dedicated routing for non-processed channels, all channels (max. 64) can be routed to/from the device or looped through • AES3 channel status management, non-audio detection • Parallel outputs (BNC/LC) for media conversion	

Technical Data – Option Board Audio-over-IP DANTE™ I/O **[O_DAP_DANTE_a]**

Standards	Audio-over-IP by Dante™ Digital Audio Networking Standard
Audio	24bits, transparent forwarding of PCM and compressed audio
Audio Sample Rate	44.1, 48, 88.2, 96kHz
Inputs and Outputs	2 x Gigabit Ethernet RJ45 connectors (100M/1Gbit), primary and secondary port
Inputs	Processable by D*AP8: 16 channels @ 44.1, 48kHz Processable by D*AP4: 8 channels @ 44.1, 48, 88.2, 96kHz
Outputs	Processable by D*AP8: 16 channels @ 44.1, 48kHz Processable by D*AP4: 8 channels @ 44.1, 48, 88.2, 96kHz
General Features	• AES67 compliant (when available) • Network master-sync can be provided by D*AP device • Master-sync capable (for D*AP device) • Non-audio detection for input channels • Glitch-free Dante™ audio redundancy using dual Ethernet networks

Technical Data – Rear Connectors – **pin assignment**

connector:	GPI/O
female	25-pin D-Sub
1	GPI_1, 2, 3, 4 common
2	GPI_1
3	GPI_2
4	GPI_3
5	GPI_4
6	GPI_5, 6, 7, 8 common
7	GPI_5
8	GPI_6
9	GPI_7
10	GPI_8
11	
12	
13	Isolated 5V **+**
14	GPO_1, 2, 3, 4 common
15	GPO_1
16	GPO_2
17	GPO_3
18	GPO_4
19	GPO_5, 6, 7, 8 common
20	GPO_5
21	GPO_6
22	GPO_7
23	GPO_8
24	Isolated 5V **-**
25	Isolated 5V **-**

connector:	Metadata IN
female	9-pin D-Sub
1	GND
2	Tx (-)
3	Rx (+)
4	GND
5	
6	GND
7	Tx (+)
8	Rx (-)
9	GND

connector:	Metadata OUT
male	9-pin D-Sub
1	GND
2	
3	Tx (+)
4	GND
5	
6	GND
7	
8	Tx (-)
9	GND

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Technical Data - Optional Interface Modules – **pin assignment**

4x analog I/O [O_DAP_ADDA_a]   4x AES I/O [O_DAP_AES_a]   8x analog out [O_DAP_8DA_a]

connector:	4 x analog I/O
female	25-pin D-Sub
1	OUT-4 +
2	GND
3	OUT-3 -
4	OUT-2 +
5	GND
6	OUT-1 -
7	IN-4 +
8	GND
9	IN-3 -
10	IN-2 +
11	GND
12	IN-1 -
13	
14	OUT-4 -
15	OUT-3 +
16	GND
17	OUT-2 -
18	Out-1 +
19	GND
20	IN-4 -
21	IN-3 +
22	GND
23	IN-2 -
24	IN-1 +
25	GND

connector:	4x AES I/O
female	25-pin D-Sub
1	OUT-4 +
2	GND
3	OUT-3 -
4	OUT-2 +
5	GND
6	OUT-1 -
7	IN-4 +
8	GND
9	IN-3 -
10	IN-2 +
11	GND
12	IN-1 -
13	
14	OUT-4 -
15	OUT-3 +
16	GND
17	OUT-2 -
18	OUT-1 +
19	GND
20	IN-4 -
21	IN-3 +
22	GND
23	IN-2 -
24	IN-1 +
25	GND

connector:	8 x analog out
female	25-pin D-Sub
1	OUT-8 +
2	GND
3	OUT-7 -
4	OUT-6 +
5	GND
6	OUT-5 -
7	OUT-4 +
8	GND
9	OUT-3 -
10	OUT-2 +
11	GND
12	OUT-1 -
13	
14	OUT-8 -
15	OUT-7 +
16	GND
17	OUT-6 -
18	OUT-5 +
19	GND
20	OUT-4 -
21	OUT-3 +
22	GND
23	OUT-2 -
24	OUT-1 +
25	GND

Technical Data - **GPI wiring**

The device offers a unique circuitry to save **GPI** setups from hum and noise influence in complex installations. Here the principle circuit of one of the **eight GPI** inputs:
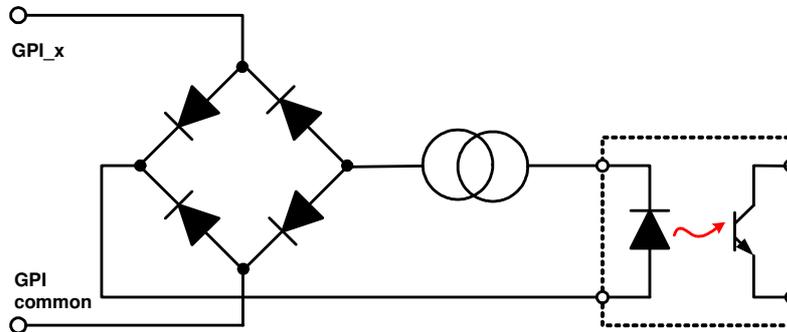

At the GPI input is a **bridge rectifier** I.e. you do **not** need to care about the polarity of the input voltage. A **constant current source** in line with the **optical coupler** limits the current.
You must simply provide a voltage in the range from 5V to 30V to activate a **GPI**.

If you have open collector outputs or simple relay closures as the driving **GPOs** (this technique is commonly known as "low active" and will be found in most legacy equipment),
you must wire up an auxiliary voltage supply.

The device provides such auxiliary power supply. It offers a balanced 5V source that you can imaging as a battery.

Here an example how to wire up GPI #4:
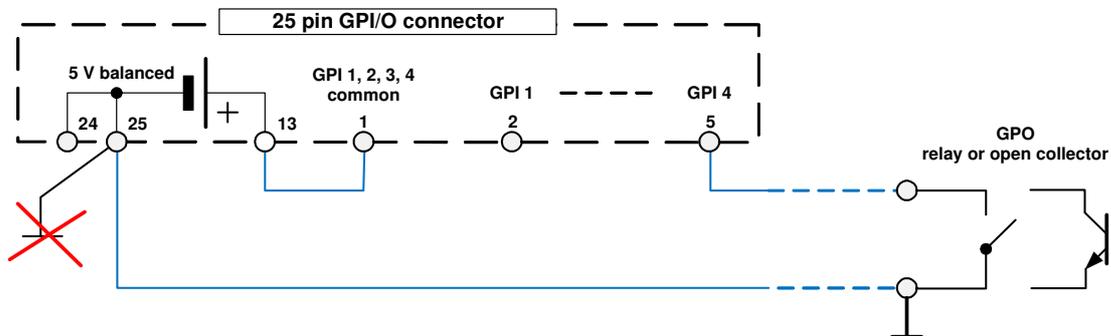
We strongly recommend to spent a wire for ground connection instead of using the chassis common grounds of an installation.

D*AP8 MAP

Safety Information

Electrical

Safety classification:	Class 1 – grounded product / Schutzklasse 1 Corresponding to EN 60065:2002
Power connection:	The device must be connected to a power socket that provides a protective earthing conductor.
Power switch:	The power switch is a toggle switch placed at the rear of the device. The ON / OFF position is indicated by engravings [I] / [o] on the lever. It must be reached without difficulty. The devices may be equipped with dual power supply, in this case it will have two power cords and switches. You must inform yourself about the location and assignment of the switches.
Water protection:	The device must not be exposed to splash or dripping water. It is permitted to place a container filled with liquids (e.g. vases) on top of the device.

Service safety   Only qualified personnel should perform service procedures.

Do not service alone:	Do not perform internal service or adjustments of the device unless another person capable of rendering first aid and resuscitation is present.
Disconnect power:	To avoid electrical shock, switch off the device power, then disconnect the power cord from the mains power. Do not block the power cord; it must remain accessible to the user at all times

To avoid fire or personal injury

Mounting:	It must be placed on a flat surface or must be mounted into an 19" rack. It is recommended to use metal brackets (sheet steel angle) to support the device.
Provide proper Ventilation	this case and if the device has a built in fan, a gap of at least 1cm must be left between the device edge and the steel angle. It is highly recommended to leave a gap of at least 1RU above and below the device.
Use proper power cord	Use only the power cord specified for this product and certified for the country of use.
Do not operate without covers	Do not operate this product with covers or panels removed.
Do not operate with suspected failures	If you suspect that there is damage to this product, have it inspected by by qualified service personnel.
Risk of explosion:	The device contains a lithium battery. If replaced incorrectly or by a different or inadequate type an explosion may occur.

Warranty

Standard Junger Audio two-year warranty on parts and labor.

Specifications are subject to change without notice

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