musikelectronic geithain
RL-Amplifier 2

Instructions for installation and use

Inhaltsverzeichnis

1 Introduction

Dear customer,

Thank you for your trust you have put in us by buying these speakers. You decided upon a quality product that in regard to tonal and technical characteristics complies with the utmost expectations.

Please read the technical description and manual to take advantage of the capabilities of these speakers and ensure safe operation.

2 Disclaimer

Technical data and appearances are subject to changes without notice. Errors and omissions excepted. Musikelectronic Geithain GmbH assumes no liability for any loss which may be suffered by any person who relies either wholly or in part upon any description, photograph or statement contained herein. Musikelectronic Geithain GmbH products are sold through authorised fulfillers and resellers only. Fulfillers and resellers are not agents of Musikelectronic Geithain GmbH and have absolutely no authority to bind Musikelectronic Geithain GmbH by any express or implied undertaking or representation. This manual is copyrighted. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system without the prior written permission of Musikelectronic Geithain GmbH.

3 System description

The RL-Amplifier 2 is a device especially designed as a separate 19 inch rack amplifier for 3 channel studio monitors from Musikelectronic Geithain GmbH. The device has PWM power amplifiers to allow operation with convection cooling in a compact 19-inch housing. It offers technical protective measures to ensure safe operation of the attached loudspeaker. It is designed for users searching for a device with minimum space requirements. The use of a digital signal processor allows for flexible adjustment of the frequency response to the acoustical environment. Integration into digital production work chains is easily possible due to the AES/EBU input.
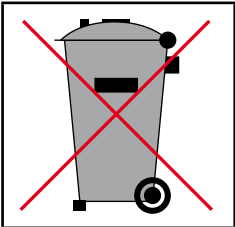
4   Technical data

nominal input level	+6 dBu
maximum input level	+22 dBu
output power limited to	
LF	160 W
MF	80 W
HF	80 W
inherent noise sound level with attached loudspeaker	$P < 10$ dB(A) / $r = 1$ m (3.3 ft)
status indication at RL Amplifier	display blue
level indicator	LED chain at amplifier
operating voltage	85 - 265 V 50 / 60 Hz
power consumption	max. 400 VA / max. 4 A
mains connector	IEC connector
protection class	protection class 1
input connector	
analogue	2x XLR3-F
digital	XLR3-F AES/EBU
output connector	2x Neutrik Speakon NL8 MPR
dimensions (w x d x h)	44.5 cm (faceplate 48.5 cm) x 27 cm x 4.5 cm (1 RU)
	17.5 in (faceplate 19.1 in) x 10.6 in x 1.8 in (1 RU)
weight	4.2 kg (9.3 lbs)
environmental specifications	
operating temperature range	+15 °C ... +35 °C
storage temperature range	-25 °C ... +45 °C
Humidity	45 % ... 75 %
EMV conformity	EN55103-1 Emission Class A
	EN55103-2 Immunity
additional accessories (optional)	NL8 Speakon connection cable between amplifier and loudspeaker

5   Basic information

5.1   Guidelines

This product complies with requirements of current European and national guidelines (Elektromagnetische Verträglichkeit 89/336/EWG). The conformity is ascertained, corresponding declarations and records are deposited with the manufacturer.

Products built by us belong to B2C-class of the WEEE guidelines and must not be disposed with domestic waste.

5.2   Safety instructions

Like using any other electrical device you should observe the following operation guidelines, safety instructions and warning signs to ensure optimum functionality and safety of operation!

◀ Read these instructions carefully.

◀ Keep these instructions during the life cycle at a safe place. The instructions are an important part of the product.

◀ Heed all warnings.

◀ Follow all instructions.

◀ Clean only with dry or slightly moistened cloth.

◀ The heat sink must not be blocked or covered. This product should not be installed unless proper ventilation is provided or manufacturer's instructions have been adhered to.

◀ Do not install the device near any heat sources.

◀ Protect the power cord from being walked on, pinched or damaged in any other way. Pay particular attention to plugs and the point where they exit from the amplifier unit.

◀ The product may only be used in accordance with the information provided in the user manual. Before and during the usage of the amplifier please ensure that all recommendations, especially the safety recommendations in the user manual, are adhered to.

◀ Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury, and serious damage to the product.

◀ Refer all servicing to qualified service personnel.

Water, rain, humidity and dust

The device is not protected against water, rain or excessive humidity and mustn't be exposed to these environmental conditions or operated next to them. Employ appropriate safety measures to prevent dust and dirt to get into the device. Dust and humidity are often the main reason for high voltage creepage paths and serious electrical dangers.

Maintenance

Unplug the device from the mains supply and refer to your authorised retailer or authorised repair and maintenance shop or the manufacturer. Maintenance is only allowed by one of the stated groups, because opening or removing the cover could expose you to dangerous voltages or other dangers. Maintenance is required when …

… liquid has been spilled or objects have fallen into the device,

… the device has been exposed to rain or moisture,

… the device has been dropped or suffered damage in any other way,

… the device exhibits a distinct change from its normal function or performance.

Repair and replacement parts

All service and repair work must be carried out by an authorised retailer or an authorised repair and maintenance shop or the manufacturer. When replacement parts are required, please ensure that only replacement parts specified by the manufacturer are used. The use of unauthorised replacement parts may result in injury and/or damage through fire or electric shock or other electricity-related hazards.

Safety check

Upon completion of any service or repairs to this product ask the retailer or the authorised repair and maintenance shop or the manufacturer to perform safety checks to determine that the device is in proper operating condition.

Transport

To ship this device, always use the original shipping carton and packaging materials. For best protection pack it the same way as the manufacturer.

Environments

Use this product only in E1, E2, E3 or E4 environments according to EN55103-2 "Electromagnetic compatibility – Product family standard for audio, video and audio-visual and entertainment lighting control apparatus for professional use – Part 2: Immunity".

Ventilation and heat sink

The heat sink is provided to ensure reliable operation of the amplifier and to protect it from

overheating. The heat sink must not be blocked or covered. This product should not be installed unless proper ventilation is provided or manufacturer's instructions have been adhered to.

Cleaning

Unplug the device from the wall outlet before cleaning. Do not use liquid or aerosol cleaners.

Power-cord protection

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon them or against them, paying particular attention to cords and plugs, and the point where they exit from the device.

Lightning

For added protection of the product during lightning storms, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.

Interference of external objects and/or liquids with the appliance

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the amplifier.

Connecting

When you connect the device to other equipment, turn off the power and unplug all of the equipment from the supply source. Failure to do so may cause an electric shock and serious personal injury. Read the user's manual of the other equipment carefully and follow the instructions when making the connections.

Sound level

Reduce the volume to minimum before you tune on the amplifier to prevent sudden high levels of noise which may cause hearing or speaker damage.

Power failure

In case of power failure while the amplifier is powered up, it will automatically restart as soon as the mains supply is restored. All settings made before the power failure are restored.

Speakon connectors and Speakon cords

WARNING: Speakon connectors marked with a lightning bolt, indicate high voltages that might be life threatening.

Refer custom wiring with these connectors to qualified personnel and use off-the-shelf cords.

To prevent electric shock, do not operate the product with any of the conductor portion of the speaker wire exposed.

Employ appropriate safety measures when connecting the mains cable.

When installing or connecting the product, disconnect it from mains supply. The product mustn't be connected to other alternating voltages and sockets than demanded on the back of the device.

IMPORTANT: Only off-the-shelf cables are allowed to be used to connect the product to mains.

IMPORTANT: To disconnect the product from mains, first disconnect the mains cable from the socket, and then remove the cable from the product.

THE MAINS CONNECTION MUSTN'T BE DISCONNECTED FROM PROTECTIVE EARTH. THAT'S ILLEGAL AND DANGEROUS.

5.3   Unboxing

Unpack the speaker carefully and check for visible damages by inappropriate transport. In case of damages report them to your retailer. Keep the packaging, in case the speaker has to be transported in the future.

5.4   Delivery contents

◀ RL-Amplifier 2
◀ Power cord
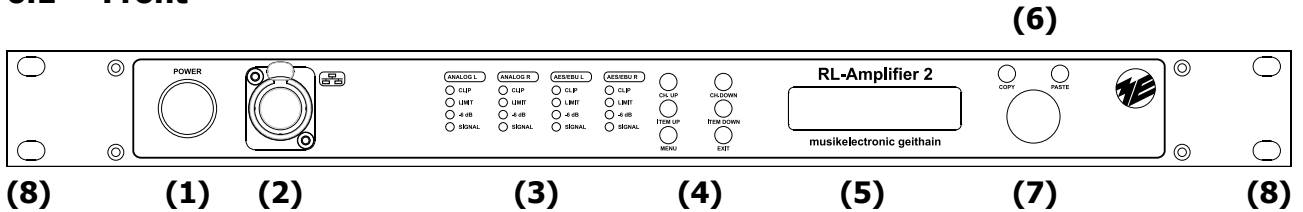◀ Technical description and user manual

Attention: The speaker cables with 8 poles are not included in the delivery contents and have to be ordered in the right length.

5.5   Guarantee acknowledgements

Opening the device by unauthorised personnel leads to all claims under guarantee expire. In case of destruction by overloading, inappropriate use or extraneous circumstances there are no claims under guarantee.
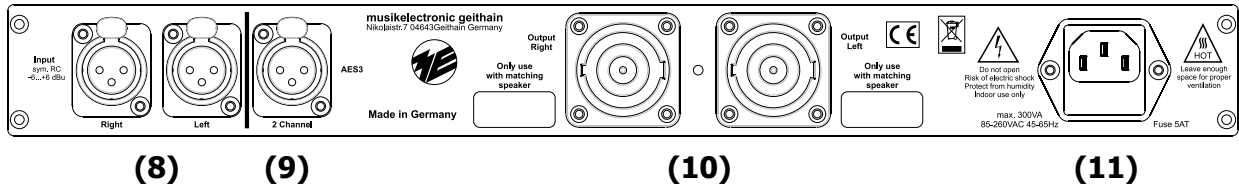
6   Controls and connections

6.1   Front

◀ Power button for switching the device on and off **(1)**

◀ RJ-45 10/100 Baste-T port for maintenance and configuration **(2)**

◀ LED level meter **(3)**

◀ Six buttons for navigation and controlling the device **(4)**

◀ LCD display with two rows **(5)**

◀ Two buttons for navigation and controlling the device with copy and paste functionality **(6)**

◀ Rotary control for navigation and controlling the device **(7)**

◀ Mounting holes for installation into a rack with four screws **(8)**

6.2   Back

◀ 2x XLR3-F connectors for the input signal (left and right channel) **(8)**

◀ XLR3-F AES/EBU connector for digital input **(9)**

◀ 2x eight-pole Speakon connector for connection to the speakers **(10)**

◀ IEC connector with fuse carrier (250 V 5 AT) for powering up the device **(11)**

7   Installation and operation

Every amplifier output is paired to exactly one speaker by the same serial number. The according serial number is located next to the output. Ensure installation in pairs.

During installation ensure sufficient convection at the heat sink. The amplifier should not be installed below devices that tower above it.

In case of rack installation the amplifier is only screwed to the rack through the face plate. Therefore ensure secure mounting.

Before start-up check the mains voltage stated on the backside of the device. If your local mains voltage does not match the specification of the speaker, please refer to your retailer or direct distribution. When the stated and your local mains voltage comply connect the mains connector **(11)** to the socket with the included mains cable.
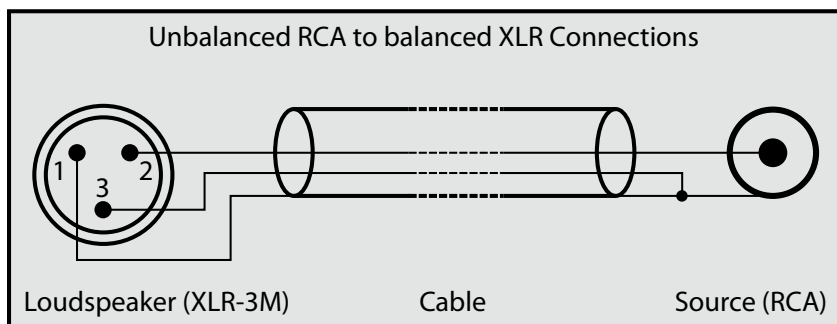
For further connections, ensure the amplifier is turned off (display unlit). In case the display is blue, turn of the device by pressing the power button at the front of the device **(1)**. Now connect the speakers with Speakon cables to the amplifier **(10)**. To minimise EMI distortion that could be produced by the device we advise the usage of the Speakon cables sold separately by Musikelectronic Geithain GmbH. Connect the signal source to the amplifier through the analogue XLR connectors **(8)**. For digital signal sources use the digital AES/EBU input **(9)**.

7.1   Cable connections

The input of the integrated amplifier is electrically balanced. When your signal source also utilizes balanced connectors, please use a cable wired as stated in the table:

	Balanced connector (Amplifier) **XLR**	Balanced connector (Signal source) **XLR**	Unbalanced connector (Signal source) **RCA**
Earth	Pin 1	Pin 1	Ring
Signal +	Pin 2	Pin 2	Tip
Signal -	Pin 3	Pin 3	Ring

When using a signal source with unbalanced outputs (RCA) you need to balance the connecting cables. This avoids hum and other noise interferences. The table and the following figure show the wiring.

Unbalanced RCA to balanced XLR Connections

Loudspeaker (XLR-3M)   Cable   Source (RCA)

To connect the RL Amplifier 2 to the corresponding speakers you need a NL8 Speakon cable, wired according to the following table:

Power signal (Amplifier)	Power signal (Speaker)
Speakon NL8	**Speakon NL8**
PIN 1	PIN 1
PIN 2	PIN 2
PIN 3	PIN 3
PIN 4	PIN 4
PIN 5	PIN 5
PIN 6	PIN 6
PIN 7	PIN 7
PIN 8	PIN 8

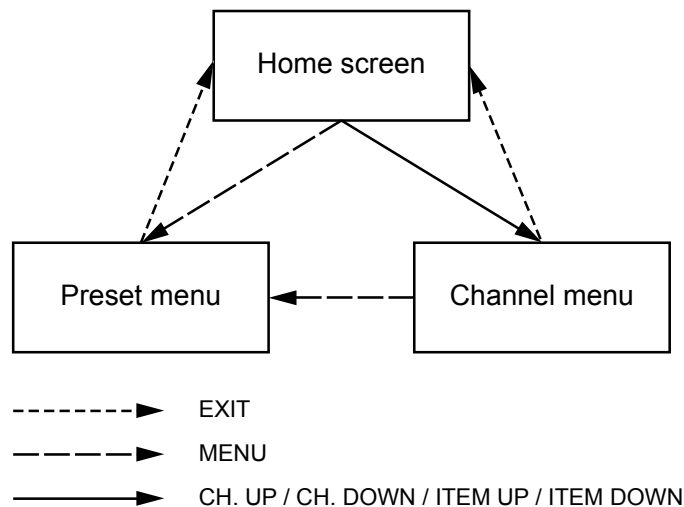## 8   Operation and configuration of the amplifier

The RL-Amplifier 2 can be configured directly at the device or comfortably with a personal computer and ME Geithain DSP Control.

8.1   Desktop-Software ME Geithain DSP Control

For RL-Amplifier 2 configuration and monitoring is possible via the integrated RJ45 ports **(2)** with a personal computer (IBM-PC or Macintosh). The according software as well as a user manual is available for download from the Musikelectronic Geithain GmbH website.
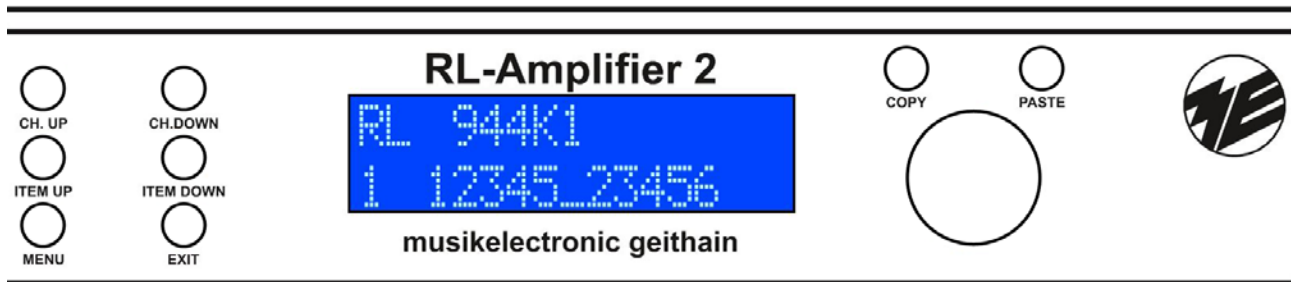
8.2   Menu structure

When the RL-Amplifier 2 is switched on the display **(5)** shows the Home screen with device name and currently loaded preset. Underneath is the Preset menu, used to load and save presets, show the serial number of the DSP module and switch to the LOCKED status. The signal processing parameters of the currently loaded preset are configured in the Channel menu. If there is no input in the lower levels the amplifier returns to the Home screen.

Navigation between the menus
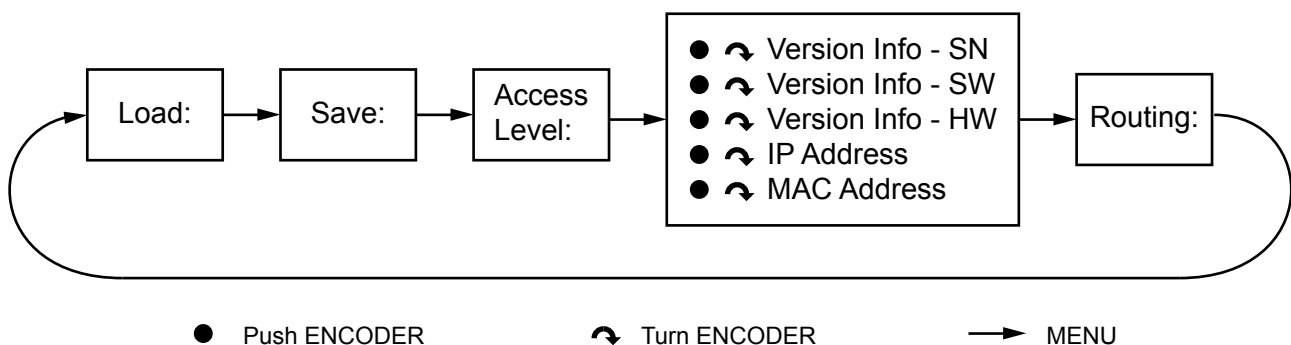
8.3 Home screen

In the first row the Home screen shows the type of the speaker connected to the RL Amplifier 2. The second row shows the number of the current preset, then the name of the preset. A "*" at the end of the line indicates that the amplifier is currently occupied (loading presets, synchronising with the PC software, etc.). Meanwhile controlling the device is not possible.

A "!" at the beginning of the first line indicates unsaved changes in the current configuration.

8.4 Preset menu

The preset menu is at any time accessible by pressing MENU. The first menu item is LOAD to load a saved preset. Press MENU again to go on through the preset menu. Turning the rotary control changes between presets and pressing it down loads the shown preset. Another menu item asks to confirm the decision. Choose No, press MENU or EXIT to abort the action and return to the Home screen. The preset number one in the device holds the factory settings. For easy assignment the name of this preset consists of the serial numbers of the according speakers. This preset cannot be overwritten so that it is always possible to restore the factory settings.

Handling the menu item SAVE works in the same way. After choosing a save location, insert a name for the preset. Chapter „8.6 Entering names and passwords" on page 18 describes the procedure.
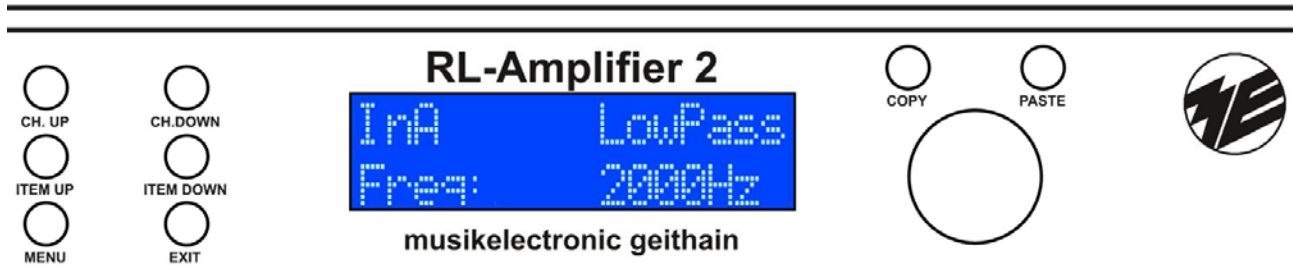

Menu items of the preset menu

After menu item SAVE follows the access level. To choose the LOCKED status, insert a password according to the user level. In chapter „8.6 Entering names and passwords" on page 18 is a description of the procedure.

The last menu item is the information panel. Turn the rotary control to browse through items showing the current hardware version, serial number of the DSP module, software version and the IP and MAC address of the device.
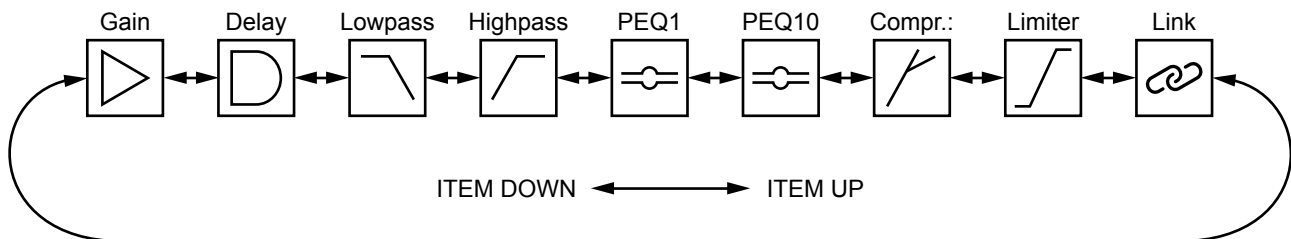
8.5   Channel menu

The channel menu is used to browse between the inputs and changing the parameters of the signal processing chain of the according channel. Enter the channel menu by pressing the rotary control or the buttons Ch. UP or Ch. DOWN. The first row shows the current input and the current item. The Ch. UP and Ch. DOWN buttons are used to choose an input. To choose an item, use the ITEM UP and ITEM DOWN buttons similarly to selecting an input. The parameters are adjustable through the rotary control. All changes take effect immediately and remain stored until a new preset is loaded. Pressing down the rotary control browses through the parameters of the items if more parameters are available to this item.

The input channels are:

◀ InA: analogue left

◀ InB: analogue right

◀ InC: digital left

◀ InD: digital right

Signal processing chain in a channel

Gain   Adjust the gain of the channel, e. g. to adjust the balance or volume between analogue and AES signals.

    ◀ Mute: -48 dB … +12 dB

Delay: Delay every input signal, e. g. for compensation of different distances in a 5.1 setup.

    ◀ 0 … 2000 ms

    ◀ 0 … 2252 ft

    ◀ 0 … 686.52 m

LowPass: Use lowpass filtering on the input signal with different slopes, filter characteristics and variable frequencies.

    ◀ Freq: 50 Hz … 20,000 Hz

    ◀ Type: BUT 6, 12, 18, 24 dB; BES 6, 12, 18, 24 dB; LR 12, 24 dB

    ◀ Enabled: Off … On

HighPass: Use highpass filtering on the input signal with the same parameters as the lowpass filter, e. g. filtering the low frequencies of the satellites in a 5.1 set-up.

    ◀ Freq: 20 Hz … 20,000 Hz

    ◀ Type: BUT 6, 12, 18, 24 dB; BES 6, 12, 18, 24 dB; LR 12, 24 dB

    ◀ Enabled: Off … On

PEQ1…10:   Parametric filters for adjustment to the room acoustics.

    ◀ Gain: -12…12 dB

    ◀ Freq: 20 Hz…20 kHz

    ◀ Type: Bell, Notch, High Shelf, Low Shelf, Allpass, Band Pass, High Pass, Low Pass

    ◀ Enabled: Off…On

    ◀ Q: 0.1…25

Compressor: Compressor for the according channel.

    ◀ Thr.:   -48 dBu…24 dBu

    ◀ Att: 1…10,000 ms

    ◀ Hold: 0…10,000 ms

    ◀ Rel.:   1…10,000 ms

    ◀ Ratio: 1.20:1…inf:1

    ◀ Gain: -12 dB…12 dB

Limiter: Limiter for the input signal.

    ◀ Thr.:   -48 dBu…24 dBu

    ◀ Rel.:   10…100 dB/s

Link: Use this option to group analogue and digital input signals so that the settings of the left channel are automatically copied to the right channel.
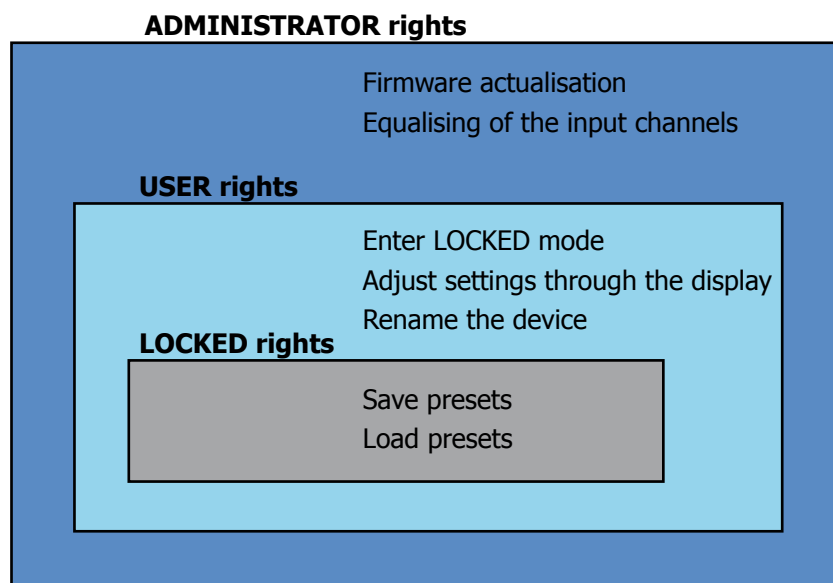
    ◀ Off…On

8.6   Entering names and passwords

To insert strings like names and passwords through the panel, choose a digit with the rotary control and confirm by pressing the rotary control down. The cursor will then jump right to the next position. Press ITEM DOWN and the cursor jumps back to the position to the left.

To confirm a name, press the MENU button. To access a password protected function it is sufficient to enter the right password.

9   User rights

The device is divided into three user levels with different permissions: LOCKED, USER and ADMINISTRATOR. The levels USER and ADMINISTRATOR are password protected. The LOCKED level prevents changes to the configuration of the device by unauthorised personnel. The device could be started up in the LOCKED mode or USER mode.

ADMINISTRATOR rights

Firmware actualisation
Equalising of the input channels

USER rights

Enter LOCKED mode
Adjust settings through the display
Rename the device

LOCKED rights

Save presets
Load presets

Standard passwords

ADMINISTRATOR: TsAmAD7
USER: tSAmPUr4

10   Troubleshooting

Description of error	Possible causes	Corrective measures
Screen dark	Device in stand-by	Press any key
	Device is switched off	Ensure the device is switched on
No sound	Speakers are not connected correctly	Examine the Speakon connections to the speakers
	In-/outputs are muted	Deactivate muting at the device or in the software
	No input signal available	Connect an analogue or digital input signal
Network does not recognise the device	Network cable defect	Exchange the network cable
	No DHCP in the network	Connect the PC directly to the amplifier with a network cable and check the network settings of the device
LED under the tweeter glows red	Amplifier is getting too hot	Remove the input signal and let the device cool down Ensure the device is installed according to the instructions and proper ventilation is provided
LED under the tweeter blinks red	Output current of the amplifier is too high	Examine the speaker or the cable for defects (Shorts)

11   Notes

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