AUDIOTECHNIK

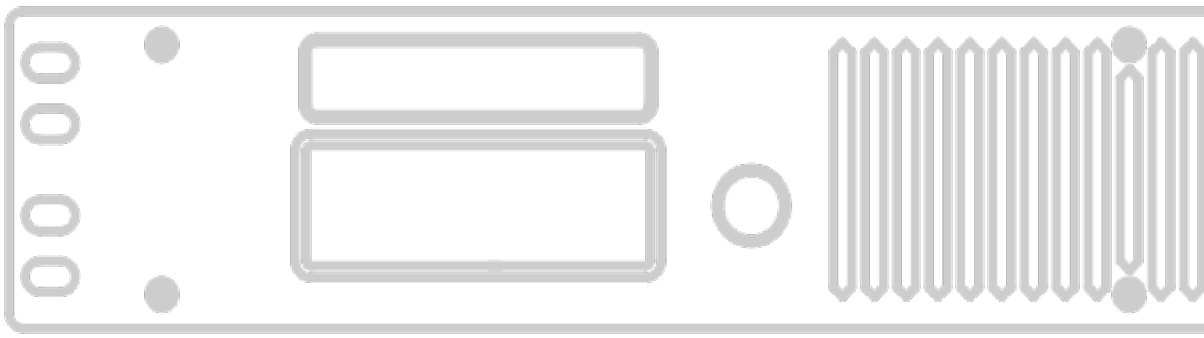
I-Line

Elegant installation speaker systems

IA 202*D*

IA 402*D*

Instruction Manual



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If you find any issues, bugs and typos, they are welcome to be reported to the following email address: u.vilcans@se-audiotechnik.de

Keep this manual with the product or in a safe place so that it is available for future reference.

We recommend you to regularly check the SE Audiotechnik website for the latest version of the firmware and documentation such as this instruction manual.

When reselling this product, hand over this manual to the new owner.

If you supply SE Audiotechnik products, please draw the attention of your customers to this manual. Enclose the relevant manuals with the systems. For more information and help, please contact us: info@se-audiotechnik.de

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1. Important Safety Instructions

Explanation of graphical symbols

The lightning bolt triangle is used to alert the user to the risk of electric shock.

The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

The CE-mark indicates the compliance with the low voltage and electromagnetic compatibility.

Symbol for earth/ground connection.

Symbol indicating that the equipment is for indoor use only.

Symbol for conformity with Directive 2002/96/EC and Directive 2003/108/EC of the European Parliament on waste electrical and electronic equipment (WEEE).

Main Electrical Safety Precautions

THE MAINS PLUG OF THE POWER SUPPLY CORD MUST REMAIN READILY ACCESSIBLE.

DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE, DRIPPING OR SPLASHING LIQUIDS. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS**.**

WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO OPEN ANY PART OF THE UNIT. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

This unit has been engineered and manufactured to ensure your personal safety. But IMPROPER USE CAN RESULT IN POTENTIAL ELECTRICAL SHOCK OR FIRE HAZARD.

Always follow the basic precautions listed here to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following items in this chapter.

Important Safety Instructions

1. Keep these instructions.
2. Read these instructions.
3. Follow all instructions.
4. Heed all warnings.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth. Disconnect the device from the AC outlet before cleaning. Do not use paint thinners, solvents, cleaning fluids, or chemical-impregnated wiping cloths.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Use the mains plug to disconnect the apparatus from the mains.
16. Do not insert your fingers, hands or any other foreign objects into any gaps or openings of the device.

2. Introduction

IA 202*D* and **IA** 402*D* are two system amplifiers as part of SE Audiotechnik installation series **I**-Line. This instruction manual explains the core functionality and features of the amplifiers.

Please check if your amplifiers are equipped with the latest firmware version as the firmware is being improved and updated. Contact your dealer for more information.

2.1. Features

Both system amplifiers are equipped with a simple to use LCD screen and rotary knob controller in a simple and unobtrusive aluminum housing. Both amplifiers have both Phoenix and SPEAKON type loudspeaker output terminals.

Built-in 24bit/48kHz DSP processing provides amplifier with controlled signal processing and limiting. Two models are available: **IA** 202*D* (2 x 250W @ 8Ω) and **IA** 402*D* (2 x 400W @ 4Ω). The amplifiers were designed to power **I**-Line installation columns **IC** 32 and **IC** 34. Additional FLAT speaker preset allows to configure the amplifier to be used with 3rd party loudspeakers, if necessary.

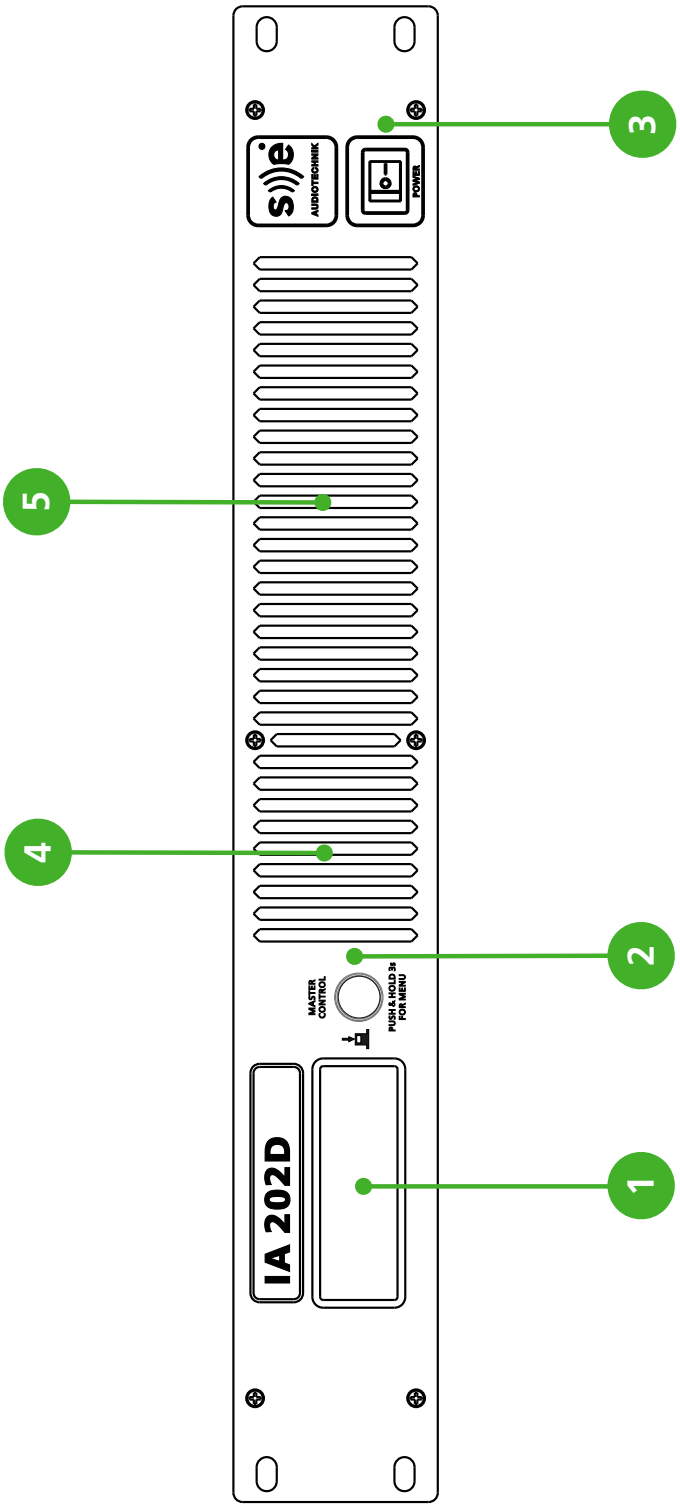
2.2. Technical Specifications

Parameter / Value	IA 202D	IA 402D
Type	Class-D, SMPS	
Power Output	2 x 250W @ 8 Ω 2 x 125W @ 16 Ω	2 x 400W @ 4 Ω 2 x 200W @ 8 Ω 2 x 100W @ 16 Ω
Minimum Load Impedance	8 Ω	4 Ω
Input Impedance	20 kΩ balanced, 10 kΩ unbalanced	
SNR (At rated power)	95 dB	
Crosstalk	64 dB	62 dB
DSP	48 kHz, 24-bit DSP processor, processing latency: 1.1 ms	
Signal Processing	Speaker presets, Delay, High-Shelf, Low-Shelf, High-Pass, Low-Pass, Parametric Equalizer, RMS Limiter, Peak Limiter, Phase Invert, Mute, Output Gain	
Controls	Digital encoder with push button	
Maximum Input Level	+20dBu	
Signal Connectors	XLR 3-pin male line-level inputs/link outputs, Phoenix Contact MSTB 3-pin inputs/link outputs	
Speaker Connectors	Neutrik SpeakON® NL4 outputs, Phoenix Contact MSTB 4-pin outputs	
Protection	short-circuit, over-heating, over-current	
Cooling	Sensor controlled fan, front-to-back air flow	
Power Efficiency	76%	83 %
Power Consumption (Idle, Full Power)	29 W / 600 W	30 W / 1000 W
Power Requirements	100 – 120 VAC 50/60 Hz 220 - 240 VAC 50/60 Hz	
Dimensions (W x H x D)	483 x 66 x 256 mm / 1.5 HU	
Weight	4.7 kg (netto)	5.1 kg (netto)

*All product specifications in this document are subject to change without notice.

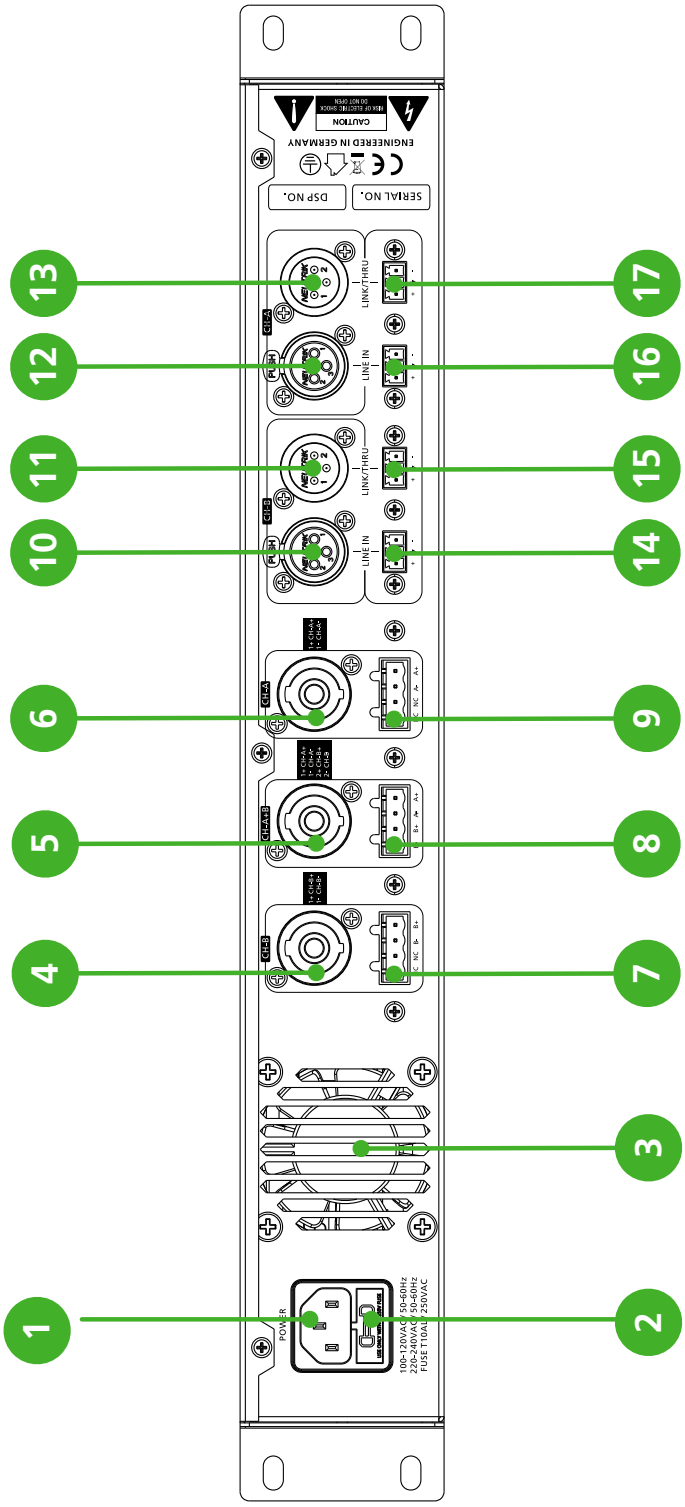
3. Overview

3.1. Front Panel



1. Alpha-numeric LCD screen.
2. **Master Control** rotary encoder with push button.
3. Power switch
4. Air-intake fan.
5. Air-intake vents.

3.2. Rear Panel



1. AC power connector.
2. Fuse.
3. Fan.
4. Output: Channel B SpeakON
5. Output: Channel A & B SpeakON
6. Output: Channel A SpeakON
7. Output: Channel B Euroblock/Phoenix
8. Output: Channel A & B Euroblock/Phoenix
9. Output: Channel A Euroblock/Phoenix
10. Input: Channel B XLR Female
11. Link/Thru: Channel B XLR Male
12. Input: Channel A XLR Female
13. Link/Thru: Channel A XLR Male
14. Input: Channel B Euroblock/Phoenix
15. Link/Thru: Channel B Euroblock/Phoenix
16. Input: Channel A Euroblock/Phoenix
17. Link/Thru: Channel A Euroblock/Phoenix

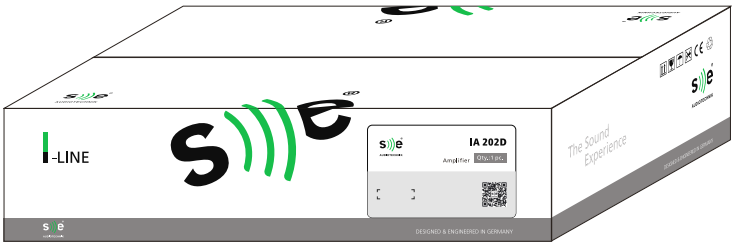
4. Setup & Installation

4.1. Package Contents

The packaging of the amplifier contains of:

- I-Line amplifier IA 202D or IA 402D
- IEC type power cord
- Attachable rubber feet
- Instruction manual
- Warranty card

4.2. Unpack Your Amplifier



Please inspect your amplifier packaging for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you can initiate a claim for shipping damage. If the packaging got damaged upon transit please unpack the amplifier and check it for any visual damage before using it. Save the shipping carton as evidence of damage for the shipper's inspection.

Contact your SE Audiotechnik dealer or SE Audiotechnik support center for help and assistance.

We recommend that you save all packing materials and full package contents if you ever need to transport the amplifier. This also includes:

- Power cable
- Attachable rubber feet
- Instruction manual

4.3. Installation

- The recommended use of the device is in fixed or portable 19" rack.
- When the device is not installed in a rack, attach the provided rubber feet to the bottom of the housing.
- Leave at least 30cm space at the back of the amplifier for proper airflow.
- Do not use the device in a confined, poorly-ventilated location.
- Do not block the air intake / blow-out holes. This device has ventilation holes at the front/rear to prevent the internal temperature from becoming too high. In particular, do not place the device on its side or upside down. Inadequate ventilation can result in overheating, possibly causing damage to the device, or even fire.

4.4. Handling

- Do not rest your weight on the device or place heavy objects on it, and avoid the use of excessive force on the buttons, switches or connectors to prevent injuries or device damage
- Condensation can occur in the device due to rapid, drastic changes in ambient temperature when the device is moved from one location to another, or air conditioning is turned on or off, for example. Using the device while condensation is present can cause damage. If there is reason to believe that condensation might have occurred, leave the device for several hours without turning on the power until the condensation has completely dried out.
- Rapidly turning the unit on and off in succession can cause it to malfunction. After turning the unit off, wait for more than five seconds before turning it on again
- Do not use this device for any other purpose than driving loudspeakers!

5. Operation

5.1. Controls & User Interface

Controlling of the power amplifier is done with rotary control encoder with push button and 4x20 symbol alpha-numeric LCD screen. Further chapters explain menu operation and features. Several cursors & symbols are being used throughout the menu structure:

- *">"* a cursor pointed to the current point of action,
- *"*"* a cursor displaying a selection (for presets or settings) and when the parameter editing is enabled,
- *"←"* deletion cursor when editing preset names,
- *"L"* displaying amplifier locked status in the Overview screen.

6. Screen Items & Operation

6.1. Overview

The *Overview* menu/screen is the default screen showed on the amplifier LCD during normal operation (Figure 1).

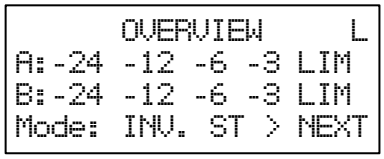


Figure 1. Overview Screen.

Various information is displayed on the screen:

- "L" Letter in top right-corner displays amplifiers Lock state. When the amplifier screen is locked the "L" letter is present in the top-right corner of the *Overview* screen,
- Output level of the amplifier is displayed in the second and third row. When the limiter threshold is reached and gain reduction is applied to the signal "LIM" letters show up at the end of the scale. The backlight of the screen blinks calling for user attention. If the channels are muted, the level display meters are replaced with the text *"MUTED"*.
- On the bottom-left part of the screen *Input Routing* mode is shown.
- When clipping occurs the level is replaced with *"INPUT CLIP"* text and the backlight of the amplifier blinks thus calling for user attention.

Further actions from the Overview screen can be:

- Scrolling the rotary knob and thus adjusting both channel output levels by the same amount. Change delta in dB is shown.
- Pressing & holding the rotary controller knob to enter MENU.

If the screen is unlocked *">"* arrow appears enabling user to go to the next view where currently active presets for each channel are shown.

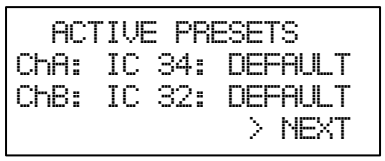


Figure 2. Active Presets View.

By clicking *"Next"* one or two more times user can access individual output level adjustments for both channels *A* and *B*.

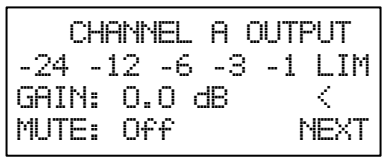


Figure 3. Channel Output View.

Here user can adjust per channel output gain level or mute the channel. Clicking *"Next"* from channel B Output view will return back to Overview screen.

6.2. Main Menu

To enter the menu of the amplifier, **press & hold** *Master Control* rotary knob for 3 seconds. A menu as shown in Figure 4 will appear on the LCD Screen.

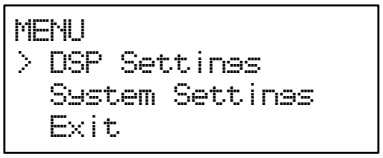


Figure 4. Main Menu

Two types of settings can be accessed from here:

- *DSP Settings* – signal processing settings such as channel presets, filters, EQ, delay are configured here,
- *System Settings* – power amplifier operation settings are configured here.

6.3. DSP Settings

DSP Settings menu is shown in Figure 5.

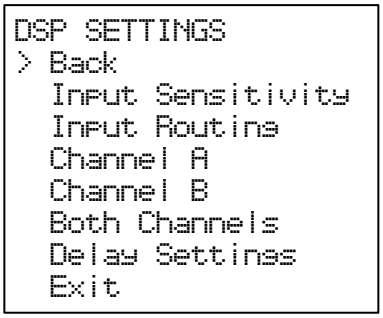


Figure 5. DSP Settings menu.

6.3.1. Input Sensitivity

Input Sensitivity menu allows user to change amplifier's reference sensitivity. Two options are available:

- Pro Audio reference level (+4 dBu or ~1.23 V)
- Consumer device reference level (-10 dBV or 0.316 V)

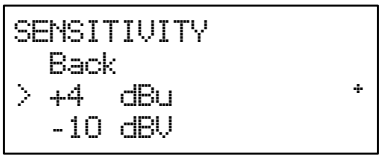


Figure 6. Sensitivity Settings Menu.

6.3.2. Input Routing

In the *Input Routing* menu the routing of input signals is defined. Several options are available:

- Stereo
- Mono (A+B). The level is reduced by -6 dB to compensate for summing

- Inv. Stereo (Inverse Stereo). This setting swaps A & B inputs
- Mono A
- Mono B

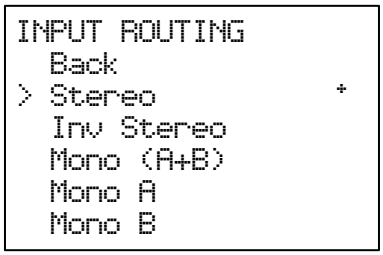


Figure 7. Input Routing Menu.

6.3.3. Channel A / B

Channel A and *Channel B* menu are identical and contain channel dependent signal controls for each channel. Here only *Channel A* is shown to explain its contents.

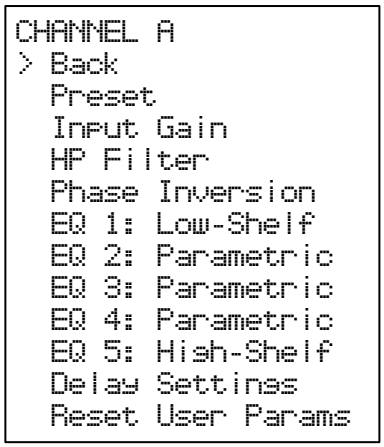


Figure 8. Channel A or B Menu.

6.3.3.1. Preset

Preset menu allows to load speaker presets. The presets are divided in two basic types:

- Factory presets. Marked with an **"F"** letter at the right side of the preset name
- User presets: Marked with an **"U"** letter at the right side of the preset name.

Currently loaded preset is marked with a **"*"** star symbol.

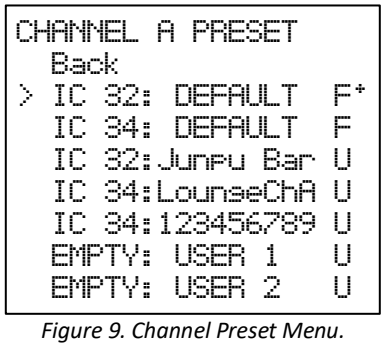


Figure 9. Channel Preset Menu.

The names of the presets are organized in such a way that first five symbols would always represent loudspeaker model for which the preset is made. This is due to the safety reason so that user always knows if his user preset has the right factory settings.

Factory presets are each speaker systems default configuration with factory pre-defined filter & limiter settings layer. User presets are being built on top of factory presets by saving additional user adjustment layer containing:

- User HP filter settings
- User EQ settings
- User Delay settings

6.3.3.1.1. Preset Loading

To load a preset scroll to the chosen preset and click the rotary controller. A dialogue is displayed on the screen to either load preset, save preset or go back. Saving is only available in user preset area to save user presets.

By pressing *Load Preset* the preset is loaded in the DSP and "Preset Loaded!" is displayed shortly on the screen.

To return choose *Back* and click the rotary controller.

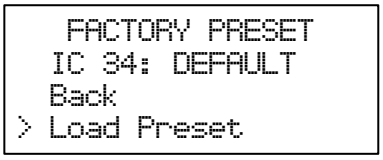


Figure 10. Preset Loading.

6.3.3.1.2. Preset Saving

To save a preset choose one of the existing or empty user preset locations and click the rotary controller. A dialogue similar to factory preset loading is displayed on the screen, only in this case an additional option is available to save the preset.

Figure 11. Preset Loading & Saving.

By click on *Save Preset* a dialogue to enter preset name is displayed.

Here user can edit last 9 symbols to write a note or name for the user preset. To edit the name click on the name with rotary controller. Character selection is done by scrolling the controller and choosing the letter by clicking. Character deletion is performed by choosing the "←" symbol and clicking. To complete the editing of the name choose space symbol and click twice.

To confirm preset saving choose *Save* and click the rotary controller. Saving is confirmed with a display on the screen "Preset Saved!"

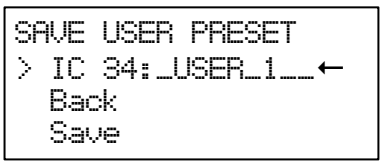


Figure 12. Preset Saving Menu.

6.3.3.1.3. Preset Information

By pressing 3 seconds on the selected preset a dialog shows up displaying various information about the preset. Currently only *Date*, *Version* and *Author* is displayed and shall be used to ensure that speaker presets are up to date.

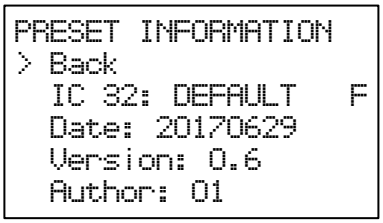


Figure 13. Preset Information Menu.

6.3.3.2. Input Level

The *Input Level* menu allows to check the input signal level of the corresponding channel. It displays the level at the input stage of the signal chain. IA 202D and IA 402D amplifiers are capable of input levels up to +20 dBu.

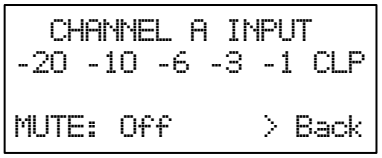


Figure 14. Channel Input Level Menu.

T menu displays input level in dBFS scale after it has been converted in to digital domain for DSP. When the level is equal to -24, -12, -6, -3 and -1 dBFS a corresponding level threshold is displayed. To avoid input clipping set your levels depending on the program material and leave the headroom of at least 6 dB for loudest peaks. Nominal input level shall be around -12 dB.

When clipping occurs a *"CLP"* text is displayed at the end of metering scale. Avoid this high input levels on all means since it causes hard-clipping and causes severe signal distortion!

Be aware that to increase signal-to-noise ratio a professional line level signal (ref. +4 dBu) shall be used!

By scrolling the rotary controller user can select between 2 choices:

- *MUTE*. When chosen the user can change the *MUTE* status of the channel output from *Off* to *On*. Click to exit/confirm.
- *Back*. Returns to the corresponding channel menu.

6.3.3.3. HP/LP Filter

Selected channels high-pass (low-cut) or low-pass (high-cut) filter settings can be set in the *HP/LP Filter* menu.

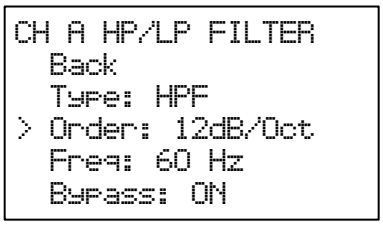


Figure 15. HP/LP Filter Menu.

Three main parameters can be changed here:

- Type. Either HPF (high-pass filter) or LPF
- Filter *Order*: User can select between 12dB/Octave or 24 dB/Octave filter slopes.
- *Frequency*: User can select the cut-off (-3dB) point of the filter up to 150 Hz.

6.3.3.4. Phase Inversion

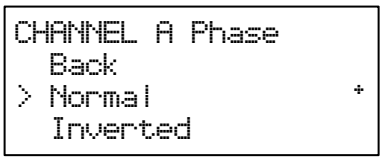


Figure 16. Phase Inversion Menu.

The Phase Inversion menu allows to switch signal phase for the corresponding channel. Also known as polarity reverse. Two settings are available:

- Normal. In phase setting.
- Inverted. In this setting phase/polarity is inverted (180° phase shift for all frequencies).

6.3.3.5. Equalizers (EQ 1 to EQ 5)

Each of IA 202D / IA 402D amplifier channels a have dedicated user equalizer section consisting of 5 fixed configuration equalizers:

- 1x (EQ 1) Low-shelf equalizer (Gain, Frequency)
- 3x (EQ 2, EQ 3, EQ 4) Fully parametric equalizers (Gain, Frequency, Q)
- 1x (EQ 5) High-shelf equalizer (Gain, Frequency)

To modify equalizer parameters, enter the corresponding equalizer menu and modify its parameters. Each equalizer band can be individually bypassed (default setting).

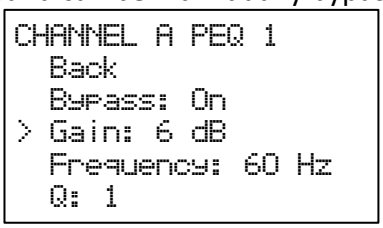


Figure 17. Parametric Equalizer Menu.

An example of parametric equalizer 1 (EQ 2: PEQ 1) is shown. Here four different parameters can be edited:

- *Bypass*. *On* – the equalizer band is bypassed. *Off* – the equalizer band is active,
- *Gain*. Allows to change the boost/cut of the frequency band by +/- 10 dB,
- *Frequency*. Allows to change the center or edge frequency (for High-shelf and Low-shelf) of the band,
- *Q*. The opposite of the bandwidth. Higher Q values mean narrower bandwidth (for parametric equalizers only).

6.3.3.6. Delay

The Delay section allows user to apply signal delay for the corresponding channel. Three different states of delay configuration are available:

- Bypassed (If the channel delay is bypassed only system latency is shown)
- Single (Minimum delay of 1 sample)
- Double (Minimum delay of 2 samples)

For more information about delay settings please refer to section ***6.3.5** Delay Settings*.

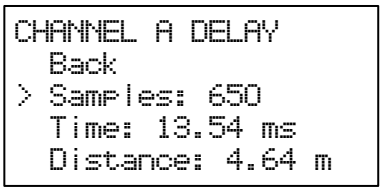


Figure 18. Channel Delay Menu.

In chosen channels *Delay* menu user can see and adjust the delay of the channel in 3 different ways:

- *Samples*. (1-700 in Single mode and 2-1400 in Double)
- *Time*. Delay in milliseconds (ref. to 48 kHz)
- *Distance*. Delay in meters (ref. to c=344 m/s)

Channel delay menu shows total introduced latency of the system including delay, system latency & look-ahead limiter. IA 202D / IA 402D amplifiers have fixed minimum latency of 52 samples (1.07 ms). Depending on the loaded preset look-ahead limiter latency is added to the channel delay (up to 2 ms, 96 samples). This allows the user to know the total system latency at any time.

6.3.3.7. Reset User Params

The *Reset User Params* menu allows to reset all current channel user DSP settings such as:

- HP Filter
- Equalizers
- Delay
- Input Gain
- Phase Inversion

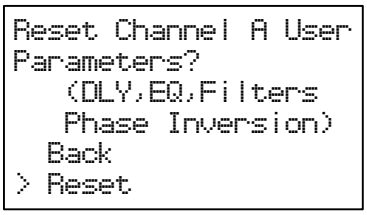


Figure 19. "Reset User Parameters" Menu.

6.3.4. Both Channels

The *Both Channels* section allows to perform certain operations for both channels simultaneously.

6.3.4.1. Link Channels

IA system amplifiers allow to link certain parameters for both channels, those currently include:

- *HP/LP Filter*.
- *User EQ*.
- *Delay*.
- Or *All* of above.

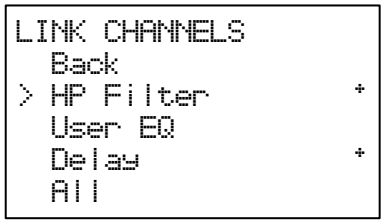


Figure 20. Channel Link Menu.

This allows for easier and faster operation when the settings in both channels need to be identical.

6.3.4.2. Load Preset

In a similar way as presets are managed and loaded for individual channels *Load Preset* enables user to load the same preset in both channels at once. Currently only Loading of both channels is supported.

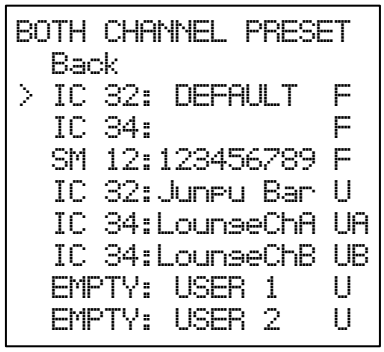


Figure 21. Both Channels Preset Menu.

Here the currently loaded presets are also shown as *"A"* or *"B"* letters next to the preset type. If the same preset is active in both channels it is shown with a star symbol *"*"*.

6.3.4.3. Reset User Params

This menu allows to reset user DSP settings for both channels at once as shown in the *section 6.3.3.7*.

6.3.5. Delay Settings

Both IA 202D and IA 402D system amplifiers have maximum delay memory of 1400 samples. As the need of delay is depending on the location of the loudspeakers SE Audiotechnik engineers introduced “shared delay” concept which allows each channel to have 3 different delay settings:

- *Bypassed*. No delay available for the channel
- *Single*. “Single Mode” delay with latency up to 700 samples (1 sample minimum latency).
- *Double*. “Double Mode” delay configuration up to 1400 samples (2 samples minimum latency). Only one channel can have this configuration. The other one is bypassed.

Delay Settings menu allows to change delay settings for each channel. The delay values are displayed in the Table 1. Please note that look-ahead function in the peak limiter introduces preset dependent latency up to 48 samples. This is not included in the table since it varies from preset to preset.

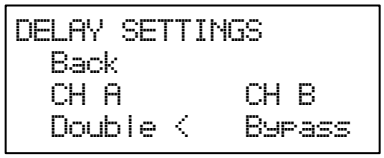


Figure 22. Delay Settings Menu.

Channel Status		Delay Range			Delay	
Channel A	Channel B	Samples	Milliseconds	Meters	Built-In (ms)	Total (ms)
Bypassed	Bypassed	0	0	0	1.07	1.07
Single Delay	Bypassed	1-700	0.021 – 14.583	0.0072 – 5.002	1.07	1.091 – 15.653
Single Delay	Single Delay					
Bypassed	Single Delay					
Dual Delay	Bypassed	701-1400	14.604 – 29.167	5.009 – 10.004	1.07	15.674 – 30.237
Bypassed	Dual Delay					

Table 1. Delay Settings Values.

6.4. System Settings

The *System Settings* menu allows to set various amplifier parameters and access various system functions.

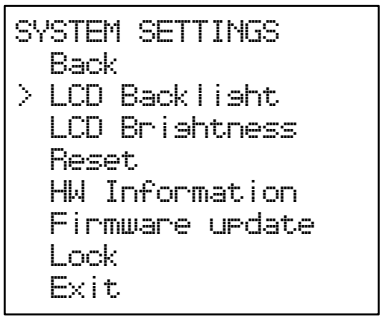


Figure 23. System Settings Menu.

6.4.1. LCD Backlight

The *LCD Backlight* menu allows to change the LCD screens backlight settings. There are two general choices:

- *Auto Off*, which will turn-off the backlight after set period of time. On selection of this setting a dialogue appears where the timeout can be set with a maximum value of 60 seconds.
- *Always On*, which sets the backlight to be always on.

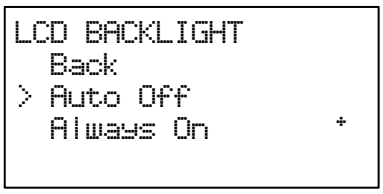


Figure 24. LCD Backlight Menu.

6.4.2. LCD Brightness

The *LCD Brightness* menu enables to set the brightness of the LCD screen.

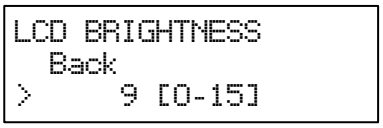


Figure 25. LCD Brightness Menu.

6.4.3. Reset

The *Reset* menu allows to reset system settings such as:

- LCD Backlight settings
- LCD Brightness
- Lock settings

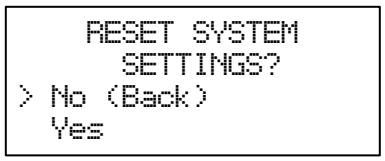


Figure 26. Reset System Settings Menu.

6.4.4. HW Information

In the *HW Information* menu users and service technicians can find amplifiers hardware information:

- MCU Firmware version
- FW (Firmware) version
- Model type

This information is necessary for service purposes.

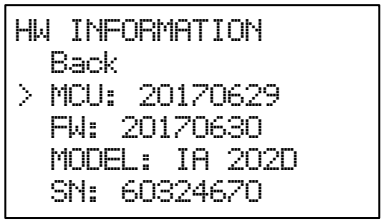


Figure 27. HW Information Menu.

6.4.5. Firmware Update

The *Firmware Update* menu is a dedicated dialogue made for amplifier's firmware update purposes. This menu shall be used by service personnel only!

Figure 28. Firmware Update Menu.

6.4.6. Lock

In the *Screen lock* menu user can set automatic screen locking settings:

- Automatic Lock. Will lock the amplifier screen after a set timeout. When chosen a dialogue appears to set automatic lock timeout [2-60] seconds.
- Lock Now. This option will lock the screen instantly. The selected settings of (*Automatic Lock* or *No Lock*) are kept.
- No Lock. This option will disable automatic lock function.

Figure 29. Screen Lock Menu.

7. Other Functions

7.1. Screen locking/unlocking

If the amplifier is set in the *Automatic Lock* setting it will lock the screen after set timeout set by the user. This is also shown by the *"L"* letter in the top-right part of the *Overview* screen.

To unlock the amplifier press & hold the rotary encoder for 3 seconds to unlock the screen for further operation.

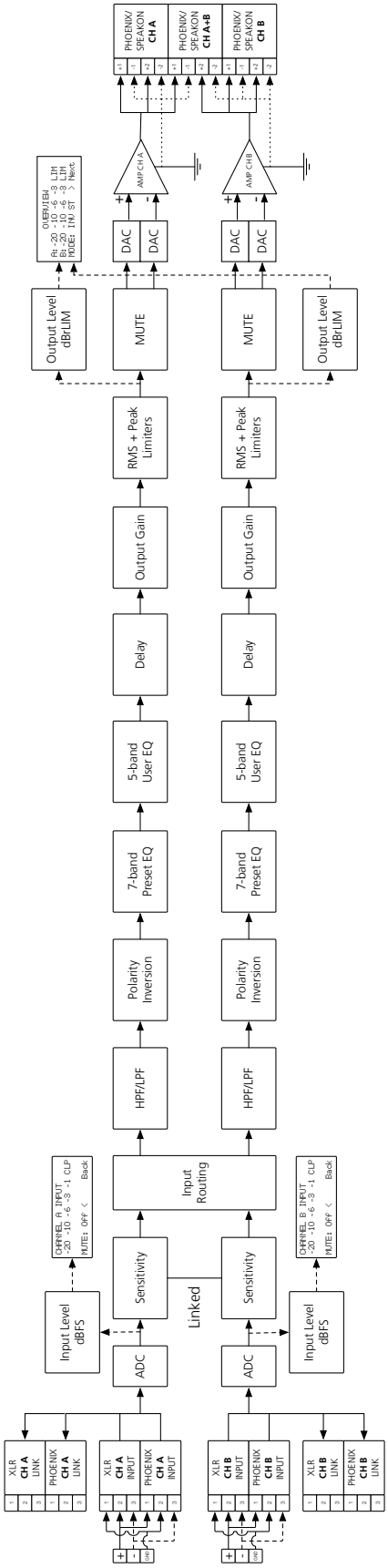
7.2. Quick Output Level Change

If the amplifier is in the *Overview* screen and is unlocked turning the rotary encoder will act as a *Quick Level Change* or *Master Level* control. This allows for quick output level changes for both channels simultaneously. The offset or level change will also be displayed on the screen.

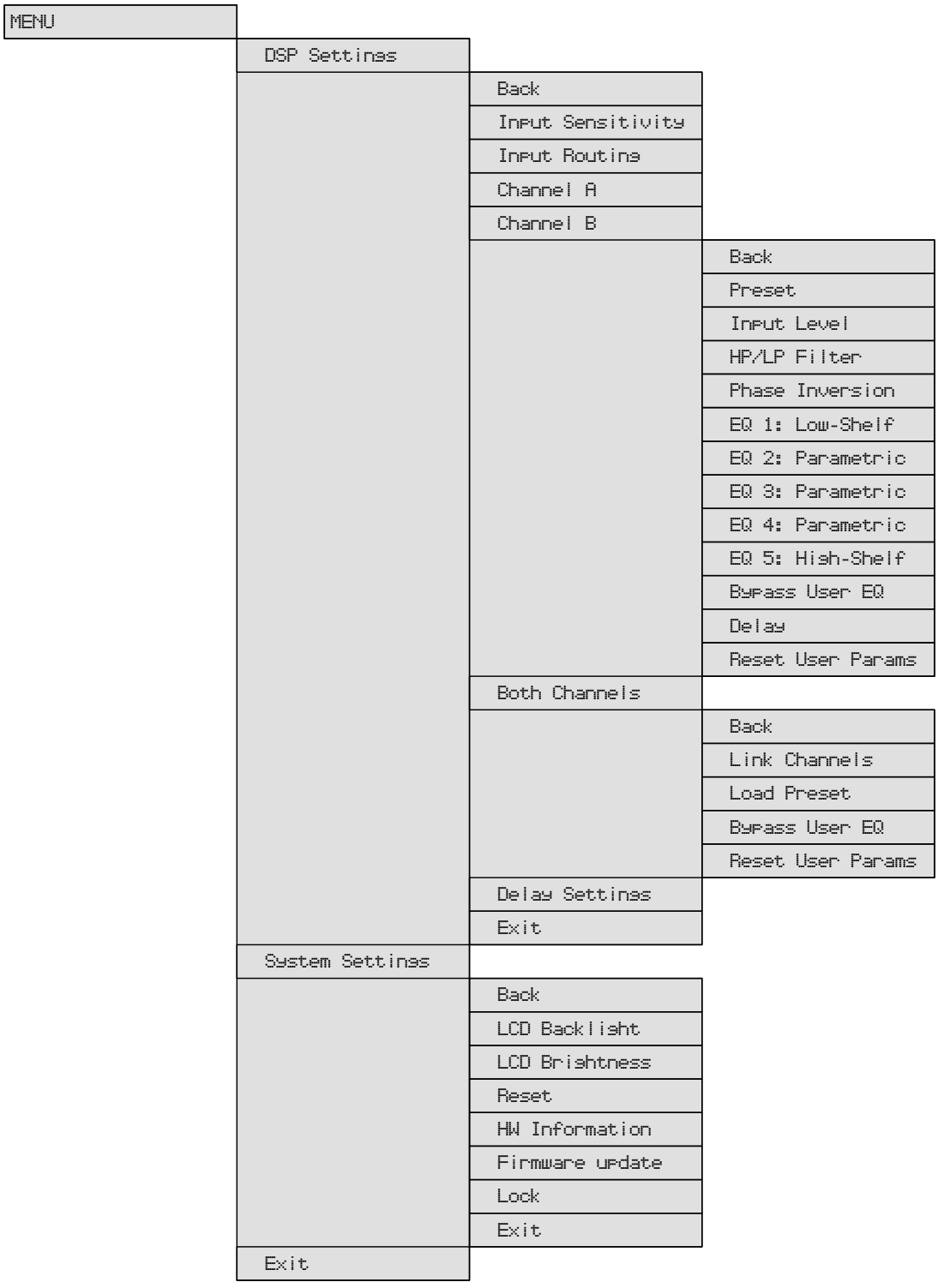
7.3. Quick Mute

If the amplifier is in the *Overview* screen quickly turning the rotary encoder and pressing it will act as mute function for both channels. This allows for quick muting of the amplifier outputs. Unmuting works in exactly the same manner.

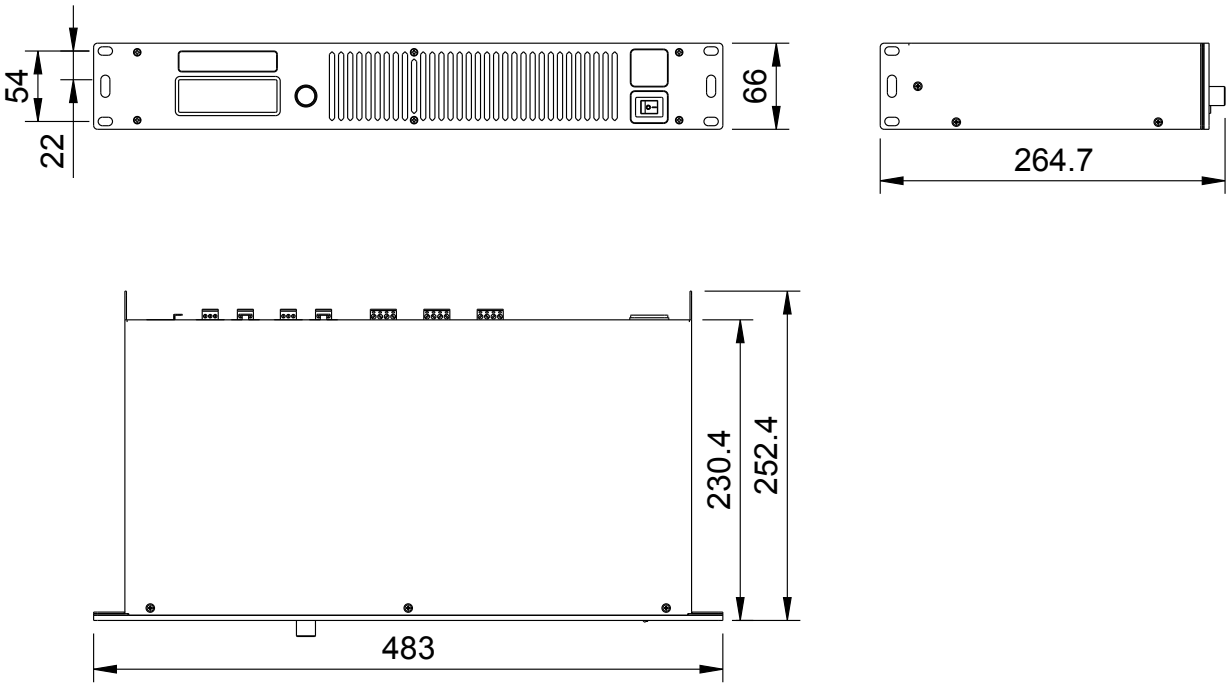
8. Signal Flow Diagram



9. Menu Tree


MENU
DSP Settings
Back
Input Sensitivity
Input Routing
Channel A
Channel B
Back
Preset
Input Level
HP/LP Filter
Phase Inversion
EQ 1: Low-Shelf
EQ 2: Parametric
EQ 3: Parametric
EQ 4: Parametric
EQ 5: High-Shelf
Bypass User EQ
Delay
Reset User Params
Both Channels
Back
Link Channels
Load Preset
Bypass User EQ
Reset User Params
Delay Settings
Exit
System Settings
Back
LCD Backlight
LCD Brightness
Reset
HW Information
Firmware update
Lock
Exit
Exit

10. Mechanical Dimensions



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