LUKA SERIES

USER MANUAL

LYNX pro-audio

V. 05.07

Lynx Pro Audio S.L. shall not be liable to the purchaser of this product or to third parties for any damages, losses, costs, or expenses incurred by the purchaser or third parties as a result of an accident, misuse, or abuse of this product, nor for any modifications, repairs, or alterations to it, or for failing to strictly adhere to the operating and maintenance instructions of Lynx Pro Audio S.L.

LUKA is a trademark of Lynx Pro Audio S.L.

Other product names used in this documentation are for identification purposes only and are trademarks of their respective owners.

LYNX Pro Audio S.L.
Calle 1. Pol. Ind. Picassent, Picassent, Valencia 46220 España
+34 961 109 601

CE

CE CERTIFICACTION, EUROPEAN PRODUCT

CONTENTS

WELCOME

Just contact the new generation of digital processors LUKA, designed and manufactured by Lynx Pro Audio S.L.

Before working with the processor we recommend that you read this manual, in its pages you will find instructions for use, programming examples and practical advice that will be of great help.

For the maximum optimization of any sound system a first class digital processor with different processing options is required. This LUKA processors become a working tool of great value, providing the user with the best solutions in the market with the highest level of accuracy and a host of features for the professional.

We hope thar as a user you will be completely satisfied. We are sure that the LUKA processor will meet your expectations and make it easier for you to get the most out of your system.

IMPORTANT SAFETY INSTRUCTIONS

The CE mark of the **LUKA** processor shows that it is verified and tested to accomplish the European Norms and International Norms about Electromagnetic Compatibility and Electrical Safety.

CE

Radiated Emisions :	EN55013-1 (1996)
RF Immunity:	EN55103-2 (1996)
Electical Safety:	EN60065 (1993)
	IEC65 (1985) and emendation 1, 2 and 3

This product also meets the specifications of the following safety directives:

Low Voltage Directive 73/23/EEC
EMC Directive 89/336/EEC

EUROPEAN PRODUCT

Product Developed and Manufactured in the European Union.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that is necessary for the user to refer to the owner's manual.

Warning :

Do not expose the processor to humidity and dust.
Do not take off the top cover.
Do not handle internal elements to avoid electrical shock.
Use only power cords in good condition.

Unpacking the LUKA

Before unpacking your new processor, verify that the box does not show any damage or deformation. If this happens, please claim the damage to your fordwarder. Once unpacked and verified its correct operation, keep the original box in case you need to ship it back to your provider.

1.- INTRODUCTION

LUKA series offers the user a perfect tool for processing, with three processor models available with two or four inputs and four, six or eight outputs (analog or digital).

LUKA series processors offer Double Dynamic, featuring an compressor/limiter. The limiter adjusts the sound level of the transducer, maintaining the original dynamics and respecting the initial transition, resulting in better acoustic performance. It also provides protection against damage and reduces distortion caused by over-excursion. This Double Dynamic system minimises distortion levels and offers protection for all the acoustic and electronic components of the system. The peak limiter controls the maximum movement of the speaker, protecting it against damage by reducing distortion caused by over-excursion.

All LUKA models come equipped with high-quality AD/DA converters, ensuring excellent audio fidelity. This ensures that sound remains accurate and clear, meeting the demands of audio professionals.

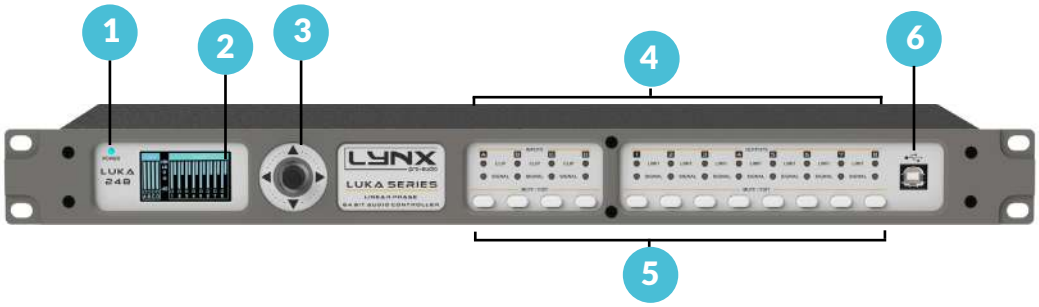
The remarkable point about the LUKA Series is its audio signal routing and distribution matrix, which allows signals to be routed between various sources and destinations. Essentially, an audio matrix is a switcher that enables you to send audio signals from multiple inputs to multiple outputs. It can assist in managing complex audio setups, such as routing signals to different speakers, monitors, or recording devices, with greater control and flexibility.

Additionally, the LUKA Series features a set of backup inputs, allowing you to have several inputs available and prioritise one at any given moment, ensuring continuity of the event without interruptions.

In the security section, different levels of access restrictions are included. That can be managed by a password, with the choice to select which processing functions can be modified or not. The front panel can also be blocked, denying any access.

The OCS software is designed to provide the user with a fast and intuitive access to each process area, facilitating the programming of the processor from a computer. The software anual is a document available in the downloads section of the our web site www.lynxproaudio.com.

LUKA frontal panel description



01. POWER SUPPLY INDICATION

The LED indicates that the processor is receiving power and is switched on.

02. IPS COLOUR DISPLAY

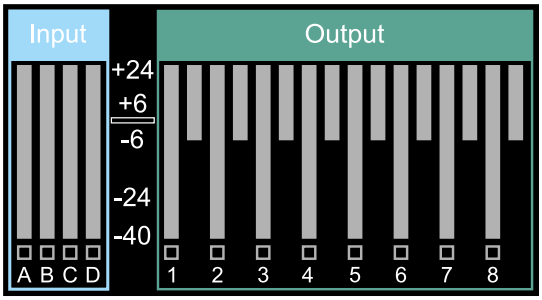
This display allows you to present a diverse range of system information with clarity and precision.

03. NAVIGATION JOYSTICK

Joystick to scroll through menus, confirmation or cancellation of the parameters.

04. SIGNAL, LIMITATION AND CLIP LEDS

Signal, limitation, and clip LEDs are small light-emitting diodes (LEDs) used to provide visual information about the status of a signal.



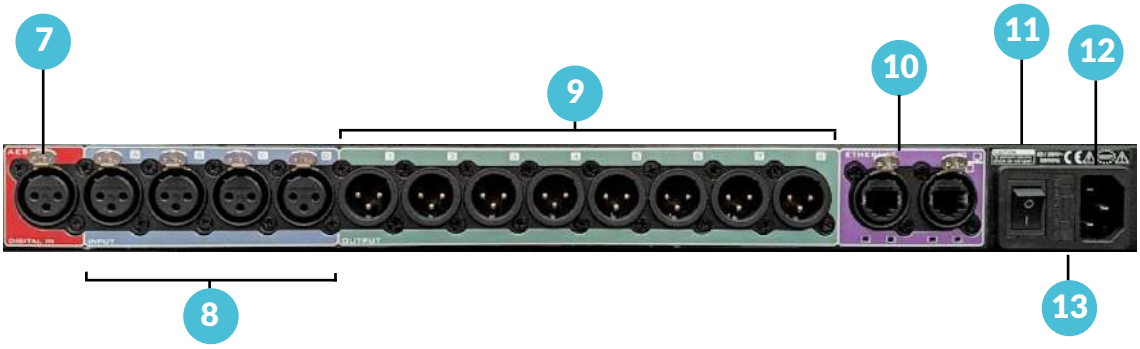
05. PUSH MUTE / EDIT

For editing parameters, this function allows you to select the desired editing mode. It can also be used to mute the sound directly.

06. USB

USB connection from the frontal to set parameters OCS software.

LUKA back panel description



07. DIGITAL INPUTS

Digital AES3: Equipped with female XLR connectors, this cutting-edge digital audio system supports a resolution of up to 24 bits and a sampling rate of 192 kHz, ensuring exceptional sound quality.

08. AUDIO INPUTS

Depending on the option:

Analog: This system utilizes female XLR connectors to receive balanced audio signals, ensuring clean and noise-free audio.

Digital AES3: Equipped with female XLR connectors, this cutting-edge digital audio system supports a resolution of up to 24 bits and a sampling rate of 192 kHz,

09. AUDIO OUTPUTS

Analog: Balanced signal via male XLR connectors.

10. ETHERNET CONNECTOR

Ethercon RJ45 connectors provide the peace of mind that comes with a secure and reliable connection, allowing you to focus on your creativity without worrying about signal dropouts or equipment failure.

11. POWER ON SWITCH

12. IEC MAIN POWER CONNECTOR

The power cord is supplied together with the processor. The **LUKA** includes a precise switching power supply. It withstands power supply from 85 to 240 volts and is continuously self-regulating providing a perfect functioning even with poorly regulated voltages.

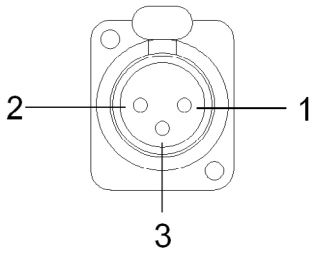
13. FUSE HOLDER

A 1A fuse is a safety device that protects electrical circuits from overheating and potential fire damage. Always replace with equivalent fuses.

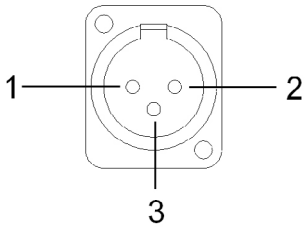
2. SET UP AND CONNECTION

Connectors and connections

XLR SOCKET CONNECTORS

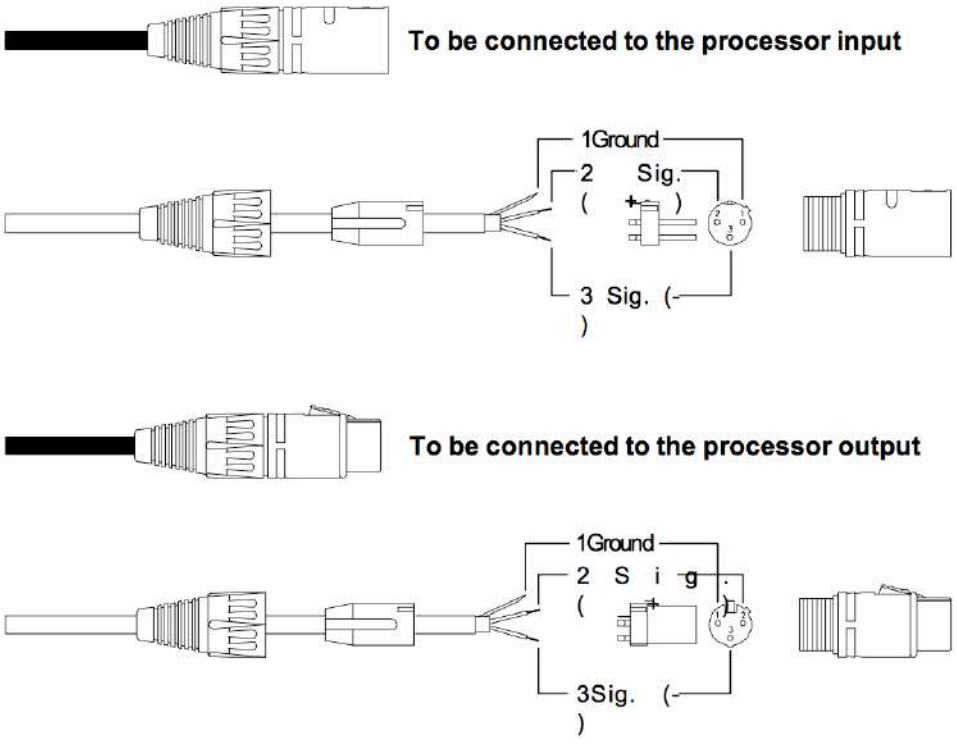


INPUTS
1- GROUND
2- SIGNAL (+)
3. SIGNAL (-)



OUTPUTS
1- GROUND
2- SIGNAL (+)
3. SIGNAL (-)

OVERHEAD XLR CONNECTORS



LUKA Dimensions (in mm)

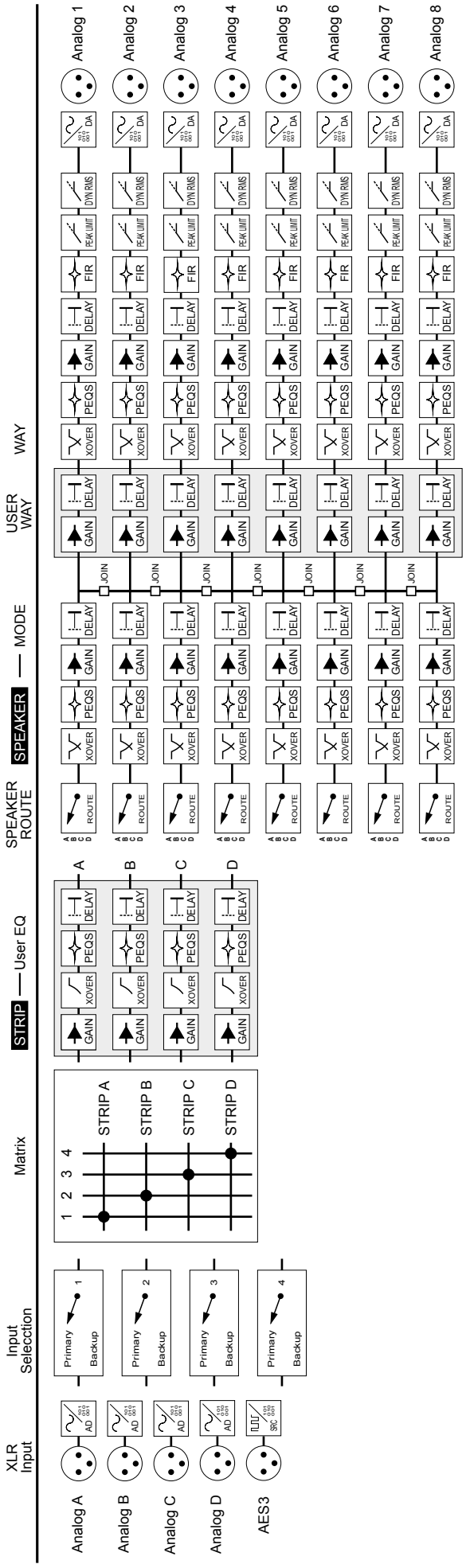
3. FUNCTIONAL DESCRIPTION

LUKA Process diagram

The DSPs (Digital Signal Processors) with 64 bits of internal resolution are included in the LUKA processor. All this calculating power is used in the signal processing algorithms which control all the process: input delays, global equalisation, crossover filters, individual equalisation for each way, output delays, protections and dynamic control. All of these algorithms have been developed to provide the best precision and the lowest round-off noise in the calculations.

This way, the best sound fidelity and transparency free of noise is achieved. The wide internal range (64 bit) allows the use of high-precision filters with very low distortion. The converters 32-bit and 121 dB dynamic range assures a clean sound without distortion and background noise makes the LUKA one of the processors in the market with the best technical characteristics.

The process diagram within the LUKA DSPs is as follows:


XLR Input
Input Selection
Matrix
STRIP — User EQ
SPEAKER ROUTE
SPEAKER — MODE
USER WAY
WAY
Analog A
Analog B
Analog C
Analog D
AES3
Primary
Backup
1 2 3 4
STRIP A
STRIP B
STRIP C
STRIP D
GAIN
XOVER
PEQS
DELAY
ROUTE
JOIN
FIR
PEAK LIMIT
DYN RMS
Analog 1
Analog 2
Analog 3
Analog 4
Analog 5
Analog 6
Analog 7
Analog 8

GAIN: Adjusting gain at the inputs allows you to adapt or fit the signal level coming from the mixing console. Similarly, adjusting gain at the outputs lets you control the level sent to each amplifier and equalise sensitivity in both directions.

PEQ: LUKA offers a long range of choices of Q, enabling the best possible signal arrangement.

DELAY: Configurable delay. In the inputs and outputs up to 206 msec. for covering a distance up to 70 m. It is mainly useful when working with important PA equipment covering a large distance with reinforcement blocs quite far from the stage. Thanks to that function, it is possible to rectify the cabinet's position (alignment) in a multi-way equipment and avoid cancelling problems due to phase cancelation effects.

CROSSOVER: Crossover filters with high and low cuts of Linkwitz Riley, Bessel, Butterworth up to 48 dB/octslopes in 6 dB steps are available. A 6 dB/octave slope, for instance, corresponding to a first order filter, allows for frequency shading.

DYNAMIC: LUKA boasts a sophisticated RMS compressor-limiter on each output. These limiters and compressors utilize C.R.I. (Continuous Increment Ratio) technology to minimize distortion.

The LUKA's front panel provides visual indication of limiting through an LIMIT LED. This LED illuminates when the signal exceeds a user-defined threshold, adjustable within the processor's global configuration.

The high-quality compression ensures a smooth and gradual transition to limiting, maintaining pristine audio clarity at all times. This eliminates the harshness often associated with conventional limiters.

4. OPERATING INSTRUCTIONS

How to proceed

a.- Before switching on the processor:

LUKA includes a precise switching power supply. That means that it can adapt itself to any input supply voltage from 85 and 240 volts and frequencies from 40 to 400 Hz. This is the reason why the processor is guaranteed to work perfectly under any voltage and the final sound quality is completely independent of the supply voltage or the kind of generator used. Nevertheless it is recommended to check the supply voltage before working to avoid any possible problem when connecting at 380 volts. A fuse holder is included in the LUKA processor with a spare fuse (1 A) situated in the IEC connector input of the power supply connector.

It is recommended to turn off the volume of all the power amplifiers down to 0 before switching on the processor. We will then be able to check whether any of the processor outputs are connected to their corresponding power cabinets, avoiding any irretrievable damage in the loudspeakers (specially in expensive high frequencies drivers).

In any installation, it is suitable to place audio and lighting systems in independent power lines to protect both parts separately and to avoid interferences between the different equipments.

b.– Once the processor is ON:

When switching on the LUKA processor, audio outputs remain short-circuited to ground for a few seconds in order to avoid the dangerous start up transient time necessary for the processor to receive a stable voltage and to check internal functions such as: good running of the converters, working memory checking, DSP processors start-up and current configuration loading.

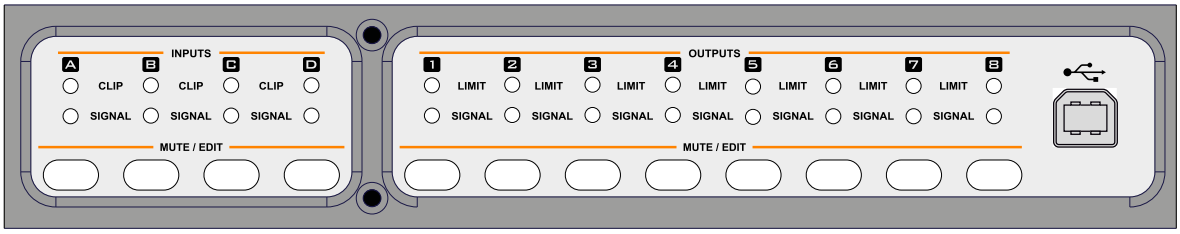
Subsequently, if everything is correct, all the outputs will commutate at the same time introducing audio in each output.

Display, buttons and encoders

LUKA processors come, for programming all functions, with IPS colour display, as well as a series of navigation joystick and encoders for real-time modification of various parameters. Despite being able to modify any parameter, **it is recommended to use the OCS software for better viewing of EQ curves and ease of programming.**

Description of the mute/edit:

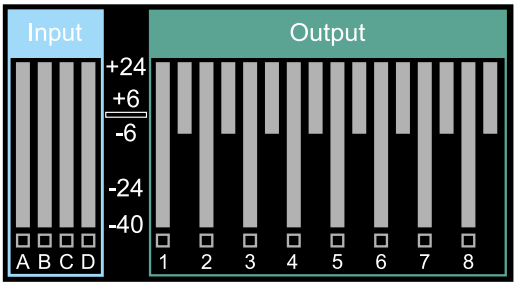
These buttons can mute either inputs or outputs, depending on the model. Inputs or outputs muted will be red illuminated continuously. In the case that we have entered into the edit menu, these push buttons will help us to select the input or output for editing. The input or output editing will blink in red.



Configuration panel

The LUKA processor is equipped with a IPS colour display. This high-quality display provides a clear view of various menus for configuring processor functions such us edit, file or settings.

On the main screen you can see the processor's input and output.

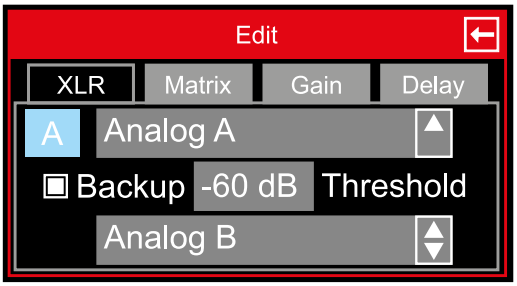


• Input:
You can see a vumeter with the input level and a clip signal, mute functionality, and polarity inversion.

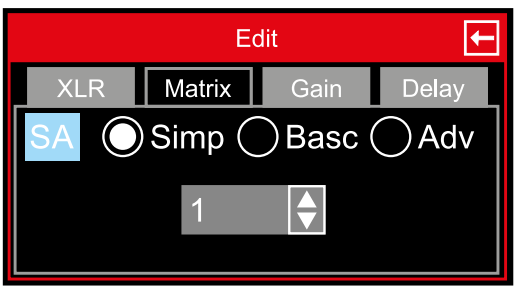
• Output:
You have a vumeter displaying the output level. You can check the compressor, the control the dynamic activity, choose the mute option and the polarity inversion.

On the display panel of the processor you will find the digital control area.

You are able to configure the Basic adjustment functions. Just select the icons of the screen.

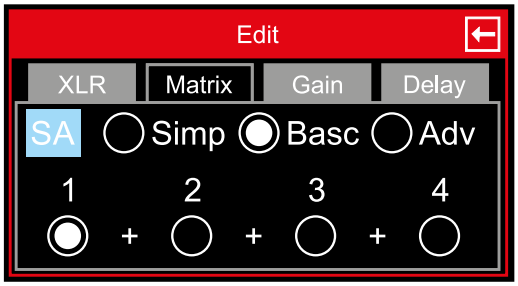


This screen allows you to configure your XLR input. You can select the desired input channel and choose between Analog mode and setting a Threshold level.

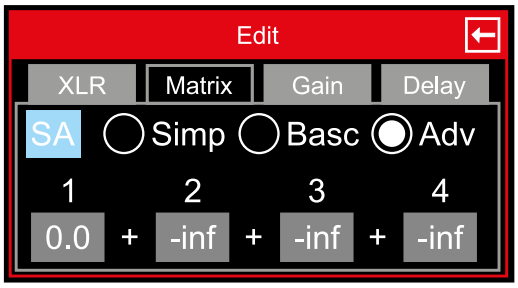


This screen lets you configure the matrix of your sound processor. Select the level of complexity that suits you best: Simple, Basic, or Advanced.

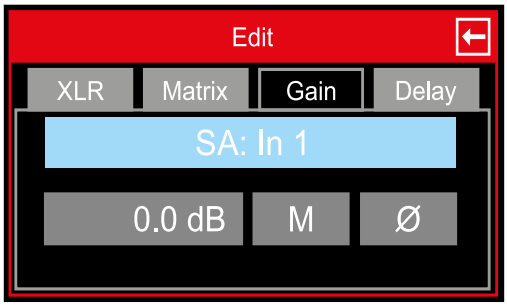
At the basic level you can select 1, 2, 3, 4,1+2 or 3+4.



The edit screen lets you adjust basic configuration options.



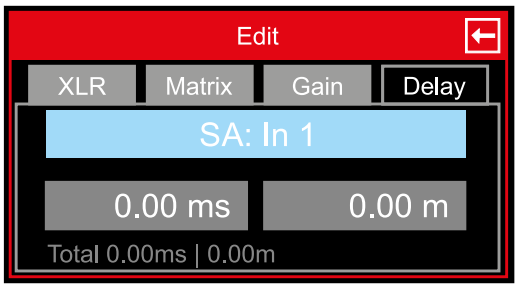
The edit screen allows you to adjust advanced Matrix configuration options. You can then configure the matrix with more specific parameters.



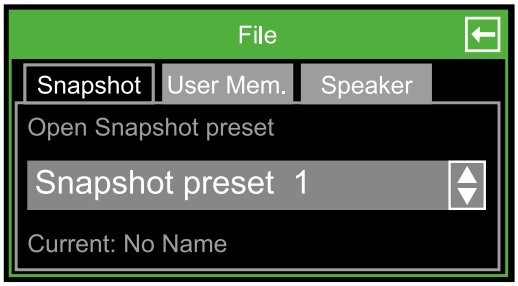
On this screen, you can view the current gain level and adjust various settings of the LUKA processor.

M This symbol means mute is enabled.

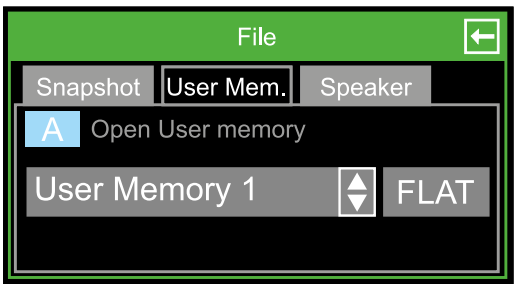
Ø This symbol enables polarity inversion.



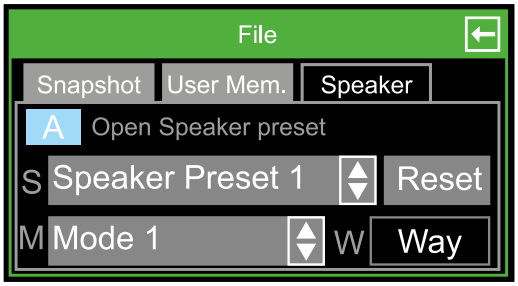
On this screen, you can view the sound processor's delay time and access its various configuration options.



This screen allow you to open the snapshot preset.

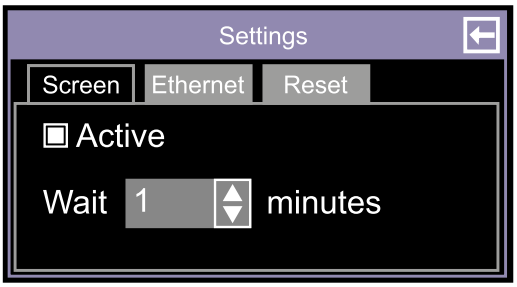


The edit screen allows you to select from your existing saved user memories for each input process.

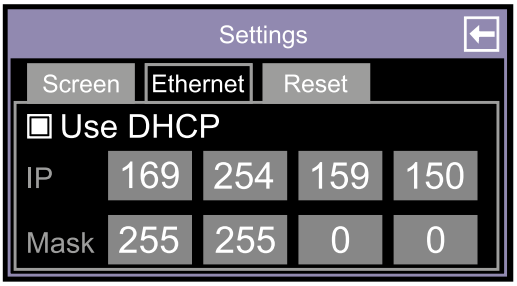


The final screen in this folder lets you load your speaker settings. You can choose a preset sound profile, adjust the mode.

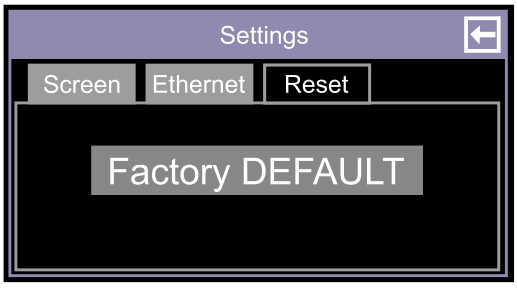
You have the option to reset the preset.



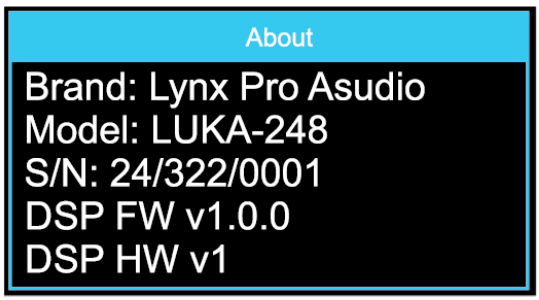
On the settings screen you can also configure the screen saver.



This screen is to configurate Ethernet. You can choose automatic or manual.



The screen allows you to reset to factory settings.



The last screen shows you some general information regarding the processor's components.

Here you can see the processor model, its serial number, DSP firmware and hardware versions.

5. TECHNICAL SPECIFICATIONS

General	**Power supply**: 85-240 V ~ 40-400 Hz. IEC connector (Switching power supply, wide range) **Consumption**: 20 W **Operating temperature:** -5° to 60° C (23° to 140° F) **Storage temperature**: -60° to 75° C (-76° to 167° F) **Humidity**: Max. 90% non-condensing **Dimensions**: 483 x 45 x 200 mm **Weight:** 3 Kg	**Front Panel**	**Display**: IPS 320 x 170 mm colour + joystick encoder + up to 12 buttons for Edition and Mute, with light indications. **Level meter:** - **Input**: LED signal + Over Limit - **Output**: LED signal + Compression
Input	2 or 4 analogic + digital AES3 2 channel **Impedance**: 10 K Ohm Balanced (5 K Ohm unbalanced) **Connector**: Balanced XLR (pin 2 +) **AD converter:** 32 bit-768KHz Sigma-Delta, 512x Oversampling. **Dynamic Range:** 121 dB **Max. level:** +24 dBu **Digital AES3:** 2 channel up to 24 bits 192 KHz	**Output**	4 / 6 / 8 **Impedance**: 200 K Ohm Balanced (100 K Ohm unbalanced) **Connector**: Balanced XLR (pin 2 +) **DA converter**; 32 bit-768KHz **Dynamic Range**: 120 dB **Max. level**: +24 dBu (balanced)
Communication	USB and Ethernet	**Latency**	1.17 ms
Audio	**Frequency Range:** 10 Hz – 24 KHz. **DSP Process:** Internal resolution with 64 bit double precision (48 KHz) **Converters**: 32 bit resolution **Propagation Delay:** 1.17 miliseconds	**Equalisation**	**User EQ:** High-Pass[1] + 10 Parametric[2] **Mode EQ:** High-Pass / Low-Pass[1] + 10 Parametric[2] **Out EQ**: High-Pass / Low-Pass[1] + 12 Parametric[2] + FIR custom (vary Magnitude and Phase). Taps File (import external FIR) up to 1000 taps. **PEQ Type filters[2]:** Parametric, Shelving High, Shelving Low, Low-Pass, High-Pass, Low-Pass Q variable, High-Pass Q variable, BandPass, Reject Band, AllPass order 1, AllPass order 2.
Input matrix	Input Routing matrix Analog/AES3 Configurable backup inputs		
Crossover [1]	Linkwitz Riley with 12, 24, 48 dB/oct. Butterworth and Bessel with 6, 12, 18, 24, 30, 36, 42 and 48 dB/oct.	**Delay**	**Input / output:** up to 206 ms (70 m)

6. TROUBLESHOOTING

We aim to resolve possible issues by providing solutions in this section:

1 – The processor does not start up
Check the power supply cord. If it is correctly connected and the red led on the front panel does not light on, check the fuse situated in the input of the power cord.

2 – The processor starts up but there is no sound
Check that the processor is being provided with a signal in the correct input, A, B, C or D. If the signal does reach the processor, the green signal LED will light.

3 – The resulting sound is "strange"
Check that the outputs and their corresponding cabinets are correctly linked. Always be careful in increasing little by little the cabinets volume channel by channel in order to check the correct connection and not to damage the transducers.

4 – One of the cabinets (with the same signal) sounds less than the others
Check that the joining cable from the processor to the cabinet is well balanced otherwise the output signal will fall 6 dB.

5 – Audio sounds wrong and distorted
Verify that we are not saturating the input (beyond the 24 dBu input). In this case the LEDs light up red clip. Enough to reduce the input signal to the processor, until no clip LEDs light up. If this does not work, verify that the signal is not distorted out from the previous gear, for example the mixer, which could be the gain of that channel very high and saturating the mixer input.

6 – Buttons or encoder do not work
Verify if there is any keyboard lock activated from the software.

7 – I can not connect by Ethernet
Check that the USB cable is not connected, it has priority and internally disables the Ethernet connection. If this is not the case, check the Ethernet connection.

LYNX PRO AUDIO GUARANTEE

Lynx products are guaranteed against every kind of manufacturing fault 2 year after the date of sale. When products are under guarantee, the repairing and the free supplying of the device parts in order to correct any kind of defect are guaranteed by Lynx Pro Audio S.L. In the case that the product could not be returned to the factory for checking and repairing, Lynx Pro Audio S.L. would supply all the necessary parts.

Lynx Pro Audio S.L. is not responsible for any damage or defect caused during the transport or caused by an undue or improper handling by a non-authorized person during the life of this guarantee.

All our products go through rigorous testing and quality controls. We guarantee the characteristics described here within and their quality against any fabrication defect.

The user loses all warranty rights if he incorporates or carries out any modification to the product, if he uses it outside of the stated safe working loads or does not secure the system properly using all the pins in their corresponding holes.

For any question regarding the product, the user must quote the model and serial number.

WEEE Declaration: Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime. Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product please contact Lynx Pro Audio S.L.

CE

DECLARATION OF CONFORMITY

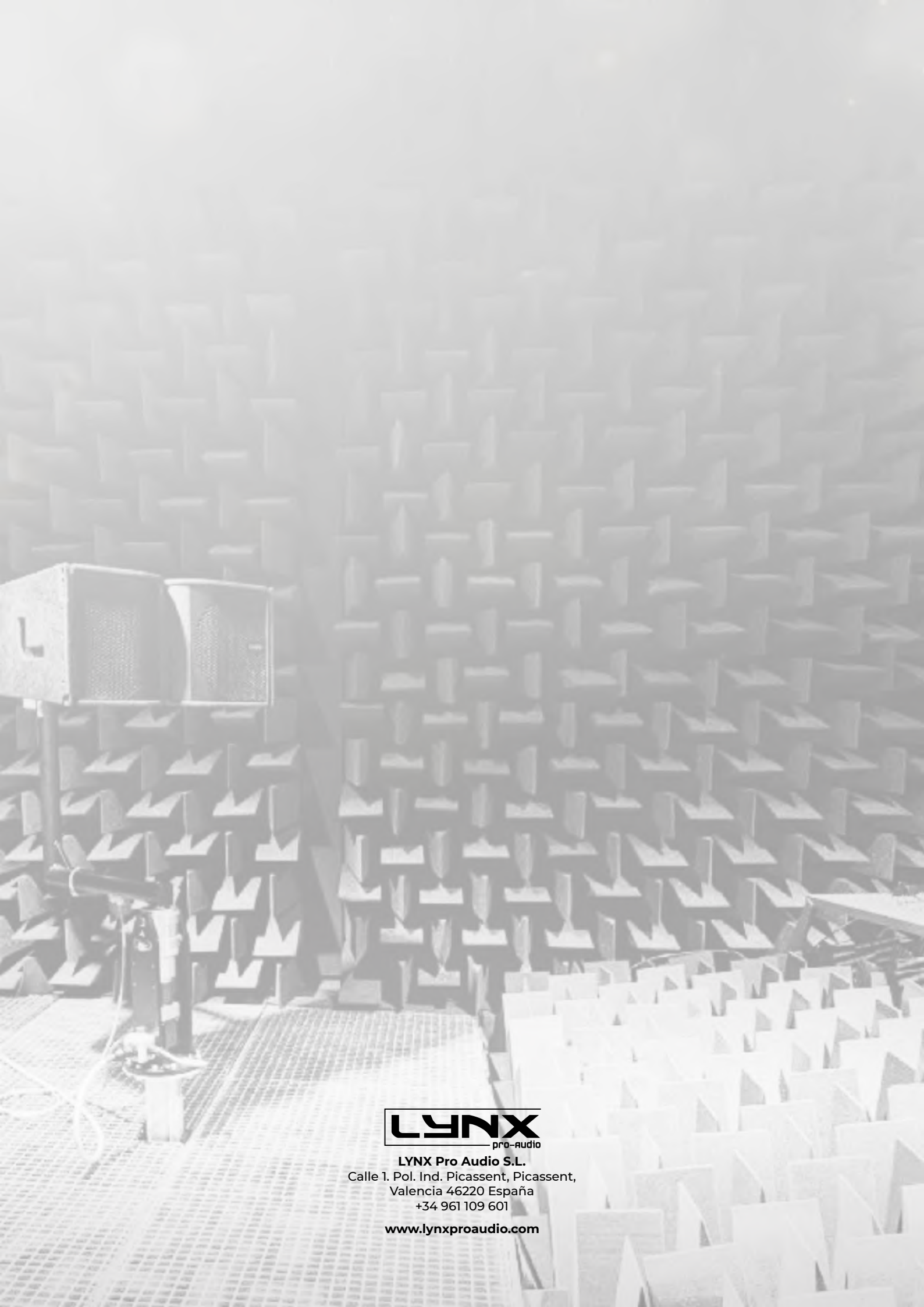
Lynx Pro Audio S.L. declares that ionic series are in conformity with the following EC directives:

Low Voltage Directive	2006/95/EC
Electromagnetic Compatibility EMC	2004/108/EC
RoHS Directive	2002/95/EC

In accordance with Harmonized European Norms:

EN 60065:2002	Audio, video and similar electronic apparatus. Safety requirements
EN 55103-1:1996	Electromagnetic compatibility. Product family standard for audio, video, audiovisual and entertainment lighting control apparatus for professional use. Part 1: Emission.
EN 55103-2:1996	Electromagnetic compatibility. Product family standard for audio, video, audiovisual and entertainment lighting control apparatus for professional use. Part 2: Immunity.

LYNX pro-audio



LYNX Pro Audio S.L.
Calle 1. Pol. Ind. Picassent, Picassent,
Valencia 46220 España
+34 961 109 601

www.lynxproaudio.com