LA4X AMPLIFIED CONTROLLER

- **4,000 W @ 8 ohms with record hold times**
- **Universal SMPS with Power Factor correction**
- **4 in x 4 out architecture**
- **AVB bridge and listener**

SELF-POWERED… OUT OF THE BOX

The LA4X is an amplified controller based on a 4-input by 4-output architecture and an exclusive green power module providing maximized efficiency. With LA4X, L-Acoustics® speakers can get all the benefits of self-powered speakers, while keeping the versatility of the separated amplification approach. The L-Acoustics systems can be operated in three connectivity modes, as described below.

''A LA CARTE''

The pool of four inputs and four amplification channels of the LA4X can be allocated "à la carte" to any passive speaker enclosures with a one-to-one link. This approach is cost effective for applications requiring a high count of independent sound sources such as stage monitors, multi-channel systems and multi-feed distributed systems.
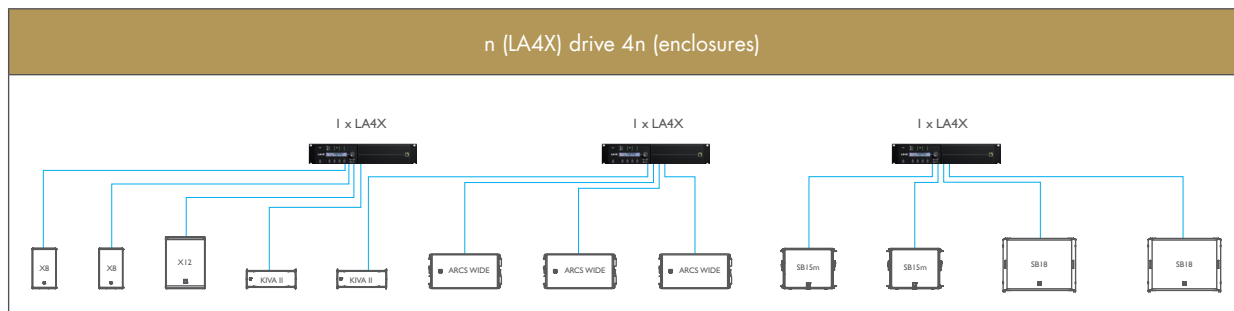
The sound designer determines the number of LA4X amplifiers based on the quantum of enclosures divided by 4.

''FULLY ACTIVE''

In high-end installation projects, the LA4X can drive active systems, up to K2, for maximum power headroom and the best possible performances. With one transducer section per output channel and the independent DSP treatment of each loudspeaker enclosure, this approach brings maximum discretization with a one-to-one-to-one link, from input-to-processing-to-enclosure.

''CONVENTIONAL''

For applications requiring a high count of loudspeaker enclosures with optimized cost of amplification, the LA4X can efficiently operate as a conventional amplified controller driving speakers in parallel from its four amplification channels, with the added benefit of the 4 inputs when using passive loudspeaker enclosures.

GREEN POWER

LA4X is a "green" amplified controller that relies on a universal switched mode power supply suitable for mains from 90V to 265V. The SMPS features a Power Factor Correction (PFC) which maximizes the amplifier efficiency and takes advantage of nearly 100% of the electrical power available with a very high tolerance to unstable mains. The PFC allows the LA4X to deliver as much power from a 10A line as from a 16A line on a conventional amp. This represents a reduction of the electrical power requirements (cable gauge, power conditioning, etc…) for substantial savings. The Class D amplification circuits ensure the LA4X energy-efficiency for minimal heat dissipation. LA4X delivers 4 x 1000W RMS power at 8 Ω or 4 Ω with record hold times. Besides the high raw RMS power rating at 8 Ω, the ability to deliver energy (power x hold time) yields the best performance from loudspeaker systems, especially in LF reproduction.
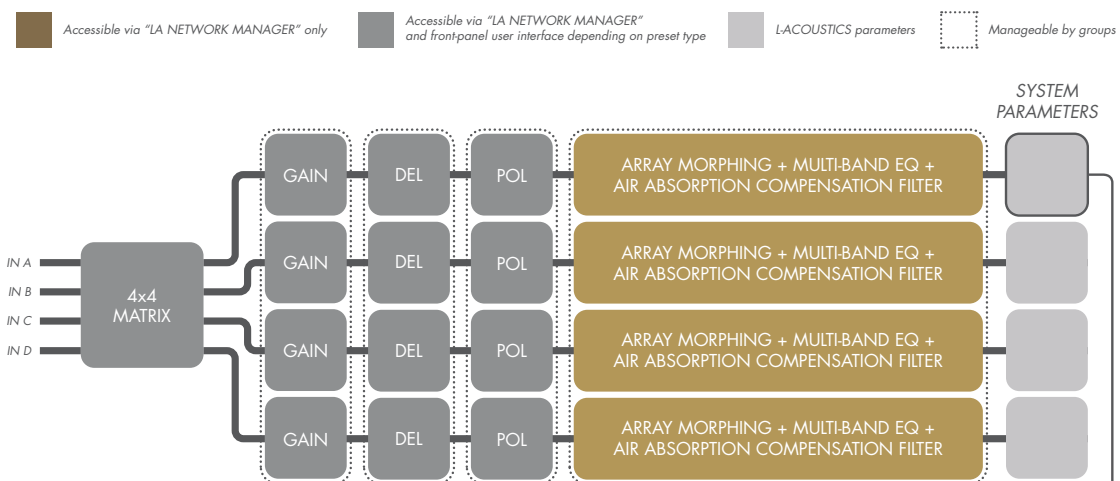
I/O

The four LA4X inputs are available in analogue, AES and AVB. Four cascaded 24-bit and 96 kHz A/D converters at the front-end yield an impressive encoding dynamic of 130 dB. AES/EBU digital inputs operate with sample rate converters from 44.1 kHz to 192 kHz. LA4X is an AVB listener capable of retrieving four audio channels from one stream that contains up to 16 channels at 48 kHz or 96 kHz. Automatic fallback functions make the creation of redundant audio paths possible with constant level.

DSP

Operating at 96 kHz with 32 bit float precision, the DSP combines IIR and FIR filters to generate perfectly linearized phase curves and significantly improved impulse responses for an even, more natural, transparent and realistic sound experience.
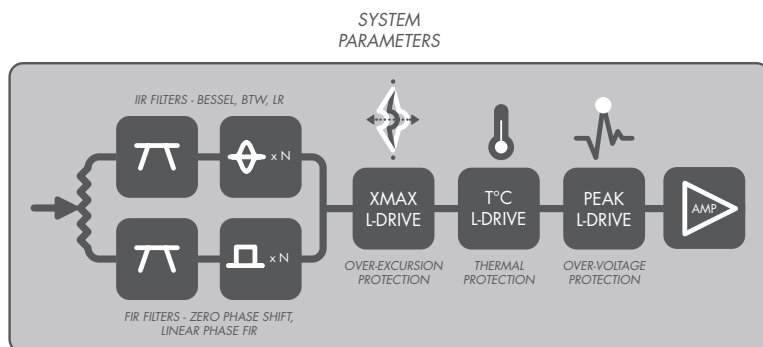
Engineer Workflow Tools

Positioned after the DSP block dedicated to gain, delay and polarity adjustment of the system, the advanced DSP tools can be used along the live engineering workflow, comprising three steps from overall system settings to specific adjustments: First, setting the frequency response of the line source with Array Morphing: the System Engineer can easily achieve the same tonal balance for different geometry line source arrays and combine different line source speakers in the same installation while offering the same sonic signature. Second, ensuring the linearization of HF using plateau FIR filters and the air absorption compensation filter. In long throw applications, high frequency propagation can be strongly affected by air absorption. Compensation of this phenomenon re-establishes the original frequency response of loudspeaker enclosures, up to a limit dictated by the need to preserve a maximum of the driver resources. Third, tweaking the system response (EQ station features) using the pool of 8 IIR filters to fine tune the system within its environment and notch out frequencies.

Legend:
- Accessible via "LA NETWORK MANAGER" only
- Accessible via "LA NETWORK MANAGER" and front-panel user interface depending on preset type
- L-ACOUSTICS parameters
- Manageable by groups

SYSTEM PARAMETERS

IN A / IN B / IN C / IN D → 4x4 MATRIX → GAIN → DEL → POL → ARRAY MORPHING + MULTI-BAND EQ + AIR ABSORPTION COMPENSATION FILTER
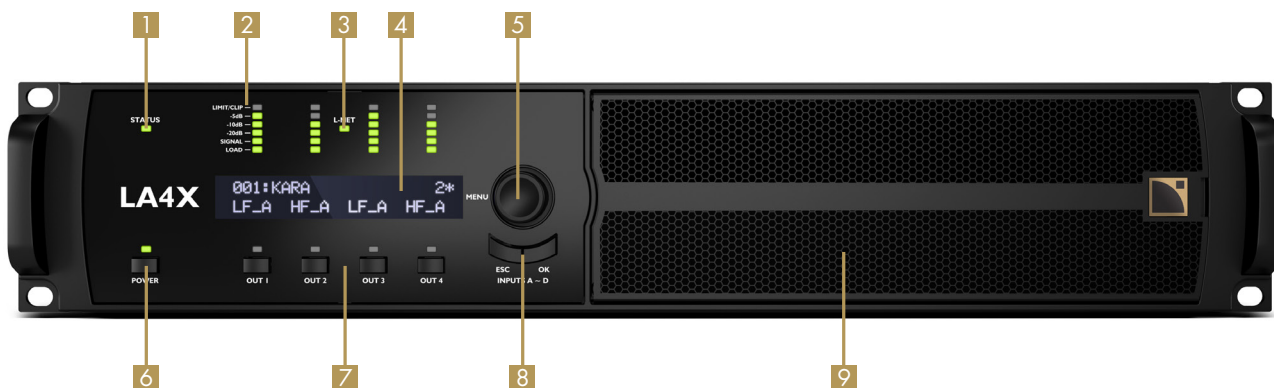
System Protection

The latest L-DRIVE protection system carries out an advanced analysis of signal level. When transducers operate in the nonlinear domain, either at high excursion, high temperature or high voltage, L-DRIVE acts as a smart power regulator to extend the component durability, while maintaining the highest dynamic range. The L-DRIVE circuit has been designed to preserve the sonic transparency of the system.

SYSTEM PARAMETERS

IIR FILTERS - BESSEL, BTW, LR
x N
x N
FIR FILTERS - ZERO PHASE SHIFT, LINEAR PHASE FIR

XMAX L-DRIVE — OVER-EXCURSION PROTECTION
T°C L-DRIVE — THERMAL PROTECTION
PEAK L-DRIVE — OVER-VOLTAGE PROTECTION
AMP

USER INTERFACE

1. Status LED
2. LOAD/SIGNAL/LIMIT/CLIP LEDS
3. L-NET control network LED
4. 2 x 24 char. LCD display
5. Navigation/Edition rotary encoder
6. Power/Standby button and LED
7. Channel selection/mute key
8. Menu keys
9. Anti-dust cover

10. PowerCON 20 A power supply inlet
11. Fan grill
12. SpeakON output connector
13. XLR analog or AES/EBU input connector
14. XLR analog or AES/EBU link connector
15. EtherCON 1 Gbit Ethernet connector

ASSOCIATED ENCLOSURES

Systems	Preset families	Max number of connections per channel (*)	Max number of enclosures per controller
Point sources	5XT	4	16
	X8	2	8
	X12	1	4
	X15 HiQ	1	2
Colinear source	Syva	1	4
Constant curvature line sources	ARCS WiFo	1	4
	ARCS II	1	2
Variable curvature line sources	Kiva II	2	8
	Kara	2	4
	K2	1	1
Subwoofers	Syva Sub	1	4
	Syva Low	1	4
	SB15m	1	4
	SB18	1	4

* The number of connections corresponds either to the number of passive enclosures or the number of sections for active speakers.
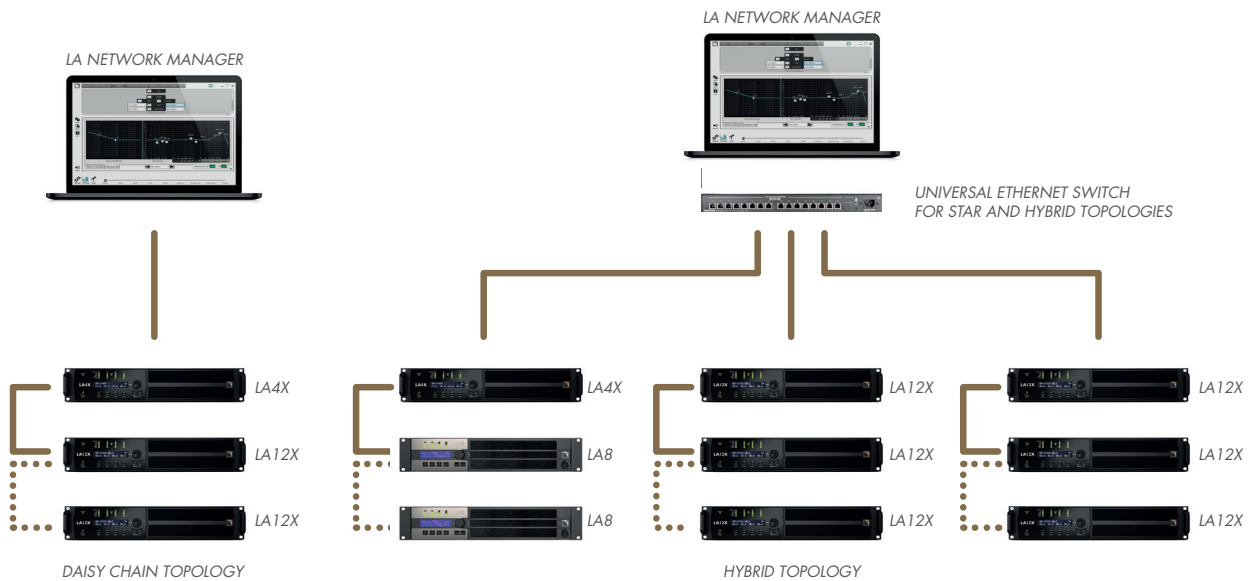
SOFTWARE AND NETWORK

The design of complex systems is made possible by the integration of the L-NET Ethernet-based network. Thanks to its high speed data transfer protocol of 1 Gbit/s, up to 253 units can be controlled and monitored in real-time by the LA Network Manager software. Multiple network topologies such as daisy-chain, star, and hybrid, are quickly and easily configurable for full flexibility in the required system architecture. The computer running LA Network Manager and the units are connected to each other by using industry standard CAT5e U/FTP fitted cables.

Optimized for Mac® and Windows® platforms, LA Network Manager relies on a purely graphical approach and allows amplified controller units and groups to be dragged and dropped in a workspace that reflects their location in the field. It is designed to quickly take the user through the workflow process of Setup, Tuning, and Live by implementing the tools required for each task into the dedicated page for each process. An advanced network engine allows automatic discovery of connected units. Multiple-group assignation capability, comprehensive real-time monitoring with event logging, as well as numerous productivity tools underpin the remarkably practical and application oriented network management software.

For third party management solutions, L-Acoustics provides SNMP support to facilitate the integration via third party control and monitoring systems. As a certified member of the CRESTRON® and EXTRON® partner programs, L-Acoustics also provides software modules allowing control integration into their automation systems, for ultimate convenience in cultural and event centers, universities, houses of worship, sport facilities, etc.

LA NETWORK MANAGER

LA NETWORK MANAGER

UNIVERSAL ETHERNET SWITCH FOR STAR AND HYBRID TOPOLOGIES

LA4X	LA4X	LA12X	LA12X
LA12X	LA8	LA12X	LA12X
LA12X	LA8	LA12X	LA12X

DAISY CHAIN TOPOLOGY

HYBRID TOPOLOGY

AMPLIFIED CONTROLLERS – THE RANGE

L-Acoustics amplified controllers offer high performance and efficient loudspeaker amplification, digital signal processing and comprehensive system protection in a single ergonomic package. The onboard preset library allows for rapid system optimization with minimum EQ correction and delivers a unique sonic signature across all L-Acoustics systems.
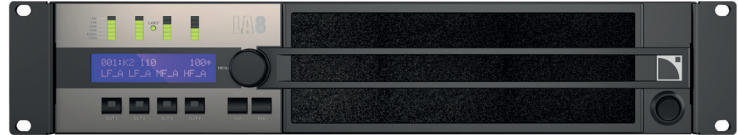
LA4X: Amplified controller with DSP
4 x 1000 W @ 8 ohms
4 inputs x 4 outputs architecture

LA8: Amplified controller with DSP
4 x 1800 W @ 4 ohms
2 inputs x 4 outputs architecture

LA12X: Amplified controller with DSP
4 x 3300 W @ 2.7 ohms
4 inputs x 4 outputs architecture

L-CASE

L-CASE is designed to offer a high level of protection against shocks, vibration, water and dust to 2U L-Acoustics electronics during their transport, storage and operation. It offers easy and comfortable handling.

Multiple L-CASE units can be individually identified and conveniently stacked on top of each other. Access to the electronics panels and cables is possible during operation.

L-CASE can be quickly and securely flown with a safety sling passing through the handle and connected to the electronics chassis.

DIMENSIONS
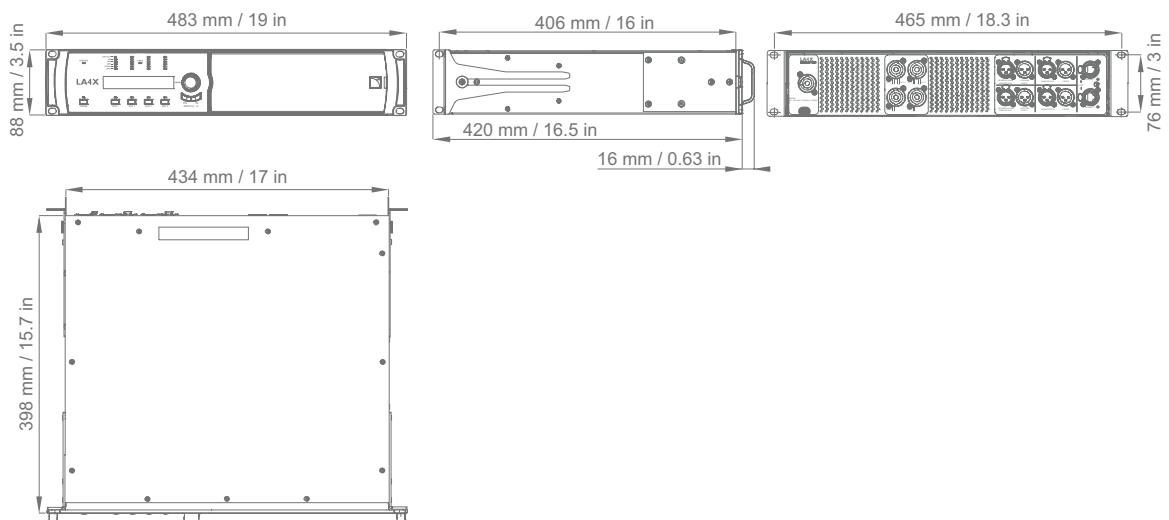
SPECIFICATIONS

Operating conditions

Temperature	Room temperature (from 0° C / 32° F to +50° C / 122° F)

Amplification and power supply

Amplification class	Class D
Output power EIA	4 x 1000 W RMS (at 8 Ω)
(1% THD, 1 kHz, all channels driven)	4 x 1000 W RMS (at 4 Ω)
Power supply model	Universal Switched Mode Power Supply (SMPS) with Power Factor Correction (PFC)
Power factor	> 0.9 (4 Ω full power)
Mains rating	100 - 240 V~ ±10%, 50-60 Hz
Nominal current requirements	20 A for 100-120 V, 10 A for 200-240 V

Audio specifications

Frequency response 20 Hz - 20 kHz	± 0.25 dB at 8 Ω
Distortion THD+N (20 Hz - 10 kHz)	< 0.05% , at 8 Ω, 11 dB below rated power
Noise level (20 Hz - 20 kHz, 8 Ω, A-weigthed)	- 71 dBV
Channel separation (at 1 kHz , 8 Ω)	> 80 dB
Latency (for both analog and digital inputs)	Standard operating mode: 3.84 ms
	Low latency operating mode: 0.76 ms

DSP

Digital Signal Processor (DSP)	SHARC 32 bit, floating point, 96 kHz sampling rate
I/O routing	Flexible 4x4 routing matrix
Per output channel	Built-in EQ station with 8 IIR, 3 FIR EQ filters
	Array morphing (LF contour, zoom factor)
	Air absorption compensation filters
	Internal IIR and FIR EQ algorithms for speaker phase linearization and improved impulse responses
	L-DRIVE protection (excursion, temperature and over-voltage)
Output delay	0 ms to 1000 ms
Transducers protection	L-DRIVE: excursion / temperature / over-voltage

Circuits protection

Mains and power supply	Over and under voltage / over temperature / overcurrent (inrush current protection)
Power outputs	Over current / short circuit / over temperature
Cooling	Cooling fans with temperature control speed

Inputs

Analog: 4 balanced analog line inputs with passively connected link

A/D conversion	4 cascaded 24-bit analog/digital converters (130 dB dynamic range)
Input impedance	22 kΩ (balanced)
Max. input level	22 dBu (balanced, THD 1%)

Digital: 2 AES/EBU inputs (4 channels) with electronically buffered link and failsafe relay

Standard	AES/EBU (AES3)
Sampling frequency (Fs)	44.1, 48, 64, 88.2, 96, 128, 176.4 or 192 kHz
Word length	16, 18, 20 or 24 bits
Synchronization	Signal resampled to internal clock at 96 kHz
Sampling frequency	96 kHz (SRC referenced to the amplified controller internal clock)
Dynamic range	140 dB
Distortion (THD+N)	< -120 dBfs
Bandpass ripple	± 0.05 dB (20 Hz - 40 kHz, 96 kHz)
Fallback mode	AB to CD: digital to analog / digital to digital
Switchover conditions	No clock, loss of lock, CRC error, bipolar encoding error or data slip
Constant delay	Independent of input Fs
Constant level	Upon user setting of AES/EBU gain, independent of input Fs
Input gain	-12 dB to +12 dB, 0.1 dB steps

AVB inputs

Stream capacity	One class A stream
Latency	2 ms (typical, depends on talker) format IEC 61883-6 AM824 at 48 kHz or 96 kHz
Channel count	4 channels from one stream that may contain up to 16 channels
Clock	Synchronized on clock of the connected AVB input stream (upsampling at 96 kHz in case of stream at 48 kHz)

Remote control and monitoring

Network connection	Dual-port Ethernet Gigabit interface, Avnu certified bridge fowarding up to 32 streams
L-Acoustics remote control software	LA Network Manager
Third-party management solutions	SNMP / Extron® / Crestron®

Physical data

Height	2U
Weight	11.3 kg / 24.9 lb
Protection rating	IP3x