

PRELIMINARY

LA RAK III TOURING RACK



- 48 channels of amplification
- Milan-AVB, AES/EBU, Analog inputs
- Seamless redundancy with Milan-AVB

- Rationalized cabling structure
- Rugged 9U frame
- Usable worldwide (100-240 V, 50/60 Hz)



LA-RAK III is a flyable touring rack offering 48 channels of amplification in a 9U frame. It is equipped with three LA7.16 amplified controllers, two LS10 AVB switches, two panels for mains power and signal distribution, and a blank panel. All devices are internally prewired for audio, control, and power to offer a plug-and-play solution with seamless Milan-AVB network redundancy.

The unique high-density approach of the LA-RAK III makes it a versatile and flexible addition to the LA-RAK family. And the multichannel capacity of LA-RAK III enables it to discretely process and amplify distributed, immersive and line source systems very efficiently, with the capability to power most L-Acoustics loudspeakers in large quantities.

The rugged LA-RAK III features a shock-absorbing inner frame, retractable front and rear doors, a detachable dolly and four handles to facilitate transport and manipulation. An optional flying frame supports up to four LA-RAK III.

LA-RAK III comes with three-phase 32 A IEC input and link connectors, allowing the linking of two LA-RAK III. It also comes with a 30 A NEMA connector for 110 V operation. Additional power sockets are available for auxiliary equipment.

Usable worldwide, LA-RAK III facilitates tour logistics and cross-rental between L-Acoustics rental network agents. LARAK III is mechanically and electrically compatible with the LA-RAK II AVB and LA-RAK legacy standards.



SYSTEM COMPONENTS



RK 9U: The 9U rack is a dual structure consisting of a rubber shock inner steel frame braced by an external aluminum structure and sided with highly resistant polyethylene panels. This ensures structural integrity while offering decoupling and maximum protection of the electronics inside the rack. Two retractable LEXAN® doors protect the internal components during transport. At the rear, two hinge-mounted panels cover and protect the amplified controllers' analog, digital, and network connectors and create a neat and tangle-free cable environment. The RK 9U is equipped with a detachable dolly board and coupling bars for stacking up to 3 LA-RAK III or flying up to 4 LA-RAK III



LA7.16: Offering a 16 x 16 architecture, the LA7.16 amplified controller delivers 1300 watts per channel at 8 Ohms and incorporates patent pending L-SMART power management technology. The LA7.16 can drive most L-Acoustics loudspeaker systems. The high output SMPS (100 - 240 V) with Power Factor Correction (PFC) offers a high tolerance to unstable mains. In an exceptionally compact and lightweight 2U chassis, LA7.16 gathers a front panel interface with a TFT touch screen display and rotary encoder. On the rear are two I/O Ethernet connection ports for Milan-AVB networked audio and control, and a terminal block connector for analog and AES/EBU inputs and links.



LS10: LS10 is a plug-and-play Avnu-certified AVB switch uniting audio and control distribution to provide a simple and reliable network solution. Two units are coupled side by side in the LA-RAK III via the dedicated 1U rack shelf. LS10 is fitted with eight etherCON™ connectors for maximum reliability. The rear etherCON™ connectors of both LS10 are connected to each LA7.16 for seamless Milan-AVB redundancy. The front etherCON™ can be used to receive and send AVB audio and control to other LA-RAKs. The SFP cages can provide additional copper ports or optical links if longer distance connections are required.



*Optical fiber connectors are not supplied

LA-PANEL III: LA-PANEL III is a 1U front patch panel for analog and digital audio signal distribution feeding the three LA7.16 with discrete analog or stereo AES/EBU signals with link-out capability to other racks. Analog and digital audio signals use XLR connectors. Four blanking plates facilitate the addition of optical fiber panel connectors*, such as HMA or opticalCON™ for additional flexibility.

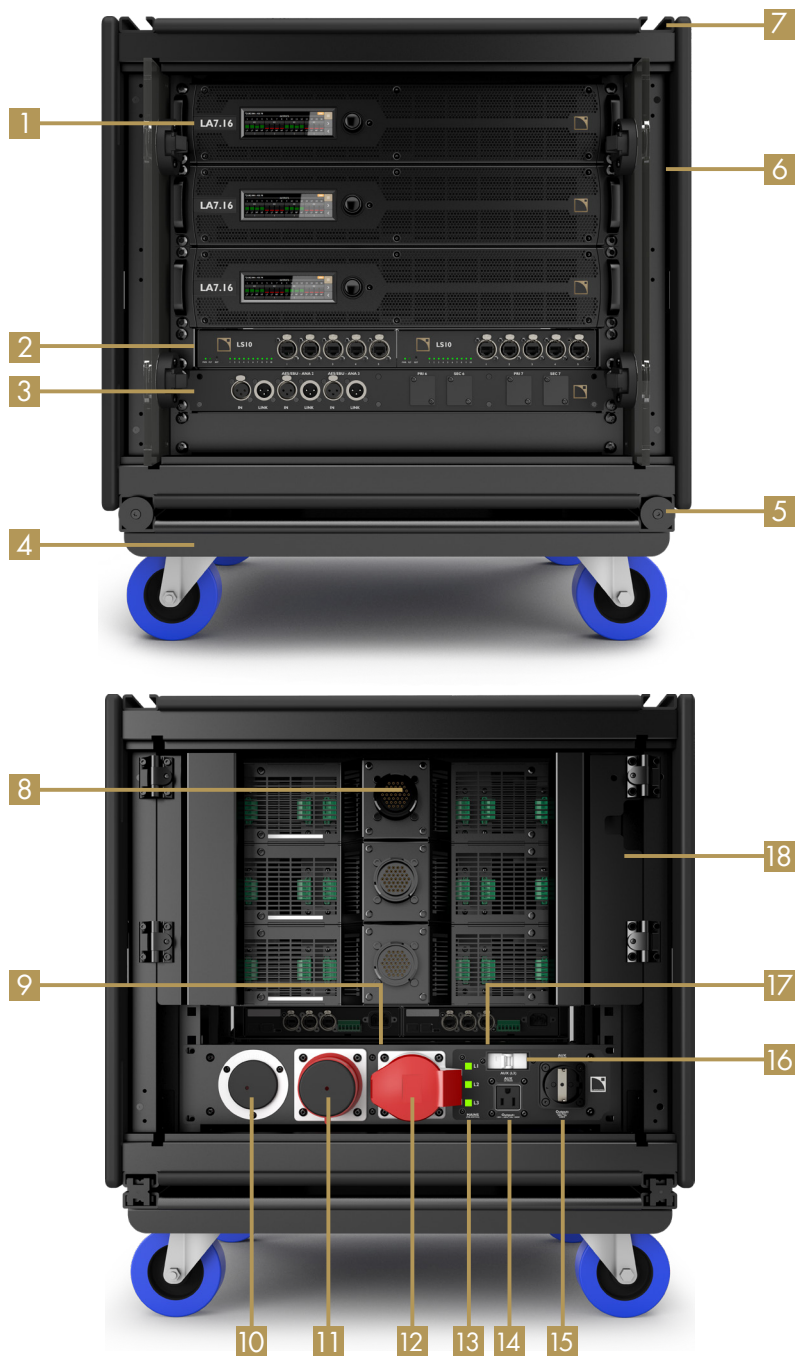


LA-POWER II: LA-POWER II is a 2U I/O power distribution panel. It automatically balances power with an equal number of LA7.16 per phase. It features a three-phase NEMA L21-30P input (US mode) and a CEE FORM 400V with a LINK OUT socket to power a second rack (EU mode). A mains switch allows operation in US or EU mode. A NEMA 5-15 (US mode) and an F "Schuko" socket (EU mode) are also available to power auxiliary equipment. The auxiliary circuit features a 10 A breaker. Three LEDs help monitor the presence of each phase on the front end of the mains circuit regardless of the position of the mains switch.



LA-RAK III BUMP: LA-RAK III BUMP is engineered to fly up to four LA-RAKs for a drive capacity of up to 192 discreet output channels. It can be flown from one or two pick points and secured to an additional safety point. Its structure features a bolted assembly for better visual safety verification and is protected by a weather resistant coating.

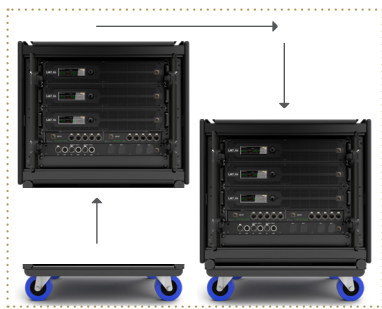
USER INTERFACE



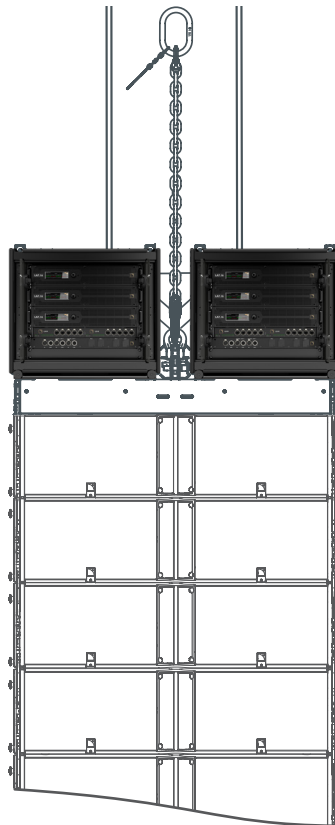
- | | | | |
|---|---|----|--|
| 1 | LA7.16 amplified controllers | 10 | 3P+N+E input (NEMA L21-30P, US mode) |
| 2 | LS10 AVB switches with 10 ethernet ports each | 11 | 3P+N+E input (CEE FORM 400V, EU mode) |
| 3 | Analog or AES/EBU inputs/links | 12 | 3P+N+E link (CEE FORM 400V, EU mode) |
| 4 | Removable dolly board | 13 | Phase presence LEDs (L1, L2, L3) |
| 5 | Coupling bars | 14 | Auxiliary output (10 A NEMA 5-15 socket, US mode) |
| 6 | Storage slots for front and rear doors | 15 | Auxiliary output (10 A type F "Shuko" socket, EU mode) |
| 7 | Assembly rails (flying and stacking) | 16 | Circuit breaker (AUX L3) |
| 8 | LA7.16 speaker output connector | 17 | Analog internal inputs (6 XLR connectors) |
| 9 | Analog or AES/EBU internal inputs/links | 18 | Hinge-mounted panels for connector protection |

ASSEMBLY PRINCIPLES

LA-RAK III stacking (max. 3 LA-RAK)



Stacking onto K2-BUMP (+K2 RAKMOUNT)
(max. 4 LA-RAK III + 24 K2)

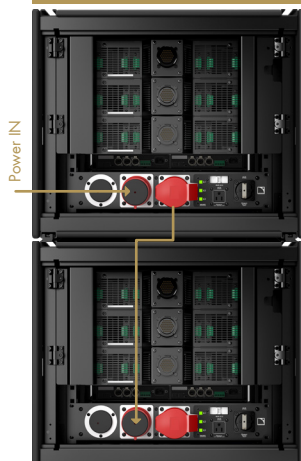


Flying under LA-RAK BUMP III (max. 4 LA-RAK)



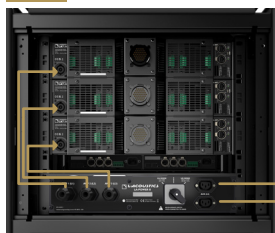
CABLING SCHEMATICS

Power*



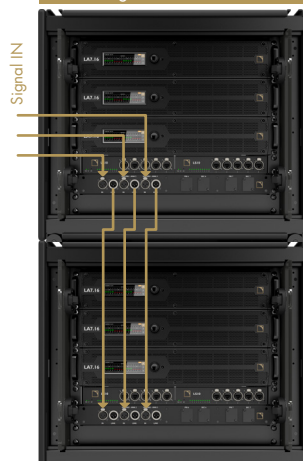
External *Links possible in 230V operation only

Internal



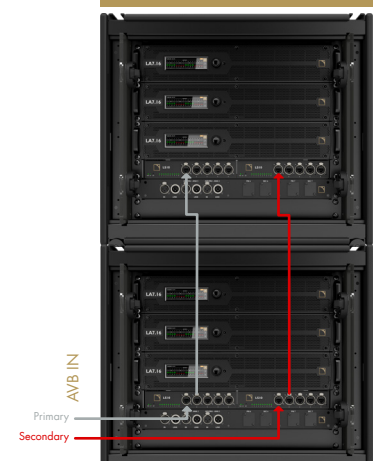
LA-POWER II rear view

Analogue or AES/EBU audio



LA-POWER II rear view

Milan-AVB audio and control



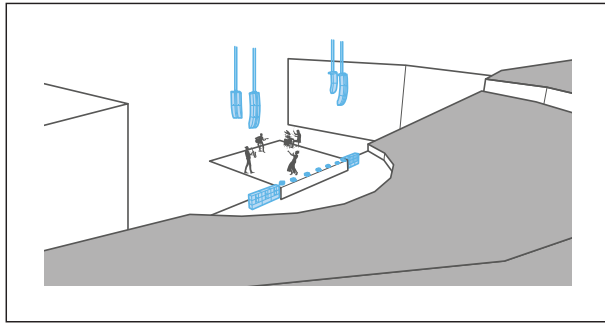
Primary

Secondary

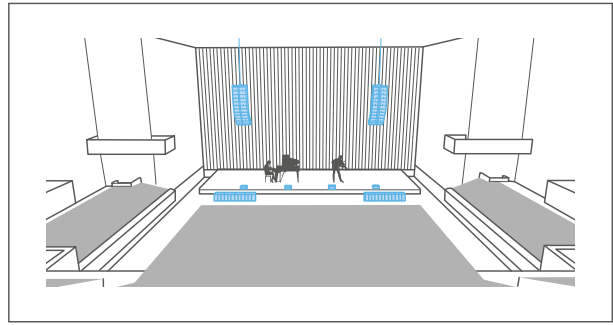


LA-PANEL III rear view

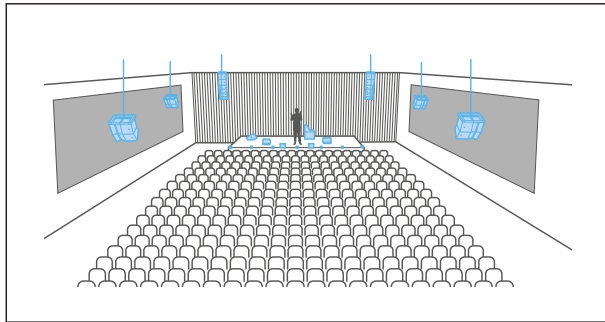
APPLICATION EXAMPLES



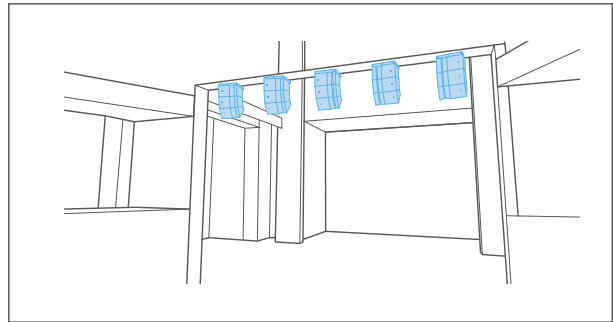
L Series: single cable connectivity



Variable Curvature Line Source: arenas, stadia and performing arts centers

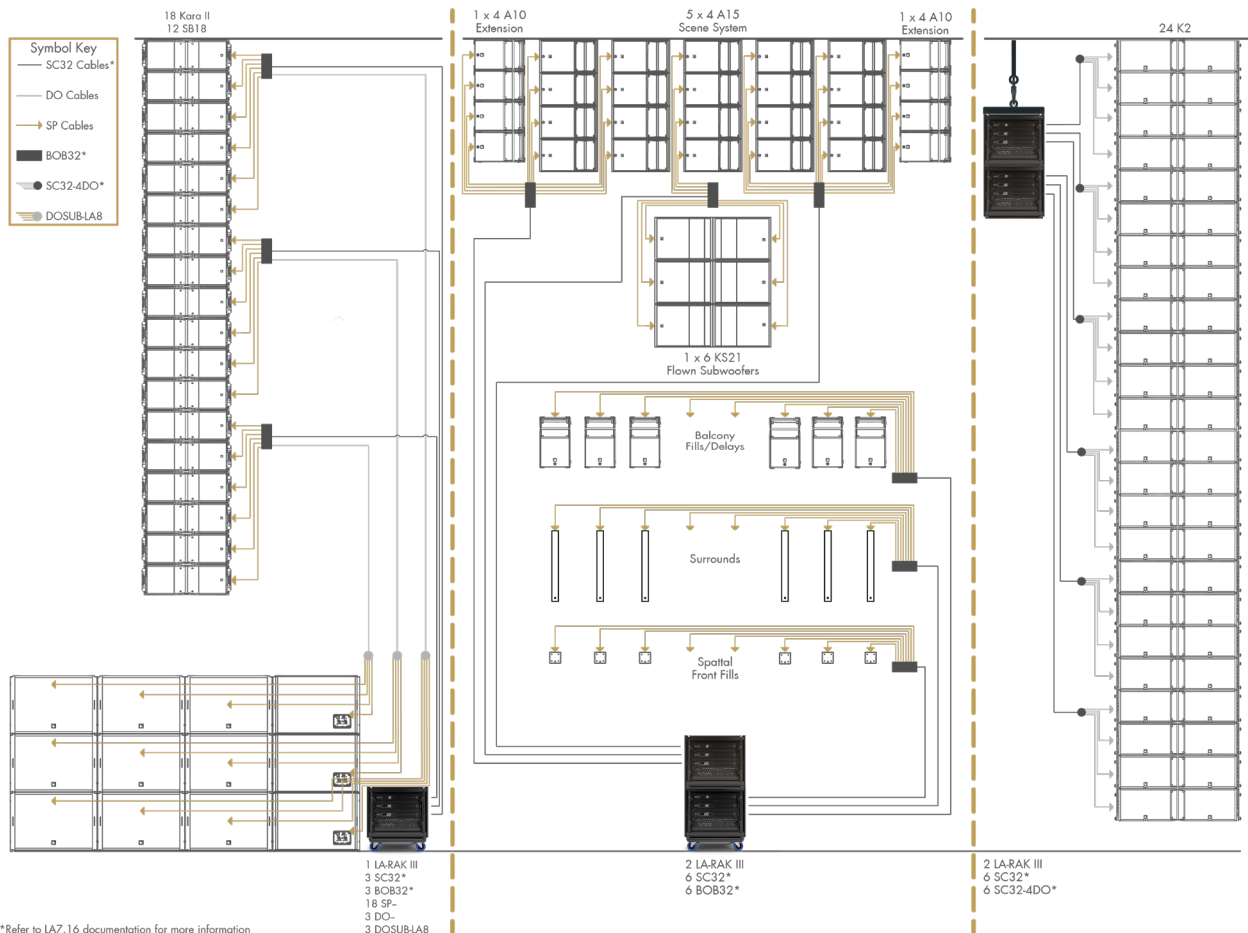


Multichannel Systems: corporate events, exhibitions, stage monitors



Immersive Hyperreal Systems: theaters and large scale installations

LOUDSPEAKER CONNECTION EXAMPLES



*Refer to LA7.16 documentation for more information

PRELIMINARY

LA-RAK III TOURING RACK



LA-RAK III is a flyable touring rack offering up to 48 channels of amplification in a 9 U frame. Three LA7.16 amplified controllers, two LS10 AVB switches and power and signal distribution panels are internally prewired to offer a plug-and-play, reliable solution that allows for seamless networked audio redundancy based on the Milan protocol.

The rugged LA-RAK III features a shock-absorbing inner frame, protective and handling elements to ease transport and manipulation. With power connectors for any voltage standard, LA-RAK III can be used worldwide to facilitate tour logistics and cross-rental between L-Acoustics rental network agents.

SPECIFICATIONS

LA-RAK III

Content	3 x LA7.16 amplified controller 2 x LS10 AVB switch 1 x LA-PANEL III 1 x LA-POWER II 2 x doors, 2 x coupling bars, 1 x dolly board and cables
----------------	---

Weight (net)	117.5 kg / 259 lb (with all the above)
---------------------	--

Material	Polyethylene, aluminium and steel external structure, LEXAN® polycarbonate doors
-----------------	--

Rigging and handling	2 x coupling bars, dolly board
-----------------------------	--------------------------------

LA-PANEL III

Front

Analog or AES/EBU input/link	3 x female Neutrik® XLR3 (IN) / 3 x male Neutrik® XLR3 (LINK)
-------------------------------------	---

Rear

Analog or AES/EBU input/link	3 x female Neutrik® XLR3 (IN) / 3 x male Neutrik® XLR3 (LINK)
-------------------------------------	---

LA-POWER II

Front

AC input (US)	30 A - NEMA L21-30P (3P+N+E) male outlet
----------------------	--

AC input/link out (EU)	32 A - IEC 60309 (3P+N+E) male outlet 32 A - IEC 60309 (3P+N+E) female outlet DANGER: Do not use with a 120 - 208 V power supply.
-------------------------------	---

AC presence	3 x dual LEDs: Left: US AC input / right: EU AC input
--------------------	---

AC auxiliary output (US)	NEMA 5-15 female outlet (AUX US MODE)
---------------------------------	---------------------------------------

AC auxiliary output (EU)	Type F «Schuko» female outlet (AUX EU MODE)
---------------------------------	---

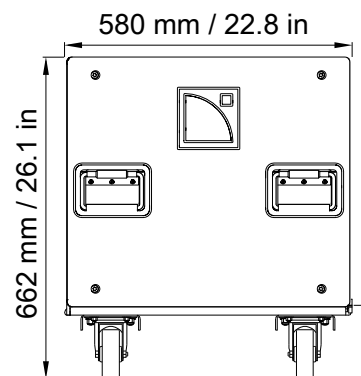
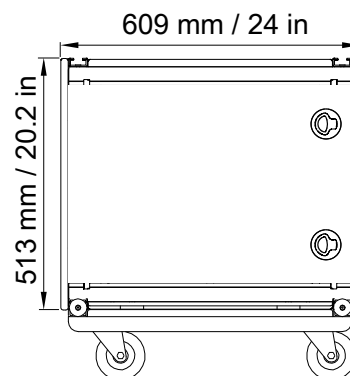
Protection	10 A type C circuit breaker (AUX L3)
-------------------	--------------------------------------

Rear

AC output for LA7.16	3 x power cords fitted with 32 A Neutrik powerCON® connectors (AMP 1 L1, AMP 2 L2, AMP 3 L3)
-----------------------------	--

AC input selector switch	Switch between EU MODE and US MODE Important: Do not switch mode when connected to power supply.
---------------------------------	---

AC output for LS10	2 x IEC 60320-1 type C13 female outlets (AUX L3)
---------------------------	--



146 mm / 5.7 in

PRELIMINARY

LA7.16 AMPLIFIED CONTROLLER

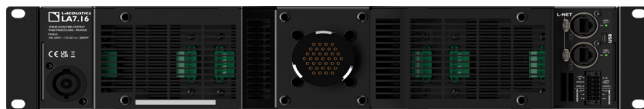


LA7.16 is a 16-channel amplified controller designed for rental applications. It integrates patent-pending L-SMART power management technology to dynamically match the real-time needs of the loudspeaker system being driven. LA7.16 is efficiently dimensioned for multichannel applications, distributed systems, or line sources for the finest discretization.

Its streamlined and elegant 2U chassis hides a powerful DSP engine with features for loudspeaker management, system protection, and monitoring as well as a comprehensive set of tools for system adjustment and calibration. The Milan-compliant LA7.16 supports AVB inputs with seamless network redundancy, in addition to AES/EBU and analog connections. The 16 amplifier outputs are available via a single SC32 loudspeaker connector.

SPECIFICATIONS

Amplification and power supply			
Output power, all channels loaded	16 channels at 4 Ω	16 channels at 8 Ω	16 channels at 16 Ω
Peak output power 12 dB Crest Factor, sine burst, 1 kHz, 2 ms	1100 W	1300 W	700 W
Output power, CEA-2006 / 490A, sine burst, 1 kHz, 20 ms, < 1 % THD	1000 W	920 W	580 W
Amplification class	High efficiency class D		
Power supply model	Universal Switched Mode Power Supply (SMPS) with Power Factor Correction (PFC)		
External DSP backup voltage input	24 V DC (± 15%) / 0.8 A		
Mains rating	100 V - 240 V ~ ±10%,50-60 Hz		
Audio specifications			
Frequency response (20 Hz - 20 kHz, 8 Ω load, 60 W output power)	± 0.05 dB		
Distortion THD+N (20 Hz - 10 kHz, 8 Ω load, 60 W output power)	< 0.1%		
Output dynamic range (20 Hz - 20 kHz, 8 Ω, A-weighted, Digital input)	> 119 dB		
Noise level (20 Hz - 20 kHz, 8 Ω, A-weighted, Digital input)	< - 78 dBV		
DSP			
Digital Signal Processor (DSP)	Gen.5 Dual SHARC 32-bit, floating point, 96 kHz sampling rate		
I/O routing	16 x 16 routing and summation matrix		
Per output channel	Built-in EQ station with 8 IIR, 4 FIR EQ filters, Autofilter full-range Array morphing (LF contour, zoom factor), Air absorption compensation filters Internal IIR and FIR EQ algorithms for speaker phase linearization and improved impulse responses Output delay from 0 to 1000 ms		
Technologies			
Loudspeaker management	L-DRIVE advanced system protection (excursion, temperature and over-voltage)		
Power management	L-SMART adaptive power management		
Circuits protection			
Mains and power supply	Over and under voltage / over temperature / overcurrent / inrush current protection		
Power outputs	Over current limiting / DC / short circuit / over temperature		
Inputs / Outputs			
AVB input with support of Milan seamless dual networking	16 channels 48kHz / 96 kHz from 16 streams of up to 8 channels		
AES/EBU input (shared connectors with Analog)	2 channels (1 x AES/EBU, 44.1 - 192 kHz sampling rate) With active link and bypass relay		
Analog input (shared connectors with AES/EBU)	1 channel, link output		
Loudspeaker output	1 SC32 connector (37 pins utilizing 32 conductors)		
Control and monitoring			
Network connection	Dual-port Ethernet Gigabit interface etherCON™ I/O		
General Purpose Inputs / Outputs (GPIO)	3 GPIO, isolated optocoupler inputs, isolated relays contacts		
Third-party management solutions	Q-SYS® / Crestron®		
Operating conditions			
Temperature	Room temperature from -5° C / 23° F to +50° C / 122° F		
Physical data			
Dimensions W x H x D	483 x 88 (2U) x 510 mm / 19 x 3.5 (2U) x 20.1 in		
Weight	15.8 kg / 34.8 lb		



PRELIMINARY

LS10 AVB SWITCH



LS10 is a plug-and-play Avnu-certified AVB switch that integrates seamlessly within the L-Acoustics ecosystem to further simplify connectivity, uniting audio and control distribution. LS10 runs out-of-the-box AVB, providing a reliable network solution that does not require IT expertise.

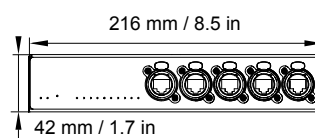
On its own or as an integral part of the LA-RAK II AVB, LS10 distributes audio and control via front and rear etherCON™ connectors and SFP cages, enabling long-distance optical links. Two units mounted side-by-side on LS10-RAKSHELF, the dedicated 1U rack shelf, allow to create a seamless redundant network effortlessly. Upgrading LA-RAK II to LA-RAK II AVB is possible.

The rugged LS10 incorporates features designed to overcome the challenges of touring events but also installation applications. The quick, 5-second, startup time allows for rapid recovery in case of power loss. A configurable GPO port enables status monitoring and the auxiliary DC input offers ultimate reliability.

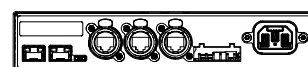
With LS10, lightning-quick setup of a stable distribution of your AVB signal is ensured without the need for extensive IT knowledge or experience.

SPECIFICATIONS

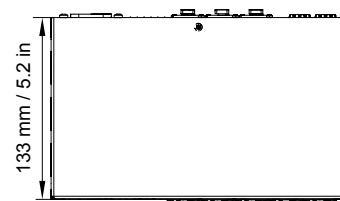
General	
Mains rating	100 V - 240 V AC (± 10%), 50 Hz - 60 Hz
Power consumption	10 W (normal operation) 20 W (backup operation)
Operating temperature	-5 °C / 23 °F to 50 °C / 122 °F
Connectors	
Network connectivity	8 Neutrik etherCON™ (5 on Front, 3 on Rear) 2 SFP cages (Rear) compliant with SFP transceivers
Power connectivity	1 IEC inlet with lock compatible to Schurter V-Lock™ External backup DC input 24V DC (± 10%) / 0.5 A External backup DC output 24V DC (± 10%) / 0.5 A
User configurable GPO	1 potential free GPO on Phoenix connector
AVB	
AVB Ports	10 AVB ports at 1 Gb/s
AVB Bridge	IEEE 802.1BA-2011 standard Augmented by Avnu ProAV 1.1 requirements
Number of supported streams	150
Time to forward AVB streams after power up	5 seconds
Features	
Management	gPTP grandmaster capable RSTP
Port Sensing	Auto negotiation
Auto Crossover	MDI / MDIX (allows use of straight or cross cables)
Auto Sensing	Full or Half Duplex
Interface	Power status LED, fault status LED link up/activity status LEDs Reset to factory settings button micro USB
Physical data	
Height x Width	1.7" x 9.5" (1U x 1/2 U)
Weight	1.5 kg / 2.2 lb



Front



Rear



Top