

PRELIMINARY

# L-ISA PROCESSOR II



- Spatial audio processor designed for adaptability
- Object-based mixing and room engine
- Up to 128 inputs x 128 outputs
- Milan-AVB and MADI
- Seamless network redundancy
- Dual redundant power supplies



L-ISA Processor II is a hardware solution dedicated to real-time spatial audio processing. It provides state of the art object-based mixing to any immersive audio production from intimate installations to the largest tours. The processor has been entirely redesigned for added robustness and greater resources, now offering 128 inputs and up to 128 outputs using Milan-AVB and MADI protocols.

L-ISA Processor II can process up to 96 objects with spatial processing parameters (pan, width, distance, elevation) and the patent-pending room engine. Improving upon its predecessor, these objects can be rendered to up to 128 outputs at 96 kHz. To adapt to any project or production size and budget, L-ISA Processor II introduces a scalable licensing model that offers license packs with 16, 32, 64 and 128 outputs, which can be upgraded as needed.

The re-engineered chassis has been ruggedized with robust mechanics and locking connectors, and includes two redundant universal power supplies. When required, a second processor can be used in mirror mode for further redundancy. As a Milan-certified device, L-ISA Processor II also ensures reliability for audio distribution with seamless Milan network redundancy for all AVB streams.

L-ISA Processor II is remotely controlled and monitored using the L-ISA Controller software.

## I/O

The available input count and feature set are the same regardless of the active license. The license packs determine the number of available outputs.

L-ISA Processor II can process 128 inputs, selected from 64 AVB channels (8 redundant streams of 8 channels) and 96 MADI channels at 96 kHz. At 48 kHz, these inputs are selected from 64 AVB channels and 192 MADI channels. The Milan-AVB streams are received via two etherCON™ connectors (primary and secondary) and the MADI streams are received via three BNC connectors.

L-ISA Processor II can output up to 128 channels via 128 redundant AVB channels (16 redundant streams of 8 channels) and the MADI output channels. The Milan-AVB streams are transmitted on the same primary and secondary etherCON™ connectors. The single BNC MADI output connector supports 32 channels at 96 kHz or 64 channels at 48 kHz.

An additional stereo AES/EBU input/output and a stereo headphone output are available for local inputs and monitoring.

# AUDIO AND SPATIAL PROCESSING

**Spatial processing:** L-ISA Processor II integrates powerful DSP resources to significantly increase the processing capabilities over its predecessor. From the 128 inputs, up to 96 can be processed with the spatial algorithms and become "objects". Each object can be individually positioned in the mix, regardless of the speaker layout, via five spatial and mixing parameters:



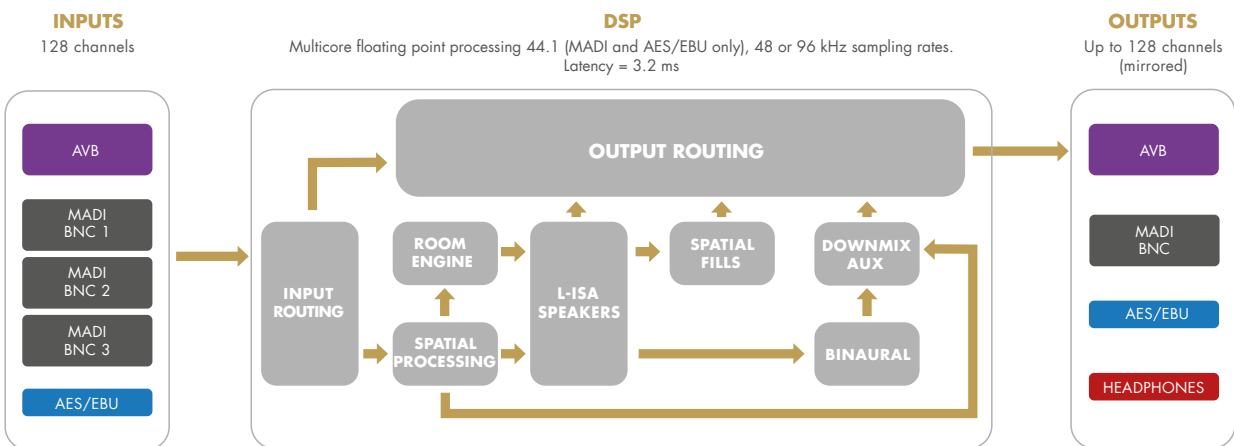
Depending on the selected license, the objects can be rendered to a maximum of 128 outputs, among which up to 64 can be L-ISA speakers. The remaining outputs can be utilized for spatial fills, downmixes and direct routings. L-ISA speakers include the Frontal system (scene and extension), the Surround system as well as Height and Bottom speakers. Spatial fills include front-fills, under-balconies and other types of fill systems. Downmixes include LCR, Stereo, Mono, Binaural and Aux Send.

**Direct routing:** Acting as a matrix, L-ISA Processor II allows the routing of any input through the L-ISA spatial processing or directly to any output. Direct routing enables media format conversion (MADI <> AVB), multiplexing AVB streams or other signal distribution purposes. The direct-routed signals have latency compensation applied automatically, maintaining synchronization with the spatially processed outputs.

**Room engine:** Accessible via the DISTANCE mixing parameter, the patent pending L-ISA room engine, allows users to complement an existing acoustic space to enhance a musical performance or create an entire virtual acoustic space for any audio content. Specifically designed for object-based audio and variable space configurations, the room engine utilizes unique multi-channel 3D processing to create a diffused energy field across many loudspeakers without audible electronic processing artifacts.



# I/O & DSP ARCHITECTURE



# LICENSES

## L-ISA PROCESSOR II standard Live 16

<b>INPUTS</b>	<ul style="list-style-type: none"> <li>• 128 inputs / 96 objects</li> </ul>
<b>FEATURES</b>	<ul style="list-style-type: none"> <li>• Room Engine</li> <li>• Snapshot Engine</li> <li>• Binaural</li> <li>• Scale Simulation</li> <li>• MIDI Time Code / Program Change</li> <li>• AAX, VST, AU / Control Plug-ins</li> <li>• OSC Input / Output</li> <li>• DeskLink</li> <li>• Spatial Fills</li> <li>• Static/Dynamic Input Delay</li> <li>• Stereo Mix Compatibility</li> </ul>
<b>OUTPUTS</b>	<ul style="list-style-type: none"> <li>• 16 outputs</li> </ul>

### Live packs

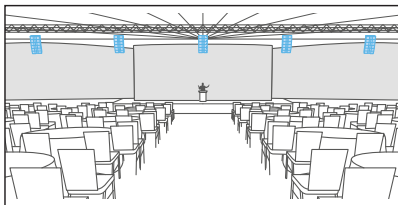
All Live packs include The Standard Live 16 features and input count

<b>LIVE 32</b>	32 outputs
<b>LIVE 64</b>	64 outputs
<b>LIVE 128</b>	128 outputs*

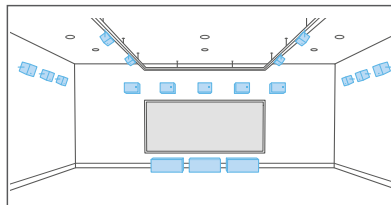
\* Of the 128 outputs, up to 64 can be L-ISA speakers

# APPLICATIONS

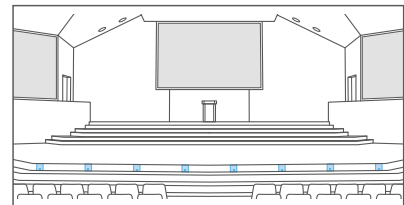
Immersive audio experiences are an essential part of designing compelling live shows, art installations, digital experiences, product launches, or theme park creations. L-ISA Processor II is the ultimate and expandable hardware platform to deliver hyperreal sound, immersive hyperreal sound or any creative sonic experience for small corporate events, theaters, congregations, through to multi-sensory immersive experiences. Because L-ISA technology is built with transportability in mind and brings the ability to mix in a soundscape regardless of the speaker layout, L-ISA Processor II allows any touring immersive show to move between intimate music clubs and the largest arena's seamlessly.



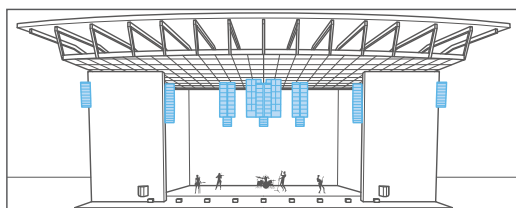
Hyperreal sound in corporate events



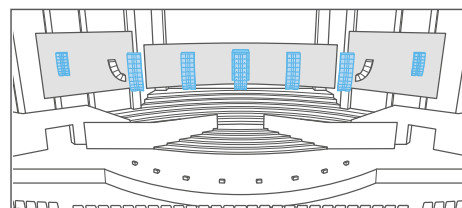
Immersive hyperreal sound for multi-sensory immersive experiences



Spatial Fills for theatrical performances



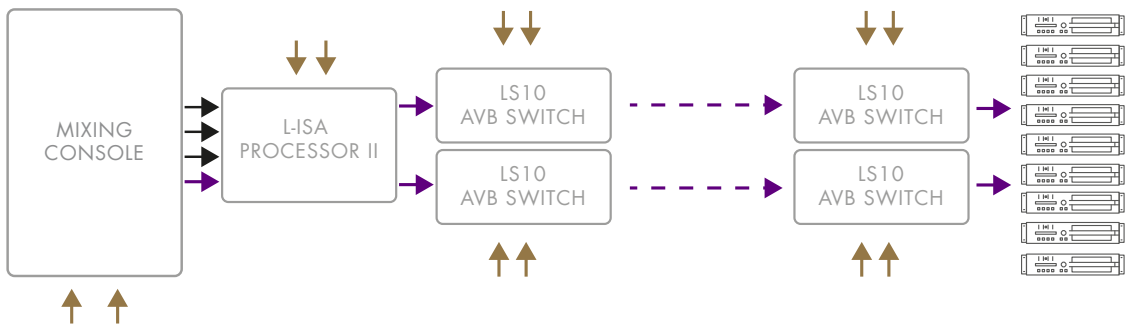
Hyperreal sound for international shows



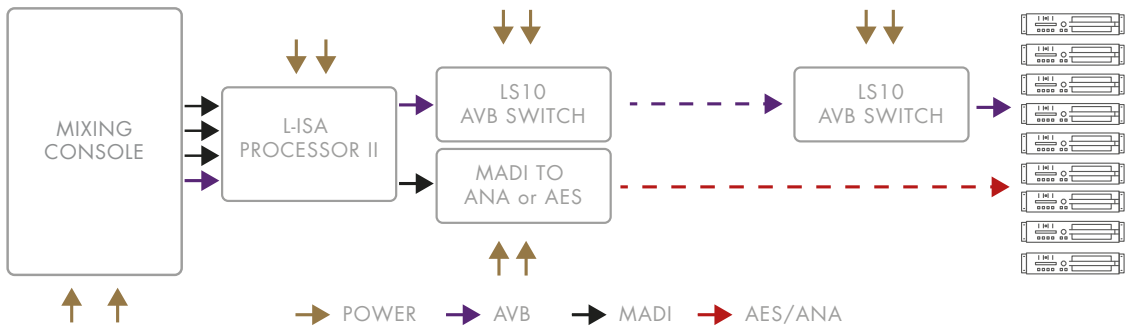
Hyperreal sound for congregations

# AUDIO SIGNAL DISTRIBUTION

Seamless redundant Milan-AVB configuration:

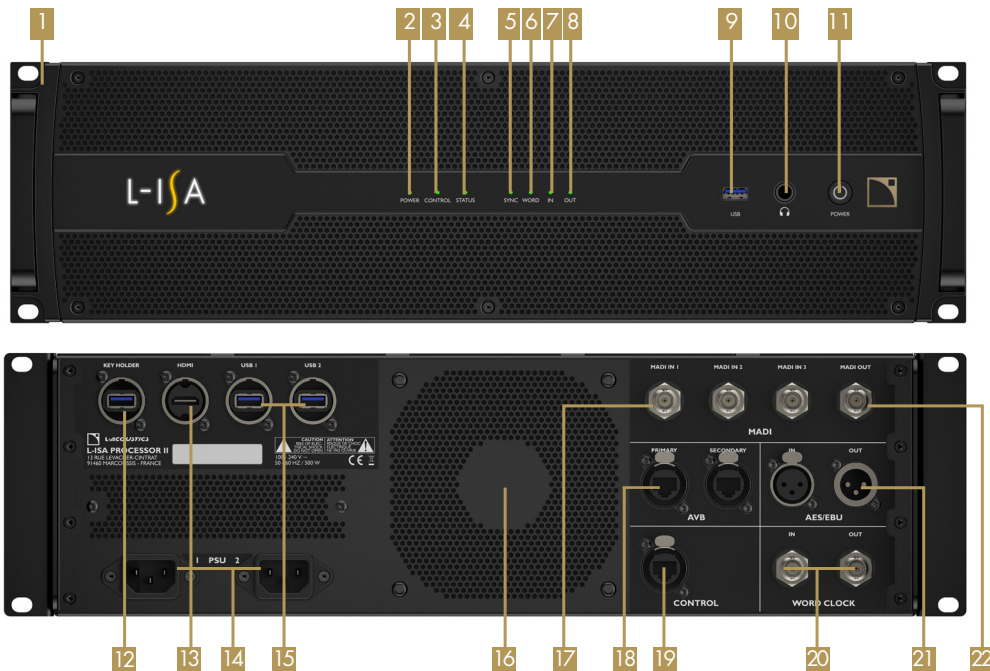


Milan-AVB with ANA or AES fallback (requires third-party conversion device)



\* Two L-ISA Processor II can be also configured in mirror mode for further hardware redundancy.

# USER INTERFACE



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|---|---|---|
| <ul style="list-style-type: none"> <li>1 3U chassis</li> <li>2 Power LED</li> <li>3 Control network LED</li> <li>4 Status LED</li> <li>5 Sync LED</li> <li>6 Word clock LED</li> <li>7 Input signal LED</li> <li>8 Output signal LED</li> </ul> | <ul style="list-style-type: none"> <li>9 USB port</li> <li>10 Stereo headphone out (6.3 mm TRS)</li> <li>11 Power button</li> <li>12 Key holder for backup system</li> <li>13 HDMI output</li> <li>14 Redundant power supply inlets (IEC C13 V-Lock power connector)</li> <li>15 Additional USB ports (x2)</li> </ul> | <ul style="list-style-type: none"> <li>16 Fan grill</li> <li>17 MADI input BNC connectors (x3)</li> <li>18 AVB etherCON 1 Gbit Ethernet connectors (Primary and Secondary)</li> <li>19 Control etherCON 1 Gbit Ethernet connector</li> <li>20 Word clock input and output BNC connectors</li> <li>21 AES/EBU input and output XLR connectors</li> <li>22 MADI output BNC connector</li> </ul> |
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## SOFTWARE

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**L-ISA CONTROLLER** is an integrated software suite that serves as the hub for all L-ISA functionality, enabling object-based mixing along with comprehensive control and programming capabilities. All in a single application.

The touch-friendly user interface was designed in collaboration with leading mixing engineers to ensure a fast and immediate workflow when programming and operating — even during the most demanding productions and creative applications.

### Control

The intuitive L-ISA Controller user-interface provides all the tools needed to efficiently create an immersive experience. The assignment and definition of mono, stereo or groups of objects can be done offline, along with preparation of all spatial parameters and programming trajectories in the soundscape. Once connected to the processor, the mix can be rendered seamlessly. The 2D/3D environment ensures a natural comprehension of the objects in the soundscape, with smart tool panels layout to match the workflow of both the creation process and show operation.

### Programming

L-ISA Controller includes a powerful snapshot engine with a wide range of editing tools to accelerate programming. Edit multiple snapshots in absolute or relative mode, use groups in combination with snapshots to create simultaneous trajectories, and use the extensive recall options when coordinating the show. Snapshots can be triggered via Midi Program Change (MPC) or Midi Time Code (MTC).

The L-ISA Controller extensive Open Sound Control (OSC) API gives access to additional advanced programming capabilities through various third-party applications or frameworks.

### L-ISA DeskLink

The L-ISA DeskLink protocol provides seamless integration of L-ISA controls into most major digital mixing consoles, allowing engineers to access L-ISA as an integrated element of their existing workflow.

### L-ISA Control Plugins

The L-ISA Control plugin enables any major Digital Audio Workstation to control and position L-ISA objects or groups and incorporate them into the DAW automation system. Used in a Playback rig or for post-production, the L-ISA Control plugin can record or playback any object positioning parameter in real-time and connects to the control network to provide maximum setup flexibility. Plugins are available as VST3 / AAX / AU / AAX-DSP.

## NETWORK

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### Network control

L-ISA Processor II is mainly controlled and monitored with L-ISA Controller using an Ethernet-based network. L-ISA Processor II is fitted with a Control Ethernet port and two AVB ports for primary and secondary streams according to the Milan protocol. While the AVB ports are used to pass audio and clock information, the Control port is used to connect the PC/ Mac hosting L-ISA Controller and control the processor.

Additionally, any third-party control interface that supports HTTP can be used to control L-ISA Processor II.

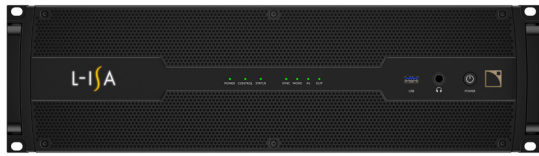
### Milan-AVB

AVB is the only protocol that guarantees deterministic and synchronous network behaviour, assuring on-time delivery of time-sensitive data. Milan is the application layer on top of AVB, independent from any private entity, that ensures seamless interoperability between any Milan-certified device. The Milan initiative developed agreed-upon standards for media stream format, media clocking, seamless redundancy, and more so that no IT expertise is required to set up a reliable and deterministic AVB network with Milan-certified devices.

Milan-AVB is an evolving, long-term, viable, and durable network developed by the industry for the industry.

PRELIMINARY

# L-ISA PROCESSOR II



L-ISA Processor II is a licensed-based processor dedicated to real-time spatial audio processing. It provides state of the art object-based mixing for any immersive audio production, from the smallest installations to the largest tours. It offers 128 inputs and up to 128 outputs using AVB or MADI protocols.

From the 128 selected hardware inputs, L-ISA Processor II can process up to 96 objects with spatial processing parameters and the patent-pending room engine. These objects can be rendered to as many as 128 outputs at 96 kHz depending on the license pack selected. Acting as a matrix, L-ISA Processor II allows the routing of any input through the L-ISA spatial processing or directly to any output, enabling media format conversion and AVB stream multiplexing. The ruggedized chassis integrates two redundant universal power supplies. As a Milan-certified device, L-ISA Processor II ensures reliability for audio distribution with the seamless Milan network redundancy for all AVB streams.

## SPECIFICATIONS

Power supply	
Power supply model	Universal Switched Mode Power Supply (SMPS) with power factor correction (PFC)
Mains rating	Redundant power supplies: 2 x 100 V - 240 V ~ ±10%, 50-60 Hz, 350 W
Connector	IEC C13 V-lock™ compatible
Audio inputs	
Milan-AVB supporting Milan seamless redundant networking	64 AVB channels (8 redundant streams of up to 8 channels) 2 x etherCON™ Gigabit ports for AVB primary and secondary
MADI	192 channels at 44.1 or 48 kHz / 96 channels at 96 kHz 3 x BNC connectors
AES/EBU	2 channels (1xAES3) at 44.1, 48 or 96 kHz 1 x XLR female connector
Audio outputs	
Milan-AVB supporting Milan seamless redundant networking	128 AVB channels (16 redundant streams of up to 8 channels) 2 x etherCON™ Gigabit ports for AVB primary and secondary
MADI	64 channels at 44.1 or 48 kHz / 32 outputs at 96 kHz 1 x BNC connector
AES/EBU	2 channels (1xAES3) at 44.1, 48 or 96 kHz 1 x XLR male connector
Headphones	Analog stereo headphones 6.3 mm TRS
Audio clock sources	
Milan-AVB	CRF input and output streams audio input and output streams
Word clock	Input and output on BNC connectors
MADI	Input and output on BNC connectors
AES/EBU	Input on XLR connector
DSP	
LISA processing at 96 kHz	96 objects rendered to a maximum of 128 outputs (depending on license pack) LISA parameters: Pan, Width, Distance, Elevation, Aux Send Room engine
Direct audio routing	Audio format conversion MADI to AVB or AVB to MADI AVB to AVB stream multiplexing
Sampling rates	44.1 (MADI and AES/EBU only), 48kHz, 96kHz
Latency (input to outputs)	3.2 ms
Boot time to AVB audio pass through	31 s
Remote control and monitoring	
Network connection	Ethernet Gigabit interface with etherCON™ connector
Remote control software	LISA Controller or any HTTP-based third-party control device
Operating conditions	
Temperature	-5° C / 23° F to +50° C / 122° F
Maximum altitude	2000 m / 6500 ft
Physical data	
Dimensions W x H x D	483 x 133.35 (3U) x 458 mm / 19 x 5.25 (3U) x 18 in
Weight	11 kg / 24.3 lb