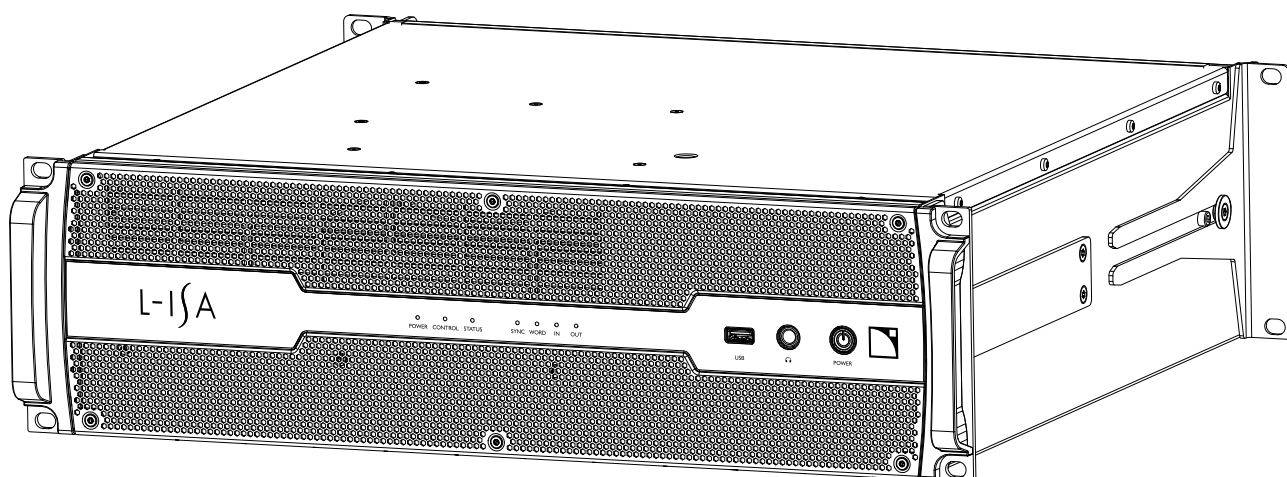


# L-ISA Processor II



owner's manual (EN)



Document reference: L-ISA Processor II owner's manual (EN) version 1.4

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# Safety

## Important safety instructions

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- 
**Inspect the product before operation.**  
 If any sign of defect or damage is detected, immediately withdraw the product from use for maintenance.
- 
**Perform preventive maintenance at least once a year.**  
 Refer to the preventive maintenance section for a list of actions and their periodicity.  
 Insufficient upkeep of the product can void the warranty.
- 
**Verify the electrical conformity and compatibility of the mains supply.**  
 Only connect the product to an AC power outlet rated 100-240 V, 50-60 Hz.  
 The product draws 150 W (typical).  
**WARNING:** The product is of Class 1 construction and shall be connected to a mains socket outlet with a Protective Earth connection.
- 
**When the product is used in a three-phase circuit, verify the electrical conformity and compatibility of the three-phase circuit.**  
 Verify that the three phases work, and balance the loads between the three phases.  
 Verify that the neutral and earth work.  
 Never try to emulate a 230 V circuit connecting an apparatus to two live wires of a 120 V three-phase circuit.  
 Never try to emulate a 200 V circuit connecting an apparatus to two live wires of a 100 V three-phase circuit.
- 
**Never incorporate equipment or accessories not approved by L-Acoustics.**  
**Read all the related PRODUCT INFORMATION documents shipped with the products before exploiting the system.**
- 
**Intended use**  
 This system is intended for use by trained personnel for professional applications.
- 
**As part of a continuous evolution of techniques and standards, L-Acoustics reserves the right to change the specifications of its products and the content of its documents without prior notice.**  
 Check [www.l-acoustics.com](http://www.l-acoustics.com) on a regular basis to download the latest document and software updates.
- 
**Beware of sound levels.**  
 Do not stay within close proximity of loudspeakers in operation.  
 Loudspeaker systems are capable of producing very high sound pressure levels (SPL) which can instantaneously lead to permanent hearing damage to performers, production crew and audience members. Hearing damage can also occur at moderate level with prolonged exposure to sound.  
 Check the applicable laws and regulations relating to maximum sound levels and exposure times.
- 
**Do not use the product outside its operating temperature range.**  
 The product operates at a room temperature between -5 °C / 23 °F and 50 °C / 122 °F.  
 Do not expose the product to direct sun.
- 
**Long term exposure to extreme conditions may damage the product.**  
 For more information, refer to the **Products weather protection** document, available on the website.
- 
**Use the product in a conformed electro-magnetic environment.**  
 The product can be used in the following environment: residential (class B).  
**Avoid radio interference.**  
 This product has been tested and complies with the regulations of the EMC directive (Electro Magnetic Compatibility). These regulations are designed to provide reasonable protection against harmful interference from electrical equipment, but it cannot be guaranteed that interference will never occur.

- ! Product disconnection**  
To completely disconnect this product from the mains, disconnect all power supply cord plugs from the mains socket outlets.
- ! Power supply cord and socket accessibility**  
The main plug of the power supply cord shall remain easily accessible.  
The mains socket outlet shall be easily accessible.
- ! Risk of start-up sequence failure**  
The HDMI port is only required for maintenance operations. Do not use the HDMI port during normal operation of the processor.  
From firmware version 2.5, the HDMI port is disabled to prevent start-up sequence failure.
- ! Read the maintenance section of this document before servicing the product.**
- ! Contact L-Acoustics for advanced maintenance.**  
Any unauthorized maintenance operation will void the product warranty.
- ! Shipping**  
Use the original packaging for shipping the product, unless it is mounted in a rack with the front and rear panels fixed to the rack, as described in this manual.

## Symbols on the product



### Explanation of graphical symbols



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.



Do not open unless authorized. This symbol indicates the presence of electrical shock hazards. It also indicates that no maintenance performed by the end user requires access to internal components.



This marking indicates that this product should not be disposed of with other household waste throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.



The device can be supplied by multiple sources of power. Disconnect all power supply cord plugs from the mains socket outlets to fully disconnect this product from the mains.

# Introduction

## L-ISA Processor II

---



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.



## How to use this manual

---

The L-ISA Processor II owner's manual is intended for all actors involved in the system design, implementation, preventive and corrective maintenance of the L-ISA Processor II product. It must be used as follows:

1. Read the technical description for an overview of all product elements, their features, and their compatibilities.
  - [Technical description](#) (p.13)
2. Before installing the product, perform mandatory inspections and functional checks.
  - [Inspection and preventive maintenance](#) (p.18)
3. To deploy the product, follow the step-by-step installation instructions and refer to the cabling schemes.
  - [Installation](#) (p.20)
  - [Audio and network cabling](#) (p.22)
4. To configure the settings and parameters of the product, follow the step-by-step operation instructions.
  - [Operation](#) (p.30)



The [Corrective maintenance](#) (p.35) section contains the operations authorized for the end user. Performing another operation exposes to hazardous situations. For advanced maintenance, contact your L-Acoustics representative.

**As part of a continuous evolution of techniques and standards, L-Acoustics reserves the right to change the specifications of its products and the content of its documents without prior notice.**

Check [www.l-acoustics.com](http://www.l-acoustics.com) on a regular basis to download the latest document and software updates.

### Contact information

For information on advanced corrective maintenance:

- contact your Certified Provider or your L-Acoustics representative
- for Certified Providers, contact the L-Acoustics customer service: [customer.service@l-acoustics.com](mailto:customer.service@l-acoustics.com) (EMEA/APAC), [laus.service@l-acoustics.com](mailto:laus.service@l-acoustics.com) (Americas).

## Symbols

The following symbols are used in this document:



This symbol indicates a potential risk of harm to an individual or damage to the product.

It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.



This symbol indicates a potential risk of electrical injury.

It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.



This symbol notifies the user about instructions that must be strictly followed to ensure proper installation or operation of the product.



This symbol notifies the user about complementary information or optional instructions.

## Revision history

---

version number	publication date	modification
1.0	Mar. 2022	Initial version.
1.1	May 2022	Added Declaration of Conformity in <a href="#">Appendix B - Approvals</a> (p.50).
1.2	Nov. 2022	Issue fixes and improvements.
1.3	Jul. 2023	<ul style="list-style-type: none"><li>• Updated DSP architecture graph.</li><li>• Added information about L-ISA Ambiance™ Acoustics System.</li></ul>
1.4	Oct. 2023	<ul style="list-style-type: none"><li>• Updated rear panel description (HDMI port disabled) in <a href="#">Front and rear panels</a> (p.13).</li><li>• Updated troubleshooting procedure (HDMI port disabled) in <a href="#">Interface issues</a> (p.36).</li><li>• Updated <a href="#">Network setup</a> (p.23).</li></ul>

## System components

### Processor

L-ISA Processor II      L-ISA multichannel audio processor

### Networking

LS10      Avnu™-certified AVB switch

### Cables

DOE cables      Dual AVB Network cable CAT6A, etherCON (black = primary network, red = secondary network)  
Come in different sizes: DOE2 (2 m / 6.6 ft), DOE45 (45 m / 147.6 ft), and DOE100 (100 m / 328.1 ft)

**!** In AVB networks, for lengths greater than 80 m / 262 ft from the processor to the listeners, add LS10 as a relay in between.

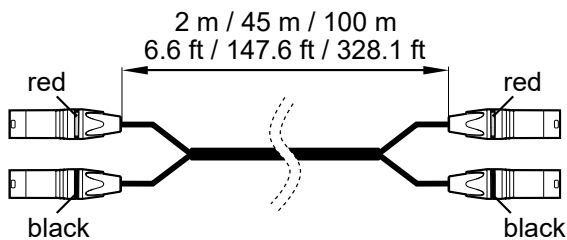
### Software applications

L-ISA Controller      Software suite for object-based mixing and remote control of L-ISA processors

**i** Refer to the **L-ISA Controller** help.

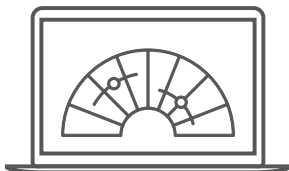
## System component illustrations

### Cables



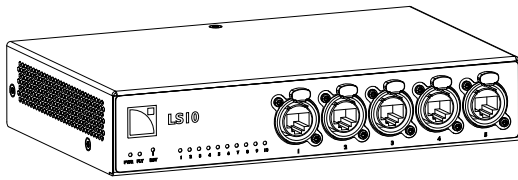
DOE cables

### Software applications



L-ISA Controller

## Network switch

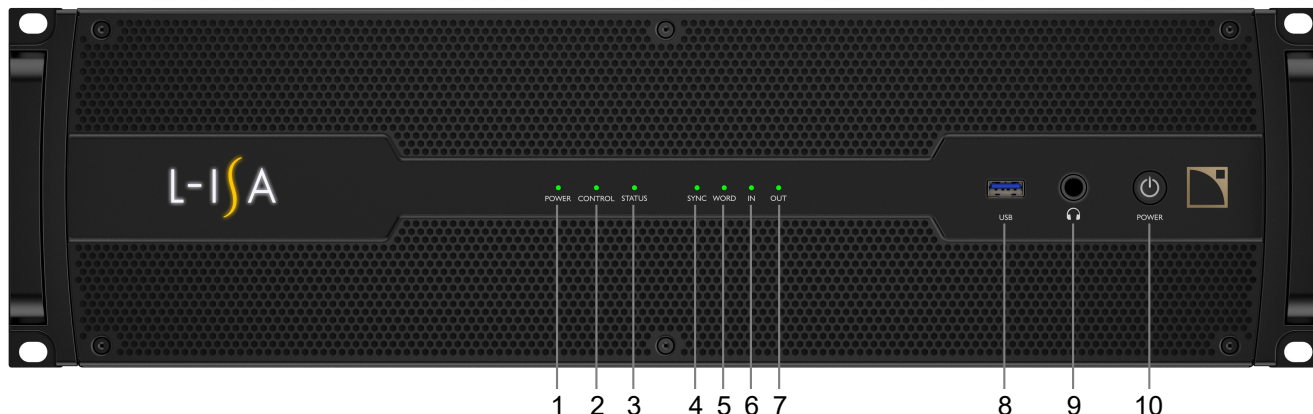


LS10

# Technical description

## Main features

### Front and rear panels



- |                                    |   |
|------------------------------------|---|
| <b>1</b> power LED                 | <b>6</b> input LED                      |
| <b>2</b> control network LED       | <b>7</b> output LED                     |
| <b>3</b> status LED                | <b>8</b> USB 3.1 port                   |
| <b>4</b> clock synchronization LED | <b>9</b> 1/4 inch stereo headphone jack |
| <b>5</b> word clock LED            | <b>10</b> power button                  |



- |   |  |
|---|--|
| <b>1</b> backup system key holder*                  | <b>7</b> 1 Gb/s Ethernet etherCON I/O connectors for AVB network   |
| <b>2</b> HDMI port**                                | <b>8</b> 1 Gb/s Ethernet etherCON I/O connector for remote control |
| <b>3</b> USB 3.1 ports (for maintenance use only)   | <b>9</b> female XLR AES/EBU input connector                        |
| <b>4</b> V-Lock compatible IEC C13 power connectors | <b>10</b> male XLR AES/EBU output connector                        |
| <b>5</b> MADI input BNC connectors                  | <b>11</b> word clock input BNC connector                           |
| <b>6</b> MADI output BNC connector                  | <b>12</b> word clock output BNC connector                          |

**i** \*The key holder port is fitted with a 32 GB USB 3.1 flash drive for backup in case of hard drive failure. Refer to [Emergency USB key](#) (p.33).

**i** \*\*From firmware version 2.5, the HDMI port is disabled to prevent start-up sequence failure.

## Signal processing

**!** L-ISA Processor II has no SRC capabilities. Therefore, the input audio streams sample rate must match the DSP sample rate, and the output streams match the DSP sample rate.

### Supported sample rates

		<b>44.1 kHz</b>	<b>48 kHz</b>	<b>96 kHz</b>
MADI	IN	192 channels		96 channels
	OUT	64 channels		32 channels
AES/EBU	IN	yes		
	OUT			
Milan-AVB	IN	N/A	yes	
	OUT			
Headphones	OUT	yes		

### Signal inputs

L-ISA Processor II features three BNC MADI input connectors and two Ethernet ports allowing it to process up to 128 inputs selected from:

- 64 AVB channels (8 redundant streams of 8 channels) and 96 MADI channels at 96 kHz.
- 64 AVB channels and 192 MADI channels at 48 kHz.

**!** To maintain the phase relationship between inputs into the L-ISA Processor II, it is recommended not to mix MADI and AVB channels from the same device due to latency differences of the stream formats (>1 ms).

In addition, L-ISA Processor II features one XLR input connector capable of retrieving two AES/EBU channels.

#### MADI

L-ISA Processor II can receive up to 192 channels at 44.1 kHz / 48 kHz or up to 96 channels at 96 kHz, using the three MADI input BNC connectors on the rear panel.

#### AES/EBU

L-ISA Processor II can receive two AES/EBU digital audio channels at 44.1 kHz, 48 kHz, or 96 kHz using the AES/EBU input connector on the rear panel.

The connector is a female XLR3.




#### Milan-AVB

Eight redundant AVB streams of up to eight channels may be connected to L-ISA Processor II, for a total of 64 AVB channels. One CRF stream may also be connected to L-ISA Processor II.

Each Ethernet port uses a high speed data transfer protocol up to 1 Gb/s and supports the Milan AAF PCM32 stream format, with stream frequencies of 48 kHz or 96 kHz.

## Signal outputs

L-ISA Processor II features a dedicated BNC MADI output connector and two Ethernet ports allowing the distribution of up to 16, 32, 64, or 128 outputs (depending on the license) that can be received from 128 redundant Milan-AVB channels (16 streams of up to 8 channels) and 32 MADI channels at 96 kHz or 64 MADI channels at 48 kHz.

-  Among the 128 outputs, up to 64 outputs can be L-ISA speakers.
-  L-ISA Processor II has a default capability of 16 audio outputs. This capability can be increased with a SW Output Pack. For more information, refer to [www.l-acoustics.com](http://www.l-acoustics.com).
-  L-ISA Processor II is Milan-certified when using a Live 16, Live 32, or Live 64 output license. The Live 128 license provides two output modes: 120 + CRF (Milan-certified), and 128 (not Milan-certified).

In addition, L-ISA Processor II features one XLR connector capable of distributing two AES/EBU digital routing output signals.

### MADI

L-ISA Processor II can distribute up to 64 channels at 44.1 kHz / 48 kHz or up to 32 channels at 96 kHz, using the MADI output BNC connector on the rear panel.

### AES/EBU

L-ISA Processor II can distribute two AES/EBU digital routing signals at 44.1 kHz, 48 kHz, or 96 kHz using the AES/EBU output connector on the rear panel.

The connector is a male XLR3.

### Milan-AVB

L-ISA Processor II can distribute up to 16 redundant streams of up to 8 channels, for a total of 128 AVB channels.


L-ISA Processor II can also distribute one CRF stream, unless all 16 stream outputs are already being used for AVB channels distribution. In this case, one of the stream output must be dedicated to the CRF stream.

Each connector uses a high speed data transfer protocol up to 1 Gb/s and supports the Milan AAF PCM32 stream format, with stream frequencies of 48 kHz or 96 kHz.

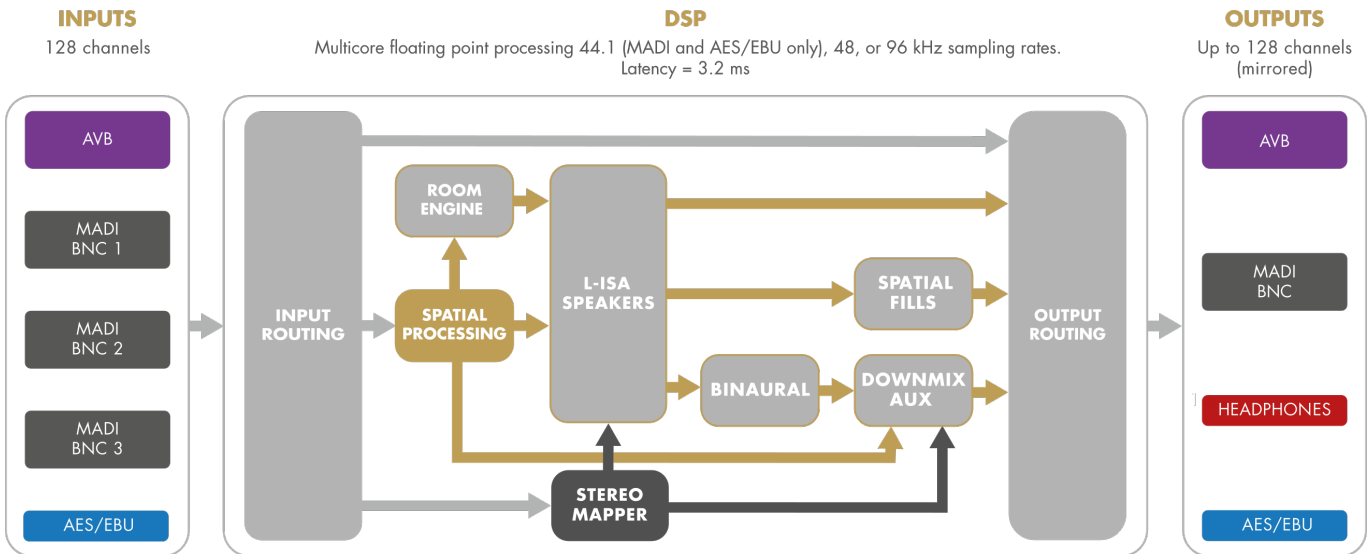
### Other

L-ISA Processor II features a 1/4 inch stereo headphone jack.

An HDMI port is available on the rear panel.

-  **Risk of start-up sequence failure**  
The HDMI port is only required for maintenance operations. Do not use the HDMI port during normal operation of the processor.  
From firmware version 2.5, the HDMI port is disabled to prevent start-up sequence failure.

## DSP architecture



## USB ports

L-ISA Processor II features three USB 3.1 ports. The USB port on the front panel and the two USB ports on the rear panel can be used to connect the emergency USB key, or for maintenance purposes.

**i** The KEY HOLDER USB port is not functional and is for storage purposes only.

**!** **If a connected device draws more than 900 mA / 5 V, the USB ports stop working.**

The integrated USB ports cannot be used to charge a device.

If the USB ports stop working, disconnect the device and power cycle L-ISA Processor II.

## Power supply

L-ISA Processor II relies on a redundant universal Switched Mode Power Supply (SMPS) suitable for mains from 100 V AC - 240 V AC ( $\pm 10\%$ ), 50 Hz - 60 Hz, 150 W.

## Monitoring and control

### User interface

The LED display provides real-time monitoring functionalities:


- power
- control
- status
- clock synchronization
- word clock
- input signal presence / clipping
- output signal presence / clipping

**i** Refer to section [Operation](#) (p.30) for detailed operating instructions.



## Remote control network

The computer running L-ISA Controller and the processors are connected with industry standard CAT5e U/FTP cables (or higher category) fitted with RJ45 connectors.

 In AVB networks, for lengths greater than 80 m / 262 ft from the processor to the listeners, add LS10 as a relay in between.

L-ISA Processor II connects to the L-ISA Controller network via the CONTROL Ethernet etherCON I/O socket located on its rear panel.

L-ISA Processor II is compatible with OSC for third party control tools.

 Refer to the **L-ISA Controller Help** for detailed operating instructions.

# Inspection and preventive maintenance

## How to do preventive maintenance

---

Inspect the product periodically as indicated, and after any corrective maintenance operation.

### Structure and cleanness

Before and after each deployment (touring applications), or at least once a month (fixed installations):

- [External structure](#) (p.18)
- [Cleanness](#) (p.19)


### Functionalities

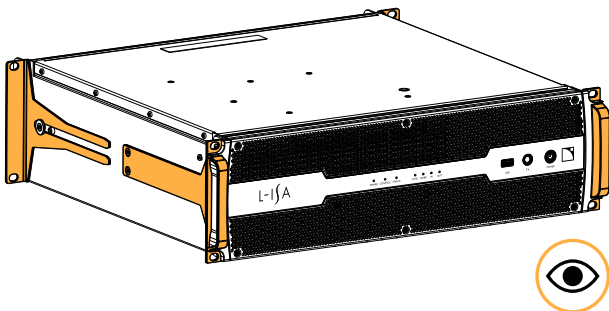
At least once a year:

- [Normal start-up sequence](#) (p.19)
- [Network functionalities and firmware](#) (p.19)

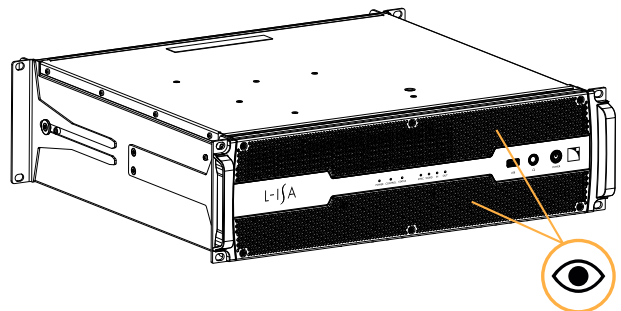
## External structure

---

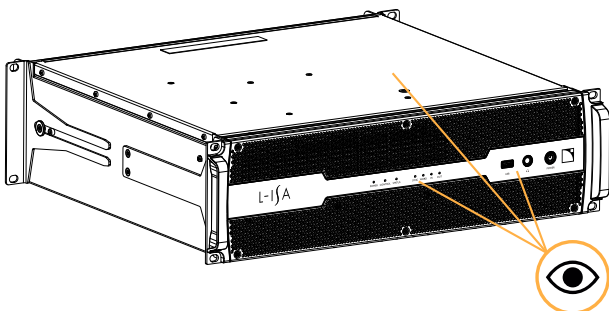
The  indicates a visual inspection.



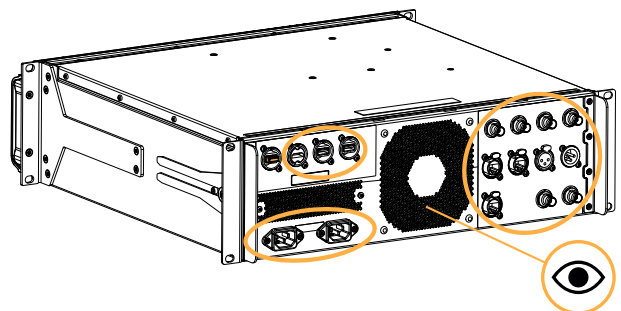
side brackets, front handles, and rear brackets are present and not damaged



front grills are clean and not damaged  
see also [Cleanness](#) (p.19)



front connectors, chassis, and LEDs are not damaged



rear connectors are not damaged  
rear grill is clean and not damaged  
emergency USB key is present in KEY HOLDER port

## Cleanness

---

### Equipment

- air blower

### Procedure

Clean the processor through the front grill with an air blower.

## Normal start-up sequence

---

### Procedure

1. Plug the processor to mains.
2. Power on the processor.
3. Check that the LEDs light up during the start-up sequence.

## Network functionalities and firmware

---

### Equipment

- computer with L-ISA Controller version 2.3.x minimum
- CAT5e U/FTP cable

### Procedure

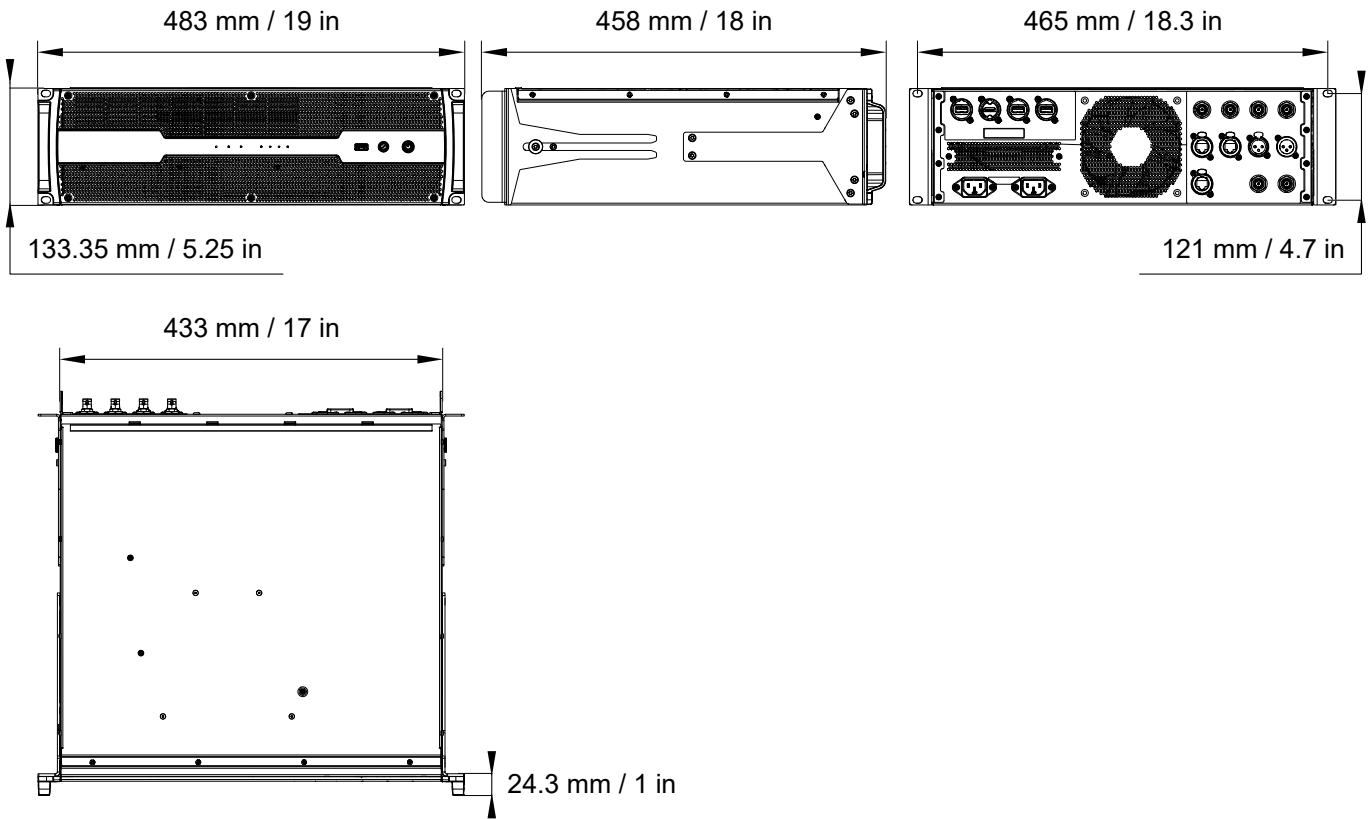
1. Connect the CONTROL Ethernet port of the processor to an Ethernet port of a computer running L-ISA Controller.  
Use the CAT5e U/FTP cable.
2. Run L-ISA Controller.
3. Check that the processor is detected as available in the **Processors** view.  
Refer to the **L-ISA Controller Help**.
4. Check that all processors in the system run the same version of the firmware, and that it matches the version of L-ISA Controller in use.
5. Update L-ISA Controller and the firmware of the processor to the latest versions.
6. Update the firmware on the emergency USB key to the latest version.  
Refer to [Emergency USB key](#) (p.33).

# Installation

## Mounting

The L-ISA Processor II is three rack units high (3U) and can be mounted in an EIA-standard 19" rack using the four points on the front panel. Use the fixing material provided by the rack manufacturer to mount L-ISA Processor II to the rack front rails.

### L-ISA Processor II dimensions



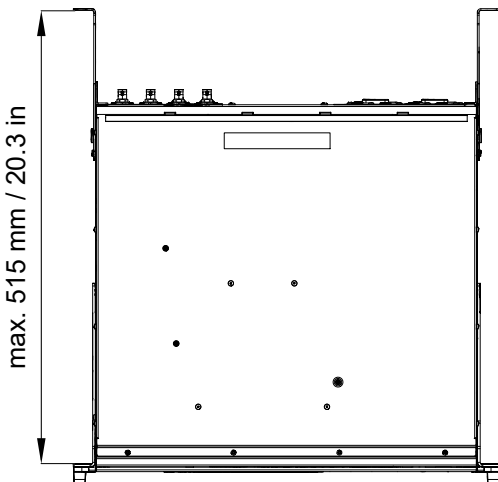
### Risk of damaging L-ISA Processor II

L-ISA Processor II should be rear supported in addition to the front panel mounting.

Use the rear brackets provided with L-ISA Processor II.

Any mechanical damage to L-ISA Processor II used without rear support is not covered by warranty.

### L-ISA Processor II with rear rack support brackets



## Ventilation

---

To maintain moderate operating temperatures, L-ISA Processor II is equipped with fans and openings providing front to rear airflow.



### **Ventilation instructions**

Install the processor in an open area so that the front and rear panels are located at a minimum distance of 30 cm / 12 in from any external object or structure.

Ensure that the front and rear grills are clean and dirt free.

Do not block the front and rear ventilation grills.

### **Ventilation when rack-mounted**

Do not block the ventilation grills with front or back panels or doors. If not possible, use a forced-ventilation system.

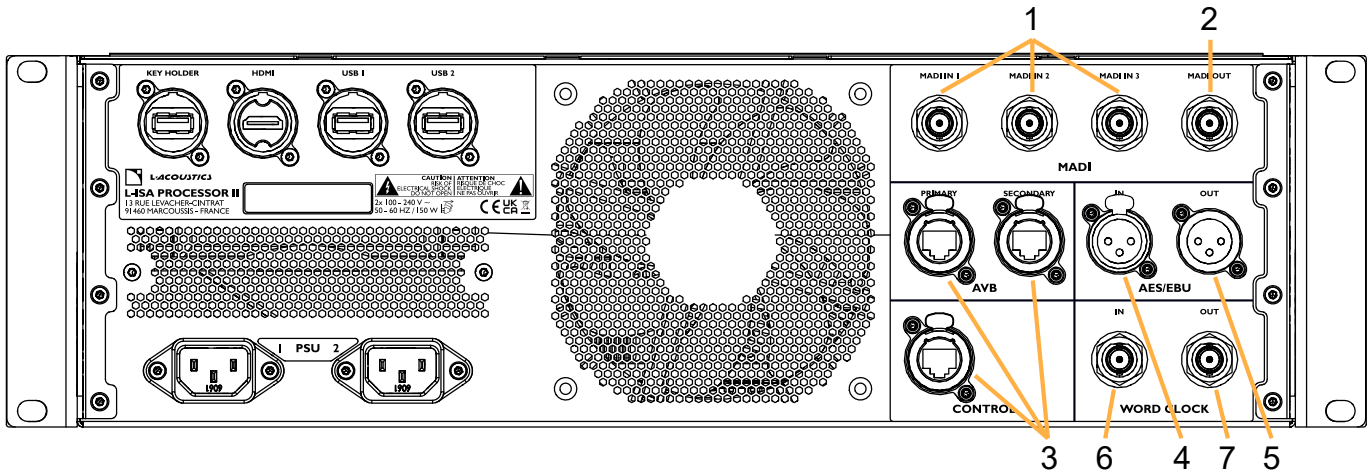
When stacking more than one processor in a rack, mount them directly on top of each other or close any open space in the rack with blank panels.

## Audio and network cabling

### Connection panels

L-ISA Processor II features input, output, and AVB connectors on its rear panel for audio and network connection.

### Audio and network connectors



1. MADI inputs
2. MADI output
3. Ethernet connectors for AVB networks and remote control
4. AES/EBU input
5. AES/EBU output
6. Word Clock input
7. Word Clock output

The AES/EBU XLR3 connectors are wired according to IEC 60268-12:

- pin 1: shield
- pin 2: + signal
- pin 3: - signal

### BNC MADI connectors

The BNC input connectors can receive 192 inputs at 44.1 kHz / 48 kHz, or 96 inputs at 96 kHz.

The BNC output connector can send 64 outputs at 44.1 kHz / 48 kHz, or 32 outputs at 96 kHz.

### AES/EBU connectors

The AES/EBU input connector can receive two digital input signals.

The AES/EBU output connector can send two digital output signals.



#### Supported digital input format

Standards: AES/EBU (AES3) or electrical S/PDIF (IEC 60958 Type II)

Sampling frequency: 44.1 kHz, 48 kHz, or 96 kHz

Word length: 24 bits

### Ethernet connectors

Use the CONTROL etherCON connector for the remote control of L-ISA Processor II using L-ISA Controller.

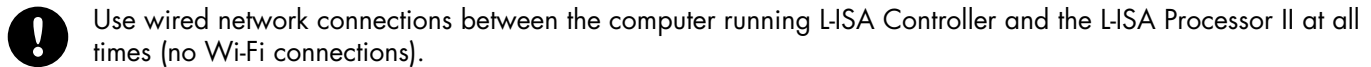
The PRIMARY and SECONDARY etherCON connectors can be used to create two redundant Milan-AVB networks.

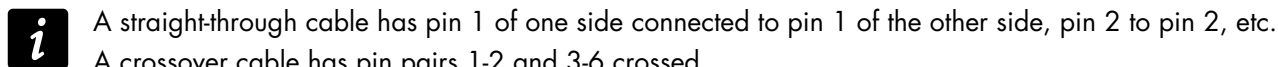
## Network setup

L-ISA control network with fixed IP or DHCP.

L-ISA requires a high-speed data transfer Ethernet network (1 GB/s minimum). The L-ISA control network setup consists in physically connecting the L-ISA Controller to the L-ISA Processor II, according to the network topology, and allocating an IP address for each one.

### Physical connections

 Use wired network connections between the computer running L-ISA Controller and the L-ISA Processor II at all times (no Wi-Fi connections).  
Connect the computer and physical units to the network using Ethernet straight-through cables of CAT5e U/FTP category (or higher) and of 100 m / 328 ft maximum length.

 A straight-through cable has pin 1 of one side connected to pin 1 of the other side, pin 2 to pin 2, etc.  
A crossover cable has pin pairs 1-2 and 3-6 crossed.  
The type of a cable can be directly identified by comparing the wire colors between its two RJ45 connectors.

### Network configuration

L-ISA Controller receives data on UDP port 8880. This is required to connect to the L-ISA Processor II, L-ISA Plugins, or to any external control device (DeskLink, Trackers, OSC).

L-ISA Processor II receives data on UDP port 9998 as well as TCP port 9998.

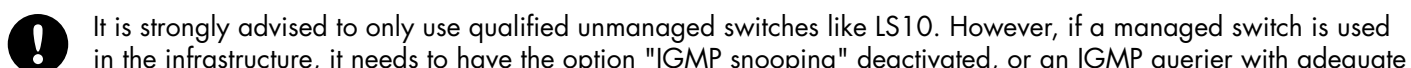
If using a software or hardware firewall, make sure its settings are appropriate to allow the required network traffic. Add L-ISA Controller to the list of allowed applications in the firewall parameters. If it is not sufficient, create a specific port rule to allow inbound traffic on UDP port 8880.

Refer to the OS documentation about firewall settings:

- macOS: <https://support.apple.com>
- Windows OS: <https://support.microsoft.com> - allow all firewall profiles (domain, public, private)

For L-ISA Controller to discover L-ISA Processor II, they must be able to use UDP port 9438 over multicast IP address 239.255.139.81.

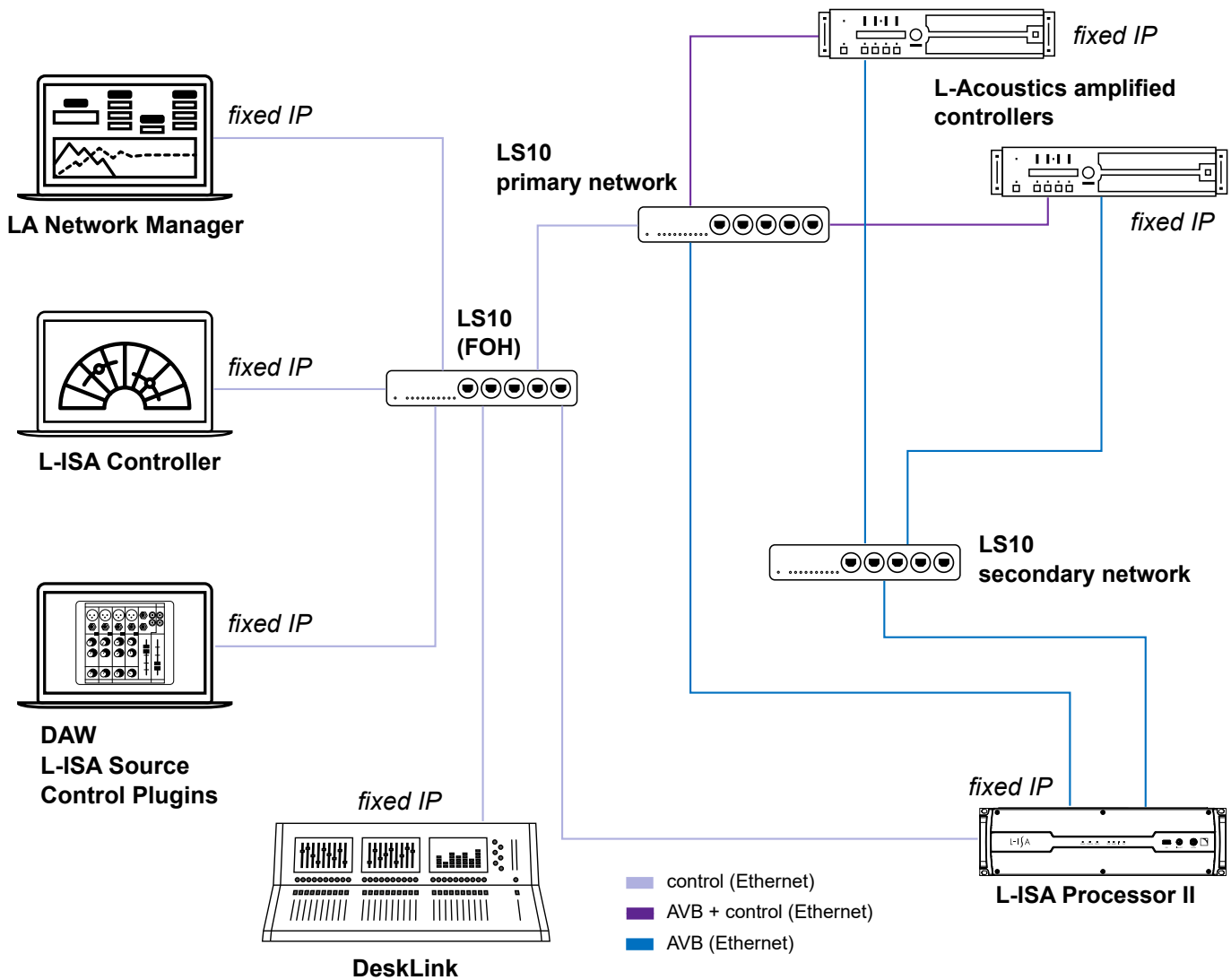
For L-ISA Plugins to work, the hosting DAW and L-ISA Controller must also be able to use UDP port 9438 over multicast IP address 239.255.139.81.

 It is strongly advised to only use qualified unmanaged switches like LS10. However, if a managed switch is used in the infrastructure, it needs to have the option "IGMP snooping" deactivated, or an IGMP querier with adequate settings must be present on the network. Otherwise, multicast traffic may be blocked, and connection timeouts can occur between the controller and the plugin, or the processor may appear partially offline on the L-ISA Controller.

L-ISA Controller needs an Internet connection in order to activate the license.

For emergency license activation through L-ISA Processor II, the L-ISA Controller and L-ISA Processor II must be able to use UDP port 11389 over multicast IP address 239.255.84.167. The same requirements regarding IGMP apply.

## L-ISA network using fixed IP



An IP address is a unique identifier for a network device on a given IP network. In IPv4 networking, it is made of 4 bytes (32 bits). An IP address is composed of a subnet address and a host address. The host address serves as a unique device identifier on the subnet. The subnet mask determines how many bits define the subnet address, and how many define the host address.

By convention, the first possible number of the host address is reserved to designate the subnet, and the last number is reserved to communicate with all devices of the subnet.

The factory default IP settings of L-ISA Processor II are:

- IP address: 192.168.1.100
- Subnet address: 192.168.1.0/24
- Subnet mask: 255.255.255.0

With these settings, the first three bytes of the IP address (192.168.1) define the subnet address, and the last byte is the host address (100).

In general, it is recommended to:

- Use the default subnet address and subnet mask.
- Edit the device host address to provide a unique identifier to each unit: use consecutive IP addresses starting from 192.168.1.**1** up to 192.168.1.**253**.
- Set the control computer to 192.168.1.**254**.

However, it is possible to configure other IP settings when required by network administration. Subnet mask may be defined from 255.0.0.0 to 255.255.255.0, and the IP must belong to one of the following IP ranges (standards for Private Local Area Networks):

- 10.0.0.1 to 10.255.255.254
- 100.64.0.1 to 100.127.255.254



- 172.16.0.1 to 172.31.255.254
- 169.254.0.1 to 169.254.255.254 (not recommended)
- 192.168.0.1 to 192.168.255.254

 **L-ISA Controller and its host computer must be using the same subnet and Subnet mask as the units.**

To set the IP settings on the computer, refer to:

- [macOS Ventura \(13\)](#) (p.26)
- [Windows 8/8.1 and 10](#) (p.27)

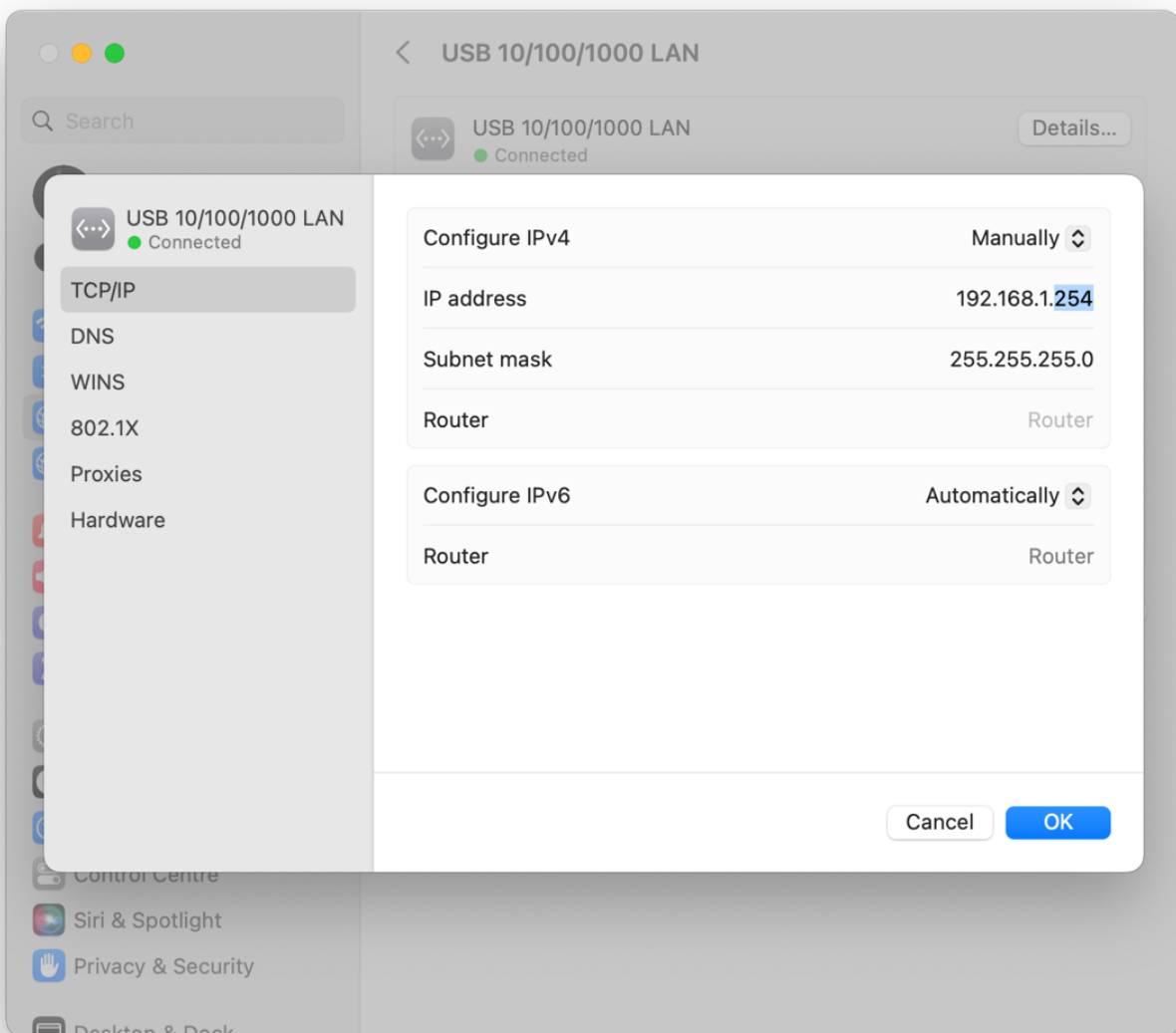
## macOS Ventura (13)

### About this task

To perform the procedure on other macOS versions, refer to the OS documentation: <https://support.apple.com>.

### Procedure

1. Click the Apple menu in the top left corner of the screen.
2. Select **System Settings**.
3. Select **Network**.
4. Select the network adapter and click **Details**.
5. Open the **TCP/IP** tab.
6. In the **Configure IPv4** field, select **Manually**.
7. Enter the IP Address and the Subnet Mask according to section [L-ISA network using fixed IP](#) (p.24).



8. Click **OK** and close.

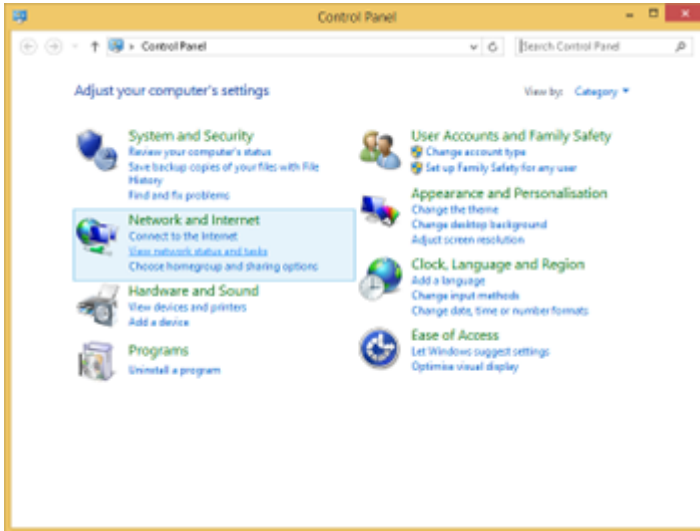
## Windows 8/8.1 and 10

### About this task

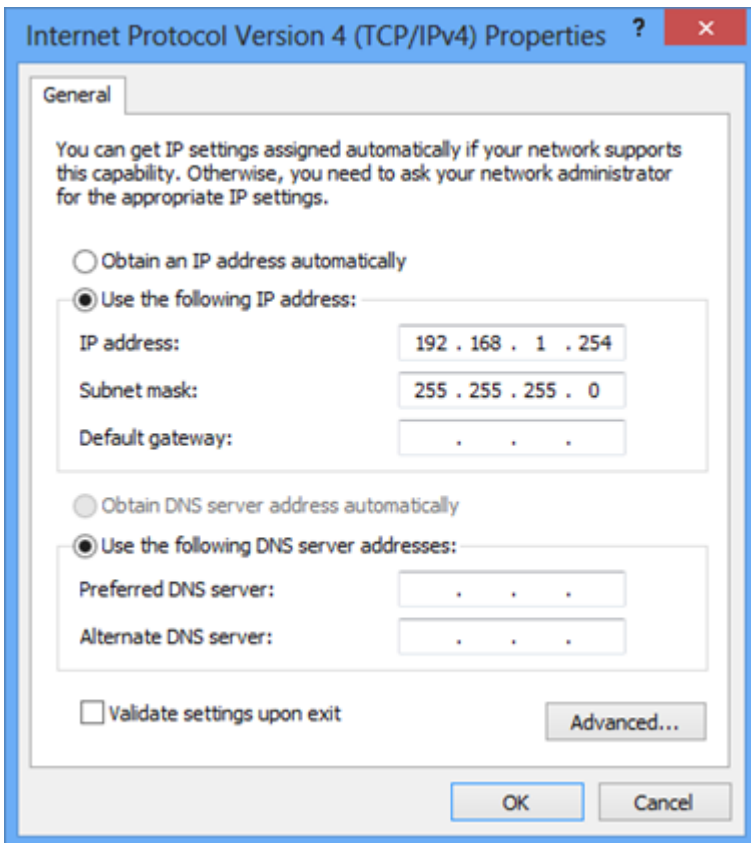
To perform the procedure on other Windows versions, refer to the OS documentation: <https://support.microsoft.com>.

### Procedure

1. On Windows 8 or 8.1, search the **Control Panel**, and click **View network status and tasks**.  
On Windows 10, click **Start > Settings > Network & Internet > Ethernet**.



2. Select **Local Area Connection > Properties**.
3. In the **Local Area Connection Properties** window, double-click **Internet Protocol Version 4 (TCP/IPv4)**.
4. In the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, select **Use the following IP address** and enter the IP address and the Subnet mask according to section [L-ISA network using fixed IP](#) (p.24).



5. Click **OK** and close all windows.

## Connecting to AC mains

### Electrical specifications

#### AC mains specifications



**Verify the electrical conformity and compatibility of the mains supply.**

Only connect the product to an AC power outlet rated 100-240 V, 50-60 Hz.

The product draws 150 W (typical).

**WARNING:** The product is of Class 1 construction and shall be connected to a mains socket outlet with a Protective Earth connection.

#### Three-phase circuit



**When the product is used in a three-phase circuit, verify the electrical conformity and compatibility of the three-phase circuit.**

Verify that the three phases work, and balance the loads between the three phases.

Verify that the neutral and earth work.

Never try to emulate a 230 V circuit connecting an apparatus to two live wires of a 120 V three-phase circuit.

Never try to emulate a 200 V circuit connecting an apparatus to two live wires of a 100 V three-phase circuit.

### Power cord

The removable power cord is fitted with a V-Lock compatible IEC connector at one end, and a country-specific plug at the other end.

type	plug	cable ratings	live	neutral	ground
CE	CEE7/VII, earthed	10 A / 250 V	brown	blue	green/yellow
CN	GB 2099, earthed				
INT	bare ends (local power plug to be fitted)				
US	NEMA 5-15, earthed	10 A / 125 V	black	white	green



Strictly apply the specific safety regulations of the country of use.

Do not defeat the ground connection of the supplied power cord using an adaptor or any other method.

A suitable plug must be wired to the INT power cord.

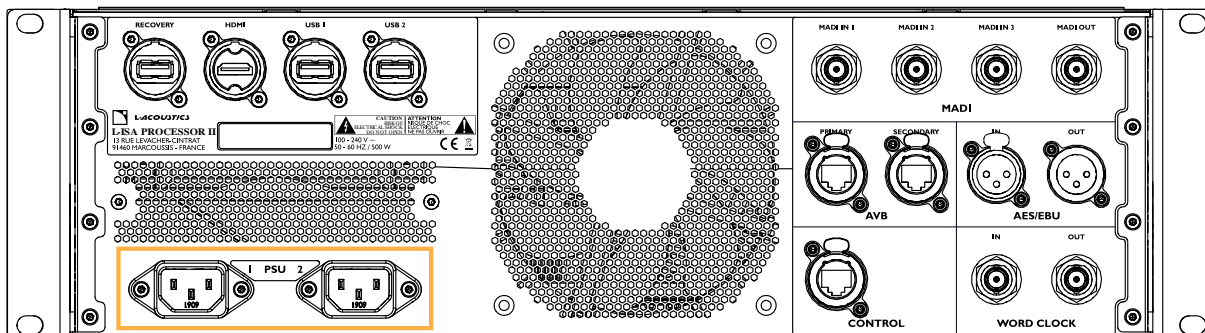
Verify that the plug conforms to the specific voltage and current rating given in section [Electrical specifications](#) (p.28).

## Plugging to AC mains

### Procedure

1. Connect the power cord female IEC C13 connector to the processor male IEC C14 power supply unit (PSU) 1 socket.

**! Check that the cable is properly locked.**



2. Connect the power cord country-specific plug to the mains socket.

### What to do next

For power supply redundancy, repeat the procedure with another power cord and the power supply unit (PSU) 2 socket.

### Power consumption

LISA Processor II power requirement is 150 W, drawn from one of the two power supply unit (PSU) sockets.

## Operation

### Powering on/off

---

The POWER button is located on the front panel. Press the POWER button for two seconds to power on/off the processor.

A number of LEDs flash in green during the start-up sequence, depending on the license level activated on the processor:

- 1 LED: Live 16
- 2 LEDs: Live 32
- 3 LEDs: Live 64
- 4 LEDs: Live 128
- WORD LED: Ambiance Active Acoustics license

If the start-up sequence fails, the SYNC, WORD, IN, and OUT LEDs flash in red.

The POWER LED is lit in:

- green when the processor is powered by both power supplies.
- orange when the processor is powered by only one power supply.



All LEDs flash in orange when identifying the device via an AVDECC controller.

During a firmware update, the LEDs display an orange chase pattern. If the update fails, all LEDs flash in red.

### Front panel LEDs

---

#### CONTROL

The CONTROL LED is lit in green when L-ISA Processor II is connected to L-ISA Controller.



## STATUS

The STATUS LED on the front panel displays the state of the processor.



green	L-ISA Processor II operates normally
orange	warning: <ul style="list-style-type: none"> <li>• CPU temperature &gt; 75 °C</li> <li>• case temperature &gt; 50 °C</li> </ul>
red	error: <ul style="list-style-type: none"> <li>• SSD SMART error</li> <li>• fan not running</li> <li>• CPU temperature &gt; 85 °C</li> <li>• case temperature &gt; 60 °C</li> </ul>

**i** For monitoring and hardware status, refer to L-ISA Controller.

## SYNC

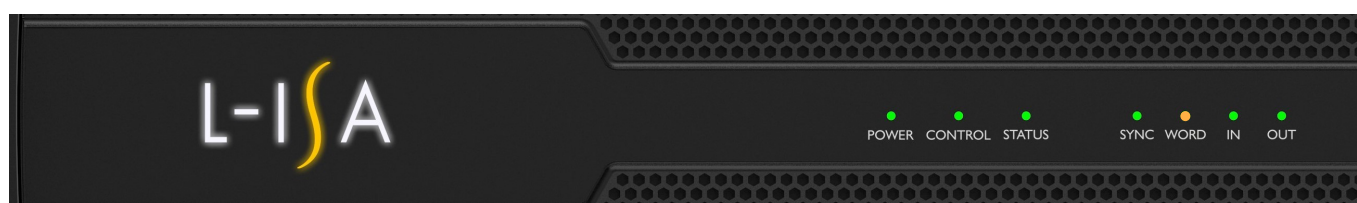
The SYNC LED on the front panel displays the status of the clock source.



off	the processor does not detect any valid signal to use for clock source
red	the DSP is starting or restarting because of a clock source change
orange	at least one of the incoming signals is not synchronized with the selected clock source
green	all incoming signals are synchronized with the selected clock source

## WORD

The WORD LED on the front panel displays the status of the word clock source.



off	word clock is not connected
orange	word clock is connected, but not synchronized
green	word clock is connected and synchronized

## IN/OUT

The IN and OUT LEDs display the state of the input and output channels.



red	the level reaches the maximum level
orange	the level reaches -5 dBFS (5 dB below the maximum level)
green (high)	the level reaches -20 dBFS (20 dB below the maximum level)
green (low)	the level reaches -60 dBFS (60 dB below the maximum level)
off	the level is more than 60 dB below the maximum level



## Emergency USB key

---

L-ISA Processor II is provided with an emergency USB key. In the rare case of the start-up sequence of L-ISA Processor II failing because of defective hard drive, the USB key can be used to temporarily keep the processor running during live shows.

If the emergency key is defective or missing, contact your Certified Provider or your L-Acoustics representative for replacement instructions.

### Preparing and updating the emergency USB key

The emergency USB key must be configured and regularly updated to be immediately usable in case of hard drive failure.

#### Equipment

- computer with L-ISA Controller version 2.3.x minimum
- CAT5e U/FTP cable

#### Procedure

1. Run L-ISA Controller.
2. Update L-ISA Controller to the latest version.
3. Connect the CONTROL Ethernet port of the processor to an Ethernet port of the computer running L-ISA Controller. Use a CAT5e U/FTP cable.
4. Check that the processor is detected as available in the **Processors** view. Refer to the **L-ISA Controller Help**.
5. Update the firmware of the processor to the latest version.
6. Write down the settings and configurations defined in all the tabs of the **Processors** view for later use.
7. Power off the processor.
8. Connect the emergency USB key to the USB 1 or USB 2 port on the rear panel, or to the USB port on the front panel.
9. Power on the processor.  
The processor boots up on the USB backup system.
10. Update the firmware of the USB backup system to the latest version.
11. In **Processors** view, reconfigure the settings and configurations as written down in step 6 (p.33) on the USB backup system.
12. Power off the processor.  
The USB backup system is now configured with the same settings as the processor.
  - ! Repeat the procedure after updating the L-ISA Processor II firmware, or changing processor settings in L-ISA Controller.
13. Remove the emergency USB key from the USB port.
  - ! **L-ISA Processor II always boots up from the backup system if the emergency USB key is connected.**  
Do not leave the emergency USB key connected to L-ISA Processor II.  
Store the emergency USB key in the KEY HOLDER port.

## Rebooting L-ISA Processor II using the emergency USB key

### Procedure

1. Power off the processor.
2. Connect the USB key to the USB 1 or USB 2 port on the rear panel, or to the USB port on the front panel.
3. Power on the processor.  
The processor boots up on the USB backup system.

### What to do next

Contact your Certified Provider or your L-Acoustics representative for corrective maintenance.

### Other operations

---

The following operations can only be done from L-ISA Controller:

- Audio Engine properties
- Input/output and clock settings
- Network settings
- Monitoring and hardware status
- Firmware and license update

Refer to the **L-ISA Controller** Help for more information.


# Corrective maintenance

## Introduction

---

### Presentation

This section is intended for end users and gathers the level 1 procedures.

 **This manual contains the maintenance operations authorized for the end user.**  
Performing another operation exposes to hazardous situations.

### Troubleshooting and diagnosis (p.36)

This section contains the diagnosis tables and procedures to identify the issues and how to address them.

### Exploded views (p.39)

This illustration gives an overview of the order in which the elements must be disassembled and reassembled. Each assembly refers to the corresponding D/R procedure and the necessary repair kit(s).

### Disassembly and Reassembly procedures (p.40)

This section contains the maintenance procedures for each assembly identified in the exploded view.

### Inspection and preventive maintenance (p.18)

These checks allow to detect an issue. The quality control must be performed regularly.

## Equipment and tools

### Equipment

Before performing maintenance on this product, make sure all the equipments listed are available.

- computer with L-ISA Controller (version 2.3 minimum) and CAT5e U/FTP cable

### Tools

Before performing maintenance on this product, make sure all the tools listed are available.

Reference are given for FACOM<sup>®</sup> products in this table. Other manufacturers can be used.

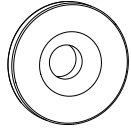
<b>name</b>	<b>reference</b>	<b>distributor</b>
torque screwdriver (0.5 - 2.5 N.m)	A.402	FACOM
set of 6-point 1/4" sockets	RL.NANO1 / R.360NANO	FACOM

## Screws and fasteners repair kit

This repair kit contains spares to replace lost or damaged screws while performing maintenance operations on L-ISA Processor II.

### G03664

KR external screws L-ISA Processor II



x2

1352

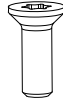
spacer for rear bracket



x2

S184

M4x8 hex socket head cap screw



x2

S100059

M4x12 Torx



x23

S100236

M3x10 Torx



x4

S100214

M3.5x16 Torx



x12

S100085

M4x10 Torx

## Troubleshooting and diagnosis

For any issue, consider the diagnosis tables for the possible causes and inspection procedures (if any).

### Power issues

#### The processor does not turn on.

possible cause	diagnosis/procedure
power cord is not connected	<ul style="list-style-type: none"> <li>check that the power cord is connected to mains</li> <li>check that the IEC C13 connector is properly connected and locked</li> </ul>
mains failure or incompatible voltage	check that mains are available and that voltage is compatible (100 V AC - 240 V AC $\pm$ 10%, 50 Hz - 60 Hz)
power cord is damaged	inspect the power cord, and replace it if necessary
other causes	contact L-Acoustics

### Interface issues

#### Start-up sequence fails (SYNC / WORD / IN / OUT LEDs flash in red).

possible cause	diagnosis/procedure
display driver failure, preventing the DSP from starting	<ol style="list-style-type: none"> <li>1. Disconnect any device from the HDMI port.</li> <li>2. Disconnect the processor from the mains.</li> <li>3. Connect the processor to the mains.</li> <li>4. Power on the processor.</li> </ol> <p>From firmware version 2.5, the HDMI port is disabled to prevent start-up sequence failure. If possible, update the L-ISA Processor II firmware to latest version.</p>

possible cause	diagnosis/procedure
hard drive failure	contact L-Acoustics In case of emergency, refer to <a href="#">Rebooting L-ISA Processor II using the emergency USB key</a> (p.34).

### USB ports stopped working.

- Check that the connected devices do not draw more than 900 mA / 5 V. If at least one device does, disconnect it, and power cycle the processor.
- Contact L-Acoustics.

## Network issues

### Impossible to connect a processor to the L-ISA Controller network.



Refer to the **L-ISA Controller Help** for software use.

possible cause	diagnosis/procedure
the processor and L-ISA Controller are using different subnets	Refer to <a href="#">Network setup</a> (p.23) for information about setting up the L-ISA control network.
several devices (processors or amplified controllers) are set with the same IP address	Refer to the <b>L-ISA Controller Help</b> for instructions on how to change processor IP settings.
connection to the processor is blocked by the firewall	
network cable is not plugged or incorrectly plugged	plug and secure CAT5e U/FTP cables into the AVB or CONTROL connectors on the processor to connect it to other processors, to amplified controllers, to the computer, or to Ethernet switches Refer to <a href="#">L-ISA network using fixed IP</a> (p.24) for network topology.
network cable is damaged	replace any damaged CAT5e U/FTP cables in the network chain
more than two software clients are already connected to the processor	disconnect all other software clients
firmware failure	restart the processor
other causes	contact L-Acoustics

## Sound issues

### No sound

possible cause	diagnosis/procedure
mains failure	inspect the mains
inputs/outputs are muted	unmute the inputs/outputs
gain value is too low	set an appropriate output gain value If there are fallbacks enabled, set an appropriate input gain value.
incorrect source selection	check the matrix mixer and routing, and input and output MAD1 and AVB mapping If there are fallbacks enabled: select another source that is not reserved for fallback, or disable fallback on the source.

<b>possible cause</b>	<b>diagnosis/procedure</b>
audio source is not plugged, incorrectly plugged, or plugged into the wrong input connector	(re)plug and secure each cable into the audio source and the corresponding input connector on the processor
audio source cable is damaged	replace the cable
incorrect settings on the audio source	set appropriate parameter values on the audio source, in particular the output gain value (refer to the third-party documentation)
non-audible bit stream	check that the MADI or AES/EBU source does not deliver non-audio bit stream (encoded audio)
no AVB input stream	check that a talker is connected to the processor by using an AVDECC controller
audio source failure	check the presence of input levels, and the current status of the MADI, AES/EBU, and AVB signals. If no signal reaches the processor, inspect the audio source for failure.  Reminder:  A digital audio source can meet the following failures: no clock, loss of lock, invalid audio (validity bit), CRC error, bipolar encoding error, data slip.  An AVB audio source can meet the following failures: switch/talker failure, cable failure, disconnection or "stop streaming" requested by AVB Controller, non-Avnu certified device in network.
other causes	contact L-Acoustics

### **Noise, level loss, distorted sound, white noise**

<b>possible cause</b>	<b>diagnosis/procedure</b>
AES/EBU audio source is connected to an analog input	check the input signal cabling
gain value too high on the processor	set an appropriate gain value on the processor channels  If there are fallback enabled, set an appropriate input gain value.
output gain value too high on the audio source	set an appropriate output gain value on the audio source (refer to the third-party documentation)
input switched to an analog fallback with an incorrect input gain value	set an appropriate input gain value, and inspect the digital audio source for failure  Reminder:  A digital audio source can meet the following failures: no clock, loss of lock, invalid audio (validity bit), CRC error, bipolar encoding error, data slip.  An AVB audio source can meet the following failures: switch/talker failure, cable failure, disconnection or "stop streaming" requested by AVB Controller, non-Avnu certified device in network.
audio source cable incorrectly plugged	unplug/replug the cable on the audio source and the processor
audio source cable damaged	replace the cable
incorrect settings on the audio source	set appropriate parameter values on the audio source (refer to the third-party documentation)
audio source failure	inspect the audio source for failure
other causes	contact L-Acoustics

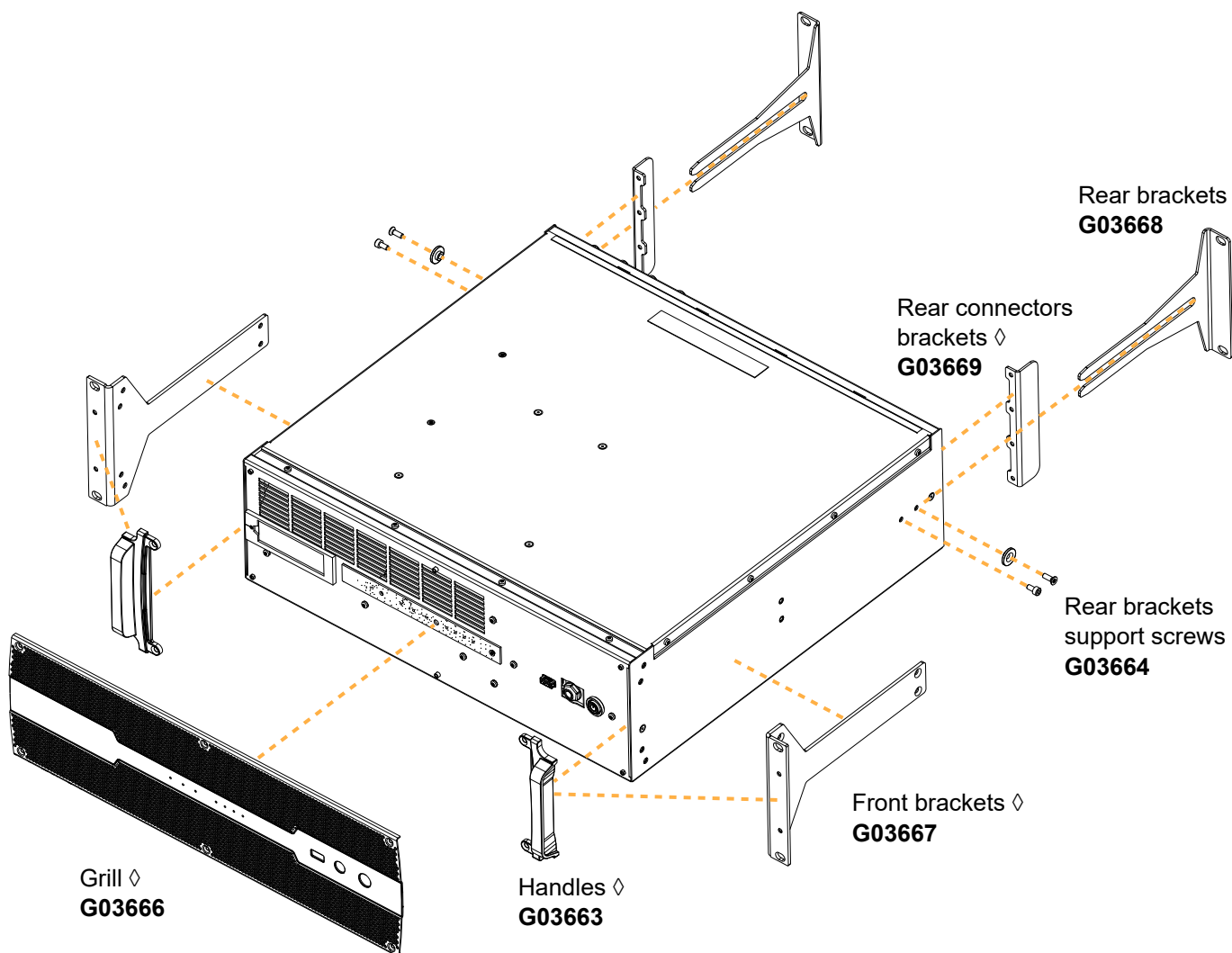
## Exploded views

In order to operate, follow the order outlined here. Each assembly refers to the corresponding Disassembly/Reassembly (D/R) procedure and the necessary repair kit.

### **i** Spare screws and fasteners

Assemblies indicated by a  $\diamond$ : order G03664 (KR external screws L-ISA Processor II) for spares.

## External modules



## Disassembly and Reassembly procedures

### D/R - Grill

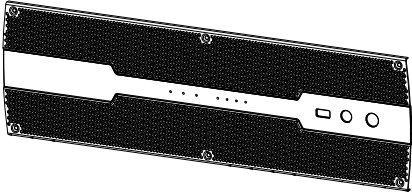
#### Tools

- torque screwdriver
- T10 Torx bit

#### Repair kit

**G03666**

**KR grill L-ISA Processor II**



x1

103076

L-ISA Processor II grill

**G03664**

**KR external screws L-ISA Processor II**

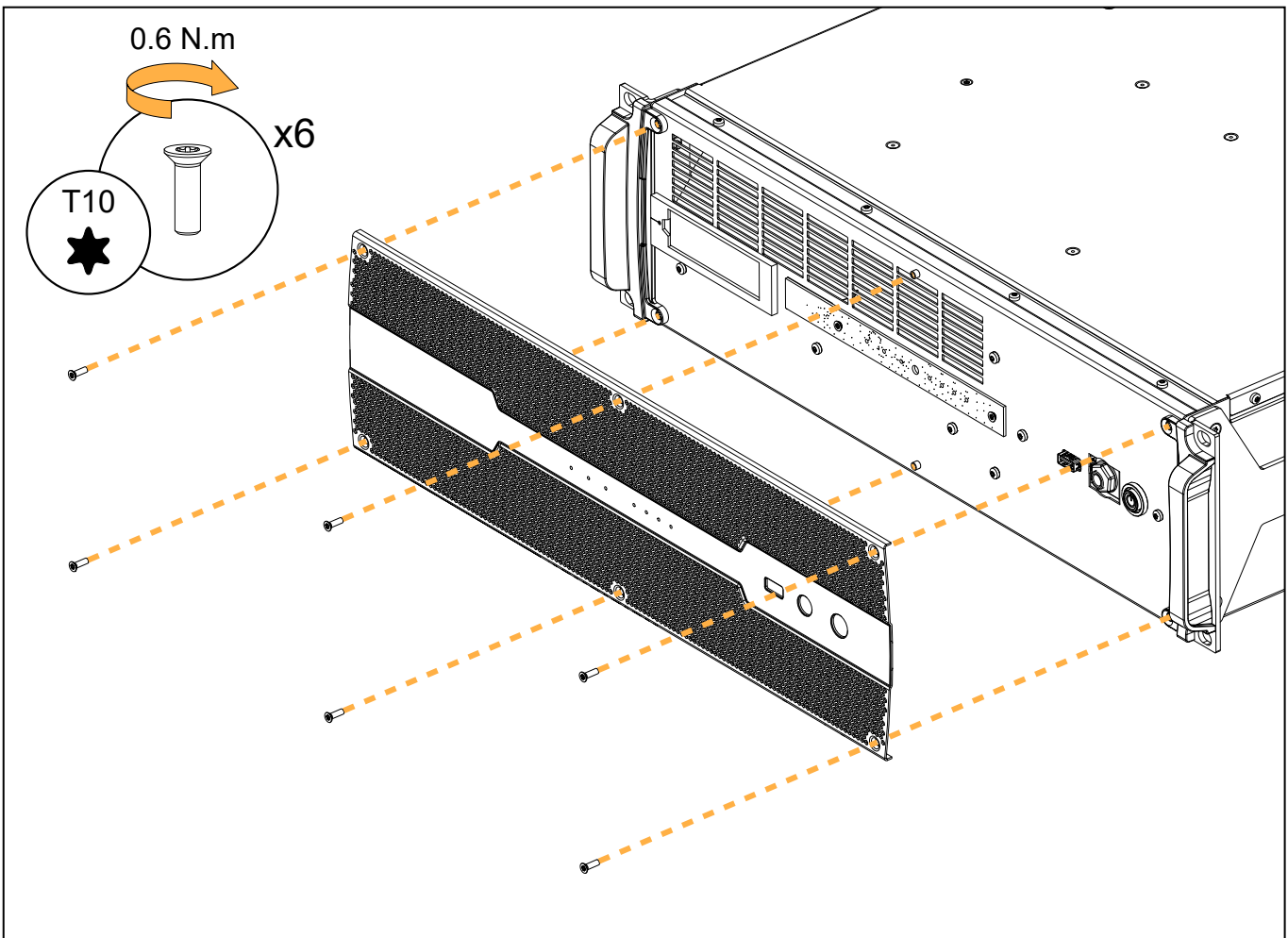


x23

S100236

M3x10 Torx

#### Exploded view





## D/R - Handles

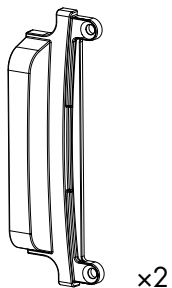
### Tools

- torque screwdriver
- T15 Torx bit

### Repair kit

#### G03663

#### KR handles L-ISA Processor II



x2

103190

L-ISA Processor II front handle

#### G03664

#### KR external screws L-ISA Processor II



x4

S100214

M3.5x16 Torx

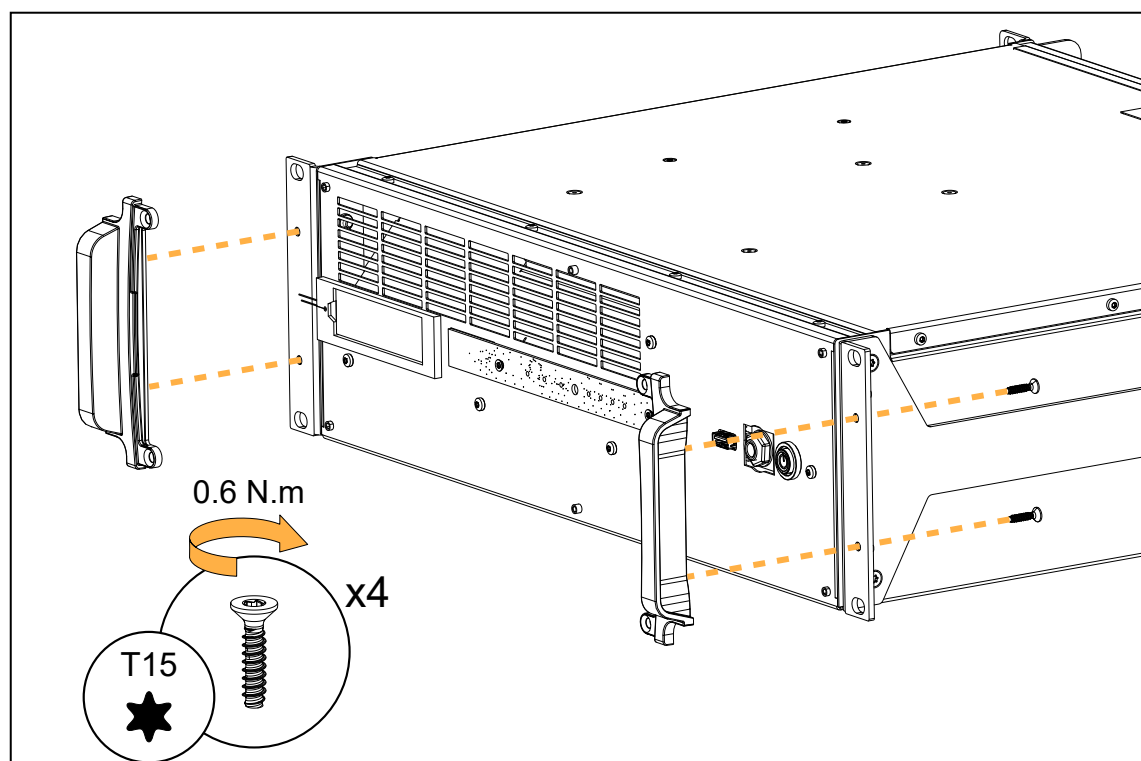
### Prerequisite

Grill removed.

See [D/R - Grill](#) (p.40)

### Exploded view

**!** S100214 are self-drilling screws. For safety reasons, always use new front handles for reassembly.



## D/R - Front brackets

### Tools

- torque screwdriver
- T20 Torx bit

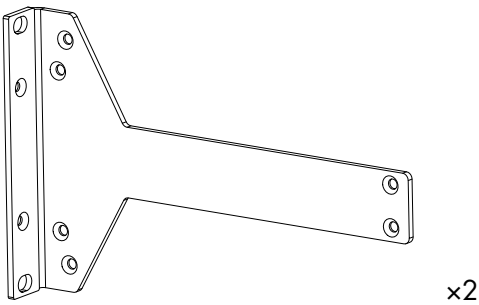
### Repair kit

#### G03667

#### KR front brackets L-ISA Processor II

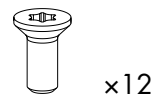
#### G03664

#### KR external screws L-ISA Processor II



102838

L-ISA Processor II front bracket



S100085

M4x10 Torx

### Prerequisite

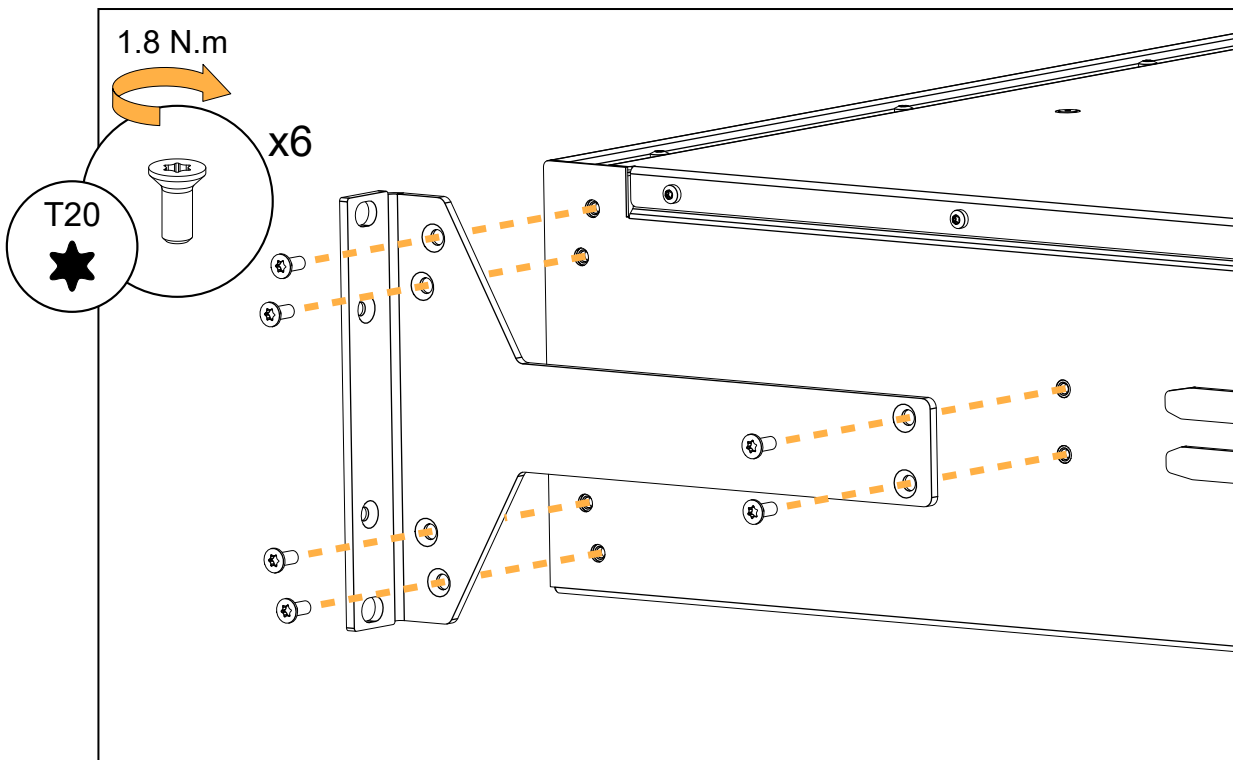
Grill removed.

See [D/R - Grill](#) (p.40)

Front handles removed.

See [D/R - Handles](#) (p.41)

### Exploded view

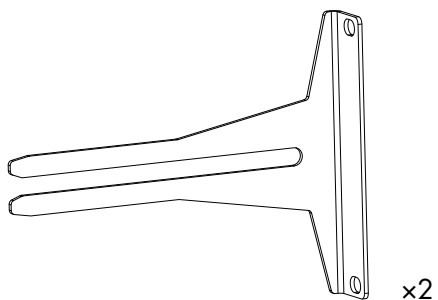


## D/R - Rear brackets

### Repair kit

### G03668

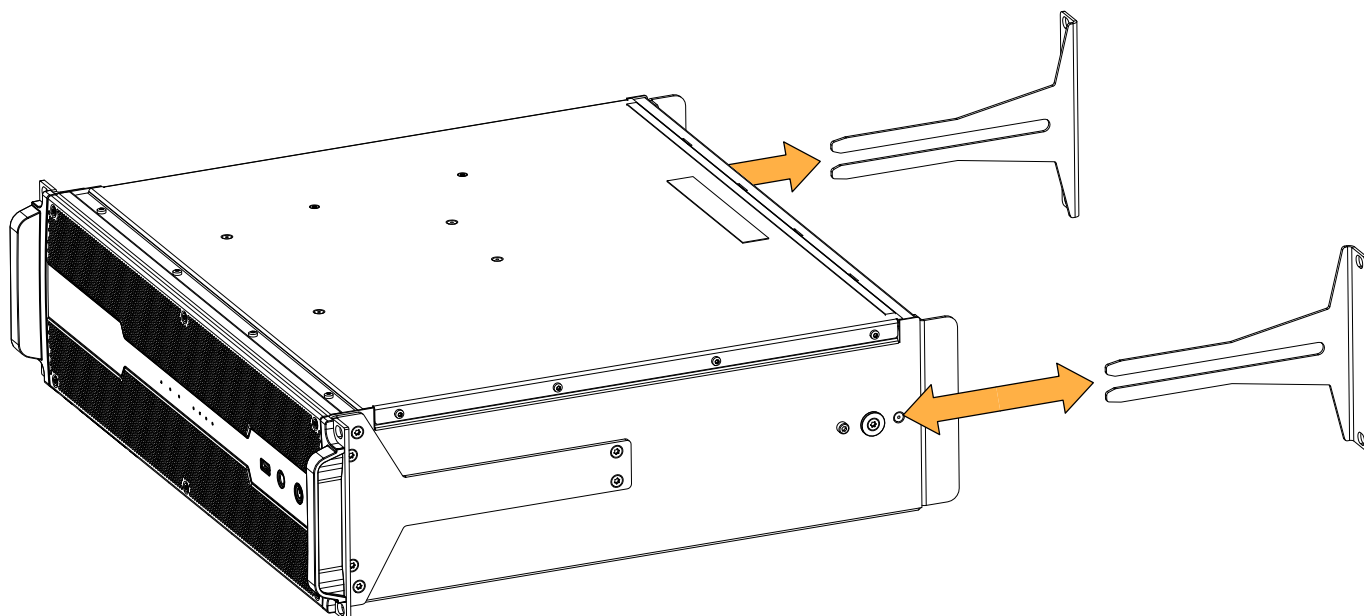
KR rear brackets LISA Processor II



102845

LISA Processor II rear bracket

### Exploded view



## D/R - Rear brackets support screws

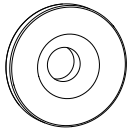
### Tools

- torque screwdriver
- 3 mm hex bit
- T15 Torx bit

### Repair kit

#### G03664

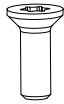
#### KR external screws L-ISA Processor II



x2

1352

spacer for rear bracket



x2

S100059

M4x12 Torx

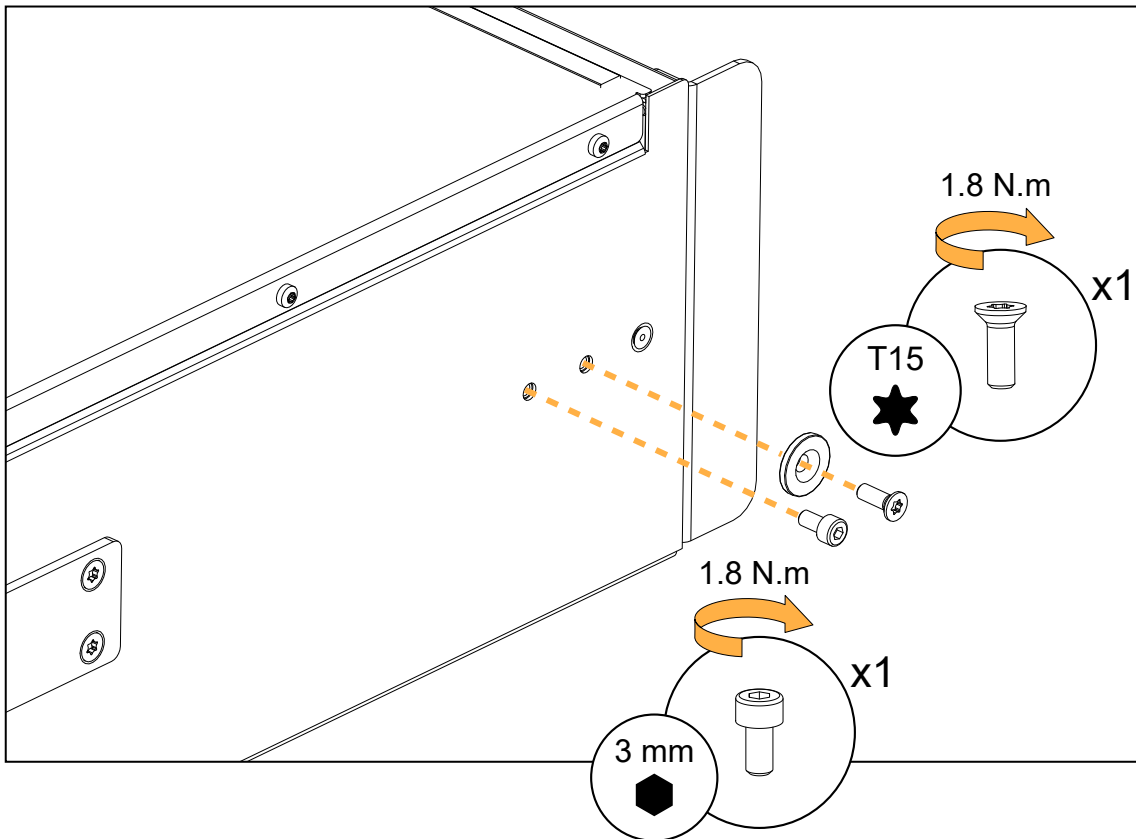


x2

S184

M4x8 hex socket head cap screw

### Exploded view



## D/R - Rear connectors brackets

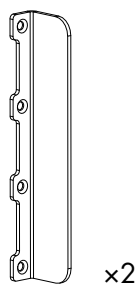
### Tools

- torque screwdriver
- T10 Torx bit

### Repair kit

**G03669**

**KR rear connectors brackets L-ISA Processor II**



x2

103097

L-ISA Processor II connectors protection bracket

**G03664**

**KR external screws L-ISA Processor II**

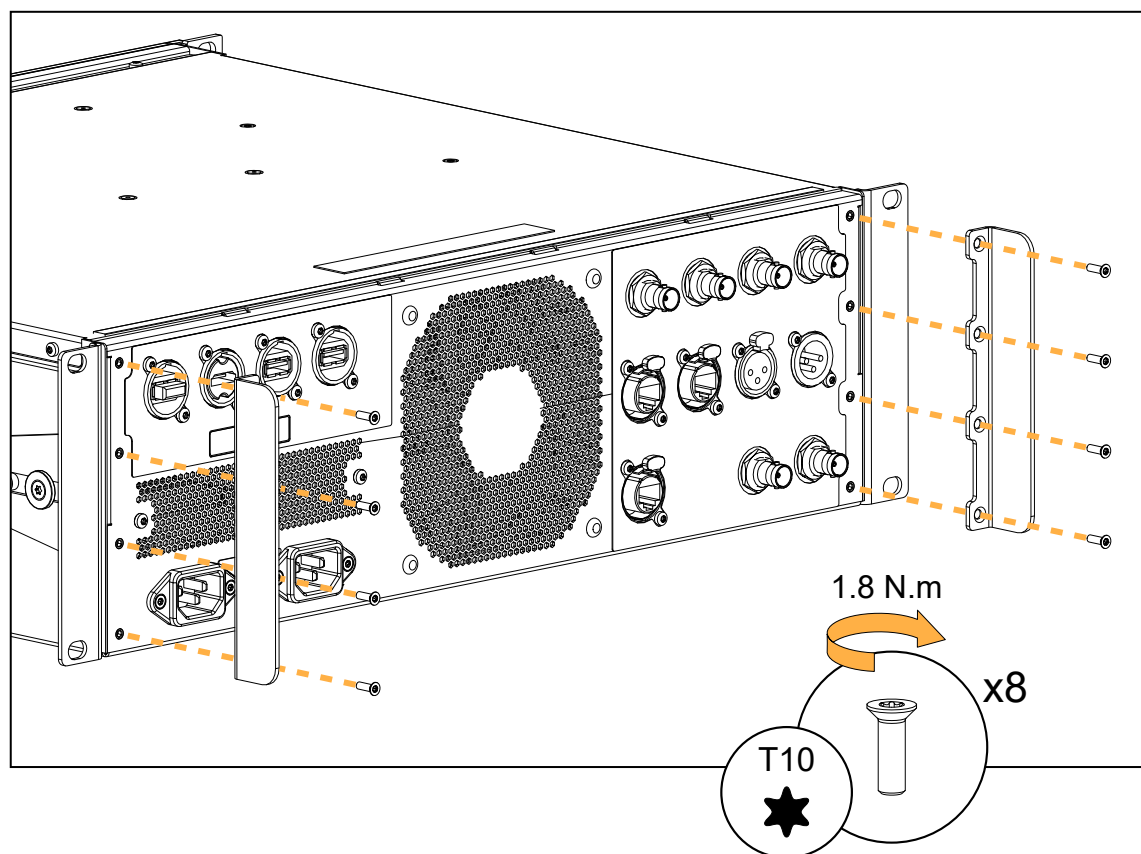


x23

S100236

M3x10 Torx

### Exploded view



# Specifications

All values given in this section are typical values.

## General

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### Power supply

Model	redundant universal Switched Mode Power Supply (SMPS) with power factor correction (PFC)
Mains rating	redundant power supply: 2 × 100 V AC - 240 V AC ± 10%, 50 Hz - 60 Hz, 150 W
Connector	IEC C13 V-Lock compatible

### Operating conditions

Temperature	-5 °C / 23 °F to 50 °C / 122 °F
Maximum altitude	2000 m
Cooling system	fans with temperature-controlled speed
Fan noise (free field, 1 m)	idle, 20 °C ambient: 32 dBA max, 20 °C ambient: 32 dBA idle, 50 °C ambient: 43 dBA max, 50 °C ambient: 46 dBA

## Inputs and outputs

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### Audio inputs

Milan-AVB	64 AVB channels (8 redundant streams of up to 8 channels) 2 × etherCON™ Gigabit ports for AVB primary and secondary
MADI	192 channels at 44.1 kHz / 48 kHz or 96 channels at 96 kHz 3 × BNC connectors
AES/EBU	2 channels (1 × AES3) at 44.1 kHz, 48 kHz, or 96 kHz 1 × XLR female connector

### Audio outputs

Milan-AVB	128 AVB channels (16 redundant streams of up to 8 channels) 2 × etherCON™ Gigabit ports for AVB primary and secondary
MADI	64 outputs at 44.1 kHz / 48 kHz or 32 outputs at 96 kHz 1 × BNC connector
AES/EBU	2 channels (1 × AES3) at 44.1 kHz, 48 kHz, or 96 kHz 1 × XLR male connector
Headphones	analog stereo headphones 1/4 inch 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

L-ISA processing at 96 kHz	up to 96 objects rendered to up to 128 speakers (with a maximum of 64 L-ISA speakers) L-ISA 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
L-ISA Ambiance™ Acoustics System	up to 32 microphone inputs processed with L-ISA room engine simultaneous use with L-ISA object-based processing
Sampling rates	44.1 kHz (MADI and AES/EBU only), 48 kHz , 96 kHz
Latency (inputs to outputs)	3.2 ms
Boot time to AVB audio pass through	31 s

## Remote control and monitoring

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Network connection	Ethernet Gigabit interface with etherCON™ connectors
L-ISA remote control software	L-ISA Controller
Third-party management solutions	compatible with OSC, HTTP, REST API*



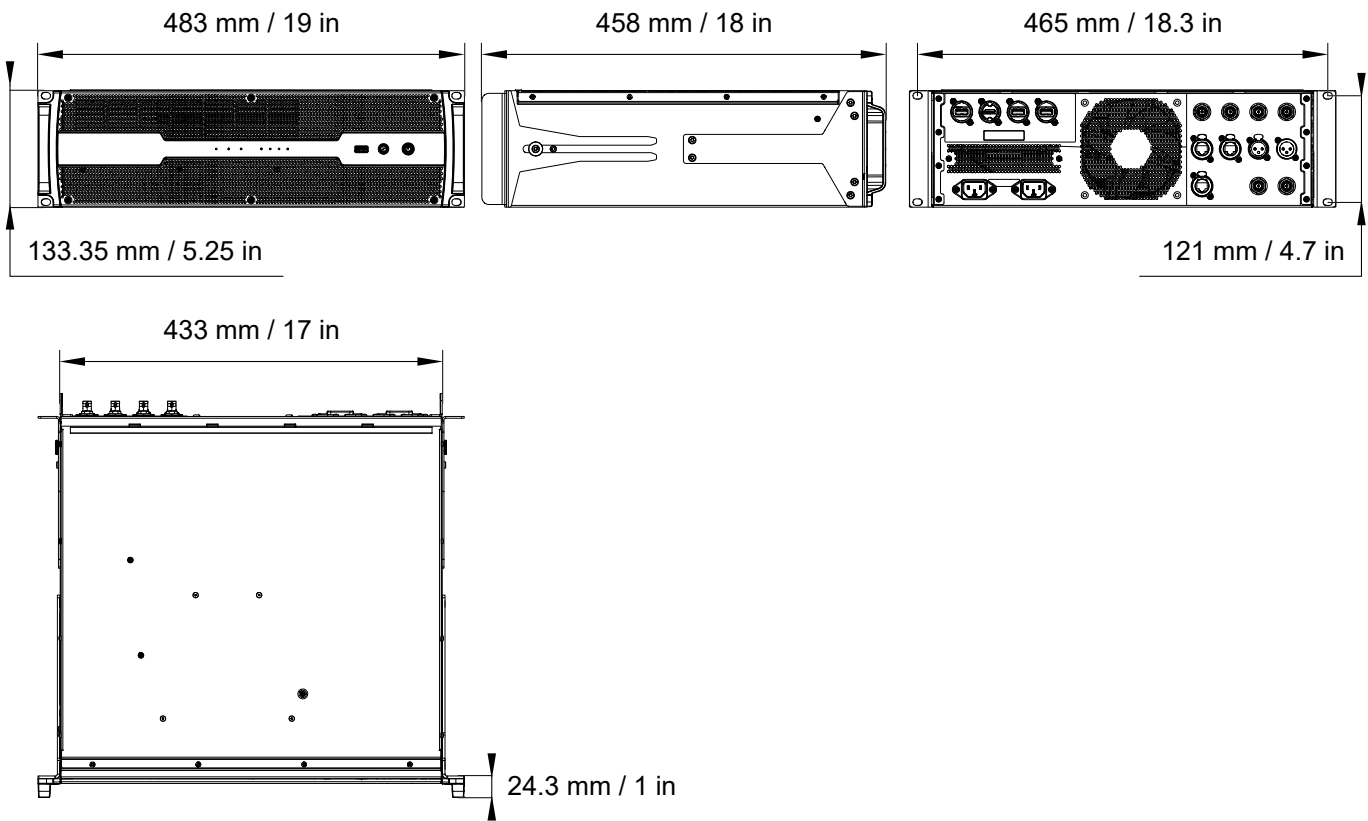
\* Refer to the **L-ISA Processor REST API** technical bulletin.

## Physical data

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Height	3U
Weight	11 kg / 24.3 lb
Finish	black
Protection rating	IP2x

## L-ISA Processor II dimensions





## Glossary

<b>CE</b>	Europe
<b>CHK</b>	check procedure
<b>CN</b>	China
<b>D/R</b>	disassembly/reassembly procedure
<b>INT</b>	international (bare lead version of the power cable)
<b>KR</b>	repair kit
<b>SMPS</b>	Switched Mode Power Supply (power supply inside of the amplified controller)
<b>US</b>	United States

## Approvals

### EU Declaration of Conformity (DoC)

We

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declare that the DoC is issued under our sole responsibility and belongs to the following product:

#### **L-ISA Processor II**

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

**2014/35/EU:** Low Voltage Directive  
**2014/30/EU:** Electro-Magnetic Compatibility Directive  
**2015/863/EU:** RoHS 3 Directive

The following harmonized standards and technical specifications have been applied:

**EN 62368-1: 2014** Audio/video, information and communication technology equipment — Part 1: Safety requirements  
**EN 55032: 2015** Electromagnetic compatibility of multimedia equipment — Emission Requirements  
**EN 55035: 2017** Electromagnetic compatibility of multimedia equipment — Immunity requirements  
**EN 63000: 2018** Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Technical file compiled by:

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Issued in Marcoussis, France

14/04/2022



Genio KRONAUER, Electronics Director

LISA Processor II is compliant with the following:



Avnu Alliance and the Avnu design mark are registered trademarks and/or service marks of Avnu Alliance.



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GROUP