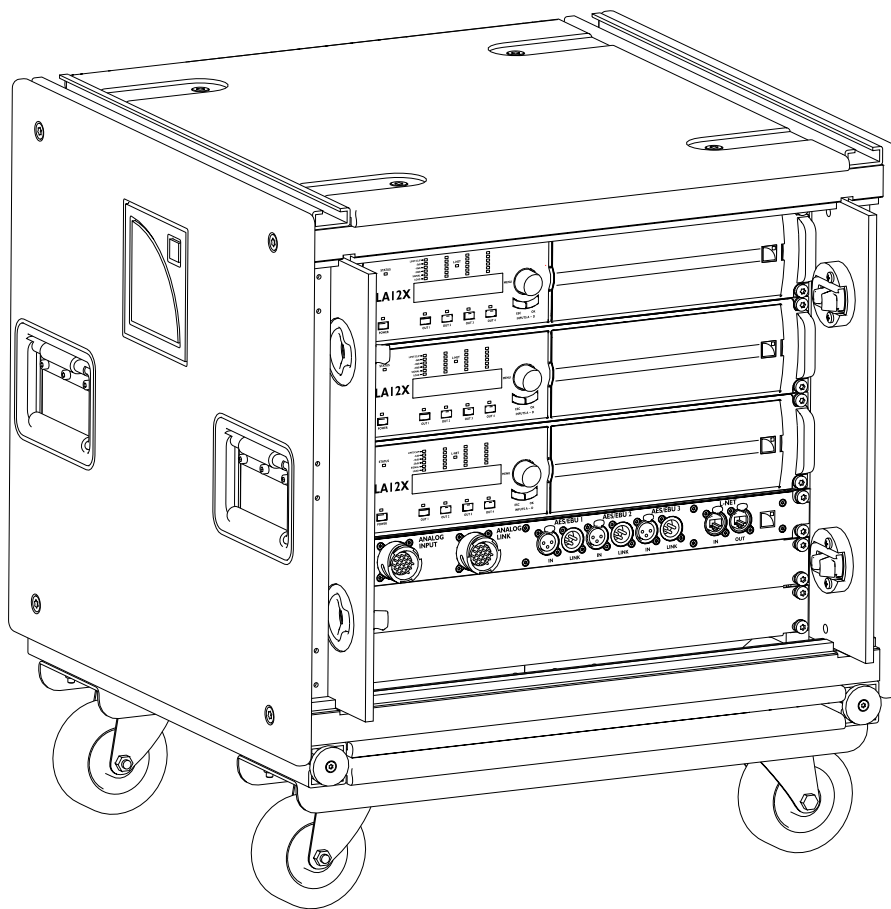


# LA-RAK II



user manual (EN)



Document reference: LA-RAK II user manual (EN) version 2.0

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# Safety

## Important safety instructions



### 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.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. **WARNING:** To reduce the risk of fire or electric shock, this apparatus should not be exposed to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.
16. To completely disconnect this equipment from the mains, disconnect the power supply cord plug from the receptacle.



Pour déconnecter complètement l'appareil du secteur, débranchez la prise de la fiche secteur.

- 17.** The main plug of the power supply cord shall remain readily accessible.  
La prise principale du cordon d'alimentation doit rester totalement accessible.
- 18.** The power supply of the product shall be protected in the installation by a 30 A circuit breaker certified for constant current at 100% (US MODE 100-120 V).

## Additional important safety instructions

---



### 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, with the following current values:

100-120 V: 30 A (US MODE)

200-240 V: 32 A (EU MODE)

WARNING: The product is of CLASS 1 construction and shall be connected to a mains socket outlet with a protective connection to earth.



### 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.



### Always interconnect a Class C circuit breaker on each phase.

The circuit breaker current rating depends on the mains voltage rating, as follows:

100-120 V: 30 A (US MODE)

200-240 V: 32 A (EU MODE)



### Electrical generator

You must power on the generator before powering on the product.

Verify that the product is turned off before powering on the generator.



### Terminals marked with the lightning flash symbol are HAZARDOUS LIVE.

The external wiring connected to these **terminals** requires installation by an **instructed person** or the use of ready-made leads or cords.

Never attempt to touch any exposed speaker wiring while the product is operating: first disconnect the connector from the product.

Mute all output channels before connecting a speaker to an amplified controller.

Do not connect a speaker output in parallel or series with any output of another amplified controller.

Do not connect the speaker outputs to any other voltage source, such as a battery, power mains, or power supply, regardless of whether the amplified controller is turned on or off.



### 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.**



### 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.










### Beware of over power risks.

Only use compatible loudspeakers with appropriate presets to avoid damage to the loudspeakers.



### Inspect the product before operation.






If any sign of defect or damage is detected, immediately withdraw the product from use for maintenance.

-  **This product is intended for use by trained personnel.**
-  **Do not place sources of open flame, such as lighted candles, on the product.**
-  **Do not use the product outside its operating temperature range.**  
The product operates at a room temperature between 0° C / 32° F and 50° C / 122° F.  
Do not expose the product to direct sun.
-  **Only use the product in a conformed electro-magnetic environment.**  
Conformed environments are specified in EN55103-2 standards as E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors), and E4 (controlled EMC environment, ex. TV studio).
-  **Avoid radio interference.**  
This product has been tested and complies with the limits indicated in the EMC directive (Electro Magnetic Compatibility). These limits are designed to provide reasonable protection against harmful interference from electrical equipment, but it cannot be guaranteed that interference will never occur.
-  **Read the maintenance section of this document before servicing the product.**
-  **Shipping**  
Use the original packaging for shipping the product

## 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.
-  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.

# Welcome

Thank you for purchasing the L-Acoustics LA-RAK II touring rack.

This document contains essential information on using the system properly.

**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 document without prior notice.** Please check [www.l-acoustics.com](http://www.l-acoustics.com) on a regular basis to download the latest document and software updates.

## LA-RAK II touring rack

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LA-RAK II offers worldwide compatibility in one sole model, a universal system that can be used around the globe, thanks to the three LA12X amplified controllers included and LA-POWER II, compatible with 115V and 230V power distributions.

LA-RAK II is electrically and mechanically compatible with LA-RAK (LA-RAK BUMP).



## System components

### Loudspeaker enclosures

**!** Refer to the user manuals of the loudspeaker systems for detailed instructions about the enclosures and their connection to the amplified controllers.

### Powering and driving system

LA12X	Amplified controller with DSP, preset library and networking capabilities
LA-RAK II	Touring rack containing three LA12X, LA-POWER II for power distribution and LA-PANEL II for audio and network distribution

### Loudspeaker cables

**!** Refer to the user manuals of the loudspeaker systems for detailed instructions about the enclosures and their connection to the amplified controllers.

### Rigging elements

**!** Rigging elements or procedures are not presented in this document.  
Refer to the LA-RAK II rigging manual.

### Software applications

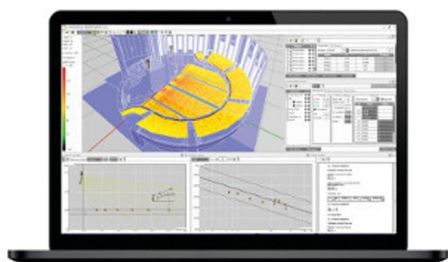
Soundvision	3D acoustical and mechanical modeling software
LA Network Manager	Software for remote control and monitoring of amplified controllers

**i** Refer to the **Soundvision** help.

**i** Refer to the **LA Network Manager video tutorial**.

## Illustrations

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Soundvision



LA Network Manager

## Technical description

### Main features

LA-RAK II is a 9U rack cabinet in which are mounted three LA12X amplified controllers and two distribution panels: LA-PANEL II for analog and AES3 audio signal and network, and LA-POWER II for power.

On the front face, an 2U space can receive additional material (such as a switch for L-NET network star topologies).

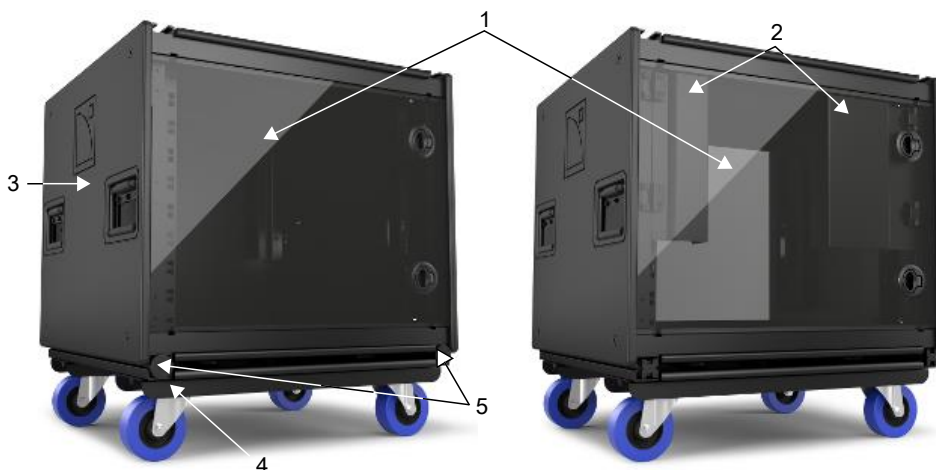


### RK9U structure

The LA-RAK II RK9U cabinet is a dual structure consisting of a rubber shock inner steel frame braced by an external aluminum frame sided with highly resistant polyethylene panels. Two storable LEXAN doors protect the internal components during transport.

On the rear face, two hinge-mounted panels cover and protect the analog, digital and network connectors of the amplified controllers. The CA-COM and speakON sockets remains accessible for loudspeaker cabling.

The RK9U is equipped with a detachable transport dolly board and two coupling bars. The coupling bars can also be used to array several LA-RAK II in flown or stacked configurations.

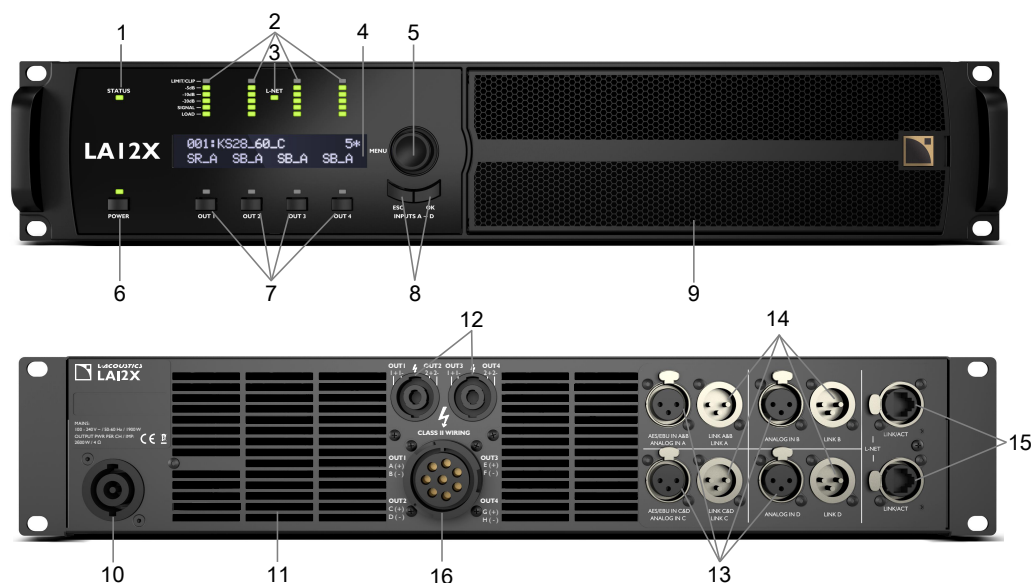


- 1 storable LEXAN doors
- 2 hinge-mounted panels
- 3 polyethylene panel
- 4 dolly board
- 5 coupling bars

## LA12X amplified controller

LA12X is a 2U amplified controller with DSP, preset library and networking capabilities.

Refer to the LA12X user manual for detailed information.



- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li><b>1</b> status LED</li> <li><b>2</b> LED meters:             <ul style="list-style-type: none"> <li>– LIMIT/CLIP level</li> <li>– audio levels (-5 dB, -10 dB and -20 dB)</li> <li>– SIGNAL presence</li> <li>– LOAD presence</li> </ul> </li> <li><b>3</b> L-NET network control LED</li> <li><b>4</b> 2 x 24 characters LCD display</li> <li><b>5</b> navigation/edition encoder wheel</li> <li><b>6</b> power/standby key and LED</li> <li><b>7</b> channel selection keys</li> <li><b>8</b> menu keys</li> <li><b>9</b> inward ventilation grill and foam filter</li> </ul> | <ul style="list-style-type: none"> <li><b>10</b> powerCON power supply connector (32 A)</li> <li><b>11</b> outward ventilation grills</li> <li><b>12</b> speakON output connectors</li> <li><b>13</b> XLR analog and AES/EBU input connectors</li> <li><b>14</b> XLR analog and AES/EBU link connectors</li> <li><b>15</b> 1 Gb/s etherCON L-NET network connectors</li> <li><b>16</b> CA-COM output connector</li> </ul> |
|---|---|

## LA-POWER II distribution panel

LA-POWER II is a 2U / 19 inch I/O power distribution panel.

**!** The LA-POWER II is equipped with a mains switch. The factory default settings is **EU MODE CEE FORM 400 V / 32 A**.

To use LA-POWER II in US mode, position the switch on **US MODE NEMA L21-30P 120-208 V** before connecting to a power source.

LA-POWER II is equipped with an IN socket for US MODE, one IN and one LINK socket for EU MODE (to power a secondary rack). Power is automatically balanced with an even number of LA12X per phase.

LA-POWER II is fitted with three power cords equipped with 32 A Neutrik powerCON sockets for the LA12X amplified controller.

Additional outlets (one NEMA, one "Schuko" and two IEC) are available to power auxiliary accessories such as Ethernet switches and laptop. The auxiliary circuit is protected by a circuit breaker. Refer to section [Powering auxiliary devices](#) (p.18) before use.

Three dual LEDs help monitor phase presence, independently from the mains switch position: their left sides indicate phase presence at the US IN connector, and their right sides indicate phase presence at the EU IN connector. The LEDs are for information only. Always apply the necessary safety precautions regardless of the LED status.



- |  |  |
|--|--|
| <b>1</b> AC input connector (US mode)            | <b>8</b> AC output cables for LA12X              |
| <b>2</b> AC input connector (EU mode)            | <b>9</b> mains switch                            |
| <b>3</b> AC link connector (EU mode)             | <b>10</b> AC auxiliary output connector (AUX L3) |
| <b>4</b> AC presence LEDs                        |  |
| <b>5</b> circuit breaker (AUX L3)                |  |
| <b>6</b> AC auxiliary output connector (US mode) |  |
| <b>7</b> AC auxiliary output connector (EU mode) |  |

## LA-PANEL II distribution panel

LA-PANEL II is a 1U distribution panel for network, analog and digital signals.

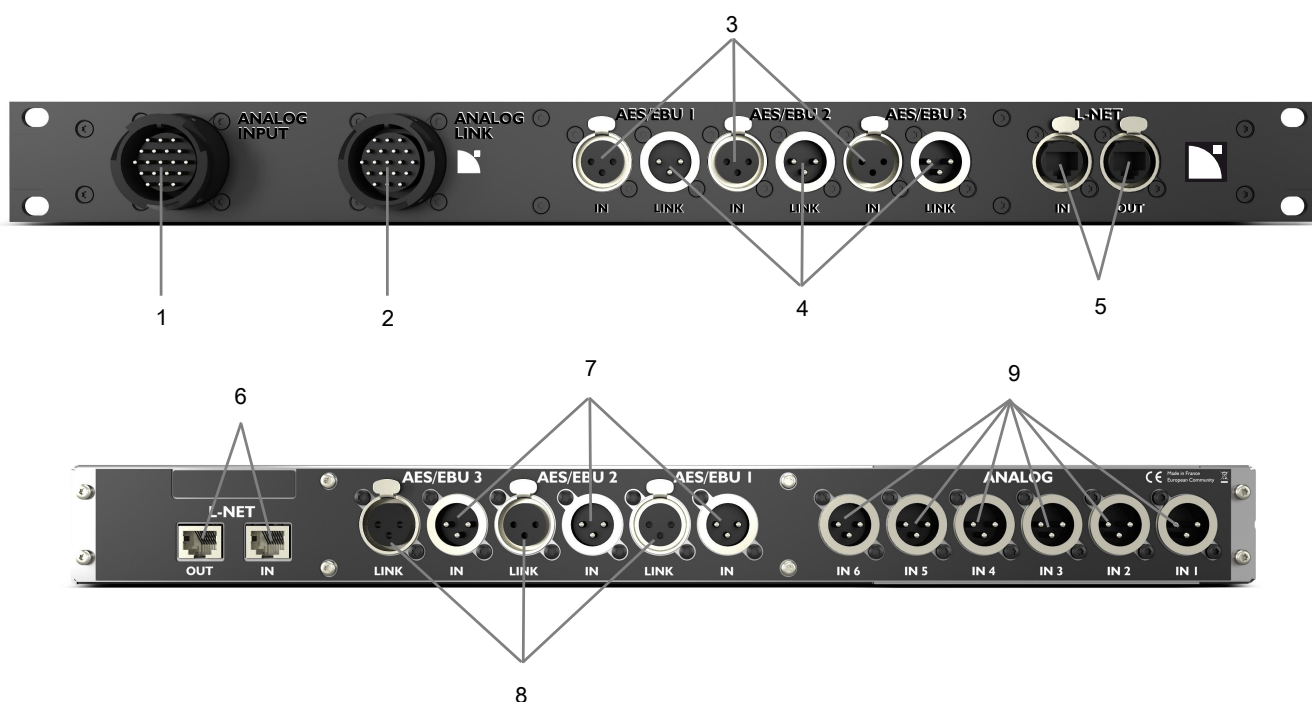
LA-PANEL II can distribute up to 6 analog or digital audio signals. The analog signals are fed through the input 19-point CA-COM connector and the AES/EBU digital signals through three IN XLR connectors.

The signals can be distributed to the three amplified controllers through six analog XLR connectors or three digital XLR connectors on the rear side of the panel.

The link 19-point CA-COM connector and the three link XLR connectors can send the signals to another LA-RAK II in a daisy-chain layout.

LA-PANEL II is equipped with 2 etherCON and 2 RJ45 I/O sockets for L-NET control and monitoring network.

Accessories include four XLR cables (two analog, two digital) to connect LINK and IN connectors on the front of the panel and set a daisy-chain between controllers within the LA-RAK II.



- |  |                                       |
|--|---------------------------------------|
| <b>1</b> analog input connector            | <b>6</b> RJ45 L-NET network           |
| <b>2</b> analog link connector             | <b>7</b> XLR AES/EBU input connectors |
| <b>3</b> XLR AES/EBU input connectors      | <b>8</b> XLR AES/EBU link connectors  |
| <b>4</b> XLR AES/EBU link connectors       | <b>9</b> analog input connectors      |
| <b>5</b> etherCON L-NET network connectors |                                       |

# Installation

## Transporting

The removable dolly board is designed to move and transport an array of two LA-RAK II. It is secured to the bottom LA-RAK II using the two coupling bars.



Do not move or transport more than two LA-RAK II on one dolly board.

## Ventilation

To maintain a moderate operating temperature, the LA12X contains fans providing front to rear airflow.



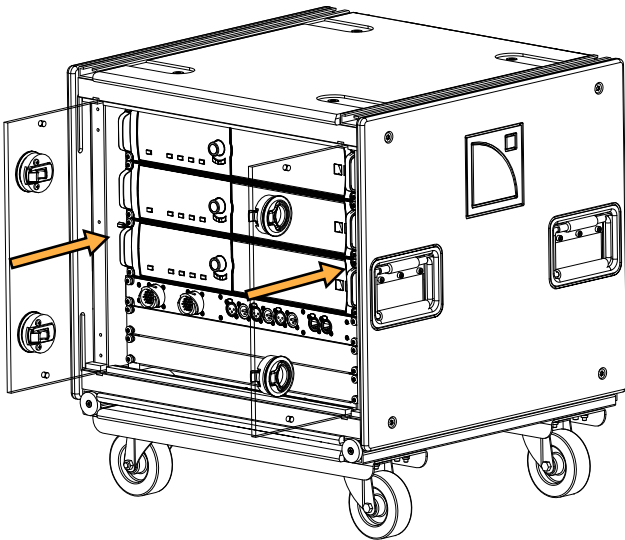
Before operation, ensure that the front filter system of each LA12X is clean and dust free. Refer to the **LA12X user manual**.

While operating, keep the LEXAN front and rear doors stored and do not block the LA12X front and rear air vents.

## Storing the LEXAN doors

### Procedure

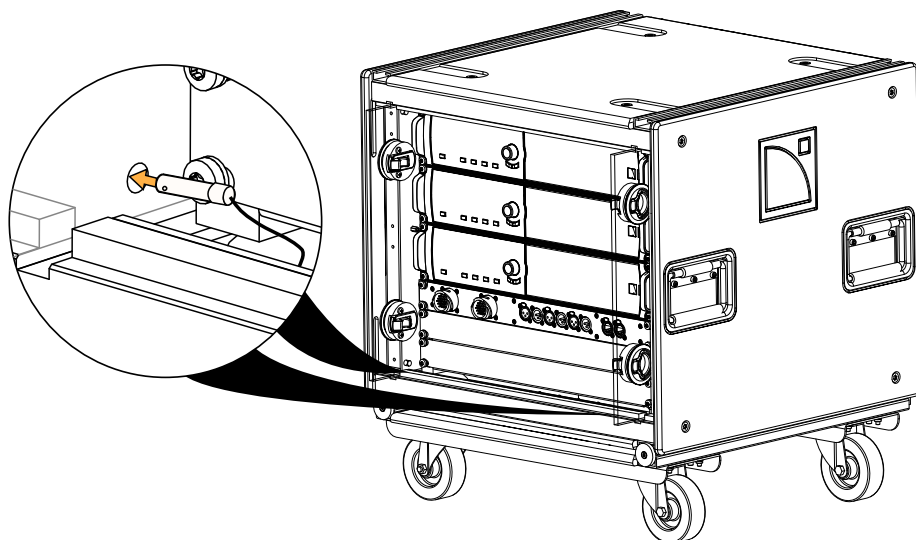
1. Pull on the handles to detach both doors.
2. Facing the LA-RAK II, slide the doors along the sides (between the outer aluminium frame and the inner steel frame).  
The door handles must be positioned towards the outside.



3. Insert and lock the ball-locking pins through each door's safety hole to secure the doors.

**Safety pin**

Make sure the doors are inserted all the way before securing the pin.  
The safety hole must be inside the inner frame.



## Connecting to AC mains

**!** The LA-POWER II is equipped with a mains switch. The factory default settings is **EU MODE CEE FORM 400 V / 32 A**.

To use LA-POWER II in US mode, position the switch on **US MODE NEMA L21-30P 120-208 V** before connecting to a power source.



Contact a local L-Acoustics distributor for countries in which these standards do not apply.

### EU mode

In EU MODE, LA-POWER II connects to 230 V / 32 A three phase AC mains using the male input socket (IEC 60309 - 3P+N+G).

A second LA-RAK II can be plugged in the female link socket to be powered in parallel.

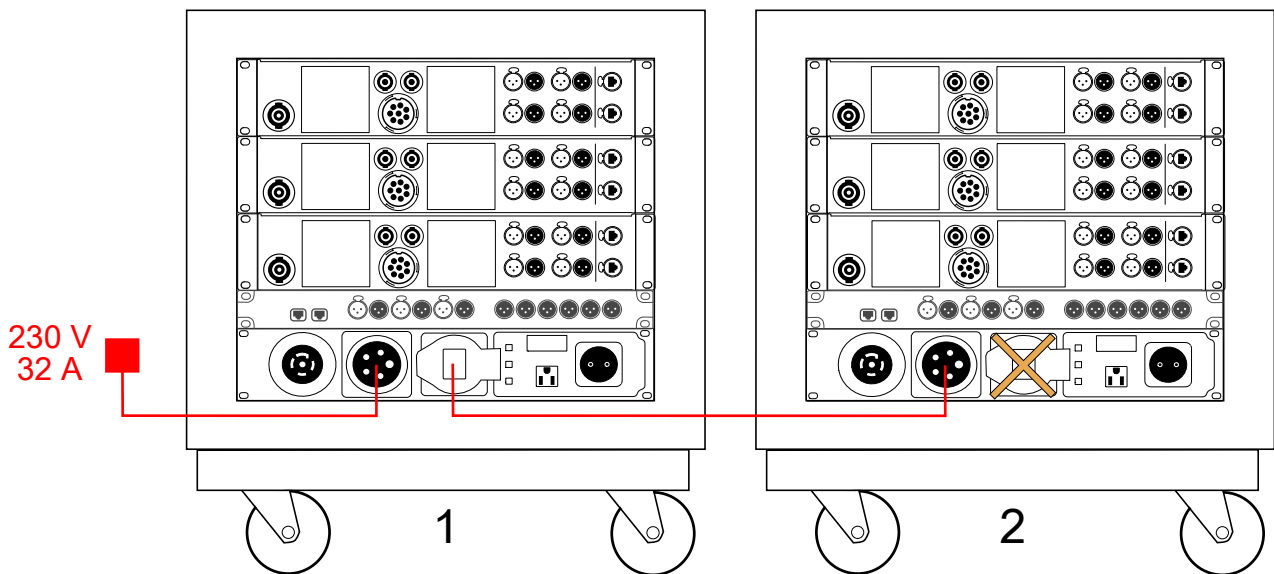
**!** Do not power LA-RAK II racks in parallel on mains ratings other than 230 V ( $\pm 10\%$ ).

Do not use the female link socket on other ratings.

The EU MODE sockets are not powered when the switch is positioned on **US MODE NEMA L21-30P 120-208 V**.

**!** Do not power more than two LA-RAK II racks in parallel from the same AC mains outlet.

### Connecting two racks to AC mains in EU mode



Place socket covers on unused sockets.



## US mode

In US MODE, LA-POWER II connects to 120 V / 30 A three phase AC mains using the male input socket (L-21-30P 3P + N + G).

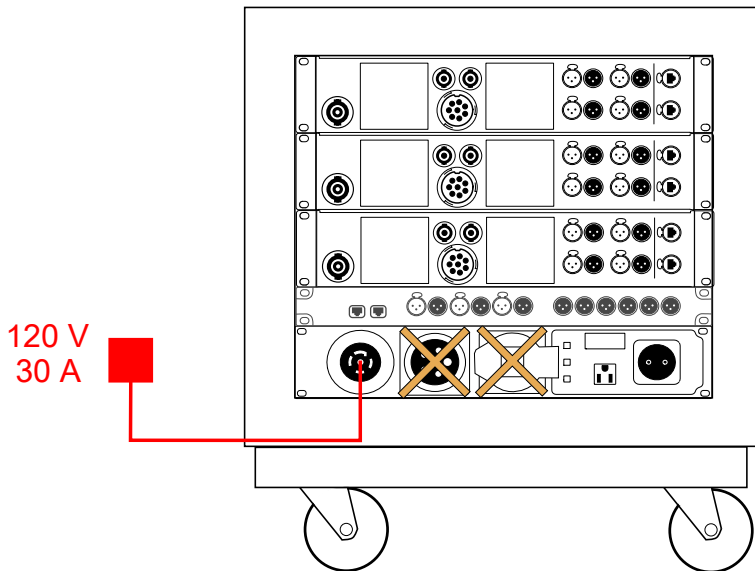


Do not power more than one LA-RAK II from the same AC mains outlet.



The EU MODE sockets are not powered when the switch is positioned on **US MODE NEMA L21-30P 120-208 V**.

### Connecting a rack to AC mains in US mode

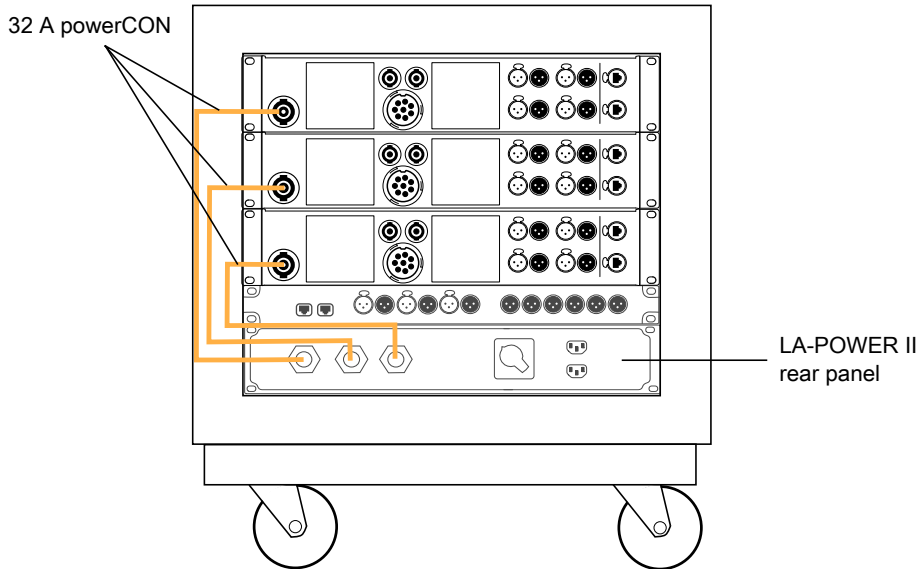


Place socket covers on unused sockets.

## Powering the amplified controllers

The LA-POWER II three-phase circuit powers three mono-phase circuits (L1, L2, L3) corresponding to the three power cords on the rear face. These cables are fitted with 32 A Neutrik powerCON to connect to the three LA12X amplified controller mounted in the LA-RAK II. Three dual LEDs help monitor the presence of each phase on the front end of the LA-POWER II.

### Powering the three amplified controllers (any mode)



### **i** If the presence LEDs are lit but the amplified controllers do not power on:

- check the cabling and connections
- check that the mains switch position corresponds to the currently used 3-phase socket (EU or US)

### Powering auxiliary devices

LA-POWER II also includes an auxiliary circuit protected by the **AUX L3** 10 A circuit breaker, shunted from phase 3.

This circuit powers one "Schuko" socket (only powered in EU MODE) and one NEMA 5-15 socket (only powered in US MODE) on the front face, and two IEC 60320-1 type C13 sockets located on the rear face (powered in both modes).

The auxiliary sockets are intended to connect laptops or additional Ethernet switches equipped with country-specific plugs only.

### **⚡** Auxiliary sockets power

In both modes, the recommended consumption is 100 W maximum.

Check that the overall consumption does not exceed LA-POWER II maximum capacity.

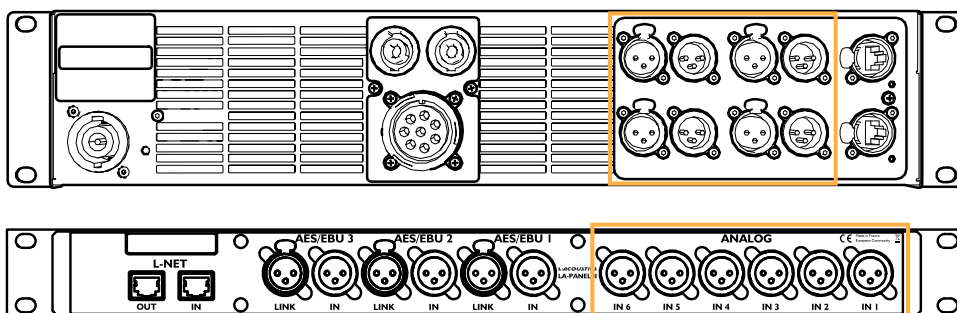
## Analog audio cabling

With analog audio, routing modularity is achieved through internal cabling, whereas external cabling uses a constant scheme.

### Internal analog audio cabling

An XLR connection panel located on the rear side of LA-PANEL II and six XLR cables allow distributing up to six different analog audio signals to the LA12X amplified controllers.

### Analog connectors on the rear panels of LA12X and LA-PANEL II

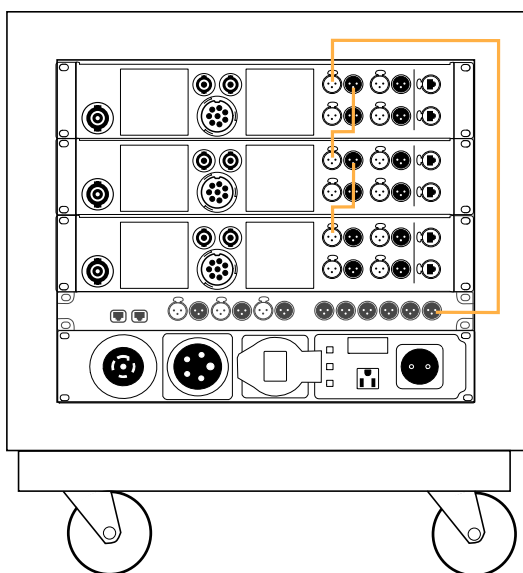


Several internal audio cabling schemes are possible. Two are shown in this manual.

### Cabling scheme A

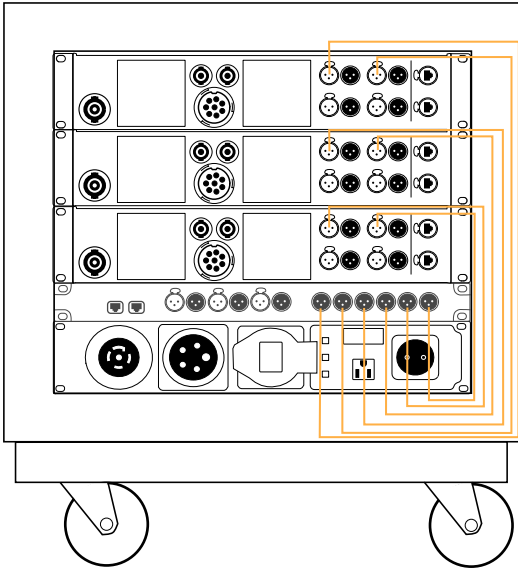
One audio signal is routed from channel 1 to the analog IN A on the first amplifier. LINK A / IN A cabling is then used to cascade all three LA12X.

Only the A channel is physically linked on each LA12X and only the A channel can further be routed to all four output channels on each LA12X. Use LA Network Manager routing as described in the **LA Network Manager** video tutorial.



### Cabling scheme B

Six audio signals respectively routed from channels 1-6 to the six controller analog inputs. In this case only the IN connectors are used on the amplifiers.



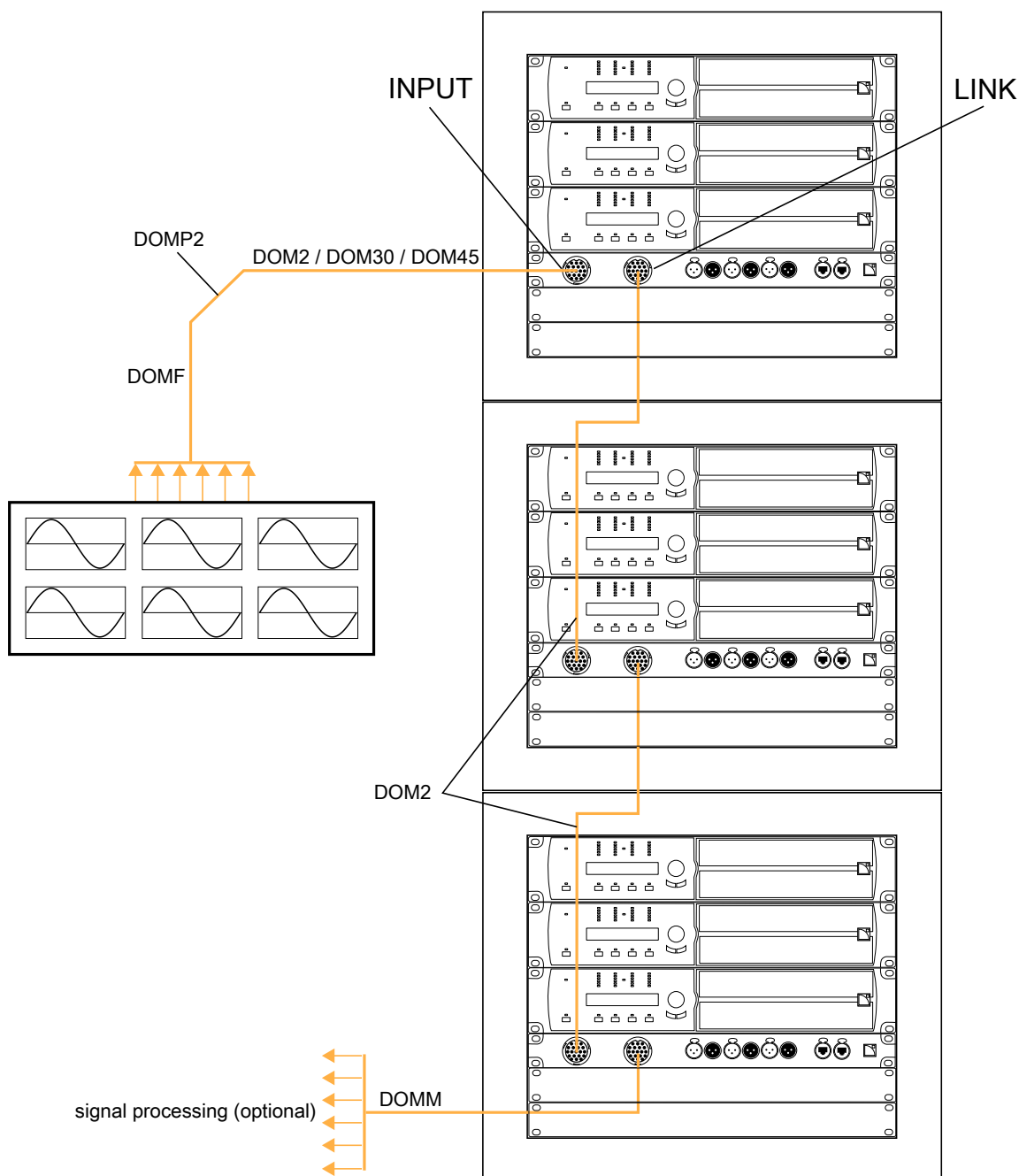
## External analog audio cabling

With analog audio, external cabling uses a constant scheme that allows feeding a LA-RAK II or a daisy-chain of several LA-RAK II with up to 6 signals. For any LA-RAK II, the internal cabling determines how many channels are used, which ones, and which amplifier receives them.

With L-Acoustics modulation cables, six audio signals can be routed from an analog audio source (mixing console or EQ device) to the 19-point CA-COM INPUT connector on the LA-PANEL II of a first LA-RAK II.

An LA-RAK II daisy-chain layout can then be set up by cabling the LINK connector of the LA-PANEL II with the INPUT connector located on the LA-PANEL II of another LA-RAK II.

The six analog audio signals can also be routed from the last LA-RAK II to other signal processing devices using a DOMM cable.



**! Loss in the analog signal**

Do not connect more than 36 LA12X (12 LA-RAK II) in parallel to avoid loading the console output with less than 600 Ω.

If more than 36 LA12X need to be connected to the same analog signal, use another console output or a line distribution amplifier.

Typically, cascading 16 LA-RAK II causes a -1 dB loss with a 50 Ω console and a -3 dB loss with a 150 Ω console.

Cable reference	Input connector(s)	Output connector(s)	Length (m / ft)
DOMF	6 x balanced female XLR	19-point female PA-COM with ring	1.5 / 5
DOMM	19-point female PA-COM with ring	6 x balanced male XLR	1.5 / 5
DOM2	19-point female PA-COM with ring	19-point female PA-COM with ring	2 / 6.5
DOM30	19-point female PA-COM with ring	19-point female PA-COM with ring	30 / 100
DOM45	19-point female PA-COM with ring	19-point female PA-COM with ring	45 / 150
DOMP-2	19-point male PA-COM	19-point male PA-COM	0.5 / 1.5

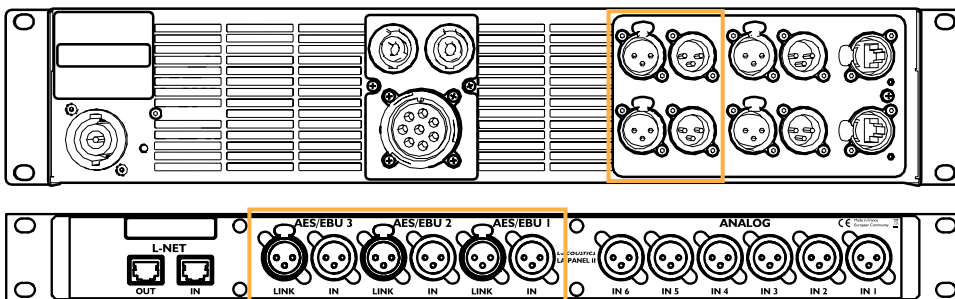
**Digital audio cabling**

With digital audio, internal cabling uses a constant scheme. As digital audio requires an active refresh of the signal, routing modularity is achieved through external cabling.

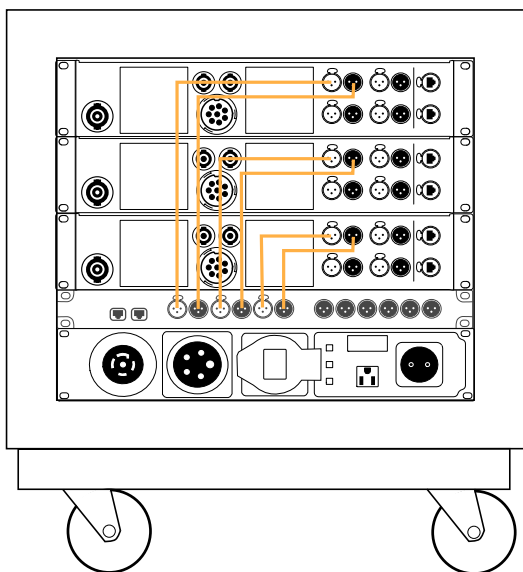
**Internal digital audio cabling**

An XLR connection panel located on the rear side of LA-PANEL II and three XLR cables allow distributing up to six different digital audio signals (two channels per signal) to the LA12X amplified controllers.

**Digital connectors on the rear panel of LA12X and LA-PANEL II**



The IN connectors of the front of LA-PANEL II are cabled to an AES/EBU IN connectors on the LA12X amplified controllers using the appropriate IN XLR cable. The AES/EBU LINK connectors on the LA12X amplified controllers are cabled to the LINK connectors of the LA-PANEL II using the appropriate LINK XLR cable.



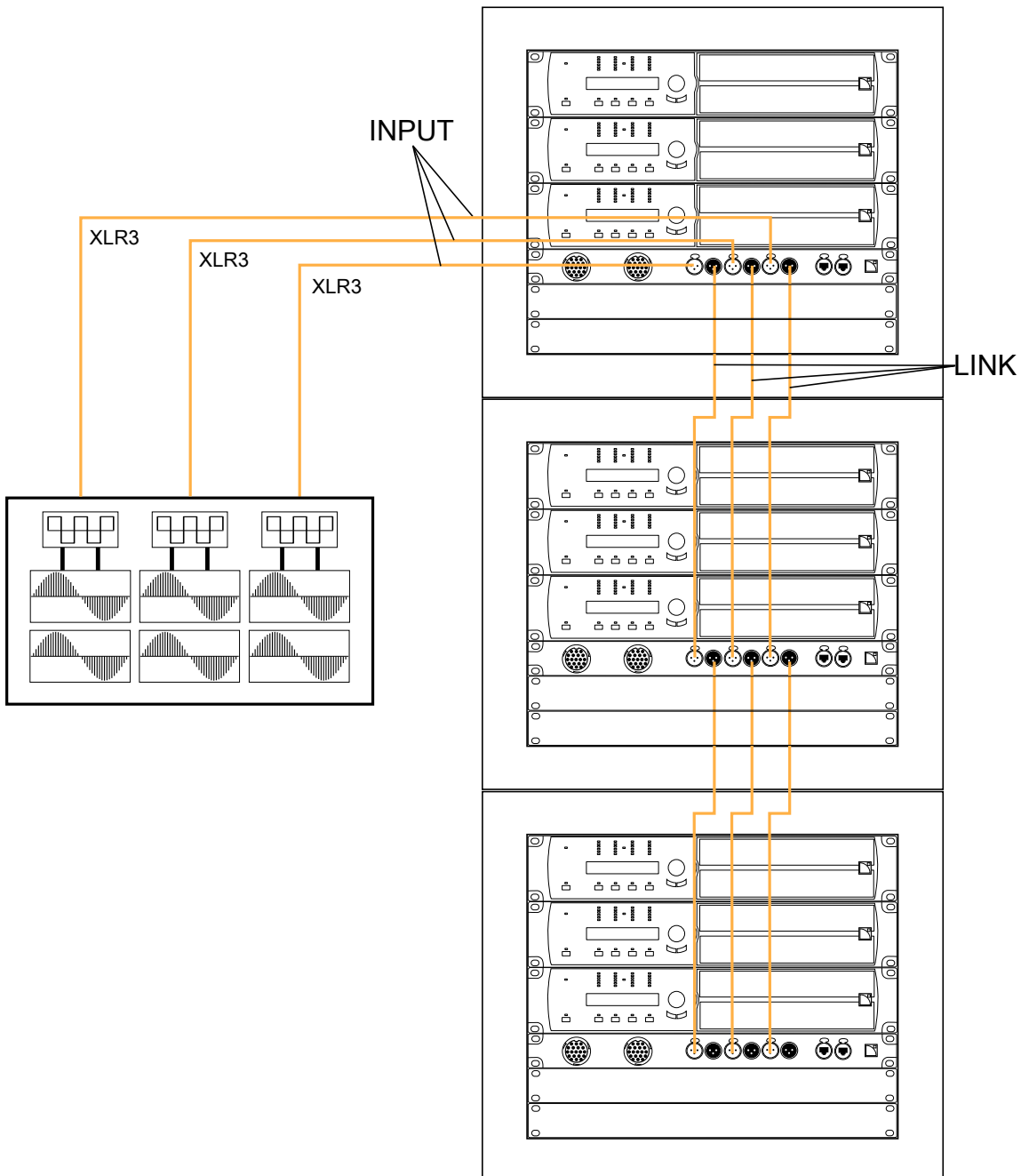
## External digital audio cabling

With digital audio, routing of the signals is flexible through external cabling with the front of LA-PANEL II. Two examples are given in this manual.

Up to six digital audio signals can be routed from an AES/EBU digital audio source (mixing console or EQ device) to the LA-PANEL II through three XLR cables, each one conveying two channels.

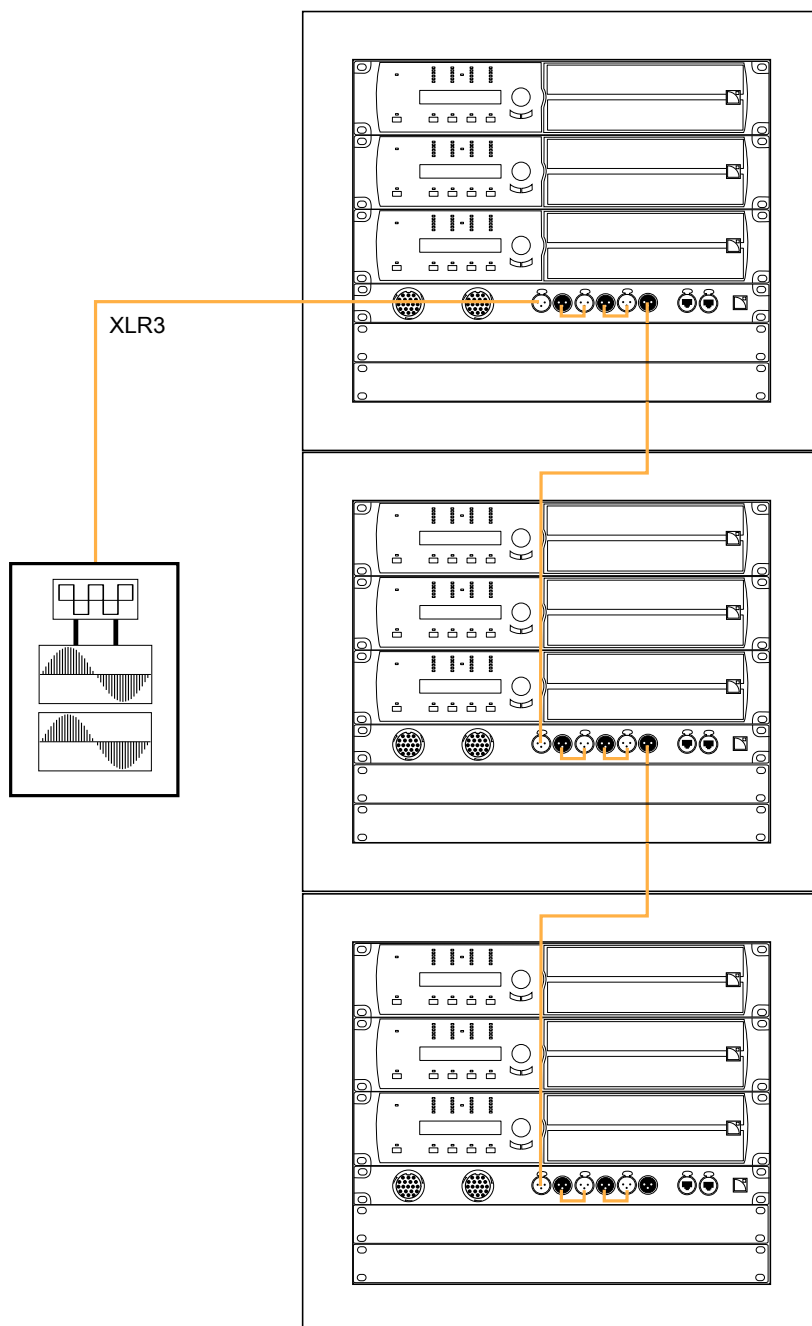
Each pair of signals can be routed in a daisy-chain layout by cabling the corresponding LINK connector of the LA-PANEL II to another IN connector of the same LA-PANEL II (for internal daisy-chaining), or to an IN connector of another LA-PANEL II (for external daisy-chaining). It allows modular routing layouts.

### External audio cabling with three pairs of digital signal





## External audio cabling for FOH applications



### Cables for AES/EBU digital audio

AES3 specifies that the nominal characteristic impedance of cables used for AES/EBU digital audio transmission shall be  $110 \Omega \pm 20\%$ , and closer tolerances allow for increased transmission reliability over long lengths or higher sampling rates.

Therefore, it is highly recommended to use high-quality AES/EBU rated cables only, although certain cables designed for balanced analog audio prove to be acceptable at 48 kHz sampling rate over short distances.

It is recommended to use single cuts of cable between AES/EBU outputs and inputs. Using several pieces reduces performances. If it is not possible to use single cuts, it is required to use the same model of cable between two AES/EBU interfaces.

In case of transmission losses, try to reduce the sampling frequency of the digital audio source. Moreover, as a general rule, avoid using sources rated beyond 96 kHz, as the maximum possible cable length is reduced, while the additional information is cancelled by SRC to 96 kHz.

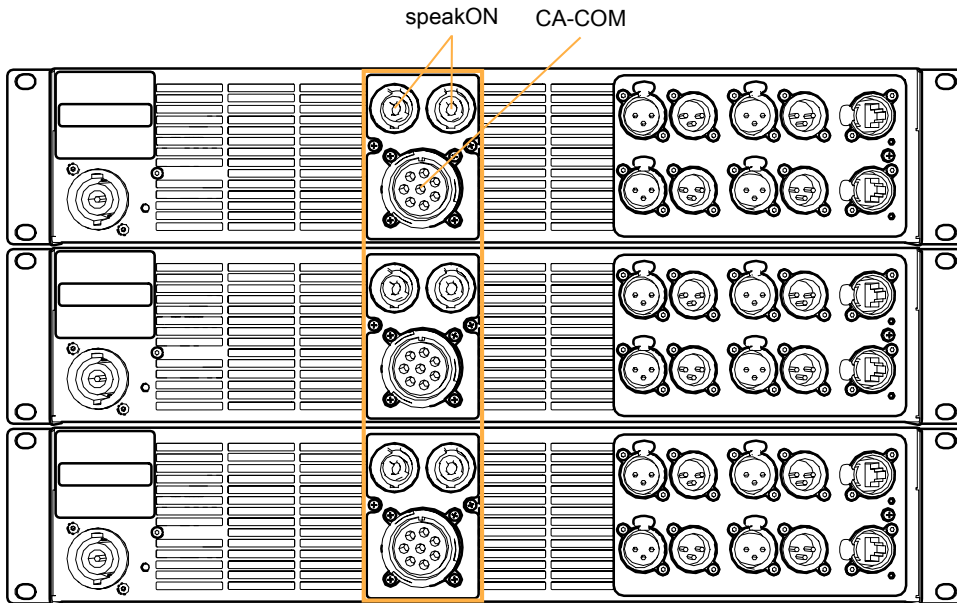
## Loudspeaker cabling

The rear side of the LA-RAK II gives access to the output connection panel of each LA12X. For each amplifier, this panel features one CA-COM connector and two speakON connectors.



Refer to the system **user manual** and the **LA12X** user manual before connecting an enclosure to LA-RAK II.

### Loudspeaker connectors



## L-NET cabling

The integration of the Ethernet-based L-NET network, with its high speed data transfer protocol up to 1 Gb/s, allows up to 253 amplified controllers to be controlled and monitored in real-time from the LA Network Manager software.

Multiple network topologies such as daisy-chain, star and hybrid are configurable. The computer running LA Network Manager and the amplified controllers are connected to each other using industry standard CAT5e U/FTP cables (or higher category) fitted with RJ45 connectors.

### **i** Operating instructions

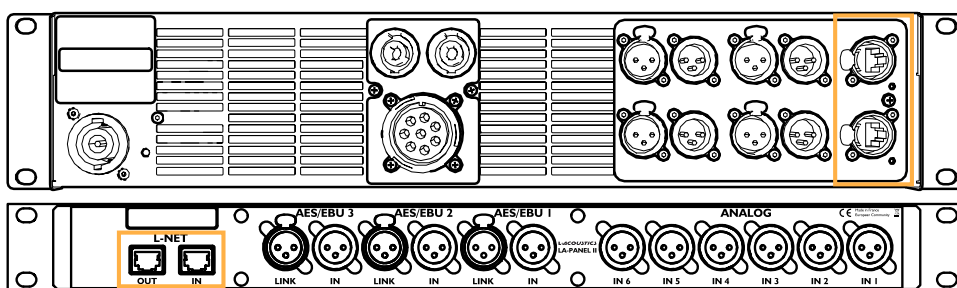
Refer to the **LA Network Manager** video tutorial for detailed operating instructions.

LA-PANEL II is equipped with four RJ45 sockets and four CAT5e U/FTP cables.

## Internal L-NET cabling

LA-PANEL II rear side features two etherCON sockets for internal L-NET network connection to all three LA12X.

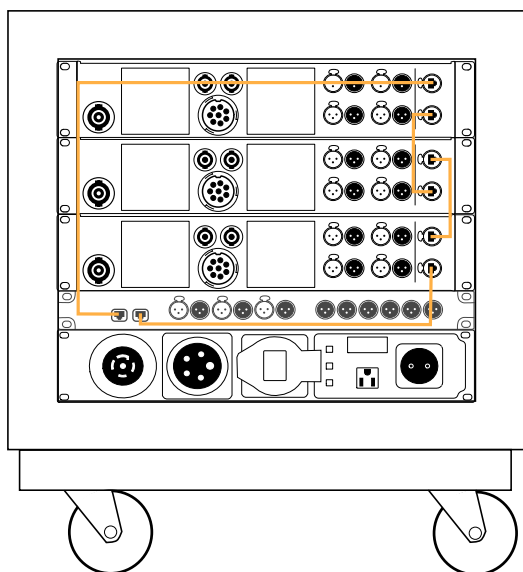
### L-NET connectors on rear panels of LA12X and LA-PANEL II



There are two potential cabling schemes:

### Cabling scheme A

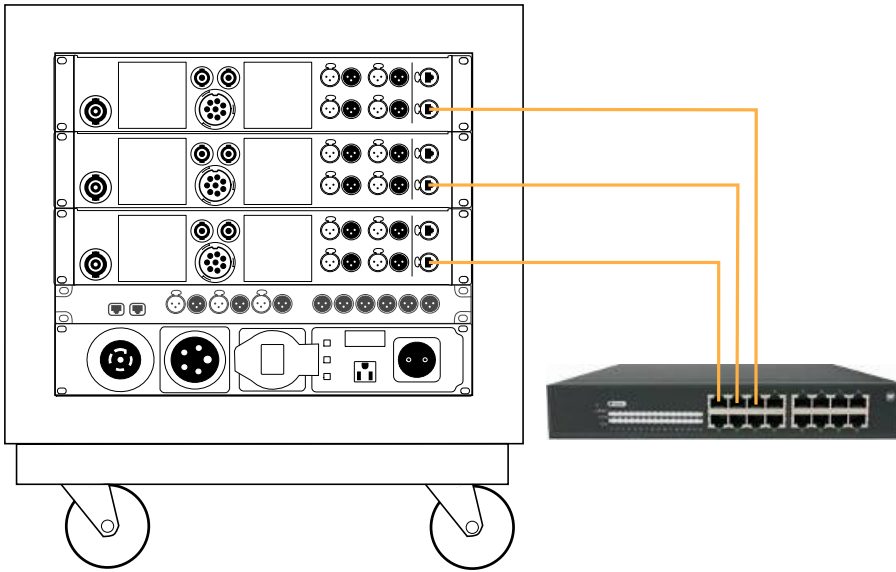
Connecting a first LA12X through one of its L-NET sockets and routing the network towards another LA12X through its other L-NET sockets, for a daisy-chain topology.



Line from AMP 3 to L-NET IN: for daisy-chaining multiple LA-RAK II. Refer to [Daisy-chain topology](#) (p.29) and [Hybrid topology](#) (p.30).

## Cabling scheme B

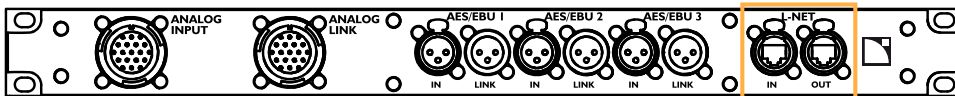
Connecting the cable to a switch (not provided) which feeds all three LA12X, for a star topology.



## External L-NET cabling

LA-PANEL II front side features two etherCON I/O sockets for external L-NET network cabling.

### L-NET connectors on front panel of LA-PANEL II

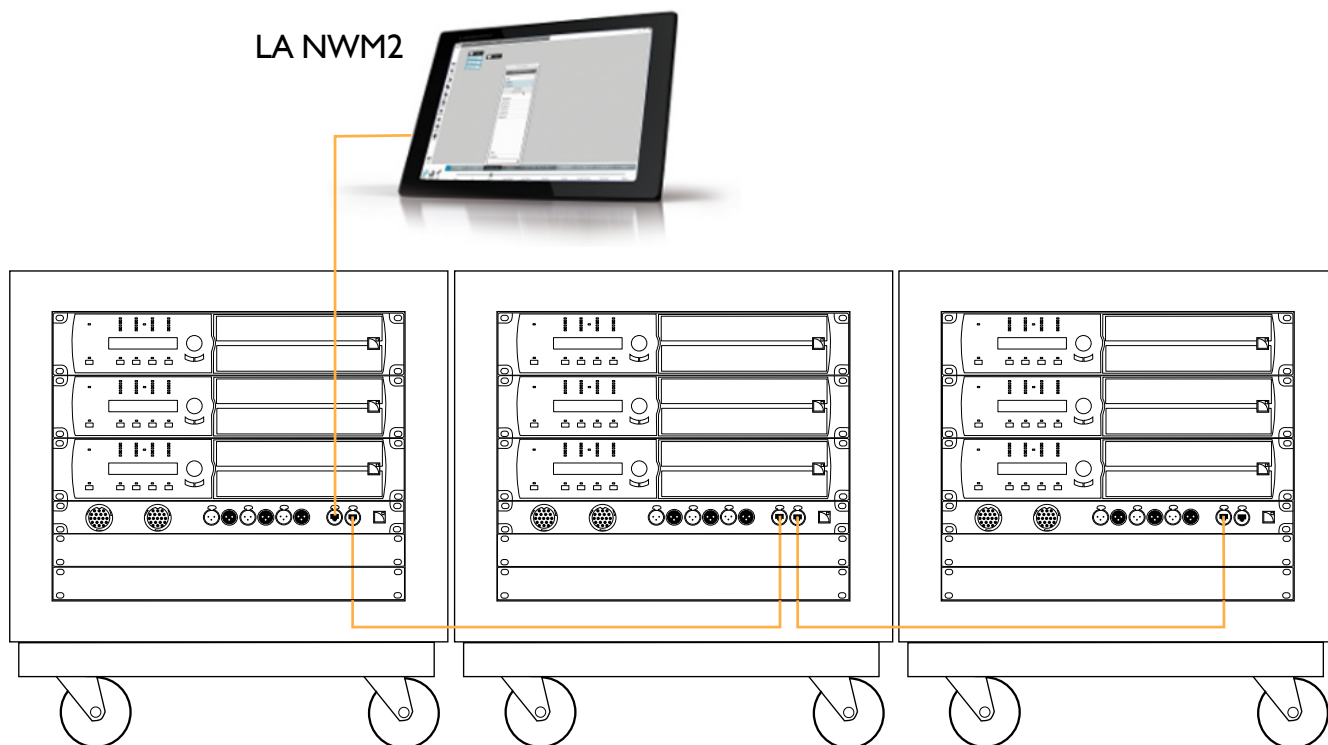


**!** A maximum of 253 LA12X can be interconnected within the same network (84 LA-RAK II + 1 LA12X).

To set up an L-NET network with several LA-RAK II, three cabling schemes can be used: daisy-chain, star or hybrid.

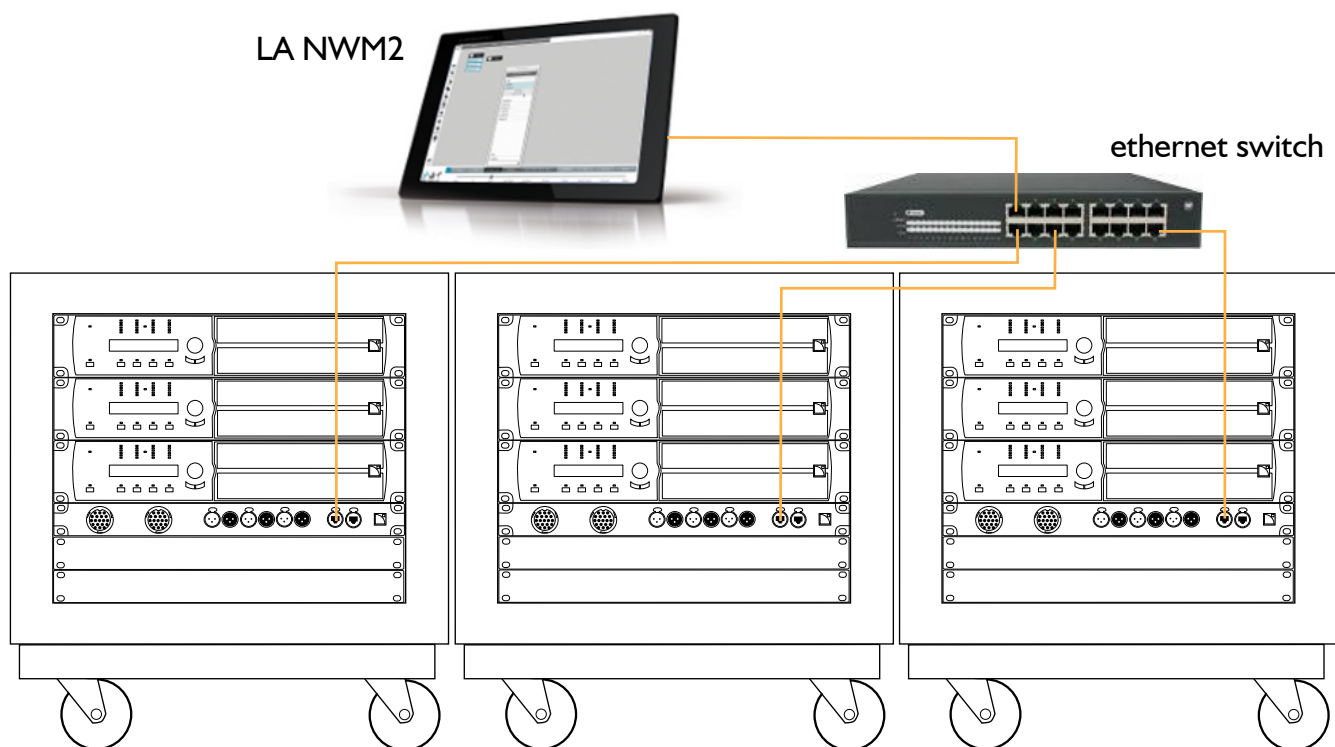
## Daisy-chain topology

The IN connector of a first LA-RAK II is linked to the computer running LA Network Manager. The network is then set up by linking the OUT connector of each LA-RAK II to the IN connector of the following LA-RAK II in the chain.



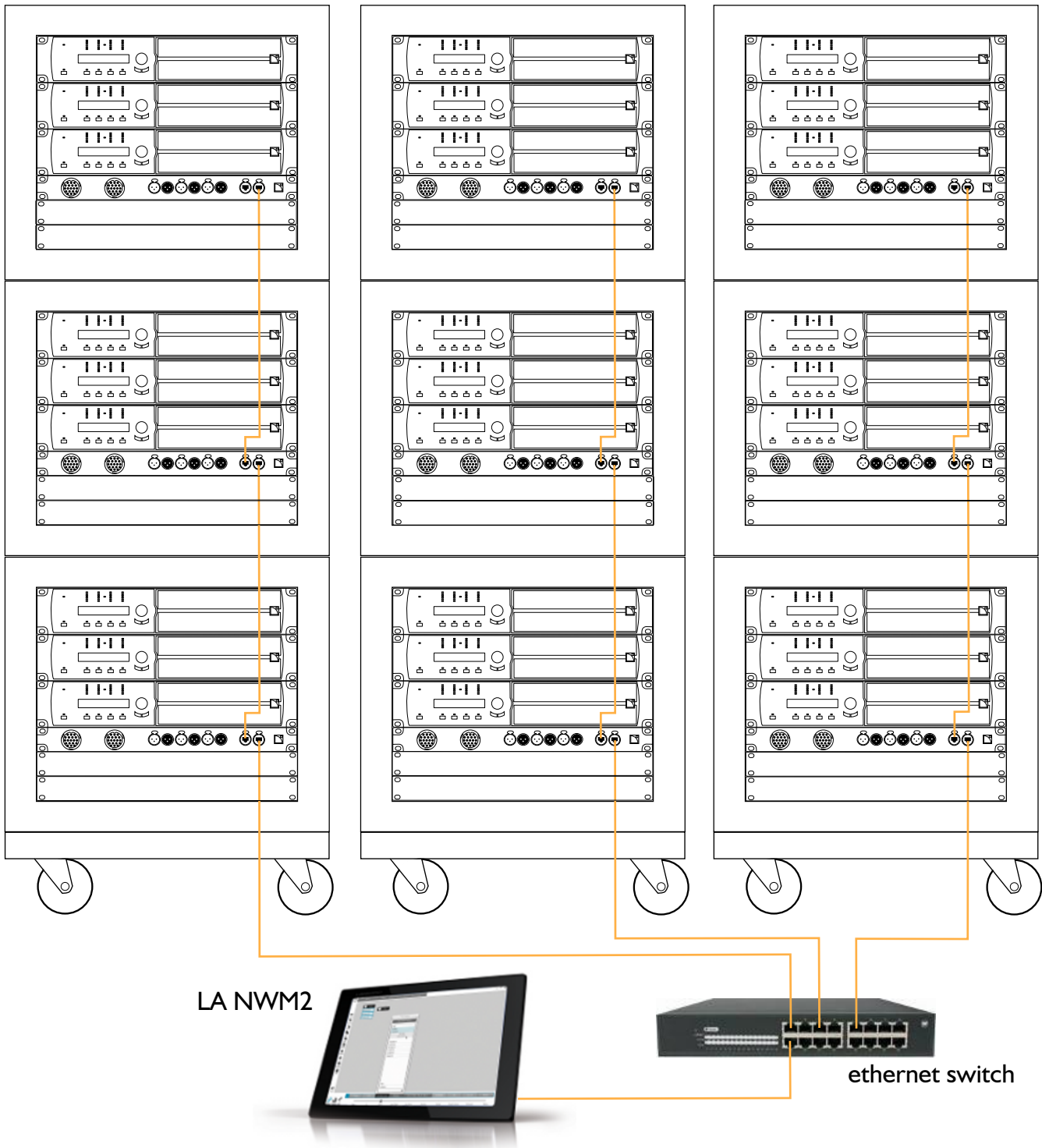
## Star topology

The computer driving LA Network Manager is connected to a switch (not provided) which is directly linked to each of the LA-RAK II through their IN connector.



## Hybrid topology

The star topology is used to distribute the network to several LA-RAK II and the daisy-chain topology is used to serially cable other LA-RAK II with each of the first LA-RAK II.



# Maintenance

## Quality control

---

### INSP - Structure

#### Procedure

Visually inspect the mechanical assembly and rigging parts for obvious damage or lost parts, in particular:

- a) the RK9U internal frames and electric/electronic devices mounted on it, their screws and washers
- b) the RK9U rigging rails, ball locking pins, rear panels, and the doors
- c) the dolly board and coupling bars with spring-loaded safety

### CHK - Internal components

#### Procedure

1. Check the LA12X as described in the maintenance section of the LA12X user manual.
2. Check the contact quality and locking action of all the LA-PANEL II sockets (CA-COM, XLR3 and etherCON).
3. Check the contact quality of all the LA-POWER II power plug and sockets.

## Mounting components on the RK9U inner frame

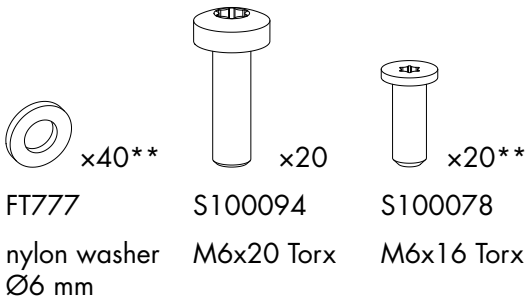
### Tools

- torque screwdriver
- T25 Torx bit
- T30 Torx bit

### Repair kits

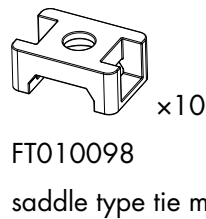
#### G03264 x5\*

#### KR screws and washers LA-RAK II



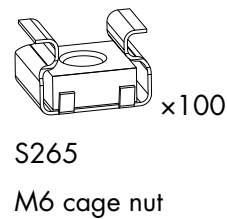
#### G03260

#### KR tie wraps (x10) LA-RAK II



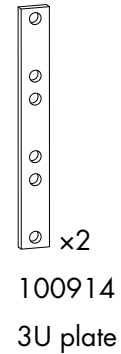
#### KR CVECRAGE2

#### KR cage nuts M6 (x100) LA-RAK II



#### G03263

#### KR 3U spacers (x2) LA-RAK II



\* quantity for one LA-RAK II

\*\* includes 8 extra spare parts

### Procedure



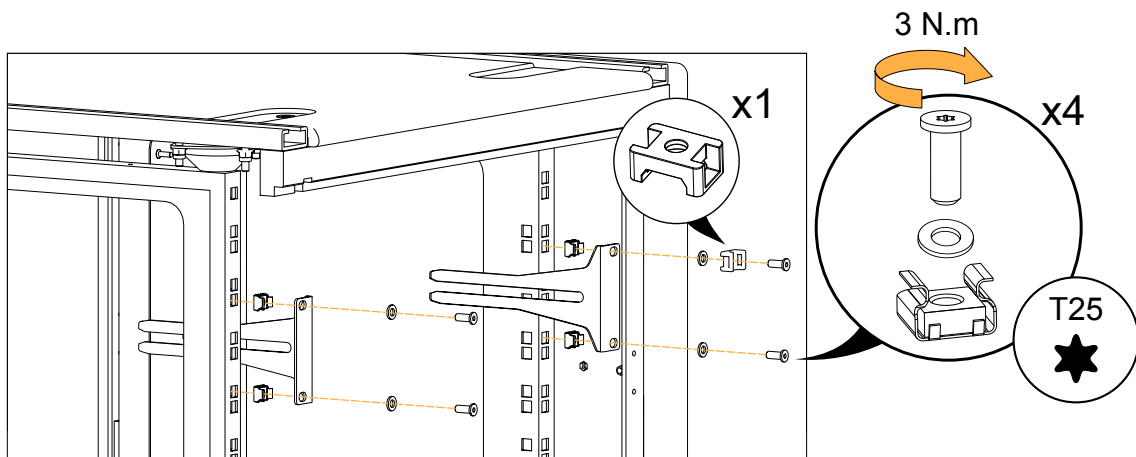
#### Risk of damaging the amplified controller during transport

During transport or while on tour it is essential that the amplified controller is rear supported in addition to the front panel mounting.

Use the rear rack support brackets provided with the controller.

Any mechanical damage to the controller used in portable applications without rear support will not be covered by warranty.

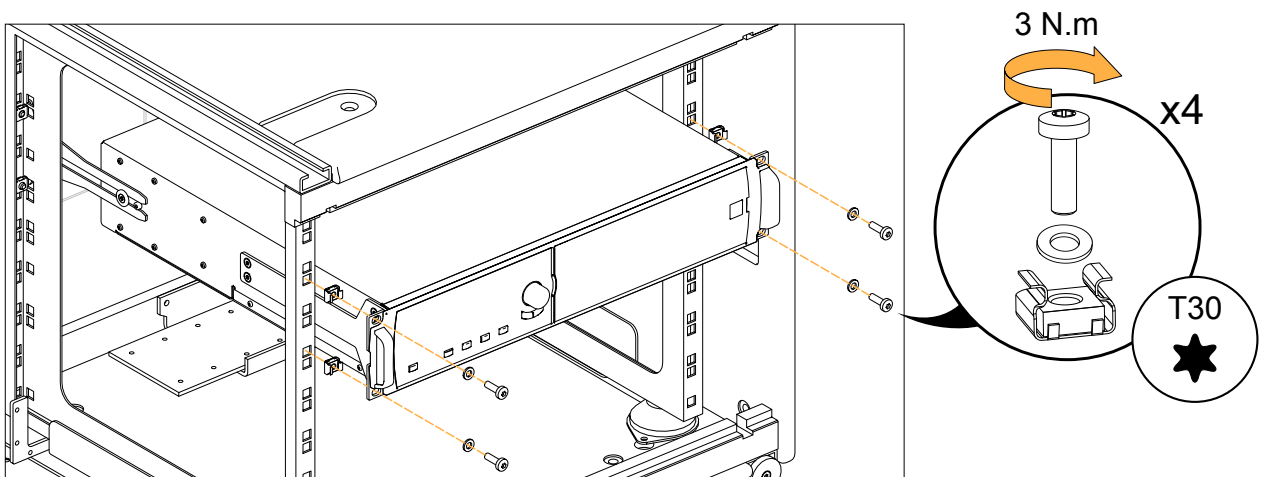
1. Mount each LA12X on both the front and the rear faces:
  - a) Mount the LA12X rear brackets to the inner frame at the rear face of the rack.  
Use four S265, four FT777 and four S100078.  
On the top right, also use one FT010098.





- b) Slide the LA12X on its rear brackets from the front face of the rack.  
 c) Mount the LA12X to the inner frame.

Use four S265, four FT777 and four S100094.

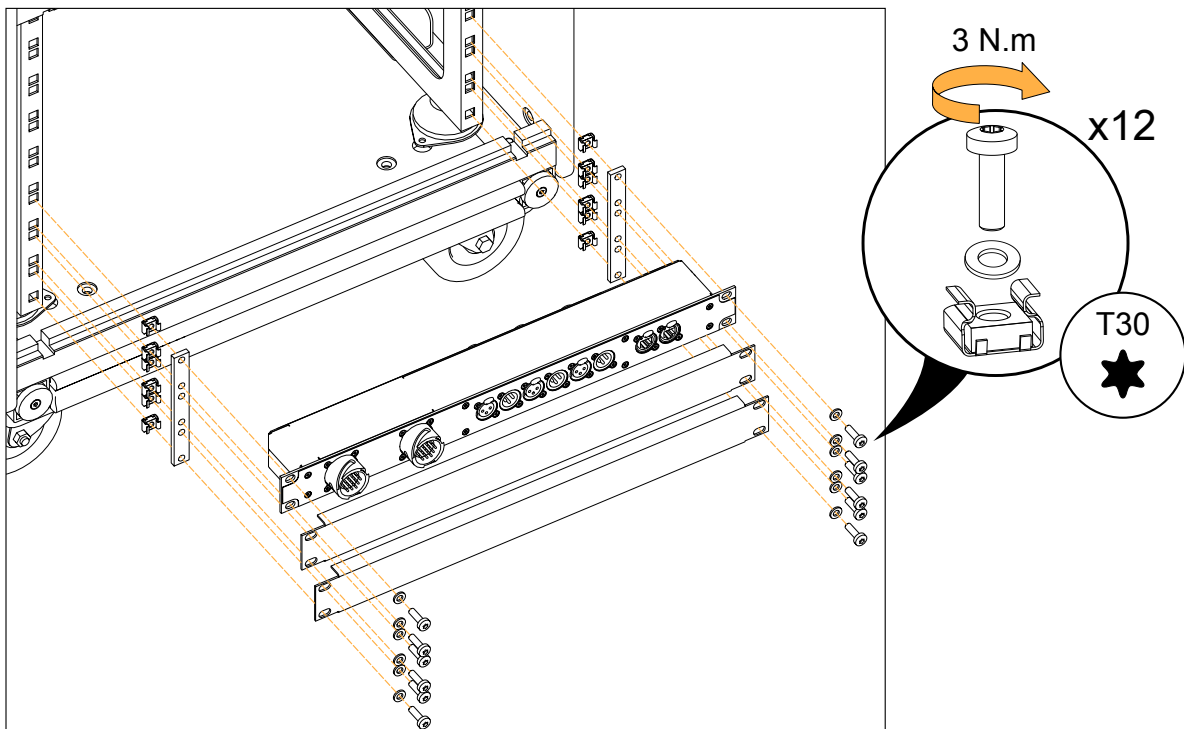


2. Mount LA-PANEL II and the two 1U blank panels to the front face of the rack.



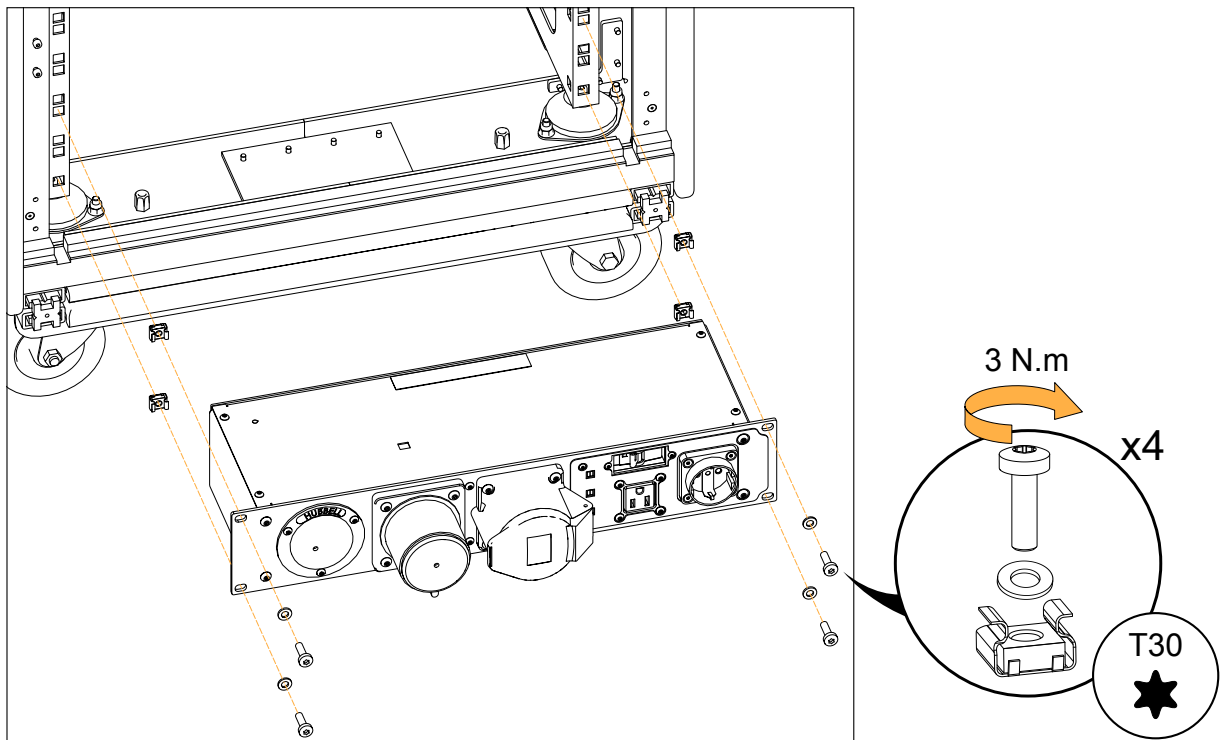
There is a 3U plate on the inner frame behind the LA-PANEL II and the two 1U blank panels.

Use four S265, four FT777 and four S100094 for each panel.



**3.** Mount LA-POWER II to the rear face of the rack.

Use four S265, four FT777 and four S100094.



# Specifications

## LA-RAK II specifications

### accessories

- 1 x dolly board
- 2 x coupling bars

### rigging

flyable	up to 4 LA-RAK II with LA-RAK BUMP
integrated rigging	coupling rails

### weight

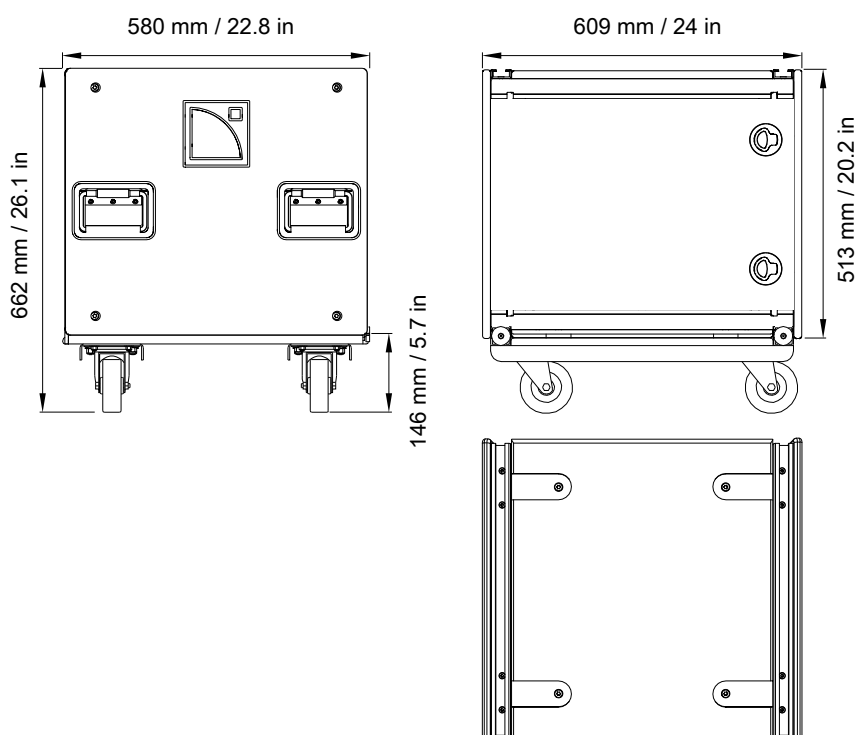
LA-RAK II (with doors, 2 x coupling bars, LA-PANEL II, cables, 3 x LA12X and LA-POWER II)	96.5 kg / 212.8 lb
dolly board	13.5 kg / 29.8 lb
2 x coupling bars	1.5 kg / 3.3 lb

### materials

external structure	polyethylene, aluminium and steel
doors	LEXAN® polycarbonate
rigging components	polyester-coated steel
handles	integrated into the cabinet
finish	black

Lexan is a trademark of SABIC Innovative Plastics IP BV.

### dimensions



## LA-PANEL II specifications

### cables

- 6 x ANALOG OUT XLR3 male/female labeled cables, 1.10 m / 3.61 ft
- 3 x AES OUT XLR3 male/female labeled cables, 1.10 m / 3.61 ft
- 3 x AES LINK XLR3 male/female labeled cables, 1.10 m / 3.61 ft
- 2 x ANALOG XLR3 male/female labeled cables, 0.55 m / 1.8 ft
- 2 x AES XLR3 male/female labeled cables, 0.55 m / 1.8 ft
- 2 x CAT5e U/FTP labeled cables, 1 m / 3 ft
- 2 x CAT5e U/FTP labeled bridge cables, 0.25 m / 0.82 ft

### front connectors

analog input/link	2 x 19-point CA-COM
AES/EBU input/link	3 x female Neutrik® XLR3 (IN) 3 x male Neutrik® XLR3 (LINK)
network	2 x etherCON® (L-NET IN/OUT)

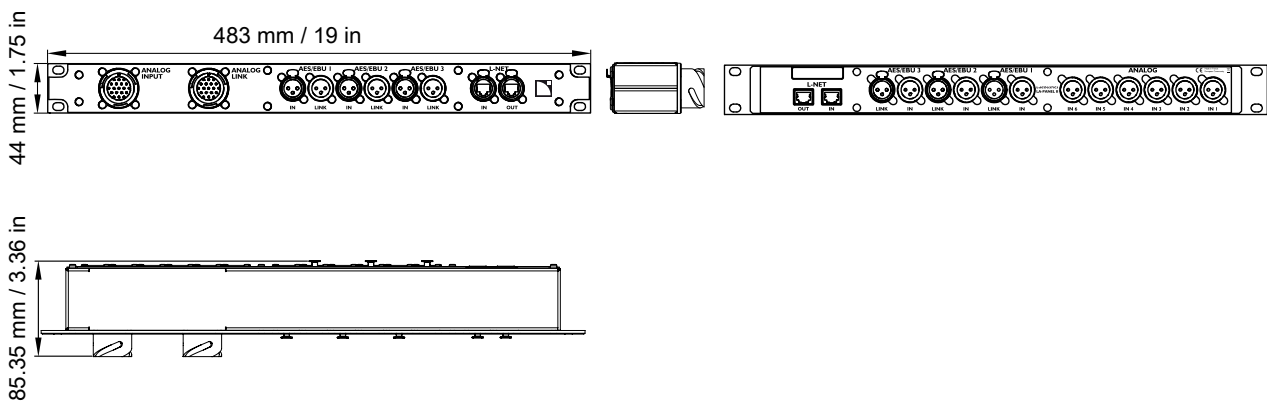
Neutrik, etherCON and powerCON are registered trademarks of Neutrik AG.

CA-COM is a trademark of ITT Cannon.

### rear connectors

network	2 x RJ45 (L-NET)
AES/EBU input/link	3 x female Neutrik® XLR3 (IN) 3 x male Neutrik® XLR3 (LINK)
analog input	6 x male Neutrik® XLR3 (IN 1 to IN 6)

### dimensions



## LA-POWER II specifications

### front

AC input (US)	30 A - NEMA L21-30P (3P+N+E) male outlet
AC input (EU)	32 A - IEC 60309 (3P+N+E) male outlet
AC link out (EU)	32 A - IEC 60309 (3P+N+E) female outlet <b>⚠ Do not use with a 120 - 208 V power supply</b>
AC presence	3 x dual LEDs (L1, L2, L3) 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)

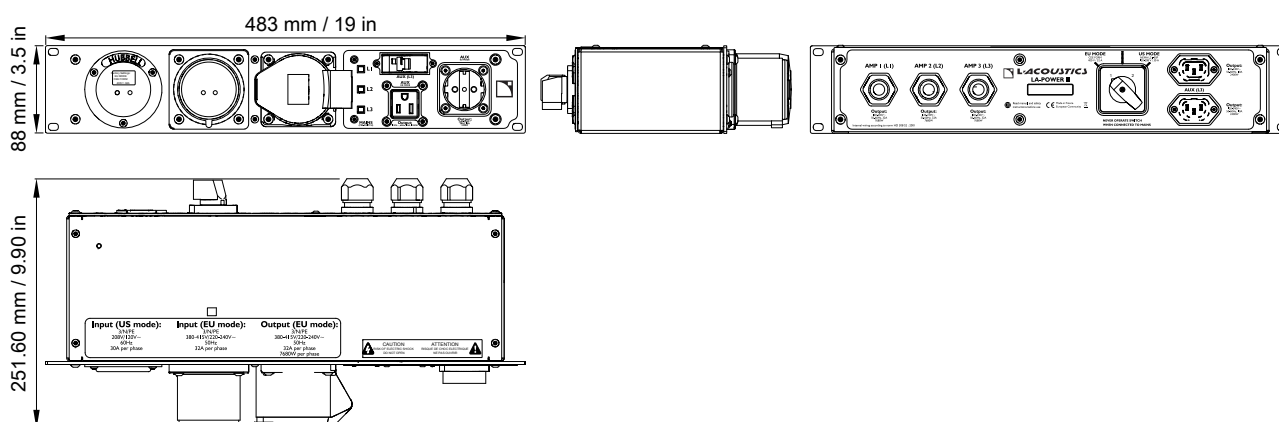
### rear

AC output for LA12X	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 <b>⚠ Do not switch between modes when connected to power supply</b>
AC auxiliary output	2 x IEC 60320-1 type C13 female outlets (AUX L3)

### storage and operating conditions

storage temperature	-5 °C / 23 °F to 70 °C / 158 °F
operating temperature	0 °C / 32 °F to 50 °C / 122 °F
maximum altitude	5000 m
climate	temperate and tropical

### dimensions



# Approvals

## LA-RAK II EU DoC

Declaration of Conformity - version 1.0



### EU Declaration of Conformity (DoC)

We

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+33 (0)1 69 63 69 63  
info@l-acoustics.com

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

#### LA-RAK II

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

- 2006/42/EC:** Machinery Directive
- 2014/35/EU:** Low Voltage Directive
- 2014/30/EU:** Electro-Magnetic Compatibility Directive
- 2011/65/EU:** RoHS 2 Directive

The following harmonized standards and technical specifications have been applied:

- EN 13155:2003 + A2:2009** Cranes - Safety - Non-fixed load lifting attachments
- EN 60065: 2002 + A1: 2006 + A11: 2008 + A12: 2010 + A2: 2011** Safety requirements for audio, video and similar electronic apparatus
- EN 55103-1: 2009** Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 1: Emissions
- EN 55103-2: 2009** Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 2: Immunity
- EN 50581: 2012** Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Year CE marking was first affixed: 2016

Issued in Marcoussis, France

24.03.2017

A handwritten signature in black ink, appearing to read 'COMBET'.

Christophe COMBET, Director of Sound System Design

# LA-POWER II EC DoC

Declaration of Conformity - version 1.0



## EU Declaration of Conformity (DoC)

We

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 Parc de la Fontaine de Jouvence  
 91462 Marcoussis Cedex  
 France  
 +33 (0)1 69 63 69 63  
 info@l-acoustics.com

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

### LA-POWER II distribution panel

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  
**2011/65/EU:** RoHS 2 Directive

The following harmonized standards and technical specifications have been applied:

**EN 60065: 2002 + A1: 2006 + A11: 2008 + A12: 2010 + A2: 2011** Safety requirements for audio, video and similar electronic apparatus  
**EN 55032: 2015** Electromagnetic compatibility of multimedia equipment – Emission Requirements  
**EN 55103-2: 2009** Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 2: Immunity

Year CE marking was first affixed: 2016

Issued in Marcoussis, France

14/09/2016

Genio KRONAUER, Electronics Director



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