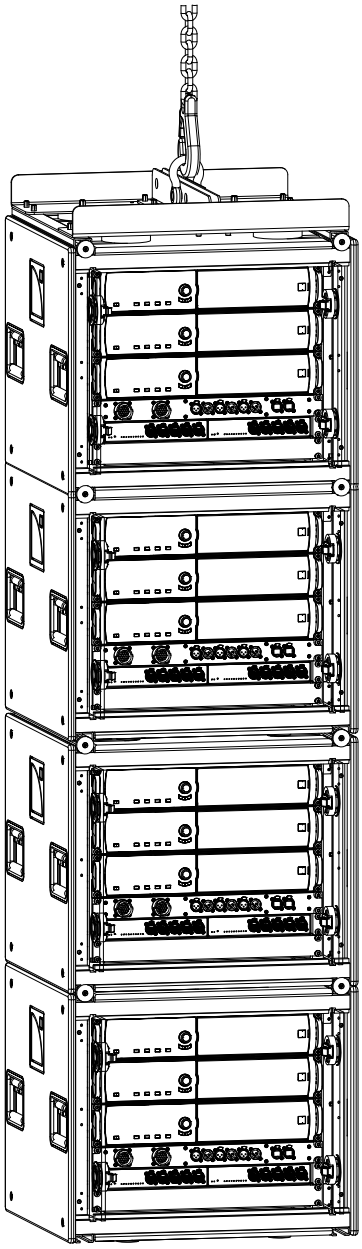
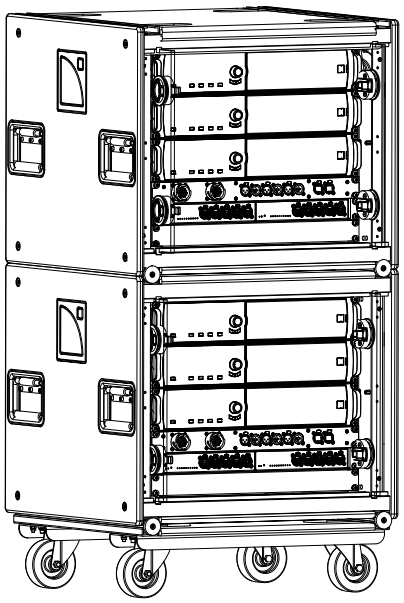
LA-RAK II AVB

owner's manual (EN)





Document reference: LA-RAK II AVB owner's manual (EN) version 2.0
Distribution date: June 13, 2022
© 2022 L-Acoustics. All rights reserved.
No part of this publication may be reproduced or transmitted in any form or by any means without the express written consent of the publisher.

Contents

Safety 5

Important safety instructions 5

Introduction 7

LA-RAK II AVB touring rack 7

How to use this manual 8

Revision history 8

System components 9

Technical description 11

Main features 11

RK9U structure 11

LA-POWER II distribution panel 12

LA-PANEL II distribution panel 13

LS10 14

Rigging system description 15

LA-RAK II AVB 15

Mechanical safety 17

Inspection and preventive maintenance 18

How to do preventive maintenance 18

Inspection 19

Rigging part inspection 19

Mechanical system overview 20

LA-RAK II AVB components 22

Amplified controllers 25

LS10 26

Functional checks 27

Normal start-up sequence 27

Network functionalities and firmware 27

LS10 27

Preventive maintenance references 29

Rigging procedures 31

Stacking LA-RAK II AVB 32

Flying LA-RAK II AVB 34

Operation..... 37
Ventilation..... 37
Connecting to AC mains..... 37
EU mode..... 37
US mode..... 38
Powering the amplified controllers..... 38
Audio cabling..... 40
Analog audio cabling..... 41
Digital audio cabling..... 45
AVB audio and control cabling..... 48
Loudspeaker cabling..... 52

Corrective maintenance..... 53
Introduction..... 53
LA-RAK II AVB..... 53
Exploded view..... 53
Screws and fasteners repair kits..... 54
Mounting components on the RK9U inner frame..... 54
LA12X..... 60
Exploded view - external modules..... 60

Specifications..... 62

Appendix..... 69
Approvals..... 69

Safety

Important safety instructions

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, with the following current values:
100-120 V: 30 A (US MODE)
220-240 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 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.

The power supply feeding LA-RAK II AVB must be equipped with circuit breakers meeting the following requirements:
There must be one dedicated circuit breaker for each phase (no mechanical link between phases).
Use these references, or equipment with equivalent characteristics:
100-120 V (US MODE): 30 A, Schneider Electric Square D 30A QO (in North America), or Mitsubishi CP30-BA-M (in Japan).
220-240 V (EU MODE): 32 A, Type C.
Circuit breakers of different characteristics could trip in case of short-term, high current draw, because they do not match LA12X Fuse Protect algorithms.

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.

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 on a regular basis to download the latest document and software updates.

Do not expose the product to extreme conditions.

Do not expose the product to moisture (rain, mist, sea spray, steam, humidity, condensation…) or excessive heat (direct sun, radiator…) for a long period of time.

For more information, refer to the **Products weather protection** document, available on the website.

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.

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 -5 °C / 23 °F and 50 °C / 122 °F.

Do not expose the product to direct sun.

Only use the product in a conformed electro-magnetic environment (EN55035 standard).

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.

Contact L-Acoustics for advanced maintenance.

Any unauthorized maintenance operation will void the product warranty.

Shipping

Use the original packaging for shipping the product.

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.

Introduction

LA-RAK II AVB touring rack

LA-RAK II AVB is a flyable touring rack offering twelve channels of high power amplification in a 9 U frame. It is equipped with three LA12X amplified controllers, two LS10 AVB switches, two panels for mains power and signal distribution and a blank panel. All devices are internally prewired for audio, control and power to offer a plug-and-play solution with seamless networked audio redundancy based on the Milan protocol.

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

LA-RAK II AVB comes with three-phase 32 A IEC input and link connectors, allowing to link two LA-RAK II AVB. It also comes with a 30 A NEMA connector for US standards. Additional power sockets are available for auxiliary equipment.

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

How to use this manual

The LA-RAK II AVB owner's manual is intended for all actors involved in the system design, implementation, preventive and corrective maintenance of the LA-RAK II AVB 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.11)
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.
   - Rigging procedures (p.31)
4. To configure the settings and parameters of the product, follow the step-by-step operation instructions.
   - Operation (p.37)

The Corrective maintenance (p.53) 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 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 (EMEA/APAC), 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.

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.

Revision history

version number	publication date	modification
1.0	Aug. 2020	Initial version.
2.0	Jun. 2022	• Added the DOE2, DOE45, and DOE100 Ethernet cables. • Issue fixes and improvements.

System components

Rack

LA-RAK II AVB	Touring rack containing three LA12X, LA-POWER II for power distribution, LA-PANEL II for audio and network distribution, and two LS10 for AVB distribution

Loudspeaker enclosures

Refer to the user documentation 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

Powering

LA-PANEL II	audio and network distribution panel
LA-POWER II	power distribution panel

Networking

LS10	AVB switch

Rigging elements

LA-RAK BUMP	Structure for flying 4 LA-RAK

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)

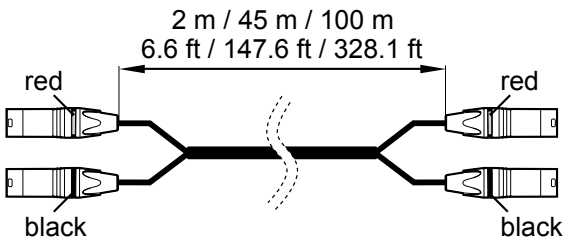
Software applications

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

Refer to the **Soundvision** help.
Refer to the **LA Network Manager** help.

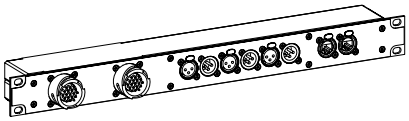
System component illustrations

Cables

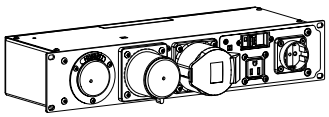


DOE cables

Components

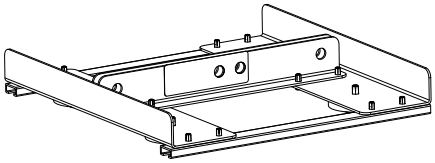


LA-PANEL II



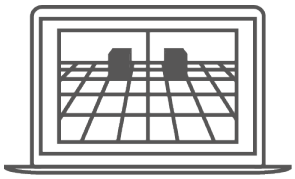
LA-POWER II

Rigging accessories



LA-RAK BUMP

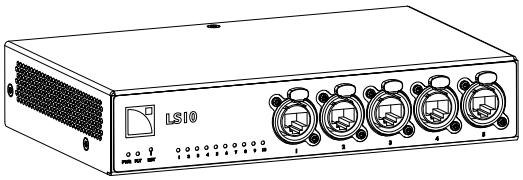
Software applications



Soundvision

LA Network Manager

Network switch



LS10

Technical description

Main features

LA-RAK II AVB 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.

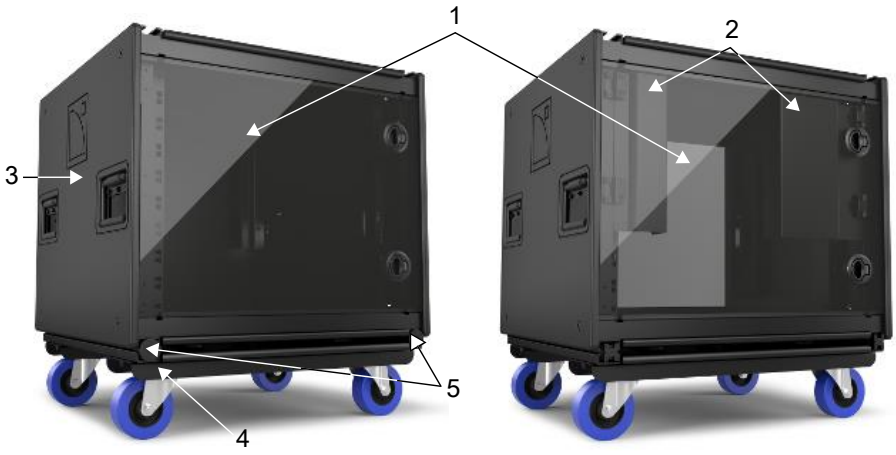
On the front face, a 1U space can receive additional material. For instance it allows to adapt a custom-built patch panel that accomodates optical connectors such as Fiberfox or OpticalCON to link to LS10 SFP optical interfaces.

RK9U structure

The LA-RAK II AVB 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 remain 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 AVB in flown or stacked configurations.



1 storable LEXAN doors

2 hinge-mounted panels

3 polyethylene panel

4 dolly board

5 coupling bars

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 / 30 A** before connecting to a power source.

LA-POWER II is equipped with an IN socket for US MODE, and 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.

The two IEC auxiliary outlets are available to power two LS10. Additional outlets (one NEMA, one "Schuko") are available to power auxiliary accessories such as a laptop. The auxiliary circuit is protected by a circuit breaker. Refer to section Powering the amplified controllers (p.38) 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.

1	AC input connector (US mode)	**8**	AC output cables for LA12X
2	AC input connector (EU mode)	**9**	mains switch
3	AC link connector (EU mode)	**10**	AC auxiliary output connector V-Lock compatible for LS10 (AUX L3)
4	AC presence LEDs		
5	circuit breaker (AUX L3)		
6	AC auxiliary output connector (US mode)		
7	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 audio signals and 6 digital audio signals. The analog signals are fed through the 19-point input CA-COM connector and the AES/EBU digital signals through three IN XLR connectors.

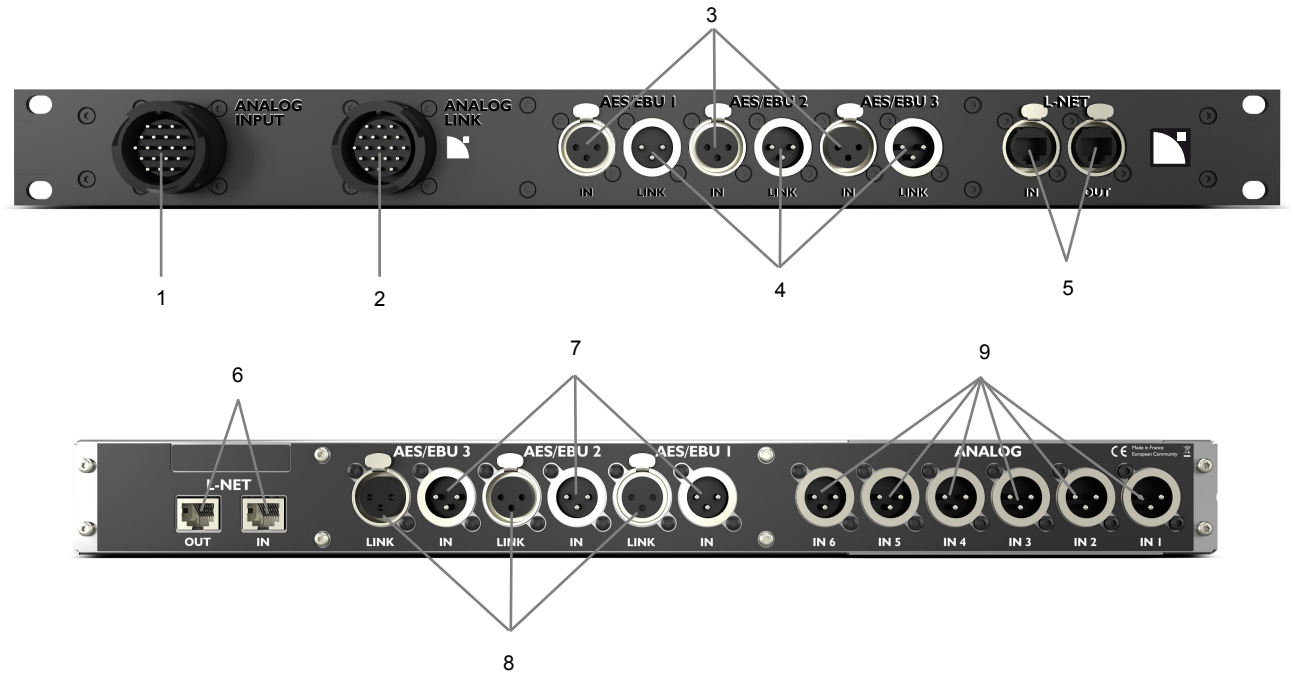
The signals can be distributed to the three amplified controllers through six analog XLR connectors or three digital XLR connectors on the rear side of the panel.

The link 19-point CA-COM connector and the three LINK XLR connectors can send the signals to another LA-RAK II AVB in a daisy-chain layout. The link 19-point CA-COM connector for ANALOG is directly wired in parallel to the 19-point input CA-COM connector.

The three LINK XLR connectors for AES must be connected to their corresponding LA12X LINK connectors to provide refreshed signals to another LA-RAK II AVB, as required by the AES standard (see Digital audio cabling (p.45)).

LA-PANEL II is equipped with two etherCON and two RJ45 I/O sockets for L-NET control and monitoring network. These are used on LA-PANEL II mounted in LA-RAK II. They are no longer used in LA-RAK II AVB where two LS10 allow for both AVB and L-NET transport to the LA12X in a redundant star network topology.

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 AVB.



1	analog input connector	**6**	RJ45 L-NET network connectors (not used in LA-RAK II AVB)
2	analog link connector	**7**	XLR AES/EBU input connectors
3	XLR AES/EBU input connectors	**8**	XLR AES/EBU link connectors
4	XLR AES/EBU link connectors	**9**	analog input connectors
5	etherCON L-NET network connectors (not used in LA-RAK II AVB)		

LS10

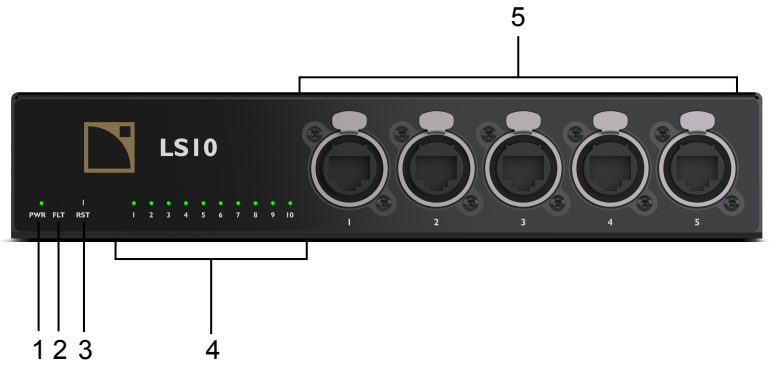
LS10 is a plug-and-play Avnu™-certified AVB switch.

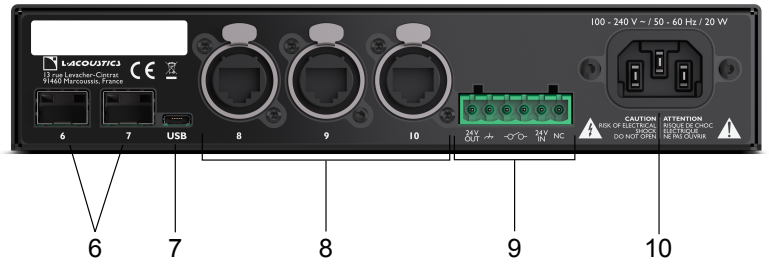
AVB

AVB is an open standard protocol developed by the Avnu Alliance organization for the transport of time-sensitive data. It ensures true synchronicity between devices on the network and guarantees the delivery of audio packets.

AVB networks reserve specific bandwidth for media to eliminate interference with other data and provide an extremely precise clock for all devices.

Front and rear panels



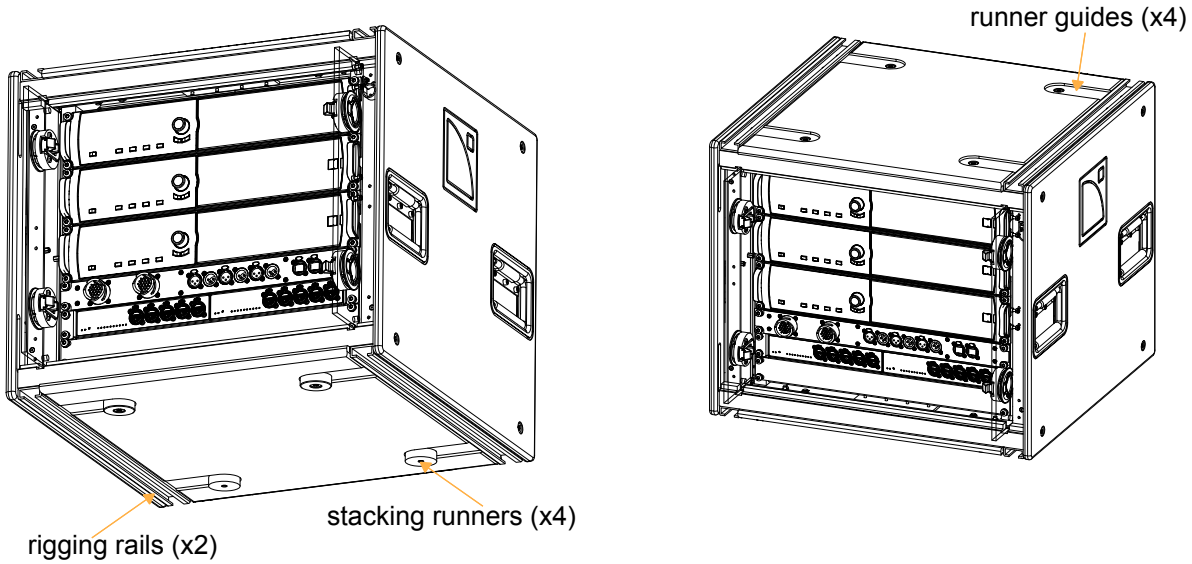


1	1 Power indicator	**6**	2 SFP cages
2	1 Fault indicator	**7**	1 female micro type USB port
3	1 Reset button	**8**	3 Ethernet etherCON I/Os
4	10 link status/port indicators	**9**	1 × 6-point terminal block, step 5 mm
5	5 Ethernet etherCON I/Os	**10**	1 mains power input, IEC C13 V-Lock compatible socket

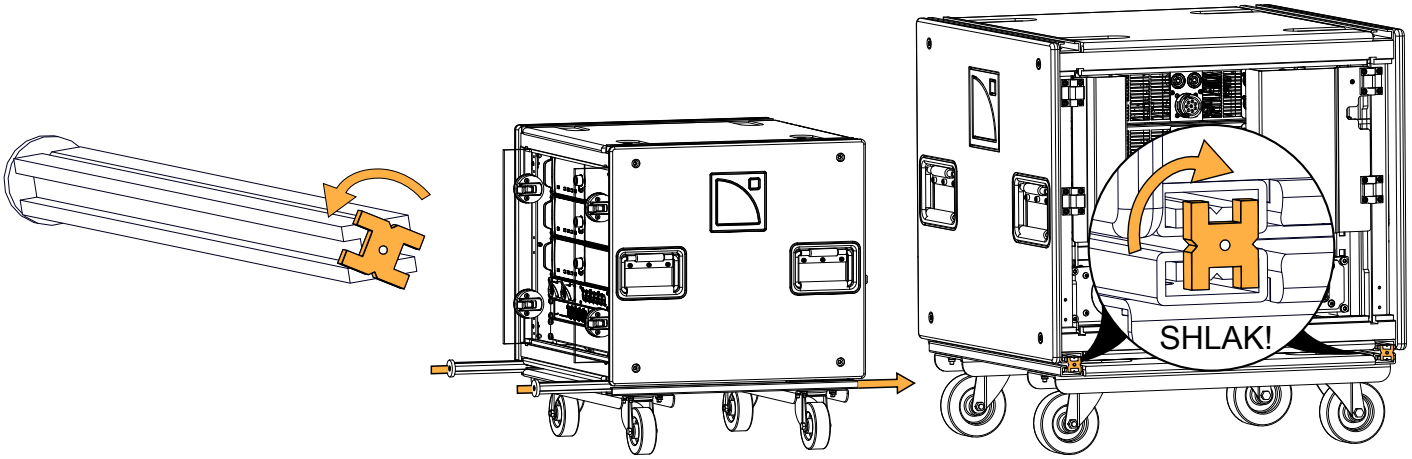
Rigging system description

LA-RAK II AVB

LA-RAK II AVB features four fully integrated rigging rails on top and bottom faces as well as four stacking runners which mate with four runner guides. These are for assembling several LA-RAK II AVB in stacked or flown configuration.

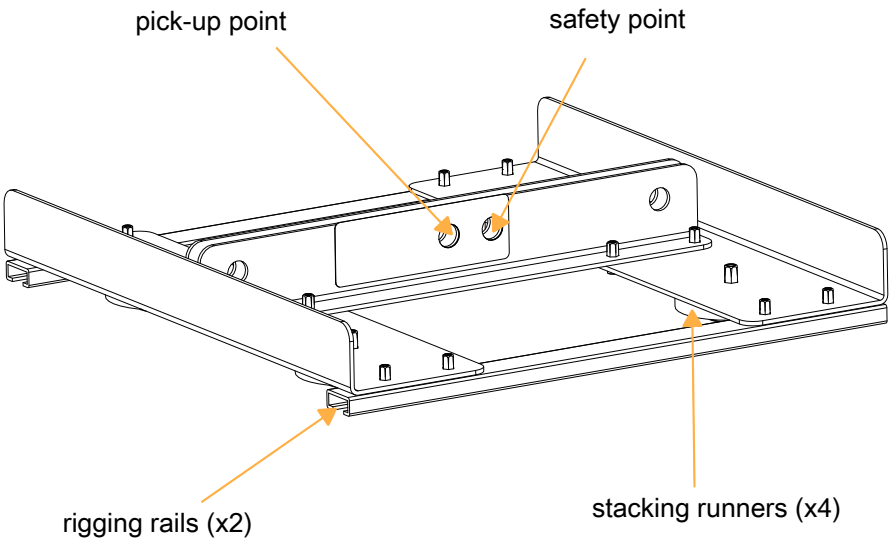


Connection with other LA-RAK II AVB or rigging elements is ensured by two coupling bars with spring-loaded safety.



LA-RAK BUMP

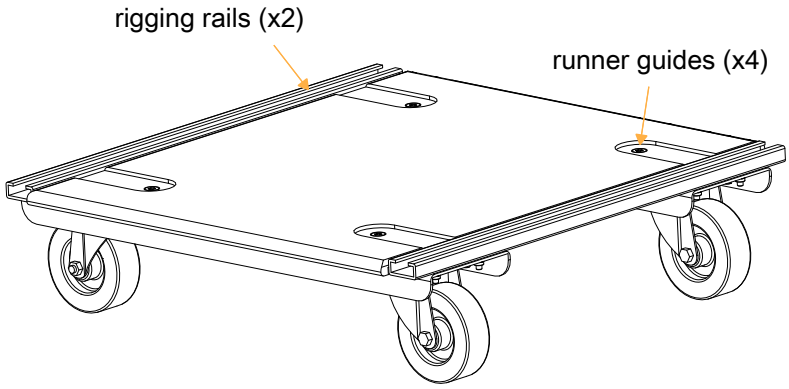
The LA-RAK BUMP flying frame is designed to fly an array of up to 4 LA-RAK II AVB. It is flown using a single pickup-point and secured using an additional safety point. It comes with two Ø19 mm shackles WLL 3.25 t.



Dolly board

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

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



Mechanical safety

Flown configurations

The LA-RAK II AVB rigging system complies with 2006/42/EC: Machinery Directive. It has been designed following the guidelines of BGV-C1.

2006/42/EC: Machinery Directive specifies a safety factor of 4 against the rupture. The flown deployments described in this manual achieve a safety factor of **4** .

Refer to Soundvision for the safety factor of a specific deployment.

LA-RAK II AVB

Configuration	Rigging accessory	Maximum / Safe limit
Flown	LA-RAK BUMP	4

Mechanical safety of the rigging system

Before any installation, always model the system in Soundvision and check the **Mechanical Data** section for any stress warning or stability warning.

Assessing mechanical safety

In order to assess the actual safety of any array configuration before implementation, refer to the following warnings:

Rated working load limit (WLL) is not enough

The rated WLL is an indication of the element resistance to tensile stress. For complex mechanical systems such as loudspeaker arrays, WLLs cannot be used per se to determine the maximum number of enclosures within an array or to assess the safety of a specific array configuration.

Mechanical modeling with Soundvision

The working load applied to each linking point, along with the corresponding safety factor, will depend on numerous variables linked to the composition of the array (type and number of enclosures, splay angles) and the implementation of the flying or stacking structure (number and location of flying points, site angle). This cannot be determined without the complex mechanical modeling and calculation offered by Soundvision.

Assessing the safety with Soundvision

The overall safety factor of a specific mechanical configuration always corresponds to the lowest safety factor among all the linking points. Always model the system configuration with the Soundvision software and check the **Mechanical Data** section to identify the weakest link and its corresponding working load. By default, a stress warning will appear when the mechanical safety goes beyond the recommended safety level.

Safety of ground-stacked arrays in Soundvision

For ground-stacked arrays, a distinct stability warning is implemented in Soundvision. It indicates a tipping hazard when the array is not secured to the ground, stage or platform. It is the user's responsibility to secure the array and to ignore the warning.

Additional safety for flown arrays

When flying an array, use available holes to implement a secondary safety.

Considerations must be given to unusual conditions

Soundvision calculations are based on usual environmental conditions. A higher safety factor is recommended with factors such as extreme high or low temperatures, strong wind, prolonged exposition to salt water, etc. Always consult a rigging specialist to adopt safety practices adapted to such a situation.

Inspection and preventive maintenance

How to do preventive maintenance

Perform the following tasks:

- before each deployment
- at least once a year
- after any corrective maintenance operation

For critical rigging parts, refer to Preventive maintenance references (p.29) for comparison and specific manipulation.

If any parts are damaged, refer to the Corrective maintenance (p.53) section for repair kits and maintenance instructions, or contact your L-Acoustics representative.

INSPECTION	
rigging	Rigging part inspection (p.19)
	Mechanical system overview (p.20)
rack	LA-RAK II AVB components (p.22)
amplified controllers	CHK - External structure (p.25)
	CHK - Cleanness (p.25)

FUNCTIONAL CHECKS	
electronics	Normal start-up sequence (p.27)
	Network functionalities and firmware (p.27)

Inspection

Rigging part inspection

About this task

For critical rigging parts, use the Preventive maintenance references (p.29) for comparison and specific manipulations.

The term "rigging part" comprises:

- lifting accessories such as clamps and shackles
- rigging accessories such as rigging frames, rigging interfaces, and brackets
- fasteners used for assembling two products together such as ball-locking pins, rigging axes, and safety pins
- rigging elements integrated in the product such as rigging arms and rails
- transportation accessories

This inspection procedure covers only L-Acoustics products. To inspect other products that are part of the lifting chain, refer to the manufacturer's instructions.

Prerequisite

Perform the inspection in a well-lit environment.

Procedure

1. Check that the rigging part is present.
2. If applicable, disassemble the rigging part from the rack or the rigging accessory.

   Check that the tethers are intact and safely secured.
3. Inspect the part from every side.

   Compare with the **reference pictures**.

   Check for:
   - corrosion
   - wear and cracks
   - bends and dents
   - holes
   - missing safety cues
   - missing identification labels
   - missing or loose fasteners

   Replacing screws

   If a screw is loose, remove and replace it.

   Always use the new screws provided in the repair kit.

   If no new screw is available, add blue threadlocker before reusing the screw.

   Do not apply more than the indicated torque.
4. Check the **geometry** of the part to identify critical deformations.

   Place the rigging part on a flat surface or hold a level against it.
5. Check the **moving parts**.

   Make sure that the mechanism engages correctly.

What to do next

If a problem is detected, perform the authorized maintenance operations or contact your L-Acoustics representative.

Mechanical system overview

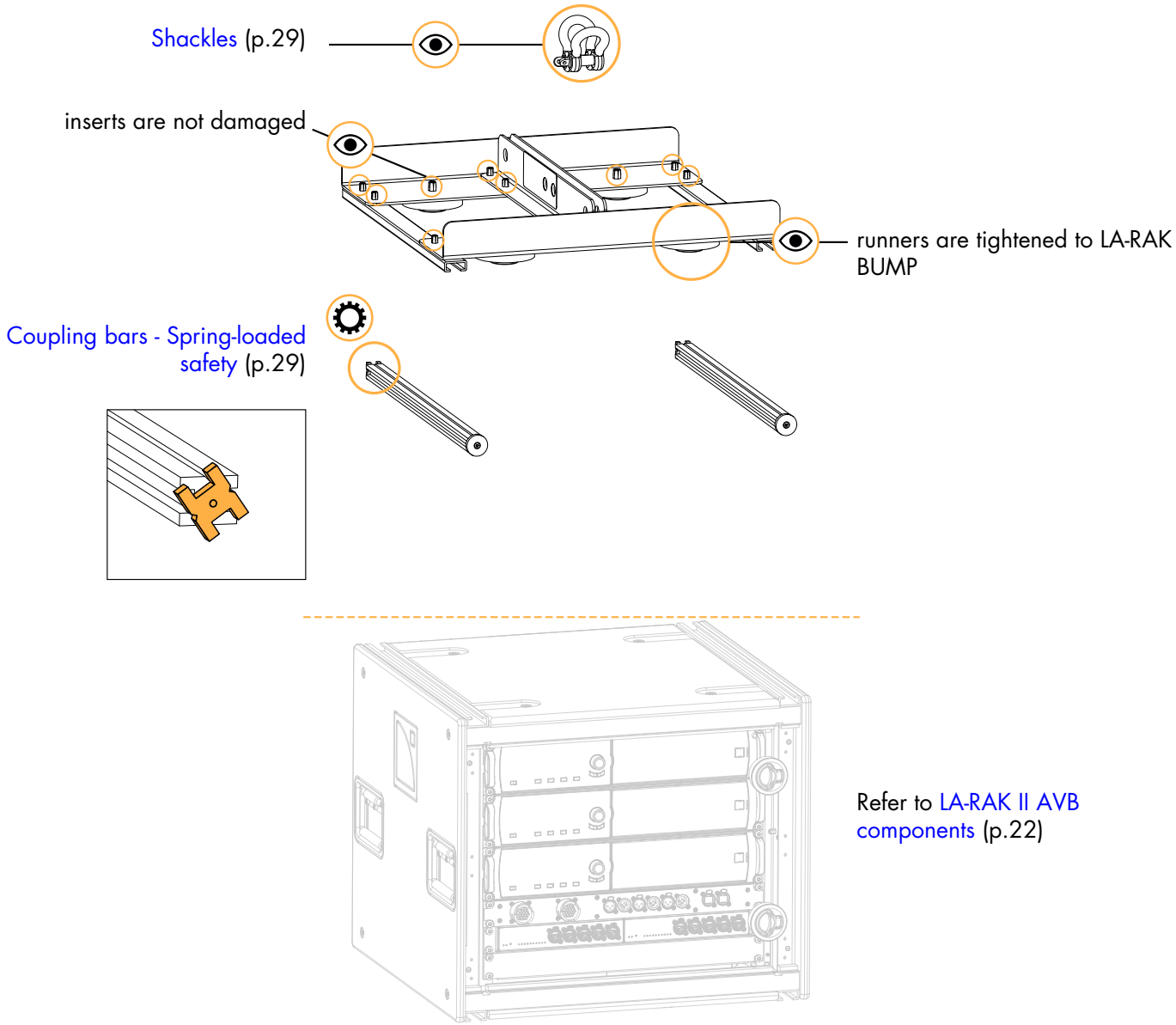
Critical parts of the lifting chains are highlighted.

The indicates a visual inspection. The indicates a functional check.

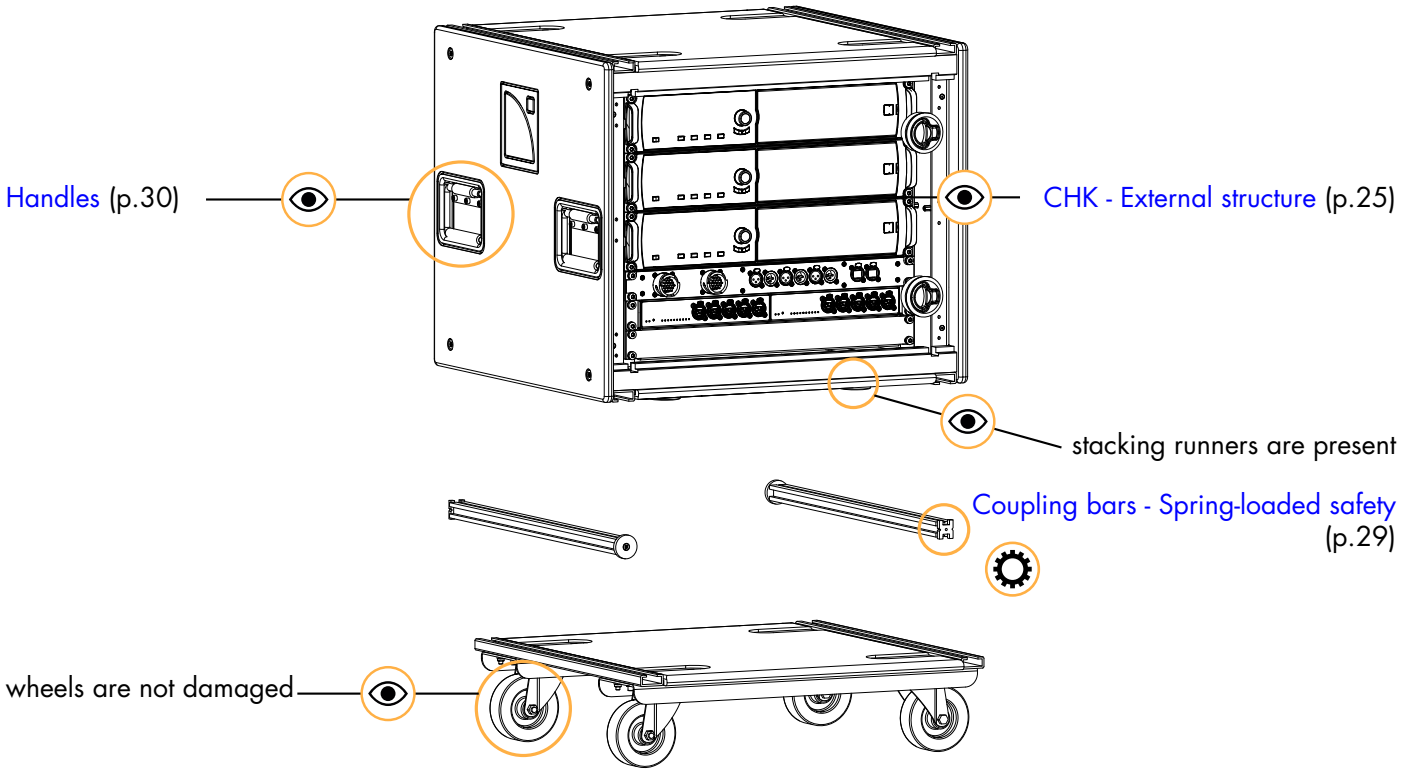
Perform the Rigging part inspection (p.19) on critical parts.
For each part, refer to the Preventive maintenance references (p.29).

Replacing screws
If a screw is loose, remove and replace it.
Always use the new screws provided in the repair kit.
If no new screw is available, add blue threadlocker before reusing the screw.
Do not apply more than the indicated torque.

LA-RAK II AVB under LA-RAK BUMP



LA-RAK II AVB stacked on dolly board



LA-RAK II AVB - Structure and internal components

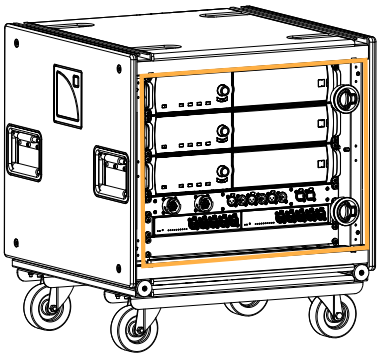
Procedure

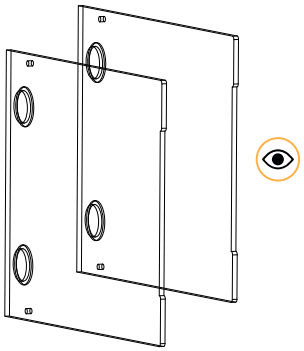
Visually inspect the mechanical assembly and rigging parts for obvious damage or lost parts.

a) Check the RK9U internal frames and electric/electronic devices mounted on it, their screws and washers
b) Check the cables and make sure they are not damaged or bent.
c) Check the connectors and make sure the pins are not bent.
d) Check the contact quality and locking action of all the LA-PANEL II and LS10 sockets (CA-COM, XLR3 and etherCON).
e) Check the contact quality of all the LA-POWER II power plug and sockets.

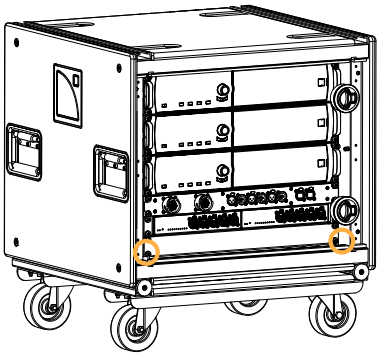
LA-RAK II AVB components

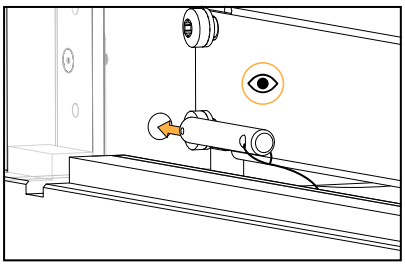
Physical parts





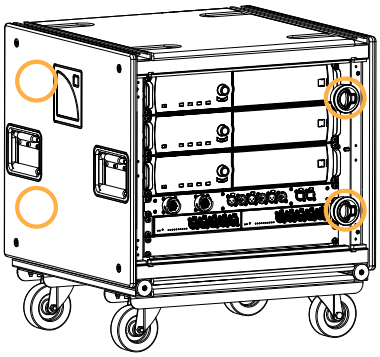
doors are not damaged

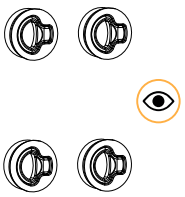




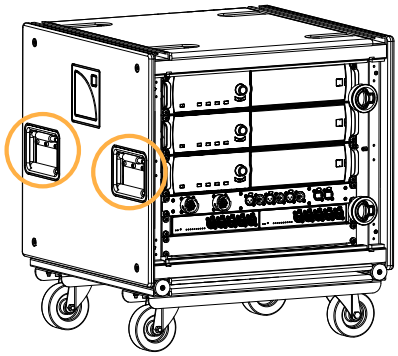
door locking pins are present

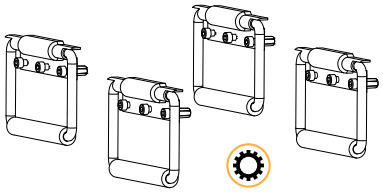
sling is present





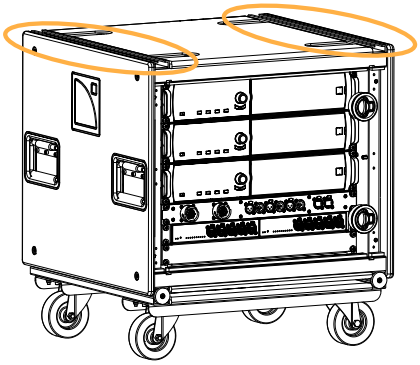
door locks are present

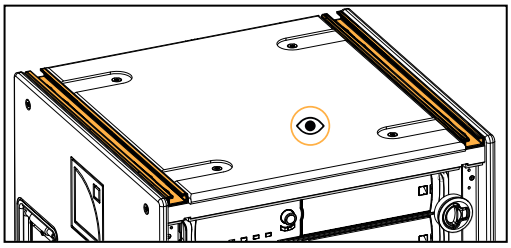




handles springs are not damaged

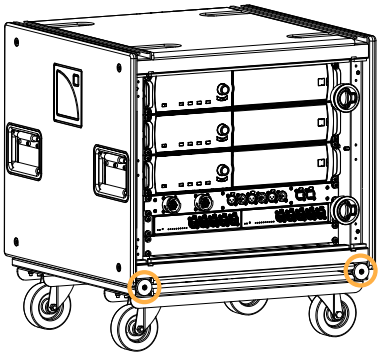
Handles (p.30)





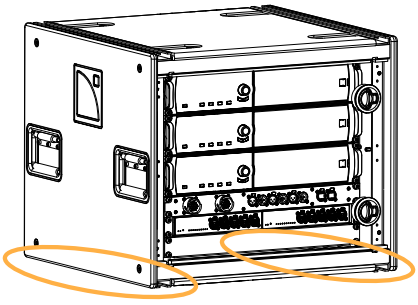
top rails are not damaged

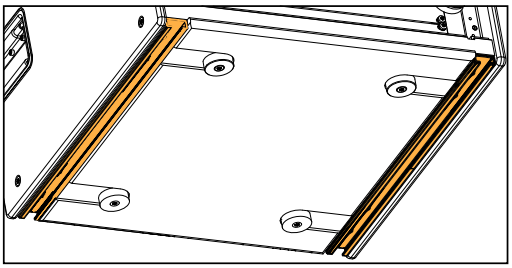
screws are tightened



coupling bars are present

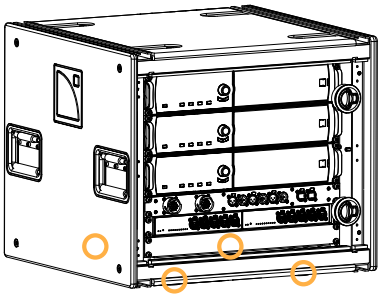
Coupling bars - Spring-loaded safety (p.29)

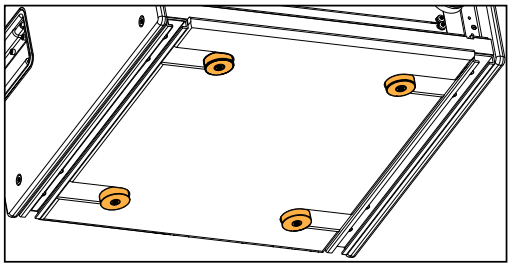




bottom rails are not damaged

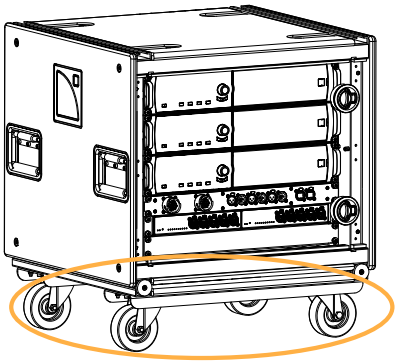
screws are tightened

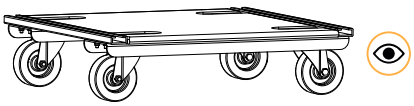




screws are tightened

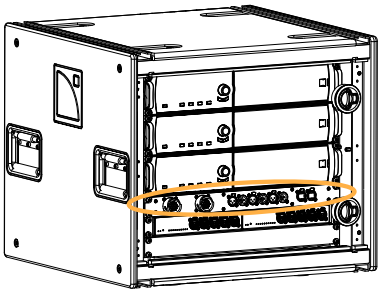
stacking runners are present and not damaged





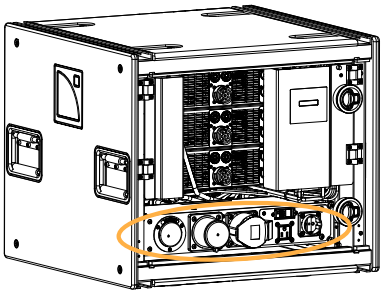
wheels are not damaged

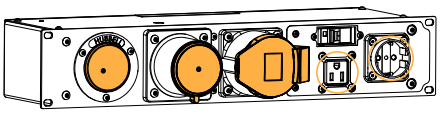
Electronic parts



LA-PANEL II is present

ports are not damaged

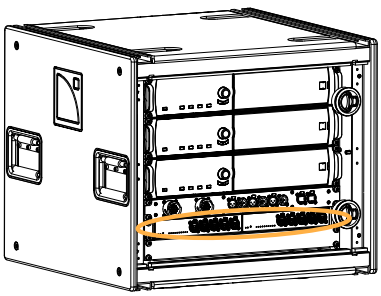


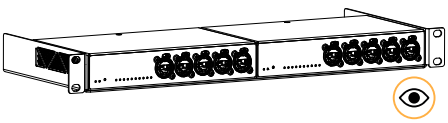


LA-POWER II is present

covers are not damaged or missing

plugs are not damaged





switches are present

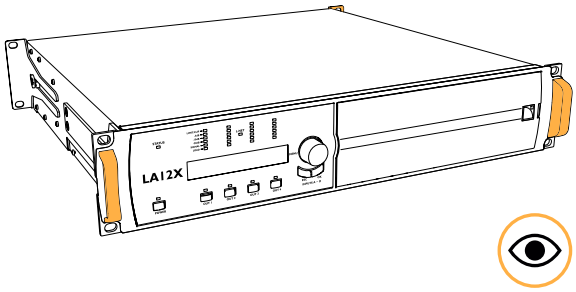
ports are not damaged

rackshelf is present and not damaged

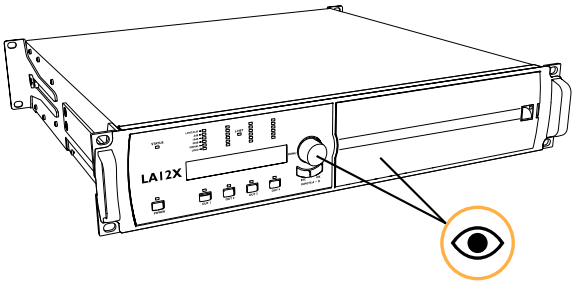
Amplified controllers

CHK - External structure

The indicates a visual inspection.

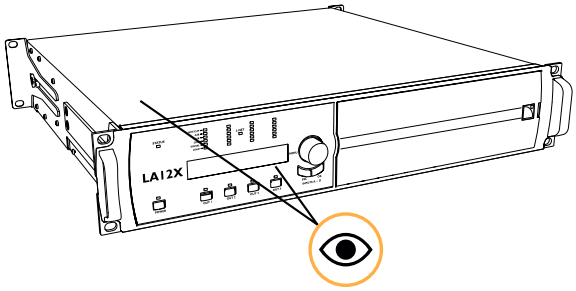


front handles are present and not damaged

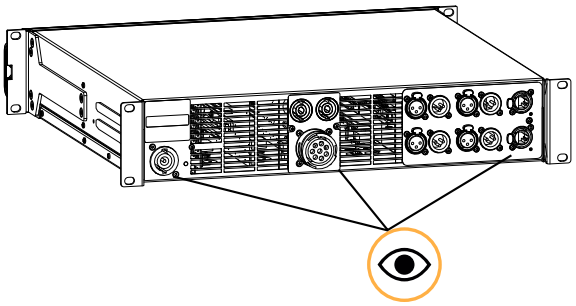


encoder wheel, and grill and foam filter are present and not damaged

see also CHK - Cleanness (p.25)



chassis, Lexan plate, LCD screen, and LEDs are not damaged



connectors are not damaged

CHK - Cleanness

Equipment

- air blower

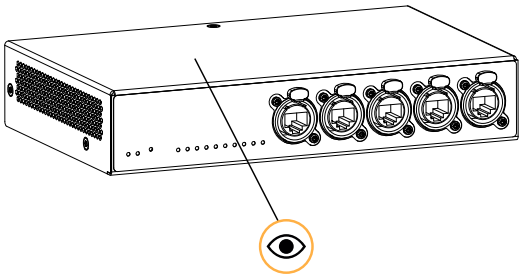
Procedure

1. Disassemble the grill to clean the foam filter.
   Refer to the D/R - Grill and foam filter (p.61) procedure.
2. Clean the amplified controller through the front grill with an air blower.
3. Reassemble the foam filter and the grill.

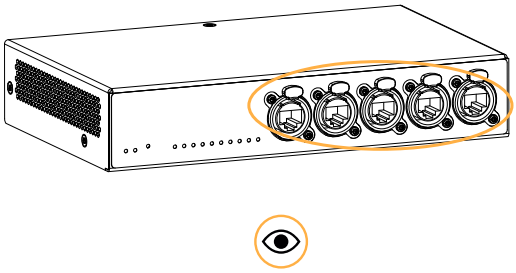
LS10

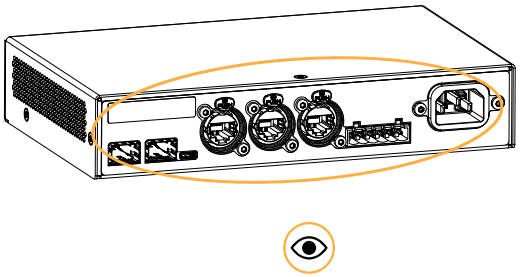
External structure

The icon indicates a visual inspection.



chassis is not damaged





front and rear connectors are not damaged

Cleanness

Use a dry cloth to remove any dust from the side grills.

Functional checks

Normal start-up sequence

Procedure

1. Plug LA-POWER II to mains.
2. Check that AUX circuit breaker is enabled.
3. Power on the amplified controllers.
4. Check that the LCD screen and all the LEDs lit during the start-up sequence.
5. Check that the power LED of LS10 lits.

Network functionalities and firmware

Equipment

- computer with LA Network Manager version 3.1.0 minimum and CAT5e U/FTP cable

Procedure

1. Connect the rack to an Ethernet port of a computer running LA Network Manager.
   Use the CAT5e cable.
2. Run LA Network Manager.
3. Check that the amplified controllers are detected as online Units.
   Refer to the **LA Network Manager Help**.
4. Check that all LA12X in the system run the same version of the firmware, and that it matches with the version of LA Network Manager in use.
   Refer to the **LA NWM and Firmware Compatibility Issues** technical bulletin.
5. If convenient, update LA Network Manager and the firmware to the latest versions.

   If using a third-party control system such as Crestron or Extron, check that updating firmware does not break compatibility.

LS10

Network functionalities and firmware

Equipment

- a computer with LA Network Manager version 3.1.0 minimum and an appropriate network cable (CAT5e, DOE, etc.).

It is recommended to use the latest version of LA Network Manager and the firmware.

Prerequisite

Refer to the **LS10 owner's manual** for more information on the use of the LS10 Manager.

Procedure

1. Plug LS10 to mains.
2. Connect LS10 to an Ethernet port of a computer running LA Network Manager.
   Use the network cable.
3. Open the LS10 Manager application.
   a) Open LA Network Manager.
   b) Click > **Utilities** > **LS10 Manager**.
      Refer to the **LA Network Manager help** for more information.
   c) Scan the network.

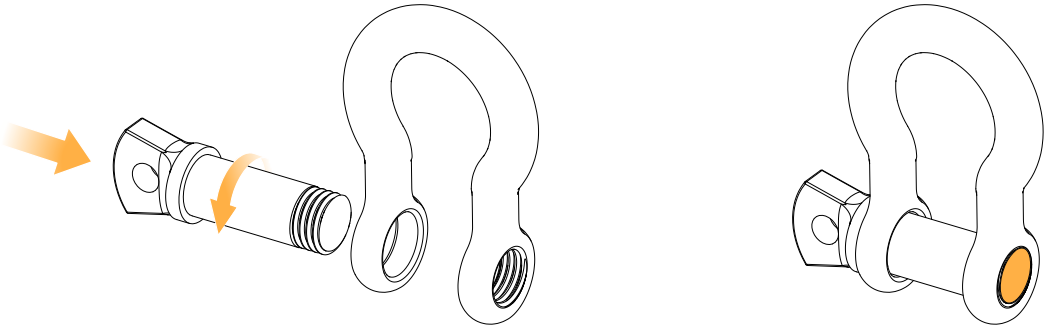
4. Check that the switch is detected by the application.
5. Perform the firmware update.
6. Check that all L-Acoustics switches in the system run the same version of the firmware.

Preventive maintenance references

Shackles

Moving parts

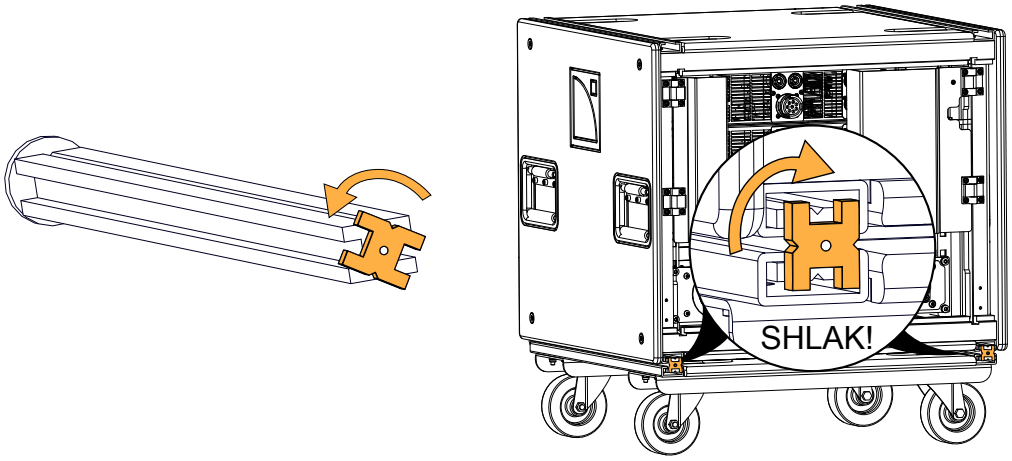
Drive the shackle axis in its lodging. Make sure that the end is flush with the shackle.



Coupling bars - Spring-loaded safety

Moving parts

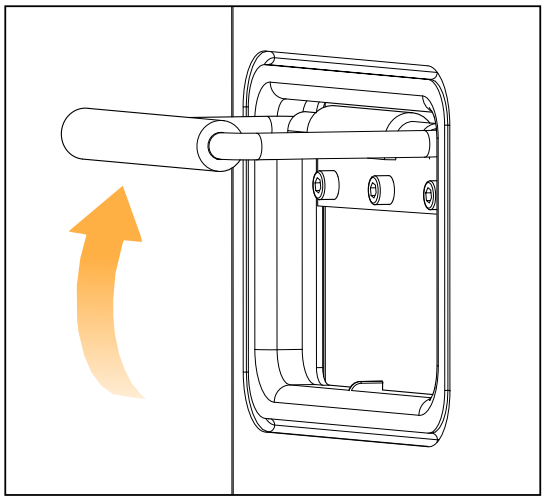
Turn the spring-loaded safety. Make sure that it quickly returns to its storage position.

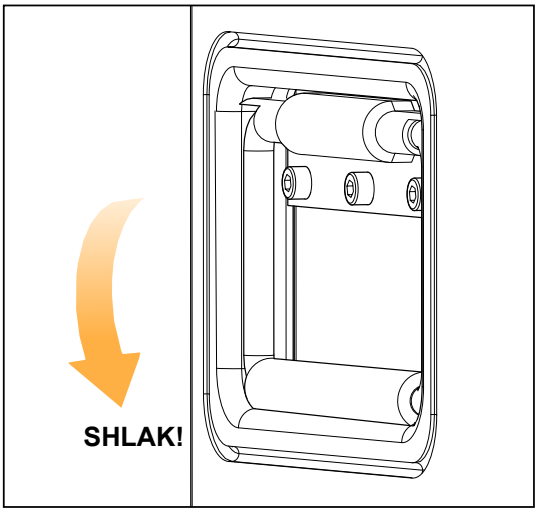


Handles

Moving parts

Pull the handles. Once released, make sure that the handles quickly return to their storage position.





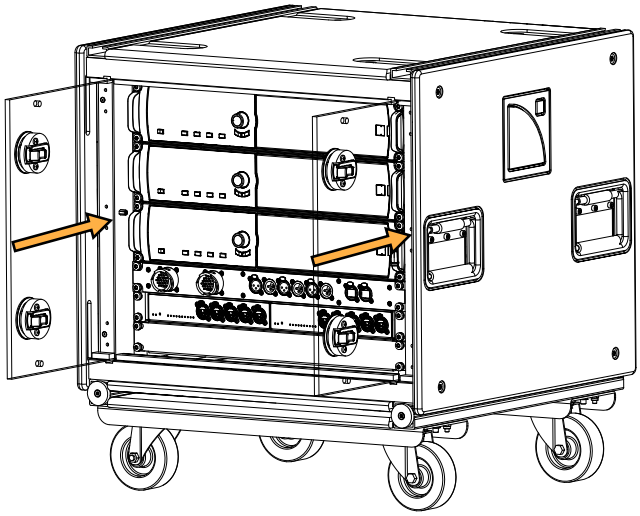
Rigging procedures

Storing the LEXAN doors

Procedure

1. Pull on the handles to detach both doors.
2. Facing the LA-RAK II AVB, 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.

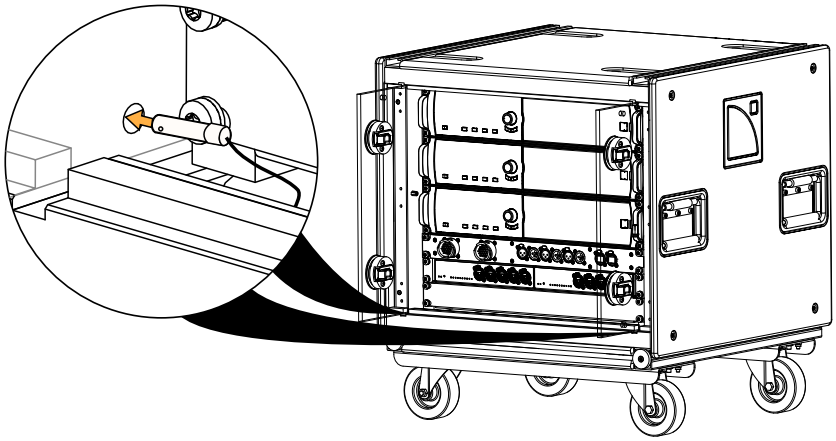


3. Insert and lock the ball-locking pins through each door's safety hole to secure the doors.

Safety pin

Make sure the doors are inserted all the way before securing the pin.

The safety hole must be inside the inner frame.



Stacking LA-RAK II AVB

Type of deployment	stacked array
Min number of operators	2

Additional safety for stacked arrays
Secure the stacked LA-RAK II AVB assembly to the structure, platform, or stage using ratchet straps or any other applicable device.

Risk of falling objects
Verify that no unattached items remain on the product or assembly.

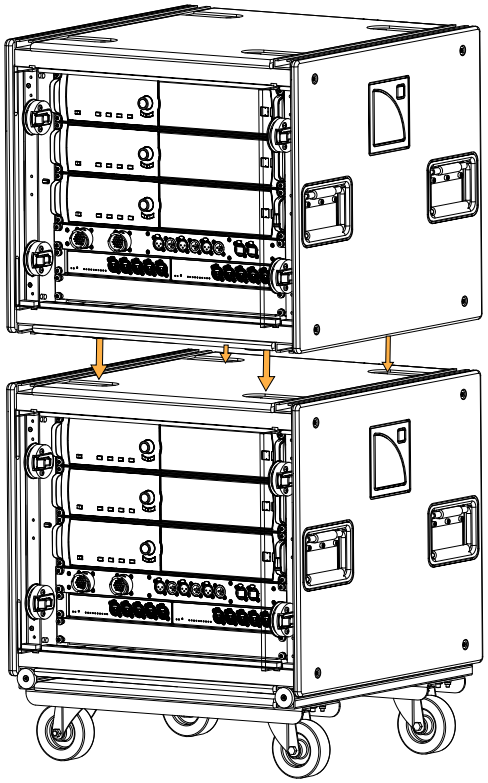
Assembly

Procedure

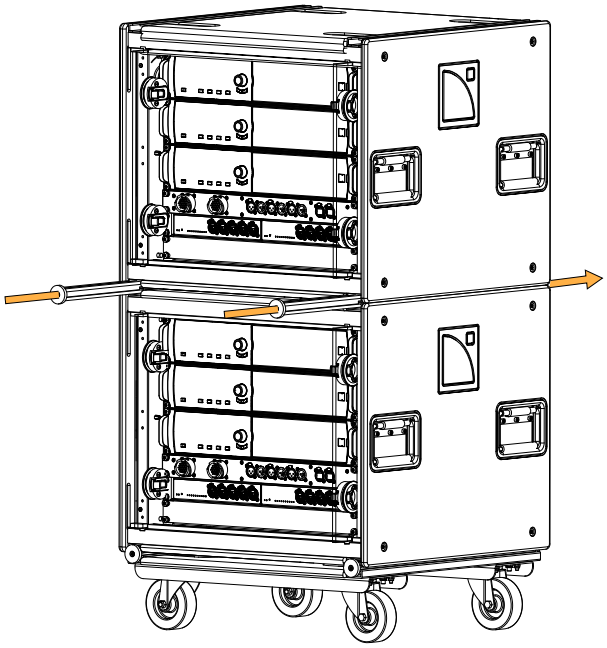
1. Position a first LA-RAK II AVB at the stacking location.
2. Bring a second LA-RAK II AVB and remove its dolly board.
3. Lift up the second LA-RAK II AVB and install it on the first one.

Runners inspection
Make sure the stacking runners are not damaged or worn-out before stacking the LA-RAK II AVB.

Align the rails and set the stacking runners into the runner guides.



4. Secure the second LA-RAK II AVB to the first one using the coupling bars.



Make sure that each spring-loaded safety is in locking position.

5. Repeat steps 2 (p.32) to 4 (p.33) until the stack is complete.

Flying LA-RAK II AVB

Type of deployment	flown array
Rigging accessories	LA-RAK BUMP
	2 x Ø19 mm shackles WLL 3.25 t
Min number of operators	2

Additional safety for flown arrays
Secure the LA-RAK II AVB flown array to the main structure using the safety point on the LA-RAK BUMP and a steel rope.

Risk of falling objects
Verify that no unattached items remain on the product or assembly.

Assembly

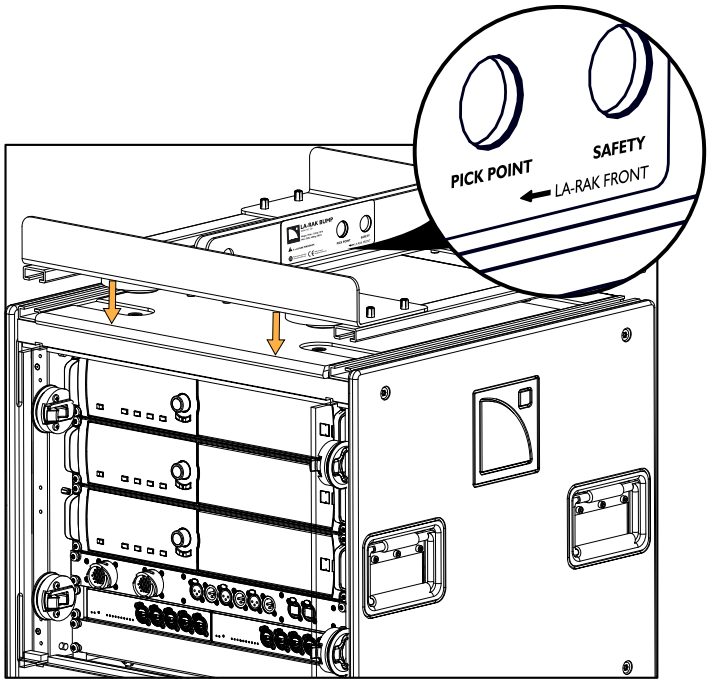
Procedure

Runners inspection
Make sure the stacking runners on the LA-RAK BUMP are not damaged or worn-out.

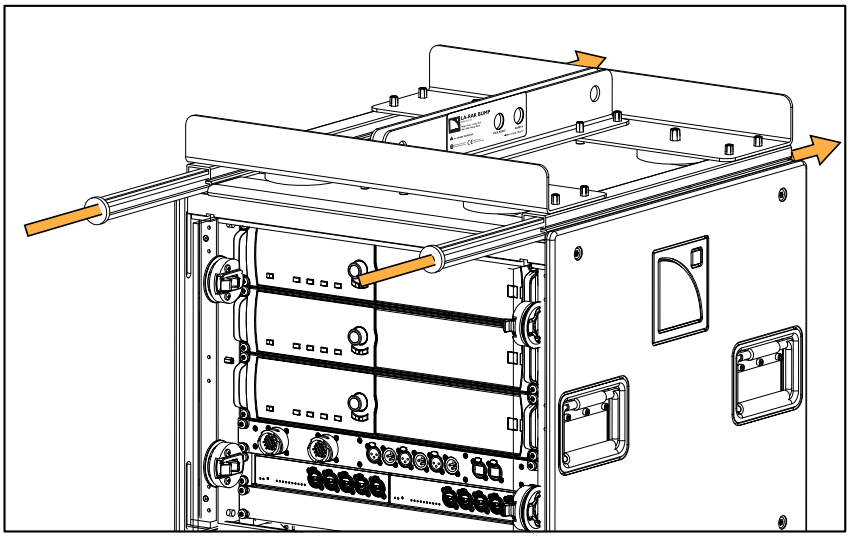
1. Install an LA-RAK BUMP on LA-RAK II AVB.

LA-RAK BUMP orientation
Respect the orientation indicated on the LA-RAK BUMP label.

Align the rails and set the stacking runners into the runner guides.



2. Remove the dolly board and secure the LA-RAK BUMP to the LA-RAK II AVB using the coupling bars.



Make sure that each coupling bar spring-loaded safety is in locking position.

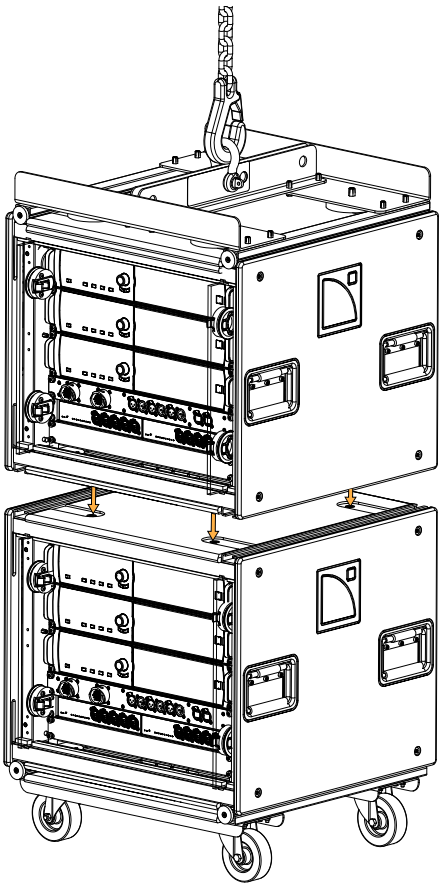
3. Lift the assembly with a shackle attached to the pickup point.

The dolly board should separate from the array.

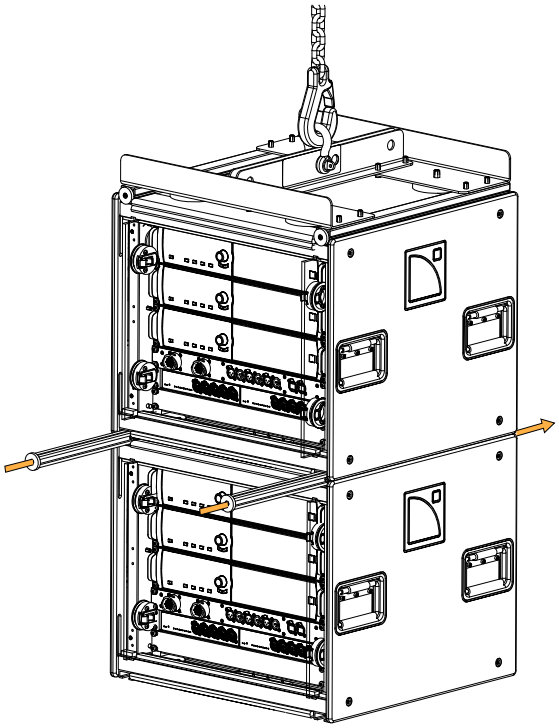
4. Prepare a second LA-RAK II AVB for lifting.
Refer to steps 1 to 3 of this procedure.

Runners inspection
Make sure the stacking runners on the top LA-RAK II AVB are not damaged or worn-out.

5. Position the LA-RAK II AVB under the assembly and lower the assembly until it rests on the LA-RAK II AVB.



6. Remove the dolly board and secure the two LA-RAK II AVB using the coupling bars.



Make sure that each coupling bar spring-loaded safety is in locking position.

7. Lift the assembly and repeat the procedure until the array is complete.

Operation

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 owner's manual**.

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

Do not expose LA-RAK II AVB to temperature below -5 °C / 23 °F or above 50 °C / 122 °F.

Do not expose LA-RAK II AVB to wet or salt environments.

Refer to Inspection and preventive maintenance (p.18) for more information on the LA-RAK II AVB maintenance and the cleanness process of the amplified controllers.

Cleanness

Before operation, make sure LA-RAK II AVB is clean and dust free.

Connecting to AC mains

The power supply feeding LA-RAK II AVB must be equipped with circuit breakers meeting the following requirements:

There must be one dedicated circuit breaker for each phase (no mechanical link between phases).

Use these references, or equipment with equivalent characteristics:

100-120 V (US MODE): 30 A, Schneider Electric Square D 30A QO (in North America), or Mitsubishi CP30-BA-M (in Japan).

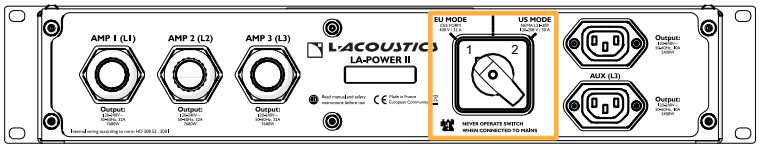
220-240 V (EU MODE): 32 A, Type C.

Circuit breakers of different characteristics could trip in case of short-term, high current draw, because they do not match LA12X Fuse Protect algorithms.

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 mains 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 AVB can be plugged in the female link socket to be powered in parallel.

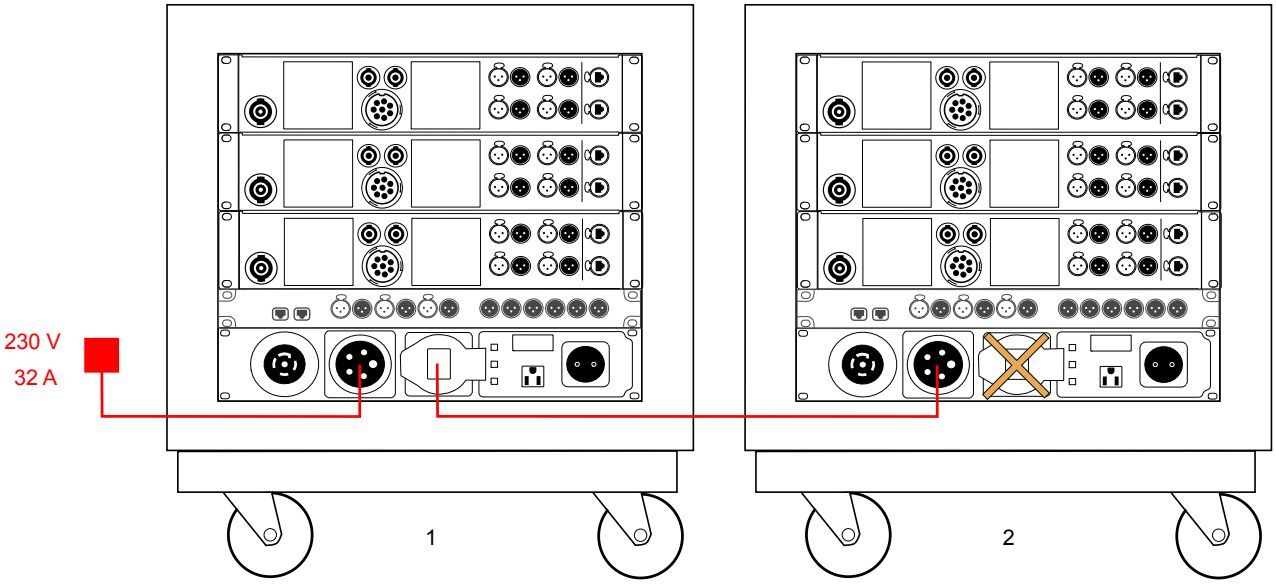
Do not power LA-RAK II AVB racks in parallel on mains ratings other than 230 V (± 10%).

Do not use the female link socket on other ratings.

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

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

Connecting two racks to AC mains in EU mode



Place socket covers on unused sockets.

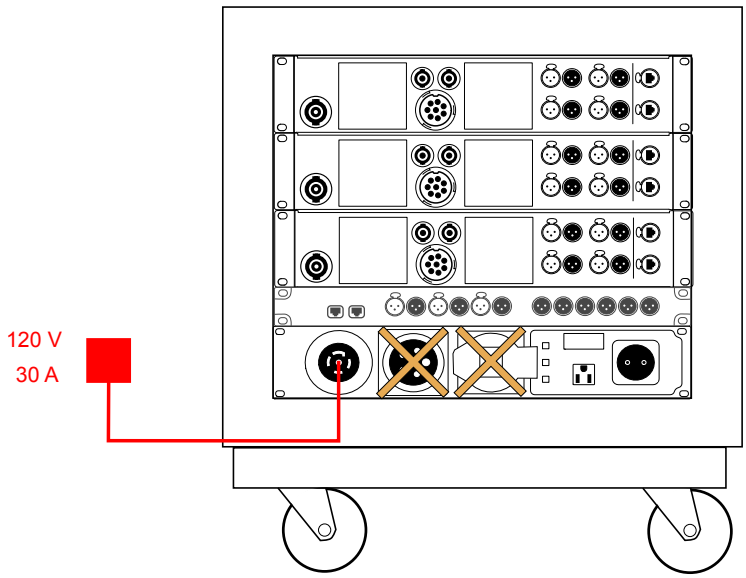
US mode

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 AVB from the same AC mains outlet.

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

Connecting a rack to AC mains in US mode



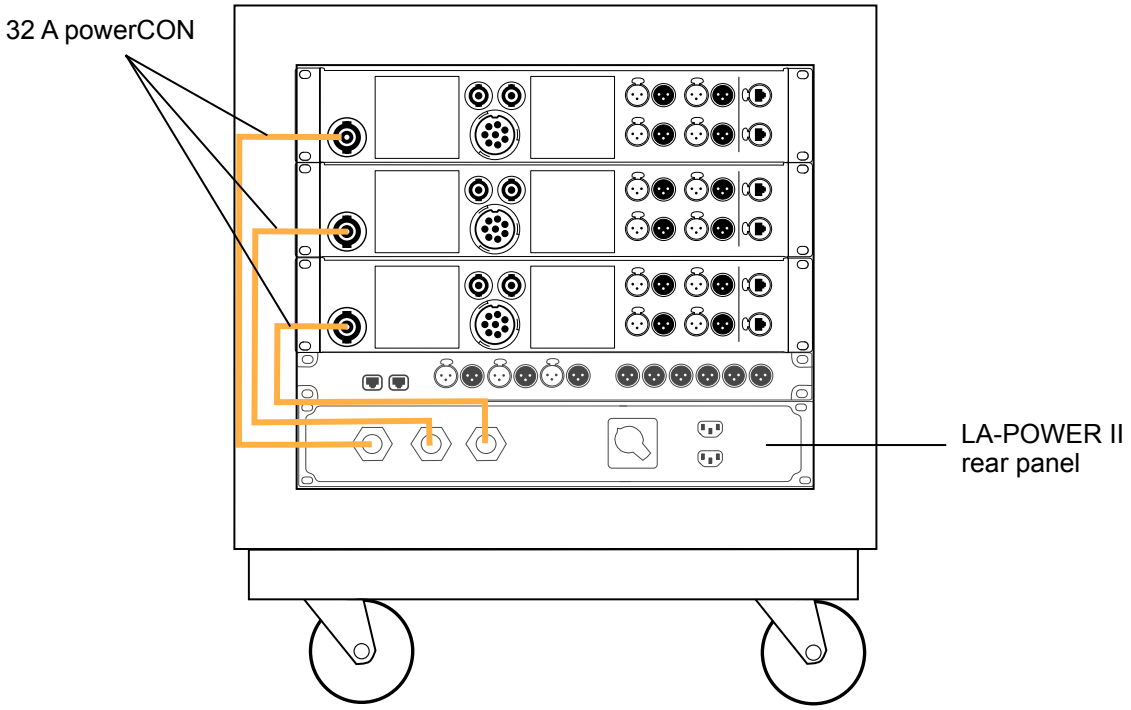
Place socket covers on unused sockets.

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

controllers mounted in the LA-RAK II AVB. Three dual LEDs help monitor the presence of each phase on the front of the LA-POWER II.

Powering the three amplified controllers (any mode)



If the AC 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 power laptops or other devices equipped with country-specific plugs only.

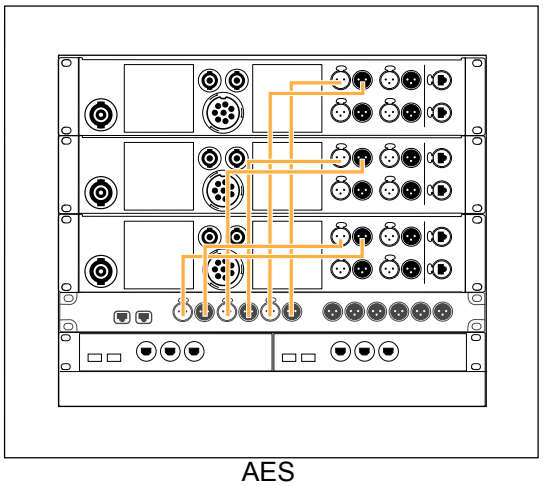
Auxiliary sockets power

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

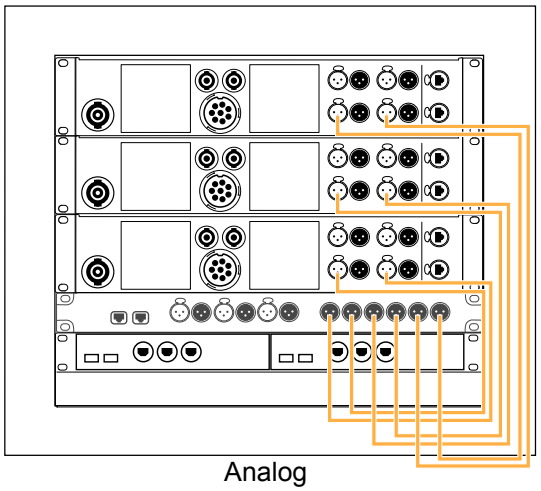
Check that the overall consumption does not exceed LA-POWER II maximum capacity.

Audio cabling

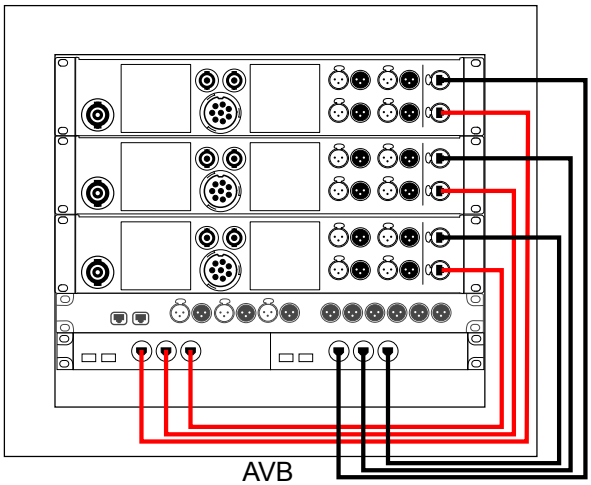
LA-RAK II AVB is cabled as follows:



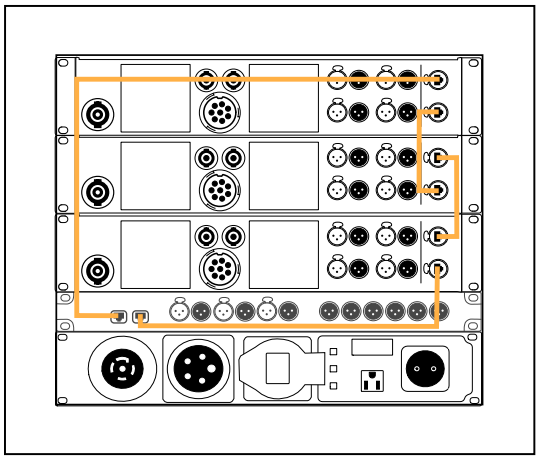
AES



Analog



AVB



L-NET

Different cabling schemes are available in Analog mode. Refer to Analog audio cabling (p.41) for more cabling options.

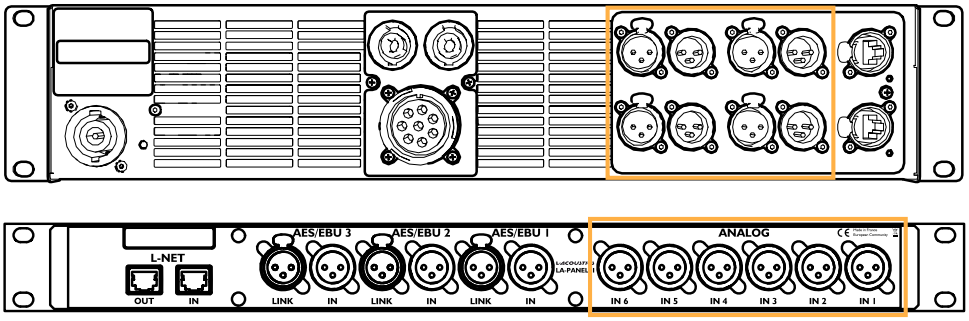
Analog audio cabling

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

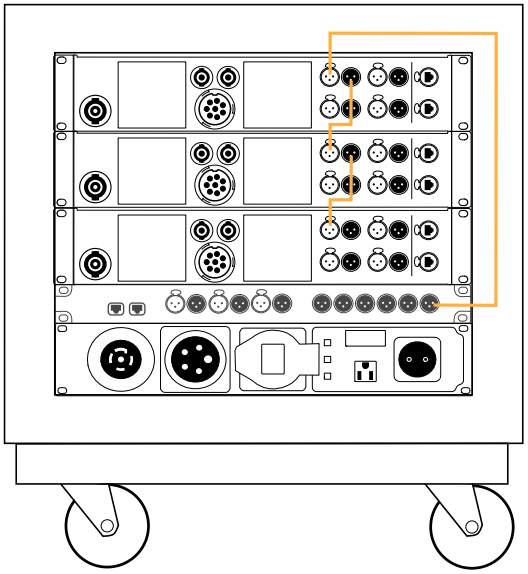


Several internal audio cabling schemes are possible. Two are shown in this manual.

Cabling scheme A

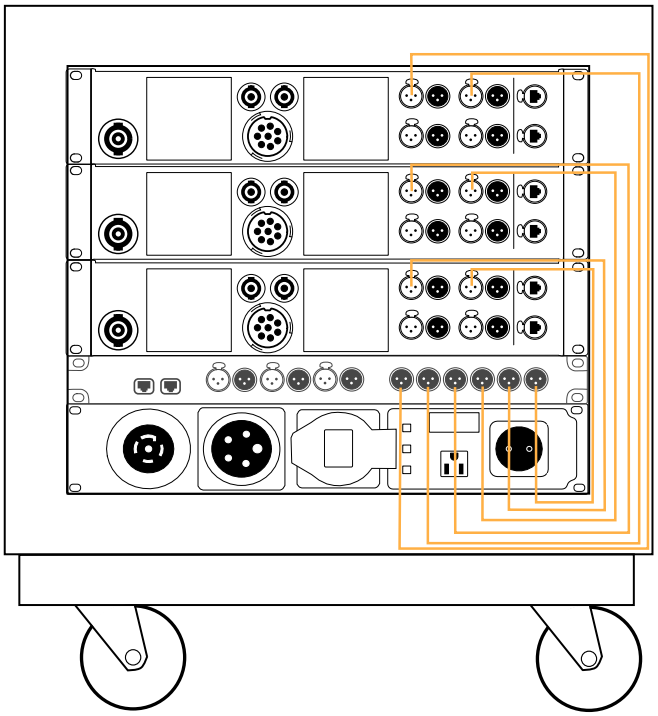
One audio signal is routed from channel 1 to the analog IN A on the first amplifier. LINK A / IN A cabling is then used to cascade all three LA12X.

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



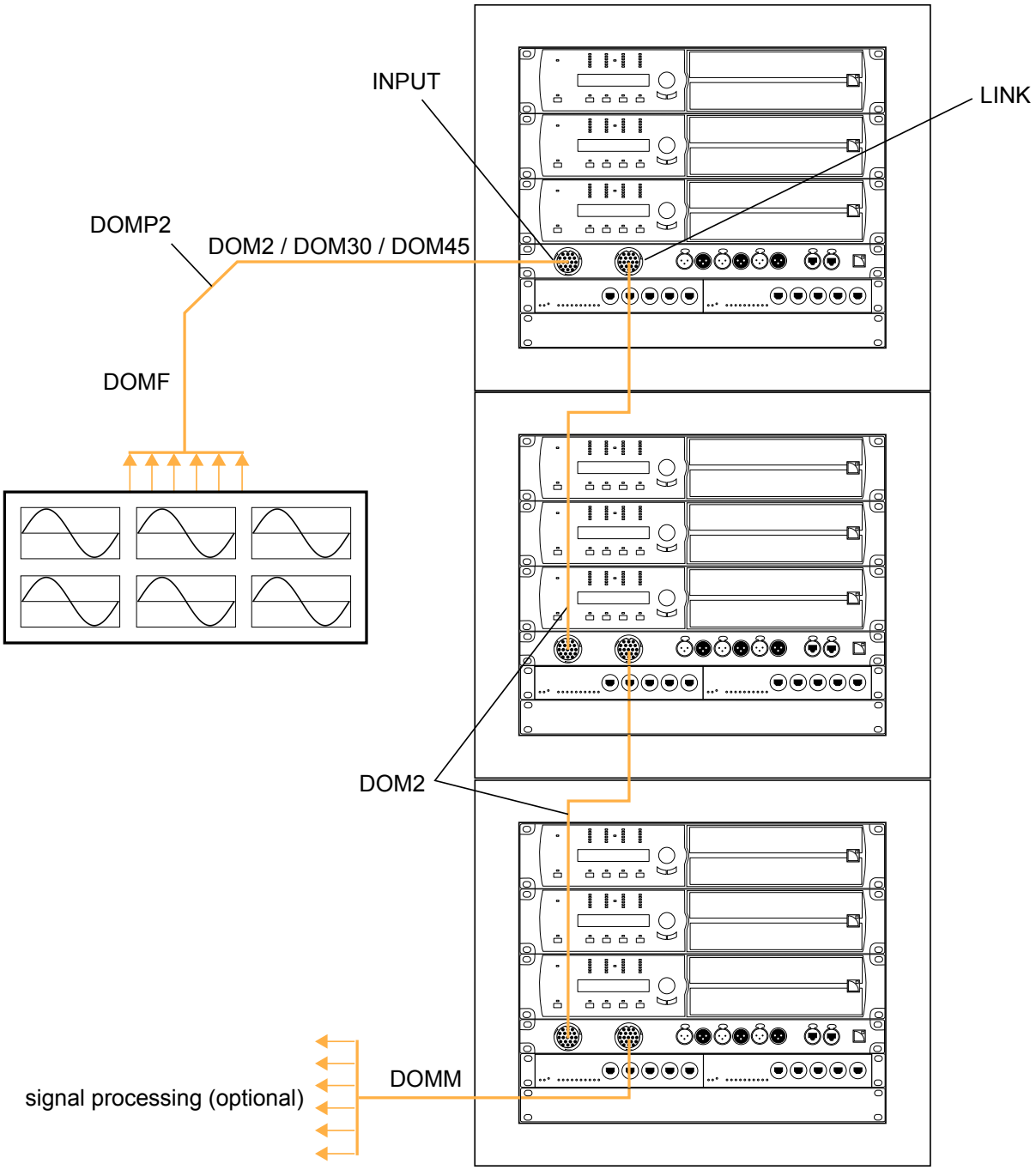
External analog audio cabling

With analog audio, external cabling uses a constant scheme that allows feeding a LA-RAK II AVB or a daisy-chain of several LA-RAK II AVB with up to 6 signals. For any LA-RAK II AVB, 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 AVB.

An LA-RAK II AVB 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 AVB.

The six analog audio signals can also be routed from the last LA-RAK II AVB 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 AVB) 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 AVB 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 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

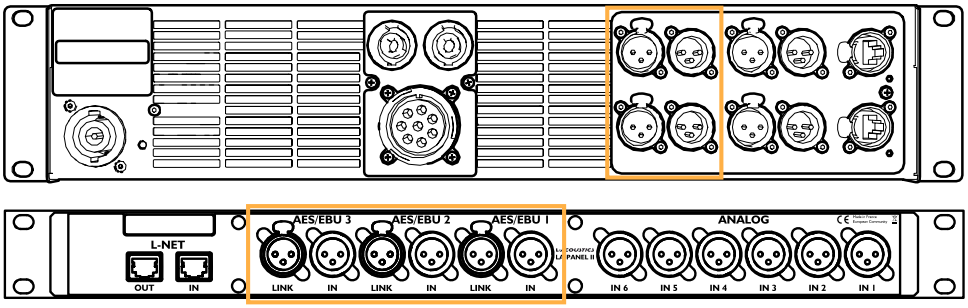
Digital audio cabling

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.

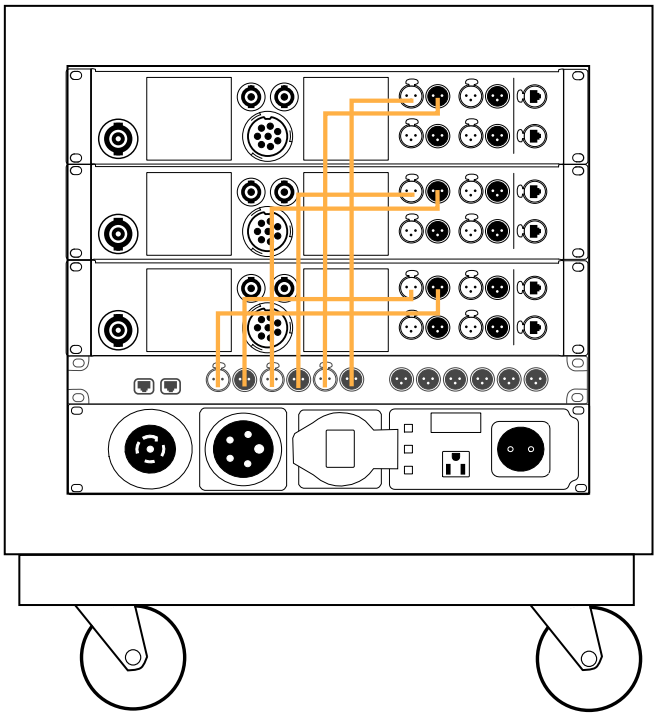
Internal digital audio cabling

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.



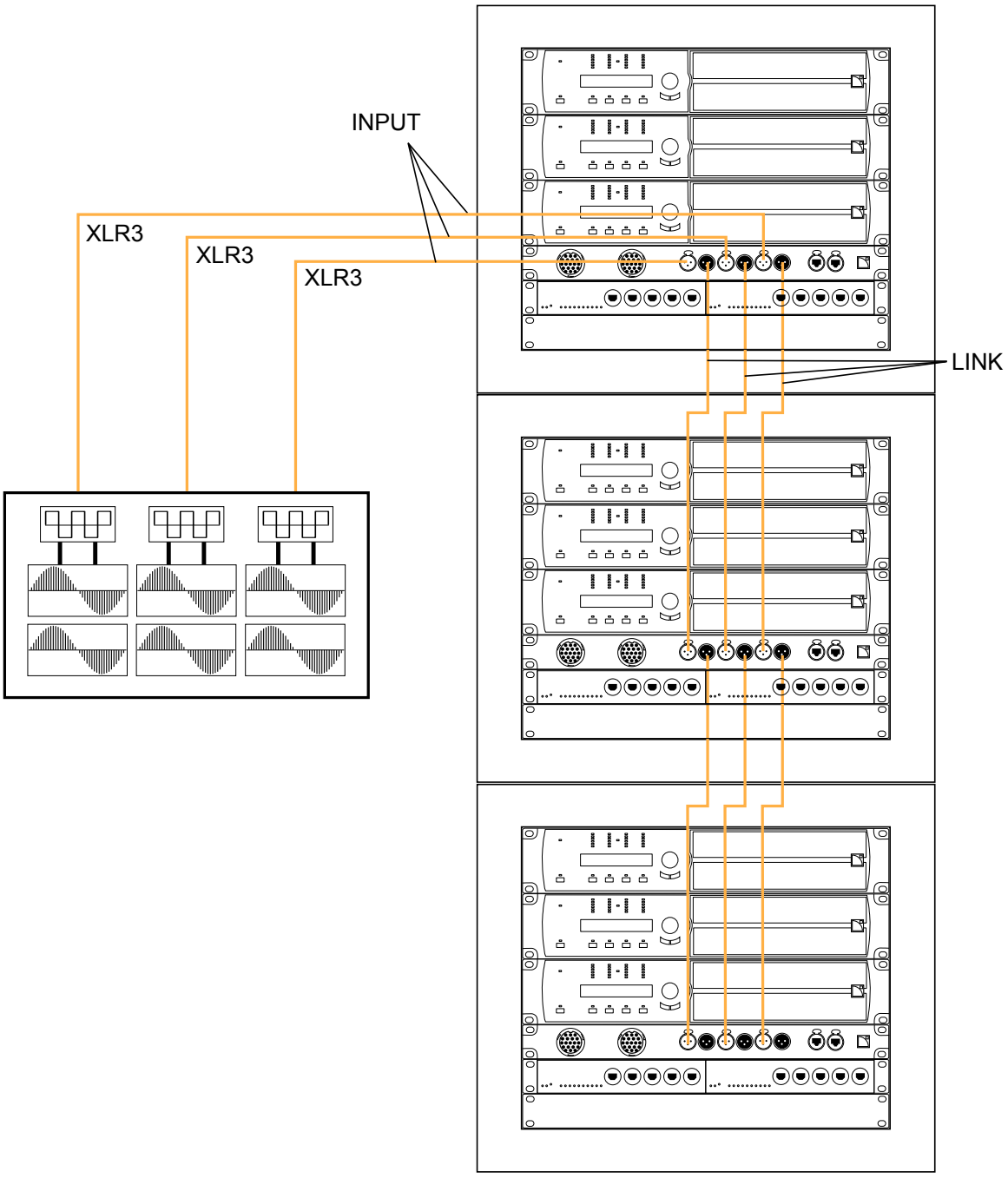
External digital audio cabling

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.

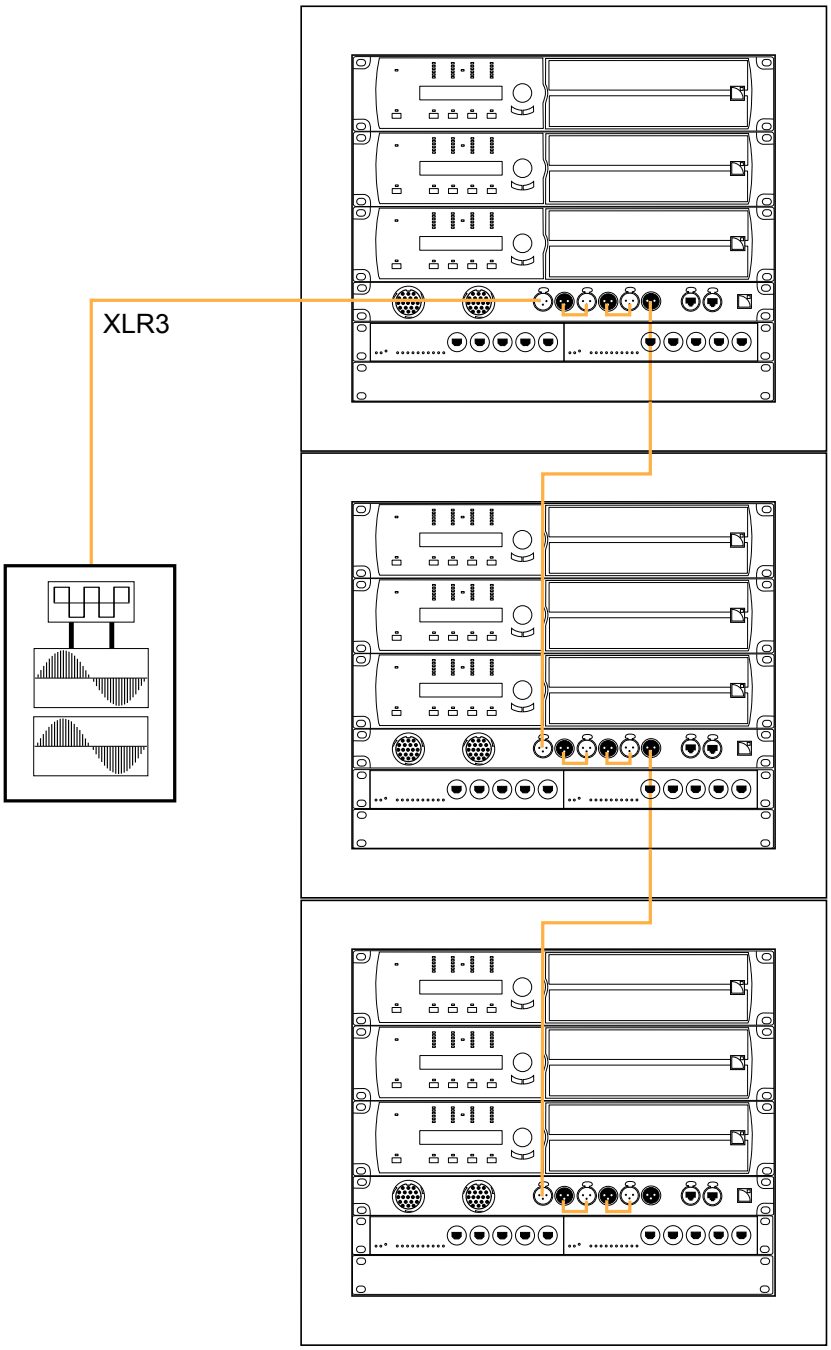
Up to six digital audio signals can be routed from an AES/EBU digital audio source (mixing console or EQ device) to the LA-PANEL II through three XLR cables, each one conveying two channels.

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 Ω ± 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 very short distances.

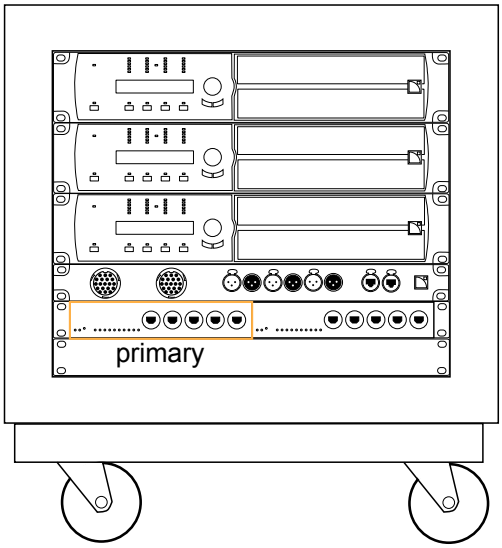
It is recommended to use single lengths of cable between AES/EBU outputs and inputs. Using several shorter cables joined together reduces performance. If it is not possible to use single lengths, it is required to use the same model of cable between two AES/EBU interfaces.

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 discarded by the SRC to 96 kHz.

AVB audio and control cabling

LA-RAK II AVB is designed to enable AVB Milan seamless network redundancy by embedding two LS10 Avnu™-certified AVB switches. See avnu.org for more details about Milan seamless network redundancy specifications.

The left LS10 (as viewed from the front of LA-RAK II AVB) pertains to the Primary network.



By convention, black Ethernet cables are used to connect it to the first port of each LA12X using ports 8, 9 and 10 at the back of LS10. Similarly, the right LS10 (as viewed from the front of LA-RAK II AVB) pertains to the Secondary network. By convention, red Ethernet cables are used to connect it to the second port of each LA12X using ports 8, 9 and 10 at the back of LS10.

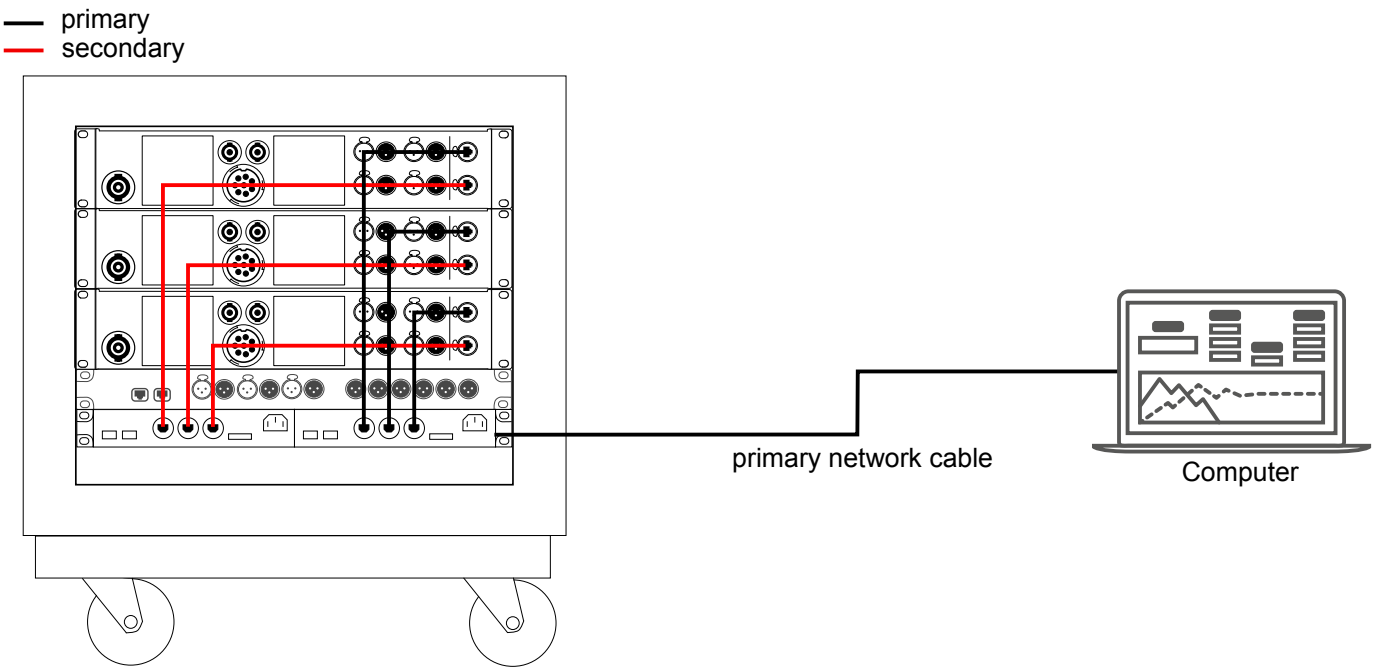
Daisy-chaining primary LS10 of multiple LA-RAK II AVB allows to easily create a Primary network. The same goes for secondary LS10.

LA Network Manager must be connected to the Primary network only.

Never connect the Primary Network and the Secondary Network together.
Never connect port 2 of LA12X to the Primary Network or port 1 to the Secondary Network.

Both LS10 are connected to the LA12X amplified controllers with three Cat 7 Ethernet cables with etherCON connectors. Red and black cables are used to make the networks recognizable.

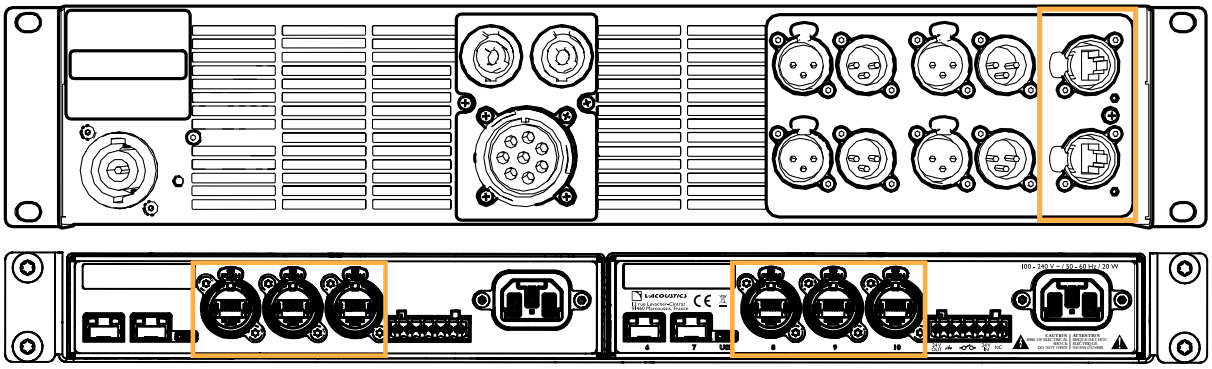
The LS10 of the primary network is connected to the computer running LA Network Manager.



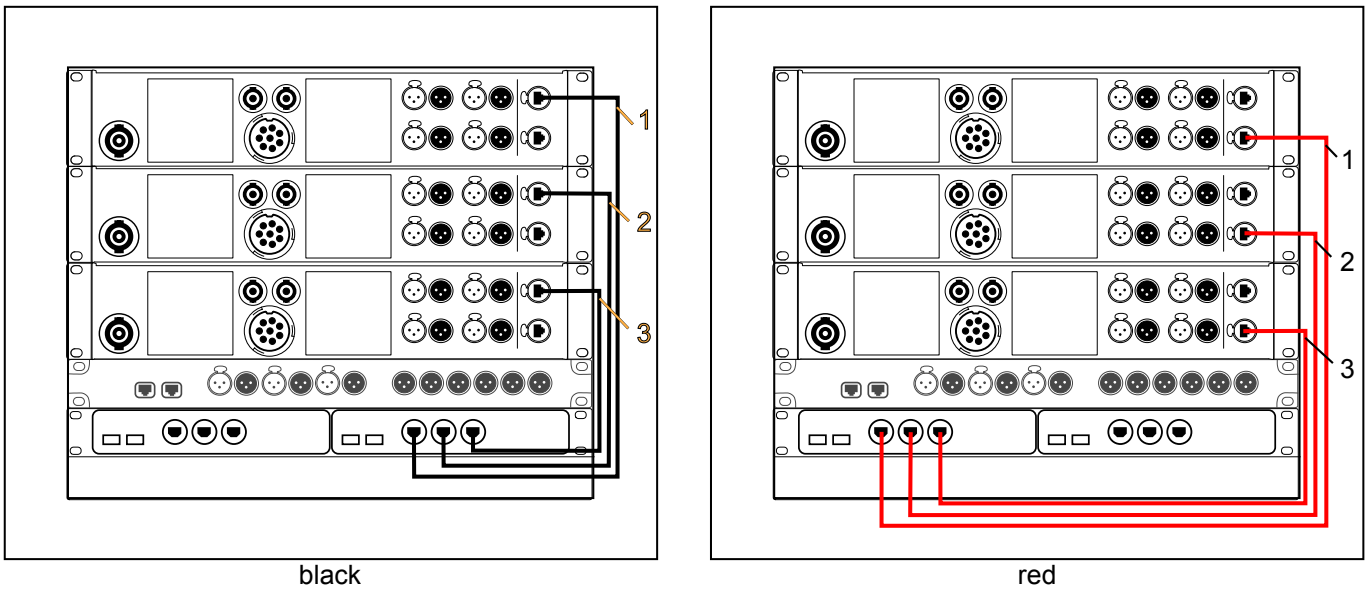
Internal AVB audio and control cabling

In order to create redundant networks inside LA-RAK II AVB, three Ethernet etherCON ports are connected at the rear of each LS10 and two at the rear of LA12X.

Ethernet etherCON I/Os ports on rear of LS10 and on the rear panel of LA12X



Internal AVB cabling with primary and secondary network



black red

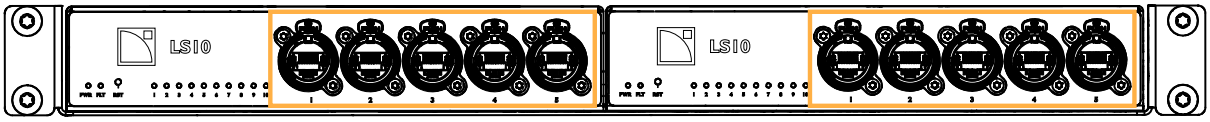
Six Ethernet etherCON cables are connected to LA12X. Red cables and black cables are used to distinguish the networks. Three first cables create a primary network (black). Three other cables create a secondary network (red).

Thanks to the redundant network star topology, each LA12X receive AVB audio from both networks simultaneously. If a failure somewhere in one of the networks happens, then AVB audio is still delivered by the other network and no audible artefact is heard. It remains also possible to additionally secure the signal distribution using LA12X automatic fallback to ANALOG or AES/EBU inputs.

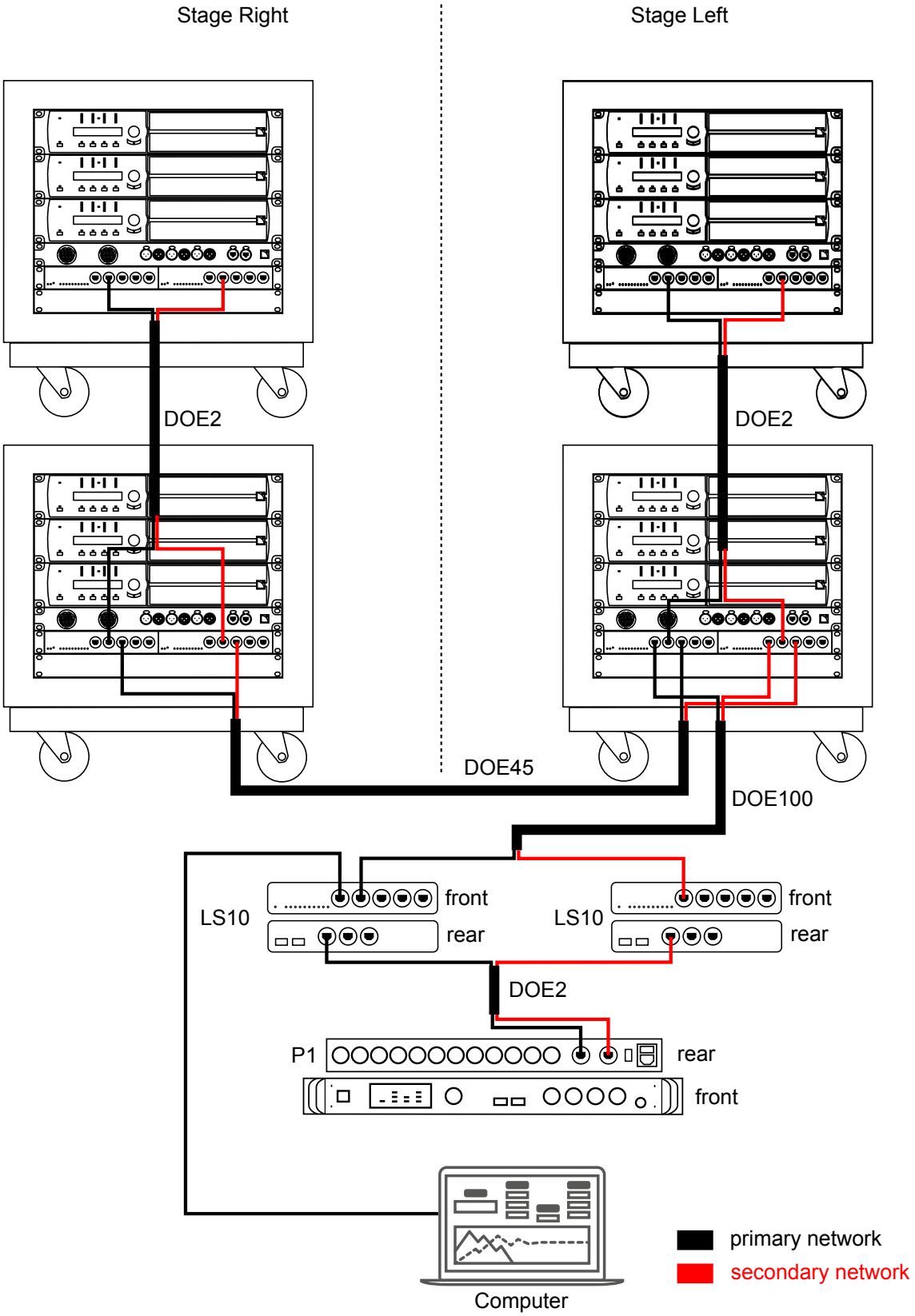
External AVB audio and control cabling

In order to create redundant networks with other switches from an external setup, five Ethernet etherCON ports can be used at the front of each LS10.

Ethernet etherCON I/Os ports on front of LS10



Redundant cabling scheme with LS10 and LA-RAK II AVB



It is also possible to connect together different LA-RAK II AVB that already have an internal AVB networking.

The primary LS10 is connected to the computer. Both LS10 are connected to each other and to P1. They are connected to a first LA-RAK II AVB that is daisy-chained with other LA-RAK II AVB.

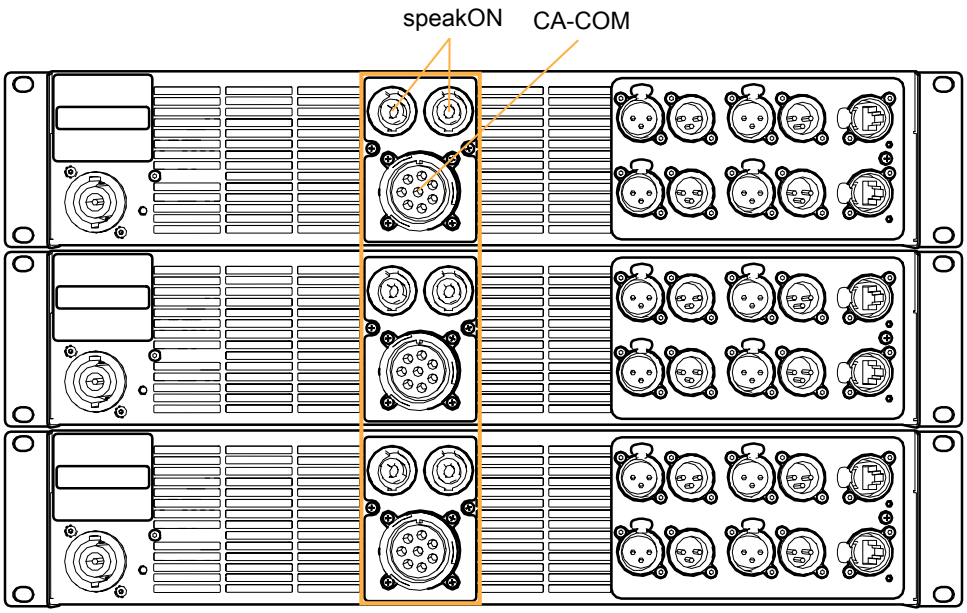
The LS10 are connected to each other with the 24 V DC pin of their 6-point terminal block so that one can take over the signal in case of internal power circuit fault.

Loudspeaker cabling

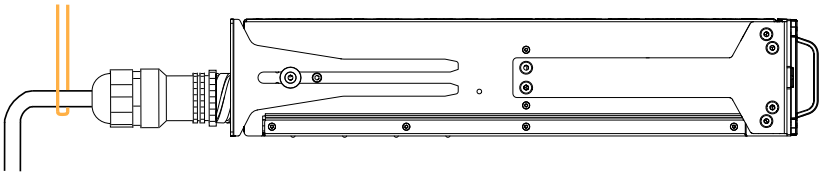
The rear side of the LA-RAK II AVB gives access to the output connection panel of each LA12X. For each amplifier, this panel features one CA-COM connector and two speakON connectors.

Refer to the system **user documentation** and the **LA12X** owner's manual before connecting an enclosure to LA-RAK II AVB.

Loudspeaker connectors



Consider supporting the cables connected to the 8-point outputs to reduce mechanical stress on the LA12X chassis, in particular when flying LA-RAK II AVB.



Corrective maintenance

Introduction

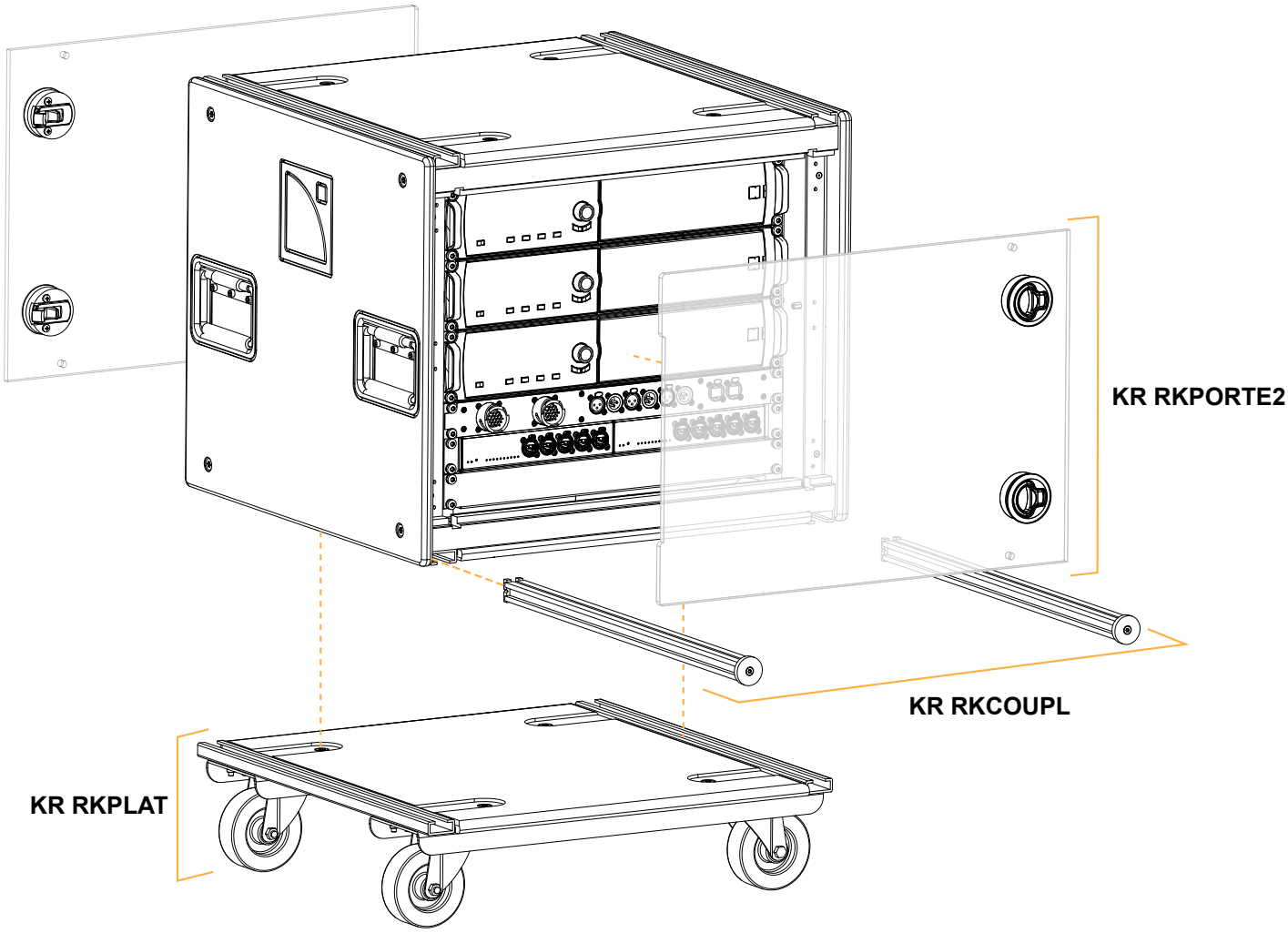
This section contains the following maintenance procedures:

- Mounting components on the RK9U inner frame (p.54)
- LA12X grill and foam filter (p.61)

For advanced maintenance, contact your L-Acoustics representative.

LA-RAK II AVB

Exploded view



Screws and fasteners repair kits

Name	Designation	Quantity
KR RKCACH	KR blank panels 1U LA-RAK II (AVB)	1
G03264	KR screws and washers LA-RAK II	5
G03260	KR tie wraps LA-RAK II (AVB)	1
KR CVECRCAGE2	KR cage nuts M6 LA-RAK II (AVB)	1
G03263	KR 3U spacers LA-RAK II (AVB)	1

Mounting components on the RK9U inner frame

Tools

- torque screwdriver
- T25 Torx bit
- T30 Torx bit

Repair kits

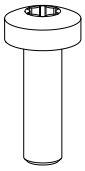
G03264 ×5*

KR screws and washers LA-RAK II

×40**

FT777

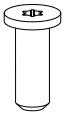
nylon washer Ø6 mm



×20

S100094

M6×20 Torx



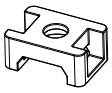
×20**

S100078

M6×16 Torx

G03260

KR tie wraps LA-RAK II (AVB)



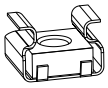
×10

FT010098

saddle type tie mount

KR CVECRCAGE2

KR cage nuts M6 LA-RAK II (AVB)



×100

S265

M6 cage nut

G03263

KR 3U spacers LA-RAK II (AVB)

×2

100914

3U spacer

* 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.

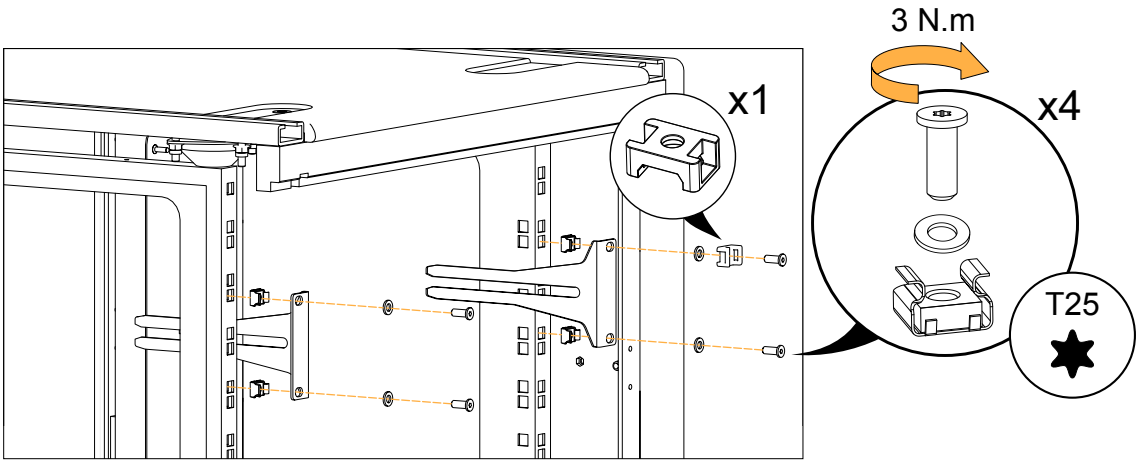
Any mechanical damage to the controller used in portable applications without rear support will not be covered by warranty.

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 M6 cage nuts, four nylon washers and four M6×16 Torx screws.

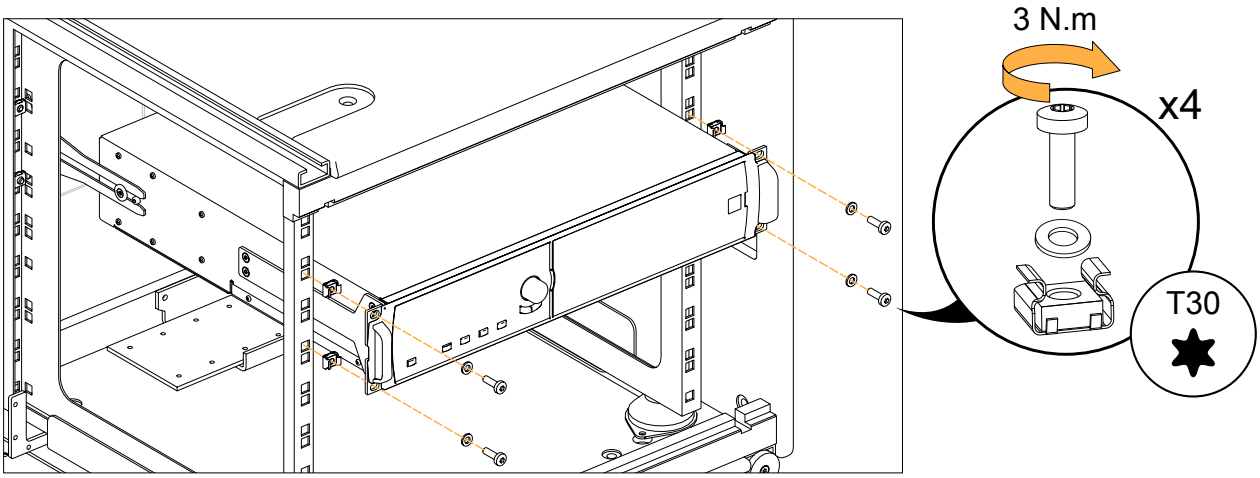
On the top right, also use one saddle type tie mount.



b) Slide the LA12X on its rear brackets from the front face of the rack.

c) Mount the LA12X to the inner frame.

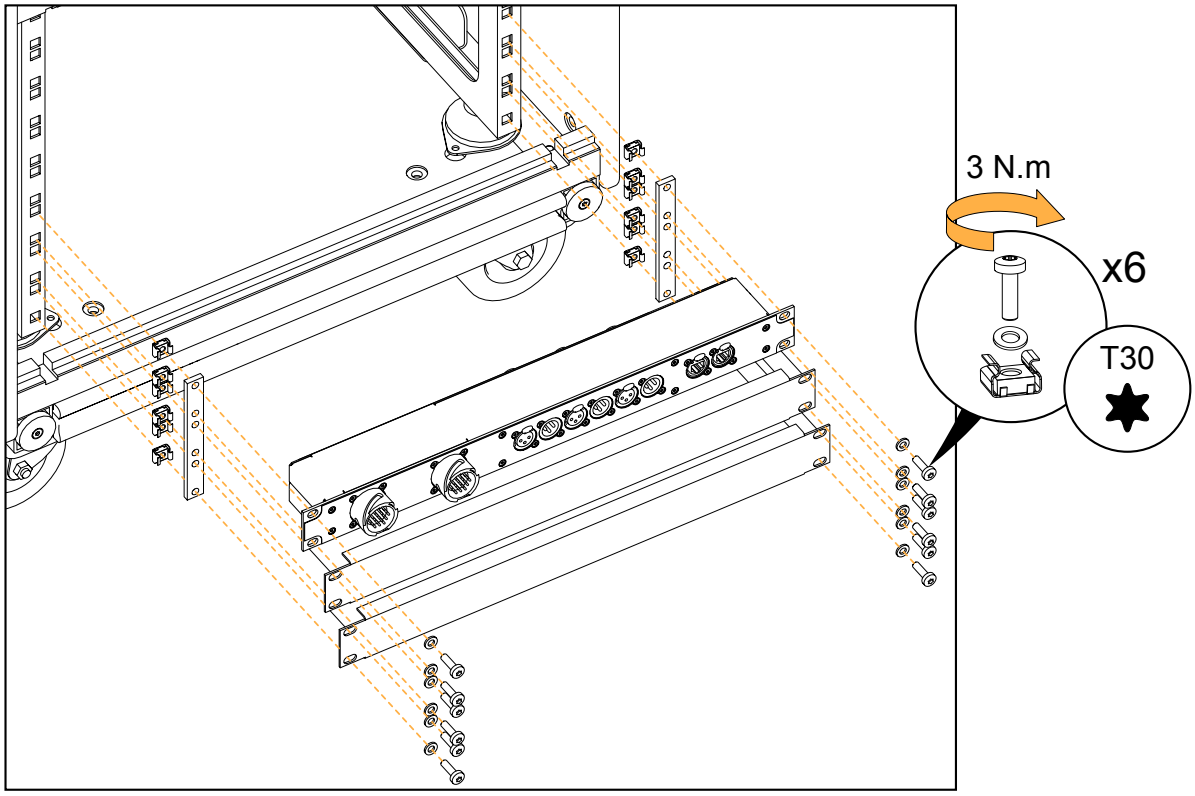
Use four M6 cage nuts, four nylon washers and four M6×20 Torx screws.



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

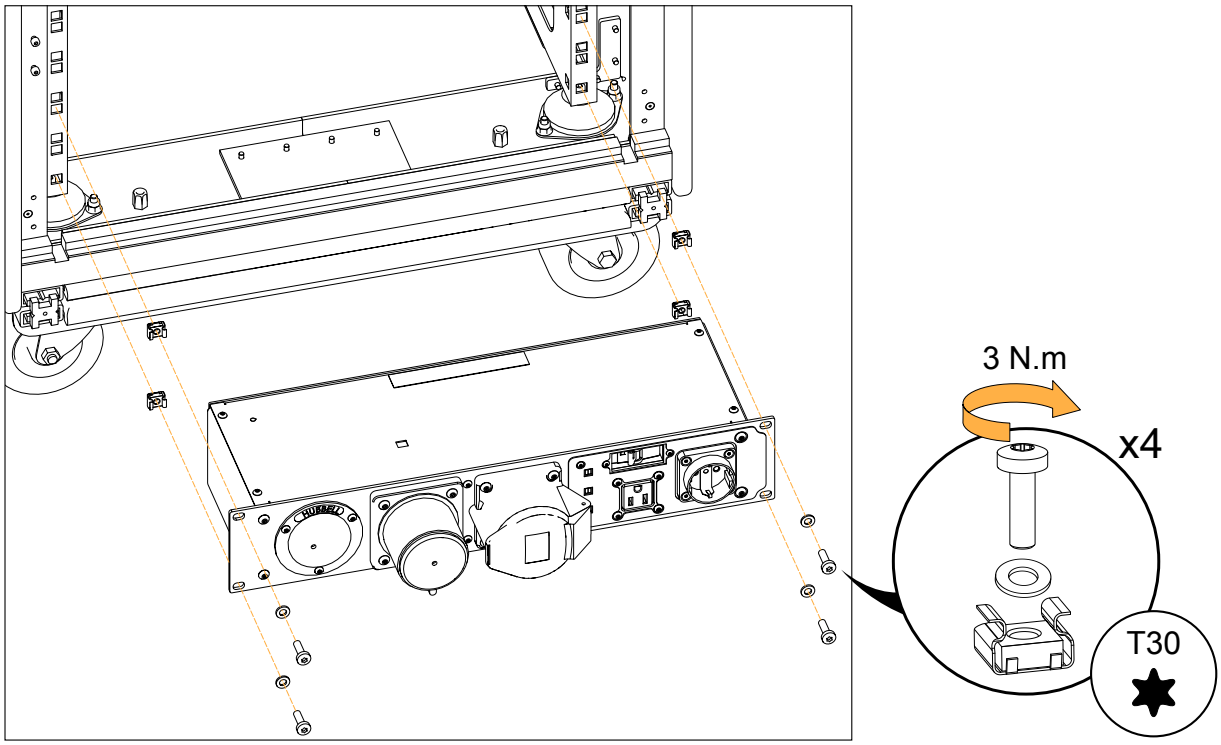
There is a 3U spacer on the inner frame behind the LA-PANEL II and the two 1U blank panels.

Use four M6 cage nuts, four nylon washers and four M6×20 Torx screws for each panel.



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

Use four M6 cage nuts, four nylon washers and four M6×20 Torx screws.



Mounting LS10-RAKSHELF in LA-RAK II AVB

Tools

- torque screwdriver
- T20 Torx bit

Material

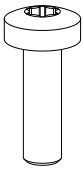
G03583

KR screws and washers LA-RAK II (AVB)

×8

FT777

nylon washer Ø6 mm



×4

S100094

M6×20 Torx

G03263

KR 3U spacers LA-RAK II (AVB)

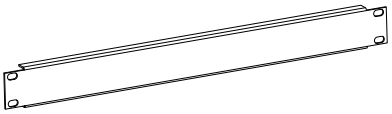
×2

100914

3U spacer

KR RKCACH

KR blank panels 1U LA-RAK II (AVB)



×1

FT010217

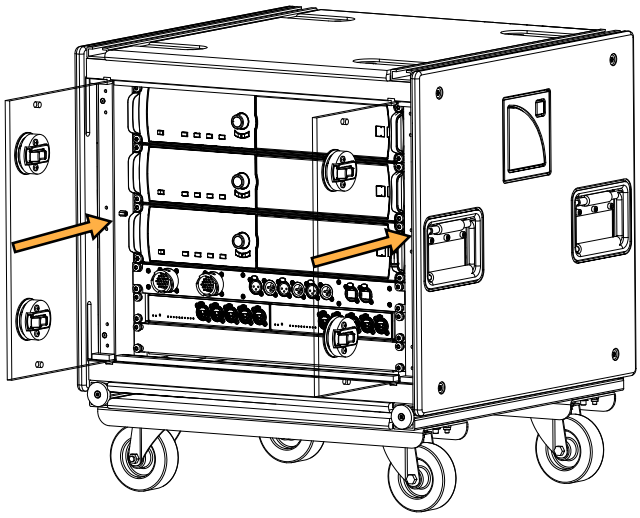
1U blank panel

Prerequisite

Remove the previous LS10-RAKSHELF.

Procedure

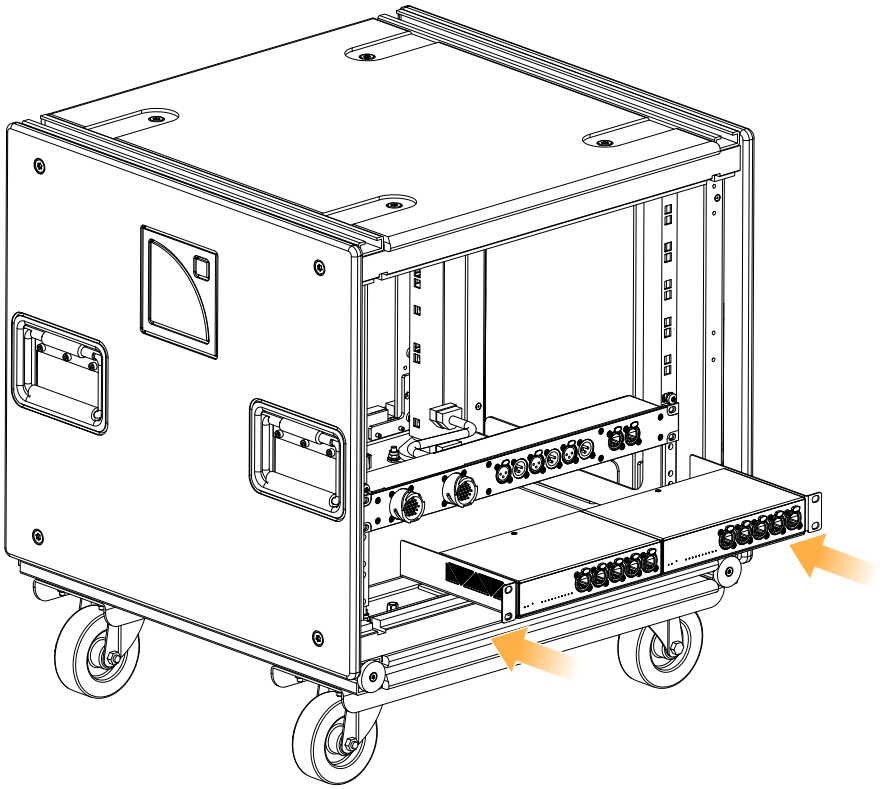
1. Put the LEXAN doors to storage mode.



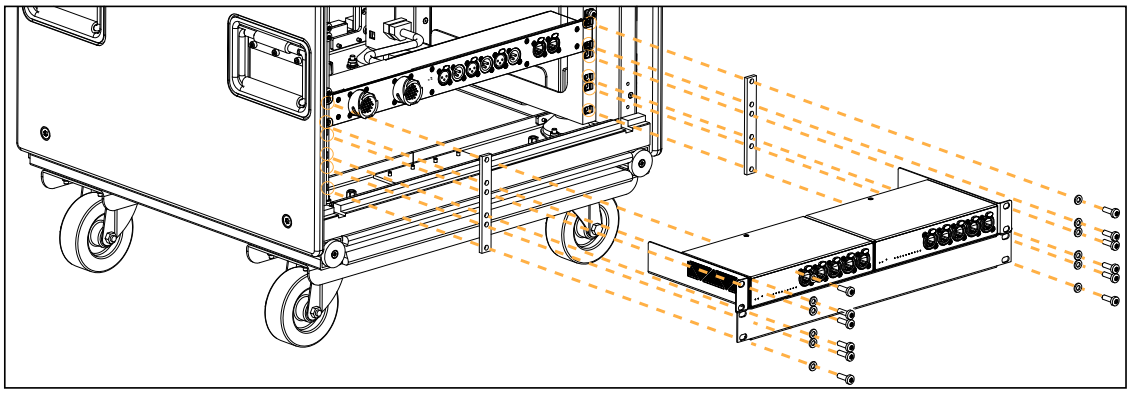
2. Mount one or two LS10 on LS10-RAKSHELF.

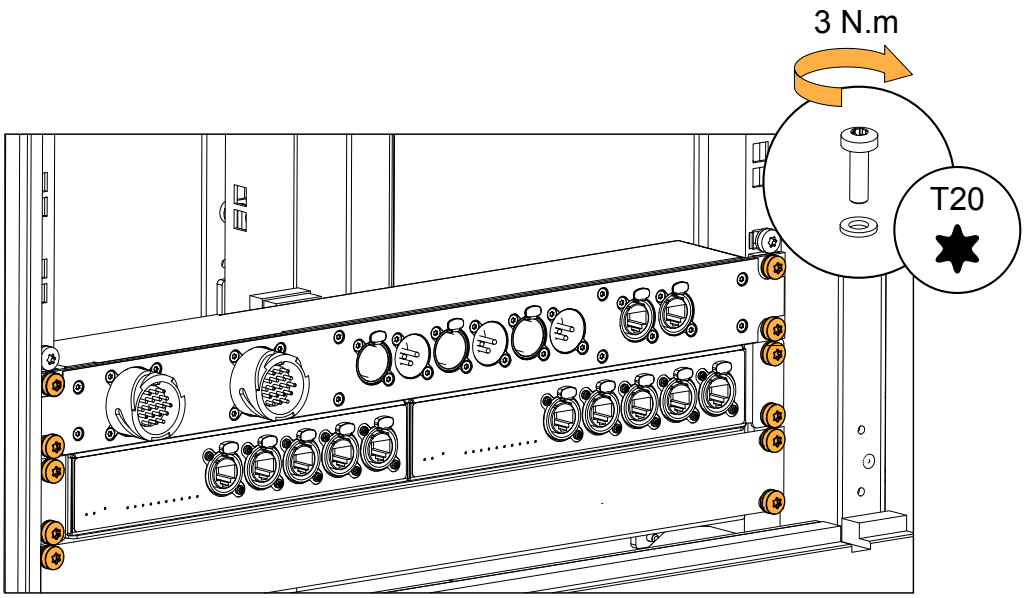
Refer to the **LS10 documentation** for more information.

3. Slide LS10-RAKSHELF in LA-RAK II AVB.



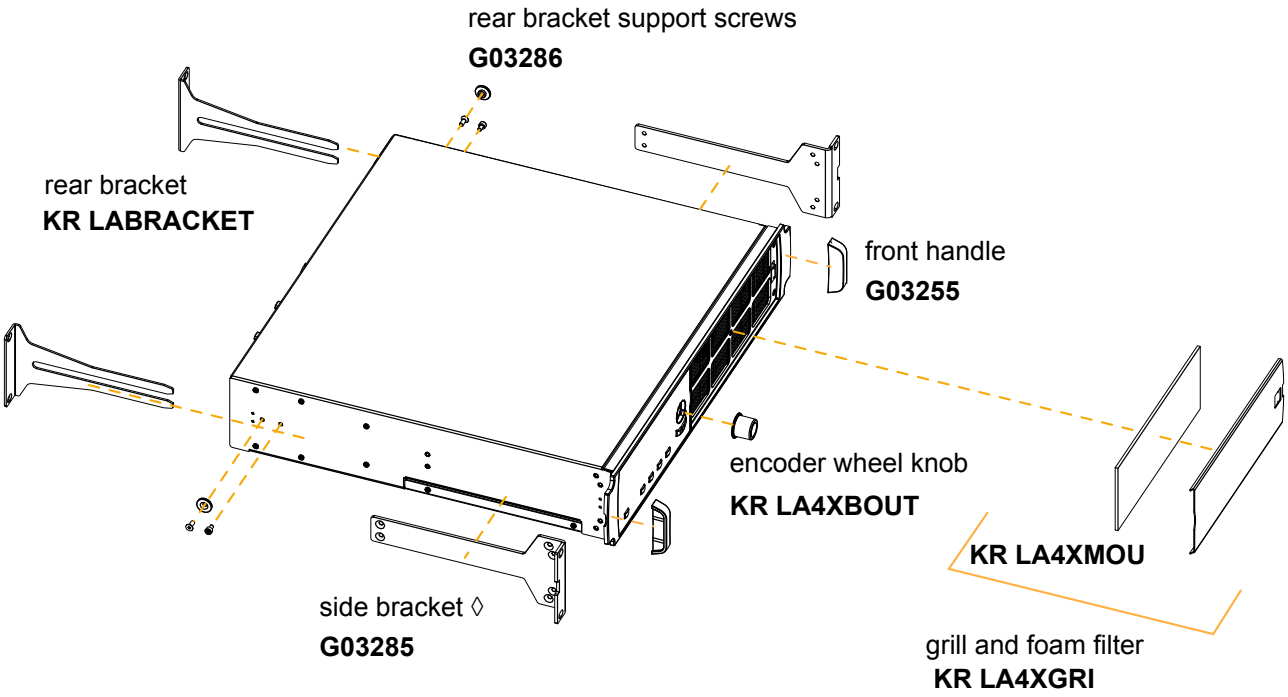
4. Secure LS10-RAKSHELF to the front face of the rack using the two spacers, the M6×20 screws, and the washers.
Secure the 1U blank panel under the switch.
Tighten the screws.





LA12X

Exploded view - external modules



D/R - Grill and foam filter

This procedure describes how to disassemble the grill and foam filter for replacement or cleaning.

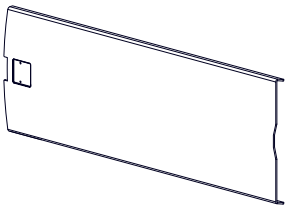
Tools

- 3 mm slotted screwdriver

Repair kits

KR LA4XGRI

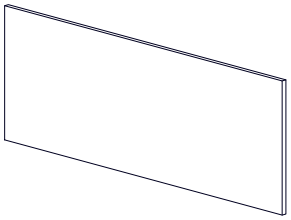
KR grill LA4X / LA12X



×1

MC LA4XGRL

LA4X and LA12X grill



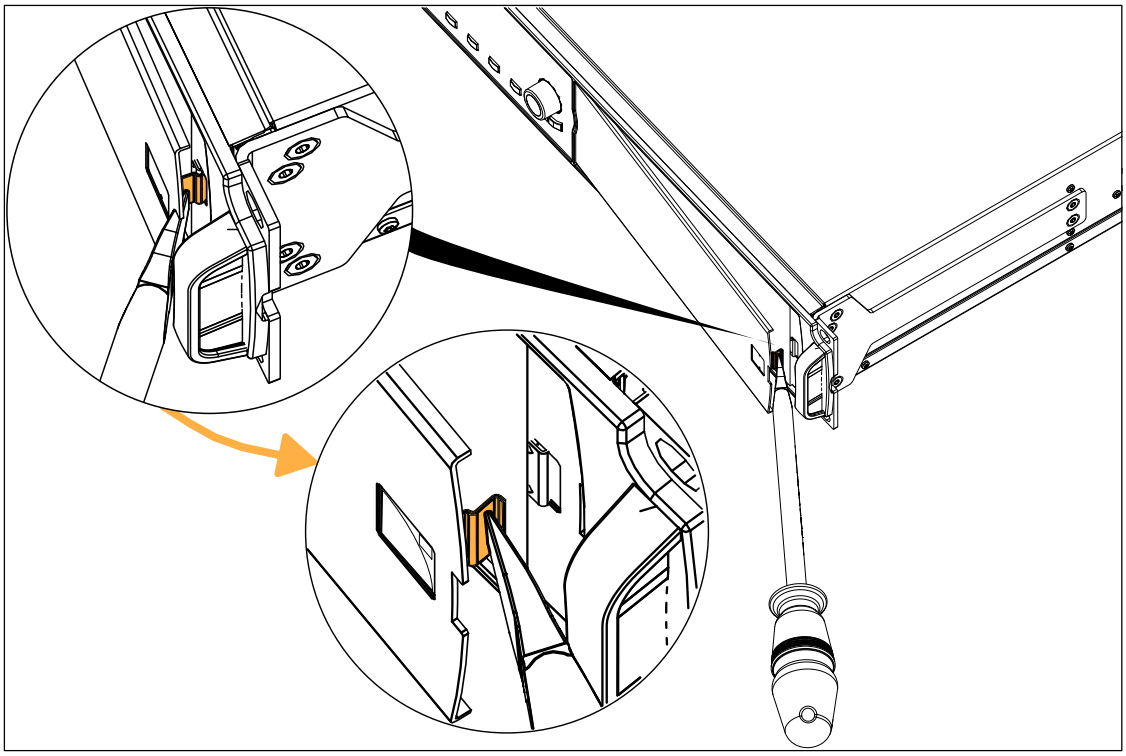
×1

CM LA4X

LA4X and LA12X foam filter

Exploded view

To clean the foam filter, use mild dishwashing detergent or soap then dry it.



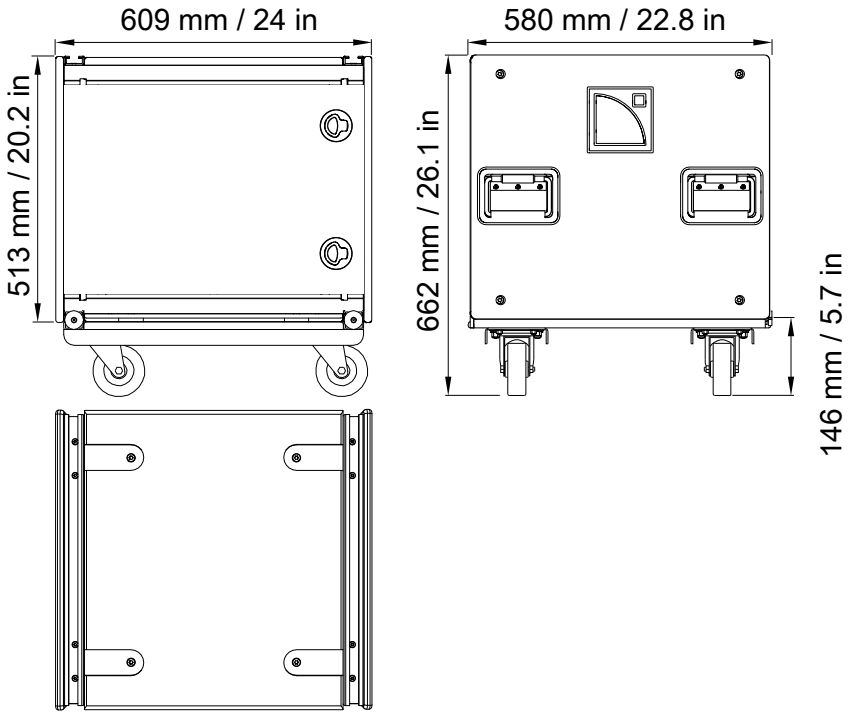
Specifications

LA-RAK II AVB specifications

Description	Touring rack containing three LA12X, LA-POWER II for power distribution, LA-PANEL II for audio and network distribution, and two LS10 for AVB distribution, compatible with LA-RAK BUMP	
Rigging and handling	2 coupling bars	
	2 coupling rails	
	4 handles	
	1 dolly board	
Cables	• 6 ANALOG OUT XLR3 male/female labeled cables, 1.10 m / 3.61 ft • 3 AES OUT XLR3 male/female labeled cables, 1.10 m / 3.61 ft • 3 AES LINK XLR3 male/female labeled cables, 1.10 m / 3.61 ft • 2 ANALOG XLR3 male/female labeled cables, 0.55 m / 1.8 ft • 2 AES XLR3 male/female labeled cables, 0.55 m / 1.8 ft • 3 CAT7 red Ethernet labeled cables, 1 m / 3 ft • 3 CAT7 black Ethernet labeled cables,1 m / 3 ft	
Weight		
	LA-RAK II AVB (with doors, LA-PANEL II, cables, 3 LA12X, LA-POWER II, and 2 LS10)	100 kg / 220.4 lb
	2 coupling bars	1.5 kg / 3.3 lb
	1 dolly board	13.5 kg / 29.8 lb
Materials		
	External structure	polyethylene, aluminum, steel
	Doors	LEXAN® polycarbonate
	Rigging components	polyester-coated steel
Finish	black	

Lexan is a trademark of SABIC Innovative Plastics IP BV.

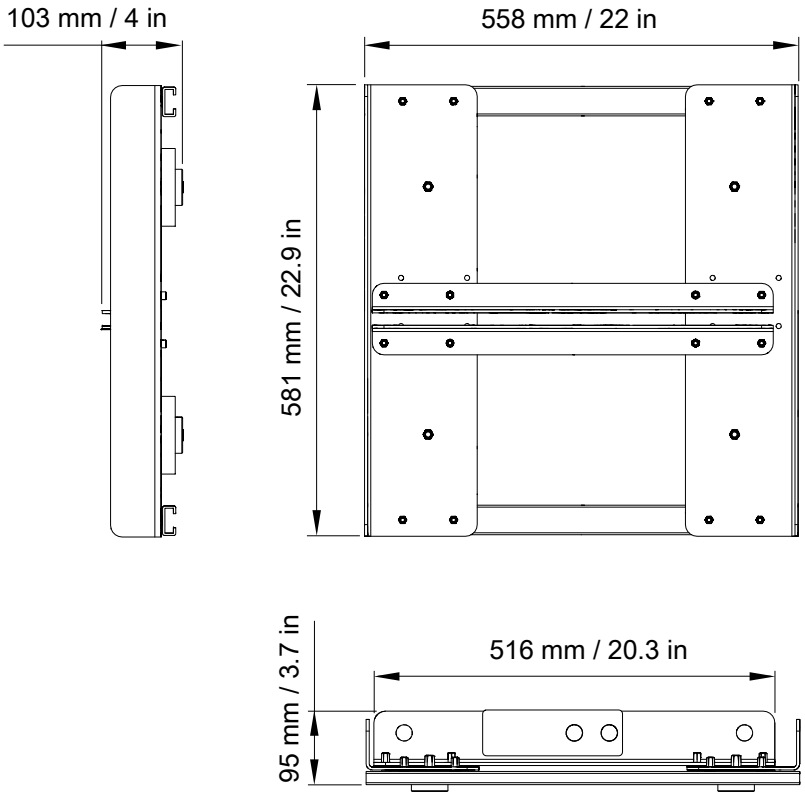
LA-RAK II AVB dimensions



LA-RAK BUMP specifications

Description	Structure for flying 4 LA-RAK
	2 x Ø19 mm shackles WLL 3.25 t
Weight (net)	13.5 kg / 29.7 lb
Material	high grade steel with anti-corrosion coating

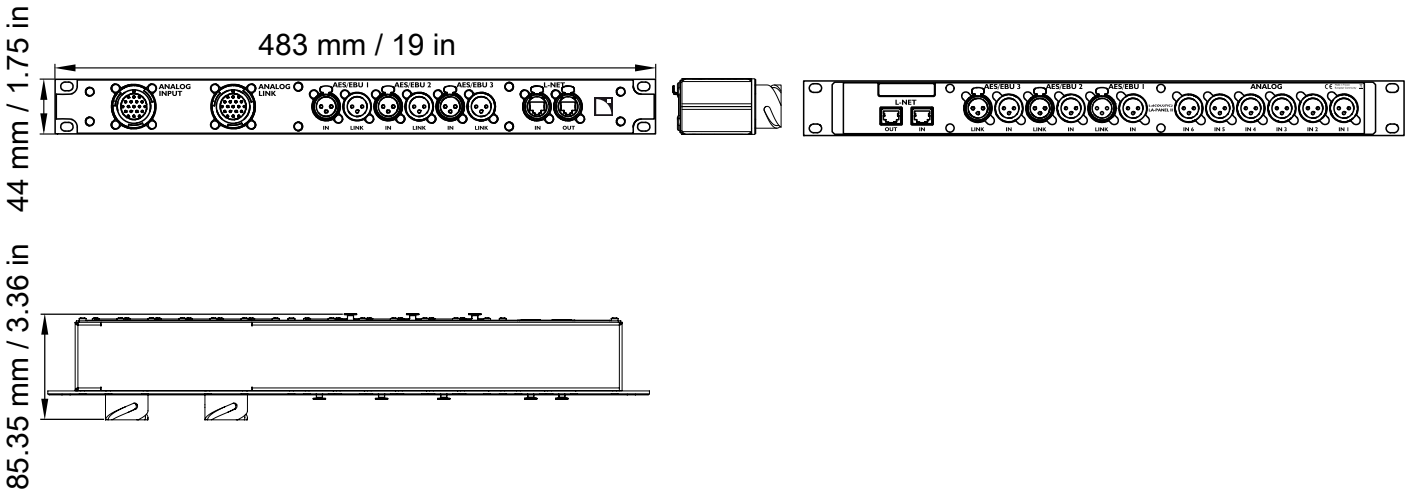
LA-RAK BUMP dimensions



LA-PANEL II specifications

Description	audio and network distribution panel	
Front connectors		
	Analog input/link	2 x 19-point CA-COM
	AES/EBU input/link	3 female Neutrik® XLR3 (IN)
		3 male Neutrik® XLR3 (LINK)
	Network	2 etherCON® (L-NET IN/OUT)
		(not used in LA-RAK II AVB)
Rear connectors		
	Network	2 RJ45 (L-NET)
	AES/EBU input/link	3 female Neutrik® XLR3 (IN)
		3 male Neutrik® XLR3 (LINK)
	Analog input	6 male Neutrik® XLR3 (IN 1 to IN 6)

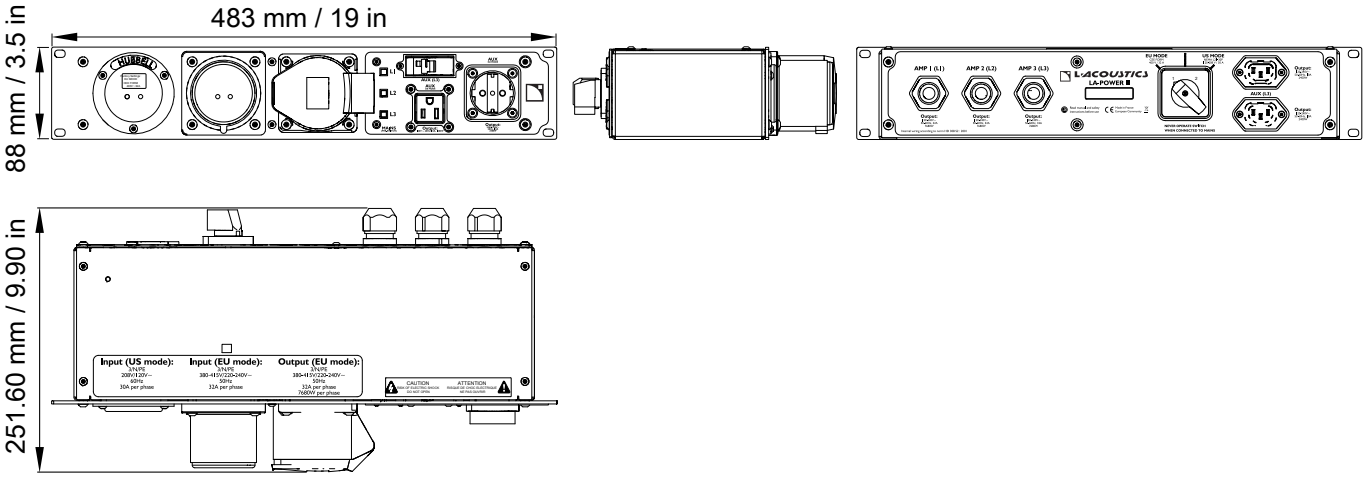
LA-PANEL II dimensions



LA-POWER II specifications

Description	power distribution panel	
Front interface		
	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
		Do not use with a 120 - 208 V power supply
	AC presence	3 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 interface		
	AC output for LA12X	3 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
		Do not switch between modes when connected to power supply
	AC auxiliary output	2 IEC 60320-1 type C13 female outlets with Schurter V-Lock (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

LA-POWER II dimensions



LS10 specifications

All values given in this section are typical values.

General

Mains rating	100 V AC - 240 V AC (± 10%), 50 Hz - 60 Hz
Power consumption	10 W - 20 W max when powering another LS10
Backup power circuit	24 V DC back-up input
	24 V DC output for powering another LS10
Startup time	ready to forward AVB streams in 5 seconds
Plug-and-play	open standard (no license required), AVB-enabled without configuration, no manual configuration required

Storage and operating conditions

Storage temperature	-5 °C / 23 °F to 70 °C / 158 °F
Operating temperature	-5 °C / 23 °F to 50 °C / 122 °F
Maximum altitude	2000 m
Climate	moderate, tropical

Interface

Indicators	1 LED for power status, 1 LED for fault status
	10 LEDs for link/act status
Button	reset to factory settings

Ethernet port features

Management	gPTP grandmaster capable, priority selection
	RSTP: enable/disable
Port sensing	auto negotiation
Auto crossover	MDI / MDIX (allows to use straight or cross cables)
Auto sensing	Full or Half Duplex (Gigabit is always Full Duplex Mode)
AVB ports	10 ports at 10/100/1000 Mb/s

Connectors

Network	8 × Ethernet etherCON® I/O (5 on front, 3 on rear)
	2 × SFP cages
Mains input	IEC C13 V-Lock compatible socket
Terminal block connector	5 mm 6-point terminal block connector for GPO and DC powering with: • 1 × 24 V DC power output (max 10 W) to power another LS10 • 1 × 24 V DC backup power input (max 10 W) • 1 GPO for fault indication (Relay, max 30 V DC / 1 A)
USB	female micro USB type

AVB

Featured AVB entities	Avnu™-certified AVB Bridge

Standards	Ethernet AVB: IEEE 802.1BA-2011 standard augmented by Avnu ProAV 1.1 requirements
Supported streams	Number: 150
	Class: A and B

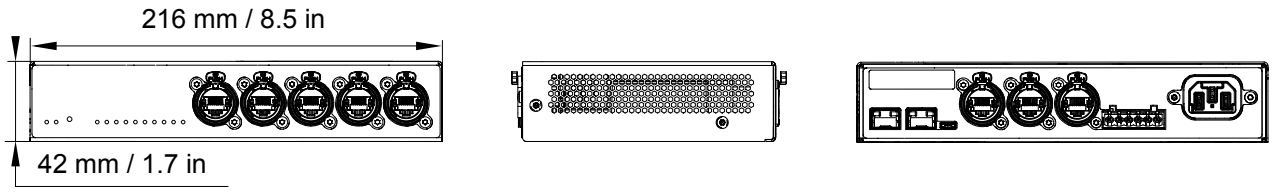
Management

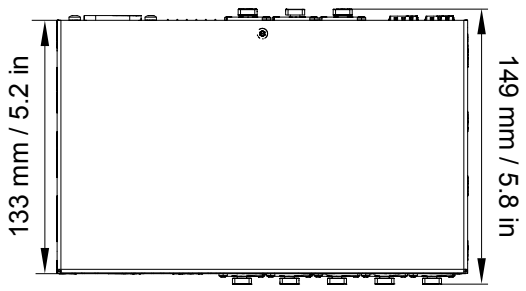
IP	static
Firmware update	through Ethernet

Physical data

Height × Width	1.7 in × 8.5 in (1U × 1/2U)
Weight	1 kg / 2.2 lb
Finish	black
Protection rating	IP2x

LS10 dimensions





Appendix

Approvals

EU Declaration of Conformity (DoC)

We

L-Acoustics

13 rue Levacher Cintrat
Parc de la Fontaine de Jouvence
91460 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-RAK II AVB touring rack

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 ISO 12100-1:2004 Safety of machinery
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 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
EN 55035:2017 Electromagnetic compatibility of multimedia equipment — Immunity requirements

Technical file compiled by:

Christophe COMBET

13 rue Levacher Cintrat
Parc de la Fontaine de Jouvence
91460 Marcoussis Cedex
France

Year CE marking was first affixed: 2020

Issued in Marcoussis, France 17.08.2020

Christophe COMBET, Director of Sound System Design

LA-POWER II EC DoC

Declaration of Conformity - version 1.0

EU Declaration of Conformity (DoC)

We

L-Acoustics

13 rue Levacher Cintrat
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 responsability 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

EU Declaration of Conformity (DoC)

We

L-Acoustics

13 rue Levacher Cintrat
Parc de la Fontaine de Jouvence
91460 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:

LS10 network switch

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 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

Technical file compiled by:

Genio KRONAUER

13 rue Levacher Cintrat
Parc de la Fontaine de Jouvence
91460 Marcoussis Cedex
France

Year CE marking was first affixed: 2020

Issued in Marcoussis, France 09.07.2020

Genio KRONAUER, Electronics Director

L-Acoustics
13 rue Levacher Cintrat - 91460 Marcoussis - France
+33 1 69 63 69 63 - info@l-acoustics.com
www.l-acoustics.com

L-ACOUSTICS
GROUP