ARA series
Users manual

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INDEX

Introduction

Welcome to the user manual for the ARA series. This comprehensive guide is designed to provide all the information needed for the effective and safe operation of our ARA systems.

This manual has been structured into several key sections, each focusing on a specific aspect of system setup, usage, and maintenance. By providing a detailed walkthrough of each process, we aim to ensure that users can optimally benefit from all features that our ARA systems offer.

The ‘Setup and Configuration’ section of this manual will guide you through the initial stages of installing and setting up your ARA system. It will delve into various network configuration options, covering the use of Ethernet switches and routers, with a focus on the DHCP Server distribution.

In the ‘Hardware and Accessories’ section, we outline recommended devices that complement and enhance your ARA system’s performance. It also provides guidelines on how to choose suitable routers and Ethernet switches.

The ‘Rigging Procedures’ section emphasizes the importance of safety and details the process of rigging your ARA systems effectively. It provides a summary of basic concepts related to rigging, though it is advisable to refer to the rigging user’s manual for more comprehensive information.

Lastly, the ‘Troubleshooting’ section provides insights into diagnosing and resolving common issues that you may encounter while operating the ARA system. From power problems to sound issues, this section aims to assist you in maintaining the system’s optimal performance.

Please read this manual thoroughly before using your ARA system and refer to it as needed. Your understanding and correct application of the information contained here are critical to ensuring the best performance from the ARA series.

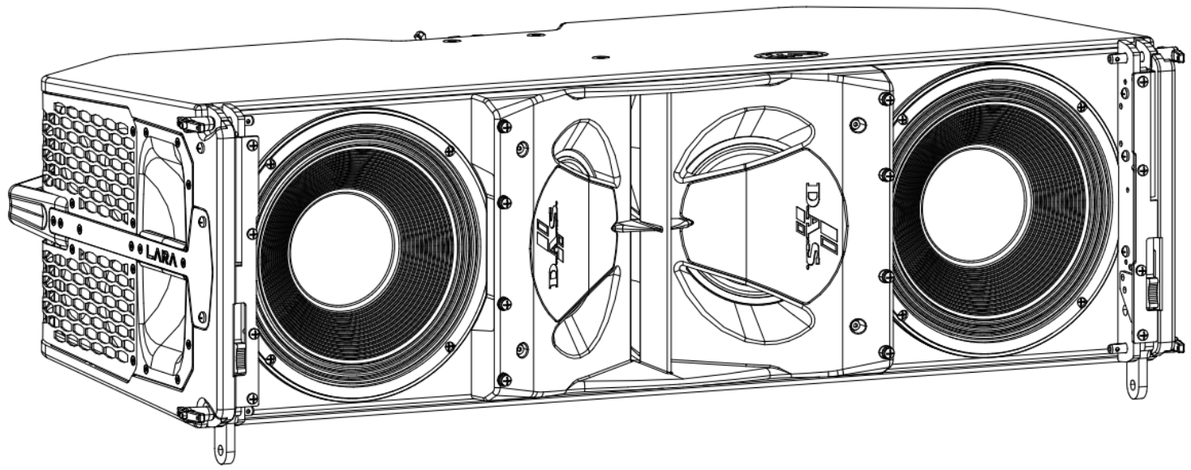
System components

LARA-80 / LARA-100

LARA® is a 4-way symmetrical, cardioid, self-amplified line array system with 6000Wrms power. LARA® has a linear performance of 146 dB SPL MAX and a wide dynamic range making it an ideal system for large events. Thanks to the cardioid design, we achieve a rear attenuation of -15 dB in the range of 63 Hz – 200 Hz.

LARA® incorporates 2 x 12" woofers with a 4" voice coil plus another 2 x 8" in cardioid configuration; for the midrange, it uses another 2 x 8" speakers with 2.5" voice coils. The high-frequency section is made up of two DAS M-78N compression drivers, with 3" voice coils and a 100° or 80° horizontal dispersion waveguide. All the elements have been designed and purpose-built to maximize the system's efficiency.
The LARA® class D amplifier integrates a switching power supply with power factor correction (PFC), ensuring maximum performance and efficiency regardless of the mains voltage. Each amplifier provides 6000Wrms divided into eight channels, 3 of them in bridge mode to feed the 2 x 12" and the two compression drivers. The remaining two channels feed the front 2 x 8" and rear 2 x 8" transducers.

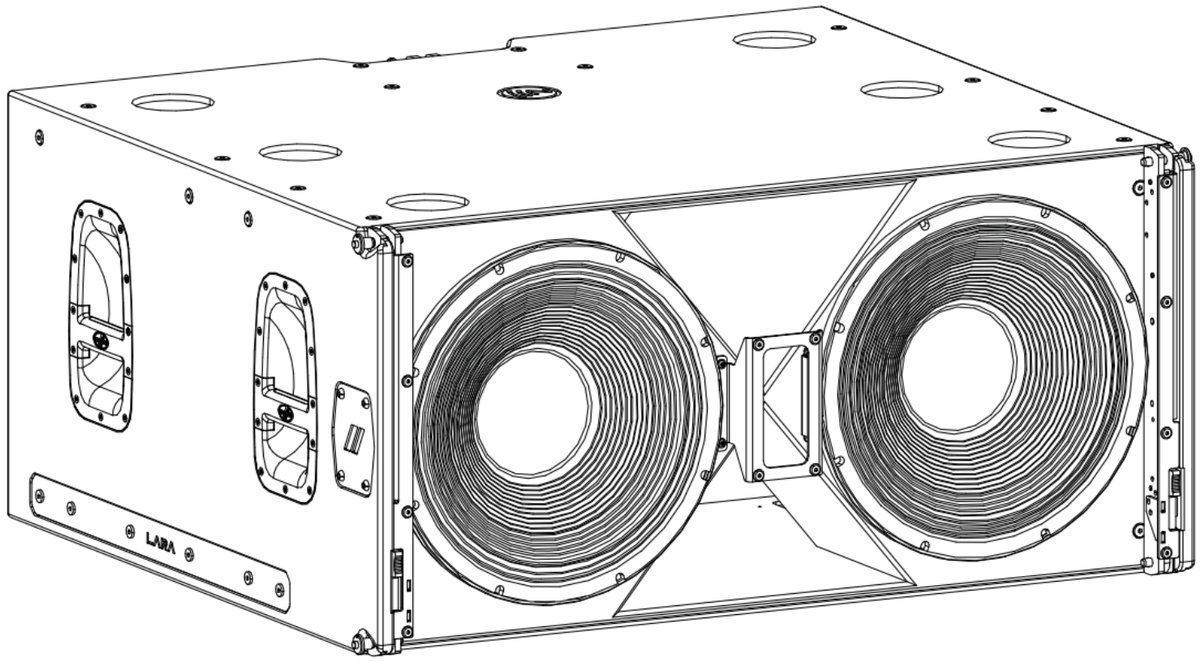
The 3-point rigging system works for both LARA® and LARA® SUB, allowing us to hang arrays of up to 24 LARA units and 16 LARA® SUB units. The FSS TM (Fast Set Splay) angulation system allows angles to be adjusted in steps of 1°, from 0° to 7° from the stacked position, significantly reducing assembly time.



LARA-SUB

The LARA-SUB is a powered cardioid subwoofer system incorporating 2 DAS 18UXN neodymium low frequency transducers with 4” voice coils in a bass-reflex configuration. A single rear-facing 18UXN is used to create the cardioid dispersion pattern avoiding unwanted energy behind the system.
Powering the LARA SUB is a 3 channel Class D amplifier with independent channels powering each of the front-loaded low frequency transducers and the rear facing cardioid speaker. The amplifier´s regulated switch mode power supply is equipped with power factor correction reducing power consumption while enhancing reliability and consistency in all operating conditions. The onboard DSP optimizes the signal parameters for front and rear drivers to maximize the rear rejection 14 dB from 40 Hz – 80 Hz average.

Cabinet construction follows DAS´s strict construction standards employing birch plywood and the durable ISO-flexTM protective exterior coating. The LARA SUB incorporates captive rigging hardware that makes use of the common LARA rigging bumper, only one bumper type is needed to fly either LARA ARRAY or LARA SUB. The protective metal grilles are backed using acoustically transparent and water repellent fabric. Two recessed handles are located on each side of the enclosure.



System components

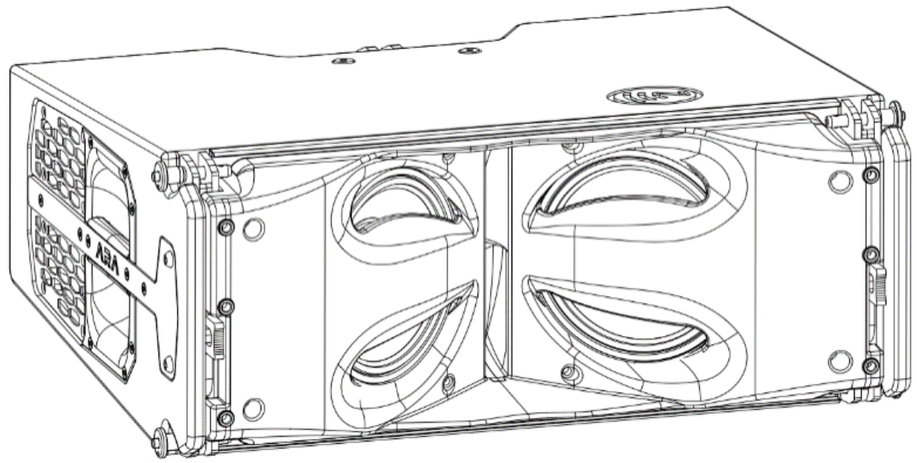
SARA-100

SARA-100 is a compact line array system with a symmetrical design and 3000Wrms of power, SARA delivers a linear performance of 139 dB SPL MAX and a wide dynamic range, making it perfect for events and medium-sized installations where sound quality and uniformity are a priority.

SARA features two customized designed 8" loudspeakers for mid and low frequencies and a compression driver for high frequencies with a 100° horizontal dispersion waveguide.

SARA's Class D amplifier integrates a switch-mode power supply with power factor correction (PFC), ensuring optimum performance and efficiency regardless of the mains voltage. The amplifier provides 3000Wrms of power, divided into 4 channels, two of which are used in bridge mode to power the compression driver, and the remaining two are used to power the 8" front speakers.

The three-point rigging system can be used for both SARA and SARA-SUB, allowing arrays of up to 24 SARA and 16 SARA-SUB units to be hung. In addition, using the JP-SARA accessory, up to 12 units of SARA can be hung below the SARA-SUB. The FSS™ (Fast Set Splay) system allows angles to be adjusted in 1° steps from the stacked position, significantly reducing assembly time.

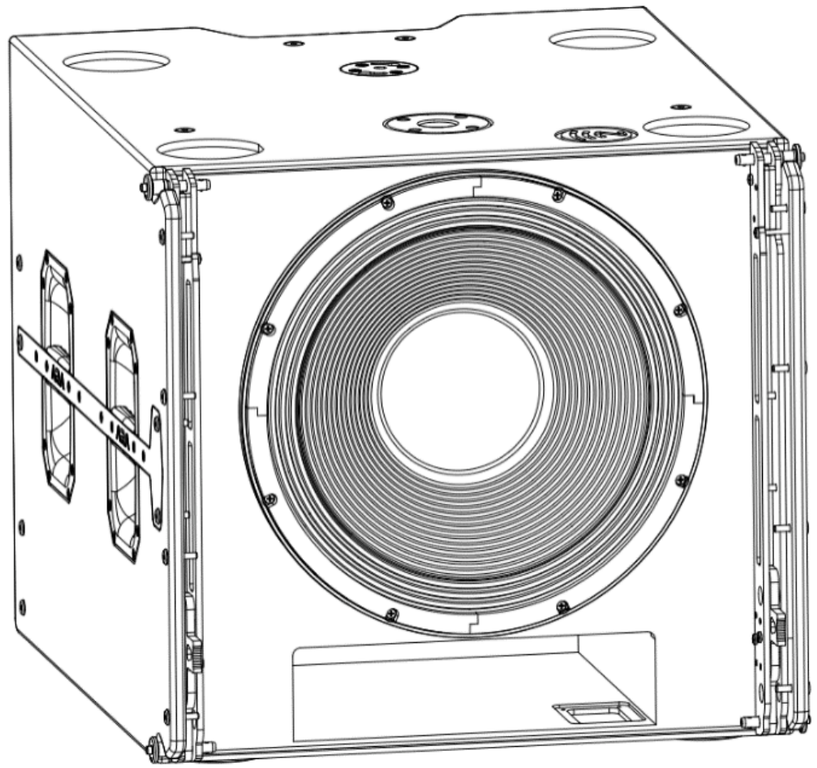


SARA-SUB

SARA-SUB is a high-fidelity subwoofer that offers an accurate and powerful bass response thanks to its cardioid design. The system incorporates a DAS 18UXN neodymium loudspeaker with a 4" voice coil for excellent low-frequency reproduction. In addition, a rear 15FWN neodymium 3" voice coil speaker creates the necessary cardioid dispersion pattern to compensate for unwanted energy in the rear.

The SARA-SUB's built-in class D amplifier has 4 channels in bridge mode for each of the speakers. The switch-mode power supply has a correction factor, allowing for greater efficiency and reliability under all operating conditions. The built-in DSP optimizes the signal parameters for the loudspeakers and allows for 14 dB of rear power compensation in the 40 Hz – 80 Hz range.

The enclosure design meets the strict DAS standards for the use of high-quality materials, such as birch plywood and ISOflex™ exterior protection. In addition, the rigging system allows the SARA to be flown underneath the SARA-SUB, using the JP-SARA. The metal grids incorporate acoustically transparent, moisture-repellent fabric. Recessed handles on the sides of the enclosure facilitate transport and handling.



The ARA series is a family of self-powered products that includes newest and most technologically sophisticated power packs in the systems. A very powerful DSP platform working at 96kHz is included allowing control and monitoring features. ALMA software is the dedicated tool to adjust, control and optimize the systems. Connectivity between the amplifier modules and the control computer and ARA-RACKs is done using standard TCP/IP data protocols.

POWER CONNECTORS and POWER CONSUMPTION
At the amplifier's panel 2 powerCON true1 connectors (in and loopthru) are used to inject power into the units and as well linking power to other units.

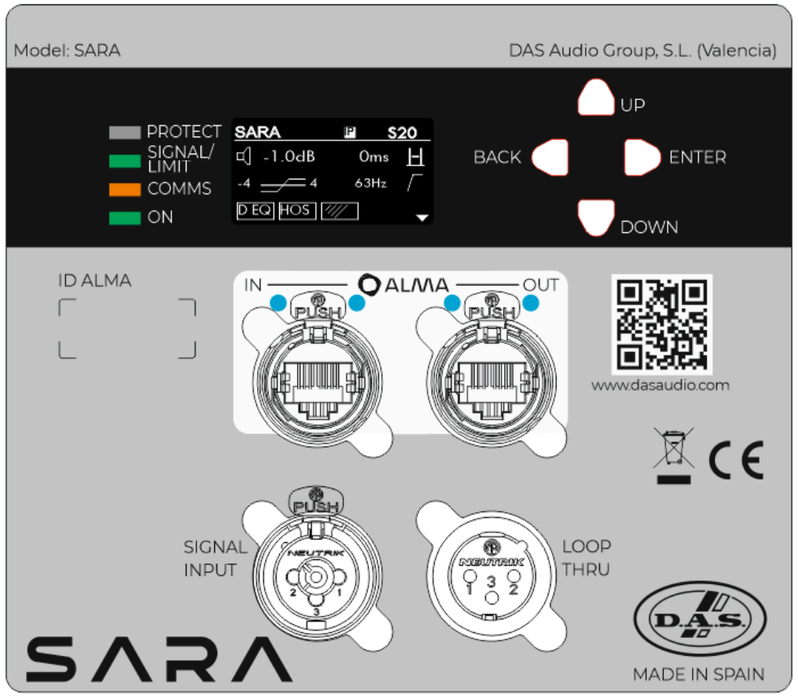
The maximum number of units that can be linked in terms of power depends on the consumption of each unit.

When working at 230/208V these are the limitations per system model:

	Max number of linked units (power)
LARA	**2**
LARA-SUB	**2**
SARA	**4**
SARA-SUB	**3**

Please refer to the configuration documents to check connections between units.

AUDIO AND AUDIO & DATA CONNECTORS
Analog audio can be connected independently by using the XLR Signal Input connector or in conjunction with control and monitoring data by the use of the IN ethercon connector:



All amplifiers are including a 1.54" OLED display to provide certain level of configuration by the use of the control knobs (up/down/back/enter) and checking information such as firmware version.

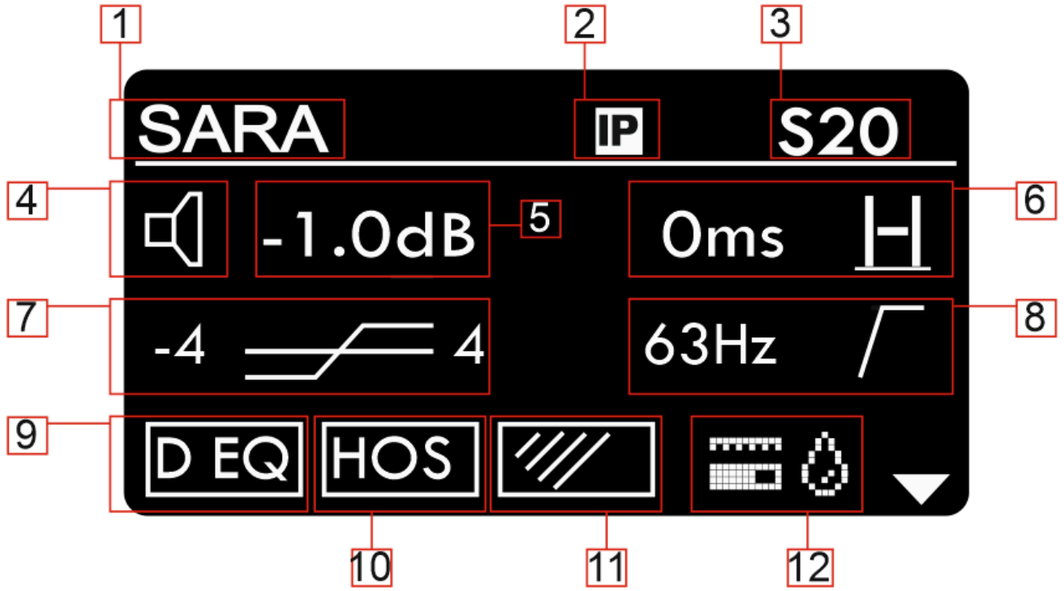
DISPLAY OF THE UNITS AND CONTROL BUTTONS

The display and control buttons of a SARA unit (LARA/LARA-SUB/ SARA-SUB use the same hardware) are shown below:

On the left side 4 different LEDs are located.

- The ON Led will lit in green when the unit is connected to mains.
- The COMMs Led will lit in orange when the system has been connected to ALMA.
- The SIGNAL / LIMIT led will lit in green or red depending on the signal level. Red shall represent limit status on at least one of the channels of the system.
- The PROTECT Led will lit in red if an amplifier detects failure or activates the protection mode.

The Display shows the status of the system as follows (LARA and SARA):



1. System Model

2. IP: Active when the system has obtained an IP address from a DHCP server (router) or via Static configuration.

3. L/Sxxxx: ID name of the system. ALMA needs a unique ID name per device. When systems are manufactured the amplifiers are loaded with this unique ID number*.

4. Mute / Unmute: this symbol shows with a X on top of the speaker symbol if the system has been totally or partially muted by using ALMA.

5. Device Gain: variations of Gain (level in dB) are possible from +6dB to -40dB in 0.1 increments / decrements.

6. Device Delay: from 0ms to 323ms.

7. Array Balance settings. The graph shows both, AB Low and AB High settings.

8. HPF filter: In case of “top” units such as SARA / LARA this part of the display shows the active High Pass Filter (63/80/100Hz). In case of subwoofer units, SARA-SUB / LARA-SUB, this part of the display shows the active Low Pass Filter (LPF) 63/80/100Hz.

9. D EQ: When an equalization is active in the device (device EQ or Global EQ on ALMA) this box will say D EQ. When no EQ is applied the box appears empty.

10. HOS: High Order Shelving EQ. When a HOS equalization is being active in the device (via ALMA), this box will say HOS. When no EQ is applied the box appears empty.

11. DASaim: When the system has an active DASaim FIR filter these lines appear in the box.

12. Atmos. Correction enabled: As sound propagates through the atmosphere its energy is gradually absorbed by a number of energy-exchange processes in the air called atmospheric absorption. To compensate this effect Atmos. Correction filter are appied at High frequencies depending on the ambient conditions.

1. System Model
2. IP: Active when the system has obtained an IP address from a DHCP server (router) or via Static configuration.
3. L/Sxxxx: ID name of the system. ALMA needs a unique ID name per device. When systems are manufactured the amplifiers are loaded with this ID number*.
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6. Device Delay: from 0ms to 323ms.
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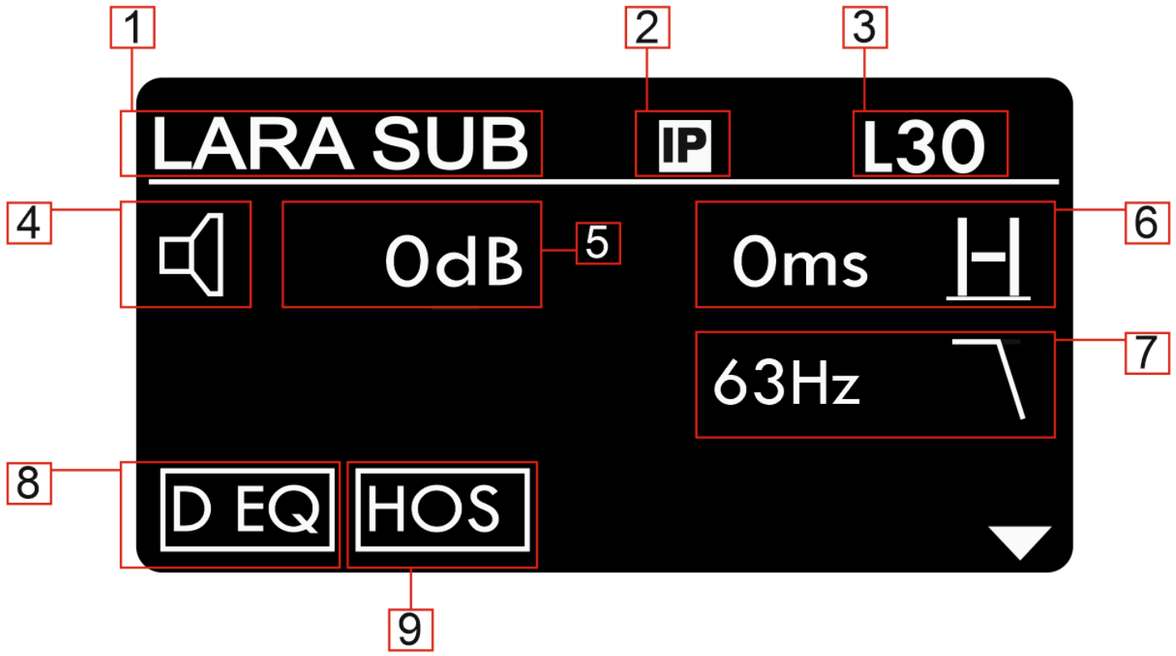


***ID numbers:**

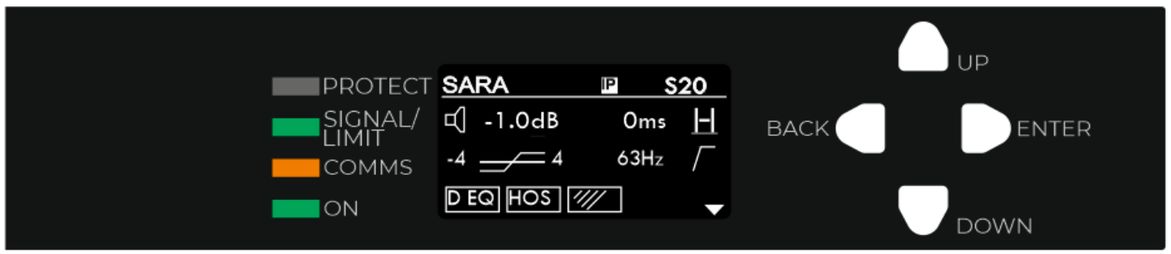
SARA-100 units are named as S20xxxx.

LARA-100 units are named as L20xxxx.

LARA-80 units are named as L10xxxx.

LARA-SUB units are named as L30xxxx.

The user can have access to different settings in the units using the control buttons (back / enter / up /down) and the display located at the amplifier's panel:

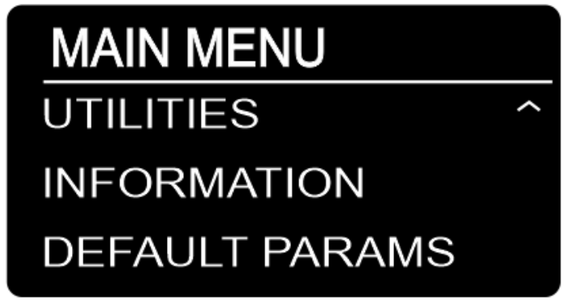


SARA Display and control buttons. When pressing BACK, the system is LOCKED (the display will turn Off)

When pressing DOWN, some rapid information is show, IP Address and Device ID:

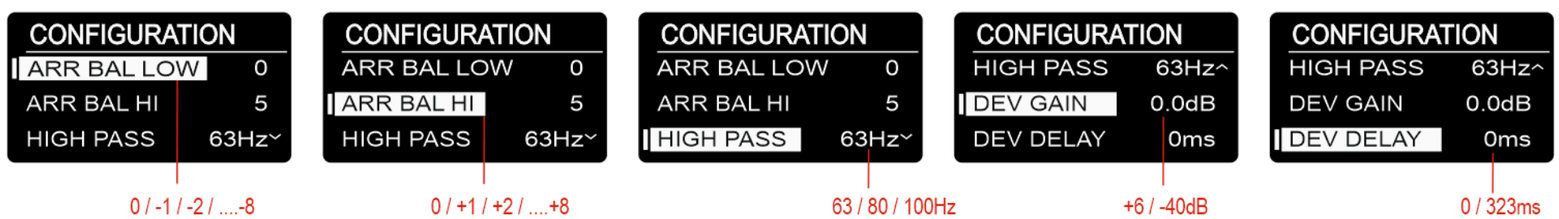
When pressing ENTER, the user access to the MAIN MENU and configuration parameters:

DISPLAY AND MAIN MENU
The Main Menu allows the user to access the following sub-menus: Configuration / Utilities / Information / Default Parameters



1. Configuration Sub-menu:

Shown in red the possible values of each parameter.



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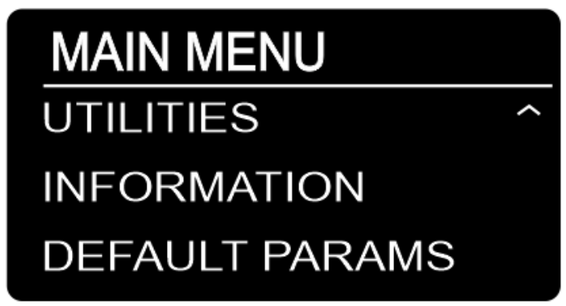
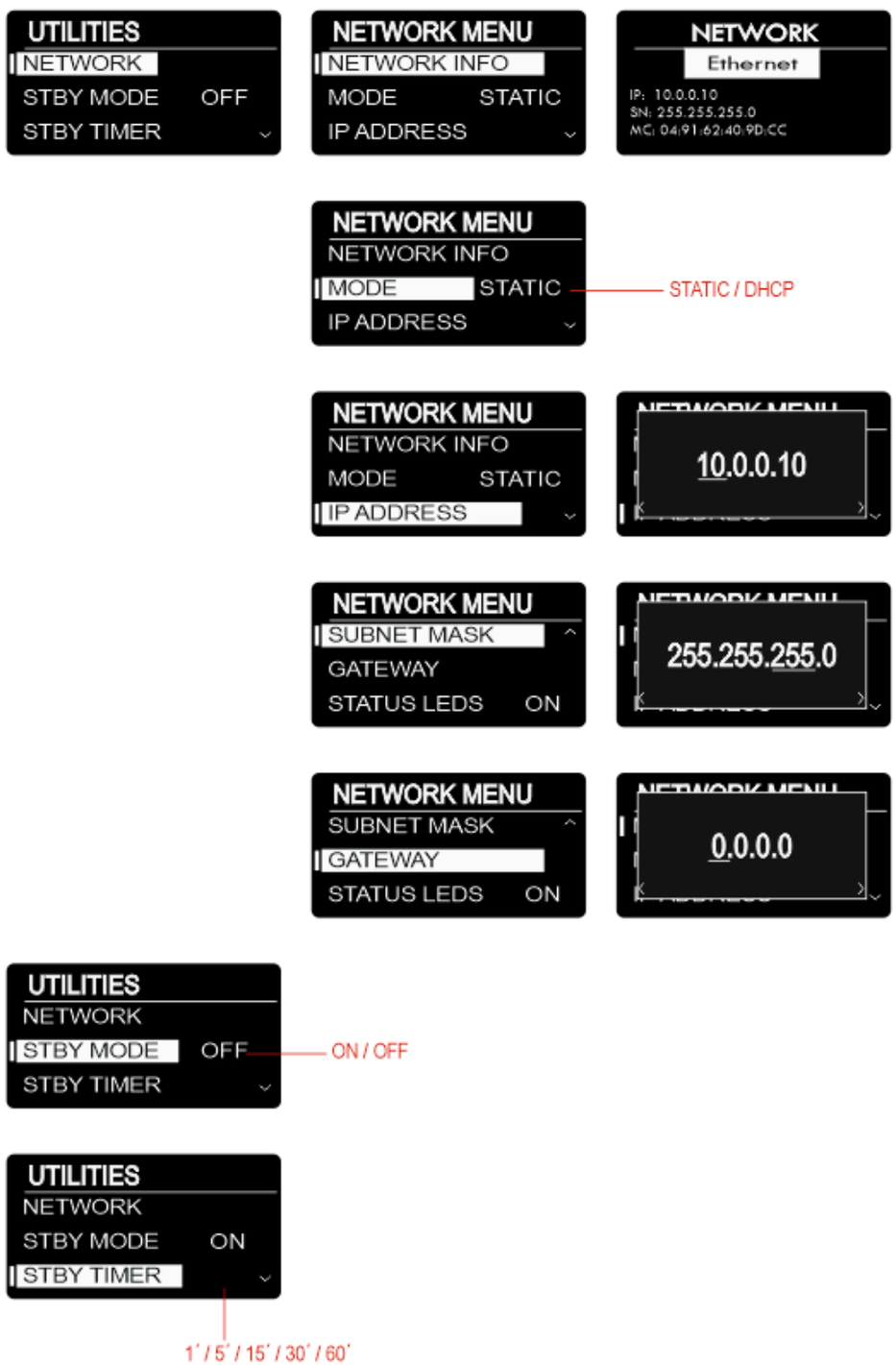


2. Utilities Sub-menu:



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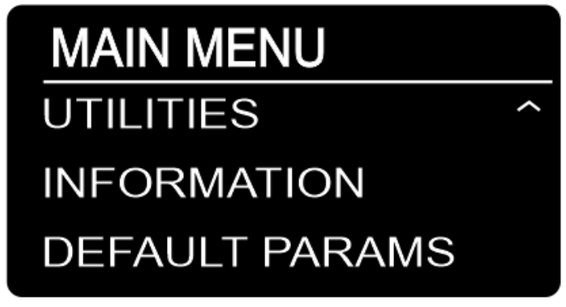


3. Information Sub-Menu:

3. Default Parameters Sub-Menu:

When confirming default parameters in a unit, all these parameters are modified:

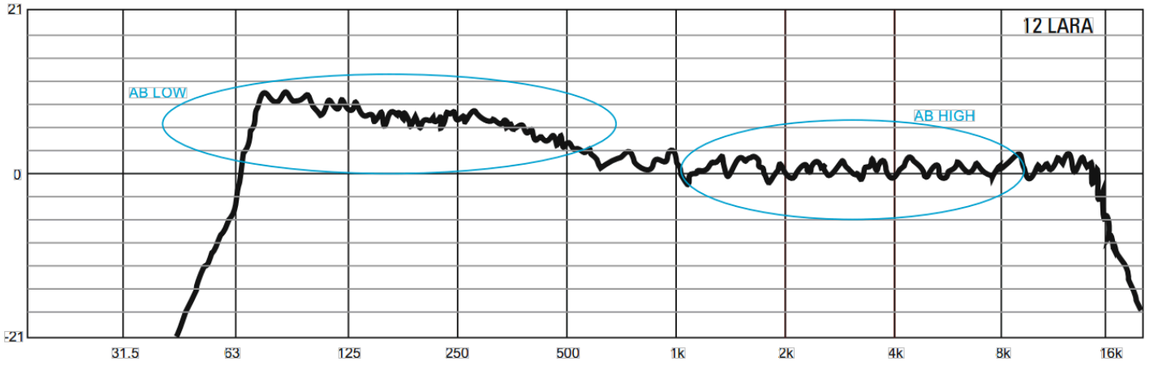
AB LO	**Set to 0**
AB HIGH	**Set to 5**
HPF	**Set to 63Hz**
LPF	**Set to 63Hz**
Device Gain	**Set to 0dB**
Device Delay	**Set to 0dB**
DASaim Filters	**Erased**
Global EQ/ Device EQ / HOS EQ	**Erased**
Channel SOLO / Device SOLO	**Erased**
Channel Mute / Global Mute / Device Mute	**Erased**

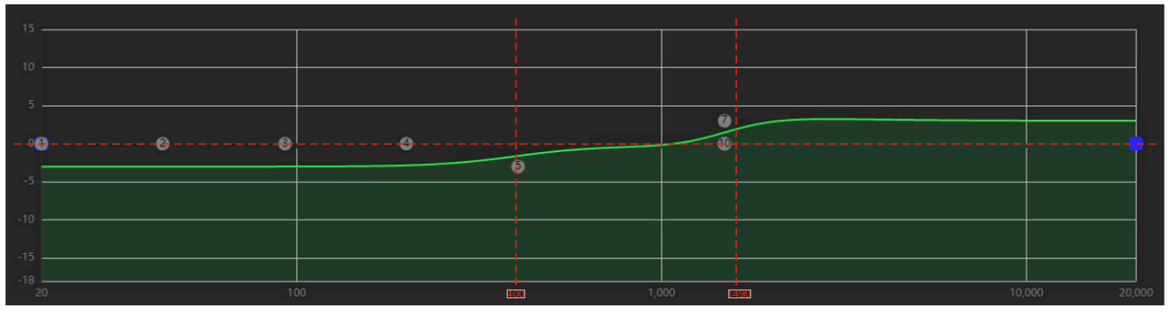
Array Balance

To compensate the acoustical coupling between elements of a line array system, two main parameters have been implemented in the units. The “target” frequency response of the entire system will be defined by the use of these 2 parameters.

Shown below, the average frequency response trace of a 12 element Lara system, measured with 3 microphones in different positions.

In this particular case AB Low was set to -4, and AB High was set to 4. The acoustical target response obtained with these 2 values had a lot of energy in the low-mid frequency domain as it was required for the application.





ARRAY BALANCE LOW (steps of 1dB):

Low Shelving filters starting at 400Hz with 8 different values in gain.

Array Balance Low 0: 0dB
Array Balance Low -1: -1dB
Array Balance Low -2: -2dB
Array Balance Low -3: -3dB (shown in the graph above)
_____

Array Balance Low -8: -8dB

ARRAY BALANCE HIGH (steps of 1dB):

High Shelving filters starting at 1490Hz with 8 different values in gain.

Array Balance High 0: 0dB
Array Balance High 1: 1dB
Array Balance High 2: 2dB
Array Balance High 3: 3dB

_____

Array Balance High 8: 8dB

In SARA and LARA systems the “default parameters” are Array Balance Low 0, Array Balance High 5.

To obtain a flat frequency response of one unique system (device) to be used for instance as a front fill, the user shall use Array Balance Low 0, Array Balance High 0.

ARA series
Atmos. Correction

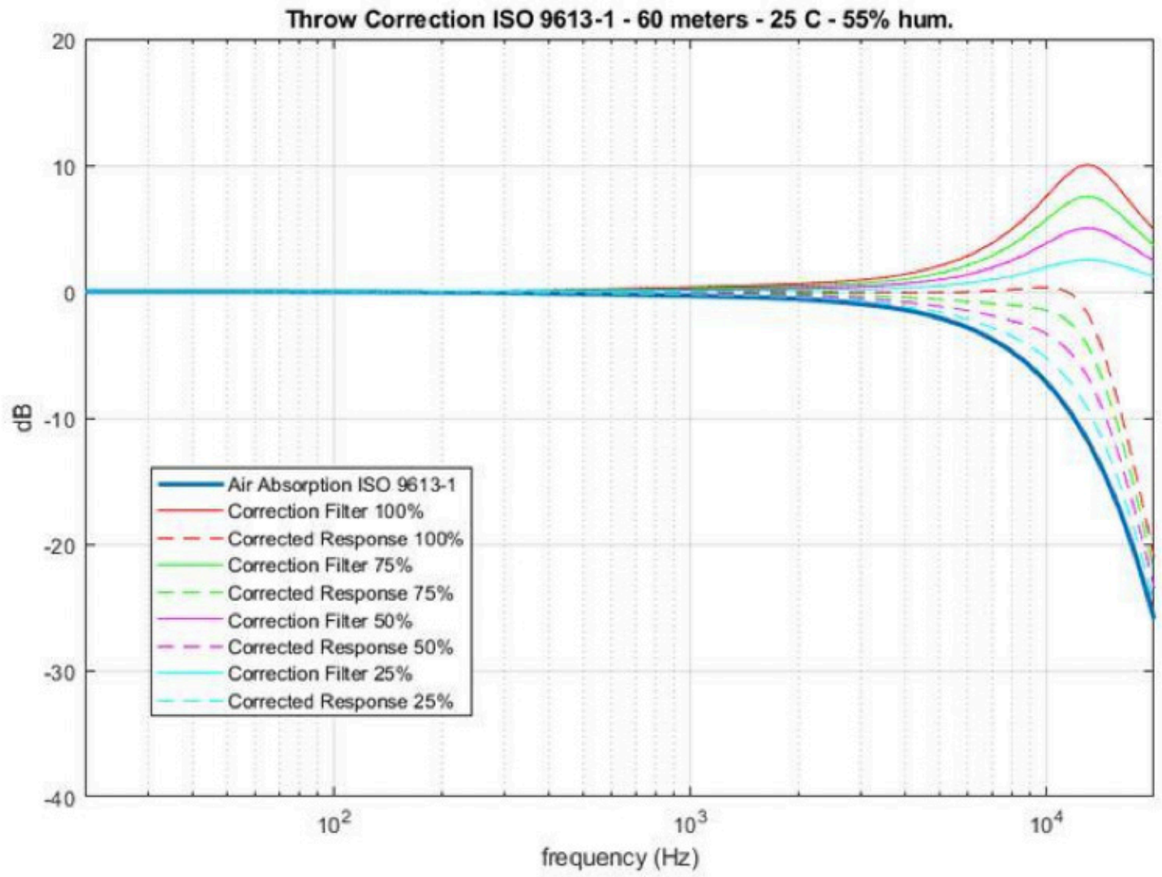
As sound propagates through the atmosphere its energy is gradually absorbed by a number of energy-exchange processes in the air called atmospheric absorption.

The degree of absorption depends on the frequency of the sound wave and the composition of the atmosphere.

At low frequencies, sound waves are generally not absorbed by the atmosphere and can travel long distances. However, as the frequency increases, the atmosphere becomes more effective at absorbing sound. This is because the air molecules themselves start to absorb some of the sound energy.

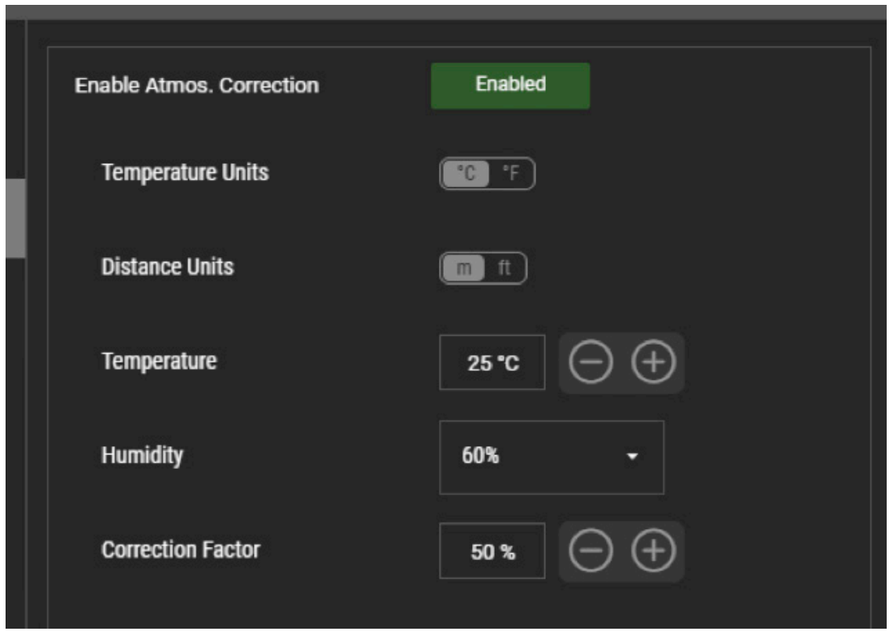
In most conditions, dry air can produce high attenuation of sound at high frequencies. Therefore, in the case of a predominantly high-frequency range, measurements made under dry conditions can differ considerably from measurements made under more humid conditions.

The compensation of the absorption of sound by air (humidity and temperature) implemented on ALMA is based in the ISO 9613-1: 1993 “Attenuation of sound during propagation outdoors -Part 1: Calculation of the absorption of sound by atmosphere”. For each ARA system, SARAs and LARAs the atmospheric correction can be activated independently per unit considering the target distance of it and the ambient conditions (air temperature and humidity). ALMA includes a family of more than 500 filters that are activated at different frequencies with different gain levels depending on the distance and ambient conditions. For example, shown above the air absorption at 25°C - 55% relative humidity. A percentage of correction parameters is presented:



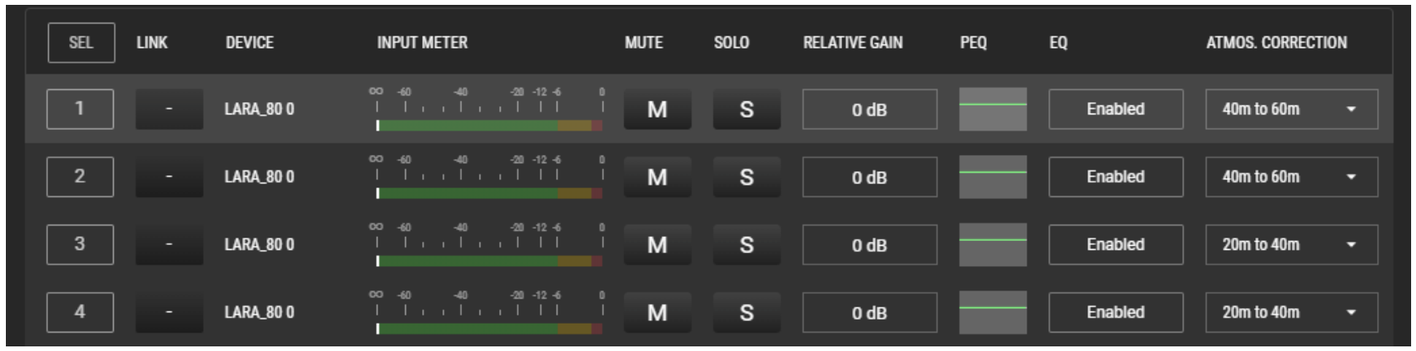
Atmos. Correction

The Atmos. correction is activated ON ALMA, not via display of the units. Atmos. Correction - parameters window on ALMA:



When Enabled, Atmos. Correction can be activated independently per unit or per group of units:

Shown below 4x LARA-80 on top of the array (12 units) with 2 different corrections (40m to 60m and 20m to 40m).



INTRODUCTION

ARA series systems communicate using standard TCP/IP data protocols. As professional audio equipment it is almost mandatory the use of ARA products with compatible professional network hardware. Gigabit switches can be found in the industry in a very wide range of prices and features but always keep in mind that domestic intended hardware may not perform properly as there exist limitations managing network bandwidths and impossibility of managing a big number of devices.

The quality of the network cabling used is also a key factor to not face problems specially when dealing with distances close to the limit (100meters) and big bandwidths. As a general rule only use CAT6e or CAT7 cabling with the proper shielding.

Ethernet cables are used to transmit data between network devices, such as computers, routers, and switches. Both Cat6e and Cat7 cables are types of Ethernet cables that are designed to support high-speed data transfer rates and reduce signal interference. However, there are some differences between the two:

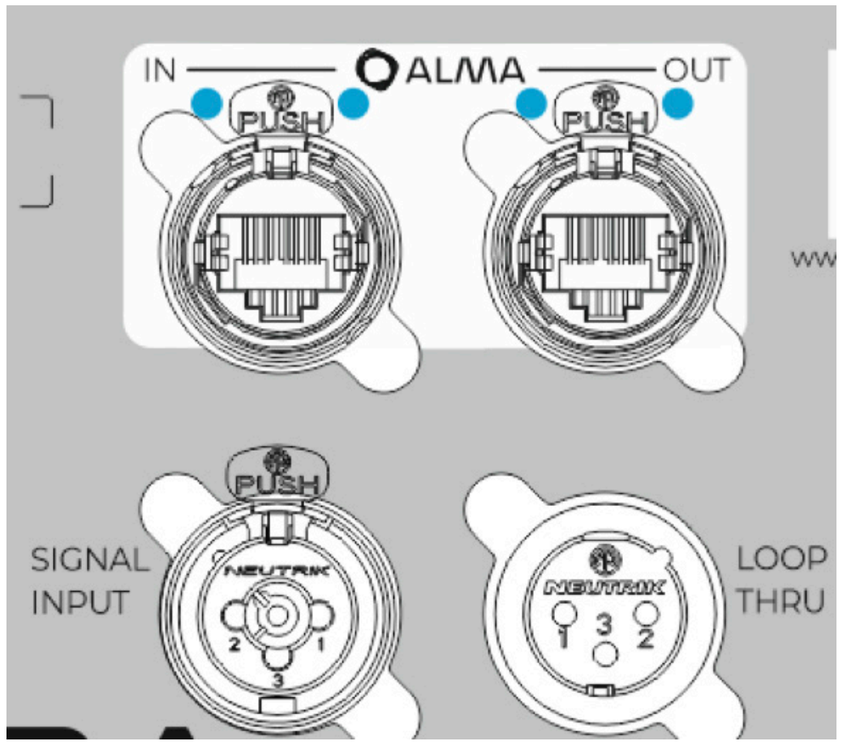
1. **Bandwidth:** Cat6e cables are designed to support bandwidths of up to 500 MHz, while Cat7 cables can support up to 600 MHz. This means that Cat7 cables have a higher capacity for transmitting data at faster speeds.
2. **Shielding:** Cat6e cables usually have shielding around each pair of twisted wires to reduce crosstalk (interference between wires). On the other hand, Cat7 cables have individual shielding around each pair of twisted wires, as well as an overall shielding around all four pairs. This provides better protection against crosstalk and external electromagnetic interference.
3. **Connectors:** Cat6e cables use the same RJ45 connectors as most other Ethernet cables, while Cat7 cables use a different type of connector called GG45, which is designed to support higher frequencies and reduce crosstalk.
4. **Distance:** Both Cat6e and Cat7 cables can transmit data over distances of up to 100 meters (328 feet), but Cat7 cables are designed to maintain their signal quality over longer distances.

Overall, Cat7 cables are a more advanced and expensive option than Cat6e cables, and are typically used in high-performance network environments that require very high bandwidths and reliable transmission of data over long distances. Cat6e cables are a more affordable and widely used option for many standard Ethernet applications.

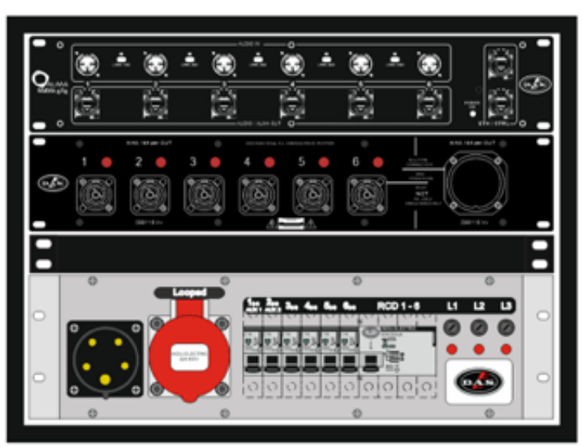
It’s important to note that the maximum distance is 100m (328feet) for a single ethernet CAT6e cable (for 10 Gbps speeds) segment without any repeaters or switches in between. If you need to extend the distance beyond these limits, you can use repeaters, switches, or fiber optic cables to extend the reach of your Ethernet network.

ARA NETWORK CONNECTIONS

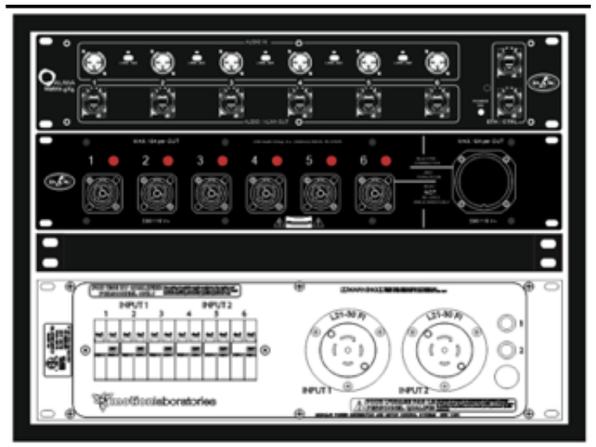
The amplifier of each ARA system uses an interface board equipped with 2 XLR connectors, named Signal Input and LOOPTHRU, and 2 ethercon connectors named ALMA IN and OUT. The ethercon connectors combine analog audio and ALMA monitoring & control data:



The power and signal distribution to the audio systems is managed from the ARA-RACKS (230 / 208V versions):

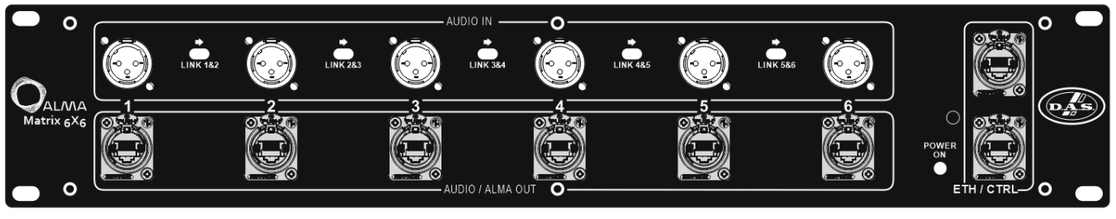


RACK-ARA-230V



RACK-ARA-208V

MATRIX-66
To distribute the audio signals (analog) and monitoring data, each rack contains a Matrix-66 ethernet switch that combines the control data and analog audio. Each Matrix-66 is equipped with 6 “ALMA outputs” that are going to be used to send audio and data to the groups of systems:



6x ALMA data & Audio outs

Ethernet IN / OUT

There exist two extra ethercon connectors, named ETH / CTRL, at the right side of the panel, to connect the ALMA network between racks and ethernet switches /routers.

The number of units (LARAs /SARAs etc.) that can be “daisy chained” in an array system should not exceed 6* (* this quantity will be less when using power and signal distribution with ECPK-20 cables. Note that for instance, the maximum number of SARAs than can be fed from a single ECPK-20 is 4).

ARA series systems communicate using standard TCP/IP data protocols, and so, like all typical network devices, need a set of unique addresses to communicate with similar devices on the network, and with the ALMA control software.

The users shall configure the systems defining properly these two parameters:

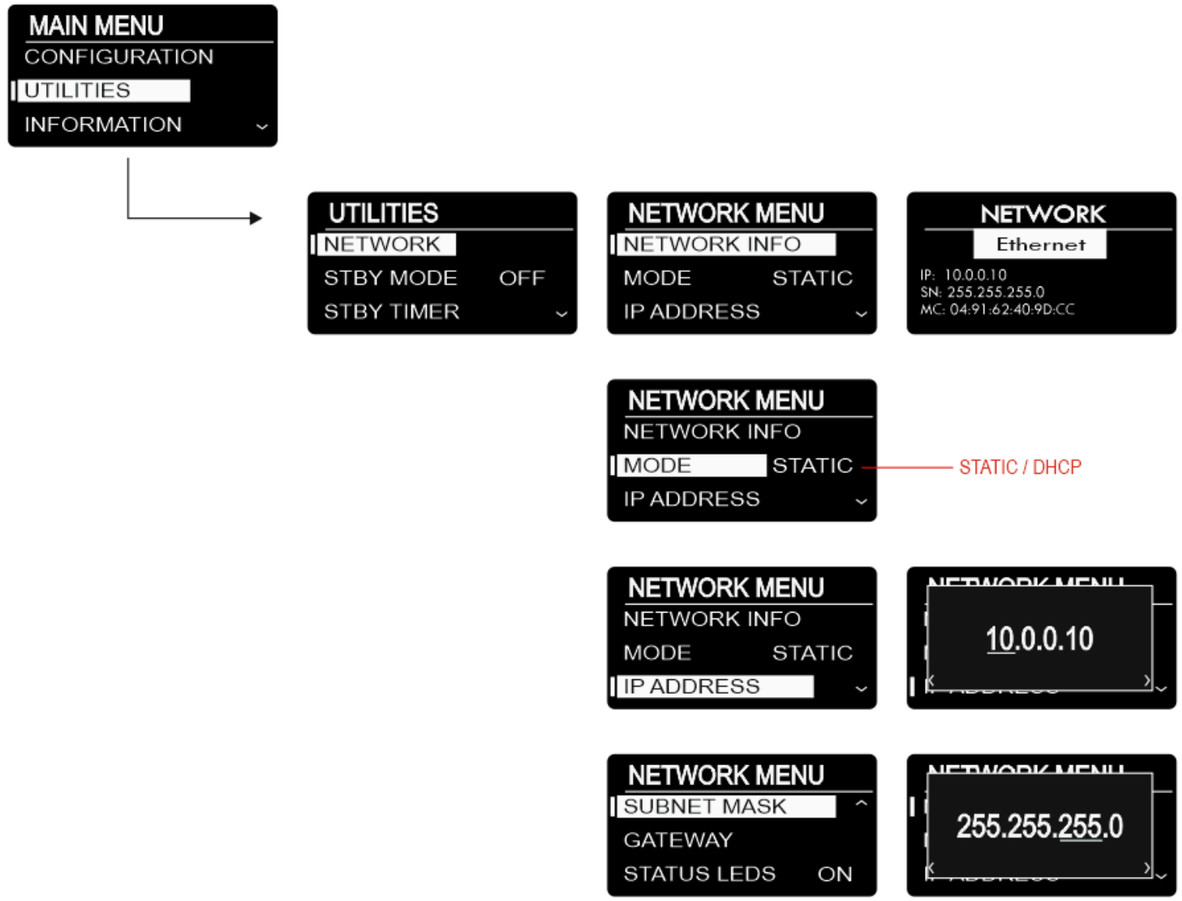
- **IP Address**
- **Subnet Mask**

IP ADDRESS

Ethernet networks can operate in either static mode or dynamic mode, which refers to how IP addresses are assigned to devices on the network. Here's a brief overview of each mode:

- **Static mode:** In static mode, IP addresses are manually assigned to each device on the network by the network administrator. This means that the same IP address is assigned to a device every time it connects to the network, which can simplify network management and troubleshooting. However, this approach can be time-consuming and may lead to conflicts if IP addresses are assigned incorrectly or if multiple devices are assigned the same IP address.
- **Dynamic mode:** In dynamic mode, IP addresses are automatically assigned to devices on the network by a DHCP (Dynamic Host Configuration Protocol) server. When a device connects to the network, it sends a request to the DHCP server for an IP address, and the server assigns an available address. This approach allows for more efficient use of IP addresses and reduces the likelihood of conflicts. Additionally, the DHCP server can also assign other network settings, such as the subnet mask and default gateway, which can simplify network configuration.

Overall, dynamic mode is generally preferred for larger networks with many devices, as it simplifies IP address management and reduces the risk of conflicts. However, static mode can be useful for smaller networks or for devices that require a fixed IP address for specific applications or services.



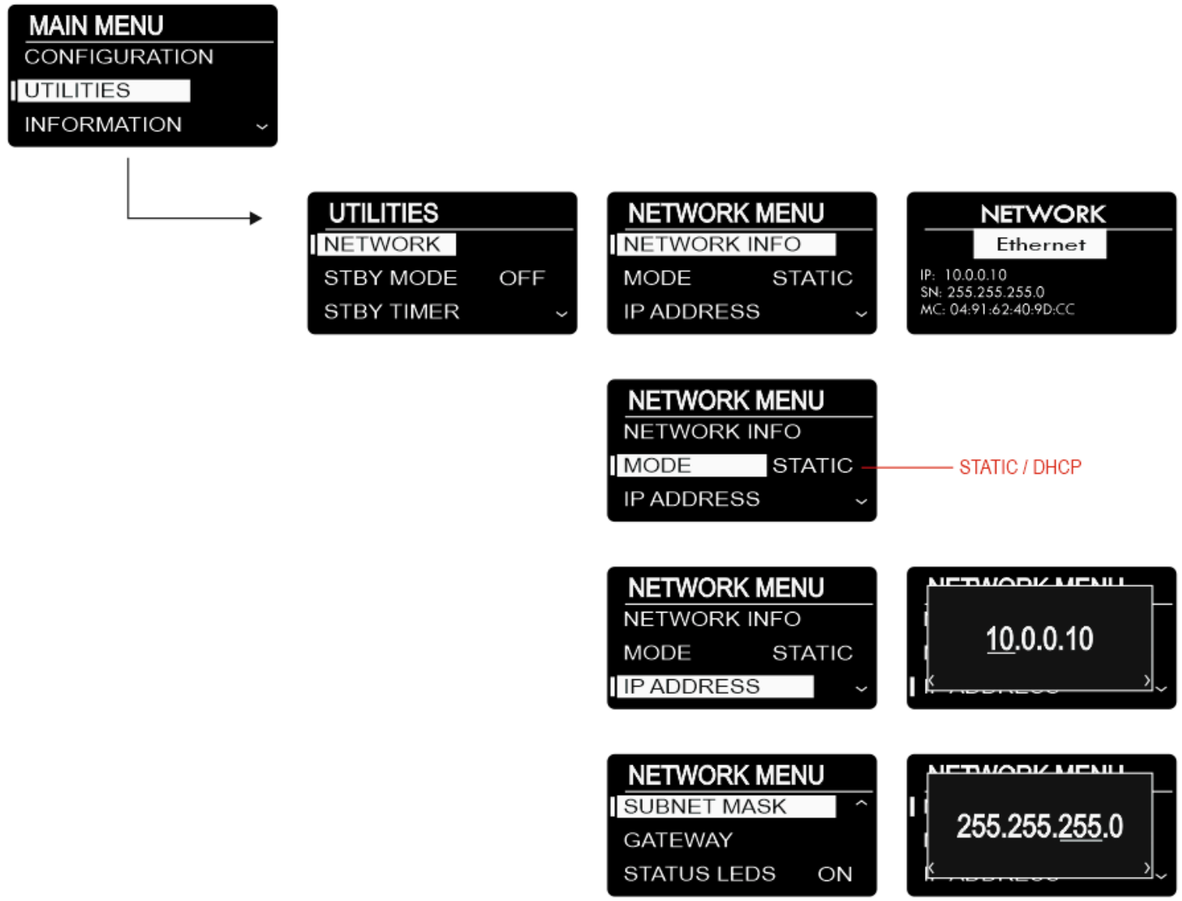
Networking

The ALMA network can be configured in the two previous seen different ways:

- **Using STATIC IP on each of the devices.** By doing this no DHCP server or router is needed. The control computer can be connected directly to the network switch and to the racks. The racks on each side of the PA can be daisy chained using the in/out ethercons of the Matrix-66 (ETH/CTRL connectors). The user shall introduce a unique IP address on every single device. The Subnet Mask shall be configured as 255.255.255.0. in all units.

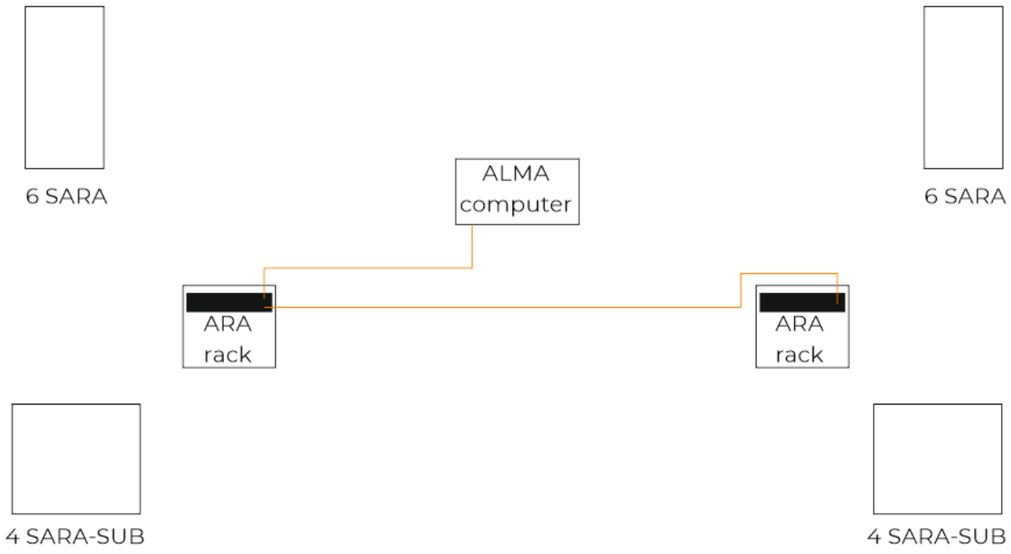
- **Using DHCP or Dymanic IP.** An ethernet switch with DHCP sever capabilities shall be used, or a router to determine automatically IP addresses to all the units present on the network. The switch shall be connected to the racks using the ethercon IN conector of the Matrix-66.

By the use of the control buttons and display of the units, the user can access the main network configuration menu and set the working mode (static / dynamic) accordingly:

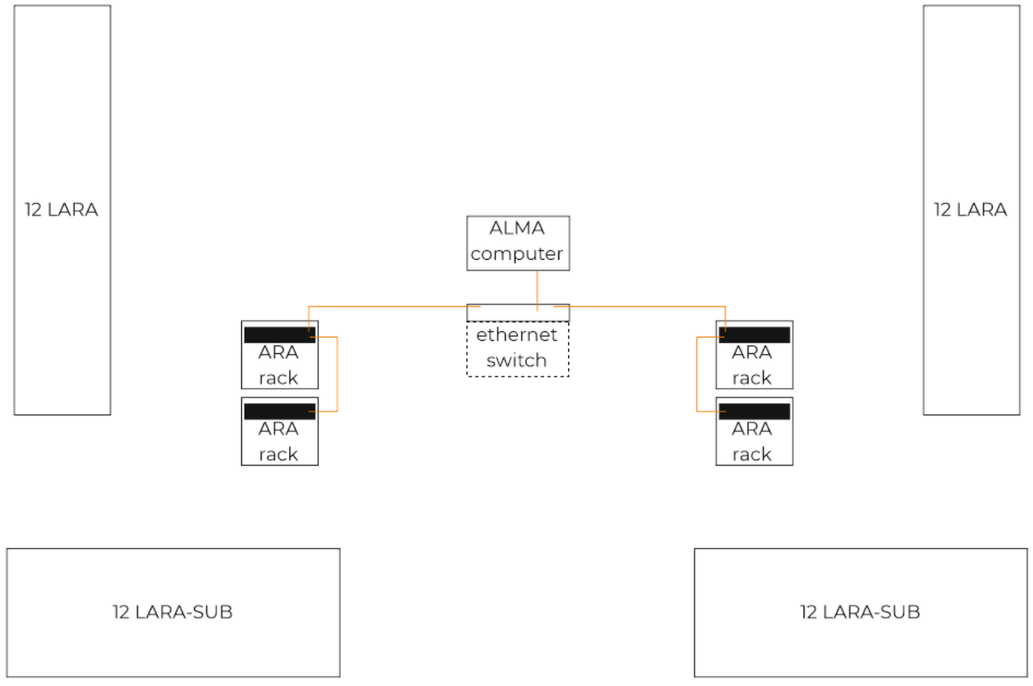


STATIC MODE

A very basic configuration with few units can be driven using static IP addresses and no other extra devices. Connect the ALMA control PC in static mode directly to the network and daisy chain de ARA racks by the use of the intended ethernet ports of the Matrix-66:



A more complex situation with bigger equipment will need a switch to split the network. One ethernet switch to distribute ALMA control to left and right ARA-RACKs. The Racks on each side can be daisy chained using the ETH/CTRL connectors of the Matrix-66:

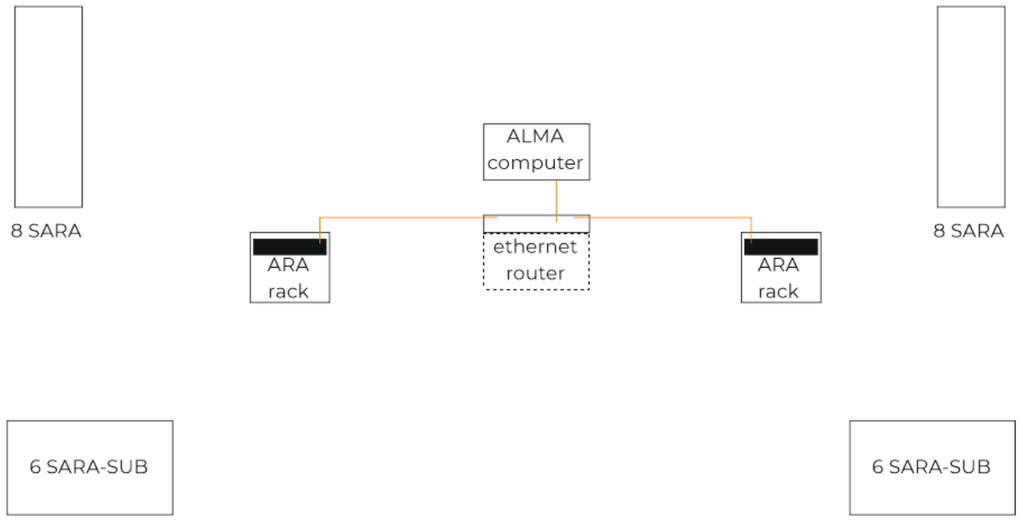


*Note: The control computer shall be configured properly on Static IP mode with an IP Address in the same range of the ones used in the systems.

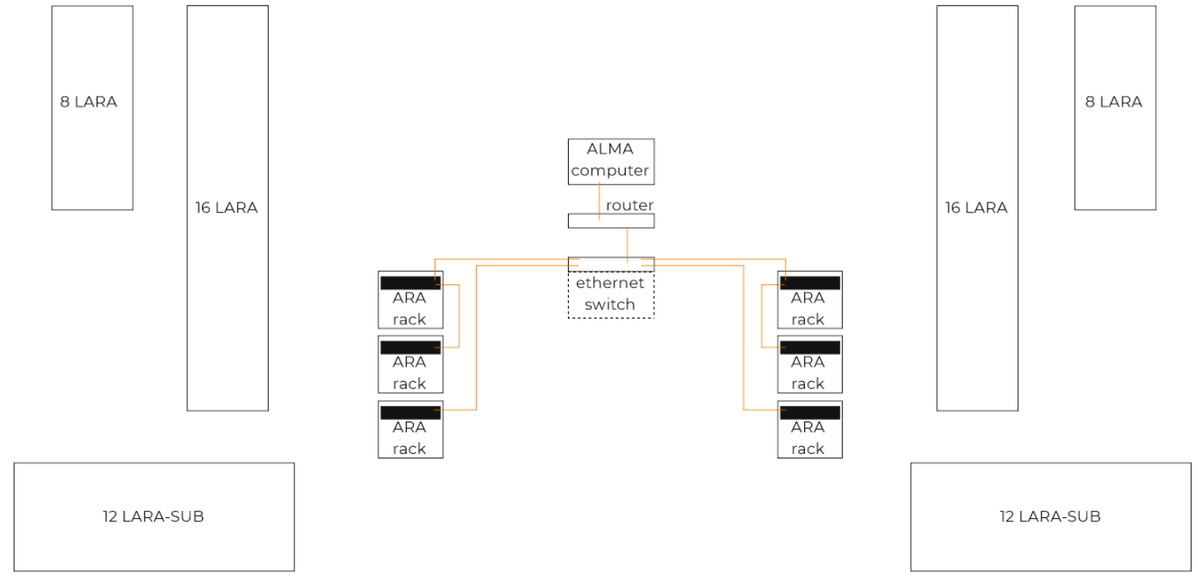
DYNAMIC MODE

One ethernet switch with DHCP Server or router to distribute ALMA control to left and right ARA-RACKs. The Racks on each side can be daisy chained using the ETH/CTRL connectors of the Matrix-66.

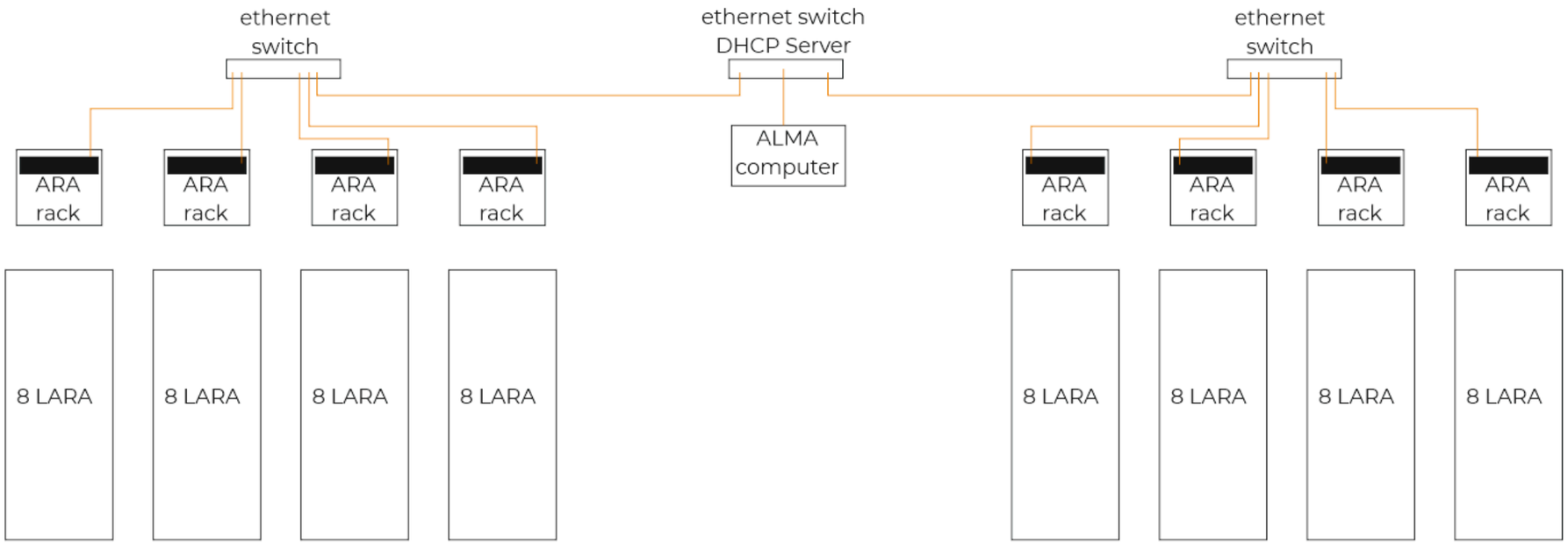
In the first example connect a portable router as the recommended GL-iNET AXT1800 to connect both racks and assign automatically IP addresses to all elements on the network:



Larger systems will require both elements, router and ethernet switch with more ports available:



In any case, the network configuration possibilities are endless. For fixed installation it is highly recommended to use separated VLAN for the Audio systems and Switches with DHCP server capabilities and advanced configuration features. The Star topology is recommended in this type of installations:



Recommended Ethernet Switches

Yamaha SWP 1-8:
The Yamaha SWP1-8 is an 8-port network switch designed for use in professional audio and video production applications. It is part of Yamaha's SWP series of network switches, which are designed to provide reliable and low-latency network connectivity for digital audio and video networks.

The SWP1-8 supports various network protocols, including Dante, which is a digital audio over Ethernet protocol used by many professional audio applications. The switch also features a web-based user interface for easy configuration and monitoring, as well as support for VLANs (Virtual Local Area Networks) to segment network traffic.

Some of the key features of the Yamaha SWP1-8 include:

- Eight 1 Gbps Ethernet ports for connecting audio and video devices
- Support for Dante digital audio protocol, as well as other network protocols
- Low-latency design for high-quality audio and video streaming
- Web-based user interface for easy configuration and monitoring
- VLAN support for network traffic segmentation

Overall, the Yamaha SWP1-8 is a high-performance network switch designed specifically for professional audio and video applications. Its low-latency design and support for Dante protocol make it a popular choice for use in live sound reinforcement, broadcast, and recording applications.

Luminex GigaCore 12
The Luminex GigaCore 12 is a 12-port network switch designed for use in professional audio, video, and lighting applications. It is part of the GigaCore series of network switches, which are designed to provide reliable and low-latency network connectivity for digital audio, video, and lighting networks.

The GigaCore 12 features twelve 1 Gbps Ethernet ports, including two Gigabit Ethernet ports for uplink or daisy-chaining to other network switches. It also supports various network protocols, including Dante, which is a digital audio over Ethernet protocol used by many professional audio applications. The switch also features a web-based user interface for easy configuration and monitoring, as well as support for VLANs (Virtual Local Area Networks) to segment network traffic.
Some of the key features of the Luminex GigaCore 12 include:

- Twelve 1 Gbps Ethernet ports for connecting audio, video, and lighting devices
- Support for Dante digital audio protocol, as well as other network protocols
- Low-latency design for high-quality audio and video streaming
- Web-based user interface for easy configuration and monitoring
- VLAN support for network traffic segmentation
- Two Gigabit Ethernet ports for uplink or daisy-chaining to other network switches

Overall, the Luminex GigaCore 12 is a high-performance network switch designed specifically for professional audio, video, and lighting applications. Its low-latency design and support for Dante protocol make it a popular choice for use in live sound reinforcement, broadcast, and lighting control applications.

Recommended Ethernet Switches

RECOMMENDED PORTABLE ROUTERS:

GL-iNET, GL-AXT1800

The GLiNET GL-AXT1800is a compact travel router designed for use in small networks and for mobile connectivity. It supports both wired and wireless connections and can be used as a router, access point, or repeater.

The GL-AXT1800 is equipped with two Ethernet ports, one of which can be used as a WAN (wide area network) port to connect to a modem or another router. This port can be configured as well as VLAN. It also features dual-band Wi-Fi, supporting both 2.4GHz and 5GHz frequencies for wireless connectivity. The router is powered by a 1.2GHz dual-core processor and comes with 256MB of RAM and 16MB of flash storage.

Some of the key features of the GLiNET GL-AXT1800 include:

- Two Ethernet ports, one of which can be used as a WAN port
- Dual-band Wi-Fi with support for 802.11ac
- Compact and portable design for travel and mobility
- Support for VPN (Virtual Private Network) and other security protocols
- Web-based user interface for easy configuration and monitoring
- Powered by a 1.2GHz dual-core processor with 256MB of RAM and 16MB of flash storage

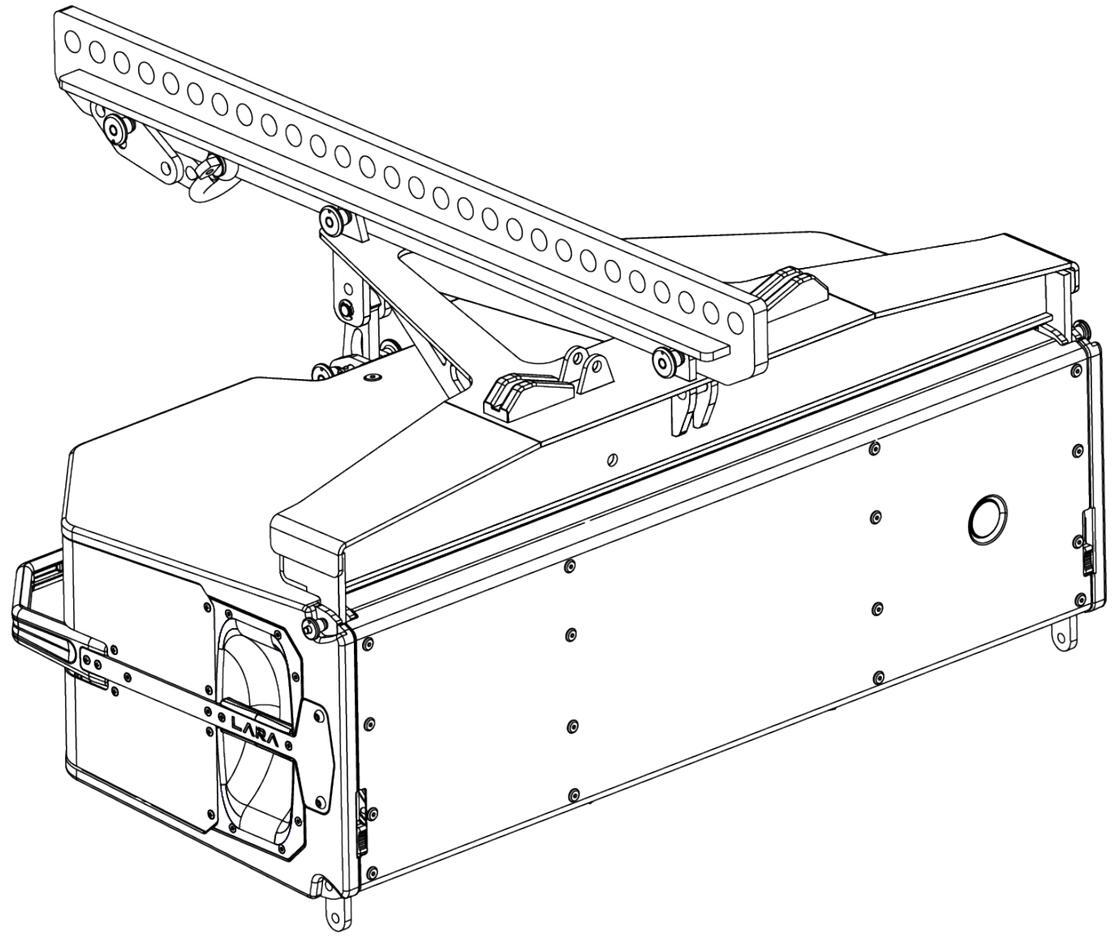
Overall, the GLiNET GL-AXT1800 is a versatile and compact travel router designed for use in small networks and for mobile connectivity. Its dual-band Wi-Fi and support for VPN and other security protocols make it a popular choice for use in remote work and travel applications.

LARA AND LARA-SUB

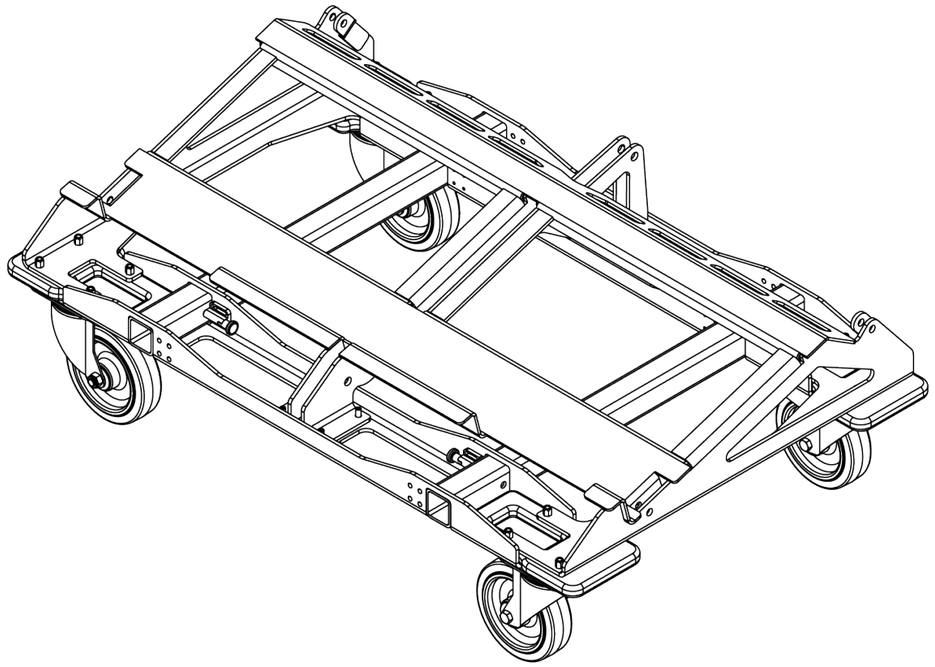
AX-LARA: STAINLESS STEEL RIGGING BUMPER. VALID FOR LARA (UP TO 24 UNITS) AND LARA-SUB (UP TO 16 UNITS). IT PERMITS UPTILT AND DOWNTILT CONFIGURATIONS.

THE RIGGING BUMPER CAN BE TRANSPORTED ON TOP OF THE FIRST UNIT ON THE DOLLY.

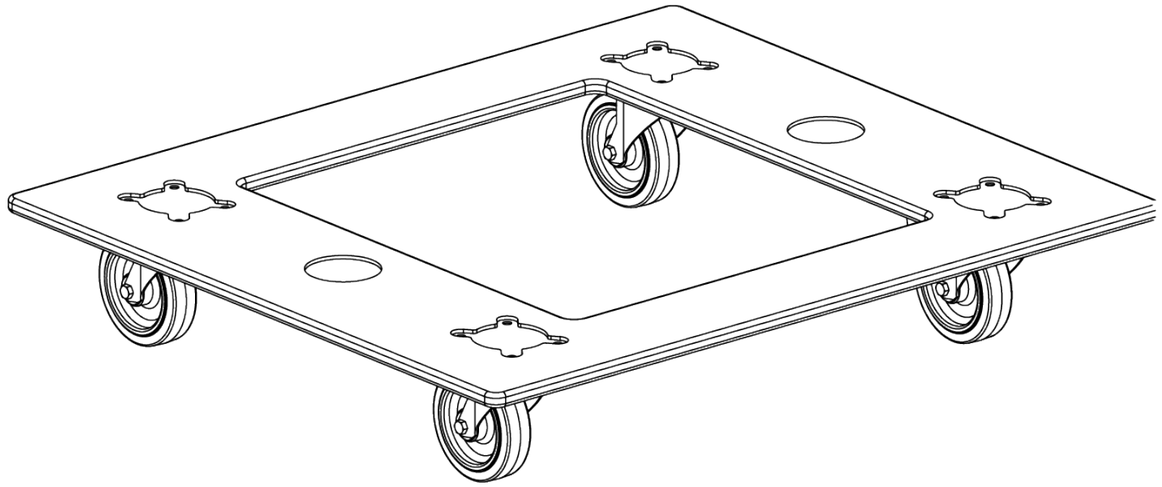
AX-LARA INCLUDES AX-PULL ACCESSORY.



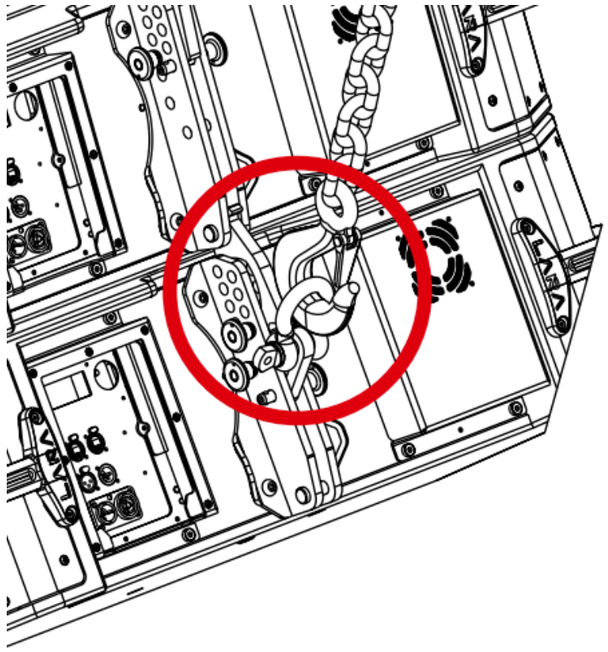
PL-LARA. STEEL TRANSPORT DOLLY FOR 4 LARA SYSTEMS.

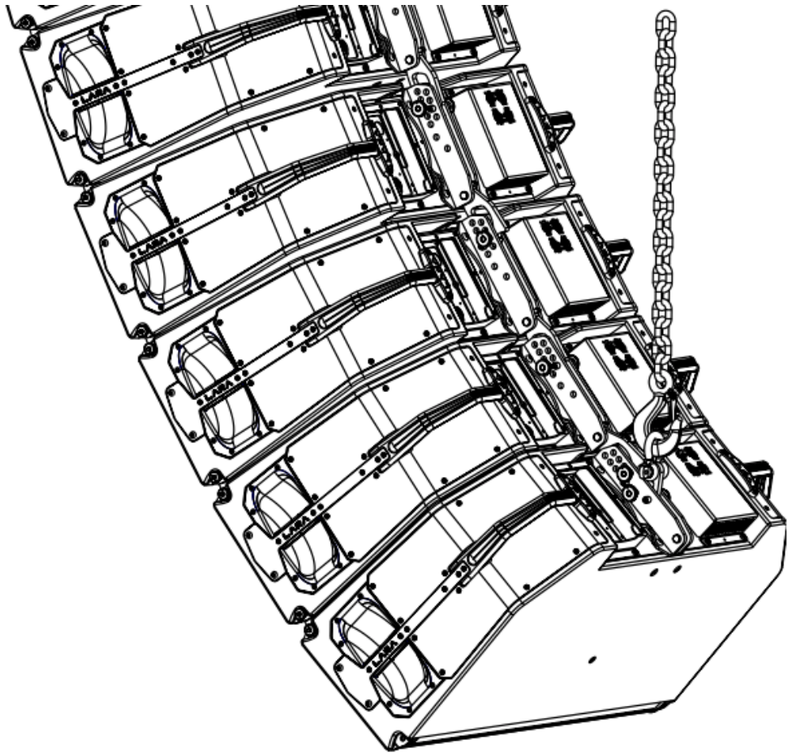


PL-LARA-SUB: WOODEN TRANSPORT DOLLY FOR 2 OR 3 LARA-SUBS.

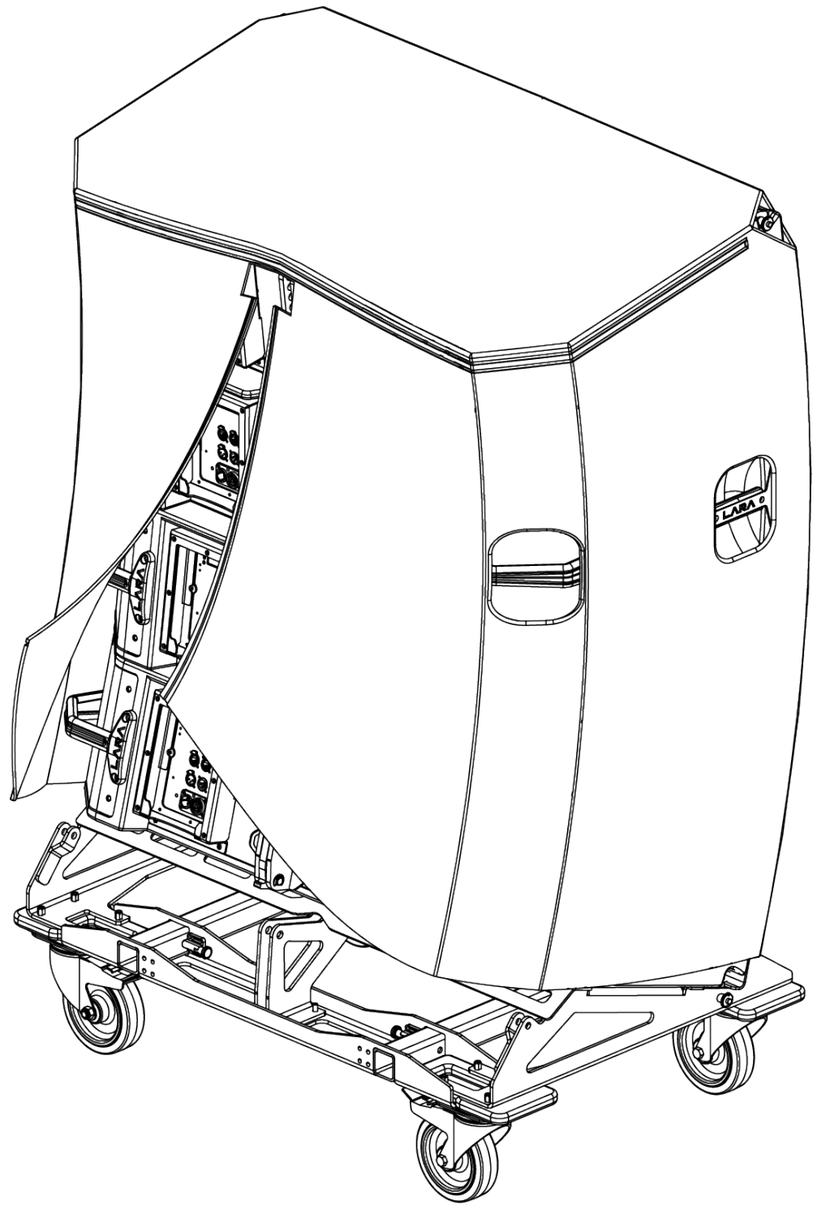


AX-PULL-LARA: INCLUDED PART IN THE AX-LARA INTENDED TO ADD A THIRD RIGGING POINT TO PULL-BACK THE SYSTEM FROM THE BOTTOM:

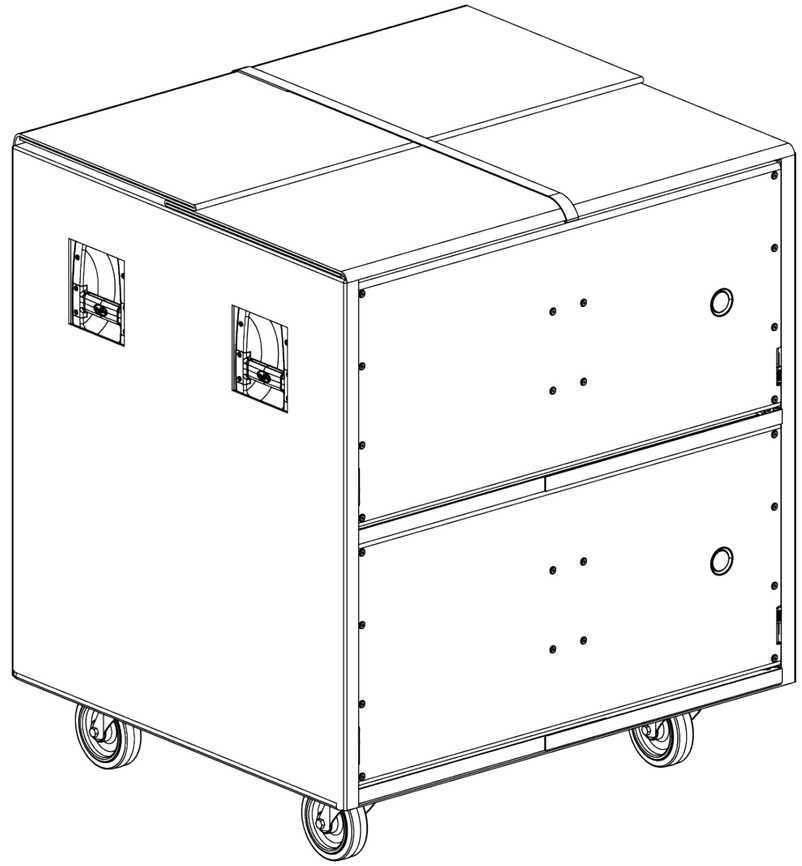




FUN-4-LARA: COVER TO BE USED WHEN TRANSPORTING 4 LARAS ON TOP OF PL-LARA.

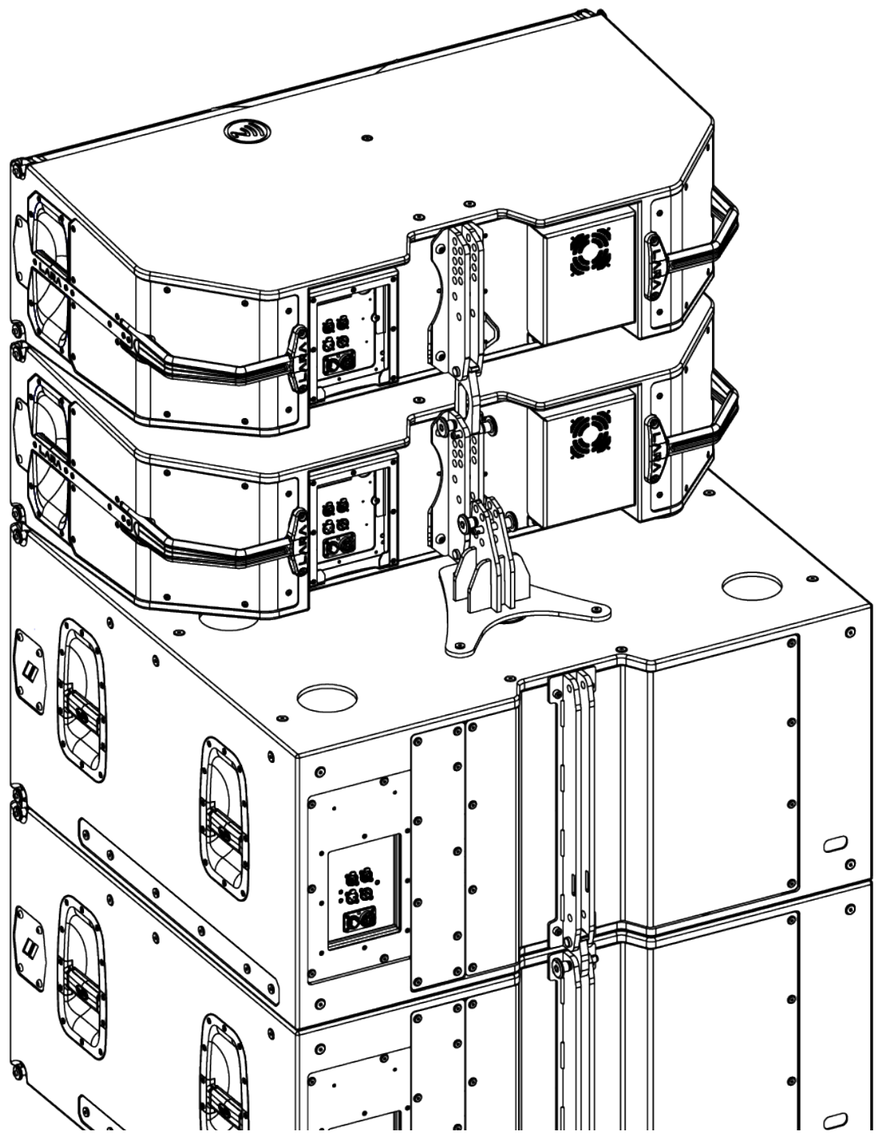


FUN-2-LARA-SUB: COVER TO BE USED WHEN TRANSPORTING 2 SUBS ON TOP OF PL-LARA-SUB. COVER CAN BE KEPT IN POSITION WHILE SYSTEM OPERATION.

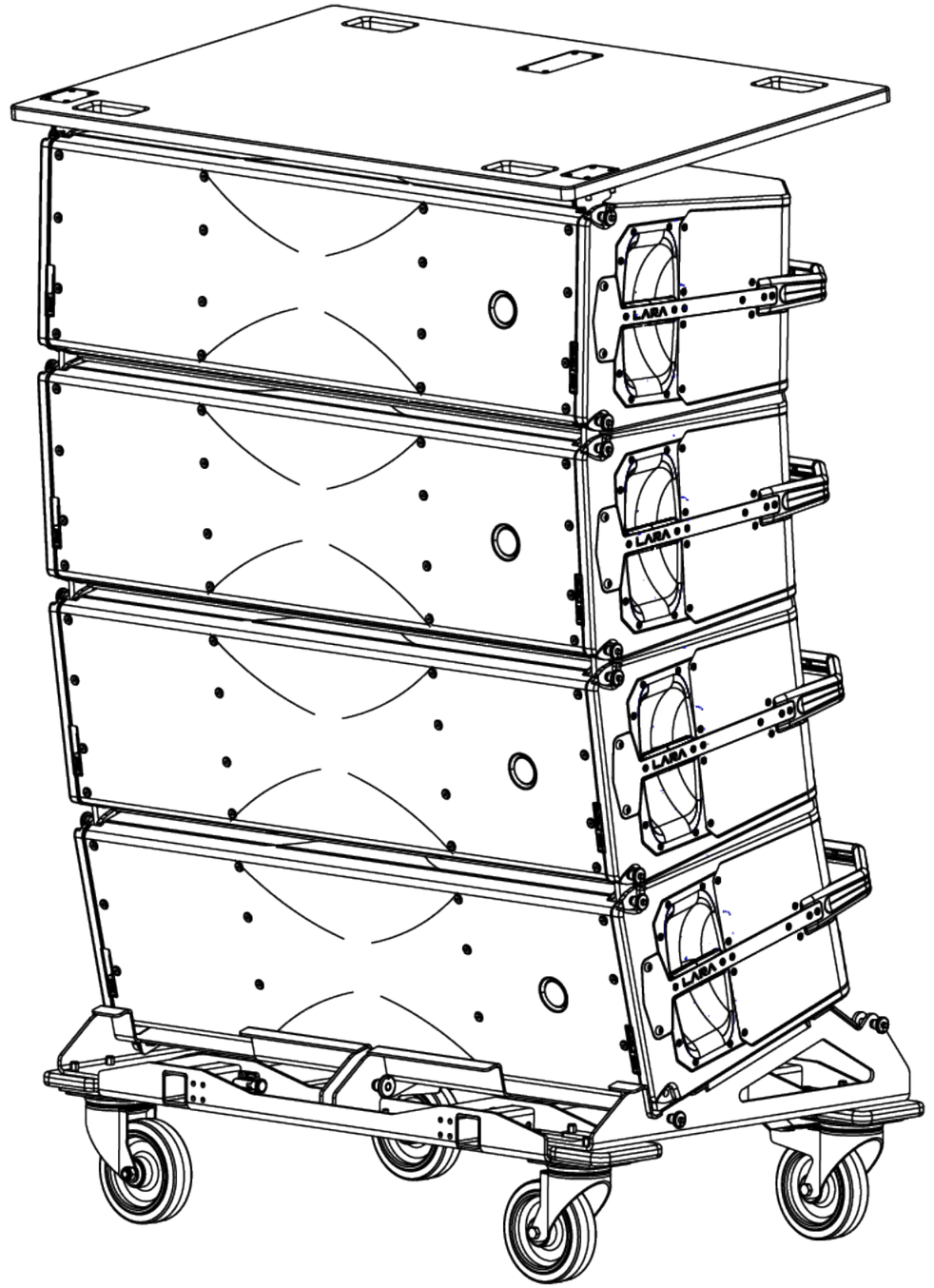


FUN-3-LARA-SUB: COVER TO BE USED WHEN TRANSPORTING 3 SUBS ON TOP OF PL-LARA-SUB. COVER CAN BE KEPT IN POSITION WHILE SYSTEM OPERATION.

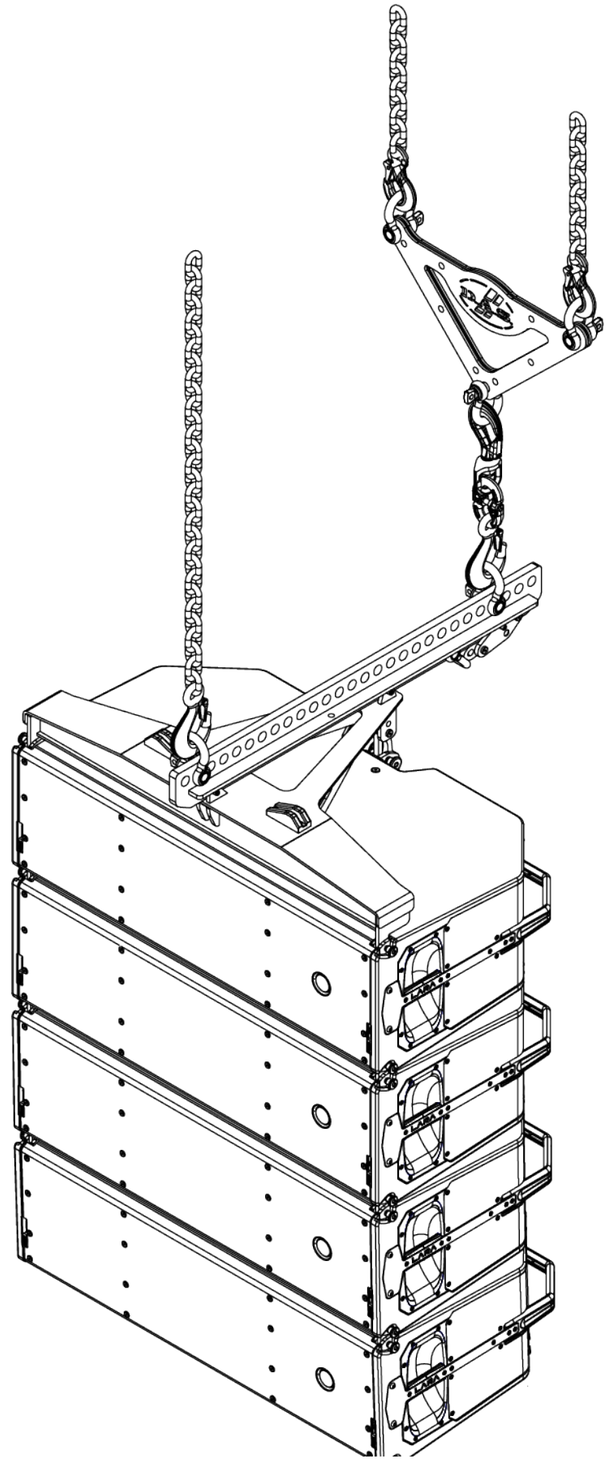
JP-LARA: STEEL STACKING BRACKET TO INSTALL LARAS ON TOP OF LARA-SUBS



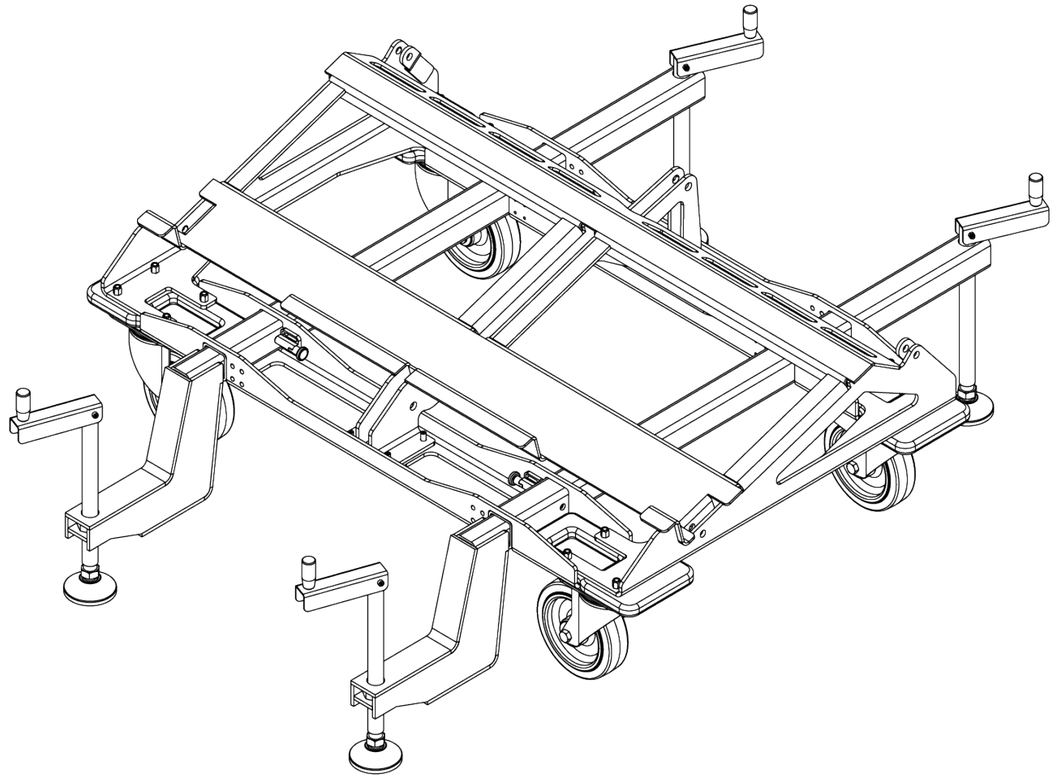
TOP-PL-LARA: WOODEN TRANSPORT SUPPORT FOR 4 LARA ON PL-LARA



V-AX-LARA: V-SHAPED PIVOT PLATE FOR HORIZONTAL ADJUSTMENT OF THE AX-LARA.

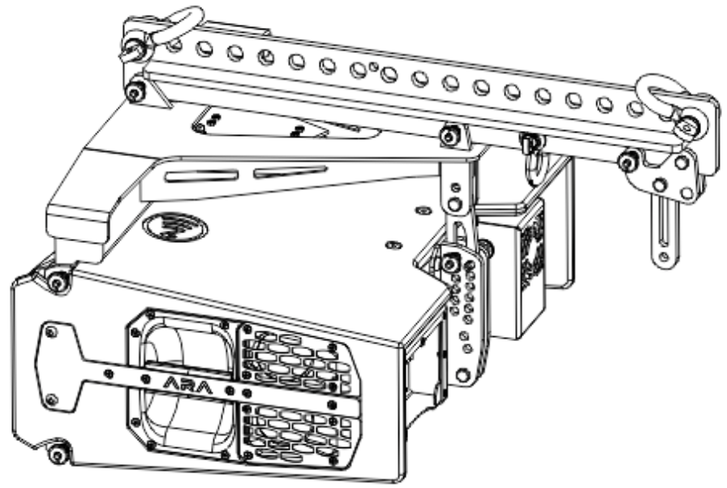


GS-PL-LARA: KIT OF ADJUSTABLE EXTENSIONS COMPATIBLE WITH PL-LARA TO STABILIZE AND ANGLE THE SYSTEM IN STACK CONFIGURATION.

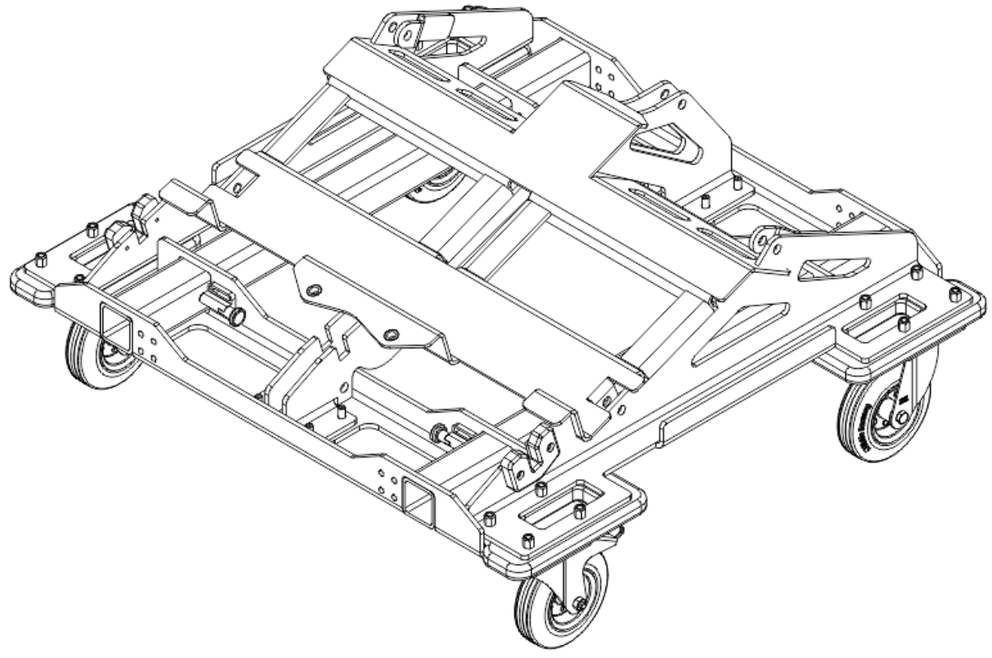


SARA AND SARA-SUB

AX-SARA: RIGGING BUMPER FOR SARA (MAX 24 U.) AND SARA-SUB (MAX 16 U.). IT PERMITS UPTILT AND DOWNTILT CONFIGURATIONS. THE RIGGING BUMPER CAN BE TRANSPORTED ON TOP OF THE FIRST UNIT ON THE DOLLY.

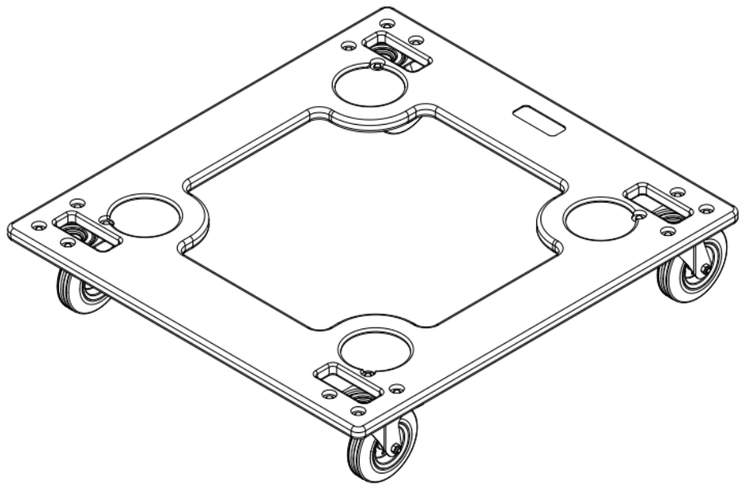


PL-SARA: STEEL TRANSPORT DOLLY FOR SARA (MAX 4 U.):

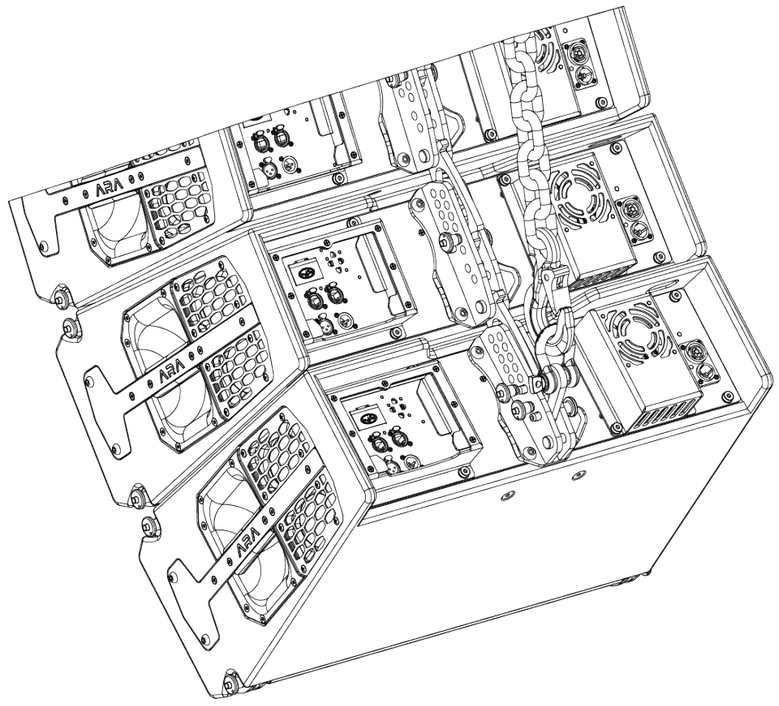


SARA AND SARA-SUB

PL-SARA-SUB: WOODEN TRANSPORT DOLLY FOR 2 OR 3 SARA-SUBS.



AX-PULL-SARA: PULL-BACK HARDWARE FOR THE BOTTOM BOX OF A SARA ARRAY.



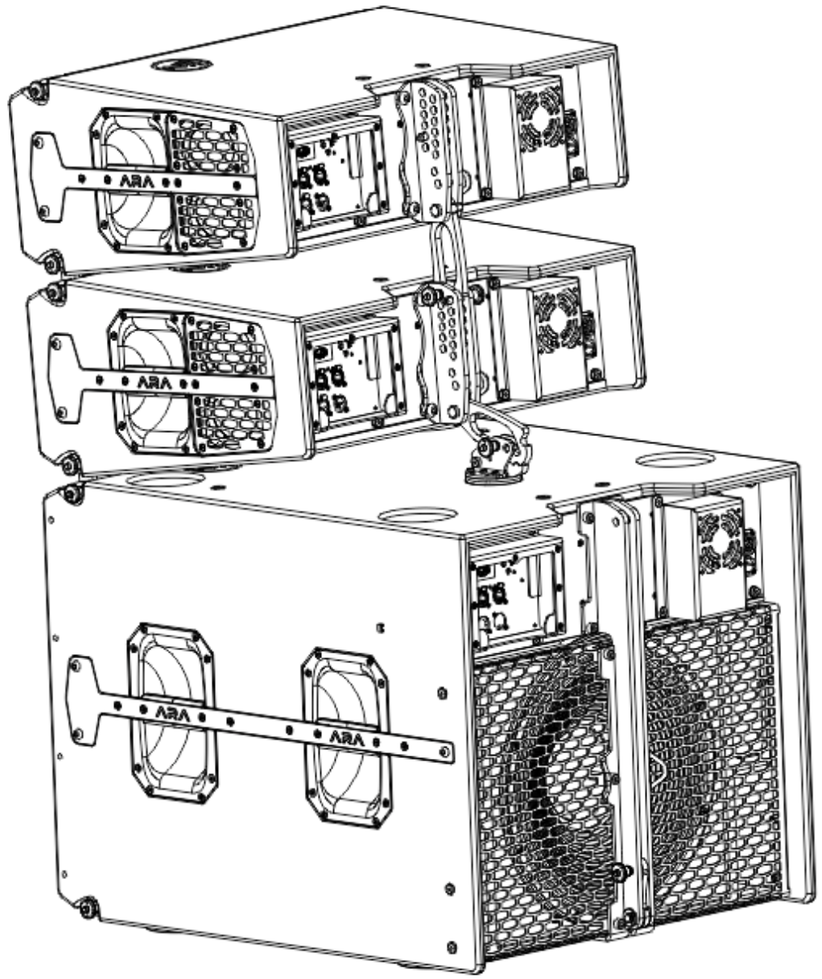
Accessories

SARA AND SARA-SUB

FUN-4-SARA: PROTECTIVE TRANSPORT COVER FOR 4 U. SARA ON PL-SARA.

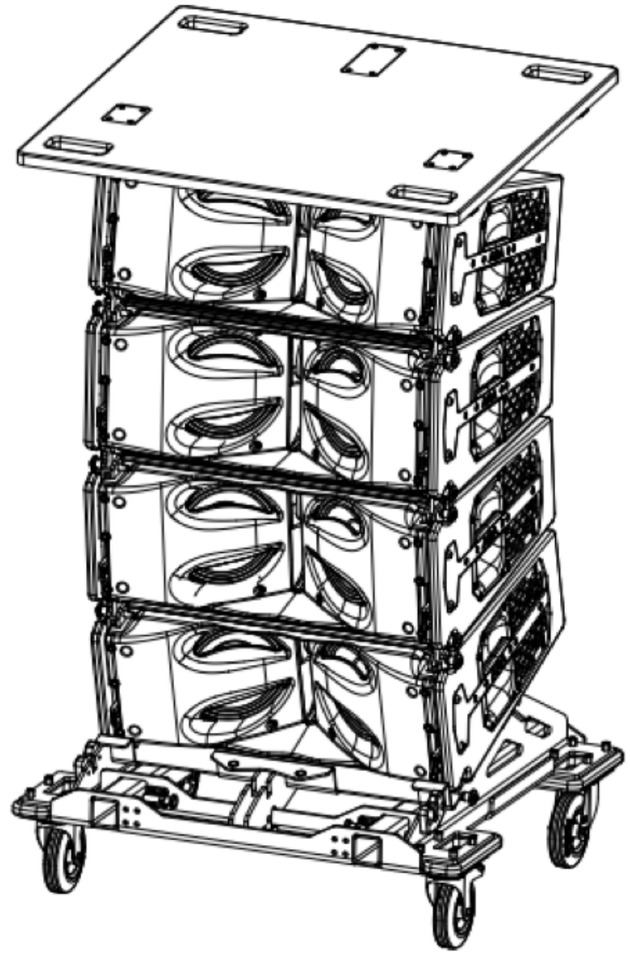
FUN-2-SARA-SUB: PROTECTIVE TRANSPORT COVER FOR 2 U. SARA-SUB ON PL-SARA-SUB.

JP-SARA: JOINING PLATE FOR ARRAY ASSEMBLING SARA/ SARA-SUB. VALID FOR STACKING SARAS ON TOP OF THE SUBS OR RIGGING SARAS BELOW SARA-SUBS.

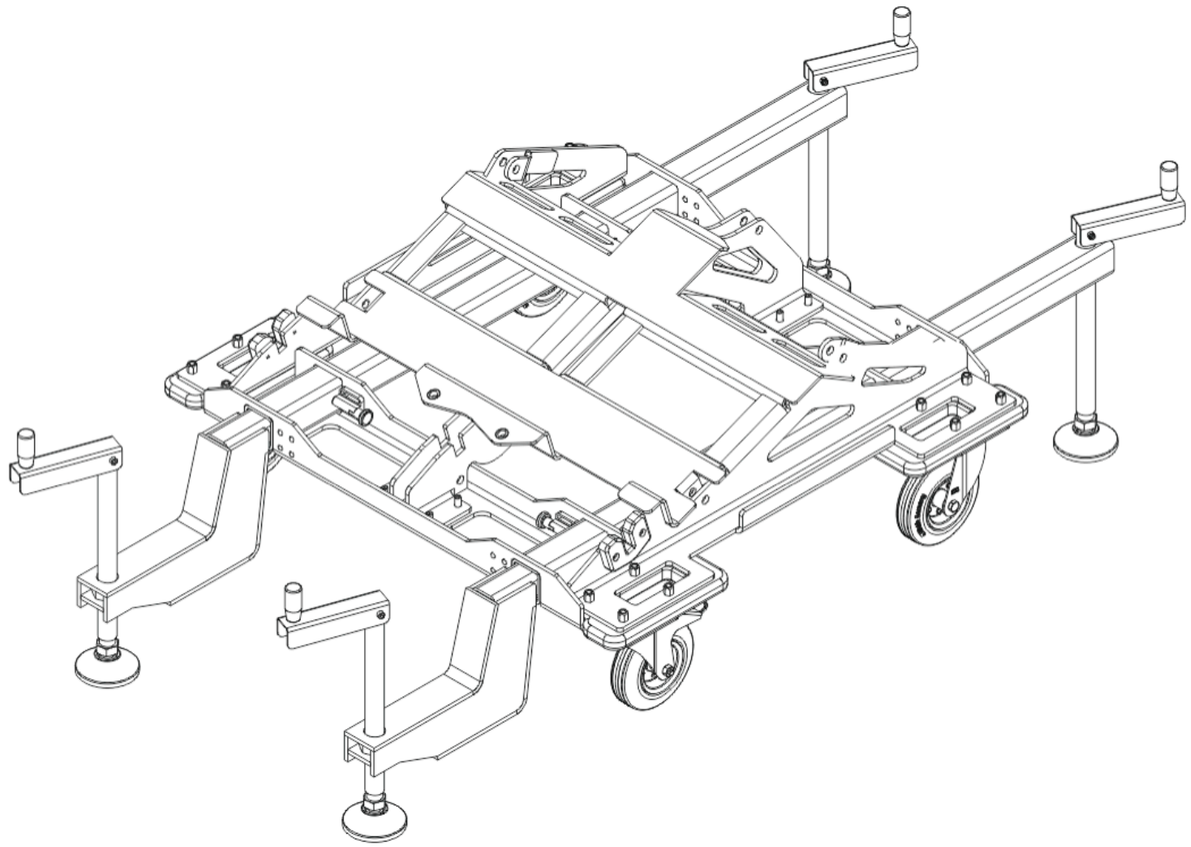


SARA AND SARA-SUB

TOP-PL-SARA: WOODEN TRANSPORT SUPPORT FOR 4 SARA ON PL-SARA



GS-PL-SARA: KIT OF ADJUSTABLE EXTENSIONS COMPATIBLE WITH PL-SARA TO STABILIZE AND ANGLE THE SYSTEM IN STACK CONFIGURATION.



ARA series
Rigging

INTRODUCTION

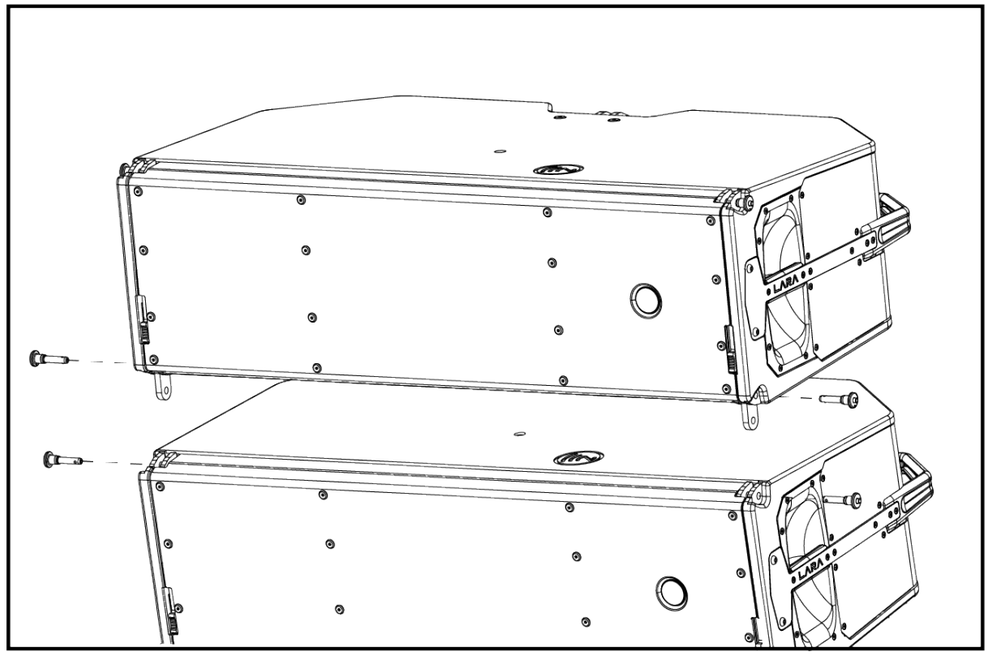
The present document is not the rigging manual of the products. This chapter is a very brief summary and explanation of the very basic concepts related to the rigging of the ARA systems. Please, refer to the rigging user´s manual for further details. Please read carefully the rigging manual before using the system for the first time.

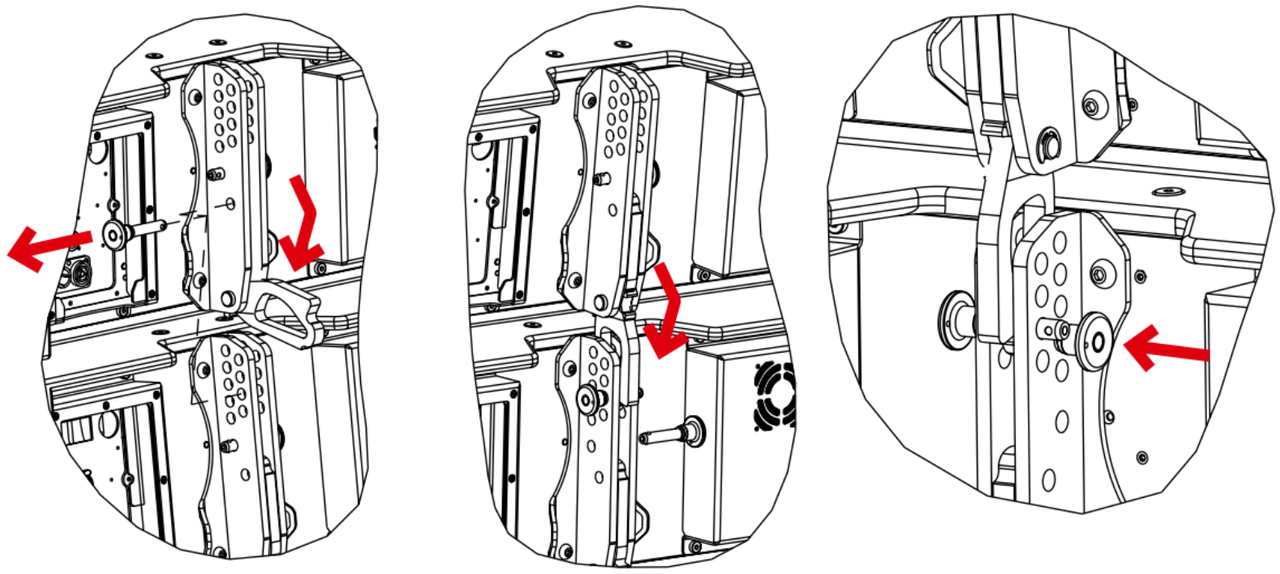
To carry out any operations related to flying a DAS Audio system, it is recommended to read the present document first and comply with the warnings and advice given. The goal is to allow the user to become familiar with the mechanical elements required to fly the acoustic system, as well as the safety measures to be taken during and after assembly. Only experienced installers with adequate knowledge of the equipment and local safety regulations should fly speaker boxes. It is the user´s responsibility to ensure that the systems to be flown (including flying accessories) comply with state and local regulations.

Rigging hardware should be regularly inspected and defective units replaced discarded. It is highly recommended that you implement an equipment inspection and maintenance program, including reports to be filled out by the inspectors. Local regulations may exist that, in case of accident, may require you to submit evidence of inspection reports and corrective actions carried out after defects were found. Absolutely no risks should be taken with regards to public safety.

ARA RIGGING SYSTEM

- All ARA systems include a 3 point stainless steel rigging system.
- AX-LARA and AX-SARA rigging bumpers are compatible with the companion subwoofer models.
- AX-LARA and AX-SARA permit uptilt and downtilt arrays.
- All models, including subwoofers, can be rigged.
- All models use 6 quick release pins to join other systems. 4 pins are used at the front (2 left, 2 right) and 2 at the back.
- Always keep the 6 pins with in the cabinet meaning that when rigging two cabinets, pins of cabinet number 2 are not going to be changed of position or moved to cabinet number one and vice versa:
- The FSSTM (Fast Set Splay) rigging system to splay angles from the ground-stack position in 1° steps, from 0° to 7° (LARA) and from 0° to 10° (SARA) combined with the three new rigging points streamline processes and reduce assembly time significantly.



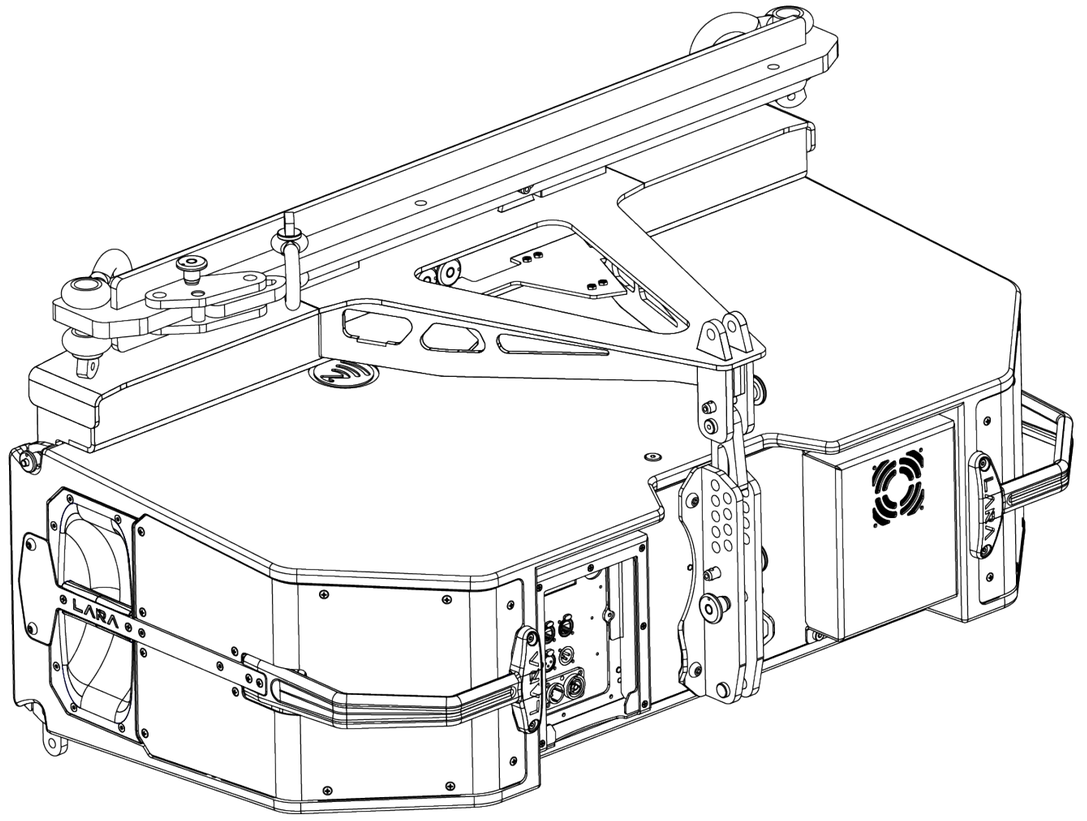


ARA RIGGING SYSTEM

- When shipped from the factory, the units have a rear security pin stowed in the “PIN HOLDER” position, inserted on the right side of their rear plate, and another rear pin stowed in the “STORE LINK” position, inserted on the left. Insert the first pin in the desired splay angle and insert the other pin to lock the connecting rod in the chosen angle plus 1. That is, if the desired angle is 4 degrees, insert the “PIN HOLDER” pin in hole “4” and the “STORE LINK” pin in hole “5”. When the desired angle is 7 degrees, insert the “PIN HOLDER” pin in hole “7”, and the “STORE LINK” pin in the hole marked “7+1”. Make sure the connecting rod from the unit on top is fitted between the rear plates of the unit below to ensure the two units are securely attached.

The use of 2 pins at the rear link is need to stack and lock the possible movement between units. When setting an splay angle for rigging or stacking, insert the first pin in the specific whole, for instance 3°, and the second pin, once the cabinets have achieved the desired 3° angle, into the whole +1° position, in this case 4°.

- The AX-LARA and AX-SARA rigging bumpers can be transported on top of the first cabinet when stacked on the dollies:



Troubleshooting

PROBLEM	CAUSE	SOLUTION
The ON LED does not light up when mains power is active.	1. Loose connector(s). 2. Defective cable wire. 3. Blown internal fuse. 4. Damaged amplifier (Protect LED ON).	1. Check powercon true1 connectors on both extremes of ECPK cablingCheck connections on the system and power distribution panels. 2. Check the cables. Use another unit if possible. 3. Prior replacing the blown fuse by a new compatible one, check there doesn't exist visible damage in the unit. 4. Replace power module.
No sound from the unit	1. Signal cable with loose connector(s). 2. No audio from the source. 3. Defective signal cable. 4. Matrix-66 with no audio. 5. The unit is Muted via ALMA. 6. Damaged transducers.	1. Check both, XLR and Ethercon connectors on both extremes of the cable. 2. Unmute and turn on the audio source. Double check the signal path. 3. Check that there is no visible damage or cuts in the cable. Try to replace the unit. 4. Check the signal path. 5. Restore parameters in the display of the unit (reset). 6. Check the status of the unit on ALMA. Replace transducers.
Distorted sound from the unit	1. Excessive signal input level. 2. If limit LED is on, the unit has reached maximum operating levels. 3. Damaged transducers	1. Check input level on ALMA. Reduce input level. 2. Check unit´s output level on ALMA. Reduce the input level or Device Gain/Group Gain. 3. Use SOLO functionality on ALMA to supervise transducer´s status.

Troubleshooting

The unit(s) is(are) not connecting to ALMA	1. Check Communication preferences on ALMA. 2. Matrix-66 switch with no power. 3. Defective cable and / or connectors. 4. Unit is set on DHCP mode and there Is no router on the network. 5. Unit is set on static mode but the IP address doesn´t match the computer´s one. 6. Wrong sub-net mask.	1. Select the correct network adapter. 2. Turn on Matrix-66. 3. Check cables and connectors, make sure they are correctly inserted into the amplifier's input connector. 4. Set the unit on Static mode or include a DHCP / router on the network. 5. Use same range of IP addresses. For instance, computer 10.0.0.10, systems 10.0.0.20 - 10.0.0.100 6. Use 255.255.255.0 on both computer and devices.
Hum or buzz.	1. Ground loop.	1. Connect the audio system and mixing console to the same circuit.
ALMA functionalities not operative.	1. Firmware not updated	1. Check your firmware version and update it via ALMA.
The sound of the unit is not as expected	1. Defective transducer(s). 2. Existing Internal "device EQ" on ALMA.	1. Check the transducer status on ALMA or measure the sytem´s frequency response. 2. Check on ALMA or in the display of the unit that there are no active EQs or processing in the unit. Apply reset device if needed.

SOUND WITH SOUL