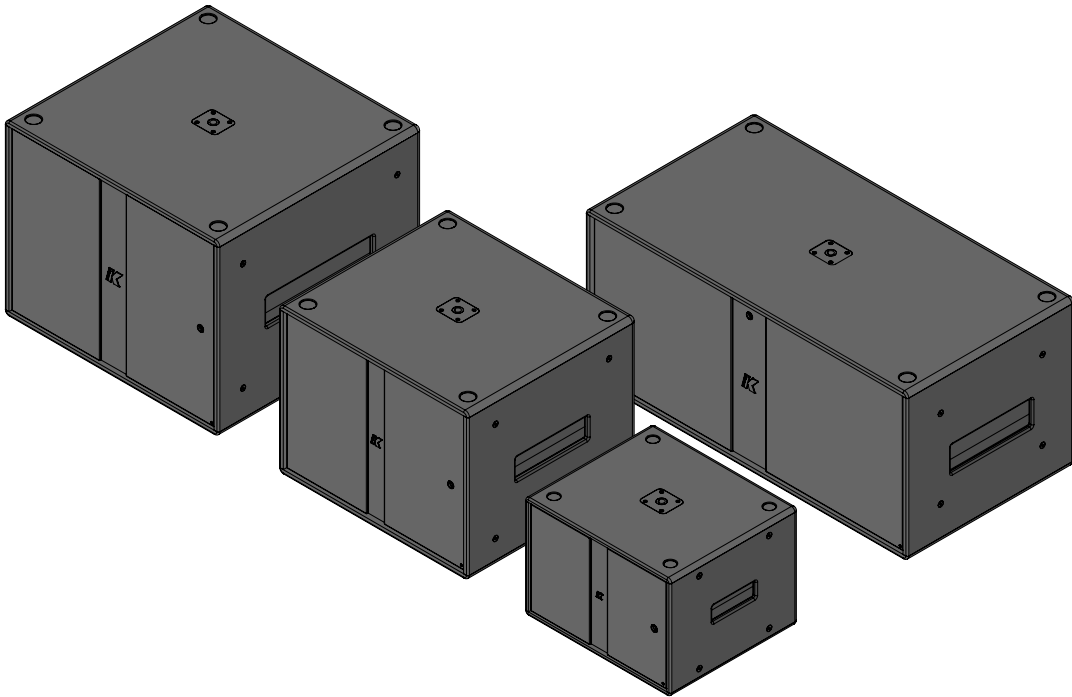


Thunder-KS


Compact, multi-tasking subwoofers

USER GUIDE




K-ARRAY
Unique Audio Solutions

IMPORTANT SAFETY INSTRUCTIONS



CAUTION
 RISK OF ELECTRIC SHOCK
 DO NOT OPEN



ATTENTION: RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**



This symbol alerts the user to the presence of recommendations about the product's use and maintenance.



The lighting flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated, dangerous voltage within the product enclosure that may be of magnitude to constitute a risk of electrical shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in this guide.



Operator's manual; operating instructions
This symbol identifies the operator's manual that relates to the operating instructions and indicates that the operating instructions should be considered when operating the device or control close to where the symbol is placed.



WEEE
Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling center for such equipment.



This device complies with Restriction of Hazardous Substances Directive.

These apparatus are intended for professional use.



Warning. Failure to follow these safety instructions could result in fire, shock or other injury or damage to the device or other property.

Installation and commissioning may only be carried out by qualified and authorized personnel.

General heed and warnings

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- Do not defeat the safety purpose of the polarized or grounding plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Only use attachments/accessories specified by the manufacturer.
- Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and at the point where they exit from the apparatus.
- Clean the product only with a soft and dry fabric. Never use liquid cleaning products, as this may damage the products cosmetic surfaces.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Avoid placing the product in a location under direct sunlight or near any appliance that generates UV (Ultra Violet) light, as this may change the product surface finishing and cause a change in color.
- Audio vibrations created by the product may cause other objects to move, ensure that loose objects are not at risk of falling onto the product or persons and cause personal or object damage.
- To prevent possible hearing damage, do not listen at high volume levels for long periods.
- Beware of sound levels. Hearing damage can occur at moderate level with prolonged exposure to sound. Check the applicable laws and regulations relating to maximum sound levels and exposure times.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- **CAUTION:** These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
- **WARNING:** Only use attachments/accessories specified or provided by the manufacturer (such as the exclusive supply adapter, battery, etc.)



- Before connecting the loudspeakers to other devices, turn off the power for all devices.
- Before turning the power on or off for all devices, set all volume levels to minimum.
- Use only speaker cables for connecting speakers to the speaker terminals. Be sure to observe the amplifier's rated load impedance particularly when connecting speakers in parallel. Connecting an impedance load outside the amplifier's rated range can damage the apparatus.
- K-array cannot be held responsible for damage caused by improper use of the loudspeakers.
- K-array will not shoulder any responsibilities for products modified without prior authorization.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:



1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

CAUTION! Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Statement

This device complies with Industry Canada's licence-exempt RSSs.

Operation is subject to the following two conditions: this device may not cause interference, and this device must accept any interference, including interference that may cause undesired operation of the device.

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS-102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

CE Statement

K-array declares that this device is in compliance with applicable CE standards and regulations. Before putting the device into operation, please observe the respective country-specific regulations!



Trademark Notice

All trademarks are the property of their respective owners.

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Index

General heed and warnings	II	K-array Connect Mobile App	8
FCC Statement	III	Connection and Discovery	8
FCC Radiation Exposure Statement	III	Connection to a single Thunder-KS	9
Canadian Statement	III	Connection to a network of Thunder-KS	10
CE Statement	III	Output configuration	11
Trademark Notice	III	Signal Routing	11
Unpacking	2	Volume	12
Self powered subwoofer rear panel	2	Media Player	12
Passive subwoofer rear panel	2	On-Board Web App	13
Introduction	3	System Update	13
Getting Started	3	System Update via Internet	14
Active Subwoofer (KS1I, KS2I, KS3I, KS4I)	3	Bundle Systems	15
Passive Subwoofer (KS1PI, KS2PI, KS3PI, KS4PI)	3	Pinnacle-KR102 II	15
Connectivity	4	Pinnacle-KR202 II	16
K-array Connect	4	Pinnacle-KR402 II	16
K-framework3	4	Pinnacle-KR802 II	17
Active Subwoofer Rear Panel	4	Accessories	17
Connectivity Reset	4	Service	18
Passive Subwoofer Rear Panel	5	Cleaning	18
NL4 SpeakON wiring	5	DSP Block Diagram	18
One-channel wiring	5	Mechanical Drawings	19
Two-channel wiring	5	Thunder-KS1 I/KS1PI	19
AC mains supply	6	Thunder-KS2I/KS2PI	19
Status LED chart	6	Thunder-KS3I/KS4PI	19
Wiring	6	Thunder-KS4I/KS4PI	19
Mono Loudspeaker System	6	Technical Specifications	20
Stereo Loudspeakers System	7		
AES3 Digital Input	8		

Thunder-KS

User Guide

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Thank you for choosing this K-array product!

To ensure proper operation, please carefully read this owner's manual and safety instruction before using the product. After reading this manual, be sure to keep it for future reference.

Should you have any questions about your new device please contact K-array customer service at support@k-array.com or contact the official K-array distributor in your country.

Our Thunder-KS line gives you all the boom with bass you need for installation and live applications. With both passive and active models in various sizes starting from 12" to 21" and dual 18", the Thunder-KS line is a high performance sub-bass system featuring a woofer with magnet structure and suspension engineered for maximum linear excursion.

Pocket handles and a M20 thread mount position for attaching top speakers make the subwoofers convenient to use and ideal for applications in theaters, concert halls, parties and restaurant installations.

More than just powered subwoofers, our active models depart from traditional subs in that their "smart" design puts electronics as the central component, transforming the mid-low frequency loudspeaker into a proper tool for the management and processing of the audio signal.

Thunder-KS

User Guide

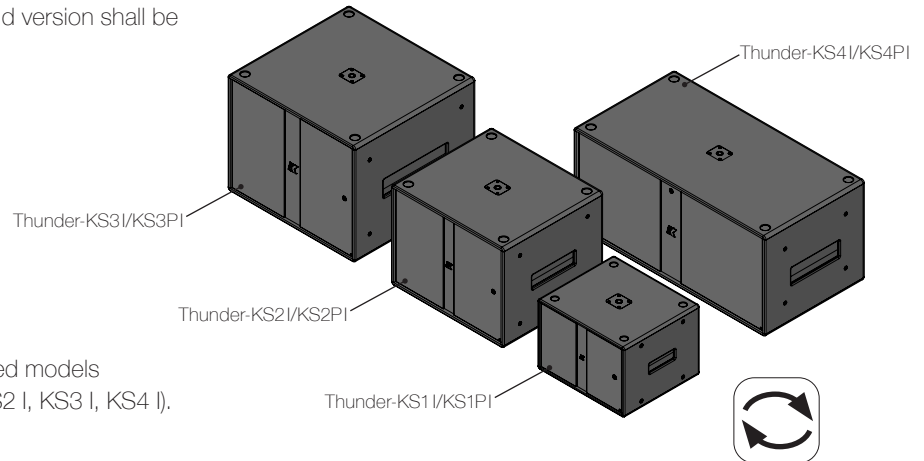
Unpacking

Each K-array subwoofer is built to the highest standard and thoroughly inspected before leaving the factory.

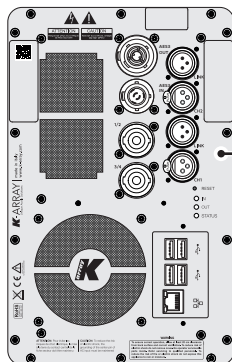
Upon arrival, carefully inspect the shipping carton, then

examine and test your new device. If you find any damage, immediately notify the shipping company. Check that the following parts are supplied with the product.

- 1x Subwoofer unit: model and version shall be one from the following list:
 - a. Thunder-KS1 I
 - b. Thunder-KS1P I
 - c. Thunder-KS2 I
 - d. Thunder-KS2P I
 - e. Thunder-KS3 I
 - f. Thunder-KS3P I
 - g. Thunder-KS4 I
 - h. Thunder-KS4P I
- 1x The quick guide
- 1x Power cord in self powered models packages only (i.e. KS1 I, KS2 I, KS3 I, KS4 I).

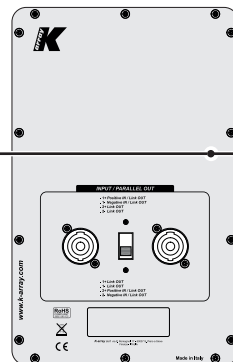


Self powered subwoofer rear panel

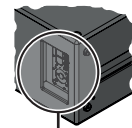


Package content:
1x Active subwoofer
1x Power cord

Passive subwoofer rear panel



Package content:
1x Passive subwoofer



Introduction

The Thunder-KS subwoofers are available in two versions: self powered (active) and passive loudspeakers. The former implement 4-channel power amplifier module with built-in DSP, the latter shall be driven by either an external K-array power amplifier or by another Thunder-KS active subwoofer.

Active sub	woofer	Amp module	Power Rating
Thunder-KS1I	12"	4-ch class-D	1500W @ 4Ω
Thunder-KS2I	18"	4-ch class-D	1500W @ 4Ω
Thunder-KS3I	21"	4-ch class-D	2500W @ 4Ω
Thunder-KS4I	2x18"	4-ch class-D	2500W @ 4Ω

Passive sub	woofer	Impedance	Power Handling
Thunder-KS1PI	12"	8 Ω	1200W
Thunder-KS2PI	18"	8 Ω	1400W
Thunder-KS3PI	21"	4 Ω	2800W
Thunder-KS4PI	2x18"	4 Ω	2800W

The active subwoofers implement multichannel amplifier modules with DSP that features four power output channels available to drive further passive loudspeakers.

The K-array Connect app and the K-framework3 software provide access to the DSP features for managing the output section and signal routing, making any Thunder-KS active subwoofer a flexible driving unit.

In order to remote control any Thunder-KS active unit download the K-array Connect app or the K-framework3 software:



click to go



click to go



Getting Started

According to the version and model, follow these steps to make the system operating:

Active Subwoofer (KS1I, KS2I, KS3I, KS4I)

1. Connect the input and output signal cables according to the configuration you want to achieve (see "[Wiring](#)", [page 6](#)).
2. Connect the power cord to an AC mains socket outlet and to the powerCon TRUE connector on the Thunder-KS rear panel: the Thunder-KS switches on when the powerCon TRUE connector is locked and electricity flows from the AC mains.
3. Hold your mobile device (smartphone or tablet):
 - a. ensure the Wi-Fi connectivity is on;
 - b. in Android based systems the app looks for any Wi-Fi network whose SSID name starts with "K-array"; swipe down to force refresh the list of available networks;
 - c. if the list of available devices is empty touch the SCAN QR CODE button and use the mobile device camera to frame the QR code at the top left corner of the Thunder-KS rear panel: this provides the mobile device to connect to the Thunder-KS Wi-Fi hotspot;
 - d. enter the password to connect to Thunder-KS active subwoofer (see "[Connection and Discovery](#)", [page 8](#) for details).
4. In the K-array Connect app bottom menu, select PRESET and touch the compass button for setting the loudspeaker configuration (see "[Output configuration](#)", [page 11](#)). Carefully check that the presets match the actual configuration of passive subwoofer and top speakers connected to the Thunder-KS speakON connectors.
5. Set the signal routing from the input channels to the output channels in the ROUTING menu (see "[Signal Routing](#)", [page 11](#)).
6. Check the signal volume in the VOLUME tab (see "[Volume](#)", [page 12](#)).
7. Enjoy K-array sound!

Passive Subwoofer (KS1PI, KS2PI, KS3PI, KS4PI)

- A. Connect a proper speaker cable to the SpeakON connector on the Thunder-KS rear panel (see "[Wiring](#)", [page 6](#)).
- B. Connect the other side of the speaker cable to a power amplifier or to a Thunder-KS active subwoofer.
- C. On the active driving unit load the proper device preset according to the Thunder-KS passive subwoofer model (see "[Output configuration](#)", [page 11](#)).

Thunder-KS

User Guide

Connectivity

The Thunder-KS active subwoofers can be controlled remotely by a mobile device or desktop PC/MAC.

K-array Connect

K-array Connect is the mobile app that allows to direct manage and control any Thunder-KS active subwoofer with a mobile device (smartphone or tablet) via the Wi-Fi connection.

Download the K-array Connect mobile APP from the dedicated store of your mobile device:

Refer to paragraph [“K-array Connect Mobile App”](#), [page 8](#) for details about the system configuration.



K-framework3

K-framework3 is the managing and control software dedicated to professionals and operators looking for a powerful tool for designing and managing a large number of units in demanding applications.

Download the K-framework3 software from K-array website.

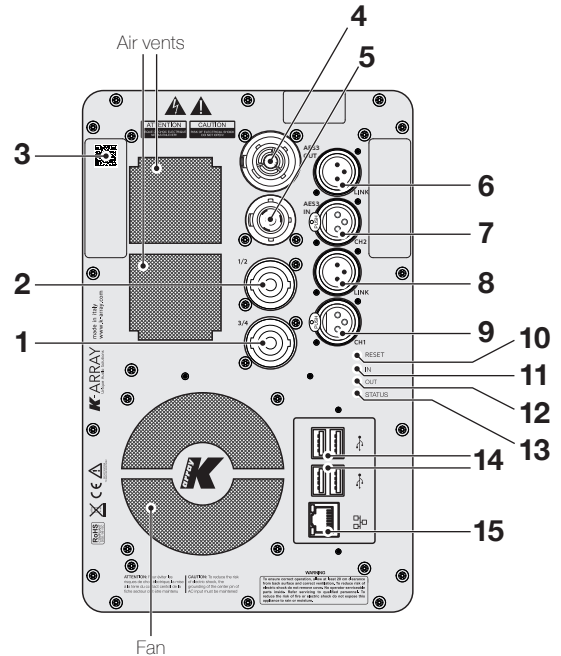


Connectivity Reset

Keep pressed the RESET button for 10 to 15 seconds in order to:

- Revert the wired IP addressing to DHCP;
- Activate the built-in Wi-Fi and reset the wireless parameters to the default SSID name and password (see [“K-array Connect Mobile App”](#), [page 8](#) for details).

Active Subwoofer Rear Panel

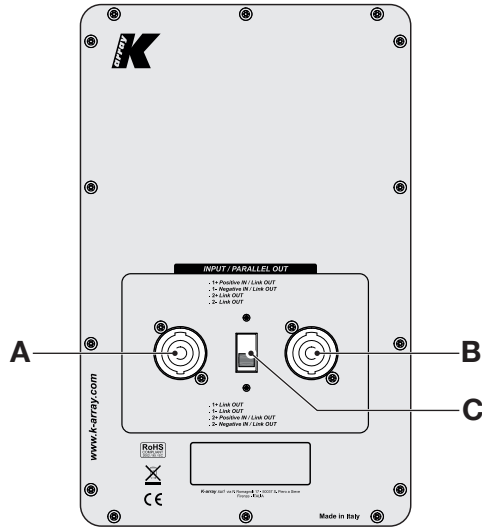


1. SpeakON NL4 speaker output channels 3 & 4
2. SpeakON NL4 speaker output channels 1 & 2
3. QR Code for the K-array Connect app remote connection
4. PowerCon TRUE link (AC mains out)
5. PowerCon TRUE inlet (AC mains in)
6. XLR-M channel 2 balanced line output or channels 3 & 4 AES3 output (user selectable via K-array Connect app)
7. XLR-F channel 2 balanced line input or channels 3 & 4 AES3 input (user selectable via K-array Connect app)
8. XLR-M channel 1 balanced line output
9. XLR-F channel 1 balanced line input
10. Reset button
11. Input signal LED monitor
12. Output signal LED monitor
13. System status LED
14. USB ports
15. RJ45 Ethernet port

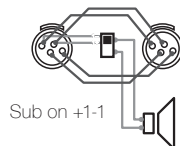
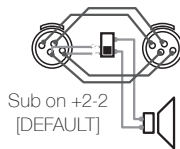
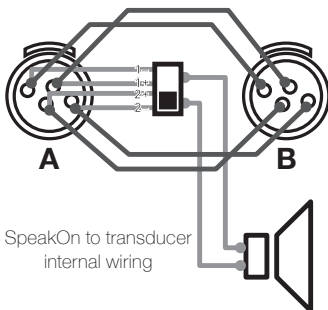
Passive Subwoofer Rear Panel



WARNING. Disconnect the input signal speakON cable BEFORE toggling the terminals switch!



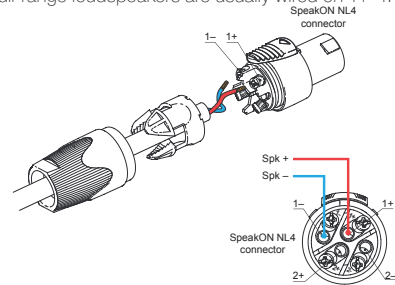
- A. SpeakON NL4
- B. SpeakON NL4
- C. Terminals switch: swap the internal loudspeaker terminals assignment.



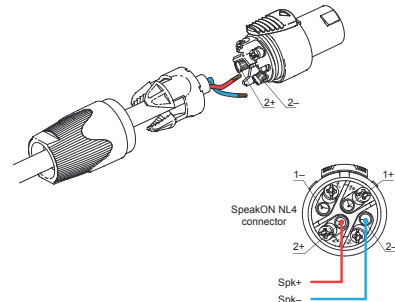
NL4 SpeakON wiring

One-channel wiring

Hi/Mid- and full-range loudspeakers are usually wired on +1 -1.



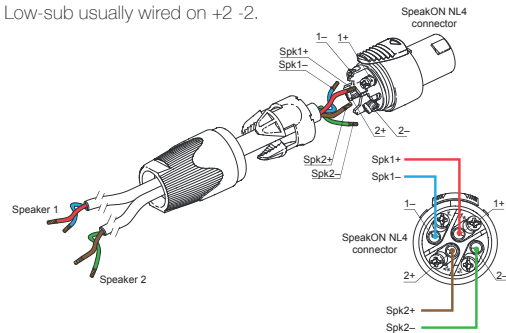
Subwoofers are usually wired on +2 -2.



Two-channel wiring

Hi/Mid-range usually wired on +1 -1.

Low-sub usually wired on +2 -2.

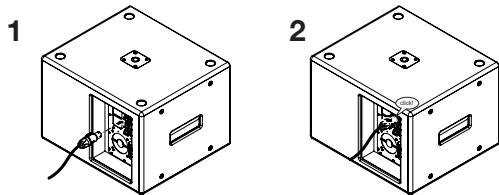


Thunder-KS

User Guide

AC mains supply

On self powered Thunder-KS subwoofers, the AC Main connection is made via the provided power cord: insert the powerCon TRUE flying connector into the inlet and then rotate it clockwise. Once properly plugged and powered, the system status LED lights on.



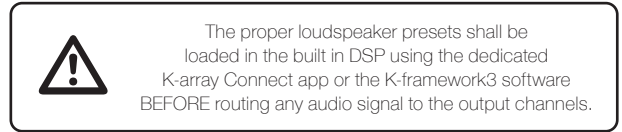
Status LED chart

Color	Mode	Description
Orange	orange solid	DSP software is loading
Green	green solid	System ready
Blue	blue solid	User command: system identification

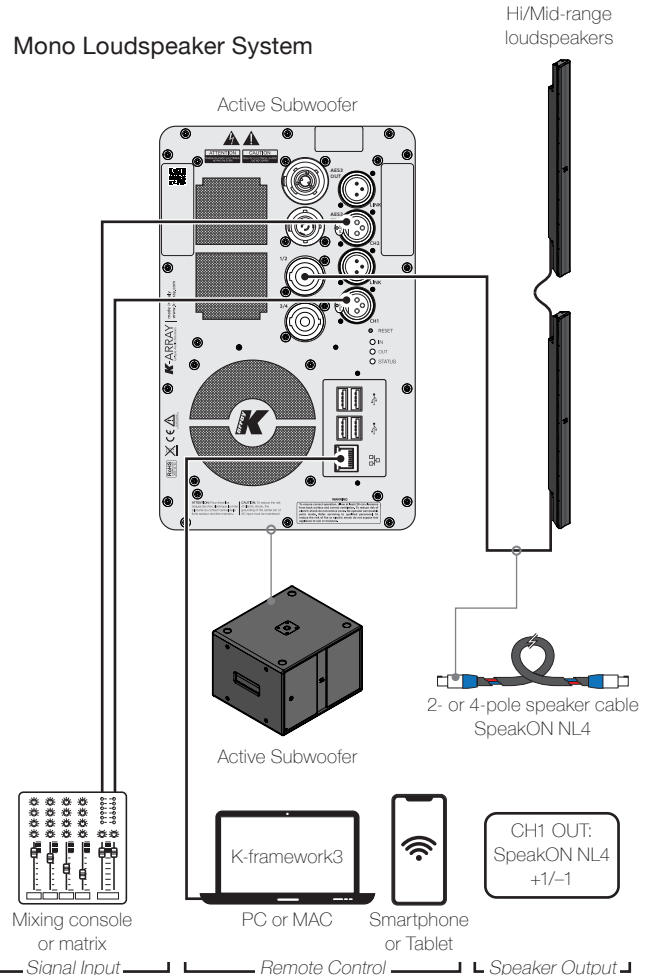
Wiring

The Thunder-KS active subwoofers features two NL4 speakOn output connectors designed to drive external Hi/Mid-range loudspeakers as well as other subwoofers or full-range passive loudspeakers systems.

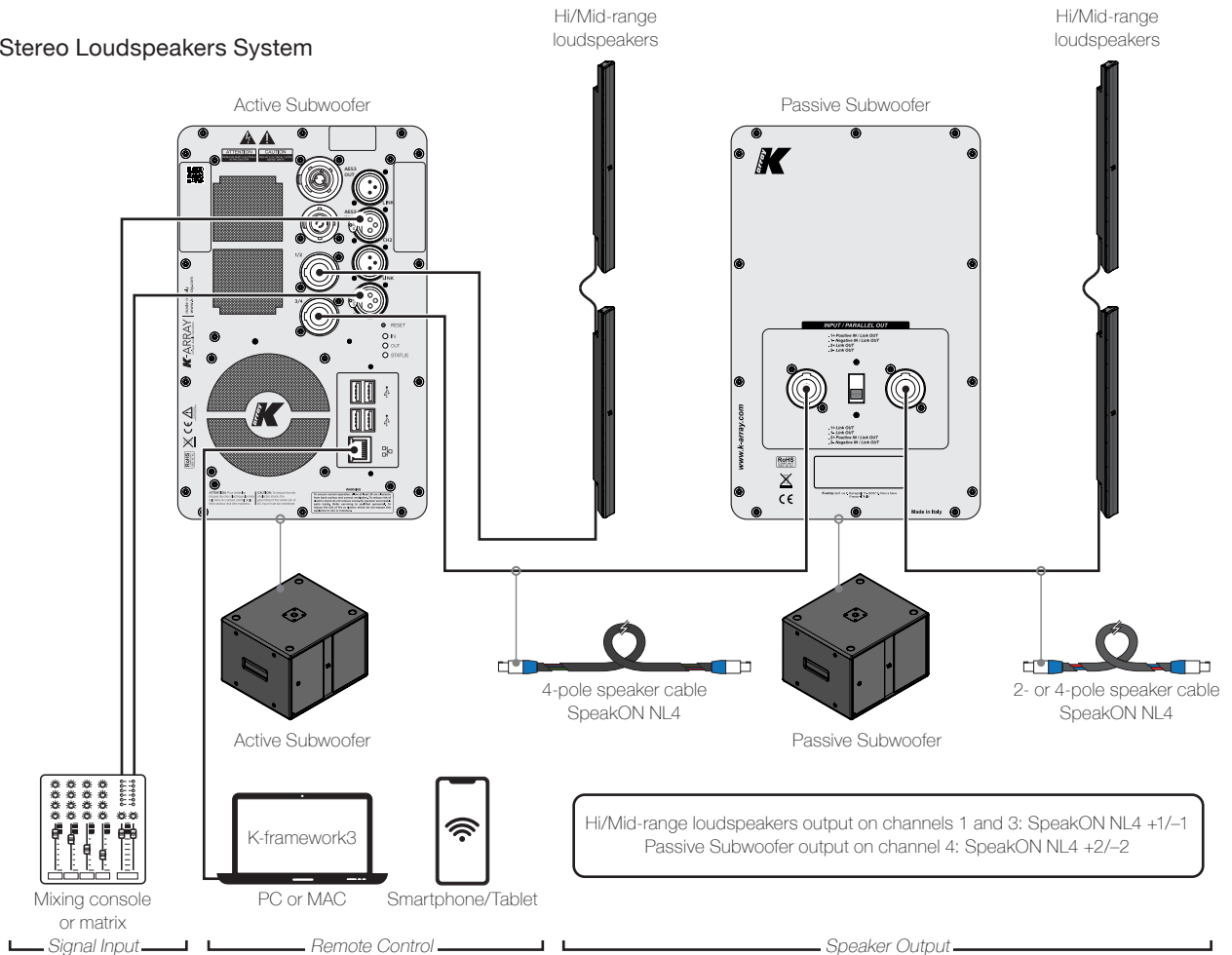
A mono loudspeaker system is composed of one Thunder-KS active subwoofer and one or more Hi/Mid-range loudspeakers. A stereo loudspeakers system is composed of one Thunder-KS active subwoofer driving both one or more Hi/Mid-range loudspeakers and one passive Thunder-KS subwoofer with satellites (Hi/Mid-range loudspeakers).



Mono Loudspeaker System



Stereo Loudspeakers System



Thunder-KS

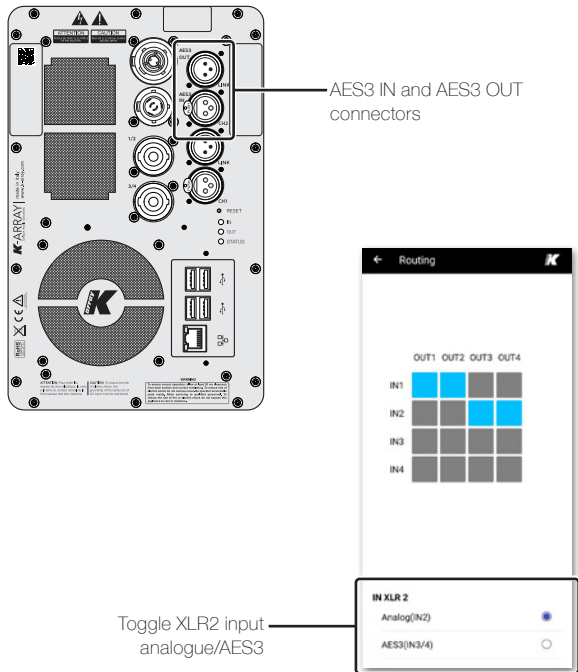
User Guide

AES3 Digital Input

The Thunder-KS active subwoofer accepts a couple of digital signals via the AES3 digital input on the connector labeled AES3 IN.

The digital input signals are routed internally to the input channels 3 and 4 and mirrored on the AES3 OUT connector. The digital input and output channels share the same XLR connectors as the analog channel 2: CH2»AES3IN and LINK»AES3OUT respectively. In order to toggle the connectors to manage either the analogue or the digital signals, the K-array Connect mobile app provides a dedicated selector in the Routing interface.

Refer to the next paragraph for details about the mobile app user interface.



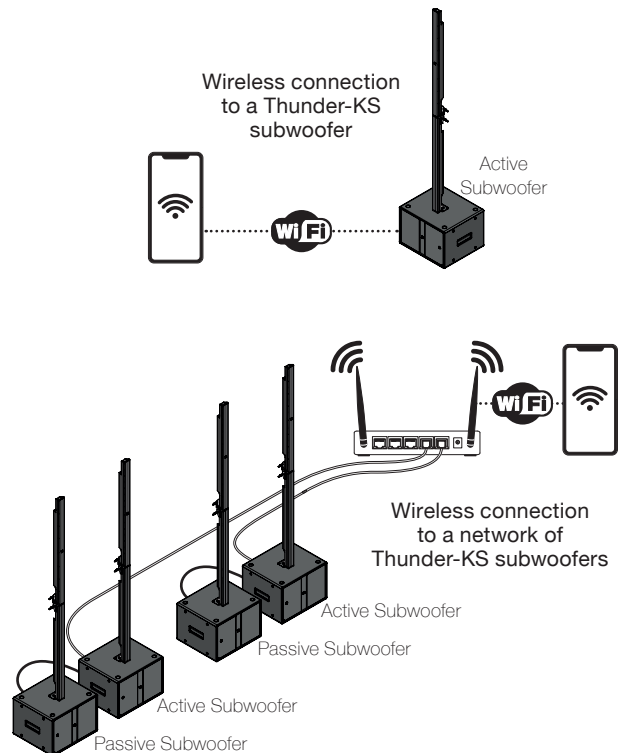
K-array Connect Mobile App

The K-array Connect mobile app is designed to allow any Android or iOS mobile device (smartphone or tablet) to connect and manage any Thunder-KS active subwoofer via the Wi-Fi connection.



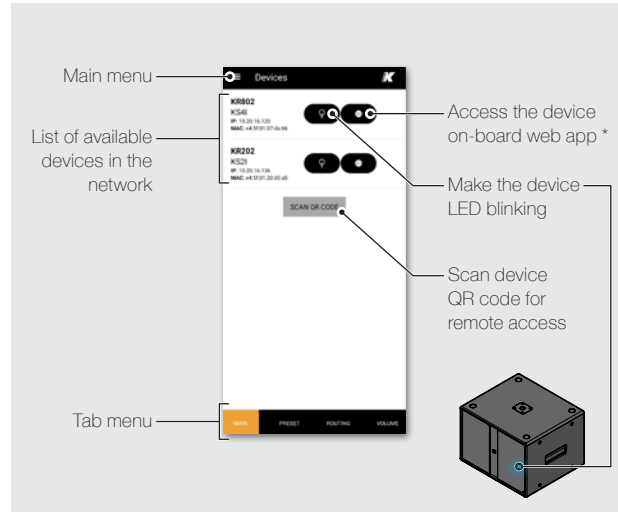
Connection and Discovery

The K-array Connect mobile app can connect to the Thunder-KS active subwoofers both directly to the built-in Wi-Fi and wireless to an access point connected to a LAN where the Thunder-KS are wired to.

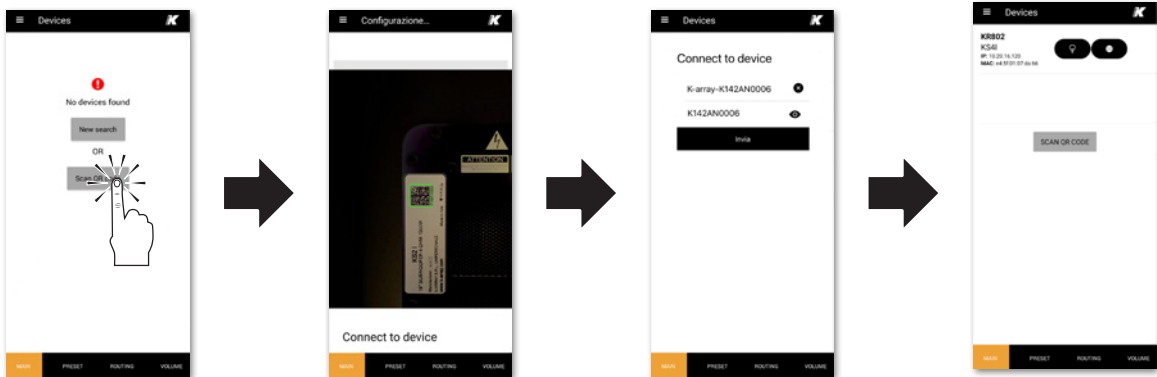


Connection to a single Thunder-KS

1. Ensure the Wi-Fi of the mobile device is on.
2. Launch the K-array Connect app.
 - a. In Android based systems the app looks for any Wi-Fi network whose SSID name starts with "K-array"; swipe down to force refresh the list of available networks.
 - b. Touch the device name to establish a connection and insert the password (see below).
3. If the list of available devices is empty touch the SCAN QR CODE button and use the mobile device camera to frame the QR code at the top left corner of the Thunder-KS rear panel: this provides the mobile device to connect to the Thunder-KS Wi-Fi network.
4. Enter the password to connect to Thunder-KS active subwoofer. If not modified, the default password is the device serial number, e.g. K142AN0006 (case sensitive).
5. The the K-array Connect app connects directly to the Thunder-KS active subwoofer.



* The on-board web interface is a further user interface embedded on the built-in DSP that allows to manage the system features over a network (see ["On-Board Web App", page 13](#) for details). The K-array Connect mobile app offers a shortcut to access the on-board web interface.



Thunder-KS

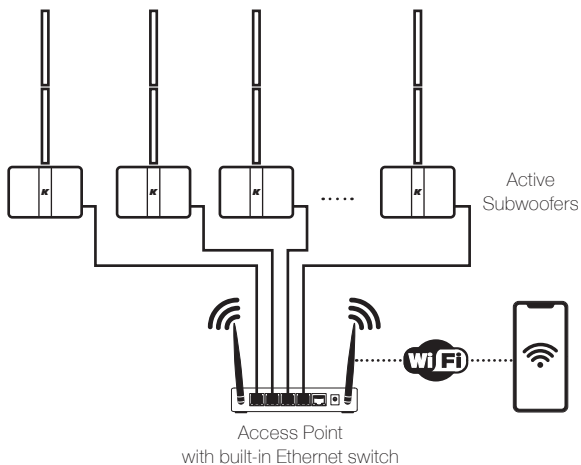
User Guide

Connection to a network of Thunder-KS

The Thunder-KS active subwoofers feature a RJ45 Ethernet port on the rear panel that allows to connect the loudspeakers to a local area network (LAN), in order to ease the remote control.

The Thunder-KS implements the zeroconf network technologies, allowing to direct connect the active subwoofer to a PC via the Ethernet CAT5 cables, as well as including the devices into a network without any user configuration.

The simplest local network of Thunder-KS active subwoofers requires the implementation of an Ethernet switch. When an access point is available, the network of Thunder-KS active subwoofers can be easily managed with the K-array Connect mobile app over the LAN.



If a DHCP service is available, it will assign an IP address to each Thunder-KS. If a DHCP service is not available, each Thunder-KS active subwoofer will self assign an IP address in the range 169.254.0.0/16 (auto-IP).

1. Connect each Thunder-KS active subwoofer to a Wi-Fi access point with built-in Ethernet switch: use Ethernet Cat5 or Cat6 cables.
2. Set the access point Wi-Fi network SSID and parameters.
3. Ensure the Wi-Fi of the mobile device is on.
4. Connect the mobile device to the access point Wi-Fi network.
5. Launch the K-array Connect app: the app looks for any device in the network whose name starts with "K-array" and tries to establish a connection.
6. If the list of available devices is empty swipe down to force refresh the list of available devices.



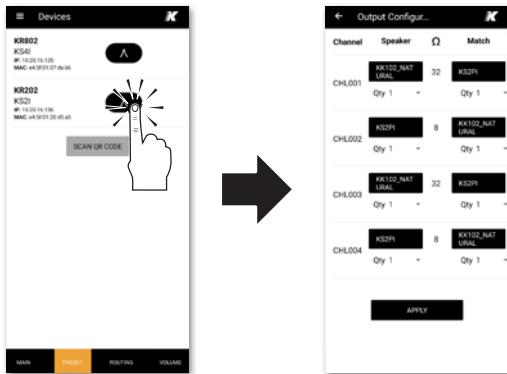
List of available devices in the network

KR202 — Device Preset Name
KS21 — Subwoofer Model
IP: 10.20.16.136 — IP Address
MAC: e4:5f:01:20:d5:a5 — MAC address

Output configuration

Once connected to the Thunder-KS active subwoofer (see paragraph [“K-array Connect Mobile App”, page 8](#)) the output configuration can be performed either using the on-board web interface or the K-array Connect app, as described below.

- A. Touch the Preset tab in the tab menu at the bottom of the screen: this will modify the buttons in the list of available devices.
- B. Select the device you want to configure and touch the button to enter the Output Configuration page.

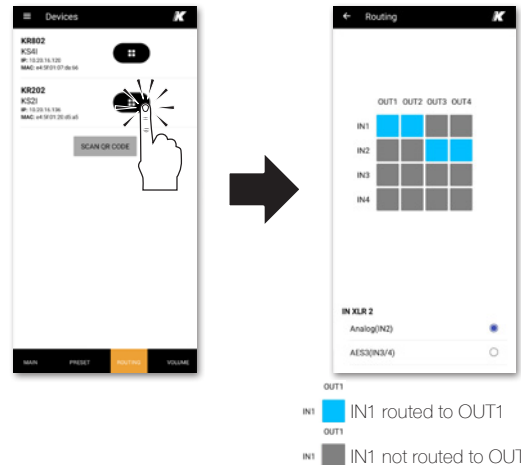


- C. In the Output Configuration page fill in the field according to the actual loudspeakers configuration: match the loudspeakers models and quantities connected to the Thunder-KS SpeakON output connectors.
- D. Once completed, save the output configuration touching the APPLY button at the bottom of the page.

Signal Routing

The Thunder-KS active subwoofer features two analog inputs on channels 1 & 2, two digital inputs on channels 3 & 4 and four freely assignable audio power outputs. The internal transducer is wired in parallel to the output channel 2 (see paragraph [“Connectivity”, page 4](#) for details). Signal routing can be configured either with the on-board web app or with the K-array Connect app, as described below.

1. Touch the Routing tab in the tab menu at the bottom of the screen: this will modify the buttons in the list of available devices.



2. Select the device you want to configure and touch the button to enter the Routing table page.
3. Touch the squares in order to toggle the connection among the input channels on the left side to the output channels in the top side.
4. If needed, toggle the input channel 2 XLR connector analog or AES3 (see [“AES3 Digital Input”, page 8](#)).

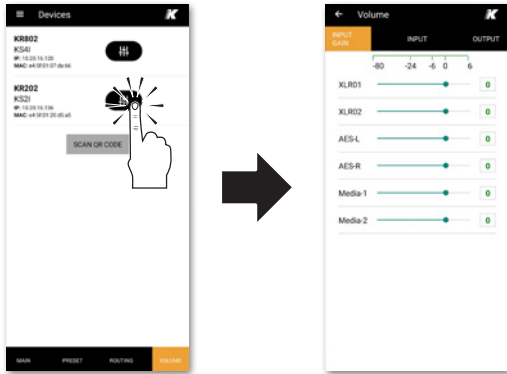
Thunder-KS

User Guide

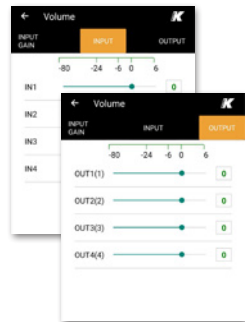
Volume

The Volume tab in the K-array-Connect mobile app provides access to volume adjustments for the input and output channels as well as the control of the signal gain at the analogue, digital and media player input.

1. Touch the Routing tab in the tab menu at the bottom of the screen: this will modify the buttons in the list of available devices.
2. Select the device you want to configure and touch the button to enter the volume adjustment section.



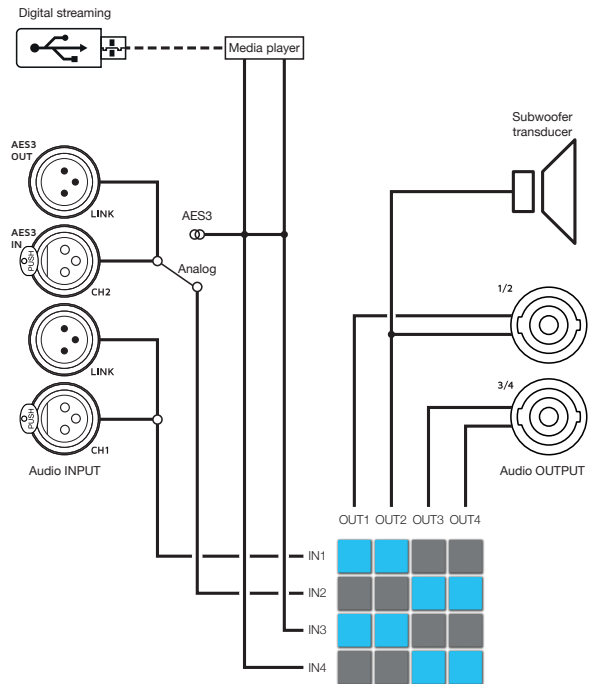
3. Three pages are available for setting the input gain, input level and output level respectively: touch the top menu buttons according to the needed adjustment.



Media Player

The Thunder-KS active subwoofer built-in DSP implements a media player that can be used to playback audio files from a USB device. The media player controls are accessible via the on-board web app user interface: see [“On-Board Web App”](#), page 13 for details.

The audio signals from the media players are routed by default to the input channels 3 & 4 as well as the AES3 input signals.

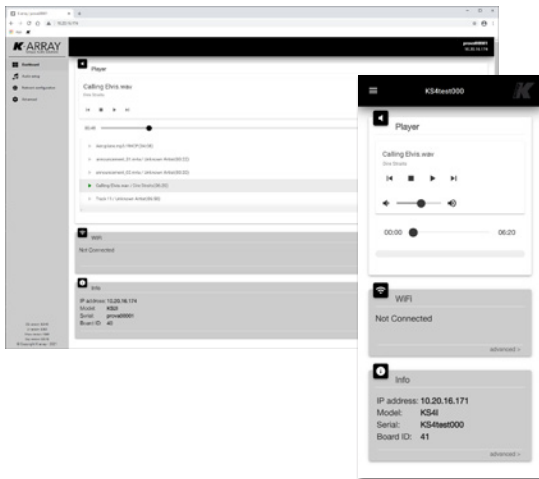


Default routing diagram.

On-Board Web App

Once the IP address of a Thunder-KS active subwoofer is set and known, it is possible to access the built-in DSP features over a LAN with a web browser (Google Chrome is recommended):

- type the Thunder-KS active subwoofer IP address in the address field of the web browser (e.g. 10.20.16.171): the Thunder-KS will push the web interface for a direct access to its DSP features.



- The K-array Connect mobile app offers a shortcut to access the on-board web interface via any mobile device.

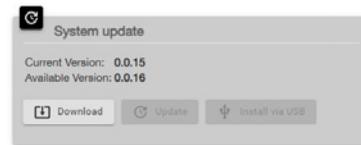
System Update

The Thunder-KS active subwoofer built-in DSP is managed by an embedded operating system whose name is osKar. osKar manages the user interface and communication as well as the system features. osKar can be updated via the on-board web app.

- Access the Thunder-KS on-board web app either via the K-array Connect mobile app, or with a web browser within a LAN (see [“On-Board Web App”](#), page 13).



- Navigate the main menu and access the Advanced menu. The System Update section lists the current system version and, if the Thunder-KS active subwoofer is connected to a LAN with Internet access, the Available Version field is filled with the latest published system version number available on K-array website.



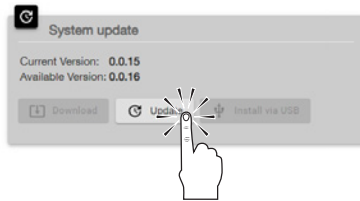
Thunder-KS

User Guide

System Update via Internet

When an Internet connection is available, the Thunder-KS active subwoofer's osKar embedded system can be updated directly from the on board web app.

1. Connect the Thunder-KS active subwoofer to a LAN with Internet access.
2. Access the Thunder-KS on board web app and open the Advanced menu page: the Download button becomes active if a higher system version is available on K-array website.
3. Click on the Download button in order to start downloading the system update file from the Internet: the file is saved inside the system local memory.



4. Once the download is finished, the Update button becomes active: click on the Update button to start updating the system.

The update procedure via Internet lasts in few minutes: at the end of the updating process the system reboots.

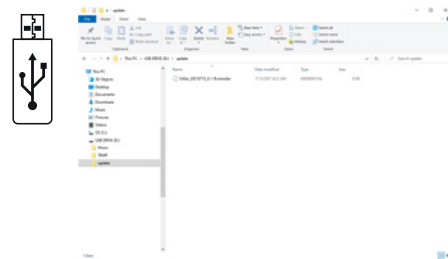
System Update via USB

In order to update the Thunder-KS active subwoofer's osKar embedded operating system locally, a USB key with the system update files must be prepared in advance.

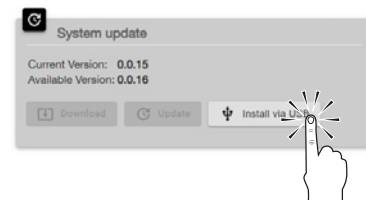
- A. Retrieve the system update file from the official K-array repository and move it into a folder named **update** on the USB key.

The system update file name ends with three numbers, e.g. 0.1.18, — namely the system version — and has **.mender** extension.

The update folder must contain only one system update file.



- B. Access the Thunder-KS on board web app and open the Advanced menu page: the Install via USB button becomes active if a valid update folder and .mender file are available on the USB key.
- C. Click on the Install via USB button in order to start the system update.



The update procedure via USB lasts in few minutes: at the end of the updating process the system reboots.

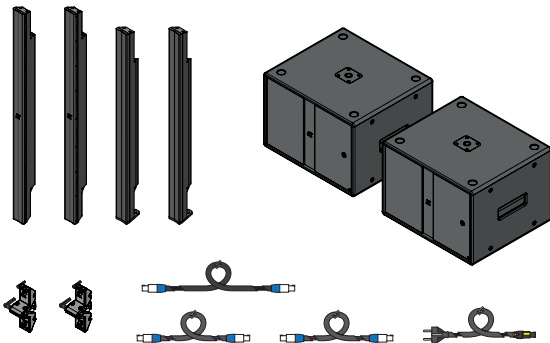
Bundle Systems

The five subwoofer models that compose the Thunder-KS series, present in both active and passive electronics versions, are at the core of the Pinnacle-KR loudspeaker systems bundles.

The Pinnacle-KR loudspeakers systems feature simple modular configurations made up of K-array column loudspeakers (Kobra-KK, Python-KP and Kayman-KY) with Thunder-KS subwoofers, in their different variants (KS1, KS2, KS3 and KS4).

Pinnacle-KR102 II

Bill of material	
2	Kobra-KK102 I Stainless steel meter-long line array element with 2" drivers
1	Thunder-KS1 I Lightweight, multi-tasking 12" self-powered subwoofer
1	Thunder-KS1P I Lightweight, 12" passive subwoofer
2	K-KKPOLE Fake Kobra 100 cm pole support
2	K-JOINT3 Joining hardware to connect Kobra loudspeakers
1	K-SPKCABLE15 4-pole speaker cable with SpeakON NL4, 15 m (49 ft)
2	K-SPKCABLE2 4-pole speaker cable with SpeakON NL4, 2 m (6.5 ft)
1	Power cable with PowerCON TRUE



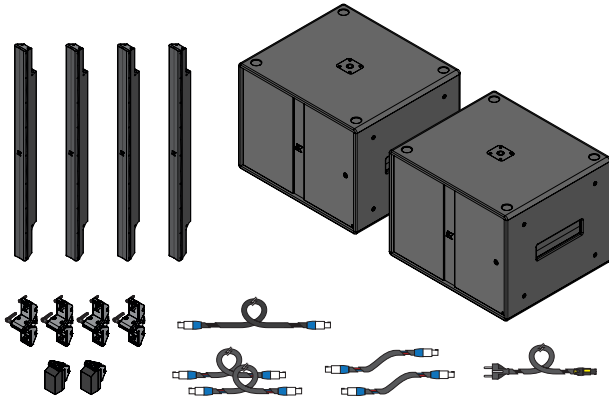
	Pinnacle-KR102 II	Pinnacle-KR202 II	Pinnacle-KR204	Pinnacle-KR208	
Kobra-KK	2	4	8	16	
Thunder-KS1	1				
Thunder-KS1P	1				KR2
Thunder-KS2		1	2	4	
Thunder-KS2P		1	2	4	
					Pinnacle-KR408
Python-KP		4	8	16	
Thunder-KS3		1	2	4	KR3
Thunder-KS3P		1	2	4	
					Pinnacle-KR808
Kayman-KY		4	8	16	
Thunder-KS4		1	2	4	KR4
Thunder-KS4P		1	2	4	

Thunder-KS

User Guide

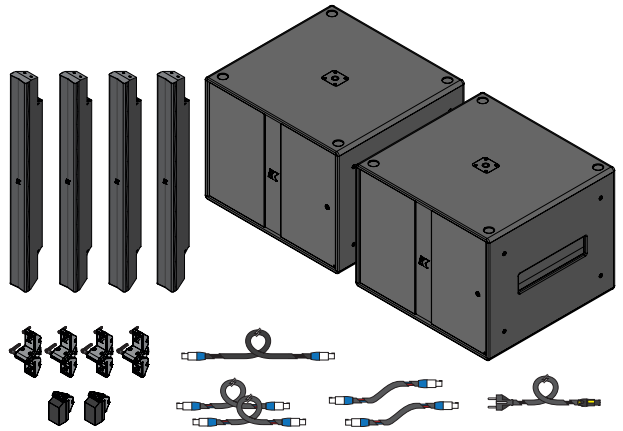
Pinnacle-KR202 II

Bill of material	
4	Kobra-KK102 I Stainless steel meter-long line array element with 2" drivers
1	Thunder-KS2 I Lightweight, multi-tasking 18" self-powered subwoofer
1	Thunder-KS2P I Lightweight, 18" passive subwoofer
2	K-FOOT3 Adapter for standing loudspeakers on top of Thunder sub
4	K-JOINT3 Joining hardware to connect Kobra loudspeakers
1	K-SPKCABLE15 4-pole speaker cable with SpeakON NL4, 15 m (49 ft)
2	K-SPKCABLE2 4-pole speaker cable with SpeakON NL4, 2 m (6.5 ft)
2	K-SPKCABLE235 4-pole joint cable with SpeakON NL4, 22,5 cm (9 in)
1	Power cable with PowerCON TRUE



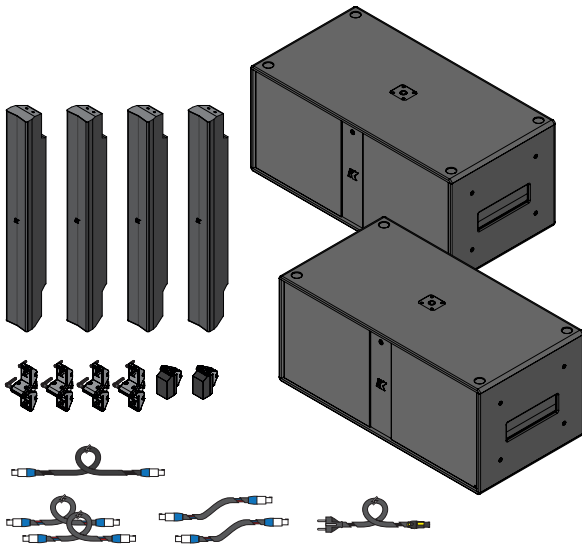
Pinnacle-KR402 II

Bill of material	
4	Python-KP102 I Stainless steel meter-long line array element with 3" drivers
1	Thunder-KS3 I Compact, multi-tasking 21" self-powered subwoofer
1	Thunder-KS3P I Compact, 21" passive subwoofer
2	K-FOOT3 Adapter for standing loudspeakers on top of Thunder sub
4	K-JOINT3 Joining hardware to connect Python loudspeakers
1	K-SPKCABLE15 4-pole speaker cable with SpeakON NL4, 15 m (49 ft)
2	K-SPKCABLE2 4-pole speaker cable with SpeakON NL4, 2 m (6.5 ft)
2	K-SPKCABLE235 4-pole joint cable with SpeakON NL4, 22,5 cm (9 in)
1	Power cable with PowerCON TRUE



Pinnacle-KR802 II

Bill of material	
4	Kayman-KY102 I Stainless steel meter-long line array element with 4" drivers
1	Thunder-KS4 I multi-tasking 2x18" self-powered subwoofer
1	Thunder-KS4P I 2x18" passive subwoofer
2	K-FOOT3 Adapter for standing loudspeakers on top of Thunder sub
4	K-JOINT3 Joining hardware to connect Python loudspeakers
1	K-SPKCABLE15 4-pole speaker cable with SpeakON NL4, 15 m (49 ft)
2	K-SPKCABLE2 4-pole speaker cable with SpeakON NL4, 2 m (6.5 ft)
2	K-SPKCABLE235 4-pole joint cable with SpeakON NL4, 22,5 cm (9 in)
1	Power cable with PowerCON TRUE

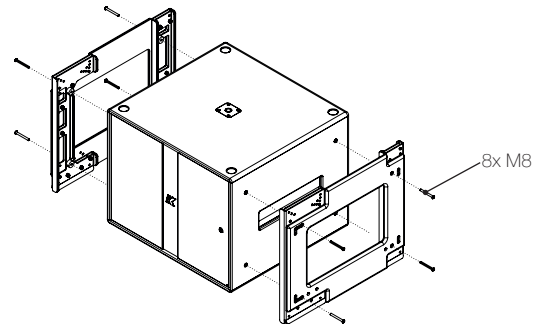


Accessories

All units	
K-FOOT3	Adapter for standing loudspeakers on top of Thunder sub

Thunder-KS3	
K-EXTFRAME3	Hardware to suspend KS3I (kit for 1 unit)
K-HCFLY2I	Fly bar for KH2I-KS3I
K-HCDOLLY2I	Dolly for KH2I-KS3I

Thunder-KS4	
K-EXTFRAME4	Hardware to suspend KS4I (kit for 1 unit)
K-HCFLY35I	Fly bar for KH5I-KH3I-KS4I
K-HCDOLLY35I	Dolly for KH3I-KH5I-KS4I



Assembling K-EXTFRAME3 on Thunder-KS3 I.

Thunder-KS

User Guide

Service

To obtain service:

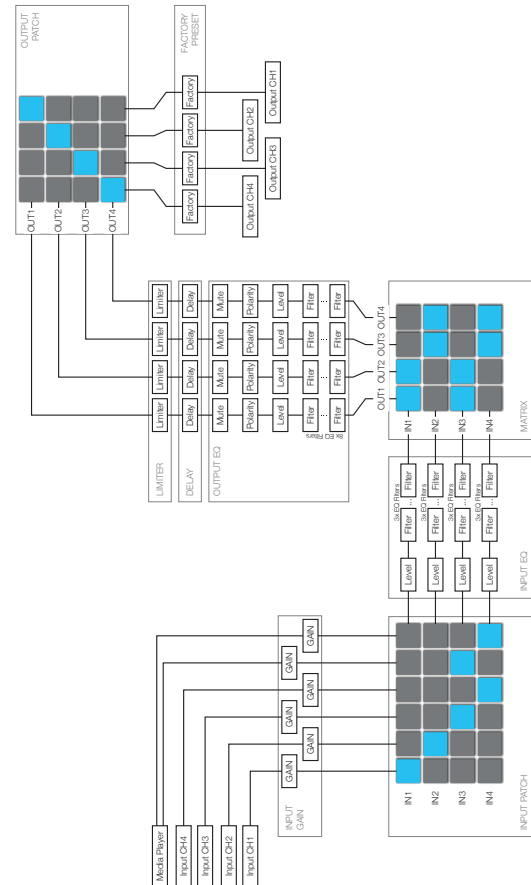
1. Please have the serial number(s) of the unit(s) available for reference.
2. Contact the official K-array distributor in your country: find the Distributors and Dealers list on [K-array website](#). Please describe the problem clearly and completely to the Customer Service.
3. You will be contacted back for on-line servicing.
4. If the problem cannot be resolved over the phone, you may be required to send the unit in for service. In this instance, you will be provided with an RA (Return Authorization) number which should be included on all shipping documents and correspondence regarding the repair. Shipping charges are the responsibility of the purchaser.

Any attempt to modify or replace components of the device will invalidate your warranty. Service must be performed by an authorized K-array service center.

Cleaning

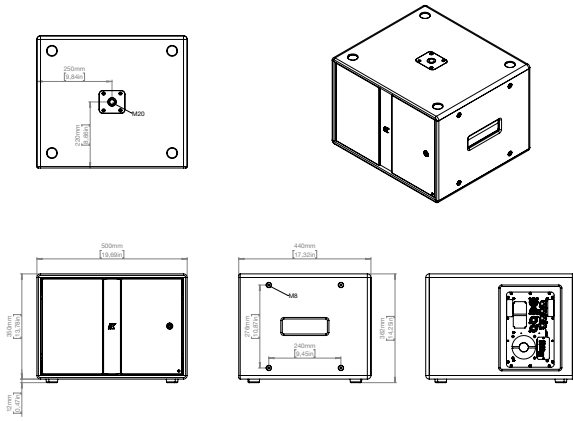
Use only a soft, dry cloth to clean the housing. Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives. Do not use any sprays near the product or allow liquids to spill into any openings.

DSP Block Diagram

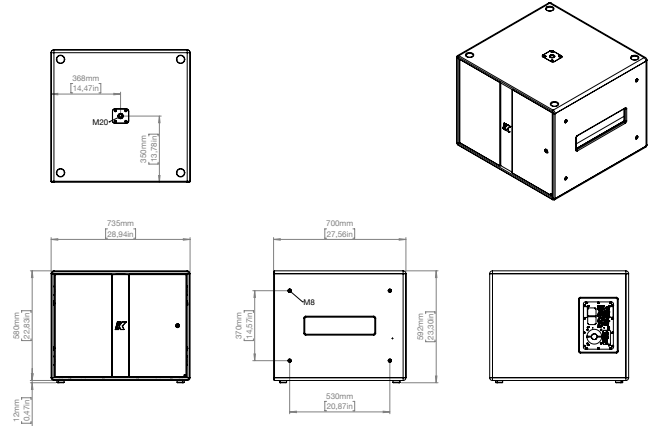


Mechanical Drawings

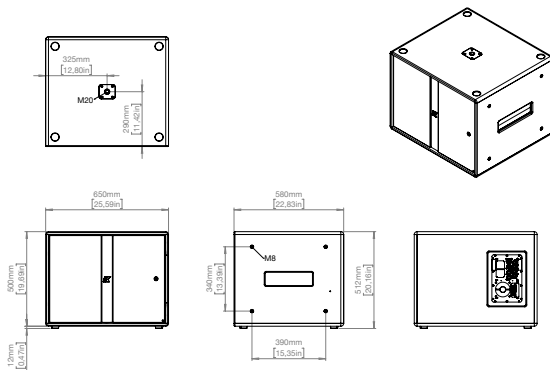
Thunder-KS11/KS1PI



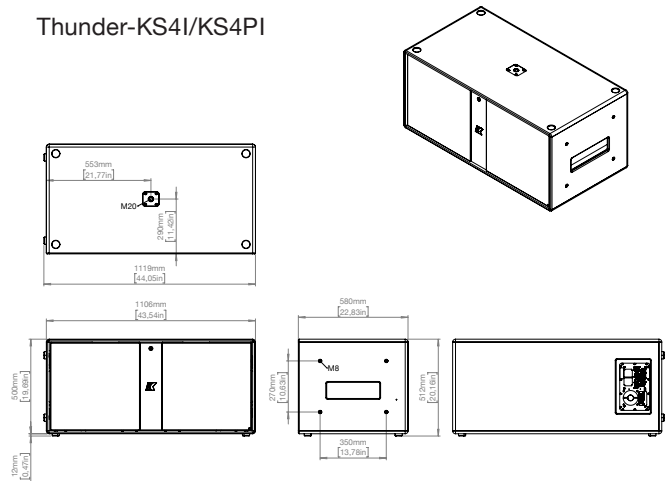
Thunder-KS31/KS4PI



Thunder-KS21/KS2PI



Thunder-KS41/KS4PI



Thunder-KS

User Guide

Technical Specifications

	Thunder-KS1I	Thunder-KS2I	Thunder-KS3I	Thunder-KS4I
Type	Active subwoofer			
Transducers	12" neodymium magnet woofer	18" neodymium magnet woofer	21" neodymium magnet woofer	2x 18" neodymium magnet woofer
Frequency Response ¹	35 Hz – 150/450 Hz (-6 dB) crossover dependent	35 Hz – 150/450 Hz (-6 dB) crossover dependent	30 Hz – 150/450 Hz (-6 dB) crossover dependent	35 Hz – 150/450 Hz (-6 dB) crossover dependent
Crossover	DSP-controlled, Low Pass @ 150 Hz up to 450 Hz, preset dependent			
Max SPL ²	134 dB peak	137 dB peak	139 dB peak	141 dB peak
Coverage	Omni			
Connectors	Line Input 2x XLR-F analog balanced / AES3 input Mains powerCON TRUE1 TOP, 16 A true mains Networking and Data 1x RJ45 4x USB-A		Line Output 2x XLR-M Link analog balanced / AES3 output Speaker Output 2x SpeakON NL4 (Ch1 1+/- // Ch2 2+/-)	
DSP	Input gain, routing matrix, delay, full parametric IIR filters (Peaking, Shelving, Hi/Lo pass, Hi/Lo Butterworth), On-board preset, Remote monitoring			
Remote control	Wi-Fi dedicated APP K-framework3 via wired Ethernet connection			
Amplifier module	4-channel switching mode, Class D			
Output power ³	4x 1500 W @ 4 Ω	4x 1500 W @ 4 Ω	4x 2500 W @ 4 Ω	4x 2500 W @ 4 Ω
MAINS Operating Range	100-240V AC, 50-60 Hz with PFC			
Power Consumption	600 W @ 8 Ω load, Pink noise, 1/4 rated power	600 W @ 8 Ω load, Pink noise, 1/4 rated power	600 W @ 4 Ω load, Pink noise, 1/4 rated power	600 W @ 4 Ω load, Pink noise, 1/4 rated power
Protections	Over Temp. (Power Limiting – Thermal Shutdown), Short Circuit/Overload Output Protection, Power Limiting, Clip Limiter/Permanent Signal Limiter, High Frequency Protection			
IP Rating	IP53			
Dimensions (WxHxD)	500 x 350 x 440 mm (19.7 x 13.8 x 17.3 in)	650 x 500 x 580 mm (25.6 x 19.7 x 22.8 in)	735 x 580 x 700 mm (28.9 x 22.83 x 20.87 in)	1106 x 500 x 580 mm (43.5 x 19.7 x 22.8 in)
Weight	21,6 kg (47.62 lb)	37,6 kg (82.9 lb)	56 kg (123.4 lb)	60 kg (132.3 lb)

¹ Extensible with dedicated preset according to the midrange crossover point.

² Maximum SPL is calculated using a signal with crest factor 4 (12dB) measured at 1 m.

³ CTA-2006 (CEA-2006) Amplifier Power Standards, single channel driven.

	Thunder-KS1PI	Thunder-KS2PI	Thunder-KS3PI	Thunder-KS4PI
Type	Active subwoofer			
Transducers	12" neodymium magnet woofer	18" neodymium magnet woofer	21" neodymium magnet woofer	2x 18" neodymium magnet woofer
Frequency Response ¹	35 Hz – 150/450 Hz (-6 dB) crossover dependent	35 Hz – 150/450 Hz (-6 dB) crossover dependent	30 Hz – 150/450 Hz (-6 dB) crossover dependent	35 Hz – 150/450 Hz (-6 dB) crossover dependent
Crossover	External DSP-controlled, Low Pass @ 150 Hz up to 450 Hz, preset dependent			
Max SPL ²	134 dB peak	137 dB peak	139 dB peak	141 dB peak
Nominal Impedance	8 Ω	8 Ω	4 Ω	4 Ω
Power Handling	1200 W _{peak}	1400 W _{peak}	2800 W _{peak}	2800 W _{peak}
Coverage	Omni			
Connectors	Speaker input/parallel output 2x SpeakON NL4		Input terminals selectable: IN+Link 1+/1- (parallel), Link 2+/2- Link 1+/1- , IN+Link 2+/2- (DEFAULT)	
IP Rating	IP54			
Dimensions (WxHxD)	500 x 350 x 440 mm (19.7 x 13.8 x 17.3 in)	650 x 500 x 580 mm (25.6 x 19.7 x 22.8 in)	735 x 580 x 700 mm (28.9 x 22.83 x 20.87 in)	1106 x 500 x 580 mm (43.5 x 19.7 x 22.8 in)
Weight	18 kg (39.7 lb)	34 kg (75 lb)	49,2 kg (108.5 lb)	53,2 kg (117.3 lb)

¹ Extensible with dedicated preset according to the midrange crossover point.

² Maximum SPL is calculated using a signal with crest factor 4 (12dB) measured at 1 m.

Passive loudspeakers requires dedicated preset loaded on board of K-array amplifiers.
New materials and design are introduced into existing products without previous notice.



Designed and Made in Italy

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