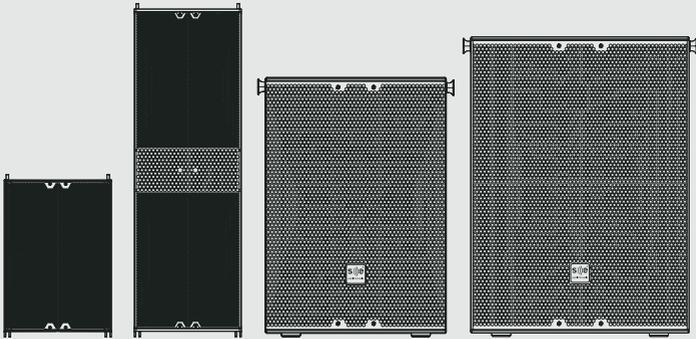




AUDIOTECHNIK

M-LINE

COMPACT LINE-ARRAY-SYSTEMS



MANUAL

THANK YOU FOR CHOOSING S)))e AUDIOTECHNIK®.

We are happy to be the solution for your sound reinforcement and professional sound needs. The system you purchased is the sum of 20 years of experience as a loudspeaker manufacturer, and more than 40 years as a speaker designer. It is the sum of German precision and Chinese effectivity, which ensures a high-quality product that will last you for the long-term.

Please, take the time to carefully read this manual and follow its instructions. It will allow you to get the most out of your product under safe operating conditions and suggest some care instructions leading to long-term endurance. Keep this manual in a safe place for further reference!

If you find any mistakes or have further questions or suggestions, please contact us at **info@se-audiotechnik.de**.

For more information about **SE AUDIOTECHNIK®** products, visit our website **www.se-audiotechnik.de**. There you will also find the latest updates to manuals, firmware and technical documents for additional support.

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The content of this document is subject to change without prior notice to improve reliability, function, design or otherwise.

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IMPORTANT SAFETY INSTRUCTIONS

GRAPHICAL SYMBOLS IN THE PRODUCT



The lightning bolt triangle is used to alert the user to the risk of electric shock.



Symbol indicating that the equipment is for indoor use only.



The exclamation point triangle is used to alert the user to important operating or maintenance procedures and instructions.



Symbol for conformity with Directive 2002/96/EC and Directive 2003/108/EC of the European Parliament, on waste electrical and electronic equipment (WEEE).



The CE mark indicates the conformity with the relevant EU directives for safety, health and environmental protection. See the Manufacturer's Declaration section.



The RCM mark indicates the conformity with the relevant Australian and New Zealand requirements for electrical safety, EMC, EME and telecommunications compliance.



The CCC mark indicates the conformity with the relevant Chinese directives for safety, health and environmental protection.

GRAPHICAL SYMBOLS IN THIS MANUAL



Symbol for important safety information related with the risk of electric shock.



Symbol for important concepts and information for a better understanding of the functioning of the product.



Symbol to alert the user about important operating or maintenance instructions.



Symbol for practical tips and ideas useful to ensure the correct use of the product and improve its operation.

The products included in this manual have been engineered and manufactured to ensure your personal safety. However, **IMPROPER USE CAN RESULT IN POTENTIAL ELECTRICAL SHOCK, FIRE HAZARD AND OTHER HEALTH RISKS**. Always follow the basic precautions listed here to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following items in this chapter.



ELECTRICAL SAFETY PRECAUTIONS



DO NOT EXPOSE ANY OF THIS EQUIPMENT TO RAIN OR MOISTURE, DRIPPING OR SPLASHING LIQUIDS. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS.



TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO OPEN ANY PART OF THE UNIT. THERE ARE NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



EQUIPMENT INCLUDED IN THIS MANUAL REQUIRE AC POWER SUPPLY. TO COMPLETELY DISCONNECT THEM FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

NOISE EXPOSURE PRECAUTIONS



PRODUCTS DESCRIBED IN THIS MANUAL CAN RADIATE HIGH SOUND PRESSURE LEVELS (SPL) THAT CAN LEAD TO IRREVERSIBLE HEARING DAMAGE. SE AUDIOTECHNIK® RECOMMENDS TO RESPECT THE TIMES OF EXPOSURE TO HIGH SPL.

Noise level (dBA)	85	94	97	112	127
Max. recommended exposure time per 24 hours	8 hrs.	1 hr.	30 min.	56 sec.	1 sec.

Noise exposure recommendations according to US National Institute for Occupational Safety and Health (NIOSH).

IMPORTANT SAFETY INSTRUCTIONS

1. Keep these instructions.
2. Read these instructions.
3. Follow thoroughly all instructions.
4. Read all warnings.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth. Disconnect the device from the AC outlet before cleaning. Do not use paint thinners, solvents, cleaning fluids, or chemical-impregnated wiping cloths.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Use the mains plug to disconnect the apparatus from the mains.
13. Keep away from objects which may be impaired by an external magnetic field. To avoid the damage of equipment such as computers, video monitors and magnetic data carriers, they should be located at least 1 meter away.
14. Only use safety pins, attachments, accessories and adapters specified and/or provided by the manufacturer.
15. Refer all servicing to qualified service personnel. This is required when the product 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.
16. Do not insert your fingers, hands or any other foreign objects into any gaps or openings of the device.
17. When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and environment.

PACKAGE CONTENTS

The packaging of the M-F3A PRO includes:

- 1 M-F3A PRO
- 1 AC power cord with powerCON® connector
- 1 power link cable with powerCON® connectors
- 1 M-Line user manual
- 1 QC PASS card
- 1 Warranty card

The packaging of the M-F3A S12 PRO, M-F3A S15 PRO and M-F3A FS subwoofers include:

- 1 M-F3A S12 PRO, M-F3A S15 PRO or M-F3A FS unit
- 1 AC power cord with powerCON® connector
- 1 M-Line user manual
- 1 QC PASS card
- 1 Warranty card

Please inspect your product packaging before unboxing it. If it has been damaged during shipping, unbox the product and check for any visual damage before using it. Notify the shipping company immediately and contact your SE AUDIOTECHNIK® dealer or support center for help and assistance.

Finally, save the shipping carton as evidence for the possible claim, which can be requested only by you. We also recommend you to keep all the packing materials and contents for any further transportation.

INTRODUCTION

M-Line products are a set of self-powered systems for indoor and outdoor PA applications with small to medium-sized audiences. Their acoustic design makes them perfect for events where sound quality and definition are the priority, while delivering high enough power for the intended attendance.

In addition, when great sound matters but space is scarce or transportation needs to be simple, you will benefit from the solutions offered by this sophisticated systems.

Compact, portable, powerful and easy-to-use, the M-Line is perfect for covering a wide range of applications and productions. It is composed by the following products:

The M-Line is composed by the following products:

- **M-F3A PRO:** Updated high-performance line array units for the M-Line systems.
- **M-F3A S12 PRO:** Ground-stacked self-powered 12" subwoofers with user controllable DSP. Referred to in this manual as "S12 PRO".
- **M-F3A S15 PRO:** Ground-stacked self-powered 15" subwoofers with user controllable DSP. Referred to in this manual as "S15 PRO".
- **M-F3A FS:** Compact self-powered subwoofers for flown applications with user controllable DSP.
- **M-F3A:** 1st generation of the hornless line array units. Not available in Europe.



Figure 1. M-Line products.

INTENDED USE

The M-Line consists of compact, active line array modules. The simple scalability of an M-Line system allows for a maximum range of applications: from the professional sound boost for large events with several thousand visitors, to small indoors and outdoors celebrations. When your aim is to have a powerful, natural sound – but there is little space for your gear or the speakers need to be installed discretely – that's when the M-Line comes to the fore.

Horns direct and guide the sound waves. But they also alter them – as anyone who has ever used both hands to form a funnel around the mouth can confirm. The M-Line is based on an innovative, horn-free design with dome tweeters in an array to provide absolutely natural, unaltered sound without sacrificing the necessary sound pressure. The M-Line thus combines the advantages of both worlds: a wide dispersion angle with robust sound pressure and crystal-clear, natural sound.

When used with the SE AUDIOTECHNIK® frame, systems of even 16 M-F3A or M-F3A PRO units can be deployed to create short to medium-throw setups and cover wide ranges of audiences. The capabilities of those systems can be extended to even the lowest frequencies by adding the S12 PRO, S15 PRO and/or M-F3A FS subwoofers.

For example, flown systems with extended low-end can be realized with M-F3A FS subwoofers. Using SE AUDIOTECHNIK® accessories, M-F3A or M-F3A PRO units can be combined with the S12 PRO and/or S15 PRO subwoofers to deploy ground-stacked systems, with up to three S12 PRO subwoofers and four M-F3A or M-F3A PRO speakers.

In addition, to broaden the capabilities of the system in the lowest frequencies, subwoofer arrays can be implemented with S12 PRO or S15 PRO subwoofers. Used with the specifically designed presets and configurations, these can be combined to create different patterns and control radiation in the low frequencies.

In all the configurations and thanks to an easy-to-use and precise rigging mechanism, you have control over each unit's alignment, ensuring maximum coverage and long-throw capabilities.

Please, read thoroughly the [Application Examples](#) and [Rigging and Installation](#) sections for further information about the setups, deployment and possibilities of the M-Line products.

M-LINE PRODUCTS

M-F3A PRO LINE ARRAY UNITS

M-F3A PRO is an ultra-compact active line array system which offers crystal-clear sound reproduction with punchy mids and studio-quality highs, due to its hornless design.

The unique PA sound is achieved by incorporating 8 high-efficiency 2.8" neodymium mid-frequency drivers, and 7 pieces of 1" direct radiation dome tweeters into each unit. All these drivers have been designed for high efficiency and extended LF bandwidth. In result, it helps to lower the cut-off frequency in the low-mid band, which makes the vocals sound exceptionally rich and natural.

All drivers are mounted on an A4 paper-sized front surface. Each unit reaches up to 129 dB peak SPL and weighs only 8.3 kg, including amplification and DSP. The M-F3A PRO's distinct sound is achieved by a 2-channel 600 W class-D power amplifier, delivering 2x300 W into the high- and mid-frequency drivers.

Two controls, the Level and the Line Unit selection, offer precise adjustment of the key system parameters, such as attenuation and system voicing, depending on the unit count in the array.

Features

- Pristine acoustic reproduction
- Hornless design for natural, high-fidelity sound
- Ultra-compact size, weighing only 8.3 kg
- 120° horizontal coverage
- Built-in DSP and 600 W of class-D amplification
- Level and Line Units control
- Wide range of supported applications
- Available in black and white colors

REAR PANEL

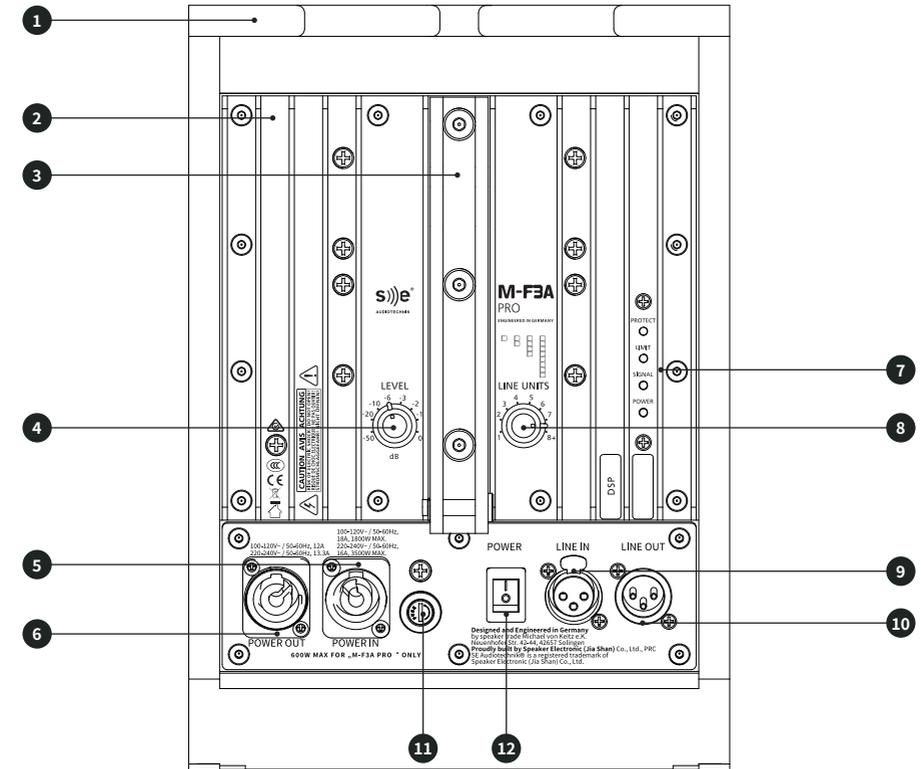


Figure 2. M-F3A PRO rear panel.

- 1 Integrated extension handle.
- 2 Rear panel heatsink.
- 3 Rear rigging piece.
- 4 **Level.** Input signal level adjustment in 8 discrete steps: -50, -20, -10, -6, -3, -2, -1 and -6 dB referring to 0 dBu nominal input sensitivity.
- 5 **Power In.** PowerCON® type-A mains power socket. The M-F3A PRO system is intended for two operating voltage ranges: 100-120 and 200-240 VAC. The electrical conversion is done automatically.

- 6 Power Out.** PowerCON® type-B mains power output to link power between several units in the line.



The recommended maximum quantity of units to be connected in series is 6 units for 200-240 VAC mains, and 3 for 100-120 VAC.

- 7 Indicator LEDs:**

- **Protect:** Lights red if the amplifier has short-circuited or overheated – the device will be muted automatically. Upon reaching standard conditions, the device reverts to normal operating mode after a few seconds.
- **Limit:** Lights orange when the limiter starts working. If the limiter LED lights up permanently or for longer periods, the gain level should be reduced. Failure to do so may result in a distorted sound.
- **Signal:** Lights green as soon as an audio signal is present. The input signal monitoring is performed before the Main Level controller.
- **Power:** Lights green once the system is properly connected to the mains power and switched on.

- 8 Line Units.** 8-position rotary switch to select the number of M-F3A PRO units in the array. On each M-F3A PRO, specify the same quantity as units in the line. For example, select "5" on all devices in an array of 5 units.



Acoustically, the bigger the line array, the greater the interference in the HF and from a lower frequency. Choosing the right setting helps to improve the HF coupling and provides balanced sound in all system sizes. Also, in combination with a dedicated multi-band limiter, it helps to keep the same sound character on all SPL levels.



Since each position sets an equalization designed precisely for that specific line length, this feature must be used correctly. Setting values different than the units in the line, may reduce the headroom of the system and alter its sound quality. Finally, when using 8 or more units, specify "8+" on all. For more than 12 units, additional HF compensation above 2 kHz may be required.

In M-F3A units, this knob is named "High Shelf" and follows the same logic as the "LINE UNITS" in M-F3A PRO. Thus, it can be used to equalize the array according with the number of units it includes.

- 9 Line In.** Balanced line-level input with female Neutrik® XLR-3 connector to connect input signal. It allows input levels up to +20 dBu.



For an optimal signal-to-noise ratio, it is recommended to input signals with a level of at least 0 dBu.

- 10 Line Out.** Balanced and buffered line-level output with male Neutrik® XLR-3 connector to link other M-F3A PRO speakers or other components like subwoofers to the system.

- 11 Fuse.**

- 12 Power.** Switch to turn the unit on and off.



To avoid clicks and pops, turn on your PA system last and turn it off first before other connected devices. Additionally, after turning the unit off, wait for more than five seconds before turning it on again.

S12 PRO AND S15 PRO SUBWOOFERS

The S12 PRO and S15 PRO are compact active subwoofers designed especially for the M-Line systems. They are composed respectively by a single 12" and 15" driver in a vented box, powered by an 800 W Class-D amplifier. Its efficient design and compact size guarantees flexible placement in all kinds of environments. In addition, a two-point SE rigging system allows for safe and easy stacking.

These units contain a newly designed 800 W Class-D power amplifier and are equipped with 48 kHz/24 bit DSP. By using the LCD screen and rotary encoder, users can easily control various system parameters such as delay, EQ, filters and more.

The built-in presets significantly reduce setup times for M-Line systems in various configurations - for example, simply select the preset for End-fire or Cardioid arrays or a combination with a flysub. User-defined custom-presets can also be stored.

Features

- Increased SPL with reduced port-noise
- DSP-Presets for quick and easy subwoofer array setups
- Ultra-compact subwoofer, weighing only 23 kg
- Built-in DSP and 800 W of class-D amplification
- Easy to use LCD screen and rotary encoder controller
- Two-points rigging system for safe and easy stacking
- Wide range of possible applications
- Available in black and white

REAR PANEL

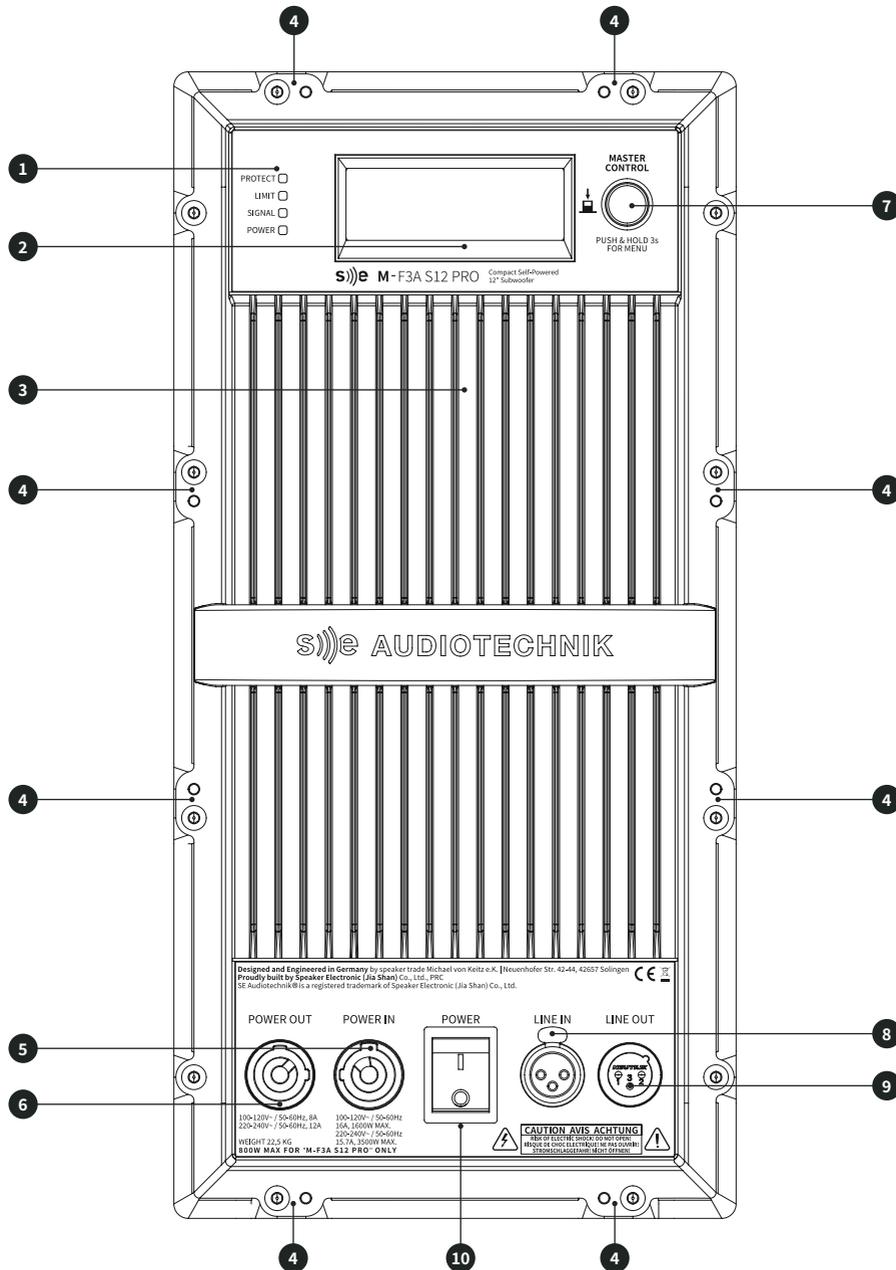


Figure 3. S12 PRO, S15 PRO and M-F3A FS rear panel.

- 1 Indicator LEDs:
 - **Protect:** Lights red if the amplifier has short-circuited or overheated – the device will mute itself automatically. Reaching standard conditions again, the device reverts to normal operating mode after a few seconds.
 - **Limit:** Lights orange when the limiter starts working. If the limiter LED lights up permanently or for longer periods, the gain level should be reduced. Failure to do so may result in a distorted sound.
 - **Signal:** Lights green as soon as an audio signal is present. The input signal monitoring is performed before the Main Level controller.
 - **Power:** Lights green once the system is properly connected to the mains power and switched on.

- 2 Alphanumeric LCD for DSP display.
- 3 Rear panel heatsink.
- 4 Mounting points for rain cover accessory.
- 5 **Power In.** PowerCON® type-A mains power socket. The plate amplifier of the three subwoofers is intended for two operating voltage ranges: 100-120 and 200-240 VAC. The electrical conversion is done automatically.
- 6 **Power Out.** PowerCON® type-B mains power output to link power between several units in the system.



The recommended maximum quantity of units to be connected in series is 4 units for 200-240 VAC mains, and 2 for 100-120 VAC.

- 7 **Master control.** Rotary encoder with push button for DSP control.
- 8 **Line In.** Balanced line-level input with female Neutrik® XLR-3 connector to connect input signal. Maximum input level is +20 dBu.



For an optimal signal-to-noise ratio, it is recommended to input signals with a level of at least 0 dBu.

- 9 **Line Out.** Balanced and buffered line-level output with male Neutrik® XLR-3 connector. Used to link more M-F3A PRO speakers or other components like subwoofers to the system.

- 10 **Power.** Switch to turn the unit on and off.



To avoid clicks and pops, turn on your PA system last and turn it off first before other connected devices. Additionally, after turning the unit off, wait for more than five seconds before turning it on again.

M-F3A FS

The M-F3A FS is the flyable bass extension module for the popular M-F3A PRO line array systems. It utilizes two specially designed 6" x 9" woofers that provide high sound pressure levels whilst presenting a sleek and discreet design. This unit is twice as high as an M-F3A PRO. Thus, the modules complement each other perfectly in every way.

The unit contains a newly designed 800 W Class-D power amplifier and is equipped with 48 kHz/24 bit DSP. The LCD display and rotary encoder allow the user to select and control various system parameters such as delay, EQ, filters and other parameters.

Custom configurations can then be saved as user presets. In addition, the built-in factory presets reduce setup times for existing M-Line systems in various configurations. In example, when flown with M-F3A PRO, the unit can deliver rich and deep bass to manage applications where no space for ground subs is available.

Improved rigging capabilities and the newly-designed extended bumper frame gives additional flexibility to integrate this adaptable subwoofer into M-Line systems.

Figure 3 in subsection S12 PRO and S15 PRO Subwoofers depicts its rear panel.

Features

- Lightweight, flyable subwoofer, weighing only 23 kg
- DSP-Presets for accurate acoustical coupling with other M-Line products
- Built-in DSP and 800 W of class-D amplification
- LCD screen and rotary encoder for quick and easy DSP control
- Four-points rigging system for safe flown setup
- Discreet and aesthetic design for elegant and coherent appearance
- Available in black and white colors

M-LINE ACCESSORIES

The range of applications of the M-Line can be enhanced with the following accessories:

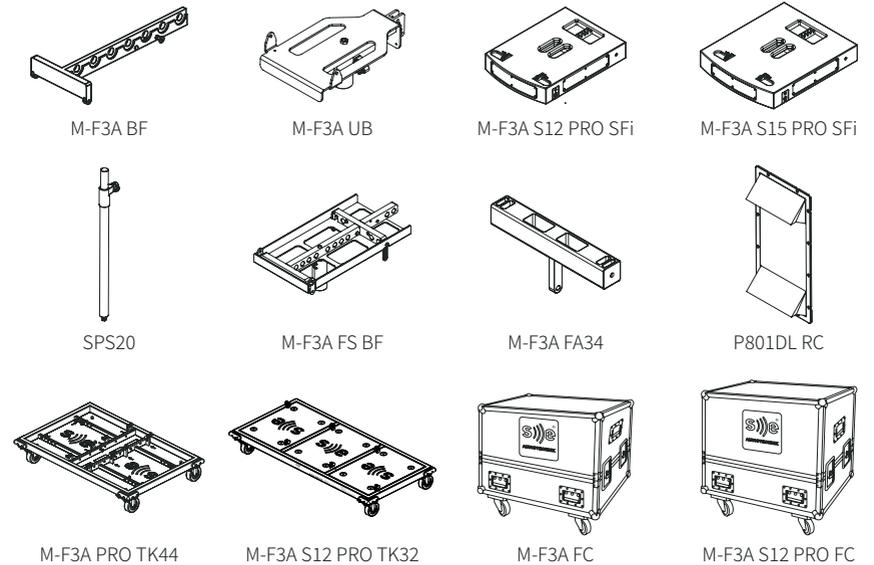


Figure 4. M-Line accessories.

- **M-F3A BF:** Bumper frame for flying up to 16 pieces of M-F3A or M-F3A PRO.
- **M-F3A UB:** U-bracket to install up to two M-F3A or M-F3A PRO units over a pole bar, mounted on any SE AUDIOTECHNIK® subwoofer with M20 thread.
- **M-F3A S12 PRO SFi:** Frame for ground stacking M-F3A or M-F3A PRO units on S12 PRO subwoofers.
- **M-F3A S15 PRO SFi:** Frame for ground stacking M-F3A or M-F3A PRO units on S15 PRO subwoofers.
- **SPS20:** Pole bar with M20 thread and adjustable height.
- **M-F3A FS BF:** Bumper frame to fly 4-point rigging systems such as M-F3A FS.
- **M-F3A FA34:** 3-to-4-point rigging adapter for flying M-F3A or M-F3A PRO under M-F3A FS.
- **M-F3A CTB:** carry-on bag to transport one M-F3A or M-F3A PRO.
- **M-F3A PRO TK44:** transport kart for up to 16 M-F3A or M-F3A PRO units.
- **M-F3A PRO TK32:** transport kart for 6 S12 PRO subwoofers.
- **M-F3A FC:** Flight case for 4 pieces of M-F3A or M-F3A PRO.
- **M-F3A S12 PRO FC:** Flight case for two pieces of S12 PRO.
- **M-F3A S15 PRO FC:** Flight case for two pieces of S15 PRO.
- **M-F3A PRO FRC 8/12/16:** rain cover for flown line arrays of 8, 12 or 16 M-F3A PRO.
- **P801DL RC:** Amplifier rain cover to protect the power amplifier of the S12 PRO, S15 PRO or M-F3A FS.
- **M-F3A PRO FRC 8/12/16:** Rain cover for flown line arrays of 8, 12 or 16 M-F3A or M-F3A PRO units.

Please, read thoroughly the Application Examples and Rigging and Installation sections for further information about the setups, deployment and possibilities of the M-Line products.

RIGGING AND INSTALLATION

RIGGING COMPONENTS

M-F3A PRO

This product features the following rigging elements:

- Front rigging points: aluminum bars on both sides for frontal fixing, including one security pin each.
- Rear rigging piece: steel tracks for splay angle definition with one security pin and an unfolding bar for rear connection. The available holes allow for defining the tilt of the specific unit in combination with the previous element.

 Since the moving piece of the last unit in an array is not used, it must be locked by inserting the security pin in the "Stow" position.

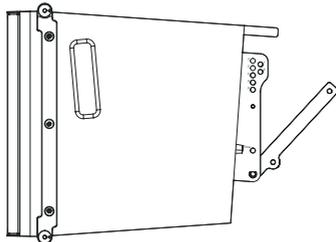


Figure 5. Front and rear rigging pieces of the M-F3A PRO units.

- Security pins: 6-mm ball lock pins in stainless steel for safe locking between units. To lock and unlock them properly:

1. Push and hold the button to release the blocking ball.
2. Insert the pin through the pieces to link.
3. Release the button to close the mechanism. Pull the pin outwards to verify a close and safe connection.

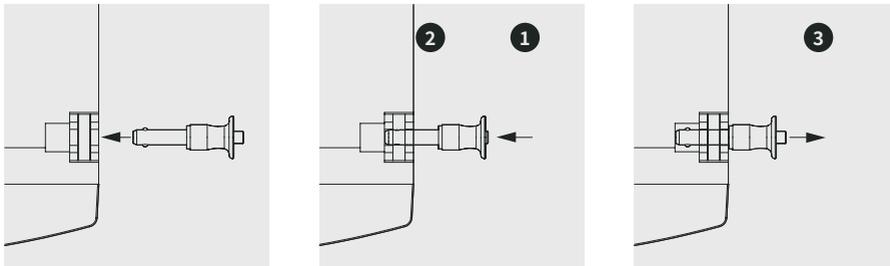


Figure 6. Manipulation of the security pins in the M-Line products.

S12 PRO AND S15 PRO

This product features the following rigging elements:

- Top holes and bottom rubber feet: included to indicate the correct position, assuring a firm grip when stacking S12 PRO or S15 PRO subwoofers.
- Side locking points: Male lever on the top of the cabinet and the female receptacle on the bottom. These must be locked when S12 PRO or S15 PRO subwoofers are used in stacked systems as described below and shown in figure 7:

1. Pull the handle to release the blocking piece.
2. Move the lever upwards to the receptacle of the unit above.
3. Release the handle to close the mechanism. Try to move the lever downwards to verify a close and safe link.

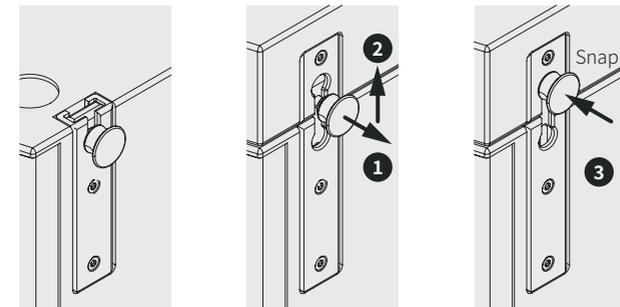
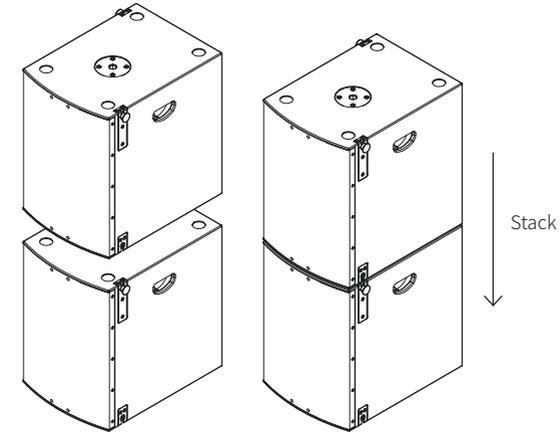


Figure 7. Linking system for stacks in S12 PRO and S15 PRO subwoofers.

M-F3A FS

This product features the following rigging elements:

- Front rigging points: aluminum bars on both sides for frontal fixing, including each one security pin.
- Rear rigging piece: steel tracks on both sides for tilt definition and rear linking with the next unit. In the upper part, these include a security pin and 9 holes to select the splay angle from 0° to 8°, in 1° steps. On the bottom, a deployable bar can be placed in three positions depending on the need:
 - Lowest hole: to hide completely the moving bar when no other device will be added below the flyable subwoofer, or for its safe storage and transport. See drawing **A** in figure 8.
 - Center hole: to attach an M-F3A FA34 adapter, which allows to add one or more M-F3A or M-F3A PRO units. See drawing **B** in 8.
 - Upper hole: to link another M-F3A FS below. In this position the bar is completely out and defines the splay angle of the next subwoofer. See drawing **C** in figure 8.

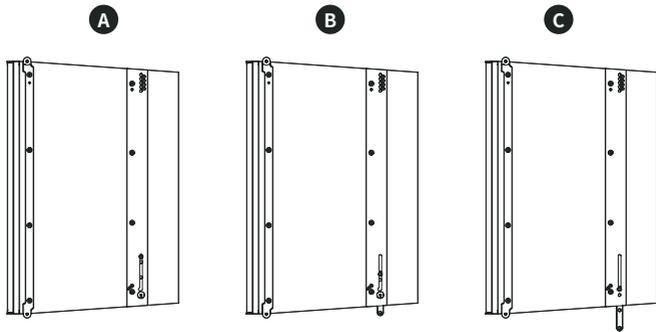


Figure 8. Rear rigging piece in M-F3A FS subwoofers.

- Security pins: 6-mm ball lock pins in stainless steel for safe locking between units, manipulated as shown before in figure 6.

INSTALLATION



For all installations, use SE AUDIOTECHNIK® accessories only. Also, please follow thoroughly the steps specified for each of these setups, and respect the security directions and warnings given in the section Important Safety Instructions.

Use SE AUDIOTECHNIK® accessories only for all installations. Please, follow thoroughly the steps specified for each of these setups, and respect the security directions and warnings given in the section Important Safety Instructions.

When rigging and installing line array systems, please mind the following security advices:

- Adhere to and respect any local regulation regarding manipulation and hoisting of heavy loads.
- Inspect the conditions of all the equipment, accessories and tools to be used. Make sure no one presents any fault or damage that may endanger or compromise safety.
- Check that the standing surfaces and holding structures are safe, stable, and can hold the weight of the designed array.
- Arrange an appropriate working environment, clear and free from unnecessary or dangerous objects.
- When installing products above head height, always use a proper ladder or industrial lift.
- Use appropriate protective elements, as good and stable shoes and clothes.
- When deploying flown arrays, always add just one piece at a time.
- Remain attentive to any risk of crushing.
- Do not stand below hanging loads.

M-F3A UB

The M-F3A UB U-bracket allows to install one or two M-F3A or M-F3A PRO pieces on any SE AUDIOTECHNIK® subwoofer with M20 thread, using the SPS20 pole mount.

! Under no circumstances should you use the M-F3A U-bracket to hang line array systems! In addition, no more than two M-F3A or M-F3A PRO units should be stacked on top of it.

To prepare the units and accessories before install the setup:

1. Prepare the power and audio cables required for the installation.
2. Adjust the same "LEVEL" and "LINE UNITS" on each of the M-F3A or M-F3A PRO units.
3. Using the screws of the SPS20 pole mount, set its length to the minimum. Seal them again before proceeding.

To install the system:

1. Locate the subwoofer in the desired place. Ensure that the four bottom feet touch the ground and its position is stable.
2. Screw the SPS20 pole mount in the M20 thread of the subwoofer.
3. Place the receptacle of the M-F3A UB bracket in the SPS20 pole mount. Fasten it tight with the screw.
4. Position the first M-F3A or M-F3A PRO unit over the U-bracket. Lock the two lower front rigging points of the box with the security pins of the U-bracket.
5. Unfold the moving part in the back of the box and set the aiming angle with the holes in the U-bracket. Use the security pin of the u-bracket to lock it.
6. Repeat steps 4 and 5 to install a second M-F3A or M-F3A PRO unit on top of the first one if desired.
7. Lock the security pins in the front of the last unit added to the stack.
8. Loosen the screws in the SPS20 pole mount and lift the top units until the desired height. Seal again the screws in the pole to lock the position.
9. Connect properly the power and audio cables and turn the units ON.

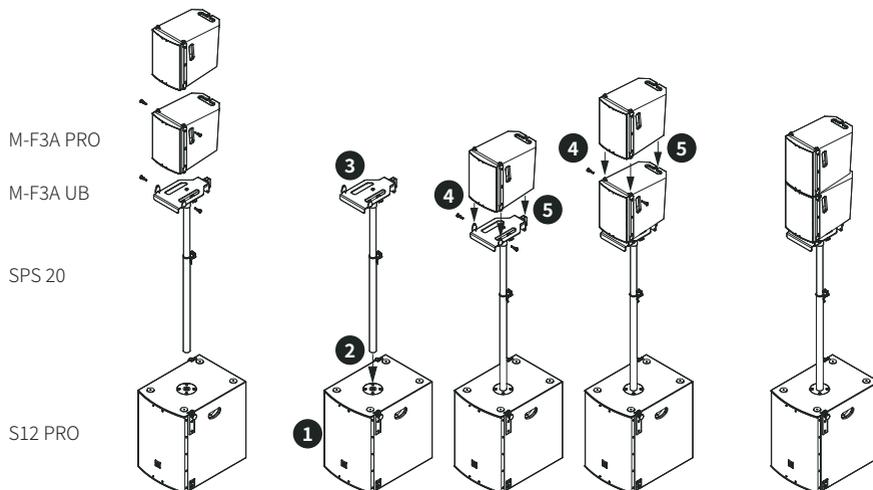


Figure 9. Installation of small arrays with the SPS20 pole mount and the M-F3A UB U-bracket.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions mentioned before.

M-F3A S12 PRO SFi AND M-F3A S15 PRO SFi

With these dedicated frames, it is possible to stack up to 4 M-F3A or M-F3A PRO units over a S12 PRO or S15 PRO subwoofer, or on the ground.

! M-F3A S12 PRO SFi or M-F3A S15 PRO SFi stacking frames are not designed for hanging loads. Under no circumstances should you use them to hang line array systems! In addition, no more than four M-F3A or M-F3A PRO units should be stacked on top of it.

Before installing the system:

1. Prepare the power and audio cables required for the installation.
2. Depending on the number of boxes in the array, set the same "LINE UNITS" on each of the M-F3A or M-F3A PRO units to use.
3. Set the "LEVEL" control to the same position on all the boxes, and turn their power switch to the ON position.

To set an array over one S12 PRO or S15 PRO subwoofer:

1. Locate the subwoofer in the desired place. Ensure that the four bottom feet touch the ground and its position is stable.
2. Fix the M-F3A S12 PRO SFi or M-F3A S15 PRO SFi stacking frame to the subwoofer using the locking points located at both sides, as shown in figures 7 and 10.
3. Follow the steps described below for a ground-stacked array.

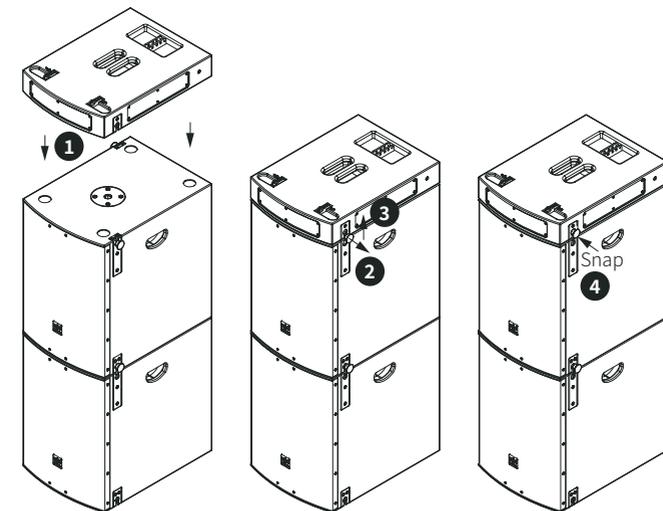


Figure 10. Subwoofer ground stack with M-F3A S12 PRO SFi and M-F3A S15 PRO SFi frames.

When this kind of setup is done with the M-F3A S12 PRO SFi or M-F3A S15 PRO SFi on the ground:

1. Release the three security pins of the stacking frame.
2. Place the first M-F3A or M-F3A PRO unit over the stacking frame. Fasten the two lower front rigging points of the box with the security pins of the frame. See figure 12.
3. Unfold the moving part in the rear of the box and lock it with the rear security pin of the stacking frame. As shown in figure 11, set the desired aiming angle with the three positions available: 0°, -2.5° and -5°.

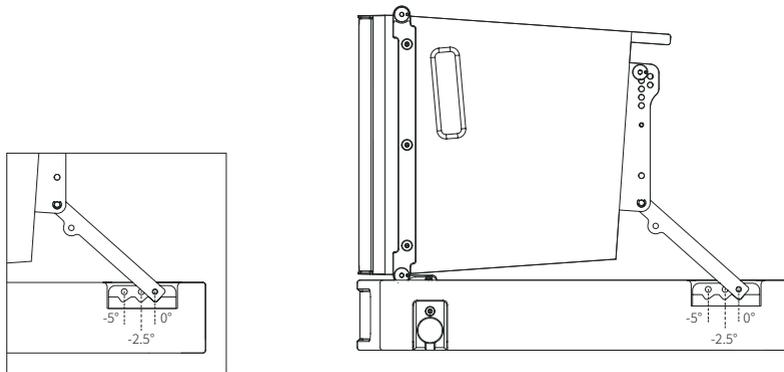


Figure 11. M-F3A S12 PRO SFi and M-F3A S15 PRO SFi rear holes for angle definition.

4. Place the next M-F3A or M-F3A PRO unit over the previous one. Fasten the two lower front rigging points of the second box with the security pins of the first one.
5. In the rear part, set the desired splay angle for the new unit linking its moving piece with the rear track of the previous one.
6. Connect properly the power and audio cables for the last unit added.
7. Repeat the three previous steps to install more M-F3A or M-F3A PRO units on top of the first ones, as shown in figure 12. No more than 4 boxes should be stacked with this frame.
8. Finally, lock the security pins in the front of the last unit added to the stack.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions mentioned before.



Notice that the previous setup can also be done on top of stack of S12 PRO or S15 PRO subwoofers, deployed as indicated in the figures 7 in subsection Rigging Components. In those cases, maximum 3 S12 PRO and 2 S15 PRO subwoofers should be stacked.

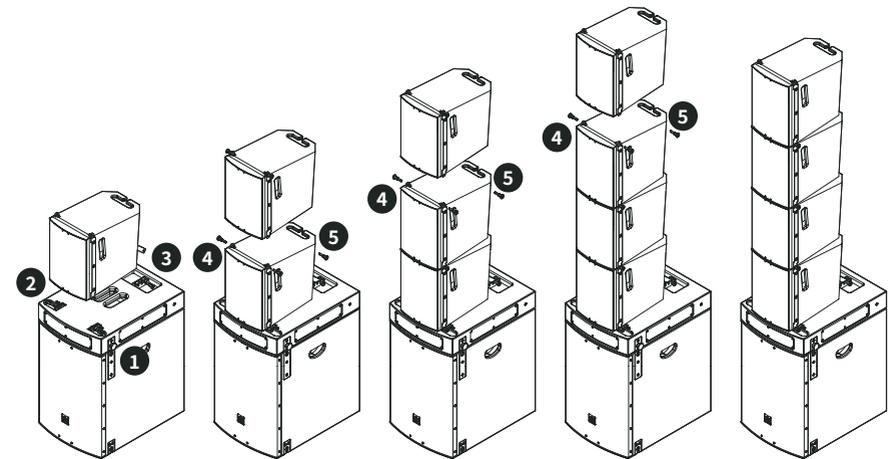


Figure 12. Installation of stacked arrays with the M-F3A S12 PRO SFi and M-F3A S15 PRO SFi frame.

M-F3A BF

The M-F3A BF bumper frame allows to deploy safely line array systems of even 16 M-F3A or M-F3A PRO units. As shown in figure 13, one or two points can be used to hang the bumper frame. Keep in mind that the tilting of the whole array depends on several factors as the amount of units, the splay angle between them, other added weight like cables, and the pick-up point chosen in the bumper frame.



The maximum supported weight for the M-F3A FS BF and M-F3A 34 accessories are 2,700 kg and 1,000 kg respectively. Care must be taken to not exceed these limits.

The suspension of this frame must be done over a structure using hoisting chains that can resist loads greater than the weight of the array.

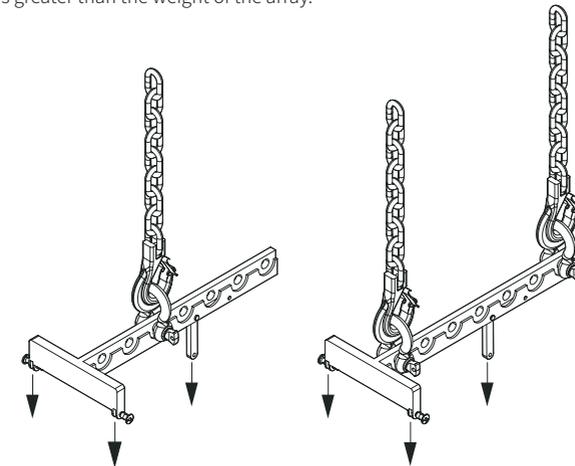


Figure 13. Suspension of the M-F3A BF bumper frame using one or two points.

To prepare the system before the installation:

1. Prepare the power and audio cables required for the installation.
2. Depending on the number of boxes in the array, set the same "LINE UNITS" on each of the M-F3A or M-F3A PRO units to use.
3. Set the "LEVEL" control to the same position on all the boxes, and turn their power switch to the ON position.

To deploy the system:

1. Connect the M-F3A BF bumper frame to the hoist chain/s using appropriate shackle/s in the hole/s selected for the desired tilting.
2. Lift the bumper frame to a comfortable height and attach the first M-F3A or M-F3A PRO unit. With the security pins, link the two front points of the first unit, to the front points of the frame.
3. Release the moving piece on the rear side of the first unit. Link the fixed rigging piece to the rear hanging bar of the bumper frame, using the hole for a 0° angle.
4. If needed, lift the array to a comfortable height.
5. Add the second unit below the first one, linking its top rigging points with the bottom points of the first one.
6. Unfold the moving part in the rear of the second box.
7. Connect the rear rigging piece of the second box with the deployable bar of the first one. Lock the security pin of the new box in the correct hole, setting the desired aiming angle with the nine positions available, as shown in figure 14.

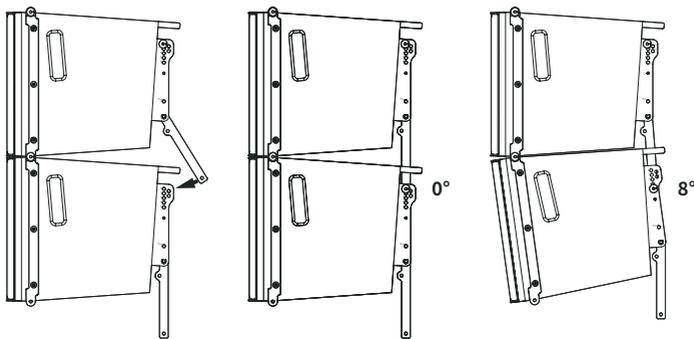


Figure 14. Front and rear linking in M-F3A PRO line arrays.

8. Connect properly the power and audio cables for the units added.
9. Repeat steps 4 to 8 until the whole system is suspended and connected.
10. Before hoisting the line array to the final position, inspect thoroughly:
 - a. Bumper frame: Check the connection of the hoist chain and the first unit.
 - b. Rigging points and security pins: Be sure they all are correctly locked in place.
 - c. Splay angles: Verify the values established are correct.
 - d. Connections: Review the proper power and audio signal flow between boxes.
 - e. Units configuration: Double-check that all the units are turned ON and have the same "LEVEL" and "LINE UNITS" values.

To unmount the system, follow the previous steps in reverse order respecting all the safety instructions mentioned before.

M-F3A FS BF

The M-F3A FS BF is a dedicated bumper frame for M-F3A FS subwoofer line arrays. Same as the M-F3A BF, this bumper frame can be suspended from one or two points, as shown in figure 15. In addition, the M-F3A 34 adapter can be used to add below arrays composed by M-F3A or M-F3A PRO units.



The maximum supported weight for the M-F3A FS BF and M-F3A 34 accessories are 2,700 kg and 1,000 kg respectively. Care must be taken to not exceed these limits.

The installation of this frame obeys the same warnings and indications given previously for the M-F3A BF.



The moving piece in the M-F3A 34 adapter allows to define only 0°, 1° and 2° splay angles for the unit connected to it.

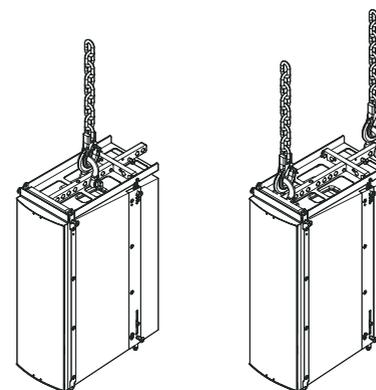


Figure 15. Suspension of the M-F3A FS BF bumper frame using one or two points.

To prepare the system before the installation:

1. Prepare the power and audio cables required for the installation.
2. Set the appropriate preset and DSP functions for the M-F3A FS subwoofer/s to deploy.
3. If applicable and depending on the number of boxes in the array, set the same "LINE UNITS" on each of the M-F3A or M-F3A PRO units to use. Also, set the "LEVEL" control to the same position on all the boxes.
4. For all the products and units to use, turn the power switch to the ON position.

To deploy a line array composed by subwoofers:

5. Connect the M-F3A FS BF bumper frame to the hoist chain/s using appropriate shackle/s in the hole/s selected for the desired tilting. See figure 16.
6. Lift the bumper frame to a comfortable height and attach the first M-F3A FS subwoofer. With the security pins, link the two front points of the first unit, to the front points of the frame.
7. Lock the upper rear part of the subwoofer by fastening the top security pins with the rear releasable bars of the M-3A FS BF bumper frame. See figure 16.

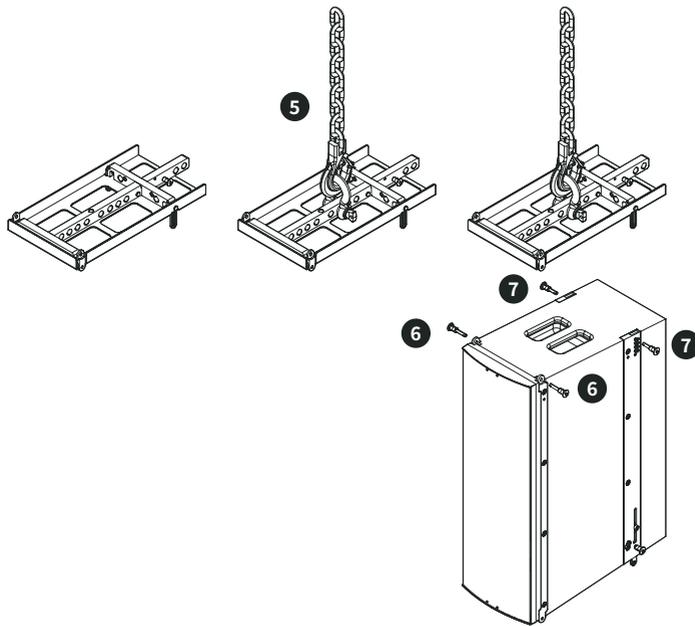


Figure 16. Attaching the M-F3A FS subwoofer to the M-F3A FS BF frame.

8. Lift the bumper frame to a comfortable height and release the rear deployable bars of the first subwoofer. Fix them in the upper hole, leaving most of their length outside.
9. Attach the second subwoofer below the first one. With the security pins, link the two front points of the new unit, to the front points of the first one.
10. Lock the rear part of the new subwoofer by fastening the top security pins with the rear releasable bars of the first one. Pick the right holes to set the desired splay angle.
11. Connect properly the power and audio cables for the units added.
12. Repeat steps 7 to 10 until all the subwoofers are suspended.

To add a line array of M-F3A or M-F3A PRO units under a flown M-F3A FS subwoofer:

4. Lift the bumper frame to a comfortable height and release the bars in the rear of the subwoofer. Fix them in the middle hole, where half of their length is exposed.
5. Attach the M-F3A 34 adapter by inserting the deployable bars of the subwoofer, in the outermost slots of the adapter. Fasten it locking its two security pins through the bars.
6. Add the first M-F3A or M-F3A PRO unit by attaching the two upper front points, to the lower front points of the subwoofer.
7. Release the rear deployable bar of the new unit. Secure the box in the back by linking its rear rigging piece with the moving bar in the M-F3A 34 adapter. Lock the security pin of the box in the hole for the 0° angle.
8. Connect properly the power and audio cables for the first unit.
9. Add the second M-F3A or M-F3A PRO unit below the first one. Link its top rigging points with the bottom points of the first one.
10. Unfold the moving part in the rear of the second box.
11. Connect the rear rigging piece of the second box with the deployable bar of the first one. Lock the security pin of the new box in the correct hole to set the desired splay angle.
12. Connect properly the power and audio cables for the unit added.
13. Repeat steps 9 to 12 until the whole system is suspended and connected.
14. Before hoisting the line array to the final position, inspect thoroughly:
 - a. Bumper frame: Check the connection of the hoist chain and the first unit.
 - b. M-F3A 34 adapter: Check the connection of the last M-F3A subwoofer and the first M-F3A or M-F3A PRO unit.
 - c. Rigging points and security pins: Be sure they all are correctly locked in place.
 - d. Splay angles: Verify the values established are correct.
 - e. Connections: Review the proper power and audio signal flow between boxes.
 - f. Units configuration: Double-check that all the units are turned ON, the preset selected for the subwoofers, and that the M-F3A or M-F3A PRO units have all the same "LEVEL" and "LINE UNITS" values.

To unmount the system, repeat the previous steps in inverse order respecting all the safety instructions mentioned before.

WIRING

M-Line products use PowerCON® connectors for the mains power input and link. Figure 17 shows how to plug-in and connect these wires.

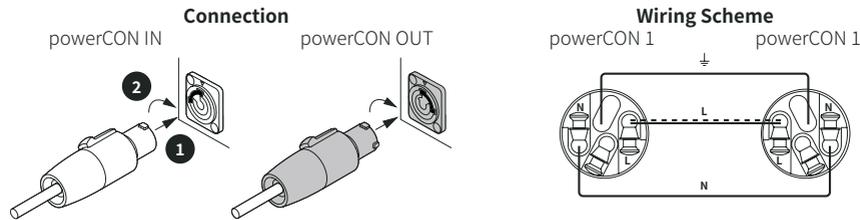


Figure 17. PowerCON® plug-in and link cable connection.

It is recommended to use cables with at least 18 AWG conductor size. For long cable lengths, the maximum conductor size is 14 AWG. Those wires must be assembled by a qualified technician.

Conversely, M-Line products use XLR-3 connectors to input and loop audio signals. They follow the next plug-in and configuration scheme:

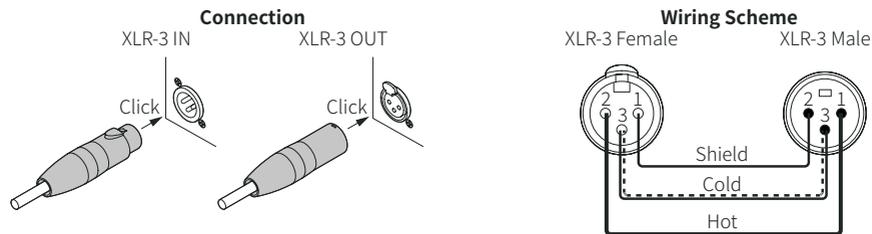


Figure 18. XLR-3 plug-in and cable connection.

LCD PLATE AMPLIFIER

The S12 PRO, S15 PRO and M-F3A FS subwoofers are equipped with a built-in 48 kHz/24 bit DSP processor, that provides controlled signal processing and limiting. This DSP core is fed by dual-range inputs to improve the SNR, and is easy to manipulate thanks to the rotary control encoder with push button, and the 4x20 symbol alpha-numeric LCD screen.

This section details the features of the DSP firmware, whose adjustable parameters and features include 5 EQ bands, delay, polarity and selection of low-pass filters. Also, S12 PRO has an additional high-pass filter, and S15 PRO the new directivity control function. In addition, a variety of factory presets is available in both subwoofers, to easily setup different systems.

Some key cursors, symbols and considerations used throughout the menu structure are:

- The first line of each screen is the specific name or title of the given screen.
- The cursor ">" marks the current point of action.
- When editing preset names, the cursor "←" indicates deleting function.
- The symbol "*" highlights the selection of a given preset or setting. It indicates also that the edition of a given parameter is enabled.
- The symbol "L" indicates the lock state of the amplifier and thus, that the editing of any parameter is not allowed. This symbol appears only when this is activated, and only in the **Overview** screen.

Figure 19 shows the different menus and functions of the DSP firmware, structured in the following subsections. Conversely, figures 24 and 38 show respectively the functions included in the **DSP Settings** and **System Settings**.

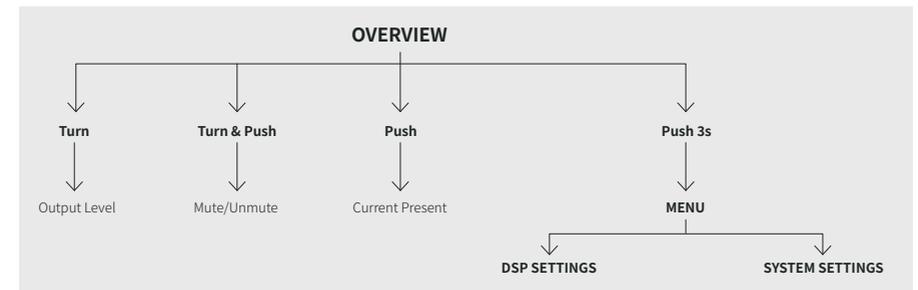


Figure 19. DSP firmware functions and menus.

OVERVIEW SCREEN

The **Overview** screen is the one shown by default on the amplifier LCD, during normal operation (Figure 20). It details the next information:

```

OVERVIEW
IN: -10 >>>>>>>
OUT: -02 >>>>>>>>>
GR: 12 6 5 4 3 2 1dB
  
```

Figure 20. Overview screen.

- The first row shows the title of the screen and if applicable, the "L" letter in the top right-corner, informing the lock state of the amplifier.
- The second row reads "IN:", followed by a numerical input level meter. The meter shows the current input level value in dB FS, with minimum "-90" for low or no signal. The ">>>" symbols show the signal strength relative to the clipping point at 0 dB FS. The readout is replaced with text "INPUT CLIPPING!" if the signal reaches or exceeds 0 dB FS. In such case, the screen backlight is flashing to call the attention of the user.
- The third row reads "OUT:" followed by the output level meter. This meter shows current output level relative to the maximum amplifier output. If the channel is muted, the level display meters are replaced with the text "MUTED".
- The fourth row shows the gain reduction in dB "GR:" applied to the signal when the limiter threshold is reached. When the value increases, new levels appear from right to left, according with the amount of reduction applied.

```

Out Gain: -6.0 dB
Change: -3.0 dB
OUT: -08 >>>>>>>>>
GR:   6 5 4 3 2 1dB
  
```

Figure 21. Turning the encoder in Overview screen allows to change output gain.

From the **Overview** screen, the following options can be executed with the Master Control rotary encoder:

1. **Turn left or right** to adjust the output level (Figure 21). The output gain and the relative change in dB are shown. The output level is always recalled and is not affected by any reset function. A value of 0.0 dB refers to the nominal output gain of the subwoofer.
2. **Turn just one step and push** to quickly mute or unmute the amplifier output.
3. **Push (without turning)** to open the Active Preset Info screen and see both the active preset and the delay currently defined (Figure 22). Clicking "Back" will return to the Overview screen.

Letters "CA" after the name of the preset indicate that the cardioid directivity function is enabled. End-fire function is denoted as "EF" and normal radiation shows no additional letters.

4. **Press and hold 3 seconds** to enter the **MENU**.

```

ACTIVE PRESET INFO
MF3AP:Default CA
USER DELAY:
0.64 ms > BACK
  
```

Figure 22. Active Presets View.

MENU

To enter the **MENU** of the amplifier, **press and hold** the Master Control rotary knob for 3 seconds. A menu as shown in Figure 5 will appear on the screen.

```

MENU
> DSP Settings
  System Settings
  Exit
  
```

Figure 23. Main Menu.

Two submenus can be accessed from this point:

- **DSP Settings:** signal processing settings such as presets, filters, EQ, delay are configured here.
- **System Settings:** power amplifier operation settings are configured here.

Clicking "Exit" will return to the **Overview** screen

DSP SETTINGS

DSP Settings menus for S12 PRO, S15 PRO and M-F3A FS are shown below in figures 24a, 24b and 24c respectively.

```
DSP Settings
> Back
  Preset Library
  Highpass Filter
  Lowpass Filter
  Directivity
  Phase Inversion
  EQ 1
  EQ 2
  EQ 3
  EQ 4
  EQ 5
  Bypass User EQ
  Delay
  Reset User Params
  Exit
```

Figure 24a. DSP Settings menu for S12 PRO.

```
DSP Settings
> Back
  Preset Library
  Lowpass Filter
  Directivity
  Phase Inversion
  EQ 1
  EQ 2
  EQ 3
  EQ 4
  EQ 5
  Bypass User EQ
  Delay
  Reset User Params
  Exit
```

Figure 24b. DSP Settings menu for S15 PRO.

```
DSP Settings
> Back
  Preset Library
  Highpass Filter
  Lowpass Filter
  Phase Inversion
  EQ 1
  EQ 2
  EQ 3
  EQ 4
  EQ 5
  Bypass User EQ
  Delay
  Reset User Params
  Exit
```

Figure 24c. DSP Settings menu for M-F3A FS.

DSP SETTINGS > PRESET LIBRARY

Preset Library menu allows to load and save DSP processing presets. These are divided in two basic types:

- Factory presets: these are the default configuration for each SE AUDIOTECHNIK®'s speaker intended to be used with your subwoofer and contain the information about factory pre-defined filter and limiter settings.

They are marked with "F" at the right side of the preset name and more details can be found in the Factory Presets subsection.

- User presets: 8 possible custom configurations to define freely, taking the factory presets as starting point and saving additional adjustments, as:
 - User High-pass filter settings
 - User Low-pass filter settings
 - User EQ settings
 - User Delay settings
 - User Phase Inversion (Polarity) settings

They are marked with "U" at the right side of the preset name.

As mentioned, the active preset is marked with the "*" symbol.

```
PRESET LIBRARY
Back
> MF3A*          F
MF3A-P          F
GENERAL         F
EMPTY: USER 1  U
EMPTY: USER 2  U
```

Figure 25. Preset Library menu.

The names of the presets always starts with a reference to the loudspeaker model which the preset has been made from. This way the user knows what factory preset was the origin of the custom user preset.

DSP SETTINGS > PRESET LIBRARY > PRESET LOADING

To load a preset, scroll to the desired one and click the rotary controller. A dialogue is displayed on the screen to either load preset, save preset or go back. By pressing "**Load Preset**", the preset is loaded in the DSP and the message "**Load Done**" is displayed shortly on the screen.

To return to the Preset Library, choose "**Back**" and click the rotary controller.

```
FACTORY PRESET
MF3A : Default
Back
> Load Preset
```

Figure 26. Loading factory preset.

DSP SETTINGS > PRESET LIBRARY > PRESET SAVING

To save a preset, choose one of the existing or empty user preset locations and click the rotary encoder. A dialogue similar to factory preset loading is displayed on the screen but in this case, an additional option is available to save the preset. Saving is only available in the user presets.

```
USER PRESET
EMPTY: USER 1
Back
Load Preset
> Save Preset
```

Figure 27. Saving user preset.

Clicking on "**Save Preset**", starts a dialogue to define the preset name. By default, the first characters of the name are the same as the currently loaded preset and these can not be changed. Thus, before setting and saving any user preset, a factory preset needs to be active.

To customize the name of the new preset, edit the last characters after ":". To do this:

1. Set the cursor ">" on the name and click the encoder. The "*" symbol appears to indicate, that the name is editable now.
2. Turn the controller to choose the character and set it by pressing the button. To delete a character, choose "←" symbol and click.
3. Complete the editing by choosing the space symbol "_" and click twice.

To confirm the preset saving, choose "**Save**" and click the rotary controller. The message "**Save Done**" is shortly displayed on the screen. To return to the Preset Library, choose "**Back**" in the succeeding two screens.

```
SAVE USER PRESET
> MF3A :_Club_←
  Back
  Save
```

Figure 28. Saving user preset.

DSP SETTINGS > PRESET LIBRARY > PRESET INFORMATION

Press and hold the rotary knob for 3 seconds on the selected preset to open the Preset Information dialog. In the latest firmware version, the Name, Date, Version and Author are displayed and shall be used to ensure that the speaker presets are up to date.

```
PRESET INFORMATION
> Back
MF3A : DLY Line U
Date: 20170629
Based-On: 0.6
Orig-Author: 02
```

Figure 29. Preset information dialog.

DSP SETTINGS > HIGHPASS FILTER (S12 PRO AND M-F3A FS ONLY)

The **Highpass Filter** section allows to change the cut-off frequency of the high-pass protection filter. The lowest possible setting is an electrical 4th order, tuned for S12 PRO at 36 Hz, and for M-F3A FS at 55 Hz. These filters are always enabled.

All frequency steps above the lowest option correspond to an acoustical 6th order Butterworth filter. These additional values are:

- S12 PRO: 48, 50, 53, 56, 60, 63, 67, 71, 75, 80, 85, 90, 95 and 100 Hz.
- M-F3A FS: 55, 65, 67, 70, 73, 76, 80, 85, 90, 95 and 100 Hz.

Changing this cut-off frequency can be useful mainly when the S12 PRO or M-F3A FS are used with other subwoofers that cover the lower frequency bands. To do this:

1. Set the cursor ">" on the option "**Freq**" and click the encoder. The "*" symbol indicates editability of the setting.
2. Turn the controller to choose the desired value and set it by pressing the button.
3. Choose "**Back**" and click the rotary controller to return to the **DSP Settings** submenu.

```
HIGHPASS FILTER
> Back
  Freq.: 36 Hz
```

Figure 30. High-pass Filter adjustment.

DSP SETTINGS > LOWPASS FILTER

The DSP of the subwoofer also includes an adjustable Lowpass Filter. This submenu allows to change its type, slope and cut-off frequency, and to bypass it.

```
LOWPASS FILTER
> Back
  Bypass: OFF
  Freq: 120 Hz
  Type: LR 24dB/Oct
```

Figure 31. Low-pass Filter adjustment.

The selection of the parameters is performed as explained for the **Highpass Filter**, the options are:

- **Bypass:** On or Off.
- **Freq.:** with 1 Hz steps, defines the cut-off frequency (-3 dB). The values are:
 - S12 PRO and S15 PRO: 80 - 240 Hz
 - M-F3A FS: 80 - 500 Hz
- **Type:**
 - Butterworth filters: BW 6 - 48 dB/Oct
 - Linkwitz-Riley filters: LR 12, 24, 36 or 48 dB/Oct

DSP SETTINGS > DIRECTIVITY (S15 PRO ONLY)

Turning the control knob in the **Directivity** menu, allows to select different directivity options, to modify the radiation of the subwoofers. This function offers three options:

- **Normal:** no process is applied and the subwoofer behaves as an omnidirectional source. For this mode, no additional information is shown in the **Active Preset Info** screen.
- **Cardioid:** Implements specific DSP processes to create a cardioid directivity pattern when used properly in a subwoofer array. In this mode, the letters "**CA**" appear in the **Active Preset Info** screen.
- **End-Fire:** Enables end-fire configuration by selecting a tuning frequency with the "**Att. Freq**" parameter. This factor ranges from 40 Hz to 100 Hz, in 1 Hz steps.
- **E-Fire Inv. (S12 PRO only):** Enables end-fire configuration with the alternative approach, to make it compatible with firmware 20190624 and earlier. More information about the two End-fire approaches is provided in subsection S12 PRO and S15 PRO Directivity Control, in Application Examples.

By changing the attenuation frequency, "**Sub Dist:**" shows the needed distance between the front grilles of the subwoofers to establish the effect. Finally, when this mode is implemented, the **Active Preset Info** screen shows the letters "**EF**"

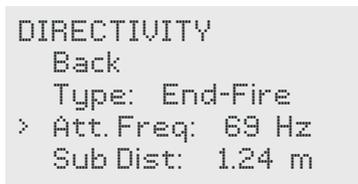


Figure 32. Example of an end-fire setup in the Directivity menu.

Find more about subwoofer arrays in the Application Examples section.

DSP SETTINGS > PHASE INVERSION

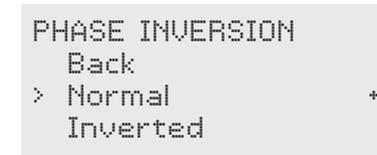


Figure 33. Phase Inversion menu.

The **Phase Inversion** submenu switches the phase of the signal. In other words, it allows to invert or "reverse" its polarity. Two settings are available:

- **Normal:** In phase setting.
- **Inverted:** The phase/polarity is inverted by introducing a 180° phase shift for all frequencies.

DSP SETTINGS > EQUALIZERS (EQ1 TO EQ5)

For system tuning purposes, 5 adjustable equalizers are available with the following parameters:

- **Bypass:** On (the EQ is bypassed) or Off (the EQ is active).
- **Type:** Low Shelf, Parametric or High Shelf.
- **Gain:** -12 to 12 dB, with 0.1 dB steps.
- **Freq:** 20 Hz to 1kHz, 1 Hz steps. Sets the center frequency for Parametric filters, or the edge frequency for Shelf filters.
- **Slope:** 0.5 to 2, with steps of 0.1. Only for Shelf filters.
- **Quality:** 0.01 to 16 with steps of 0.01, where higher Quality Factor values mean narrower bandwidth. Only for Parametric filters.

An example of a parametric equalizer with EQ1 in parametric mode is shown below.

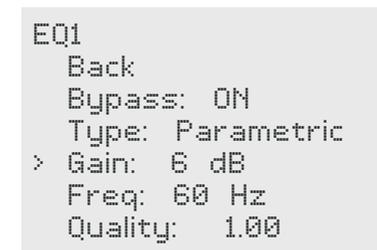


Figure 34. Equalizer menu.

To modify equalizer parameters, follow the same steps as explained in the **Highpass Filter** section. Notice that the equalizers can be individually bypassed - by default, all of them are set to bypass.

DSP SETTINGS > BYPASS USER EQ

In order compare the response of the subwoofer with and without the applied EQ, this section allows to bypass all user EQs with a single click.

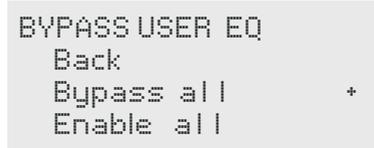


Figure 35. Bypass User EQ menu.

Remember that user EQs are bypassed by default and can be activated individually.

DSP SETTINGS > DELAY

The **Delay** section allows the user to apply a delay to the signal, visualize it in different units and determine the total delay. This screen has the following three sections:

- **User added delay:** This is the delay defined or added by the user depending on the specific needs of his application.
- **Preset delay:** Depending on the preset enabled or selected, the system may include an additional delay. This delay is added by the current preset and for some factory presets, it can be also edited.
- **Total DSP delay:** Total sum of "User", "Preset" and internal DSP latency. It is not an editable parameter and is only shown for information and reference.

The "**User**" and "**Preset**" delays can be defined in three different units, corresponding to the editable parameters in the first two delay sections:

- **Samples:** for 48 kHz sampling rate.
- **Time:** Delay in milliseconds (ms), referred to the 48 kHz sampling rate.
- **Distance:** Delay in meters (m), referred to $c = 343$ m/s.

When changing a parameter in any section, all the other parameters are updated with the corresponding value in their units.

```

DELAY
  Back
  User added delay:
> Bypass: OFF
  Samples: 0
  Time: 0.00 ms
  Distance: 0.00 m
  Preset delay:
  Bypass: OFF:
  Samples: 10
  Time: 0.21 ms
  Distance: 0.07 m
  Total DSP delay:
  Samples: 63
  Time: 1.31 ms
  Distance: 0.45 m
  
```

Figure 36. Delay menu.

The table below details the minimum "**User**" delay available for the three subwoofers. Depending on the preset, slightly higher delays can be defined.

Subwoofer	Minimum "User" delay available		
	Samples	Time [ms]	Distance [m]
S12 PRO	1285	26.8	9.2
S15 PRO	1250	26.0	8.9
M-F3A FS	1399	29.1	10.0

DSP SETTINGS > RESET USER PARAMS

The **Reset User Params** submenu allows to reset user DSP settings such as:

- High-pass filter
- Low-pass filter
- Equalizers
- Delay
- Phase Inversion
- Bypass user EQ

The Output Gain and the Preset selected are not affected by this function.



Figure 37. Reset user parameters menu.

By turning the controller the options "**Reset**" or "**Back**" will appear. By choosing the first one, the message "**Reset Done**" is shortly displayed on the screen. To return to the **DSP Settings**, choose "**Back**".

SYSTEM SETTINGS

The **System Settings** is the second submenu of the main **MENU**. It allows to set different parameters of the amplifier and access various system functions.

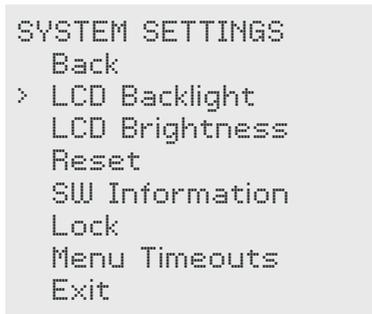


Figure 38. System Settings menu.

SYSTEM SETTINGS > LCD BACKLIGHT

The **LCD Backlight** submenu configures the LCD screen's backlight settings. There are two options:

- **Auto Off:** Will turn-off the backlight after 6 seconds by default. To set a different value:
 1. Set the cursor ">" on this option and click the encoder.
 2. Turn the controller to choose a value between 1 and 60 seconds. Pressing the button will set this value and return the screen to the **LCD Backlight** submenu.
- **Always On:** Sets the backlight to be always on.



Figure 39. LCD Backlight menu.

SYSTEM SETTINGS > LCD BRIGHTNESS

The **LCD Brightness** screen enables to set the brightness of the LCD screen. To set a value, follow the same procedure as described in the **LCD Backlight** submenu.



Figure 40. LCD Brightness menu.

SYSTEM SETTINGS > RESET

The **Reset** function clears the current selections and sets the factory-default ones for the following settings:

- LCD Backlight settings
- LCD Brightness
- Lock settings

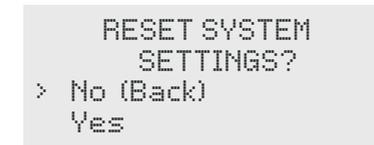


Figure 41. Reset menu.

SYSTEM SETTINGS > SW INFORMATION

This screen shows the most relevant information about the amplifier's firmware, which can be important not only for users but also for service technicians.

- **MCU:** Software version of the Micro Controller Unit.
- **FW:** Firmware version.
- **Model:** model of your SE AUDIOTECHNIK® product.

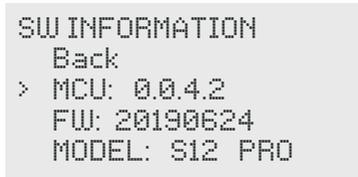


Figure 42. SW Information menu of the S12 PRO.

SYSTEM SETTINGS > LOCK

In the **Lock** menu, the user can set one of the following options for the screen locking function:

- **Automatic Lock:** This option will lock automatically the amplifier's screen after 10 seconds by default. To set a different value, between 2 and 60 seconds, follow the same procedure described for the LCD Backlight submenu.
- **Lock Now:** This option will lock the screen instantly. The selected settings for Automatic Lock or No Lock, are kept.
- **No Lock:** This is the option set by default. It will disable the automatic lock function and make the screen always accessible.

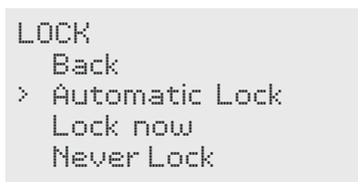


Figure 43. Screen Lock menu.

Remember that when the screen is locked, the "L" letter is shown in the top-right part of the **Overview** screen. To unlock the amplifier, press the controller for 3 seconds until the message "Screen Unlocked!" is shortly displayed on the screen. This message details the active preset as well.

SYSTEM SETTINGS > MENU TIMEOUTS

In the **Menu Timeouts**, the preferred behavior of the main **MENU** can be configured:

- **On, jumping out:** After five minutes of inactivity, the display returns to the **Overview** screen. In M-F3A PRO FS this time are 20 seconds.
- **Off, stay in menu:** the display stays in the current menu indefinitely. This option is selected by default.

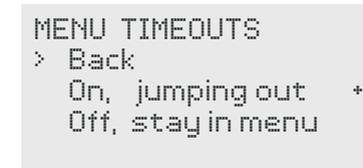


Figure 44. Menu Timeouts menu.

FACTORY PRESETS

The subwoofers always have to be operated with one of the factory presets from the **Preset Library**, which are the basis for the user presets. If the Preset Library on your product differs from the list shown below, please check your firmware version in the System Settings > SW Information menu and contact your dealer to update it.

S12 PRO

In June 2020 with the firmware **20200803**, the structure of the presets was improved. Before, there was only one preset to work with M-F3A PRO line arrays but in order to provide more flexibility, an additional preset for M-F3A PRO was added. The difference between both lays in the Low-pass filter of the crossover and thus, in the character of the sound in that range.

Basically, the new crossover improves the phase matching between the subwoofers and the top boxes, yielding a better addition at the cut-off frequency and a more flat response in this region. Conversely, the original preset presents a boost around 80 Hz, giving a more "punchy" sound in the low frequencies.

In addition to this change, the new versions of the S12 PRO firmware includes the Directivity menu, which offers wider possibilities to deploy subwoofer setups. Therefore, the presets for Cardioid and End-Fire setups were removed and the new bank of presets is as follows:

Product	Preset Name	Description
	MF3AP_O:Origin.	Default preset for systems comprising M-F3A PRO units. Original crossover for a "punchy" sound character.
	MF3AP_N:Neutral	Default preset for systems comprising M-F3A PRO units. New crossover offers improved phase match and a more flat response.
M-F3A	MF3A:Default	Default preset for systems comprising M-F3A units.
GENERAL	GENERAL	General preset for use with other products systems.

S15 PRO

The factory presets available for S15 PRO are:

Product	Preset Name	Description
M-F3A PRO	MF3AP	Default preset for systems comprising M-F3A PRO units.
M-F3A	MF3A	Default preset for systems comprising M-F3A units.
SMX 12A	SMX12	Default preset when using SMX 12A monitor as PA unit.
GENERAL	GENERAL	General preset for use with other products systems.

M-F3A FS

The list of available presets for the M-F3A FS subwoofer is shown below:

Product	Preset Name	Description
	MF3AP	Default preset for systems using M-F3A PRO units.
M-F3A PRO	MF3APO ¹	Preset for "Overlap" responses between the subwoofer and the M-F3A PRO units.
	MF3A	Default preset for systems using M-F3A units.
M-F3A	MF3AO ¹	Preset for "Overlap" responses between the subwoofer and the M-F3A units.
GENERAL	GENERAL	General preset for use with other products systems.

¹ Creates a boost in the Low-Mid range of the whole system, preferred for some applications.

APPLICATIONS

The M-Line consists of compact, active line array modules. The simple scalability of an M-Line system allows for a maximum range of applications – from the professional sound boost for large events with several thousand visitors to small indoors and outdoors celebrations. When your aim is to have a powerful, natural sound – but there is little space for your gear or the speakers need to be installed discretely, that's when the M-Line comes to the fore.

Below, some typical setups are detailed but, depending on your application, many different configurations can be implemented. Finally, it is recommended to always perform a dual-FFT measurements of the system once installed, to optimize its response in the given environment.

STAND-ALONE FLOWN SYSTEM WITH 5 UNITS

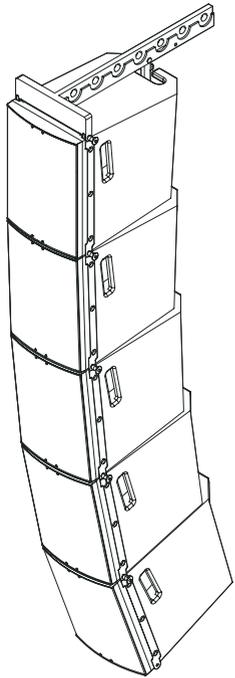


Figure 45. Stand-alone Flown System with 5 units.

Features

- Wide bandwidth from single array
- Mainly for speech reproduction
- Deployment of arrays of up to 16 units

Events

- Conference rooms
- Theaters
- Multipurpose halls
- Cafés and bars

Coverage ¹

- About 300 seated and 800 standing listeners
- Around 94 dBZ SPL at 40 meters (on-axis)
- 97 ±3 dBZ average SPL
- 110 Hz to 18 kHz (-6 dB)

Components ²

- 5x M-F3A PRO or M-F3A line array elements
- 1x M-F3A BF bumper frame

Adjustments

Set the "Line Elements" adjust switch for each M-F3A or M-F3A PRO speaker depending on the quantity you are using. For line arrays with more than 8 units, "8+" must be selected.

Deployment Limits

- For optimal acoustical results, up to 16 M-F3A or M-F3A PRO units should be used in a line array.
- Up to 2,700 kg can be hung with the M-F3A BF bumper frame.

⚠ Be sure not to exceed this weight limit when deploying line arrays with this product.

¹ EASE Focus estimation for a 6 meters wide stereo setup, in an audience area of 20 x 45 meters.

² For a single side of the stereo system.

POLE-MOUNTED SYSTEM

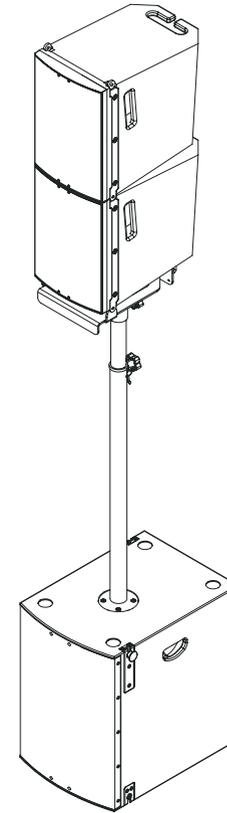


Figure 46. Pole Mount System

Features

- Full bandwidth with minimum components
- Very easy to transport and install
- Can be used also as stage monitor

Events

- Small venues
- Conference rooms
- Multipurpose halls
- Cafés and bars indoor and outdoor
- Small to medium sized clubs

Coverage ¹

- Up to 150 seated spectators
- 96 dBZ SPL at 25 meters (on-axis)
- 99 ±4 dBZ average SPL
- 40 Hz to 18 kHz (-6 dB)

Components ²

- 2x M-F3A PRO or M-F3A line array elements
- 1x S12 PRO or S15 PRO subwoofer
- 1x M-F3A UB U-Bracket
- 1x SPS20 or 3rd party pole mount with M20 thread

Adjustments

S12 PRO or S15 PRO Subwoofer:

Select M-F3A or M-F3A PRO default presets:

- MF3A for M-F3A
- MF3AP for M-F3A PRO

M-F3A PRO units:

Set the "Line Elements" adjust switch to 2 for each M-F3A or M-F3A PRO speaker, depending on the quantity you are using.

Deployment Limits

Up to two M-F3A PRO units can be stacked over the M-F3A UB U-bracket.

¹ EASE Focus estimation for a 4 meters wide stereo setup, in an audience area of 15 x 30 meters.

² For a single side of the stereo system.

GROUND STACK WITH LF CARDIOID PATTERN

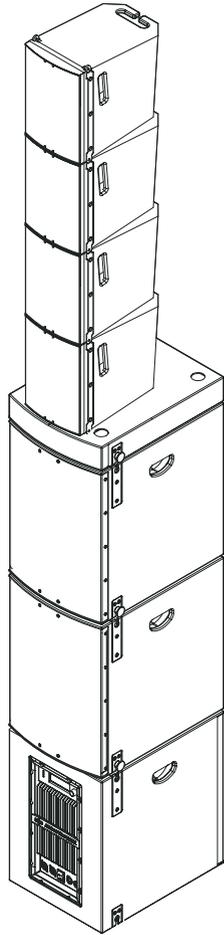


Figure 47. Ground Stack with LF Cardioid Pattern.

¹ EASE Focus estimation for a 10 meters wide stereo setup, in an audience area of 25 x 50 meters.

² For a single side of the stereo system.

Features

- Stand-alone solution that avoids flying components
- Allows to set radiation patterns for low frequencies
- Can also be used as stage monitors

Events

- Medium-sized concert venues
- Small outdoor festivals
- Clubs, cafés and bars
- Big stages and arenas as stage fill

Coverage ¹

- Up to 400 seated and 700 standing listeners
- 94 dBZ SPL at 45 meters (on-axis)
- 96 ± 3 dBZ average SPL
- 40 Hz to 18 kHz (-6 dB)

Components ²

- 3-4x M-F3A PRO or M-F3A line array elements
- 1-2x S12 PRO or 1x S15 PRO subwoofer facing front
- 1x S12 PRO or S15 PRO subwoofer facing rear
- 1x M-F3A S12 PRO SFi or M-F3A S15 PRO SFi stacking frame

Adjustments**S12 PRO or S15 PRO subwoofers:**

For subwoofers facing front, select default presets:

- MF3A for M-F3A
- MF3AP for M-F3A PRO

For subwoofer facing rear, select the cardioid preset:

- MF3AC for M-F3A
- MF3APC for M-F3A PRO

S15 PRO Subwoofers:

In the Directivity menu, select:

- "Normal" mode for subwoofers facing front
- "Cardioid" mode for subwoofers facing rear

M-F3A PRO units:

Set the "Line Elements" adjust switch to 3-4 for each M-F3A or M-F3A PRO speaker, depending on the quantity you are using.

Deployment Limits

- Up to 3 S12 PRO subwoofers can be stacked on top of each other.
- Up to 2 S15 PRO subwoofers can be stacked on top of each other.
- Up to 4 M-F3A PRO units can be stacked over the M-Line stacking frames.

⚠ Be sure not to exceed this mechanical limits when deploying stacks and line arrays with these products.

EXTENDED-BANDWIDTH FLOWN SYSTEM

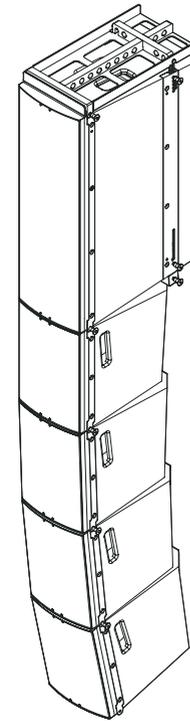


Figure 48. Extended Flown System.

Features

- Single flown system with increased bandwidth
- The M-F3A FS extends the low frequency range
- No subwoofers in front of the audience

Events

- Medium-sized concert venues
- Small outdoor festivals
- Clubs, cafés and bars

Coverage ¹

- About 300 seated and 800 standing people
- Around 94 dBZ SPL at 40 meters (on-axis)
- 98 ± 4 dBZ average SPL
- 53 Hz to 18 kHz (-6 dB)

Components ²

- 4x M-F3A PRO or M-F3A line array elements
- 1x M-F3A FS subwoofer
- 1x M-F3A BF bumper frame
- 1x M-F3A FA34 adapter

Adjustments**M-F3A FS Subwoofer:**

Select the default or "Overlap" preset for the M-F3A or M-F3A PRO system.

M-F3A PRO units:

Set the "Line Elements" adjust switch to 4 for each M-F3A or M-F3A PRO speaker, depending on the quantity you are using.

Deployment Limits

- For optimal acoustical results, when "Overlap" preset is used, a maximum of 4 M-F3A or M-F3A PRO units should be flown under M-F3A FS.
- Up to 2,700 kg can be hung with the M-F3A BF bumper frame and 1,000 kg with the M-F3A 34 adapter.

⚠ Be sure not to exceed these weights when combining both products in a single array.

¹ EASE Focus estimation for a 6 meters wide stereo setup, in an audience area of 20 x 45 meters.

² For a single side of the stereo system.

FULL-BANDWIDTH FLOWN SYSTEM WITH LF CAROID PATTERN

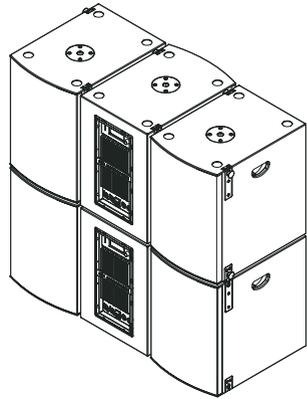
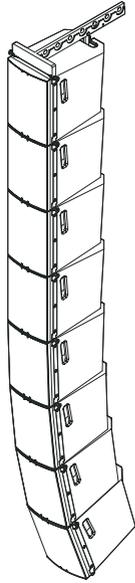


Figure 49. Full-bandwidth Flown System.

Features

- Two-way full-bandwidth system
- Long throw and wide coverage at high SPL levels
- Allows to set radiation patterns for low frequencies

Events

- Large theaters and venues
- Big concert halls and event centers
- Medium-sized outdoor concerts and festivals

Coverage ¹ (8 units, 6 subwoofers)

- About 600 seated and 1,000 standing spectators
- Around 97 dBZ SPL at 65 meters (on-axis)
- 100 ±5 dBZ average SPL
- 40 Hz to 18 kHz (-6 dB)

Components ²

- 8x M-F3A PRO or M-F3A line array elements
- 4x S12 PRO or S15 PRO subwoofers facing front
- 2x S12 PRO or S15 PRO subwoofers facing rear
- 1x M-F3A BF bumper frame

Adjustments

S12 PRO or S15 PRO subwoofers:

In the Directivity menu, select:

- "Normal" mode for subwoofers facing front
- "Cardioid" mode for subwoofers facing rear

M-F3A PRO units:

Set the "Line Elements" adjust switch to 8 for each of M-F3A or M-F3A PRO speakers, depending on the quantity you are using.

Deployment Limits

- Up to 3 S12 PRO subwoofers can be stacked on top of each other.
- Up to 2 S15 PRO subwoofers should be stacked on top of each other.
- Up to 2,700 kg can be hung with the M-F3A BF bumper frame.

⚠ Be sure not to exceed this mechanical limits when deploying stacks and line arrays with these products.

RATIOS OF UNITS

When combining M-Line subwoofers and line array units, it is possible to generate different spectrums according to the intended target curve and the application. Thus, it is important to match properly the levels of the subwoofers and the top units, depending on how many there are in the given setup.

Please remember - as shown in figure 50 - that the nominal levels are:

- S12 PRO, S15 PRO and M-F3A FS subwoofers: a maximum output gain of 0.0 dB, set with the rotary controller of the plate amplifier.
- M-F3A PRO units: set with the Level knob placed in the "-6 dB" position.
- M-F3A units: set with the Level knob at "MAX" position.

Based on this, you can adjust the level on the different units to the desired response.



Figure 50. Nominal levels in M-Line subwoofers (left), M-F3A PRO (center) and M-F3A (right).

The following graphs compare the SPL generated by a different number of units used. They can provide hints about the achievable levels and balance of low and high frequencies in a given system. The curves show the levels for the same "Number of units" of the products named in the title of the graph.

Keep in mind that these curves were derived from measurements performed under controlled conditions. In real applications, the behavior of the system can be heavily modified by external factors such as ground reflections, air attenuation and, in large line arrays, an increased baffle effect between units. These last two affect mostly the high frequencies, which may flatten the range compared to the spectra shown below.

Finally, notice also the effect of the "LINE UNITS" adjustment in the response of the M-F3A PRO arrays. As explained, this feature introduces fundamental high-frequency compensation.

¹ EASE Focus estimation for a 12 meters wide stereo setup, in an audience area of 35 x 70 meters.

² For a single side of the stereo system.

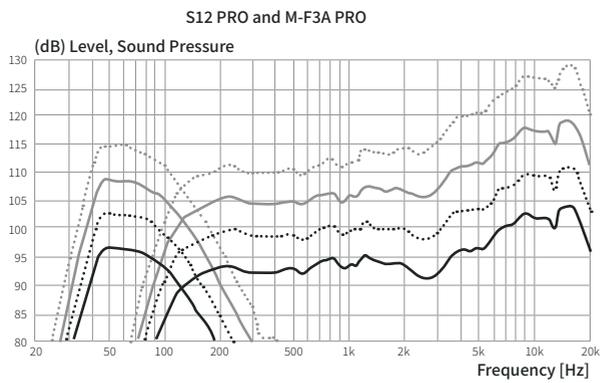


Figure 51. SPL generated by different combinations of S12 PRO subwoofers and M-F3A PRO units.

Number of units	SPL Increase
8	18 dB
4	12 dB
2	6 dB
1	0 dB

S12 PRO Preset: MF3AP
 M-F3A "High Shelf" knob: set to +6 dB

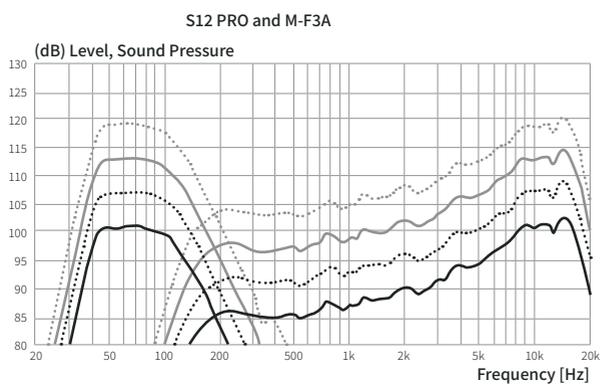


Figure 52. SPL generated by different combinations of S12 PRO subwoofers and M-F3A units.

Number of units	SPL Increase
8	18 dB
4	12 dB
2	6 dB
1	0 dB

S12 PRO Presets: MF3A
 M-F3A "High Shelf" knob: set to +6 dB.

The spectra of different systems comprising S12 PRO and M-F3A PRO are compared below. Notice that these include a Pole-mounted System, Ground Stack and Full-bandwidth Flown System application examples.

Application Examples - M-F3A PRO

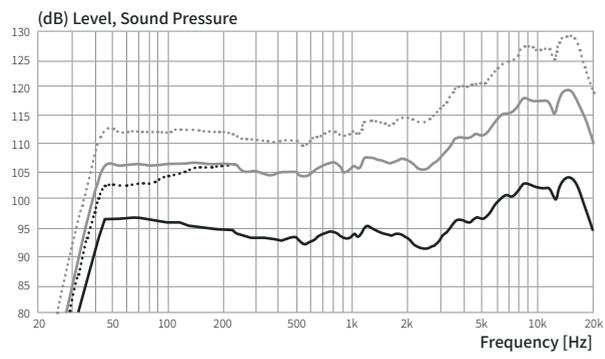


Figure 53. Spectra of different setups composed by S12 PRO subwoofers and M-F3A PRO units.

S12 PRO	M-F3A PRO
6	8
3	4
2	4
1	1

S12 PRO Presets: MF3AP
 M-F3A PRO "Line Units" knob: set for each case to match the number of units.



Adding more units to a system allows to achieve a higher SPL and more important, increases the available headroom for that range. Thus, higher levels can be obtained without the risk of clipping. Under standard conditions, this will extend the products life and integrity.

The main side-effect of having more units with different proportions is the shift of the crossover frequency, as can be seen in figures 51 and 52. This may create undesired additions or cancellations around this frequency, due to different phase relations between the subwoofers and the top units. Learn more about this below.



In addition to the level set individually on the units of the system, a Low-Shelf filter can be used to boost or cut the lowest frequencies, and fine-tune the balance between the low and high ranges.

This filter should not be applied only to the subwoofers with their DSP. The correct practice is to do it over the whole signal from the mixer or any external processor before the amplifiers. With a gain between ±6 dB and centered at the crossover frequency, the filter will also help to prevent the shift in the cut-off frequency when different ratios of units are used, as described before.

S12 PRO AND S15 PRO DIRECTIVITY CONTROL

The wavelength for the frequencies reproduced by any subwoofer in general, are usually much larger than its physical dimensions. Due to this, most subwoofers have no control over directivity and their radiation pattern in the pass-band is omnidirectional.

Different subwoofer setups have been proposed to introduce directivity in a given intended direction, thus controlling or shaping the radiation of the sound in the low frequencies also known as gradient subwoofer setups. Some of their main benefits are:

1. Reduced low frequency SPL behind the subwoofers and thus, reduced overall SPL on the stage. This helps to reduce LF bleed in the microphones and may improve the comfort, monitoring and performance for the musicians.
2. Reduced reflections indoors as the majority of the sound is directed towards the audience, and less towards the walls.
3. Reduced energy spill outside of the venue area towards the households and living areas around.

The Directivity function in the S12 PRO and S15 PRO subwoofers, allows and eases the creation of two of the most successful gradient types: the "Cardioid" and the "End-Fire". For more information about this function, see subsection DSP Settings.

CARDIOID SETUP

A classic cardioid radiation setup for S12 PRO and S15 PRO is achieved by combining three subwoofers in a ratio of **2:1**. This means two subwoofers facing front or towards the audience, and one subwoofer facing rear or towards the stage. Figure 54 shows possible arrangements for these arrays.

Cardioid setups offer higher cancellation in the rear side of the subwoofer array. The amount of rejection varies with frequency, and depends strongly on the chosen arrangement and the acoustic environment. In half-space conditions such as outdoors, a rear-rejection of 15 to 25 dB can be achieved. Also, the stacked arrangement has proven to be the most effective.



Compared to a single subwoofer usage, the response of a cardioid arrangement exhibits an increase in the level of the highest frequencies of the subwoofer's range. In order to retrieve a flat spectrum, a parametric EQ around 85 Hz with a Q3 and gain of at least -3 dB should be used equally on all the subwoofers of the array.



Due to the size of the subwoofers, the cardioid setup reduces the energy by around 1.5 dB in the range between 45-55 Hz. Since this is an acoustic cancellation, it is pointless and not recommended to try to equalize it.

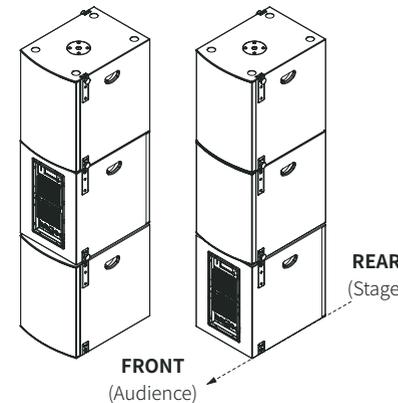
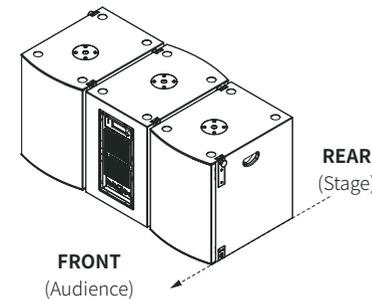


Figure 54. Some configurations for Cardioid setups.

All the additional processing like level, delay and EQ, should be done identically to all subwoofers within the cardioid configuration, in order to maintain proper phase relations for cardioid operation.

Features

- In-Line subwoofer array for directivity control
- Cardioid radiation of low frequencies
- Lower SPL on the stage, higher comfort for musicians

Components

- 2x S12 PRO or S15 PRO subwoofers facing front
- 1x S12 PRO or S15 PRO subwoofer facing rear

Adjustments for S12 PRO or S15 PRO subwoofers

For subwoofers facing front, select "Normal" mode in the Directivity menu.

For the subwoofer facing rear, select the "Cardioid" mode.

Deployment Limits

- Up to three S12 PRO subwoofers can be stacked on top of each other.
- Up to two S15 PRO subwoofers should be stacked on top of each other.



Be sure not to exceed this mechanical limits when deploying stacks and line arrays with these products.

END-FIRE SETUPS

In End-Fire setups, two or more subwoofers are placed behind each other with a specific distance to introduce a delay between them. This delay defines the center frequency of the cancellation and in most cases, part of this delay is applied electronically. This is mainly to reduce the space required to place the subwoofers.

Depending on the subwoofer delayed, two types of End-fire setups can be distinguished:

- End-Fire: in the most common approach, the front subwoofer is delayed. This approach creates rear-sound cancellation in a narrow range around the center frequency. However, its main advantage is the higher SPL level achieved in the front.
- Alternative End-Fire: also referred to as "Inverted End-Fire" or simply "Gradient setup", applies the delay to the rear subwoofer and in addition, reverses its polarity. Contrary to the other approach, the range of the cancellation is almost one octave wide. This, for some the applications, can yield better results.



Firmware previous than version **20200803** include presets for end-fire setups under the "Alternative" approach. These define a fixed distance of 1.25 meters between the front grilles of the subwoofers, which gives the highest gain-reduction efficiency around 69 Hz, over the main operating band of the subwoofer.



When deploying End-Fire setups, keep in mind the position of the line array relative to the delayed subwoofer: depending on the case and the type of end-fire, an additional delay must be applied to the top units to achieve the correct time alignment.

The directivity function in S12 PRO and S15 PRO subwoofers allows to tune end-fire setups under both approaches, at the frequency of choice, from 40 Hz to 100 Hz. As explained in the *DSP Settings* subsection, selecting the desired frequency displays the distance required between grilles.

Same as for Cardioid setups, the levels, delays and EQ of the subwoofers in the array must be set identically. This guarantees the intended control of the radiation of the system.

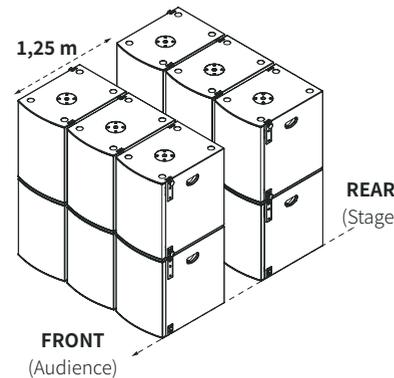
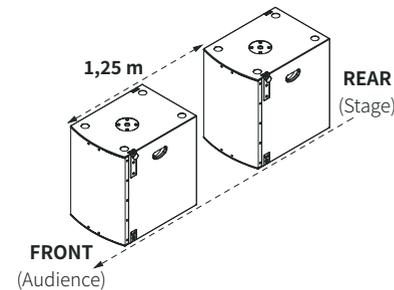


Figure 55. S12 PRO end-fire subwoofer setups.
Notice the distance is taken from grille to grille.

Features

- End-Fire subwoofer array for directivity control
- Cardioid radiation of low frequencies
- Lower SPL on the stage, higher comfort for musicians

Components

- 1x S12 PRO or S15 PRO subwoofer
- 1x S12 PRO or S15 PRO subwoofer placed behind the one facing front

Adjustments for S12 PRO and S15 PRO subwoofers

For the subwoofer placed front, enable "End-Fire" mode in the Directivity menu by selecting the desired attenuation frequency. Below in the screen, observe the distance calculated for that frequency. This distance must match the real separation of the subwoofers, from grille to grille.

For the subwoofer placed rear, select the "Normal" preset in the Directivity menu.

Deployment Limits

- Up to three S12 PRO subwoofers can be stacked on top of each other.
- Up to two S15 PRO subwoofers should be stacked on top of each other.



Be sure not to exceed this mechanical limits when deploying stacks and line arrays with these.

USING S12 PRO SUBWOOFERS WITH AND WITHOUT DIRECTIVITY FUNCTION

As explained in subsection *Factory Presets*, the Directivity function was implemented in S12 PRO subwoofers from firmware 20200803. Since previous versions allowed to create subwoofer setups through specific presets, both can be used together under some conditions.

To create Cardioid setups with S12 PRO subwoofers with different firmware:

1. Load the normal preset of the product in use for all the subwoofers facing forward.
In the Directivity menu of the subwoofers with new firmware, select the "Normal" mode.
2. For subwoofers facing rear: for those with new firmware, select the "Cardioid" mode in the Directivity menu. For previous versions, select the cardioid preset corresponding to the product in use.

Regarding End-fire setups, the factory presets included in previous firmware set a distance between subwoofers of 1.25 meters and thus, no other configuration can be done with them.

Hence, when using also S12 PRO subwoofers with Directivity function, these must be configured to work as those without. This means, the center frequency must be 69 Hz, for a distance between grilles of 1.25 meters.

SPECIFICATIONS

TECHNICAL SPECIFICATIONS

PARAMETER	M-F3A PRO	M-F3A S12 PRO	M-F3A S15 PRO	M-F3A FS
ELECTRO-ACOUSTICAL				
Frequency range (-3 dB) ¹	140 Hz - 20 kHz	42 Hz - 99 Hz	39 Hz - 108 kHz	60 Hz - 103 kHz
Frequency range (-10 dB) ¹	100 Hz - 20 kHz	36 Hz - 145 Hz	33 Hz - 145 kHz	52 Hz - 143 kHz
Coverage (-6 dB) [H x V]	120° x 16°	Omnidirectional	Omnidirectional	Omnidirectional
Maximum Peak SPL ²	129 dB	132 dB	136 dB	127 dB
System type	2-way active system	1-way active system	1-way active system	1-way active system
Crossover frequency	1.9 kHz	-	-	-
Transducers	MF: 8 x 2.8" drivers, HF: 7 x 1" dome tweeters	1 x 12" driver	1 x 15" driver	2 x 6" by 9" drivers
Enclosure type	Vented box	Vented box	Vented box	Vented box
AMPLIFICATION				
Type	2 channel, class-D with SMPS	Single channel, class-D with SMPS	Single channel, class-D with SMPS	Single channel, class-D with SMPS
Total power ³	600 W	800 W	800 W	800 W
Output power per channel:	MF: 300 W, HF: 300 W			
Protection	Short circuit, overheating, overcurrent			
Connectors	Input signal: balanced XLR 3-pin female Link output: balanced XLR 3-pin male Power input: powerCON® 20A Power link output: powerCON® 20A	Input signal: balanced XLR 3-pin female Link output: balanced XLR 3-pin male Power input: powerCON® 20A Power link output: powerCON® 20A	Input signal: balanced XLR 3-pin female Link output: balanced XLR 3-pin male Power input: powerCON® 20A Power link output: powerCON® 20A	Input signal: balanced XLR 3-pin female Link output: balanced XLR 3-pin male Power input: powerCON® 20A Power link output: powerCON® 20A
Wiring	Pin 1: Ground, Pin 2: Positive, Pin 3: Negative	Pin 1: Ground, Pin 2: Positive, Pin 3: Negative	Pin 1: Ground, Pin 2: Positive, Pin 3: Negative	Pin 1: Ground, Pin 2: Positive, Pin 3: Negative
Input sensitivity	0 dBu	0 dBu	0 dBu	0 dBu
DSP	48 kHz/24 bit with extended dynamics Processing latency: 1.1 ms	48 kHz/24 bit with extended dynamics Processing latency: 1.1 ms	48 kHz/24 bit with extended dynamics Processing latency: 1.1 ms	48 kHz/24-bit with extended dynamics, Processing latency: 1.1 ms
Processing	Level, factory EQ presets	Factory and user presets, directivity control, EQ, delay, phase inversion	Factory and user presets, directivity control, EQ, delay, phase inversion	Factory and user presets, EQ, delay, phase inversion
User controls	Power: ON/OFF switch, Level: 8-position rotary knob (-50, -20, -10, -6, -3, -2, -1, 0) Line units: 8-position rotary knob (1 - 8+)	Power: ON/OFF switch DSP: display with digital encoder	Power: ON/OFF switch DSP: display with digital encoder	Power: ON/OFF switch DSP: display with digital encoder
MECHANICAL				
Product dimensions [H x W x D] (Including rigging)	317 x 265 x 359 mm	507 x 385 x 495 mm	586 x 460 x 520 mm	651 x 265 x 430 mm
Net weight	8.3 kg	23 kg	32 kg	23 kg
Packaging dimensions [H x W x D]	388 x 290 x 440 mm	598 x 435 x 575 mm	673 x 510 x 600 mm	743 x 310 x 530 mm
Total weight	9.5 kg	24.8 kg	34.9 kg	25 kg
Cabinet	12 mm plywood	15 mm plywood	15 mm plywood	15 mm plywood
Cabinet finishing	Black or white polyurea coating			
Grille	Powder coated perforated steel			
Hardware	Rear handle in 12 mm plywood, plus side grips, embedded in cabinet	Two side handles embedded in cabinet, 4 rubber feet and top slots for stacking, M20 pole thread	Two side handles embedded in cabinet, 4 rubber feet and top slots for stacking, M20 pole thread	Top handle embedded in cabinet
Rigging	Three-point rigging system, 3 x SE AUDIOTECHNIK® 6 mm locking pins	Two-point SE AUDIOTECHNIK® stacking system	Two-point SE AUDIOTECHNIK® stacking system	Four-point rigging system, 4 x SE AUDIOTECHNIK® 6 mm locking pins
Splay angles	0°, 1°, 2°, 3°, 4°, 6°, 8°	-	-	0°, 1°, 2°, 3°, 4°, 5°, 6°, 7°, 8°
ACCESSORIES				
Bumper frame	M-F3A BF	-	-	M-F3A BF FS
U-bracket	M-F3A UB	-	-	-
Pole bar	SPS20	SPS20	SPS20	-
Stacking frame for M-F3A PRO	-	M-F3A SFI S12	M-F3A SFI S15	-
4 to 3 point adapter	-	-	-	M-F3A FA34
Transport kart	M-F3A PRO TK 44	M-F3A S12 PRO TK 32	-	-
Flight case	M-F3A FC	M-F3A S12 PRO FC	M-F3A S15 PRO FC	-
Amplifier rain cover	-	P801DL RC	P801DL RC	P801DL RC
Line rain cover	M-F3A PRO FRC 8/12/16	-	-	-

¹ Measured for S12 PRO, S15 PRO and M-F3A FS with MF3AP preset.

² Measured with 12 dB Crest factor Pink Noise: M-F3A PRO, M-F3A FS, whole space. S12 PRO, S15 PRO, half space.

³ Total power value is the sum of all individual channel output power.

MECHANICAL DRAWINGS

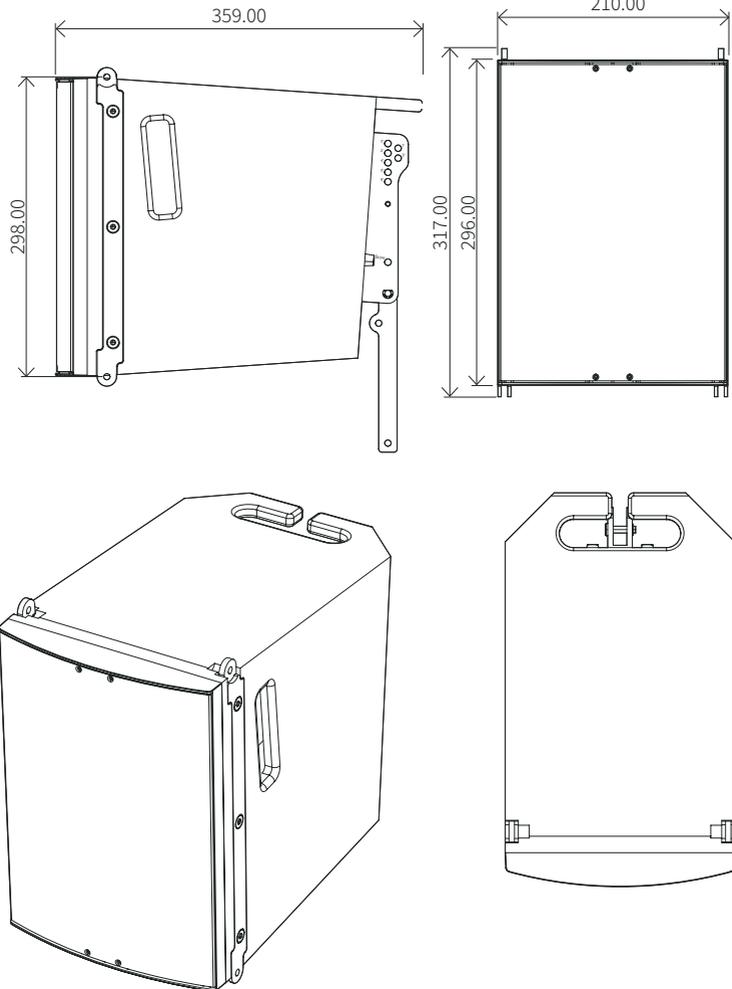


Figure 56. M-F3A PRO views and dimensions. Annotations given in millimeters

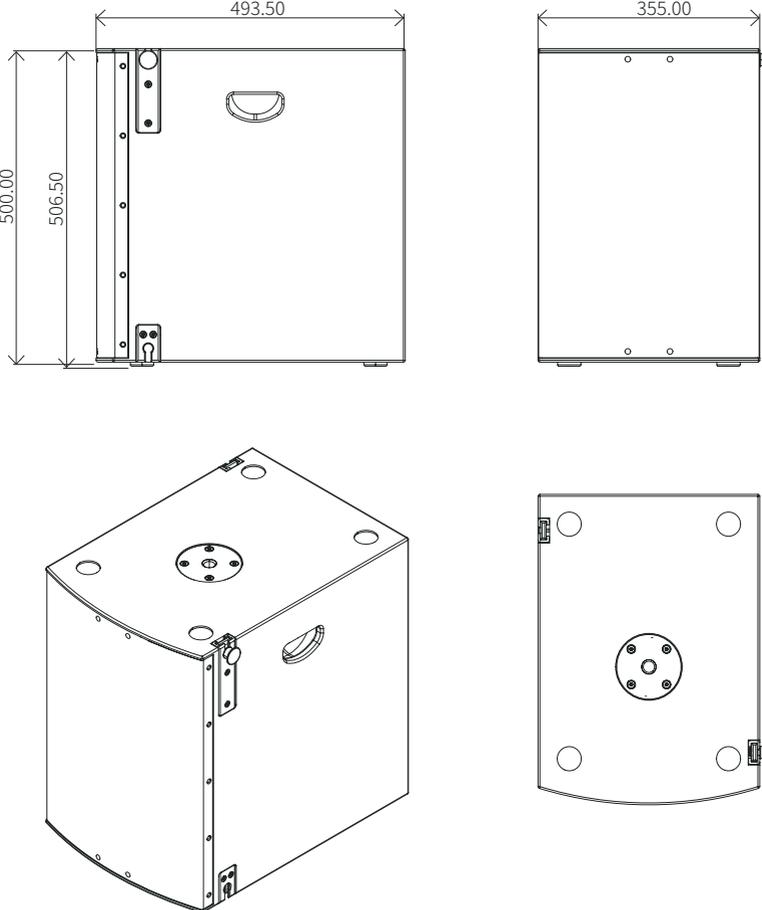


Figure 57. S12 PRO views and dimensions. Annotations given in millimeters.

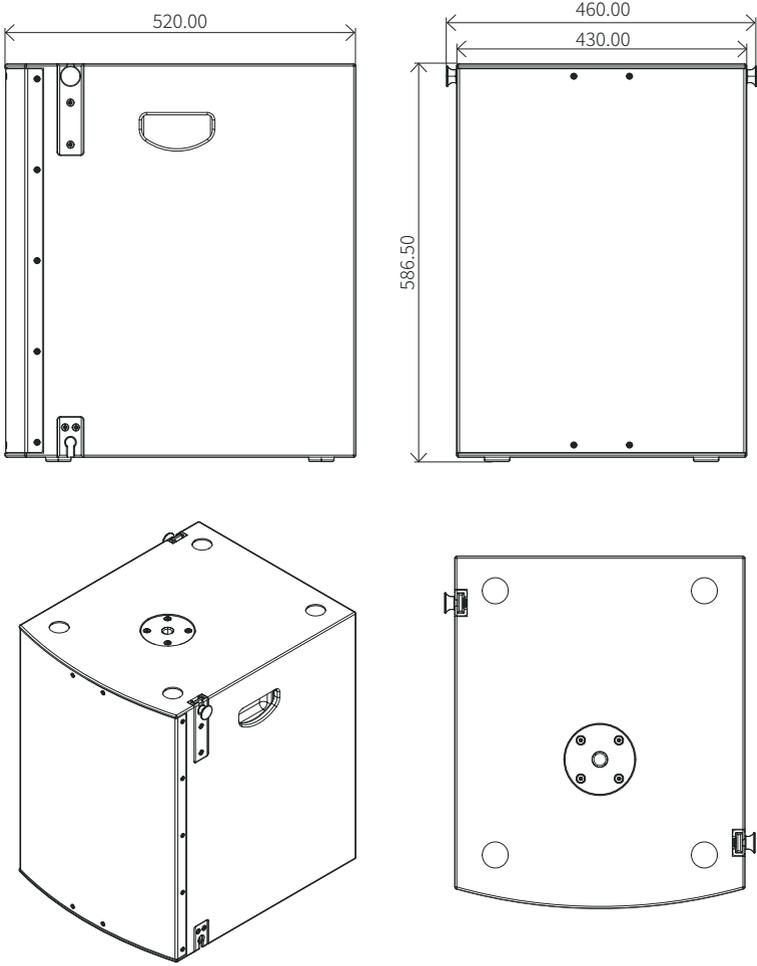


Figure 58. S15 PRO views and dimensions. Annotations given in millimeters.

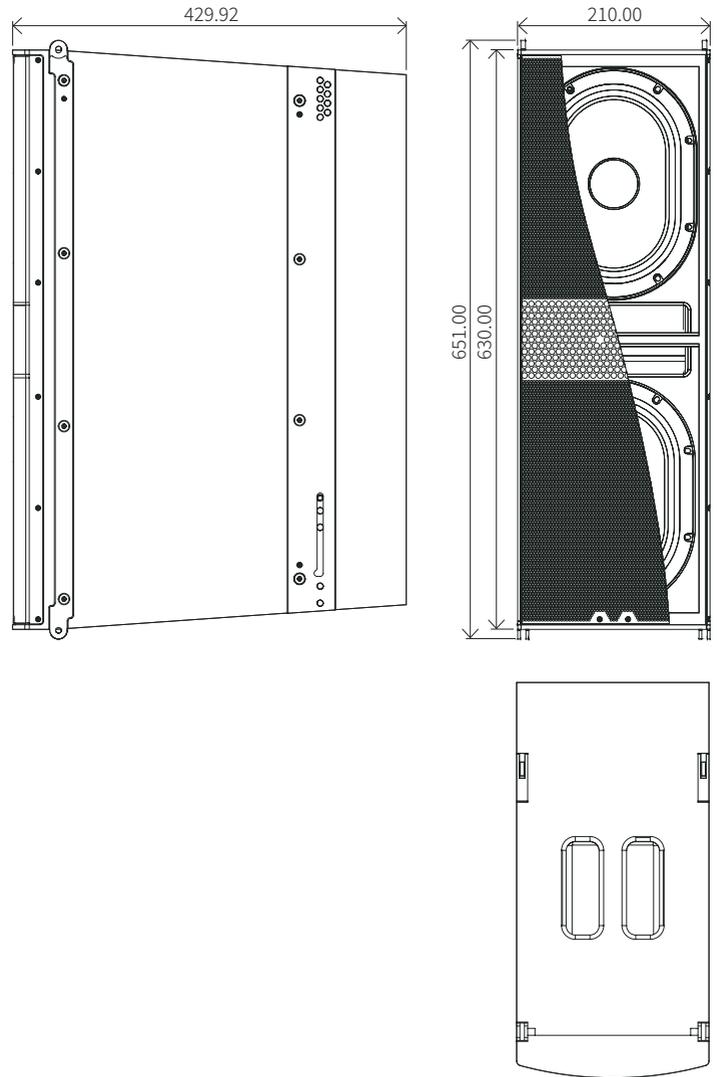


Figure 59. M-F3A FS views and dimensions. Annotations given in millimeters.

MANUFACTURER'S DECLARATIONS

LIMITED WARRANTY

This limited warranty applies to SE AUDIOTECHNIK® branded products.

The statutory warranty rights towards the seller are not affected by this guarantee. In fact, it justifies additional independent warranty claims towards SE AUDIOTECHNIK®.

SE AUDIOTECHNIK® warrants that the SE AUDIOTECHNIK® product purchased from SE AUDIOTECHNIK® or from an SE AUDIOTECHNIK® authorized reseller, is free from defects in materials or workmanship under normal use, for a period of three years from the date of purchase.

The limited warranty period starts on the date of purchase. To receive warranty services, proof of the purchase must be provided. The dated sales or delivery receipt, stating the date of purchase, is the proof of purchase. Should products of the brands named above be in need of repair within the limited warranty period, you are entitled to warranty services according to the terms and conditions stated in this document.

This limited warranty extends only to the original purchaser of this SE AUDIOTECHNIK® branded product and is not transferable to anyone who obtains ownership of the SE AUDIOTECHNIK® product from the original purchaser. During the limited warranty period, SE AUDIOTECHNIK® will repair or replace the defective component parts or the product. All component parts or hardware products removed under this limited warranty become the property of SE AUDIOTECHNIK®.

In the unlikely event that the SE AUDIOTECHNIK® product has a recurring failure, SE AUDIOTECHNIK®, at its discretion, may elect to provide a replacement unit of SE AUDIOTECHNIK® choice that is at least equivalent to your SE AUDIOTECHNIK® branded product in hardware performance.

SE AUDIOTECHNIK® does not warrant that the operation of this product will be uninterrupted or error-free. SE AUDIOTECHNIK® is not responsible for damage that occurs as a result of your failure to follow the instructions included with the SE AUDIOTECHNIK® branded product.

This limited warranty does not apply:

- to wear parts
- to any product from which the serial number has been removed or that has been damaged or rendered defective as the result of an accident
- in case of misuse, abuse, or other external causes
- by operation outside the usage parameters stated in the user's documentation
- by use of spare parts not manufactured or sold by SE AUDIOTECHNIK®
- by modification or service by anyone other than SE AUDIOTECHNIK®

These terms and conditions constitute the complete and exclusive warranty agreement between the purchaser and SE AUDIOTECHNIK® regarding the SE AUDIOTECHNIK® branded product purchased.

LIMITATION OF LIABILITY

If the SE AUDIOTECHNIK® branded hardware product fails to work as warranted above, the sole and exclusive remedy shall be repair or replacement. SE AUDIOTECHNIK®'s maximum liability under this limited warranty is explicitly limited to the lesser of the price it has been paid for the product, or the cost of repair or replacement of any hardware components that malfunction in conditions of normal use.

SE AUDIOTECHNIK® is not liable for any damages caused by the product or the failure of the product, including any lost profits or savings or special, incidental or consequential damages. SE AUDIOTECHNIK® is not liable for any claim made by a third party or made by the purchaser for a third party.

This limitation of liability applies whether damages are sought, or claims are made, under this limited warranty or as a tort claim (including negligence and strict product liability), a contract claim, or any other claim. This limitation of liability cannot be waived or amended by any

person. This limitation of liability will be effective even if the purchaser has advised SE AUDIOTECHNIK®, or an authorized representative of SE AUDIOTECHNIK®, of the possibility of any such damages. This limitation of liability however, will not apply to claims for personal injury.

This limited warranty gives the purchaser specific legal rights. There may also be other rights that may vary from state to state or from country to country. The purchaser is advised to consult applicable state or country laws for a full determination of his rights.

REQUESTING WARRANTY SERVICE

To request warranty service for the product, the purchaser must contact SE AUDIOTECHNIK®, or the SE AUDIOTECHNIK® authorized reseller from which the product was purchased.

EC DECLARATION OF CONFORMITY

This device meet the essential requirements and further relevant specifications of the Directives of the European Union. The detailed declaration, and the list of these Directives and the Harmonized Standards, is available in our website www.se-audiotechnik.de.

CORRECT DISPOSAL OF THIS PRODUCT (ELECTRICAL WASTE)

(Applicable in the European Union and other European countries with separate collection systems)

This marking, shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of waste and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details on where and how they can recycle this item in an environmentally friendly manner.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other wastes for disposal.

WEEE-DECLARATION

This SE AUDIOTECHNIK® product was developed and manufactured with high quality materials and components which can be recycled and/or reused. This symbol indicates that electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose this product by bringing it to your local collection point or recycling centre for such equipment. This will help to protect the environment in which we all live.

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Designed in Germany

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