

MM-4XP Miniature Self-Powered Loudspeaker



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MM-4XP Operating Instructions, PN 05.163.005.01 B

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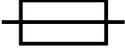
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## IMPORTANT SAFETY INSTRUCTIONS

These symbols indicate important safety or operating features in this booklet and on the frame or chassis:

### SYMBOLS USED

					
<b>Dangerous voltages: risk of electric shock</b>	<b>Important operating instructions</b>	<b>Replaceable Fuse</b>	<b>Protective earth ground</b>	<b>Hot surface: do not touch</b>	<b>Electronic instructions for use: instruction location in QR code</b> 
<b>Gefährliche Spannungen: Stromschlaggefahr</b>	<b>Hinweis auf wichtige Punkte der Betriebsanleitung</b>	<b>Austauschbare Sicherung</b>	<b>Schutzerde</b>	<b>Heiße Oberfläche: nicht berühren</b>	<b>Elektronische Gebrauchsanweisung: anweisungsort im QR-Code</b>
<b>Pour indiquer les risques résultant de tensions dangereuses</b>	<b>Instructions d'utilisation importantes</b>	<b>Fusible remplaçable</b>	<b>Terre de protection</b>	<b>Surface chaude: ne pas toucher</b>	<b>Mode d'emploi électronique: emplacement des instructions dans le code QR</b>
<b>Para indicar voltajes peligrosos</b>	<b>Instrucciones importantes de funcionamiento y/o Mantenimiento</b>	<b>Fusible reemplazable</b>	<b>Toma de tierra de protección</b>	<b>Superficie caliente: no tocar</b>	<b>Instrucciones de uso electrónicas: ubicación de instrucciones en el código QR</b>

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with Meyer Sound's installation instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus 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. The AC mains plug or appliance coupler shall remain readily accessible for operation.
11. Only use attachments/accessories specified by Meyer Sound.
12. Use only with the caster rails or rigging specified by Meyer Sound, or sold with the apparatus. Handles are for carrying only.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. If equipped with an external fuse holder, the replaceable fuse is the only user-serviceable item. When replacing the fuse, only use the same type and the same value.
15. Refer all other servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or

plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; rain or moisture has entered the apparatus; the apparatus has been dropped; or when for undetermined reasons the apparatus does not operate normally.



**WARNING:** For Meyer Sound IntelligentDC Power Supply models MPS-488HP and MPS-482HP, the external wiring connected to the output terminals of the units require installation by an Instructed person or the use of ready-made leads or cords.



**WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.



**WARNING:** Class I apparatus shall be connected to a mains socket outlet with a protective earthing connection.



**CAUTION:** Disconnect the mains plug before disconnecting the power cord from the loudspeaker.

## English

- To reduce the risk of electric shock, disconnect the apparatus from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections.
- Connect the apparatus to a two-pole, three-wire grounding mains receptacle. The receptacle must be connected to a fuse or circuit breaker. Connection to any other type of receptacle poses a shock hazard and may violate local electrical codes.
- Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.
- Do not allow water or any foreign object to get inside the apparatus. Do not put objects containing liquid on or near the unit.
- To reduce the risk of overheating the apparatus, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove.
- If equipped with an external fuse holder, the replaceable fuse is the only item that can be serviced by the user. When replacing the fuse, only use the same type and value.
- This apparatus contains potentially hazardous voltages. Do not attempt to disassemble the unit. The only user-serviceable part is the fuse. All other repairs should be performed only by factory-trained service personnel.

## Deutsch

- Zur Minimierung der Gefahr eines elektrischen Schlages trennen Sie das Produkt vor dem Anschluss von Audio-und/oder Steuerleitungen vom Stromnetz. Das Netzkabel darf erst nach Herstellung aller Signalverbindungen wieder eingesteckt werden.
- Das Produkt an eine vorschriftsgemäss installierte dreipolige Netzsteckdose (Phase, Neutralleiter, Schutzleiter) anschließen. Die Steckdose muss vorschriftsgemäß mit einer Sicherung oder einem Leitungsschutzschalter abgesichert sein. Das Anschließen des Produkts an eine anders ausgeführte Stromversorgung kann gegen Vorschriften verstossen und zu Stromunfällen führen.
- Das Produkt nicht an einem Ort aufstellen, an dem es direkter Wassereinwirkung oder übermäßig hoher Luftfeuchtigkeit ausgesetzt werden könnte, solange es sich nicht um ein Produkt handelt, das mit der Meyer Sound Weather Protection Option ausgestattet ist.
- Vermeiden Sie das Eindringen von Wasser oder Fremdkörpern in das Innere des Produkts. Stellen Sie keine Objekte, die Flüssigkeit enthalten, auf oder neben dem Produkt ab.
- Um ein Überhitzen des Produkts zu verhindern, halten Sie das Gerät von direkter Sonneneinstrahlung fern und stellen Sie es nicht in der Nähe von wärmeabstrahlenden Geräten (z.B. Heizgerät oder Herd) auf.
- Bei Ausstattung mit einem externen Sicherungshalter ist die austauschbare Sicherung das einzige Gerät, das vom Benutzer gewartet werden kann. Verwenden Sie beim Austausch der Sicherung nur den gleichen Typ und Wert.
- Dieses Gerät enthält möglicherweise gefährliche Spannungen. Versuchen Sie nicht, das Gerät zu zerlegen. Der einzige vom Benutzer zu wartende Teil ist die Sicherung. Alle anderen Reparaturen dürfen nur von im Werk geschultem Servicepersonal ausgeführt werden.

## Français

- Pour éviter tout risque d'électrocution, débranchez l'enceinte de la prise secteur avant de mettre en place le câble audio. Ne rebranchez le cordon secteur qu'après avoir procédé à toutes les connexions de signal audio.
- Brancher l'appareil sur une prise secteur à trois fils et deux pôles avec mise à la terre. La prise doit être reliée à un fusible ou à un disjoncteur. Le branchement à tout autre type de prise présente un risque de choc électrique et peut enfreindre les codes locaux de l'électricité.
- N'installez pas l'enceinte dans des endroits humides ou en présence d'eau sans utiliser d'équipements de protection adéquats fournis par Meyer Sound.

- Ne laissez pas d'eau ou d'objet étranger, quel qu'il soit, pénétrer à l'intérieur de l'enceinte. Ne posez pas d'objet contenant du liquide sur ou à proximité de l'enceinte.
- Pour réduire les risques de surchauffe, évitez d'exposer directement l'enceinte aux rayons du soleil. Ne l'installez pas à proximité de sources de chaleur, radiateur ou four par exemple.
- S'il est équipé d'un porte-fusible externe, le fusible remplaçable est le seul élément qui peut être réparé par l'utilisateur. Lors du remplacement du fusible, n'utilisez que le même type et la même valeur.
- Cet appareil contient des tensions potentiellement dangereuses. N'essayez pas de démonter l'appareil. Le fusible est la seule pièce réparable par l'utilisateur. Toutes les autres réparations doivent être effectuées uniquement par du personnel de maintenance formé en usine.

## Español

- Para reducir el riesgo de descarga eléctrica, desconecte el aparato de la red eléctrica antes de instalar el cable de audio. Vuelva a conectar el cable de alimentación sólo después de realizar todas las conexiones de señal.
- Conecte el aparato a una toma de corriente de tres hilos y dos polos con conexión a tierra. El receptáculo debe estar conectado a un fusible o disyuntor. La conexión a cualquier otro tipo de receptáculo representa un riesgo de descarga eléctrica y puede violar los códigos eléctricos locales.
- No instale el aparato en lugares húmedos o mojados sin usar el equipo de protección contra intemperie de Meyer Sound.
- No permita que penetre agua u otros objetos extraños en el interior del aparato. No coloque objetos que contengan líquido sobre o cerca de la unidad.
- Para reducir el riesgo de sobrecalentamiento del aparato, evite exponerlo a la luz solar directa. No instale la unidad cerca de aparatos que emitan calor, como un calefactor o una estufa.
- Si está equipado con un portafusibles externo, el fusible reemplazable es el único elemento que puede ser reparado por el usuario. Cuando reemplace el fusible, use solamente el mismo tipo y valor.
- Este aparato contiene voltajes potencialmente peligrosos. No intente desmontar la unidad. La única pieza que el usuario puede reparar es el fusible. Todas las demás reparaciones deben ser realizadas únicamente por personal de servicio capacitado de fábrica.



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## INTRODUCTION

### HOW TO USE THIS MANUAL

Please read these instructions in their entirety before configuring a Meyer Sound product or system. In particular, pay close attention to material related to safety issues.

As you read these instructions, you will encounter the following icons for notes, tips, and cautions:



**NOTE:** A note identifies an important or useful piece of information relating to the topic under discussion.



**TIP:** A tip offers a helpful tip relevant to the topic at hand.



**CAUTION:** A caution gives notice that an action may have serious consequences and could cause harm to equipment or personnel, or could cause delays or other problems.

Information and specifications are subject to change. Updates and supplementary information are available at:

- [meyersound.com/products](http://meyersound.com/products)
- [meyersound.com/documents](http://meyersound.com/documents).

Meyer Sound Technical Support is available at:

- +1 510 486.1166  
(Monday through Friday 9:00 am to 5:00 pm PST)
- +1 510 486.0657  
(after hours support)
- [meyersound.com/support](http://meyersound.com/support).

### THE MM-4XP MINIATURE LOUDSPEAKER

The MM-4XP miniature loudspeaker is a self-powered loudspeaker designed for high-quality distributed systems. Housed in a compact aluminum enclosure, the MM-4XP is especially suitable for installations involving space limitations and visibility concerns. The loudspeaker's proprietary 4-inch cone transducer, manufactured at Meyer Sound's Berkeley factory, delivers a linear peak SPL of 111.5 dB with crest factor > 16.5 dB (see "Specifications" on page 9), and has a wide operating frequency range of 120 Hz to 18 kHz with very low distortion. The MM-4XP exhibits the same high intelligibility and flat frequency and phase responses for which Meyer Sound loudspeakers are known. Peak and rms limiters regulate loudspeaker temperatures and excursion, ensuring that the MM-4XP performs exceedingly well even when driven into overload.



*MM-4XP Loudspeaker*

The MM-4XP's amplifier and signal-processing circuits are designed to store DC power and tolerate voltage drops, thereby accommodating light-gauge cables and long cable runs. The MM-4XP receives balanced audio and DC power from a SwitchCraft® EN3™ 5-pin male connector on its rear panel.

MM-4XP loudspeaker systems require an Meyer Sound external power supply (see [meyersound.com/product/mps](http://meyersound.com/product/mps) for more information and to locate datasheets and operating instructions). The MPS-488HP single-space 19-inch rack unit receives eight channels of balanced audio from its XLR female inputs and routes the audio, along with 48 V of DC power, to its eight channel outputs. The outputs—equipped with either Phoenix 5-pin male connectors on the MPS-488HPP model, or EN3 5-pin female connectors on the MPS-488HPE model—can deliver DC power to the MM-4XP loudspeakers at cable lengths of up to 300 feet with just 1 dB of loss in peak SPL using 18 AWG wire. The use of composite multiconductor cables (such as Belden® 1502) allows a single cable to carry both audio and DC power to the MM-4XP. Longer cable lengths are possible for moderate applications that don't drive the loudspeakers to maximum output, or for installations with heavier wire gauges. The smaller MPS-482HP provides two channel outputs via 5-pin male Phoenix connectors.



*MPS-488HPP Power Supply*

The MM-4XP's extruded aluminum enclosure acts as a heat sink to dissipate heat from the driver's voice coil. The enclosure is available in standard white or black anodized finishes with a perforated steel grille. It can also be custom painted to match specific color schemes.

The MUB-MM-4XP U-bracket mounts the loudspeaker on walls and ceilings at adjustable angles. The U-bracket is also available in standard white or black anodized finishes and custom colors.



*MM-4XP Loudspeaker Mounted with MUB-MM-4XP U-Bracket*

# THE MM-4XP LOUDSPEAKER

## THE MM-4XP CONNECTOR

The MM-4XP receives DC power and balanced audio from a EN3 5-pin male connector on its rear panel. The connector's five pins include two for DC power (negative and positive) and three for balanced audio (shield, negative, and positive). To function properly, the MM-4XP requires 48 V of DC power.



MM-4XP Connector

A single composite cable (such as Belden 1502) wired for both DC power and balanced audio can be used to connect the MM-4XP to one of the MPS-488's eight or the MPS-482's two channel outputs.

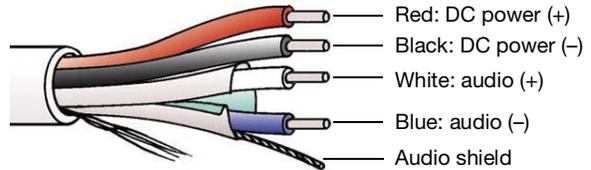
## Wiring the EN3-to-Pigtail Cables

Each MM-4XP loudspeaker comes with one EN3 5-pin female to pigtail cable. The EN3 end of the cable connects directly to the MM-4XP connector. The pigtail end of the cable can be equipped with either an EN3 5-pin male connector for connecting to the MPS-488HPE power supply, or a Phoenix 5-pin female connector for connecting to the MPS-488HPP or MPS-482HP power supplies. The pigtail can also be spliced to a longer loudspeaker cable or to a junction box. The included EN3-to-pigtail cable uses Belden 1502 cable, which can be wired for both DC power and balanced audio. The EN3-to-pigtail cable is available in plenum or regular (non-plenum) versions.

**NOTE:** For a complete list of cables and cable connectors available from Meyer Sound that can be used with the MM-4XP loudspeaker, see "MM-4XP Accessories" on page 15.

When assembling MM-4XP loudspeaker cables with the included EN3-to-pigtail cables, make sure to use the wiring scheme in Table 1. The red and black wires in Belden 1502 cable have a thicker gauge than the other three wires and

should be used for DC power. The blue, white, and shield wires should be used for audio.



Belden 1502 Composite Cable

**NOTE:** For details on assembling MM-4XP loudspeaker cables, see "Assembling Loudspeaker Cables" on page 17.

Table 1: MM-4XP Cable Wiring for Belden 1502

Wire	Gauge	Signal
Red	18 AWG	DC power, positive (+)
Black	18 AWG	DC power, negative (-)
White	22 AWG	Balanced audio, positive (+)
Blue	22 AWG	Balanced audio, negative (-)
Shield	24 AWG	Balanced audio, shield

When wiring MM-4XP cables, it is extremely important that each pin in the cable be wired so that the pins in the MM-4XP connector align with those in the MPS channel output connector (see "Channel Outputs" on page 6). Make sure the 48 V DC from the MPS power supply is wired directly (and only) to the 48 V DC pins on the MM-4XP connector, and that the polarity is observed (negative to negative, positive to positive) to avoid damage to the loudspeaker. In addition, make sure the audio pins are wired correctly; polarity reversals for audio signals can affect system performance.

**NOTE:** For information on MM-4XP cable requirements, see "MM-4XP Current Draw and Cable Requirements" on page 3.

## MM-4XP Current Draw and Cable Requirements

Each MM-4XP loudspeaker draws a maximum current of 0.7 A rms and 2.2 A peak from the 48 V DC output of the MPS power supply. The current draw for the MM-4XP is dynamic and fluctuates as operating levels change. The cabling between the MM-4XP and the MPS power supply

adds resistance and hence causes a voltage drop at the loudspeaker. Because lower voltages compromise peak SPL, and in some cases frequency response, cable resistance should be minimized.

 **NOTE:** When connecting an MM-4XP to an MPS channel output, the total cable resistance should not exceed 4 ohms.

**Cable Lengths and Cable Gauges for MM-4XPs**

When connecting an MM-4XP to an MPS channel output, you can use cable lengths of up to 300 feet with only 1 dB of peak SPL loss using 18 AWG wire. Longer cable lengths are possible with heavier wire gauges (see Table 2 and Table 3).

 **NOTE:** For music playback at moderate levels (when the MM-4XP is not driven to maximum output), cable lengths of up to 500 feet with 18 AWG wire are acceptable.

**Table 2: MM-4XP Loudspeaker Cable Lengths (AWG)**

Cable Gauge	Resistance (Ω/ft)	Approximate Max. Length
12 AWG	0.0016	1200 ft
14 AWG	0.00253	750 ft
16 AWG	0.00402	475 ft
18 AWG	0.00636	300 ft
20 AWG	0.01008	175 ft

**Table 3: MM-4XP Loudspeaker Cable Lengths (European)**

Cable Gauge	Resistance (Ω/m)	Approximate Max. Length
2.50 mm <sup>2</sup>	0.0052	365 m
1.50 mm <sup>2</sup>	0.01076	175 m
1.00 mm <sup>2</sup>	0.02087	90 m
0.75 mm <sup>2</sup>	0.03307	55 m

The maximum cable length for an MM-4XP can be calculated with the following formula:

$$\text{maximum length} = 4 \Omega / 2 * \text{cable resistance (in } \Omega/\text{ft)}$$

For example, the maximum length of an 18 AWG cable with a resistance of 0.00636 Ω/ft is equal to 314.4 feet (4 Ω / 2 \* 0.00636 Ω/ft).

 **NOTE:** For long cable runs, you can use large cable gauges for most of the run and then terminate with the included EN3-to-pigtail cable.

**THE MM-4XP LED**

The MM-4XP has a three-color LED on its rear panel that changes color to indicate the loudspeaker’s status.

**Powering On (Green)**

When powering up the MM-4XP loudspeaker, the following startup events occur and are indicated by the LED:

1. The LED flashes green and then yellow during power up.
2. The LED turns solid green indicating the loudspeaker is ready to reproduce audio.

 **CAUTION:** If the MM-4XP LED turns red and stays solid red after powering up and the audio is muted, the loudspeaker has encountered a failure and may need to be serviced. Contact Meyer Sound Technical Support.

 **CAUTION:** If the MM-4XP LED turns solid red and the loudspeaker continues to output audio, though at reduced levels, the loudspeaker’s voltage may have dropped below 25 V DC. Operation of the loudspeaker under these conditions is not recommended and the loudspeaker’s power supply and cabling should be verified.

**Limiting (Yellow)**

Limiting activity is indicated when the MM-4XP LED turns yellow. When engaged, the limiter protects the loudspeaker’s driver and prevents signal peaks from causing excessive distortion in the loudspeaker’s amplifier, thereby preserving headroom and maintaining smooth frequency response at high levels. When the level returns to

normal, below the limiter's threshold, the LED turns green and limiting ceases.

The MM-4XP performs within its acoustical specifications at normal temperatures when the MM-4XP LED is green, or if the LED turns yellow for two seconds or less and then turns green for at least one second. If the LED remains yellow for longer than three seconds, that loudspeaker enters hard limiting where:

- Increases to the input level have no effect.
- Distortion increases due to clipping and nonlinear driver operation.
- The driver is subjected to excessive heat and excursion, which will compromise its life span and may eventually lead to damage over time.

 **CAUTION:** The MM-4XP LED turns yellow when the loudspeaker's signal goes 2 dB beyond the actual onset of limiting, and indicates a safe, optimum level has been exceeded. If the MM-4XP loudspeakers in a system begin to limit before reaching the required SPL, consider adding more loudspeakers to the system to achieve the desired SPL without exposing the loudspeakers to excessive levels and possible overheating.

### Loudspeaker Temperature and Limiting

The MM-4XP LED turns solid yellow when the temperature of the MM-4XP heatsink reaches 65° C (145° F), indicating the unit is reaching its maximum heat dissipation and a reduction in SPL is recommended. While the MM-4XP will continue to operate while the LED is yellow, the limiter threshold is lowered to a safe level (causing the output level to be lowered by 6 dB) to prevent the loudspeaker from overheating. When the temperature of the MM-4XP heatsink cools to 50° C (122° F), the LED changes from yellow to green and the limiter threshold returns to normal.

### Clipping (Red)

The MM-4XP LED flashes red when its input signal causes the amplifier to overload. If the LED flashes red continuously, the loudspeaker is severely overloaded and a reduction in the input level is recommended.

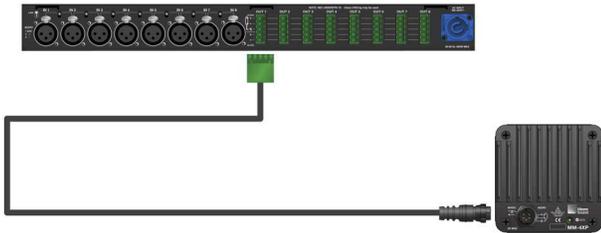
 **CAUTION:** If the MM-4XP LED turns solid red and the loudspeaker continues to output audio, though at reduced levels, the loudspeaker's voltage may have dropped below 25 V DC. Operation of the loudspeaker under these conditions is not

recommended and the loudspeaker's power supply and cabling should be verified.

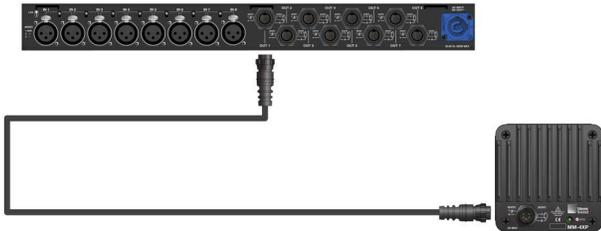
## CONNECTING MM-4XP LOUDSPEAKERS TO A MEYER SOUND POWER SUPPLY

To connect MM-4XP loudspeakers to an MPS power supply:

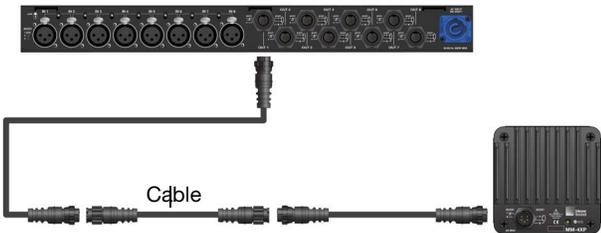
1. Power off the MPS power supply.
2. Connect audio sources (from a mixer or processor) to the MPS channel inputs. Use balanced XLR cables.
3. Use the MPS link switches to route channel inputs to the desired channel outputs.
4. Connect the MM-4XP loudspeakers to the MPS channel outputs. Use a composite cable (such as Belden 1502) wired for both DC power and balanced audio and outfitted with the appropriate connector:
  - For an MPS-488HP or MPS-482HP power supply, use an EN3 5-pin female to Phoenix 5-pin female cable.



- For an MPS-488HPE power supply, use an EN3 5-pin female to EN3 5-pin male cable.



- To join two cables, one with an EN3 5-pin male cable mount connector to one with an EN3 5-pin female cable mount connector, use an EN3 5-pin female-to-male cable coupler (PN 28.163.033.01).



**CAUTION:** Make sure the MM-4XP loudspeaker cables are wired correctly. For details on assembling loudspeaker cables, see “Assembling Loudspeaker Cables” on page 17.

5. Power on the MPS power supply and monitor the LEDs on the front panel to verify connections (for more information, see “Voltage and Load Current LEDs (1–8)” on page 3).
6. Check the MM-4XP LEDs on the rear panel and verify they are green (ready to reproduce audio).
7. Enable output from the audio sources (from the mixer or processor) connected to the MPS power supply.

## MOUNTING THE MM-4XP

### IMPORTANT SAFETY CONSIDERATIONS

When installing Meyer Sound loudspeakers, the following precautions should always be observed:

- All Meyer Sound products must be used in accordance with local, state, federal, and industry regulations. It is the owner's and user's responsibility to evaluate the reliability of any rigging method for their application. Rigging should only be carried out by experienced professionals.
- Use mounting and rigging hardware that has been rated to meet or exceed the weight being hung.
- Make sure to attach mounting hardware to the building's structural components (studs or joists), and not just to the wall surface. Verify that the building's structure and the anchors used for the installation will safely support the total weight of the mounted loudspeakers.
- Use mounting hardware appropriate for the surface where the loudspeaker will be installed.
- Make sure bolts and eyebolts are tightened securely. Meyer Sound recommends using Loctite® on eyebolt threads and safety cables.
- Inspect mounting and rigging hardware regularly. Immediately replace any worn or damaged components.

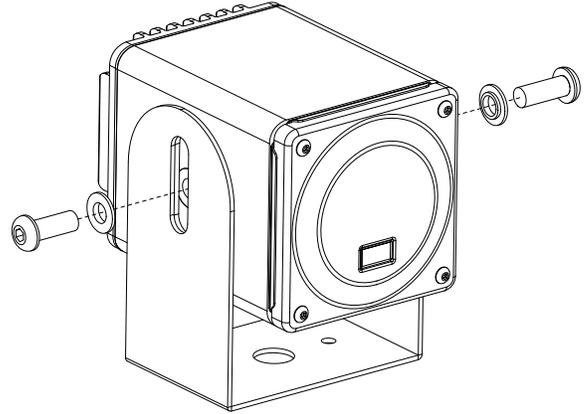
### MOUNTING THE MM-4XP WITH THE MUB-MM4XP U-BRACKET

The MUB-MM-4XP U-bracket allows the MM-4XP to be mounted on virtually any flat surface at adjustable angles. (See "MUB-MM-4XP Dimensions" on page 14 for size.)

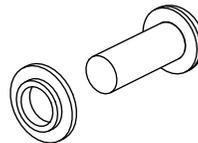
To mount the MM-4XP with the MUB-MM-4XP U-bracket:

1. Mount the MUB-MM-4XP U-bracket to the mounting surface using screws in the two holes in the back of the U-bracket. Use fastening hardware appropriate for the mounting surface.

2. Insert the MM-4XP into the U-bracket, seating its sides against the bracket's attached neoprene strips. Align the loudspeaker's screw inserts near the top of the U-bracket's slots to allow for maximum tilting.



3. Secure the loudspeaker to the U-bracket using the two 3/8-inch-16 screws and two shoulder washers included with the MUB-MM-4XP. The shoulder washers should be placed between the screws and the outside of the U-bracket, with the shoulder oriented toward the loudspeaker. Do not yet tighten the U-bracket screws.



**CAUTION:** Make sure to use the shoulder washers. They insulate the MM-4XP from the U-bracket and mounting surface, eliminating grounding and differential problems.

4. Adjust the angle of the loudspeaker as desired.
5. Tighten the U-bracket screws to secure the MM-4XP.

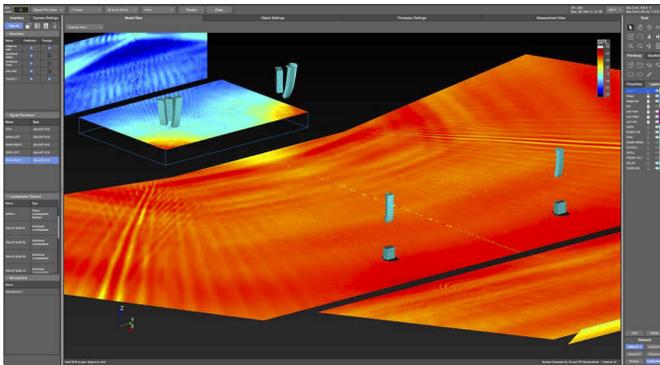


## SYSTEM DESIGN AND INTEGRATION TOOLS

This chapter introduces MAPP, Meyer Sound's patented system design tool and the Galileo GALAXY Network Platform.

### MAPP SYSTEM DESIGN TOOL

The MAPP System Design Tool is a powerful, cross-platform application for accurately predicting the coverage pattern, frequency response, phase response, impulse response, and SPL capability of individual or arrayed Meyer Sound loudspeakers.



*MAPP System Design Tool*

Whether planning for fixed installations or for tours with multiple venues, use MAPP to accurately predict the appropriate loudspeaker deployment for each job, complete with coverage data, system delay and equalization settings, rigging information, and detailed design illustrations. MAPP's accurate, high-resolution predictions ensure that systems will perform as intended, thereby eliminating unexpected coverage problems and minimizing onsite adjustments.

The key to the accuracy of MAPP's predictions is Meyer Sound's exhaustive database of loudspeaker measurements. Performance predictions for each loudspeaker are based on 3-dimensional, 65,000+ 1/48th-octave-band measurements taken in the Meyer Sound anechoic chamber. The extraordinary consistency between Meyer Sound loudspeakers guarantees that predictions from MAPP will closely match their actual performance.

MAPP software allows for configuration of Meyer Sound loudspeaker systems and definition of the environment in which they operate, including air temperature, pressure, humidity, and the location of prediction surfaces. Importing both CAD (.DXF) and Sketchup (.SKP) files containing detailed venue information to act as an anchor model to the prediction surfaces and a visual aid to facilitate prediction data interpretation is also possible.

 **TIP:** See [meyersound.com](http://meyersound.com) for support and more information about MAPP.

### MAPP Capabilities

With MAPP, the user can:

- Simulate different loudspeaker configurations to refine system designs and determine the best coverage for intended audience areas
- Model loudspeaker interactions to locate constructive and destructive interferences so that loudspeakers can be re-aimed and repositioned as necessary
- Place microphones anywhere in the Model View space and predict loudspeaker frequency response, phase response, and sound pressure levels at each microphone position
- Determine delay settings for fill loudspeakers using the Inverse Fast Fourier Transform and phase response feature
- Preview the results of signal processing to determine optimum settings for the best system response
- Automatically calculate load information for arrays to determine necessary minimum rigging capacity, front-to-back weight distribution, and center of gravity location
- Generate and export system images and system PDF reports for client presentations
- Synchronize GALAXY processor output channel settings in real time with virtual or real GALAXY units, allowing in-the-field changes to be predicted during system alignments.

## **GALILEO GALAXY NETWORK PLATFORM**

The Galileo GALAXY Network Platform is a sophisticated loudspeaker management tool for controlling all Meyer Sound speaker types. The GALAXY loudspeaker processor extends a high level of audio control in driving and aligning loudspeaker systems with multiple zones. It provides a powerful tool set for corrective equalization (EQ) and creative fine-tuning for a full range of applications from touring to cinema.

Users can readily program the GALAXY processor using Compass software running on a host computer or via the Compass Go application for the iPad. Connecting MAPP to the GALAXY processor will also allow the user to push output channel settings created in MAPP as a starting point. Compass Control Software includes custom-designed settings for each family of speakers, as well as to integrate families together. For example, the Product Integration feature matches the phase characteristics between Meyer speaker families to ensure the most coherent summation.

Processing tools for inputs and outputs include delay, parametric EQ and U-Shaping EQ. Output processing also includes polarity reversal, Low-Mid Beam Control (LMBC), atmospheric correction, and All Pass filters.

The built-in summing and delay matrices allow a user to easily assign gain and delay values, respectively, at each cross point. This capability greatly facilitates using one loudspeaker to satisfy multiple purposes.

Front panel controls let a user intuitively and quickly operate a GALAXY processor without a computer during live use.

The GALAXY 408, GALAXY 816 and GALAXY 816-AES3 processor versions have the same audio processing capability with different I/O. See [meyersound.com](http://meyersound.com) to locate their datasheets for more information.

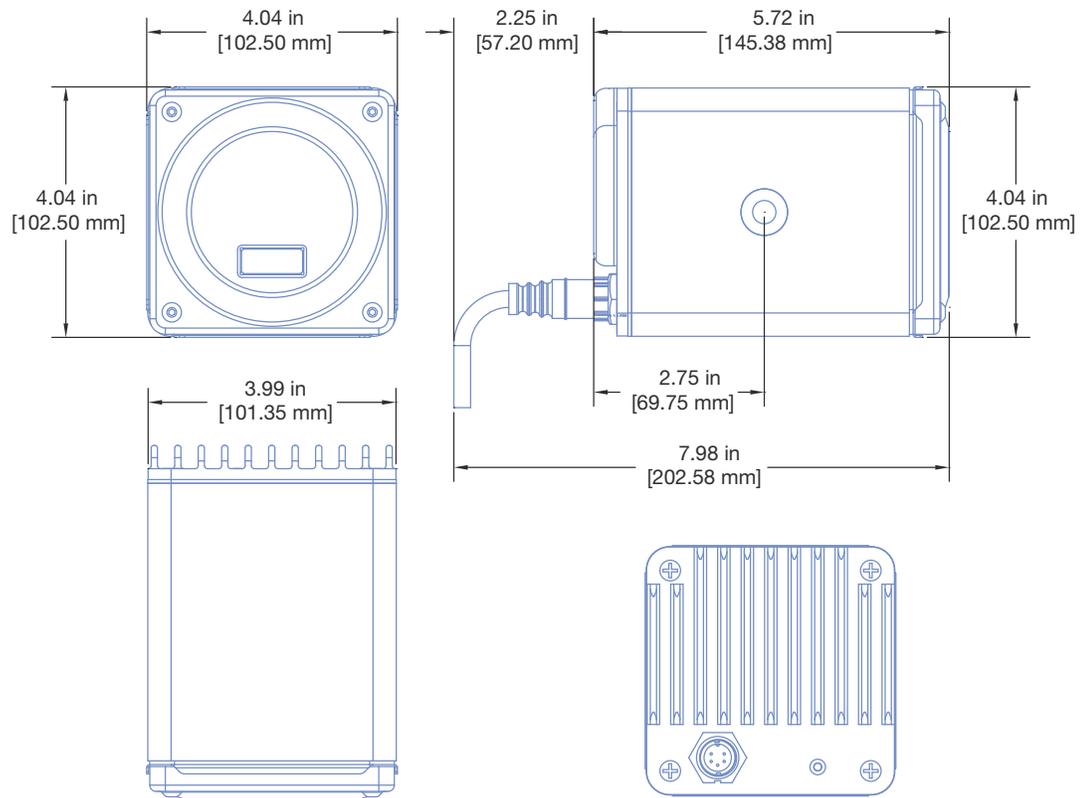
## MM-4XP SPECIFICATIONS

### MM-4XP ACOUSTICAL, ELECTRICAL, AND PHYSICAL SPECIFICATIONS

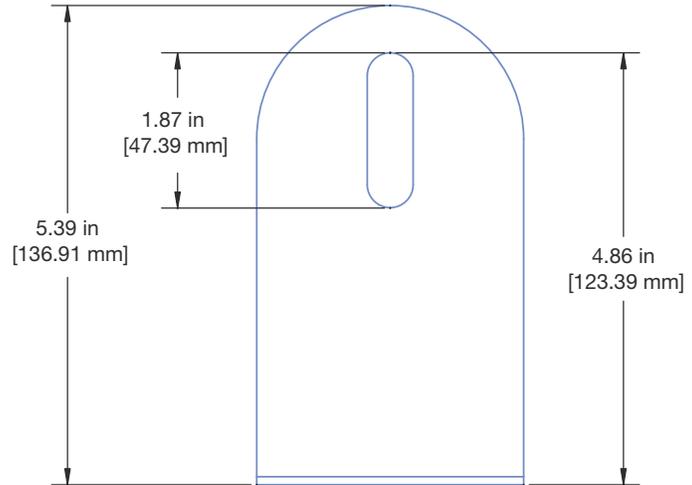
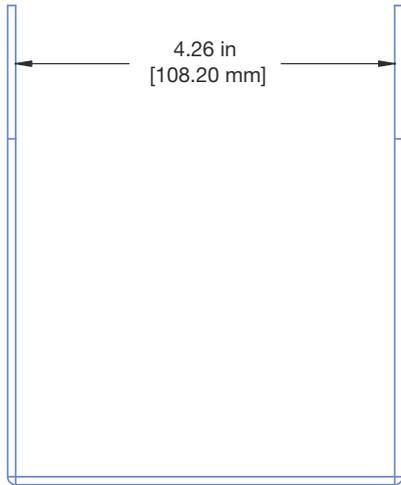
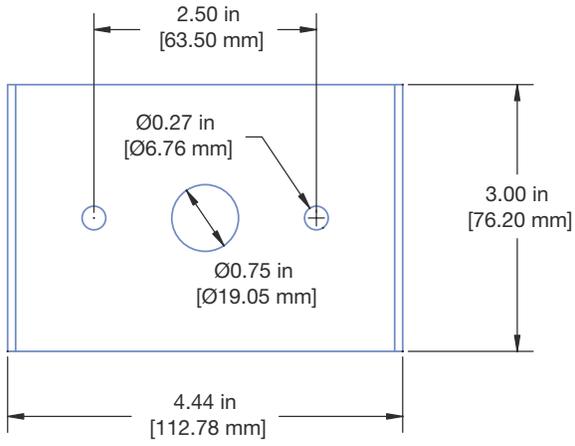
ACOUSTICAL	
Operating Frequency Range	120 Hz – 18 kHz <b>Note:</b> Recommended maximum operating frequency range. Response depends on loading conditions and room acoustics.
Frequency Response	135 Hz – 17 kHz $\pm 4$ dB <b>Note:</b> Free field, measured with 1/3 octave frequency resolution at 4 m
Phase Response	400 Hz – 20 kHz $\pm 45^\circ$
Linear Peak SPL	<b>111.5 dB with crest factor &gt;16.5 dB (M-noise)</b> , 109 dB (Pink noise), 111 dB (B-noise) <b>Note:</b> Linear Peak SPL is measured free-field at 4 m referred to 1 m. Loudspeaker SPL compression measured with M-noise at the onset of limiting, 2-hour duration, and 50 °C ambient temperature is < 2 dB. <b>M-noise</b> is a full bandwidth (10 Hz–22.5 kHz) test signal developed by Meyer Sound to better measure the loudspeaker’s music performance. It has a constant instantaneous peak level in octave bands, a crest factor that increases with frequency, and a full bandwidth Peak to RMS ratio of 18 dB. The presence of a greater-than (>) symbol with regard to crest factor indicates it may be higher depending on EQ and boundary loading. <b>Pink noise</b> is a full bandwidth test signal with Peak to RMS ratio of 12.5 dB. <b>B-noise</b> is a Meyer Sound test signal used to ensure measurements reflect system behavior when reproducing the most common input spectrum, and to verify there is still headroom over pink noise.
COVERAGE	
Horizontal Coverage	80° (3 kHz – 14 kHz $\pm 10^\circ$ ); 120° (below 2 kHz)
Vertical Coverage	80° (3 kHz – 14 kHz $\pm 10^\circ$ ); 120° (below 2 kHz)
TRANSDUCERS	
	One 4-inch cone driver; 4 $\Omega$ nominal impedance
AUDIO INPUT	
Type	Differential, electronically balanced
Maximum Common Mode Range	$\pm 5$ V DC
Connector	SwitchCraft EN3 5-pin male (two pins for 48 V DC power, three pins for balanced audio)
Input Impedance	10 k $\Omega$ differential between Audio (+) and Audio (-)
Wiring	Pin 1: DC Power (-) Pin 2: DC Power (+) Pin 3: Audio Shield, chassis/earth Pin 4: Audio (-) Pin 5: Audio (+)
Nominal Input Sensitivity	-2.5 dBV (0.75 V rms) continuous average is typically the onset of limiting for noise and music.
Input Level	Audio source must be capable of producing +16 dBV (6.3 V rms) into 600 $\Omega$ to produce maximum peak SPL over the operating bandwidth of the loudspeaker.

<b>AMPLIFIER</b>	
Type	Class D
Total Output Power	440 W peak <b>Note:</b> Peak power based on the maximum unclipped peak voltage the amplifier will produce into the nominal load impedance.
THD, IM TIM	<.02%
Cooling	Convection
<b>DC POWER</b>	
Connectors	SwitchCraft EN3 5-pin male (two pins for 48 V DC power, three pins for balanced audio, see Wiring above)
Safety Agency Rated Operating Voltage	48 V DC (Meyer Sound IntelligentDC External Power Supply Required) <b>Note:</b> Tolerates voltage drops up to 30% due to long cable runs. Normal operating conditions with recommended cable gauge and length assures peak SPL remains within 2 dB of max SPL specification.
<b>PHYSICAL</b>	
Dimensions	W: 4.04 inch (103 mm) x H: 4.04 inch (103 mm) x D: 5.72 inch (145 mm)
Weight	4.2 lb (1.9 kg)
Enclosure	Sealed extruded aluminum with standard white-painted or a black-anodized finish
Protective Grille	Perforated steel
Rigging	Two 3/8-inch – 16 side inserts; optional MUB-MM-4XP U-bracket
<b>ENVIRONMENTAL</b>	
Operating Temperature	0 °C to +45 °C
Non Operating Temperature	-40 °C to +75 °C
Humidity	To 95% at 45 °C (non-condensing)
Operating Altitude	To 5,000 m (16,404 ft)
Non Operating Altitude	To 12,000 m (39,000 ft)
Shock	30 g 11 msec half-sine on each of 6 sides
Vibration	10 Hz – 55 Hz (0.010 m peak-to-peak excursion)



**MM-4XP LOUDSPEAKER DIMENSIONS**

## MUB-MM-4XP DIMENSIONS



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## MM-4XP ACCESSORIES

### MM-4XP ACCESSORIES



**NOTE:** For information about the Meyer Sound Power Supply options, please visit: [meyersound.com/product/mps](http://meyersound.com/product/mps).

The following MM-4XP accessories are available from Meyer Sound.

#### MM-4XP Accessories

Part Number	Accessory	Notes
40.163.003.02	MUB-MM-4XP Mounting Bracket (black)	Includes black mounting hardware
40.163.003.04	MUB-MM-4XP Mounting Bracket (white)	Includes clear mounting hardware

### MM-4XP CABLE CONNECTORS AND ADAPTERS

The following MM-4XP cable connectors and adapters are available from Meyer Sound.

#### MM-4XP Cable Connectors and Adapters

Part Number	Connector/Adapter	Use
484.053	Phoenix 5-pin female cable mount connector	Connects to the MPS-488P channel output connector (a Phoenix 5-pin male connector).
468.069	EN3 5-pin female cable mount connector	Connects to the MM-4XP loudspeaker connector (an EN3 5-pin male panel mount connector).
468.071	EN3 5-pin male cable mount connector	Connects to the MPS-488E channel output connector (an EN3 5-pin female panel mount connector).
468.072	EN3 5-pin female inline cable adapter	Connects to an EN3 5-pin male cable mount connector.
468.073	EN3 5-pin male inline cable adapter	Connects to an EN3 5-pin female cable mount connector.
28.163.033.01	Cable coupler EN3 5-pin female-to-male	Joins two cables: one with an EN3 5-pin male cable mount connector to one with an EN3 5-pin female cable mount connector.

## MM-4XP CABLES

The following MM-4XP cables are available from Meyer Sound.



**NOTE:** All MM-4XP loudspeaker cables and bulk cable use Belden 1502R (regular) or Belden 1502P (plenum) cable. Belden 1502 is a composite cable comprised of two 18 AWG wires for DC power, two 22 AWG wires for balanced audio, and one 24 AWG wire for audio shield.

### MM-4XP Loudspeaker Cables

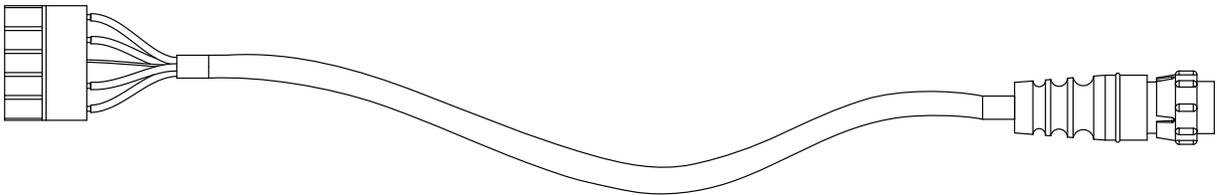
Part Number	Cable	Color	Coating	Length
524.014	Bulk (no connectors)	Black	Regular	500 ft spool
524.015	Bulk (no connectors)	White	Plenum	500 ft spool
28.163.009.01	EN3 5-pin female to pigtail	Black	Regular	10 ft
28.163.009.11	EN3 5-pin female to pigtail	White	Plenum	10 ft
28.163.009.21	EN3 5-pin female to EN3 5-pin male	Black	Regular	10 ft
28.163.009.22				20 ft
28.163.009.23				30 ft
28.163.009.24				50 ft
28.163.009.25				100 ft
28.163.009.26				150 ft
28.163.009.31				EN3 5-pin female to EN3 5-pin male
28.163.009.32	20 ft			
28.163.009.33	30 ft			
28.163.009.34	50 ft			
28.163.009.35	100 ft			
28.163.009.36	150 ft			
28.163.033.01	Cable coupler EN3 5-pin female-to-male (joins two cables: one with an EN3 5-pin male cable mount connector to one with an EN3 5-pin female cable mount connector)			
28.163.009.41	EN3 5-pin female to Phoenix 5-pin female	Black	Regular	10 ft
28.163.009.42				20 ft
28.163.009.43				30 ft
28.163.009.44				50 ft
28.163.009.45				100 ft
28.163.009.46				150 ft
28.163.009.51				EN3 5-pin female to Phoenix 5-pin female
28.163.009.52	20 ft			
28.163.009.53	30 ft			
28.163.009.54	50 ft			
28.163.009.55	100 ft			
28.163.033.01	150 ft			

## ASSEMBLING LOUDSPEAKER CABLES

**CAUTION:** When wiring loudspeaker cables, it is extremely important that each pin be wired correctly. Make sure that the 48 V DC from the external power supply is wired directly (and only) to the 48 V DC pins on the loudspeaker connector, and that the polarity is observed (negative to negative, positive to positive) to avoid damage to the loudspeaker. In addition, make sure that audio pins are wired correctly; polarity reversals for audio signals affect system performance.

### ASSEMBLING PHOENIX-TO-EN3 LOUDSPEAKER CABLES

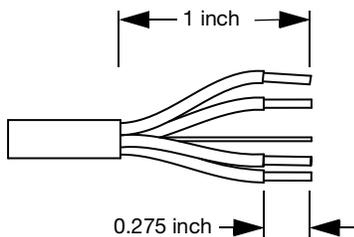
When connecting loudspeakers equipped with EN3 connectors to power supplies equipped with Phoenix connectors, a Phoenix 5-pin female to EN3 5-pin female cable is required. The following procedure documents how to assemble this cable. If starting with an EN3-to-pigtail cable, skip steps 4–7 in this procedure.



*Assembled Phoenix-to-EN3 Cable*

To assemble a Phoenix-to-EN3 cable:

1. If the cable has not yet been stripped, strip one end of the cable. Strip the outer shielding by 1 inch and then strip the black, red, blue, and white wires by 0.275 inch.



2. Insert the five exposed conductors into the five cable holes in a Phoenix 5-pin female cable mount connector. Use the following wiring scheme.

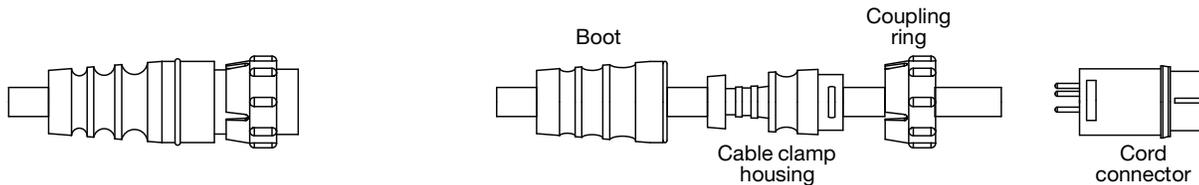


*Pin Destinations for Phoenix 5-Pin Female Cable Mount Connector*

3. Secure the conductors by tightening the five screws in the Phoenix cable mount connector. Screws should be torqued to 0.5–0.6 Nm (4.4–5.3 In-Lbs).

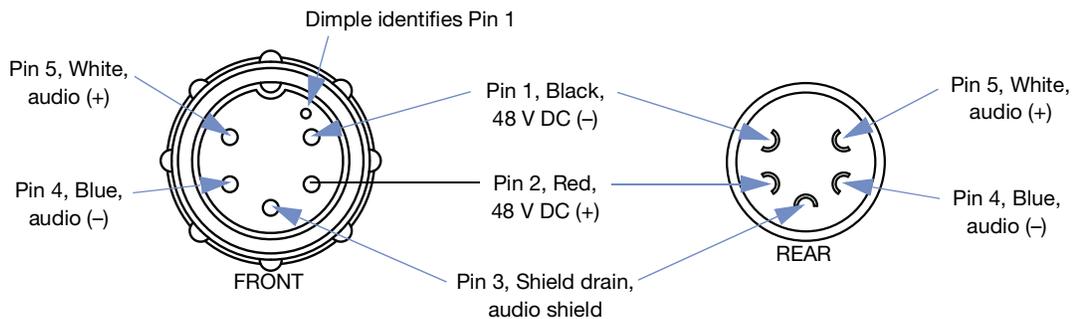
**CAUTION:** Screws should not be tightened while the connector rests in a mating plug. Doing so will damage the contacts. During assembly, the Phoenix connector should only be held in place externally.

- If the other (EN3) end of the cable has not been stripped, strip the outer shielding 1 inch and then strip the black, red, blue, and white wires 0.275 inch.
- Disassemble the EN3 5-pin female connector and feed the stripped cable through the boot, cable clamp housing, and coupling ring.



EN3 5-Pin Female Cable Mount Connector, Assembled (Left), Disassembled (Right)

- Solder the five exposed conductors to the five pins on the EN3 cord connector using the following wiring scheme.



Pin Destinations for EN3 5-Pin Female Cable Mount Connector

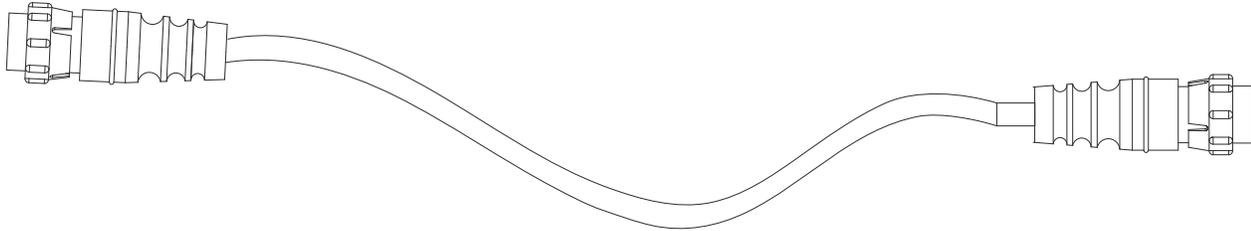
- Reassemble the EN3 5-pin female connector:
  - Align the coupling ring's side notches with the cord connector's side notches and slide the couple ring onto the cord connector.
  - Carefully insert the end of the cable clamp housing into the cord connector until it locks into place. Snap the cable clamps in the cable clamp housing into their compartments.
  - Slide the boot forward so it covers the cable clamp housing completely.
- Verify the wiring polarity is correct for both cable ends.

## ASSEMBLING EN3-TO-EN3 LOUDSPEAKER CABLES

To connect the MM-4XP loudspeaker directly to the MPS-488E power supply, you need an EN3 5-pin female to EN3 5-pin male cable. The following procedure documents how to assemble this cable. If you are starting with an EN3-to-pigtail cable (included with the MM-4XP), you can disregard step 5 in the procedure.



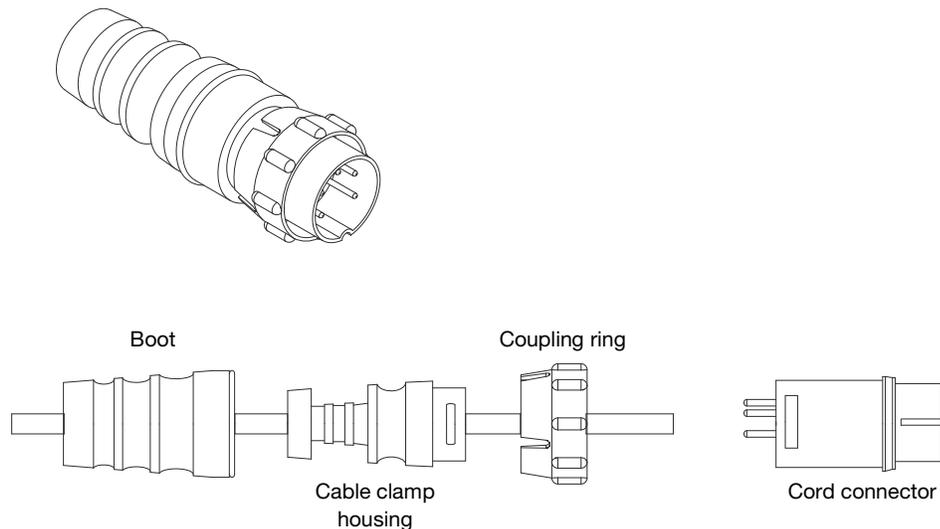
**NOTE:** Cable mount connectors cannot connect to other cable mount connectors. Cable mount connectors can only connect to panel mount connectors (like those on the MM-4XP and MPS-488E) or inline connectors. To extend cables with EN3 connectors on both ends you can use an EN3 5-pin female-to-male cable coupler.



*Assembled EN3-to-EN3 Cable*

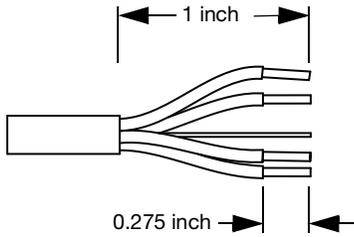
To assemble an EN3-to-EN3 loudspeaker cable:

1. Disassemble the EN3 5-pin male connector and feed one end of the cable through the boot, cable clamp housing, and coupling ring.

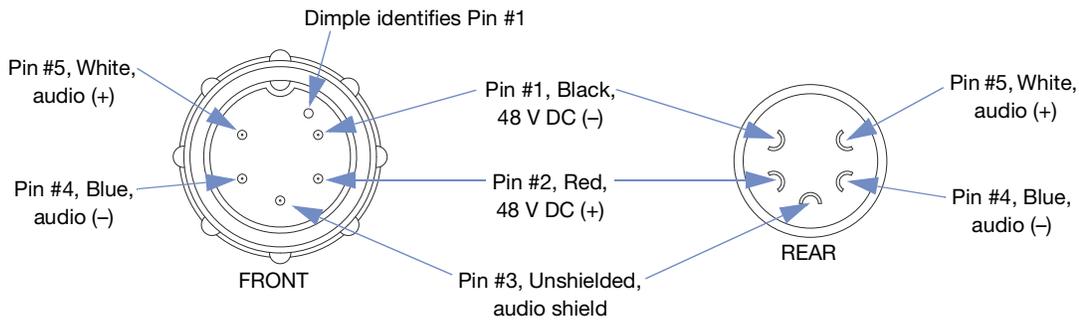


*Disassembled EN3 5-Pin Male Cable Mount Connector*

- If the cable has not yet been stripped, strip one end of the cable. Strip the outer shielding by 1 inch and then strip the black, red, blue, and white wires by 0.275 inch.



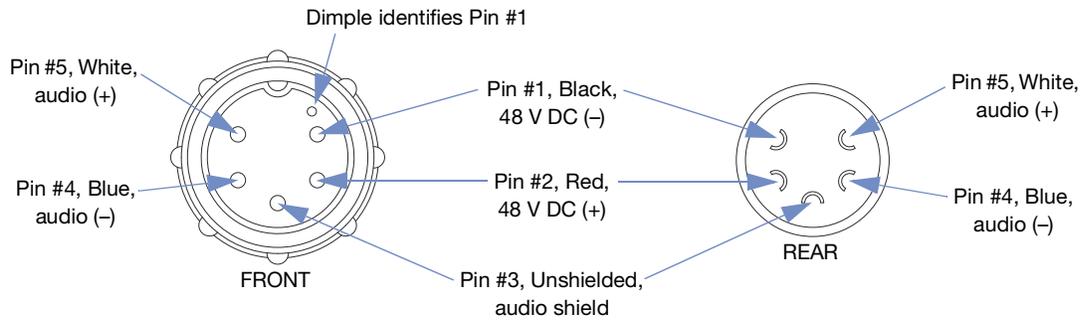
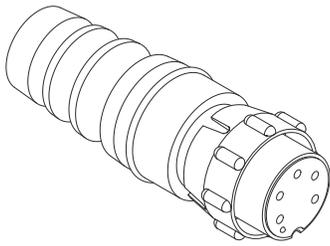
- Solder the five exposed conductors to the five pins on the EN3 cord connector using the following wiring scheme.



*Pin Destinations for EN3 5-Pin Male Cable Mount Connector*

- Reassemble the EN3 5-pin male connector:
  - Align the coupling ring's side notches with the cord connector's side notches and slide the couple ring onto the cord connector.
  - Carefully insert the end of the cable clamp housing into the cord connector until it locks into place. Snap the cable clamps in the cable clamp housing into their compartments.
  - Slide the boot forward so it covers the cable clamp housing completely.

5. Repeat the previous steps to attach the EN3 5-pin female connector to the other end of the cable.



*Pin Destinations for EN3 5-Pin Female Cable Mount Connector*

6. Verify the wiring polarity is correct for both cable ends.







THINKING SOUND

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MM-4XP Operating Instructions PN 05.163.005.01 B