

UPM-1P Ultra-Compact Wide Coverage Loudspeaker
UPM-2P Ultra-Compact Narrow Coverage Loudspeaker



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DECLARATION OF CONFORMITY ACCORDING TO ISO/IEC GUIDE 22 AND EN 45014

Manufacturer's Name:

Meyer Sound Laboratories Inc.

Manufacturer's Address:

2832 San Pablo Avenue
Berkeley, CA 94702-2204, USA

Declares that the products

Product Name: UPM-1P
UPM-2P

Product Options: All

Conforms to the following Product Specifications

Safety: UL 813: 1999
EN 60065: 1998
IEC 60065: 1998

EMC: EN 55103-1: 1997 emission(1)
EN 55103-2: 1997 immunity(2)

This device complies with EN 55103-1 & -2. Operation is subject to the following two conditions:

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

Supplementary Information

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

Office of Quality Manager
Berkeley, California USA
February 15, 2004

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Environmental specifications for Meyer Sound Electronics products

Operating Temperature	0° C to +45° C
Non operating Temperature	<-40° C or > +75° C
Humidity	to 95% at 35° C
Operating Altitude	to 4600 m (15,000 ft)
Non operating Altitude	to 6300 m (25,000 ft)
Shock	30 g 11 msec half-sine on each of 6 sides
Vibration	10 Hz to 55 Hz (0.010 m peak-to-peak excursion)

Made by Meyer Sound Laboratories
Berkeley, California USA
European Office:
Meyer Sound Lab. GmbH
Carl Zeiss Strasse 13
56751 Polch, Germany



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UPM-1P Ultra-Compact Wide Coverage Loudspeaker/UPM-2P Ultra-Compact Narrow Coverage Loudspeaker Operating Instructions

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

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Printed in the U.S.A.


Part Number: 05.084.003.01, Rev. C

SYMBOLS USED

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

			
Dangerous voltages: risk of electric shock	Important operating instructions	Frame or chassis	Protective earth ground
Pour indiquer les risques résultant de tensions dangereuses	Pour indiquer important instructions	Masse, châssis	Terre de protection
Zu die gefahren von gefährliche spanning zeigen	Zu wichtige betriebsanweisung und unterhaltsanweisung zeigen	Rahmen oder chassis	Die schutzerde
Para indicar voltajes peligrosos.	Instrucciones importantes de funcionamiento y/o mantenimiento	Armadura o chassis	Tierra proteccionista

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
 2. Keep these instructions.
 3. Heed all warnings.
 4. Follow all instructions.
 5. Do not use this loudspeaker 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 loudspeaker. 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 loudspeaker. Handles are for carrying only.
-
- 

CAUTION: Rigging should only be done by experienced professionals.
-
13. Unplug this loudspeaker during lightning storms or when unused for long periods of time.
 14. Refer all servicing to qualified service personnel. Servicing is required when the loudspeaker 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 loudspeaker; rain or moisture has entered the loudspeaker; the loudspeaker has been dropped; or when for undetermined reasons the loudspeaker does not operate normally.

SAFETY SUMMARY

English

- To reduce the risk of electric shock, disconnect the loudspeaker from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections.
- Connect the loudspeaker 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 loudspeaker 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 loudspeaker. Do not put objects containing liquid on or near the unit.
- To reduce the risk of overheating the loudspeaker, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove.
- This loudspeaker contains potentially hazardous voltages. Do not attempt to disassemble the unit. The unit contains no user-serviceable parts. Repairs should be performed only by factory-trained service personnel.

Français

- Pour réduire le risque d'électrocution, débrancher la prise principale de l'haut-parleur, avant d'installer le câble d'interface allant à l'audio. Ne rebrancher le bloc d'alimentation qu'après avoir effectué toutes les connections.
- Branchez l'haut-parleur dans une prise de courant à 3 dérivations (deux pôles et la terre). Cette prise doit être munie d'une protection adéquate (fusible ou coupe-circuit). Le branchement dans tout autre genre de prise pourrait entraîner un risque d'électrocution et peut constituer une infraction à la réglementation locale concernant les installations électriques.
- Ne pas installer l'haut-parleur dans un endroit où il y a de l'eau ou une humidité excessive.

- Ne pas laisser de l'eau ou tout objet pénétrer dans l'haut-parleur. Ne pas placer de récipients contenant un liquide sur cet appareil, ni à proximité de celui-ci.
- Pour éviter une surchauffe de l'haut-parleur, conserver-la à l'abri du soleil. Ne pas installer à proximité d'appareils dégagant de la chaleur tels que radiateurs ou appareils de chauffage.
- Ce haut-parleur contient des circuits haute tension présentant un danger. Ne jamais essayer de le démonter. Il n'y a aucun composant qui puisse être réparé par l'utilisateur. Toutes les réparations doivent être effectuées par du personnel qualifié et agréé par le constructeur.

Deutsch

- Um die Gefahr eines elektrischen Schlages auf ein Minimum zu reduzieren, den Lautsprecher vom Stromnetz trennen, bevor ggf. ein Audio-Schnittstellensignalkabel angeschlossen wird. Das Netzkabel erst nach Herstellung aller Signalverbindungen wieder einstecken.
- Der Lautsprecher an eine geerdete zweipolige Dreiphasen-Netzsteckdose anschließen. Die Steckdose muß mit einem geeigneten Abzweigschutz (Sicherung oder Leistungsschalter) verbunden sein. Der Anschluß der unterbrechungsfreien Stromversorgung an einen anderen Steckdosentyp kann zu Stromschlägen führen und gegen die örtlichen Vorschriften verstoßen.
- Der Lautsprecher nicht an einem Ort aufstellen, an dem sie mit Wasser oder übermäßig hoher Luftfeuchtigkeit in Berührung kommen könnte.
- Darauf achten, daß weder Wasser noch Fremdkörper in das Innere den Lautsprecher eindringen. Keine Objekte, die Flüssigkeit enthalten, auf oder neben die unterbrechungsfreie Stromversorgung stellen.
- Um ein Überhitzen dem Lautsprecher zu verhindern, das Gerät vor direkter Sonneneinstrahlung fernhalten und nicht in der Nähe von wärmeabstrahlenden

Haushaltsgeräten (z.B. Heizgerät oder Herd) aufstellen.

- Im Inneren diesem Lautsprecher herrschen potentiell gefährliche Spannungen. Nicht versuchen, das Gerät zu öffnen. Es enthält keine vom Benutzer reparierbaren Teile. Reparaturen dürfen nur von ausgebildetem Kundendienstpersonal durchgeführt werden.

Español

- Para reducir el riesgo de descarga eléctrica, desconecte de la red de voltaje el altoparlante antes de instalar el cable de señal de audio. Vuelva a conectar la alimentación de voltaje una vez efectuadas todas las interconexiones de señalización de audio.
- Conecte el altoparlante a un tomacorriente bipolar y trifilar con neutro de puesta a tierra. El tomacorriente debe estar conectado a la protección de derivación apropiada (ya sea un fusible o un disyuntor). La conexión a cualquier otro tipo de tomacorriente puede constituir peligro de descarga eléctrica y violar los códigos eléctricos locales.
- No instale el altoparlante en lugares donde haya agua o humedad excesiva.
- No deje que en el altoparlante entre agua ni ningún objeto extraño. No ponga objetos con líquidos encima de la unidad ni cerca de ella.
- Para reducir el riesgo de sobrecalentamiento, no exponga la unidad a los rayos directos del sol ni la instale cerca de artefactos que emiten calor, como estufas o cocinas.
- Este altoparlante contiene niveles de voltaje peligrosos en potencia. No intente desarmar la unidad, pues no contiene piezas que puedan ser reparadas por el usuario. Las reparaciones deben efectuarse únicamente por parte del personal de mantenimiento capacitado en la fábrica.

CONTENTS

INTRODUCTION	1
How to Use this Manual	1
Introducing the UPM-1P and UPM-2P Loudspeakers	1
Optimized Control Electronics	1
Three-Way System	2
Applications	2
CHAPTER 1: Power Requirements	5
AC Power	5
Voltage Selection	5
Current Requirements	6
Power Connector Wiring	6
Electrical Safety Issues	7
CHAPTER 2: Amplification and Audio	9
Audio Input	9
Looping Audio Input Module	9
Looping, Polarity and Attenuating Audio Input Module	9
Amplification and Limiting	10
Driver Interconnections	11
Amplifier Cooling System	11
CHAPTER 3: RMS™ Remote Monitoring System (Optional)	13
Understanding the RMS User Panel	13
Service LED (Red)	13
Service Button	14
Wink LED (green)	14
Reset Button	14
Activity LED (Green)	14
User Interface	14
CHAPTER 4: Using Subwoofers with the UPM-1P and UPM-2P	15
Daisy-Chained	15
Adding a Line Driver	15
Engaging the Lo-Cut Filter	16
Digital Signal Processors	16
CHAPTER 5: System design and Integration	17
Meyer Sound MAPP Online®	17
SIM® Measurement System	18
Source Independent Measurement Technique	18
Applications	18
CHAPTER 6: QuickFly® Rigging	19
Stand-Mounting the UPM-1P and UPM-2P Loudspeakers	19
MYA-UPM Mounting Yoke Assembly	19
Using the MUB-UPM U-Bracket	20
Wall Mount	20
Ceiling Mount	20
Floor Mount	21

APPENDIX A: Basic Troubleshooting

23

APPENDIX B: Specifications

25

INTRODUCTION

HOW TO USE THIS MANUAL

As you read this manual, you'll find figures and diagrams to help you understand and visualize what you're reading. You'll also find icons that flag important information or warn you against improper or potentially harmful activities. These icons include:



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



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



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

INTRODUCING THE UPM-1P AND UPM-2P LOUSPEAKERS

Meyer Sound's UPM-1P ultra-compact wide coverage and UPM-2P ultra-compact narrow coverage loudspeakers are self-powered professional sound reinforcement loudspeakers made for applications that require a small, inconspicuous system capable of high sound pressure levels.



Figure i.1. UPM-1P ultra-compact wide coverage loudspeaker and the UPM-2P ultra-compact narrow coverage loudspeaker

In standalone under-balcony, front- or side-fill applications, UPM-1P and UPM-2P loudspeakers can provide vocal range reinforcement as a small PA system, while a full-range system can be created with the addition of a separate subwoofer. Other features include:

- Extremely low distortion
- Uniform directional control on both the horizontal and vertical axes
- Dual 5-inch low-mid transducers
- 1-inch metal dome high-frequency driver on constant directivity symmetrical horns
- Two-channel power amplifier
- Proprietary phase-corrected active processing circuitry

Both the UPM-1P and UPM-2P use a 1-inch metal dome tweeter on a symmetrical constant-directivity high-frequency horn. With its 45-degree beamwidth, the UPM-2P loudspeaker produces a narrow, symmetrical pattern for precise coverage control, while the UPM-1P loudspeaker offers a wider 100-degree symmetrical coverage pattern for broad listening areas.

Optimized Control Electronics

Like all Meyer Sound self-powered loudspeakers, the UPM-1P and UPM-2P exhibit superior performance across virtually all parameters. Because the amplifiers and control electronics are precisely optimized for each driver, the overall system is able to produce more power with flatter response and lower distortion. Self-powering also means simplifying installation by eliminating amplifier racks and external drive processing — allowing configuration of extensive distributed systems free from the signal losses imposed by long loudspeaker cable runs or 70/100-volt wiring schemes. The UPM-1P and UPM-2P loudspeakers also include a laser-trimmed differential input stage for high common mode rejection, and can be equipped with Meyer Sound's RMS™ remote monitoring system.

Three-Way System

Unlike similar conventional systems, the UPM-1P and UPM-2P loudspeakers are three-way systems. In the pass band below 320 Hz, where greater power handling and cone area are needed, the 5-inch drivers are driven together in parallel. However, above 320 Hz a high-pass filter rolls off the signal going to one of the drivers, so only one of the two drivers reproduces the critical mid frequencies close to the crossover frequency. Since power requirements are drastically lower in this region, there is no loss in response, and a remarkably uniform response at all frequencies along all axes — horizontal, vertical and diagonal.



NOTE: In conventional two-way designs both low-mid drivers reproduce the same information throughout their operating range. At low frequencies this is not an issue, since the wavelengths (500 Hz, about two feet) are longer than the distance between the center points of the two cones. But at around 1 kHz, problems arise in the off-axis vertical response of the system. As the wavelengths of critical mid frequencies approach the distance between loudspeaker centers, significant comb filtering effects appear. These “holes” can be quite severe. In applications where such a loudspeaker is mounted vertically and the audience area is contained entirely within a 50-degree vertical arc, sharp off-axis attenuation may not be detrimental. However, if you flip the cabinet on its side to use it as an under-balcony loudspeaker, you will experience serious difficulties.

The UPM-1P and UPM-2P loudspeakers provide a more elegant solution, with an active crossover distributing the signal between the low- and high-frequency sections, and a simpler 2-way passive crossover that is employed to implement the single-point midrange solution. In addition, a sophisticated phase correction circuit in the active electronics compensates for phase shift in the passive network. The result is a significantly better system impulse response, and better imaging when UPM-1P and UPM-2P loudspeakers are used in stereo or multi-channel applications.

APPLICATIONS

The UPM-1P and UPM-2P loudspeakers are designed to be used in a wide variety of applications in sound reinforcement, as well as music playback and monitoring. In theatre sound design, the UPM-1P and UPM-2P loudspeakers may be used as fill as well as a stand-alone effects loudspeaker system for surround, onstage effects and anywhere a compact device is required. For example, equally spacing UPM-1P loudspeakers across the downstage edge or under a balcony offers very accurate audio reproduction for theatre design (Figure i.3).

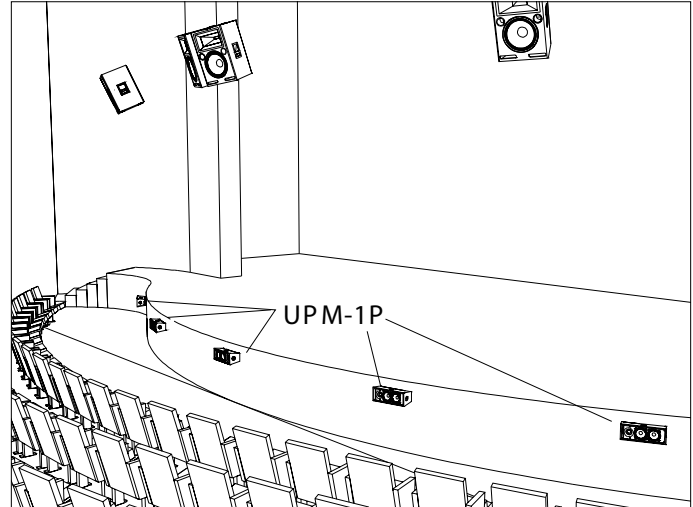


Figure i.3: UPM-1Ps arranged across a downstage edge

The UPM-1P loudspeaker's wide 100-degree pattern is designed to keep sound from being too localized, allowing for more even SPL distribution across seats near to the stage or any other areas the loudspeaker is intended to cover. For more focused directional control, the UPM-2P's 45-degree beamwidth produces a narrow, symmetrical pattern to accommodate ultra-precise design requirements.

The 123 dB peak SPL of the UPM-1P and UPM-2P loudspeakers makes them an excellent choice for use as fill in sports facilities. They can be used in stadiums and arenas as upper level delay loudspeaker or under upper level overhangs, as well as in suites and box seats that fall out of the main system's direct path.

The UPM-1P and UPM-2P loudspeakers also work as stand-alone PA systems for accurate spoken word reproduction and, with the addition of a companion subwoofer, a small music reinforcement system.

In addition, because of the flatter phase and frequency response of Meyer Sound UltraSeries loudspeakers, the UPM-1P and UPM-2P loudspeakers can be ideal for high definition music monitoring when used with a subwoofer. The wide-coverage UPM-1P loudspeaker provides better imaging in stereo and 5.1 playback applications, while the narrower UPM-2P gives you the flexibility to localize coverage in the near field.

Available QuickFly® rigging accessories— including a mounting yoke (MYA-UPM), stand adapter (MSA-UPM) and U-bracket (MUB-UPM)— attach easily to the UPM-1P and UPM-2P allowing them to be mounted or flown, either as a single cabinet or in arrays. The optional RMS remote monitoring system module allows comprehensive monitoring of all key system parameters on a remote RMS host PC.



NOTE: Read this entire manual carefully before configuring and deploying a UPM-1P or UPM-2P system. In particular, pay careful attention to the sections about safety issues.

Information and specifications are applicable as of the date of this printing. Updates and supplementary information are posted on the Meyer Sound website at:

<http://www.meyersound.com>

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CHAPTER 1: POWER REQUIREMENTS

Self-powered and compact, UPM-1P and UPM-2P loudspeakers combine advanced technology with equally advanced power capabilities. Understanding power distribution, voltage and current requirements, as well as electrical safety issues, is critical to the safe operation of the loudspeakers.

AC POWER

UPM-1P and UPM-2P loudspeakers use a PowerCon® three-pole AC mains system with locking connectors to prevent accidental disconnection. They may also be daisy-chained by using the grey connector (Figure 1.1) to loop units together. The blue connector serves as the power input; to loop additional units, simply attach a cable from the grey connector of the first loudspeaker system to the blue connector of the second, and so on. One cable-mount loop-out grey connector is shipped with the unit.

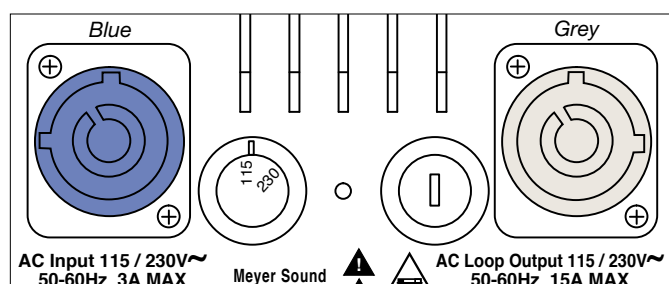


Figure 1.1. You can daisy-chain UPM-1P and UPM-2P loudspeakers using the grey connector.

CAUTION: Do not loop more than four UPM-1P or UPM-2P loudspeakers from the loop out connector when driven at 115 volts and not more than eight when driven at 230 volts.

CAUTION: Ensure that you select the correct power plug for the AC power in the area in which you use your loudspeaker.

The power supply suppresses high voltage transients up to several kilovolts and also filters EMI (radio frequencies and noise present) on the incoming AC voltage. The UPM-1P can withstand continuous voltages up to 264 volts and allow any combination of voltage to GND (that is neutral-line-ground or line-line-ground).

CAUTION: Continuous voltages higher than 265 volts may damage your UPM-1P or UPM-2P loudspeaker.

Voltage Selection

Two versions of both the UPM-1P and UPM-2P loudspeakers are available: a switchable 115/230-volt and a non-switchable 100-volt version. The non-switchable 100-volt version will operate properly when receiving between 87 and 113 volts; the switchable version requires you to check the voltage switch and set it to either 115 or 230 volts. When set to 115 volts, the UPM-1P and UPM-2P will operate properly when the AC remains within the range of 105 to 130 volts. If set to 230 volts, the unit operates safely and without audio discontinuity within the range of 210 to 264 volts. Operating outside these ranges or with the voltage switch set improperly could damage the unit.

CAUTION: To avoid damage to the unit, check the AC voltage selector switch (Figure 1.2) on the user panel before plugging in the unit and applying power. Set the switch to local AC voltage. Always unplug the power cord before changing the voltage selector switch.

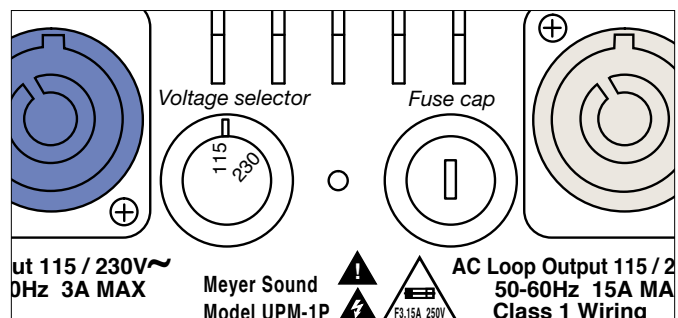


Figure 1.2. Rear panel AC inlet and voltage selector switch


After applying AC power, the system is muted while the circuitry charges up and stabilizes. After two seconds, the following occurs:

1. The main power supply slowly ramps on.
2. The green On/Temp LED on the user panel lights up, indicating that the system is enabled and ready to pass audio signals.

CAUTION: If the On/Temp LED does not illuminate or the system does not respond to audio input after 10 seconds, remove AC power immediately. Verify that the voltage is within the proper range. If the problem persists, please contact Meyer Sound or an authorized service center.

If voltage drops below the low boundary of its safe operating range (brownout), the UPM-1P or UPM-2P loudspeakers use stored energy to continue functioning briefly, and shut down only if voltage does not rise above the low boundary before storage circuits are depleted. How long the loudspeaker will continue to function during brownout depends upon the amount of voltage drop and the audio source level during the drop.

If the voltage increases above the upper boundary of either range, the power supply may be damaged.

 **NOTE:** It is recommended that the supply be operated in its rated voltage window at least a few volts away from the turn on/off points. This ensures that that AC voltage variations from the service entry – or peak voltage drops due to cable runs – do not cause the amplifier to cycle on and off or cause damage to the power supply.

Current Requirements

The UPM-1P and UPM-2P loudspeakers require approximately 3 amps rms max at 115 volts AC for proper operation. This allows up to five loudspeakers to be powered from one 15-amp breaker.

The UPM-1P and UPM-2P loudspeakers present a dynamic load to the AC mains, which causes the amount of current to fluctuate between quiet and loud operating levels. Since different cables and circuit breakers heat up at varying rates, it is essential to understand the types of current ratings and how they correspond to circuit breaker and cable specifications.

The *maximum long-term continuous current* is the maximum rms current during a period of at least ten seconds. It is used to calculate the temperature increase in cables, in order to select a cable size and gauge that conforms to electrical code standards. It is also used to select the rating for slow-reacting thermal breakers.

The *burst current* is the maximum rms current during a period of approximately one second, used to select the rating of most magnetic breakers and to calculate the peak voltage drop in long AC cables according to the formula:


$$V_{pk}(\text{drop}) = I_{pk} \times R(\text{cable total})$$

The *ultimate short-term peak current* is used to select the rating of fast reacting magnetic breakers.


Use Table 1.1 below as a guide when selecting cable gauge size and circuit breaker ratings for your operating voltage.

Table 1.1: Current Ratings for UPM-1P and UPM-2P

Current Draw	115 V AC	230 V AC	100 V AC
Max. long-term continuous	1 A rms	0.5 A rms	1.2 A rms
Burst current	1.3 A rms	0.65 A rms	1.5 A rms
Ultimate short-term peak	2.9 A pk	2 A pk	3.3 A pk
Idle current	0.13 A rms	0.065 A rms	0.15 A rms

 **NOTE:** For best performance, the AC cable voltage drop should not exceed 10 volts, or 10 percent at 115 volts and 5 percent at 230 volts. Make sure that even with the AC voltage drop the AC voltage always stays in the operating window.

The minimum electrical service amperage required by UPM-1P and UPM-2P systems is the sum of each loudspeaker’s maximum continuous rms current. An additional 30 percent above the minimum amperage is recommended to prevent peak voltage drops at the service entry.

 **CAUTION:** In the unlikely event that the fuse trips, always replace a fuse with the same rating and type of fuse. The UPM-1P and UPM-2P loudspeakers use a quick-acting 3.15-amp current, 250 volts low breaking capacity fuse.

Power Connector Wiring

The UPM-1P and UPM-2P loudspeakers require a grounded outlet. It is very important that the system be properly grounded in order to operate safely and properly. Use the AC cable wiring diagram shown in Figure 1.3 to create international or special-purpose power connectors.

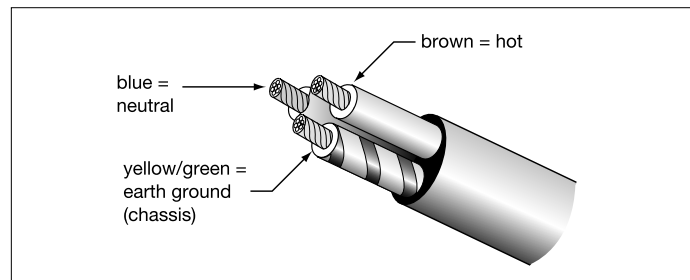


Figure 1.3. AC cable color code

If the colors referred to in Figure 1.3 don't correspond to the terminals in your plug, use the following guidelines:

- Connect the blue wire to the terminal marked with an N or colored black.
- Connect the brown wire to the terminal marked with an L or colored red.
- Connect the green and yellow wire to the terminal marked with an E, G or the protective earth ground symbol:



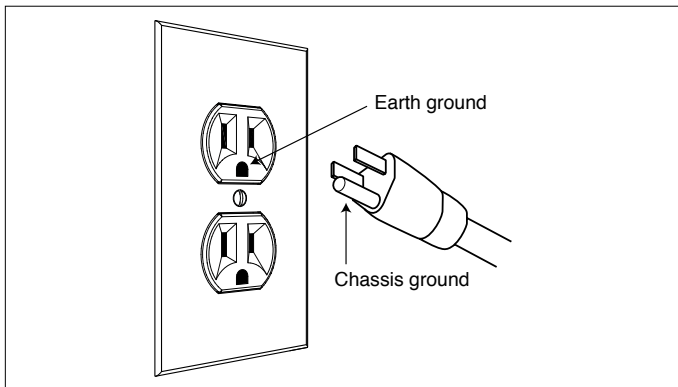
or colored green.



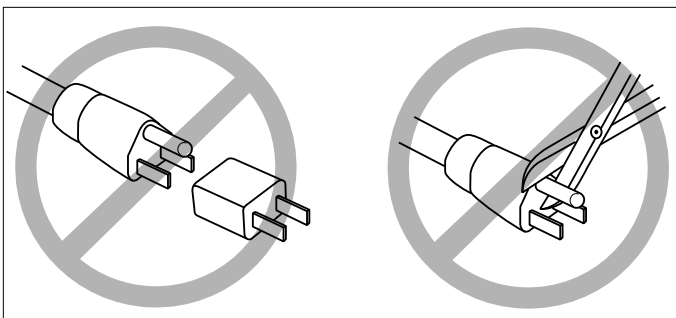
CAUTION: Do not operate the unit with worn or frayed cables; replace them immediately.

ELECTRICAL SAFETY ISSUES

Pay close attention to these important electrical and safety issues.



CAUTION: The UPM-1P and UPM-2P require a ground connection. Always use a grounded outlet and plug. Do not use a ground-lifting adapter or cut the AC cable ground pin.



CAUTION: Keep all liquids away from the UPM-1P and UPM-2P to avoid hazards from electrical shock.

CHAPTER 2: AMPLIFICATION AND AUDIO

The UPM-1P and UPM-2P loudspeakers use sophisticated amplification and protection circuitry to produce consistent and predictable results in any system design. This chapter will help you understand and harness the power of the UPM-1P and UPM-2P amplifier and audio systems.

The user panel of the loudspeaker (Figure 2.1) provides two slots for modules. The top slot contains the audio input module. The optional RMS communications module sits in the bottom slot if installed; a blank plate covers the bottom slot if RMS is not installed.

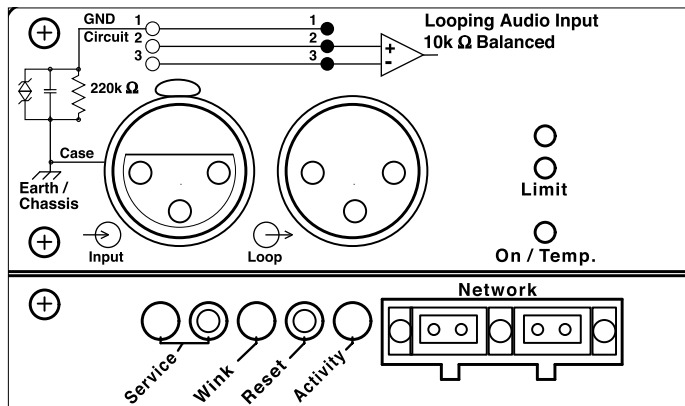


Figure 2.1. The user panel of the UPM-1P with standard looping audio input module and optional RMS

NOTE: See Chapter 3, “RMS Remote Monitoring System (Optional),” for more information on using RMS with the UPM-1P and UPM-2P loudspeakers.

AUDIO INPUT

UPM-1P and UPM-2P loudspeakers use a balanced, female XLR connector for the audio input module in the loudspeaker, and a male XLR loop connector to interconnect multiple cabinets. The loop connector, wired in parallel to the audio input, transmits the input signal if the loudspeaker is turned off for any reason.

The audio input presents a 10 kOhm balanced input impedance to a three-pin XLR connector with the following connectors:

- Pin 1 — 220 kOhm to chassis and earth ground (ESD clamped)
- Pin 2 — Signal (+)
- Pin 3 — Signal (-)
- Case — Earth (AC) ground and chassis

NOTE: Ensure that all cabling carrying signal to multiple loudspeakers is wired correctly (Pin 1 to Pin 1, Pin 2 to Pin 2, and so on), to prevent the polarity from being reversed. If one or more loudspeakers in a system has reversed polarity, this can cause severe degradation in frequency response and coverage.

CAUTION: Shorting an input connector pin to the case can form a ground loop and cause hum.

Input Module Options

There are two interchangeable audio input modules with and without controls for different applications.

Looping Audio Input Module

All UPM-1P and UPM-2P loudspeakers are equipped standard with the looping audio input module (Figure 2.2), Pins 2 and 3 carry the input as a differential signal; pin 2 is hot relative to pin 3, resulting in a positive pressure wave when a positive signal is applied to pin 2. This input module has a balanced, female XLR audio input connector and a male XLR loop out connector.

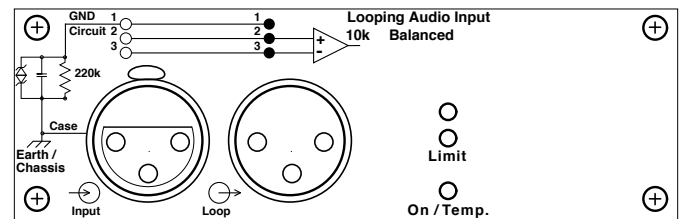


Figure 2.2. The looping audio input module

Looping, Polarity and Attenuating Audio Input Module

The looping, polarity and attenuating audio input module (Figure 2.3) has a balanced, female XLR audio input connector, a male XLR loop connector, an input polarity switch, and a level attenuator. The input polarity switch offers a convenient method of reversing the polarity of the loudspeaker. The loop out remains unchanged.

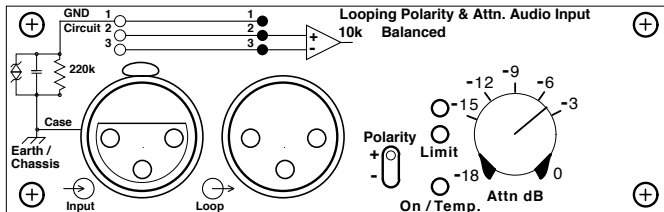


Figure 2.3. The looping, polarity and attenuating audio input module

When the input polarity switch is in the up (+) position, pin 2 is hot. When the switch is down (-), pin 3 is hot relative to pin 2, resulting in a positive pressure wave when a positive signal is applied to pin 3. The level attenuator operates between 0 dB (no level attenuation) when turned all the way to the right and -18 dB when turned all the way to the left.



NOTE: In both modules, Pin 1 is connected to earth through a 220 kOhm, 1000 pF, 15-volt clamp network. This ingenious circuit provides virtual ground lift at audio frequencies, while allowing unwanted signals to bleed to ground. Use standard audio cables with XLR connectors for balanced signal sources with all three pins connected on both ends. Telescopic grounding is not recommended.

Regardless of the input module type, audio signals can be daisy-chained using the loop output connector on the user panel. A single source can drive multiple loudspeakers with a paralleled input loop, creating an unbuffered hard-wired loop connection. If driving multiple loudspeakers in a system, make certain that the source device can drive the total load impedance presented by the paralleled input circuit of the system. The audio source must be capable of providing a minimum of 20 dB volts (10 volts rms into 600 ohms) to produce the maximum peak SPL over the operating bandwidth of the loudspeaker.

To avoid distortion from the source, make sure the source equipment provides an adequate drive circuit design for the total paralleled load impedance presented by the system. The input impedance for a single loudspeaker is 10 kOhms. If n represents the number of loudspeakers in a system, paralleling the inputs of n loudspeakers will produce a balanced input load of 10 kOhms divided by n .



NOTE: Most source equipment is safe for driving loads no smaller than 10 times the source's output impedance.

For example, cascading an array of 10 loudspeakers produces an input impedance of 1000 ohms (10 kOhms divided by 10). The source equipment should have an output impedance of 100 ohms or less. This is also true when connecting UPM-1P or UPM-2P loudspeakers in parallel (loop out) with other self-powered Meyer Sound loudspeakers and subwoofers



TIP: If the loudspeaker produces hissing and popping or similar noises, disconnect the audio cable from the loudspeaker. If the noise stops, then most likely the problem is not with the loudspeaker. Check the audio cable, source, and AC power.

AMPLIFICATION AND LIMITING

The low- and high-frequency drivers in the UPM-1P and UPM-2P loudspeakers are powered by a two-channel proprietary Meyer Sound amplifier utilizing complementary MOSFET output stages. The amplifier processes the audio through the use of electronic crossover, phase and frequency response correction filters as well as driver protection circuitry. Each channel has peak and rms limiters that prevent driver over-excursion and regulate the temperature of the voice coil. Limiter activity for the high and low channels is indicated by two yellow limit LEDs on the rear panel (the high-frequency limit LED is on top and the low-frequency limit LED is on bottom).



CAUTION: Although the UPM-1P and UPM-2P use the same amplifier/heatsink module, their internal control boards are different. In order to maintain factory acoustical specifications and driver protection (as well as keep from voiding the factory warranty), never interchange the amplifiers used in the UPM-1P and UPM-2P. If you need to replace a UPM-1P or UPM-2P amplifier and/or control board, please contact Meyer Sound.

The UPM-1P and UPM-2P loudspeakers perform within their acoustical specifications and operate at a normal temperature if the limit LEDs are on for no longer than two seconds, and off for at least one second. If either LED remains on for longer than three seconds, that channel incurs these consequences:

- Increasing the input level will not increase the volume.
- The system distorts due to clipping and nonlinear driver operation.
- Unequal limiting between the low and high frequency drivers alters the frequency response.
- The lifespan of the drivers is reduced because they are subjected to excessive heat.

Limiters protect the system under overload conditions and exhibit smooth sonic characteristics, but it is recommended that you do not drive the loudspeaker into continuous limiting.



CAUTION: The limit LEDs indicate when the safe power level is exceeded. If the loudspeakers used in the system begin to limit before reaching the required SPL, consider adding more loudspeakers to satisfy the SPL requirements without exposing the drivers to excessive heat and/or excursion.

DRIVER INTERCONNECTIONS

The two 5-inch, low-frequency drivers are powered by one channel of the amplifier. The single 1-inch metal dome high-frequency driver is powered by the other channel. Figure 2.4 shows how the UPM-1P and UPM-2P drivers are connected to the amplifier.

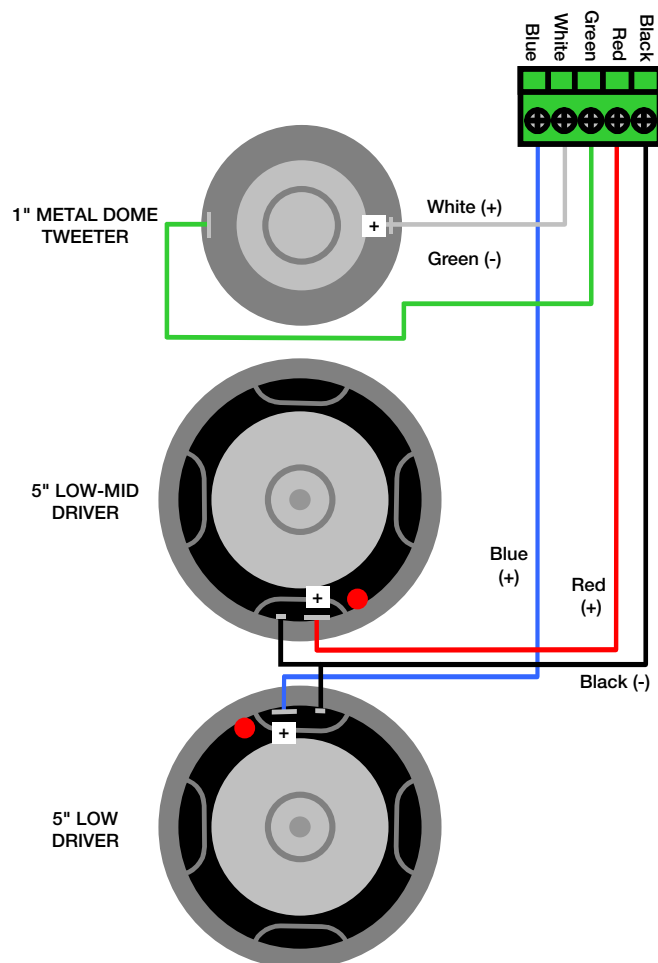


Figure 2.4: UPM-1P/UPM-2P internal wiring harness diagram



CAUTION: All Meyer Sound loudspeakers are shipped with the drivers in correct alignment. However, if a driver needs to be replaced, make sure the replacement is reinstalled with the correct polarity. Incorrect driver polarity impairs the system performance and may damage the drivers.

CHAPTER 3: RMS REMOTE MONITORING SYSTEM (OPTIONAL)

An optional RMS communication module can be installed in the UPM-1P and UPM-2P loudspeakers' lower module slot.

RMS is a real-time networked monitoring system that connects Meyer Sound self-powered loudspeakers with a Windows-based PC at the sound mix position or other desired remote location. Optional RMS software delivers extensive status and system performance data directly to you from every installed loudspeaker.

RMS allows you to monitor amplifier voltages, limiting activity, power output, temperature, fan and driver status, warning alerts, and other key data for up to 62 loudspeakers without a network repeater; data is updated two to five times per second.



NOTE: Optional Loudspeaker Mute and Solo functions, helpful for acoustic setup or troubleshooting, are also available. A jumper must be installed in the RMS communication module in order to enable Mute and/or Solo functionality; the software also needs to be enabled for these functions. When fitted with an RMS communication module, the loudspeaker is shipped with these functions disabled. Once the RMS jumper(s) are installed, muting can still be disabled to eliminate any chance of an operator error (a muting error, for example) during a performance. Both functions can be controlled by software commands. Also note that RMS does not control AC power.

Loudspeakers are identified on the network by Node Names assigned during a one-time “commission” (Figure 3.1) into the RMS database that resides on the host computer (as a part of the software).

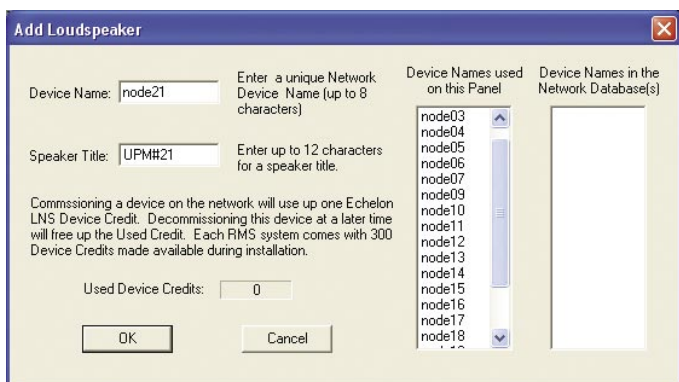


Figure 3.1. Commissioning a loudspeaker using RMS

This information is permanently stored on each RMS communication module and in the RMS database unless you modify it. Speaker Titles can be modified at any time, allowing you to customize how you view the data.

In addition, any loudspeaker can be physically identified from RMS software by activating the Wink function – a Wink LED will turn on the RMS communication board that corresponds to its Node Name.

A loudspeaker is identified using the RMS software by activating the “service” function; an icon will show up on the RMS screen corresponding to its Node Name (Figure 3.2). This makes verifying Speaker Titles and speaker field labels easy, using the Wink or Service Button commands.

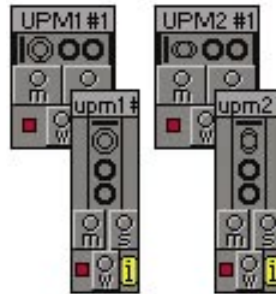


Figure 3.2. RMS loudspeaker icons



NOTE: If the loudspeaker’s amplifier heatsink temperature exceeds 75° C (167° F), the loudspeaker’s user panel On/Temp LED will turn red, while the loudspeaker icon in the RMS host software will respond by displaying yellow – indicating that the loudspeaker is running hot, but still within safe operating limits. If the LED in the RMS host software changes to red, then the UPM-1P/UPM-2P is operating above its 100° C (212° F) maximum safe operating temperature. Check to ensure that the cabinet is properly ventilated and/or decrease the loudspeaker’s audio output signal immediately.

UNDERSTANDING THE RMS USER PANEL

The RMS section of the user panel has three LEDs and two buttons (Figure 3.3).

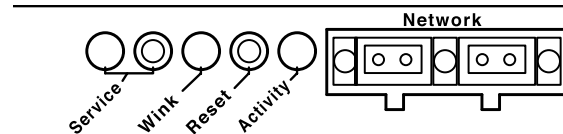


Figure 3.3. RMS section of the user panel

The following sections describe their functions.

Service LED (Red)

When blinking once every two seconds, the Service LED indicates that the network hardware is operational, but the loudspeaker is not installed (commissioned) on the network. When a loudspeaker has been installed on the network

the Service LED will be unlit and the Activity LED will flash continuously.



NOTE: When continuously lit, the Service LED indicates that the loudspeaker has had a local RMS hardware failure. In this case, the RMS communication module may be damaged and you should contact Meyer Sound Technical Support.

decommissioned from the network and the red Service LED will blink.

Activity LED (Green)

When the loudspeaker has been commissioned the Activity LED will flash continuously. When the Activity LED is unlit (and the red LED is blinking) the loudspeaker has not been installed on the network.

Service Button

Pressing the Service button will display an indicator on the corresponding loudspeaker display icon on the RMS screen. Press and hold both the Service and the Reset buttons to decommission the communications module will from the network. The red Service LED will blink.



NOTE: The LEDs and buttons on the RMS section of the user panel shown in Figure 3.3 are used exclusively by RMS, and have no effect on the acoustical and/or electrical activity of the loudspeaker itself – unless Mute or Solo is enabled at the module and from the RMS software.

Wink LED (green)

When lit, the Wink LED indicates that an ID signal has been sent from the host station computer to the loudspeaker. This is accomplished using the Wink button on the loudspeaker Icon, Meter or Text views in the RMS monitoring program.

Reset Button

Pressing the Reset button will cause the firmware code within the RMS card to reboot. However, the commissioning state of the communications module will not change (this is stored in flash memory). When used in combination with the Service button, the communications module will be

USER INTERFACE

The optional RMS software features an intuitive, graphical user interface. As mentioned earlier, each loudspeaker appears on your computer monitor as a “view” in the form of a status icon, bar graph meter, or text meter (numerical values), depending on your preferences.

Each view contains loudspeaker identification information and data from the amplifier, controller, drivers and power supply of that particular unit. System status conditions cause changes in icon and bar graph indicators, alerting the operator to faults or excessive levels. The views are moveable and are typically arranged on the screen to reflect the physical layout of the loudspeakers. You can design a screen “panel” of icons or meters, as shown in Figure 3.4,

and save it on your hard disk, with the panel conveniently named for a unique arrangement or performance.

If the loudspeaker installation pattern changes completely, a new screen panel can be built. If a different subset of already installed loudspeakers will be used for a subsequent show, only selected loudspeakers need to appear on the monitoring screen for that performance.

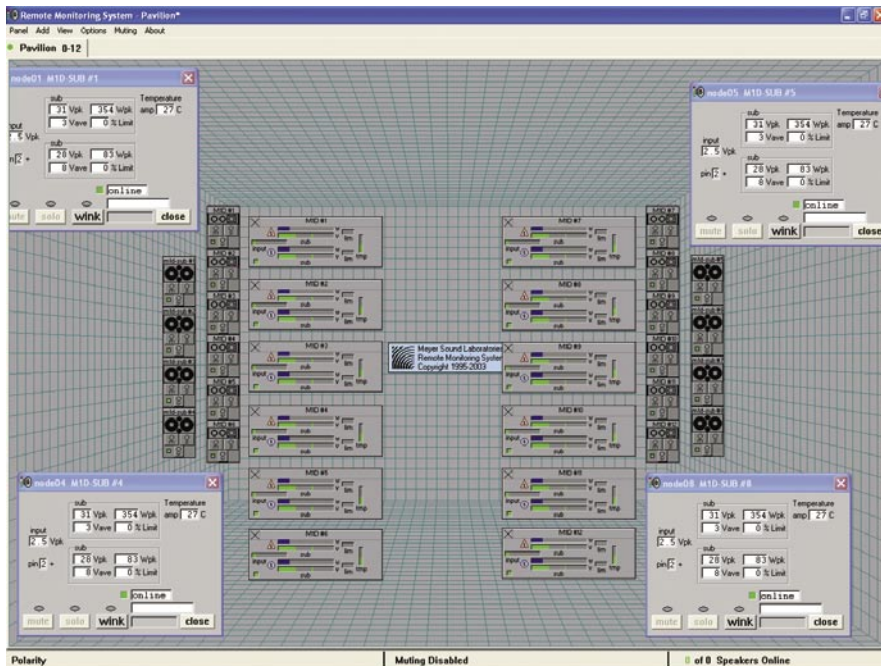


Figure 3.4: Sample RMS display panel



NOTE: For more information on RMS, please refer to the RMS User Guide included with the software.

CHAPTER 4: USING SUBWOOFERS WITH THE UPM-1P AND UPM-2P

UPM-1P and UPM-2P loudspeakers can be deployed in combination with Meyer Sound self-powered USW-1P compact and UMS-1P ultra-compact subwoofers. These subwoofers are capable of producing very low frequencies and extending overall system response appreciably and increasing the acoustic power of a system in the lowest frequencies. The UMS-1P and USW-1P extend system frequency response down to 29 Hz and 30 Hz, respectively.

In addition, the use of high-pass filters to drive a UPM-1P or UPM-2P system with subwoofers flattens overall frequency response and slightly increases UPM-1P or UPM-2P headroom in the lowest end of their usable spectrum.

The ideal ratio of UPM-1P or UPM-2P loudspeakers to subwoofers depends on the configuration of the system, the application, and the frequency content of the signal being reproduced. For most applications, a ratio of two UPM-1P or UPM-2P loudspeakers for each UMS-1P subwoofer and four UPM-1P or UPM-2P loudspeakers for each USW-1P subwoofer yields good results in frequency response and headroom.



NOTE: The limit LEDs indicate when the safe power level is exceeded. If the subwoofers used in the system begin to limit before reaching the required SPL at low frequencies, consider adding more subwoofers to satisfy the SPL requirements without exposing the drivers to excessive heat and/or excursion.

Three basic connection options exist depending on your system configuration.

DAISY-CHAINED

When UPM-1P or UPM-2P loudspeakers and subwoofers are daisy-chained using the loop feature on the user panel, the result will be a fairly flat frequency response. However, the response will show a rise in the 60 to 200 Hz range where the loudspeakers' response overlaps at a ratio of two UPM-1P or UPM-2P loudspeakers to each subwoofer.

Make sure the polarity of the UPM-1P or UPM-2P loudspeakers and the subwoofers are identical. If the UPM-1P/UPM-2P and the USW-1P or UMS-1P are both fitted with the standard looping module, there is no polarity switch; all loudspeakers in the system are set to pin 2+. However, if they are fitted with looping, polarity and attenuation audio input modules, make sure both are set to the same polarity.



CAUTION: Make sure that the source equipment can drive the total load of the paralleled system. (See the Audio Input section on page 9.)



NOTE: When a UPM-1P or UPM-2P loudspeaker and a subwoofer are used in their full-range configuration (e.g., looped audio or the same audio feed), their polarities should be kept the same if they are co-planar or near to each other. If they are separated by a greater distance — or delay must be used between them — a measurement system such as Meyer Sound's SIM® audio analyzer should be used to determine the correct delay and polarity.

ADDING A LINE DRIVER

Driving a UPM-1P or UPM-2P loudspeaker system and subwoofers with the same signal from different outputs using a line driver allows adjustments to the gain and polarity of each sub-system. This could be used effectively to compensate for the ratio of loudspeakers or acoustical conditions. If gains are adjusted to the same level, the combined response is identical to a daisy-chain configuration with a rise in level in the overlapping range.



NOTE: When driving UPM-1P and/or UPM-2P loudspeakers from the Mid-Hi output of the LD-1A, LD-2 or LD-3 line driver, with USW-1P or UMS-1P subwoofers driven from the subwoofer output in their full-range configuration, their polarities should be kept the same if they are co-planar or near each other.

If the UPM-1P/UPM-2P loudspeakers and USW-1P or UMS-1P subwoofers are separated by a greater distance — or delay must be used between them — a measurement system such as the SIM audio analyzer should be used to determine the correct delay and polarity.

Engaging the Lo-Cut Filter

Using the LD-1A, LD-2 or LD-3 Lo-Cut filter (160 Hz position on the LD-3) with a system comprising UPM-1P or UPM-2P loudspeakers and subwoofers in close proximity and co-planar will produce a very flat frequency response with a minimal area of overlap. The UPM-1P or UPM-2P loudspeakers in the system receive their signal following a high-pass filter, while the subwoofers apply their normal internal crossover frequencies to a full range signal. To achieve this flat response, the subwoofers need to have their polarity reversed.



TIP: The flatness of the response is dependent on proximity to boundary surfaces.

While the change of polarity with respect to a daisy-chained configuration is needed due to the phase shift caused by the high-pass filter at overlapping frequencies, placing subwoofers more than 4 feet apart from UPM-1P or UPM-2P loudspeakers may require reversing the polarities once again to compensate for the delay propagation.



NOTE: When driving UPM-1P or UPM-2P loudspeakers from the Mid-Hi output of the LD-1A, LD-2 or LD-3 line driver — with the Lo-Cut filter engaged (160 Hz position), and USW-1P or UMS-1P subwoofers in their full-range configuration — their polarities should be reversed if they are co-planar or near each other. The simplest way to achieve this is by engaging the “reverse polarity” switch on the sub output of the line driver.

If your UPM-1P or UPM-2P loudspeakers and UMS-1P/USW-1P subwoofers are separated by a greater distance — or delay must be used between them — a measurement system such as the SIM audio analyzer should be used to determine the correct delay and polarity.

DIGITAL SIGNAL PROCESSORS

Full-range signals may be applied to Meyer Sound’s self-powered loudspeakers because they have built-in active crossover circuits; external crossovers and digital signal processors (DSP) are optional and should be used very carefully as phase shifts can cause destructive cancellations.

If a DSP is used, the UPM-1P or UPM-2P loudspeakers and subwoofers should be fed from the DSP in order to keep their delay time the same and avoid any phase shift differences between the UPM-1P or UPM-2P loudspeakers and the subwoofers. In addition, it is good practice to verify

that the delay time between channels is correct: Some DSPs may develop channel-to-channel delay errors when the DSP is near maximum throughput.

In no case should a filter higher than 2nd order be used. The additional phase shift introduced deteriorates the impulse response and higher roll-off does not improve crossover interaction. In fact, it is highly recommended that the crossover/filter is set to emulate the low-cut LD-1A, LD-2 and LD-3 (160 Hz position) characteristics themselves, as shown in Table 4.1.

Table 4.1: LD-1/LD-2/LD-3 Lo-Cut Filter Parameters

Type	Order	Pole Frequency	Q
High Pass	2 nd (-12dB/oct)	162 Hz	0.82*

**If the DSP does not have variable Q for high-pass filters, the filter should be set to “Butterworth” (Q = .7).*

If the loudspeakers are going to be driven directly from DSP, verify that the outputs of the processor have the driving capabilities to drive the total load presented by the loudspeakers connected to it.



NOTE: When precise system design, subwoofer integration, DSP and delay systems, and compensation for acoustical conditions all come into play, measurement and correction tools are a must. Meyer Sound’s SIM audio analyzer; LD-1A, LD-2 and LD-3 line drivers; and the CP-10 parametric equalizer are highly recommended.

CHAPTER 5: SYSTEM DESIGN AND INTEGRATION

Meyer Sound offers two comprehensive tools to assist you with the acoustical and functional requirements of system design and optimization. This chapter introduces you to the Meyer Sound MAPP Online acoustical prediction program, and the SIM audio analyzer, a robust instrumentation package for system measurement, analysis, and more.

MEYER SOUND MAPP ONLINE

The MAPP Online prediction program is a powerful, cross-platform, Java-based application for accurately predicting the coverage pattern, frequency response, impulse response, and maximum SPL output of single or arrayed Meyer Sound loudspeakers.

As its name indicates, the MAPP Online prediction program is an online application: When a prediction is requested, data is sent over the Internet to a high-powered server at Meyer Sound that runs a sophisticated acoustical prediction algorithm using high-resolution, complex (magnitude and phase) polar data. Predicted responses are returned over the Internet and displayed on your computer in color.

With the MAPP Online prediction program, you can:

- Plan an entire portable or fixed loudspeaker system and determine delay settings for fill loudspeakers.
- Clearly see interactions among loudspeakers and minimize destructive interference.

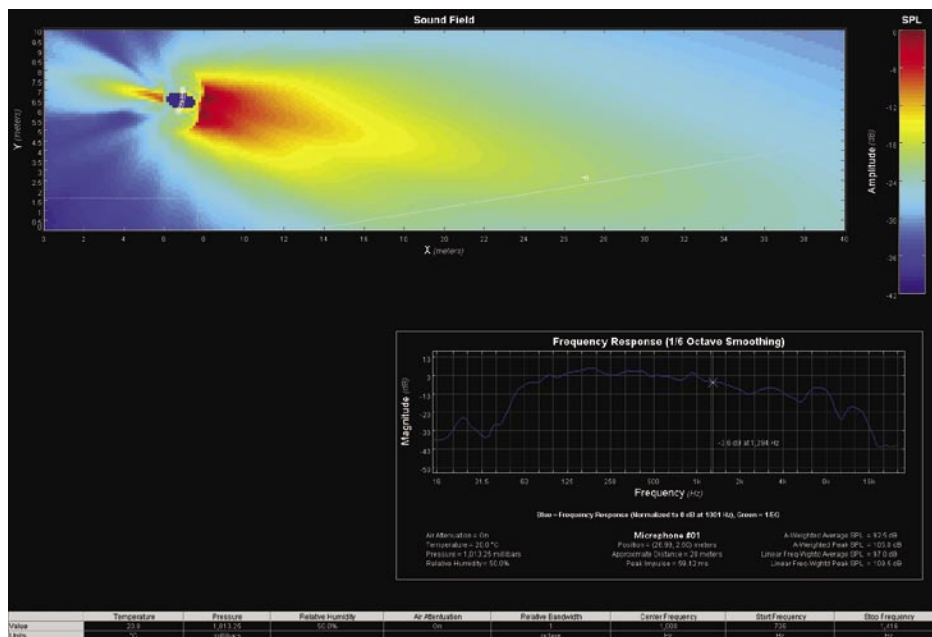


Figure 5.1. MAPP Online is an intuitive, powerful system design tool

Residing on your computer, the MAPP Online prediction program facilitates configuring arrays of a wide variety of Meyer Sound products and, optionally, defines the environment in which they will operate, including air temperature, pressure, and humidity, as well as the location and composition of walls. You can find the program at:

www.meyersound.com/products/software/mapponline



NOTE: In order to use the MAPP Online prediction program, you will need to register by clicking “Apply for MAPP Online” on the website listed above. After registration and upon approval, an e-mail will be sent to you with a user name and password along with the address for the website where you can download MAPP Online.

- Place microphones anywhere in the sound field and predict the frequency response, impulse response, and sound pressure level at the microphone position using MAPP Online's Virtual SIM feature.
- Refine your system design to provide the best coverage of the intended audience area.
- Use a Virtual VX-1 program equalizer to predetermine the correct control settings for best system response.
- Gain valuable load information about the array to determine rigging capacities.

The MAPP Online prediction program enables you to come to an installation with a wealth of information that

ensures the system will satisfy your requirements “out of the box” – including basic system delay and equalization settings. Its accurate, high-resolution predictions eliminate unexpected onsite adjustments and coverage problems.

MAPP Online is compatible with Windows, Linux®, Unix®, and Apple® Macintosh® computers running Mac OS® X version 10.1.2 or higher. The MAPP Online Web page lists additional system requirements and recommendations.

SIM MEASUREMENT SYSTEM

The SIM audio analyzer is a measurement and instrumentation system including a selection of hardware and software options, microphones and accessory cables. The SIM analyzer is optimized for making audio frequency measurements of an acoustical system with a resolution of up to 1/24 of an octave; the high resolution enables you to apply precise electronic corrections to adjust system response using frequency and phase (time) domain information.

Source Independent Measurement Technique

The SIM audio analyzer implements Meyer Sound's source independent measurement technique, a dual-channel method that accommodates statistically unpredictable excitation signals. Any excitation signal that encompasses the frequency range of interest (even intermittently) may be used to obtain highly accurate measurements of acoustical or electronic systems. For example, concert halls and loudspeaker systems may be characterized during a musical performance using the program as the test signal, allowing you to:

- View measurement data as amplitude versus time (impulse response) or amplitude and phase versus frequency (frequency response)
- Utilize a single-channel spectrum mode
- View frequency domain data with a logarithmic frequency axis
- Determine and internally compensate for propagation delays using SIM Delay Finder function

Applications

The main application of the SIM audio analyzer is loudspeaker system testing and alignment. This includes:

- Measuring propagation delay between the subsystems to set correct polarities and set very precise delay times
- Measuring variations in frequency response caused by the acoustical environment and the placement and interaction of the loudspeakers to set corrective equalization
- Optimizing subwoofer integration
- Optimizing loudspeaker arrays

The SIM audio analyzer can also be used in the following applications:

- Microphone calibration and equalization
- Architectural acoustics
- Transducer evaluation and correction
- Echo detection and analysis
- Vibration analysis
- Underwater acoustics

CHAPTER 6: QUICKFLY RIGGING

The UPM-1P and UPM-2P can utilize components from Meyer Sound's QuickFly system — a range of rugged, reliable and deceptively simple rigging and mounting components. QuickFly facilitates placing loudspeakers in single units, hanging or attached to a surface, for a variety of applications.

CAUTION: All Meyer Sound products must be used in accordance with local, state, federal and industry regulations. It is the owner's and/or user's responsibility to evaluate the reliability of any rigging method for their application. Rigging should be carried out only by experienced professionals.

CAUTION: Always use properly rated rigging hardware.

CAUTION: It is important to inspect rigging hardware regularly and replace worn or damaged components immediately.

Each loudspeaker includes three rigging plates, situated on the top, bottom and on one side of the cabinet. There are two types of interchangeable rigging hardware, each fastened by three Phillips screws:

- 3/8"-16 nut plates
- M10 x 1.5 metric nut plates

CAUTION: Units are rated for the weight of one cabinet only.

STAND-MOUNTING THE UPM-1P AND UPM-2P LOUSPEAKERS

You can mount the UPM-1P or UPM-2P loudspeaker on a stand using the MSA-UPM stand adapter (Figure 6.1) along with a third party loudspeaker stand such as those made by Ultimate Support Systems (www.ultimatesupport.com). The MSA-UPM kit includes 3/8"-16 and M10 hardware. To secure the adapter, attach the adhesive-backed cork washer onto the stand and secure the stand to the loudspeaker using the bolt and washer, as shown in figure 6.1.

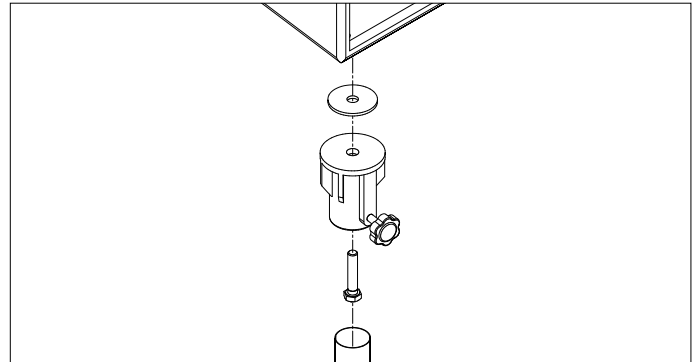


Figure 6.1. MSA-UPM Stand Adapter

MYA-UPM MOUNTING YOKE ASSEMBLY

This cradle-style mounting yoke (Figure 6.2) suspends a single UPM-1P or UPM-2P loudspeaker and allows a wide range of horizontal and vertical adjustment. The yoke attaches to the top and bottom nut plates. The mounting yoke kit includes 3/8"-16 and M10 hardware.

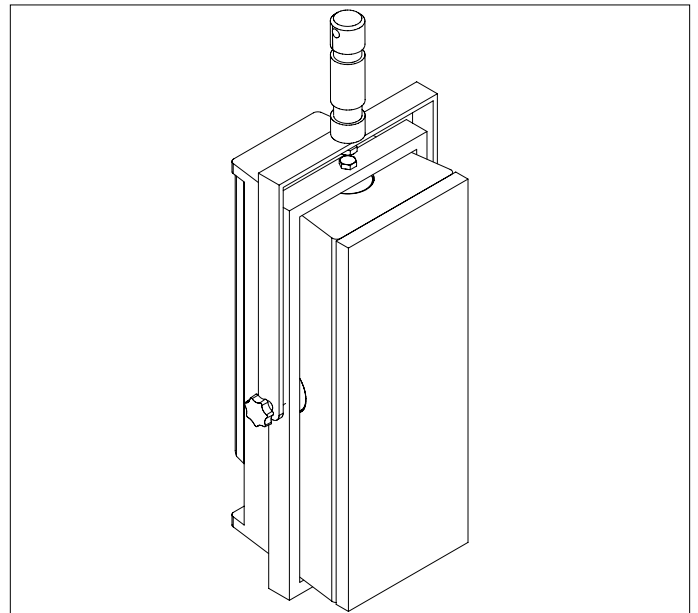


Figure 6.2. The MYA-UPM is used to suspend a single UPM-1P or UPM-2P cabinet

CAUTION: To secure the loudspeaker to the yoke, tighten the bottom bolt first and then the top. Do not overtorque the top and bottom bolts, as this may damage the cabinet.

A hanging clamp ("C" or "G" type) and a steel safety cable are required to enable the yoke to be used (not supplied as a part of the yoke assembly kit).

USING THE MUB-UPM U-BRACKET

The MUB-UPM U-bracket (Figure 6.3) allows a UPM-1P or UPM-2P loudspeaker to be mounted to a wall, ceiling or floor.

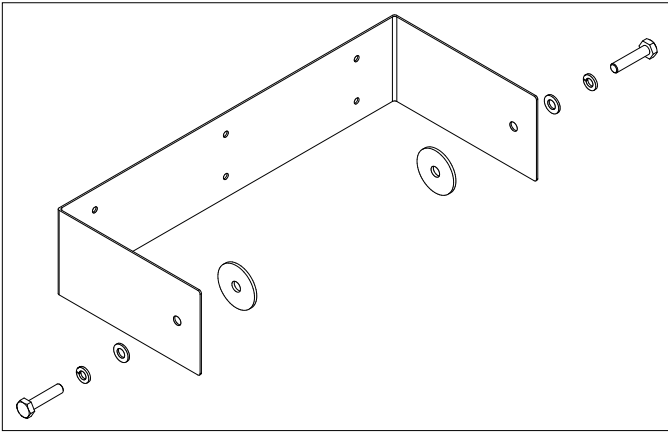


Figure 6.3. MUB-UPM U-bracket

A single MUB-UPM U-bracket provides maximum flexibility for positioning and securing the U-bracket according to the needs of the design and/or the venue.

To secure the bracket, attach the adhesive backed cork washer onto the inside walls of the bracket and bolt the loudspeaker to the MUB-UPM bracket using the bolts and washers as shown on figure 6.3. Make sure the bolts are well tightened.

Wall Mount

The MUB-UPM allows you to mount the UPM-1P or UPM-2P in both a vertical (Figure 6.4) and horizontal orientation (Figure 6.5) for wall mounting.

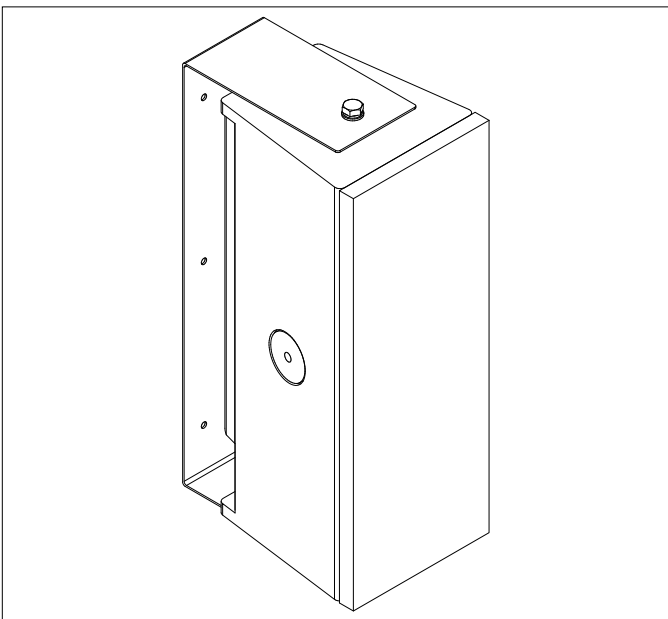


Figure 6.4. Vertically wall-mounting the UPM-1P

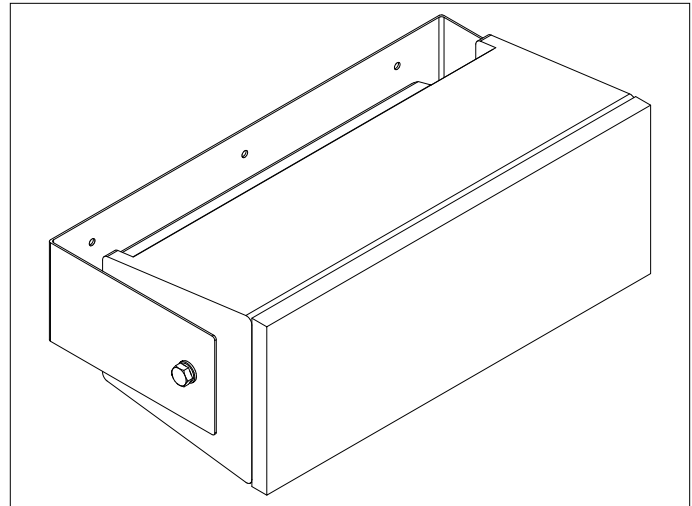


Figure 6.5. Horizontally wall-mounting the UPM-1P

Ceiling Mount

For mounting the UPM-1P or UPM-2P loudspeaker on a ceiling, underbalcony or canopy area, the MUB-UPM U-bracket is effective and stable (Figure 6.6).

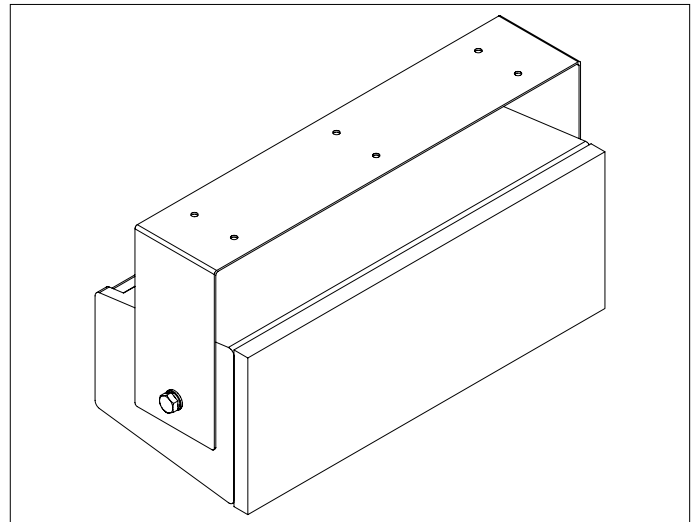


Figure 6.6. Ceiling-mounting the UPM-1P

Floor Mount

The MUB-UPM can also be used to mount the UPM-1P or UPM-2P on the floor or stage lip, which is useful for monitoring or front-fill applications, for example (Figure 6.7).

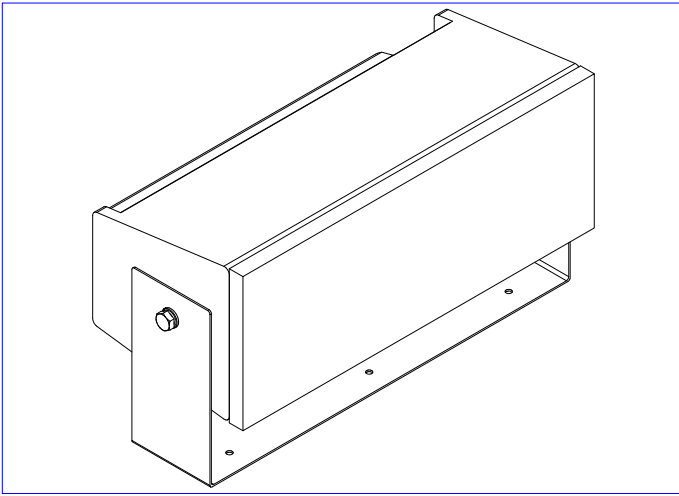


Figure 6.7. Floor-mounting the UPM-1P



CAUTION: Always use mounting hardware appropriate for the construction of the surface where the MUB-UPM will be installed.



CAUTION: Always use mounting and rigging hardware that has been rated to meet or exceed the weight being hung.

APPENDIX A: BASIC TROUBLESHOOTING

This section contains possible solutions to common problems encountered by UPM-1P and UPM-2P loudspeaker users and is not intended to be a comprehensive troubleshooting guide.

The On/Temp. LED does not illuminate and there is no audio.

1. Make sure the AC power cable is the correct type for the regional voltage and that it is securely connected to the AC inlet, then unplug and reconnect the AC cable.
2. Use an AC voltmeter to verify that the AC voltage is within the ranges 105 - 130 V AC and 210 - 260 V AC (for 100 volt version, 90 - 100 V AC recommended).
3. Check voltage switch.
4. Check fuse.
5. Call Meyer Sound Technical Support.

The On/Temp. LED is illuminated green but there is no sound.

1. Verify that the audio source (mixer, EQ, delay) is sending a valid signal.
2. Make sure the XLR cable is securely fastened to the XLR audio input connector.
3. Verify that the XLR cable is functioning by substituting another cable or by using the cable in question in a working system.
4. Send the audio signal to another loudspeaker to insure signal presence and that the level is within the proper range. Turn the source level down before reconnecting the audio input and increase the level slowly to avoid a sudden blast of sound.
5. If possible, monitor the audio source with headphones.

Hum or noise is produced by the loudspeaker.

1. Disconnect the audio input. If the noise persists, the problem is within the loudspeaker. In this case return the unit to the factory or nearest authorized service center. If the hum ceases, the noise originates somewhere earlier in the signal path.
2. Make sure the XLR cable is securely fastened to the XLR audio input connector.
3. Send the audio signal to another loudspeaker to insure signal presence and that the level is within the proper range. Turn the source level down before reconnecting the audio input and increase the level slowly to avoid a sudden blast of sound.

4. Hum or noise can be produced by a ground loop. Since the UPM-1P and UPM-2P are effectively ground-lifted, the loop must be broken elsewhere in the system.

The audio produced by the loudspeaker is distorted or compressed but the Limit LED is not illuminated.

1. Make sure the XLR cable is securely fastened to the XLR audio input connector.
2. Send the audio signal to another loudspeaker to insure that the level is within the proper range. Turn the source level down before reconnecting the audio input and increase the level slowly to avoid a sudden blast of sound.
3. Monitor the audio source with headphones.

The audio produced by the loudspeaker is highly compressed and the Limit LED is constantly yellow.

1. Turn down the level of the input signal to the speaker system.

The On/Temp. LED is illuminated red.

This occurs in conditions where the heatsink temperature reaches 75° C (167° F), indicating that the amplifier is thermally overloaded.

1. Turn down the level of the input signal to the loudspeaker system.
2. Make sure there is sufficient air flow around the unit.
3. Avoid exposing the heatsink to direct sunlight if the ambient temperature is high.

See the Amplification and Limiting, and Amplifier Cooling System sections on page 10 for a complete discussion about the cooling system.

Only the high or low drivers seem to produce sound.

1. Make sure the audio signal is full-range and has not been filtered in a previous stage of the signal chain. If possible, monitor the audio source with high-quality headphones.
2. Send the audio signal to another loudspeaker to ensure that the signal is full-range. Turn the source level down before reconnecting the audio input and increase the level slowly to avoid a sudden blast of sound.
3. Use a sine wave and/or pink noise generator to send a variety of frequencies to the loudspeaker.

APPENDIX B: SPECIFICATIONS

ACOUSTICAL – UPM-1P	
Operating frequency range	75 Hz - 20 kHz Note: Recommended maximum operating frequency range. Response depends on loading conditions and room acoustics.
Frequency response	80 Hz - 16 kHz ± 4 dB Note: Free field, measured with 1/3-octave frequency resolution at 4 meters.
Phase response	300 Hz - 18 kHz $\pm 60^\circ$
Maximum peak SPL	123 dB Note: Measured with music at 1 meter.
Dynamic range	>110 dB
Coverage	100° x 100°
Acoustical crossover	1.3 kHz Note: At this frequency, the transducers produce equal sound pressure levels.
ACOUSTICAL – UPM-2P	
Operating frequency range	80 Hz - 20 kHz Note: Recommended maximum operating frequency range. Response depends upon loading conditions and room acoustics.
Frequency response	85 Hz - 19 kHz ± 4 dB Note: Measured with 1/3 octave frequency resolution at 4 meters.
Phase response	300 Hz - 18 kHz $\pm 60^\circ$
Maximum peak SPL	123 dB Note: Measured with music at 1 meter.
Dynamic range	>110 dB
Coverage	45° x 45°
Acoustical crossover	2.3 kHz Note: At this frequency, the transducers produce equal sound pressure levels.
TRANSDUCERS – UPM-1P/UPM-2P	
Low frequency	Two 5" cone drivers Nominal impedance: 8 Ω Voice coil size: 1" Power-handling capability: 200 W (AES) Note: Power handling is measured under AES standard conditions: transducer driven continuously for two hours with band limited noise signal having a 6 dB peak-average ratio.
Note: To eliminate interference at short wavelengths, the two 5" drivers work in combination at low frequencies below 320 Hz. Above 320 Hz only the cone driver closer to the tweeter is fed from the crossover up to the crossover frequency to maintain optimal polar and off-axis frequency response characteristics.	
High frequency	One 1" metal dome tweeter on symmetric horn Nominal impedance: 8 Ω Voice coil size: 1" Diaphragm size: 1" Power-handling capability: 20 W (AES) Note: Power handling is measured under AES standard conditions: transducer driven continuously for two hours with band limited noise signal having a 6 dB peak-average ratio.

AUDIO INPUT – UPM-1P/UPM-2P	
Type	Differential, electronically balanced
Max. common mode range	± 15 V DC, clamped to earth for voltage transient protection
Connectors	Female XLR input and male XLR loop output
Input impedance	10 k Ω differential between pins 2 and 3
Wiring	Pin 1: Chassis/earth through 220 k Ω , 1000pF, 15V clamp network to provide virtual ground lift at audio frequencies; Pin 2: Signal + Pin 3: Signal - Case: Earth ground and chassis
DC Blocking	Differential DC blocking up to max. common mode voltage
CMRR	>50 dB; typically 80 dB (50 Hz - 500 Hz)
RF filter	Common mode: 425 kHz low-pass; Differential mode: 142 kHz
TIM filter	Integral to signal processing (<80 kHz)
Nominal input sensitivity	0 dBV (1 V rms, 1.4 V pk). 0 dBV continuous average is typically the onset of limiting for pink noise and music.
Input level	Audio source must be capable of producing a minimum of 20 dBV (10 V rms, 14 V pk) into 600 Ω in order to produce maximum peak SPL over the operating bandwidth of the loudspeaker.

AMPLIFIERS – UPM-1P/UPM-2P	
Note: The specific functions for each model such as crossover points, frequency and phase response, and driver protection are determined by the control card installed inside the amplifier.	
Amplifier type	Two-channel complementary MOSFET output stages class AB/bridged
Output power	350 W total
	Note: Amplifier wattage rating is based on the maximum unclipped burst sine-wave rms voltage the amplifier will produce in to the nominal load impedance low and high channels 30 V rms (42 V pk) into load impedance.
THD, IM TIM	< .02%
Load capacity	4 Ω low-frequency channel, 8 Ω high-frequency channel
Cooling	Convection

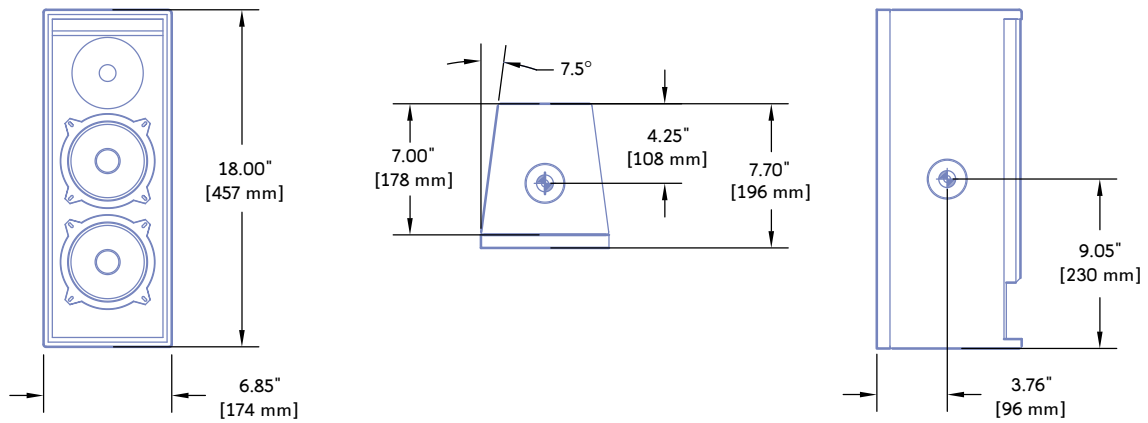
AC POWER – UPM-1P/UPM-2P	
AC power connector	PowerCon with looping output
Voltage selection	External 115/230 V AC switch (100 V option available)
Safety agency rated operating voltage	115 V AC - 240 V AC
Turn on/turn off points	Recommended voltage: 105 V AC - 130 V AC (115 V AC); 210 V AC - 260 V AC (230 V AC); no turn-off, only fuse protected above 135 V AC and 265 V AC (For 100 V AC version 90 V AC - 100 V AC recommended, 115 V AC max)

<i>Current Draw</i>	
Idle current	0.13 A rms (115 V AC); 0.065 A rms (230 V AC); 0.15 A rms (100 V AC)
Max. long-term continuous current (>10 sec)	1 A rms (115 V AC); at 0.5 A rms (230 V AC); 1.2 A rms (100 V AC)
Burst Current (<1 sec)	1.3 A rms (115 V AC); 0.65 A rms (230 V AC); 1.5 A rms (100 V AC)
Ultimate Short-Term Peak Current Draw	2.9 A pk (115 V AC); 2 A pk (230 V AC); 3.3 A pk (100 V AC)
Inrush Current	18 A pk (115 V AC); 12 A pk (230 V AC); 15 A pk (100 V AC)

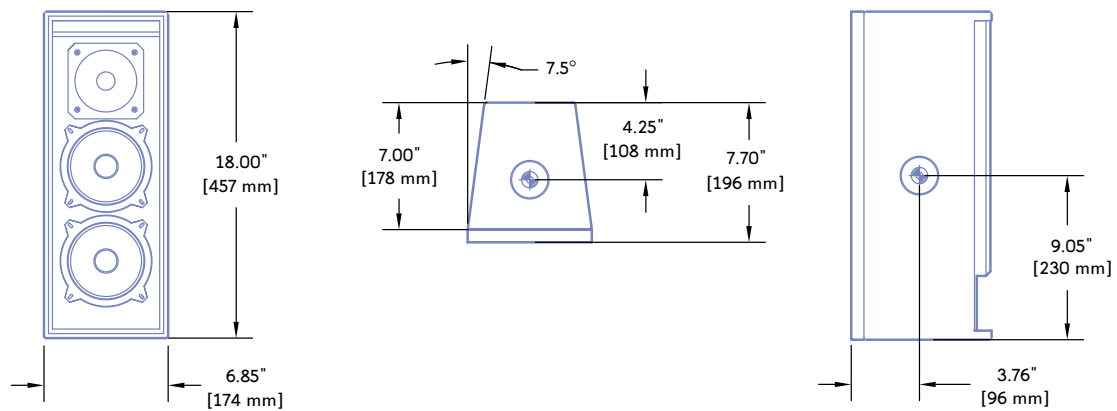
PHYSICAL – UPM-1P/UPM-2P

Enclosure	Multi-ply hardwood
Finish	Black textured
Protective grille	Hex stamped metal screen frame charcoal-grey foam covering
Rigging	3/8"-16 or M10 nut plates
Dimensions	6.85" w x 18.00" h x 7.70" d (174 mm x 457 mm x 196 mm)
Weight	21 lbs (9.53 kg)/shipping: 24 lbs (10.88 kg)

UPM-1P



UPM-2P





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05.084.003.01, Rev. C