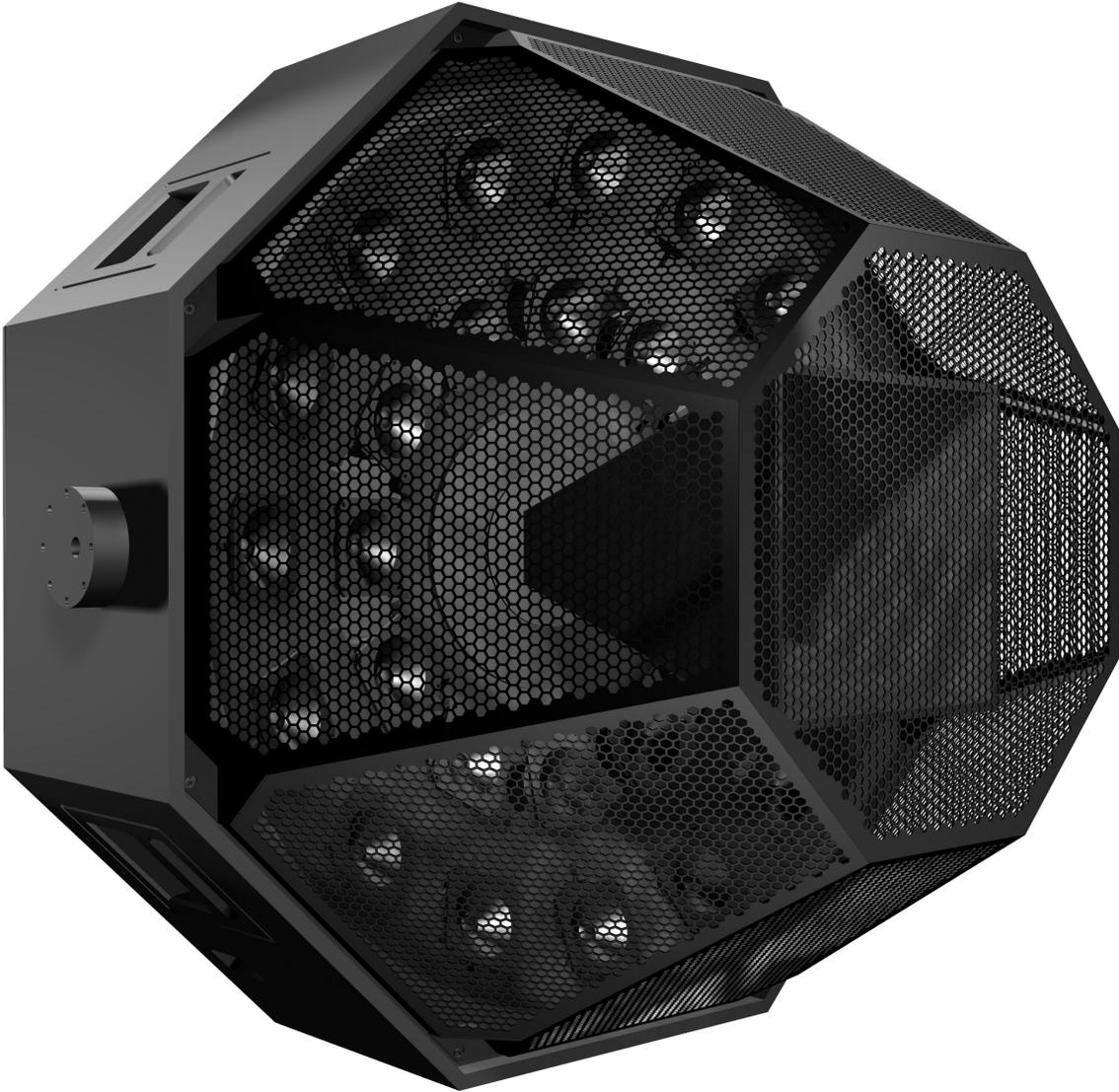


SB-2 Parabolic Wide-Range Sound Beam



*Keep these important operating instructions.  
Check [www.meyersound.com](http://www.meyersound.com) for updates.*

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SB-2 Operating Instructions, PN 05.108.015.01 A

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# SAFETY INSTRUCTIONS FOR LOUDSPEAKERS/ELECTRONICS

## 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 spannung 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 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. Refer all 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:** To reduce the risk of 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.

## POWERCON USE CAUTION

Disconnect the mains plug before disconnecting the power cord from the speaker.

# SAFETY INSTRUCTIONS FOR LOUDSPEAKERS/ELECTRONICS

## 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.
- This apparatus 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 connexions.
- 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 dégageant 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.

---

## **FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## **INDUSTRY CANADA COMPLIANCE STATEMENT**

This Class A digital apparatus complies with Canadian ICES-003.

## **AVIS DE CONFORMITÉ À LA RÉGLEMENTATION D'INDUSTRIE CANADA**

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



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## CHAPTER 1: INTRODUCTION

### HOW TO USE THIS MANUAL

Make sure to read these operating instructions in their entirety before configuring a loudspeaker system with SB-2s. In particular, pay close attention to material related to safety issues.

As you read these operating 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 [www.meyersound.com](http://www.meyersound.com).

Meyer Sound Technical Support is available at:

- **Tel:** +1 510 486.1166
- **Tel:** +1 510 486.0657 (after hours support)
- **Web:** [www.meyersound.com/support](http://www.meyersound.com/support)
- **Email:** [techsupport@meyersound.com](mailto:techsupport@meyersound.com)

### SB-2 PARABOLIC WIDE-RANGE SOUND BEAM

The SB-2 is a bi-amplified sound reinforcement loudspeaker housed in an octagonal enclosure with a parabolic dish front face. Capable of high sound pressure levels with precisely defined narrow coverage, the SB-2 offers a unique solution for large-scale distributed paging and music systems.



*SB-2 Parabolic Wide-Range Sound Beam*

While distributed ceiling loudspeakers are often employed in an attempt to overcome reverberation and improve intelligibility, large venues pose problems of scale that conventional ceiling loudspeakers cannot effectively address. In applications where the ceiling height is 40 feet or more, a conventional distributed system lacks both the power to overcome air losses and the directionality to avoid combing and excessive reverberation.

The SB-2 provides a unique and effective solution to these problems. Featuring a tight 20-degree coverage pattern with high output capability, the SB-2 offers the ability to cover individual zones with highly intelligible, full-range sound while avoiding overlapping. A hybrid two-way system, the SB-2 uses a waveguide to achieve directionality at high frequencies and a parabolic array of cone drivers at mid-to-low frequencies. The result is tightly controlled coverage from 500 Hz to 16 kHz with low-frequency response extending down to 130 Hz.

The SB-2 is comprised of 28 4-inch cone drivers, a single 2-inch throat, 4-inch diaphragm compression driver, an integral complementary MOSFET power amplifier with 1240 W burst capability, and optimized signal processing circuitry. It features options for L6-20, IEC 309, and VEAM all-in-one AC connectors, as well as compatibility with Meyer Sound's RMS™ remote monitoring system.

## SB-2 RIGGING OPTIONS

The SB-2 supports the following rigging options:

- MYA-SB-2 yoke assembly kit — suspends a single SB-2.
- VAK-SB-2 vertical array kit — vertically links two SB-2s equipped with MYA-SB-2 yokes. Multiple VAK-SB-2 array kits can be used to construct vertical arrays with multiple SB-2s: up to 14 units at a 5:1 safety factor, or up to 10 units at a 7:1 safety factor.
- HAK-SB-2 horizontal array kit — horizontally links two SB-2s equipped with MYA-SB-2 yokes at 0-, 15-, or 20-degree angles. Multiple HAK-SB-2 array kits can be used to construct horizontal arrays with multiple SB-2s.



*HAK-SB-2 Horizontal Array with Two SB-2s*

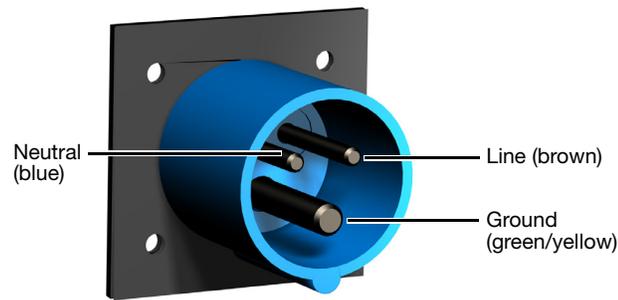
 **NOTE:** For more information on SB-2 rigging hardware, including configuration and load ratings, refer to the *MYA-SB-2 Assembly Guide* (PN 05.108.400.01) available at [www.meyersound.com](http://www.meyersound.com).

## CHAPTER 2: POWER REQUIREMENTS

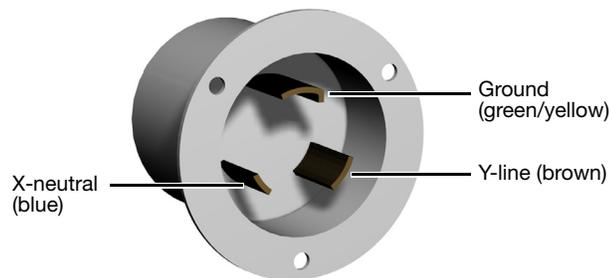
The SB-2 combines advanced loudspeaker technology with equally advanced power capabilities. Understanding power distribution, voltage and current requirements, and electrical safety guidelines is critical to the safe operation of the SB-2.

### AC CONNECTOR

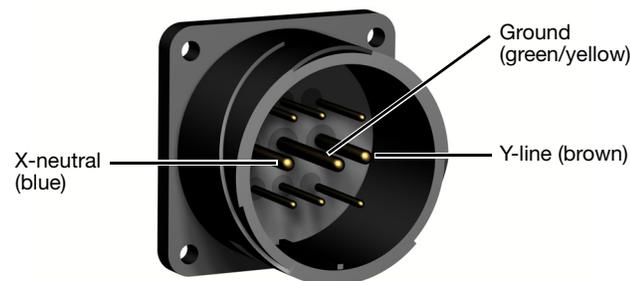
The SB-2 AC connector supplies AC power to the unit and is located on its rear user panel. The SB-2 can be equipped with either a NEMA L6-20 (twistlock) male inlet, IEC 309 male inlet, or VEAM all-in-one connector.



NEMA L6-20 (Twistlock) Male Inlet



IEC 309 Male Inlet Connector



VEAM All-In-One Connector

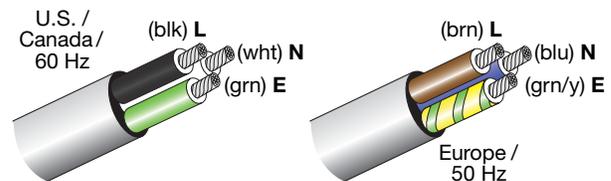
The SB-2 requires a grounded outlet. To operate safely and effectively, it is extremely important that the entire system be properly grounded.

If you replace the included AC power cable, make sure to use a cable that is wired correctly and equipped with the with the appropriate power plug (on the other end) for the area in which you will operate the unit.

**NOTE:** For wiring conventions for the VEAM all-in-one connector (AC, audio, and RMS), refer to the *VEAM Cable Wiring Reference* (PN 06.033.113.01) document available from [www.meeyersound.com](http://www.meeyersound.com).

### WIRING AC POWER CABLES

When wiring AC power cables, use the following wiring scheme:



AC Cable Wiring Scheme

Wire Color		Attach to Following Terminal
U.S. / Canada / 60 Hz	European / 50 Hz	
Black	Brown	Hot or live (L)
White	Blue	Neutral (N)
Green	Green and Yellow	Protective earth / ground (E or PE)

**CAUTION:** When creating AC power cables and distribution systems, it is important to preserve AC line polarity and connect the earth ground on both ends of the cable. SB-2 requires a grounded connection. Always use a grounded outlet and plug. It is extremely important that the system be properly grounded to operate safely and properly. Do not ground-lift the AC cable.

## AC POWER DISTRIBUTION

All components in an audio system (self-powered loudspeakers, mixing consoles, and processors) must be properly connected to an AC power distribution system, ensuring that AC line polarity is preserved and that all grounding points are connected to a single node or common point using the same cable gauge as the neutral and line cables.

**NOTE:** Improper grounding of connections between loudspeakers and the rest of the audio system may produce noise or hum, or cause serious damage to the input and output stages of the system's electronic components.

**CAUTION:** Before applying AC power to any Meyer Sound self-powered loudspeaker, make sure that the voltage potential difference between the neutral and earth-ground lines is less than 5 V AC.

Figure 1 illustrates a basic three-phase AC distribution system with the loudspeaker load distributed across the three phases. All loudspeakers are connected to common neutral and earth-ground lines.

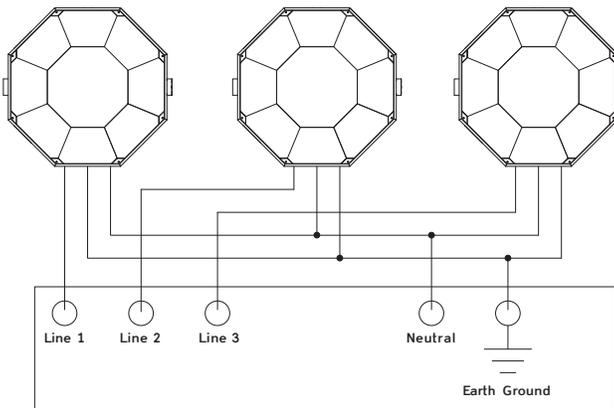


Figure 1: AC Power Distribution System

## SB-2 VOLTAGE REQUIREMENTS

The SB-2 operates safely and continuously when the AC voltage stays within 85–134 V AC and 165–264 V AC at 50 or 60 Hz. The loudspeaker allows any combination of voltage to GND (neutral-line-ground or line-line-ground).

If the voltage drops below 85 V (brownout), the SB-2 uses stored power to continue operating temporarily; the loudspeaker shuts down if the voltage does not rise above the low boundary before the stored power is used.

If the voltage rises above 275 V, the power supply could become damaged.

**CAUTION:** The power source for the SB-2 should always operate within the required voltage range, at least a few volts from the upper and lower ranges. This will ensure that AC voltage variations from the service entry — or peak voltage drops due to cable runs — will not cause the loudspeaker's amplifier to cycle on and off or cause damage to the power supply.

**TIP:** Since the SB-2 does not require a dedicated neutral line, and it can tolerate elevated voltages from the ground line, it can be connected to line-line terminals in 120 V, 3-phase Wye systems. This results in 208 V AC between lines (nominal) and therefore draws less current than when using 120 V AC (line-neutral). Make sure that the voltage remains within the SB-2's recommended operating windows (85–134 V AC and 165–264 V AC). The ground line must always be used for safety reasons and the line-to-ground voltage should never exceed 250 V AC (typically 120 V AC from line-to-ground).

## SB-2 CURRENT REQUIREMENTS

The current draw for the SB-2 is dynamic and fluctuates as operating levels change. Since different cables and circuit breakers heat up at varying rates, it is important to understand the following types of current ratings and how they affect circuit breaker and cable specifications.

- **Idle Current** — The maximum rms current during idle periods.
- **Maximum Long-Term Continuous Current** — The maximum rms current during a period of at least 10 seconds. The Maximum Long-Term Continuous Current is used to calculate temperature increases for cables, to ensure that cable sizes and gauges conform to electrical code standards. The current rating is also used as a rating for slow-reacting thermal breakers.
- **Burst Current** — The maximum rms current during a period of around one second. The Burst Current is used as a rating for magnetic breakers. It is also used for calculating the peak voltage drop in long AC cable runs according to the following formula:
 
$$V_{pk}(\text{drop}) = I_{pk} \times R(\text{cable total})$$
- **Ultimate Short-Term Peak Current** — A rating for fast-reacting magnetic breakers.
- **Inrush Current** — The spike of initial current encountered when powering on.

You can use Table 1 as a guide for selecting cable gauges and circuit breaker ratings for the system's operating voltage.

**Table 1: SB-2 Current Draw**

Current Draw	115 V AC	230 V AC	100 V AC
Maximum Long-Term Continuous Current	8 A rms	4 A rms	10 A rms
Burst Current	15 A rms	8 A rms	18 A rms
Maximum Instantaneous Peak Current	22 A peak	11 A peak	25 A peak
Inrush Current	<7 A peak	—	—

The minimum electrical service amperage required by an SB-2 loudspeaker system is the sum of the Maximum Long-Term Continuous Current for each loudspeaker. An additional 30 percent above the minimum amperage is recommended to prevent peak voltage drops at the service entry.



**NOTE:** For best performance, the AC cable voltage drop should not exceed 10 V, or 10 percent at 115 V and 5 percent at 230 V. Make sure that even with AC voltage drops that the AC voltage always remains within the operating windows.

## POWERING UP THE SB-2

When AC power is applied to the SB-2 its Intelligent AC™ power supply automatically selects the correct operating voltage, allowing it to be used internationally without manually setting voltage switches. In addition, Intelligent AC suppresses high-voltage transients up to several kilovolts, filters common mode and differential mode radio frequencies (EMI), and sustains operation temporarily during low-voltage periods.

When powering up the SB-2, the following startup events take place over several seconds.

1. Audio output is muted.
2. Voltage is detected and the power supply mode is automatically adjusted as necessary.
3. The primary fan turns on.
4. The power supply ramps up.
5. The green Active LED on the user panel lights up, indicating the loudspeaker is ready to output audio.



**CAUTION:** If the Active LED does not light up, or the SB-2 does not output audio after ten seconds, remove AC power immediately and verify

that the voltage is within the required range. If the problem persists, contact Meyer Sound Technical Support.

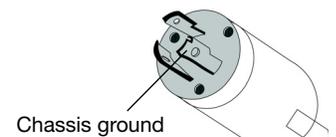
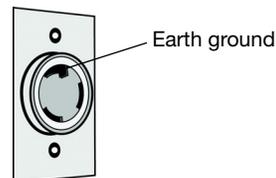


**CAUTION:** If either of the SB-2's circuit breakers trip (the white center buttons disengage), make sure to disconnect the AC power cable before resetting the breakers. If necessary, contact Meyer Sound for repair information.

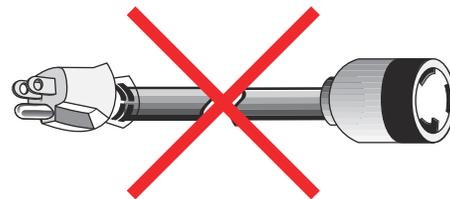
## ELECTRICAL SAFETY GUIDELINES

Pay close attention to these important electrical and safety guidelines.

- The SB-2 requires a grounded outlet. Always use a grounded outlet and plug.



- Do not use a power cord adapter to drive the SB-2 from a standard three-prong Edison outlet, since that connector is only rated for 15 A (NEMA 5-15R, 125 V AC maximum).

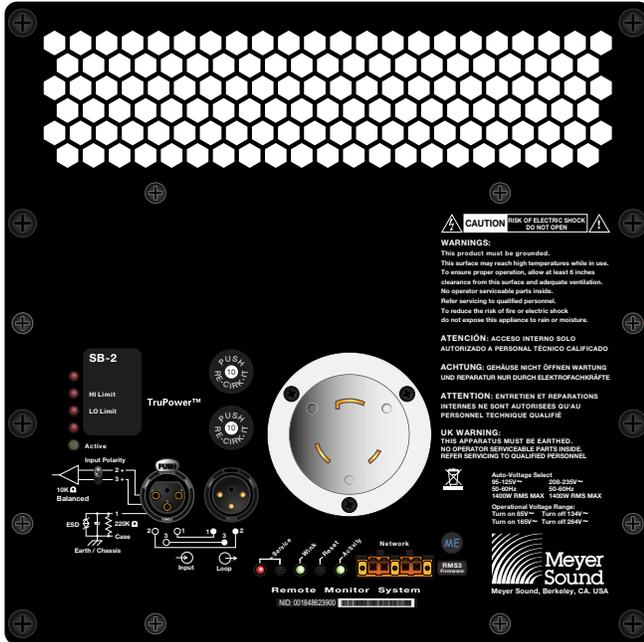


- Make sure the AC power cable for the loudspeaker has the appropriate power plug (on the other end) for the area in which you will operate the loudspeaker.
- Do not operate the unit if the power cable is frayed or broken.
- Keep all liquids away from the SB-2 to avoid hazards from electrical shock.



## CHAPTER 3: AMPLIFICATION AND AUDIO

The SB-2's drivers are powered by a 2-channel proprietary Meyer Sound amplifier with MOSFET output stages. The audio signal is processed with an electronic crossover, correction filters for phase and frequency responses, and driver protection circuitry. Each channel has peak and rms limiters that prevent driver over-excursion and regulate voice coil temperatures.



SB-2 Rear Panel (with NEMA L6-20 AC Connector)

The SB-2 rear panel includes audio connectors for Input and Loop output, as well as an Input Polarity switch. The SB-2 is also available with an optional RMS module (see Chapter 4, “RMS Remote Monitoring System”).

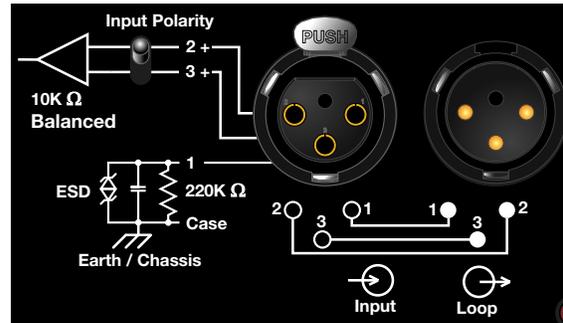
### AUDIO CONNECTIONS WITH VEAM CABLING

The SB-2 can be ordered from the factory with a VEAM all-in-one connector. VEAM connectors consolidate AC power, audio, and RMS into a single cable, facilitating easy connections and quick setups.

For wiring conventions for the VEAM all-in-one connector (AC, audio, and RMS), refer to the *VEAM Cable Wiring Reference* (PN 06.033.113.01) document available from [www.meyersound.com](http://www.meyersound.com).

### AUDIO CONNECTORS

The SB-2 include female XLR Input and male XLR Loop output connectors.



SB-2 Audio Connectors, Input and Loop Output

### Input Connector

The female XLR Input connector accepts a balanced audio signal with an input impedance of 10 kOhm. The connector uses the following wiring:

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

Pins 2 and 3 carry the input as a differential signal. Pin 1 is connected to earth through a 220 kOhm, 1000 pF, 15 V clamped network. This circuitry provides virtual ground lift for audio frequencies while allowing unwanted signals to bleed to ground. Make sure to use standard, balanced XLR audio cables with all three pins connected on both ends. Telescopic grounding is not recommended, and shorting an input connector pin to the case may cause a ground loop, resulting in hum.

💡 **TIP:** If unwanted noise or hiss is produced by the loudspeaker, disconnect its input cable. If the noise stops, there is most likely nothing wrong with the loudspeaker. To locate the source of the noise, check the audio cable, source audio, and AC power.

## Loop Output Connector

The male XLR Loop output connector allows SB-2 loudspeakers to be looped from a single audio source. For applications that require multiple SB-2s, connect the Loop output of the first unit to the Input of the second, and so forth.



**NOTE:** The order in which loudspeakers are connected when looping audio signals is unimportant. The Loop connector is wired in parallel to the Input connector and transmits the unbuffered source signal even when the SB-2 is powered off.

To avoid distortion when looping multiple SB-2s, make sure the source device can drive the total load impedance of the looped loudspeakers. In addition, the source device must be capable of delivering approximately 20 dBV (10 V rms into 600 ohms) to yield the maximum peak SPL over the entire operating bandwidth of the loudspeakers. Most professional audio equipment can transmit these source levels.

To calculate the load impedance for the looped loudspeakers, divide 10 kOhms (the input impedance for a single SB-2) by the number of looped loudspeakers. For example, the load impedance for 10 SB-2 loudspeakers is 1000 ohms (10 kOhms / 10). To drive this number of looped loudspeakers, the source device should have an output impedance of 100 ohms or less. This same rule applies when looping SB-2s with other self-powered Meyer Sound loudspeakers and subwoofers.



**NOTE:** Most source devices are capable of driving loads no smaller than 10 times their output impedance.



**CAUTION:** Make sure that all cabling for looped loudspeakers is wired correctly (Pin 1 to Pin 1, Pin 2 to Pin 2, and so forth) to prevent the polarity from being reversed. If one or more loudspeakers in a system have reversed polarity, frequency response and coverage will be significantly degraded.

## LIMITING

The SB-2 employs Meyer Sound's advanced TruPower® limiting. Conventional limiters assume a constant loudspeaker impedance and set the limiting threshold by measuring voltage alone. This method is inaccurate because loudspeaker impedances change as frequency content in the source material changes, and as thermal values for the loudspeaker's voice coil and magnet vary. Consequently, conventional limiters often begin limiting prematurely, which reduces system headroom and dynamic range.



SB-2 Limit LEDs

In contrast, TruPower limiting anticipates varying loudspeaker impedances by measuring both current and voltage to compute the actual power dissipation in the voice coil. This improves performance, both before and during limiting, by allowing the driver to produce the maximum SPL across its entire frequency range. TruPower limiting also eliminates power compression at high levels over lengthy periods, which helps regulate voice coil temperatures, thereby extending the life of the driver.



**NOTE:** Since TruPower limiting only reduces signal levels to keep voice coil temperatures under a safe margin, signal peaks remain unaffected.

## HI Limit LED

The low- and high-frequency drivers for the SB-2 are powered by separate amplifier channels, each with their own limiter. Limiting activity is indicated with the two Limit LEDs. The HI Limit LED indicates limiting for the high-frequency channel and the LO Limit LED indicates limiting for the low-frequency channel.

When engaged, the limiter not only protects the drivers but also prevents signal peaks from causing excessive distortion in the amplifier channels, thereby preserving headroom and maintaining smooth frequency responses at high levels. When levels returns to normal, below the limiter thresholds, limiting ceases.

The SB-2 performs within its acoustical specifications at normal temperatures when the Limit LEDs are unlit, or when an LED is lit for 2 seconds or less and then turns off for at least 1 second. If an LED remains lit for longer than 3 seconds, the loudspeaker enters hard limiting where:

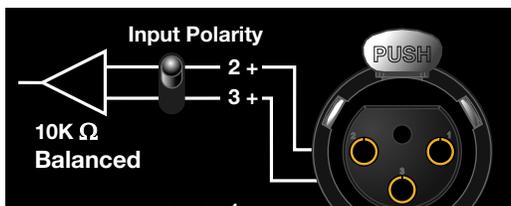
- Increases to the input level have no effect.
- Distortion increases due to clipping and nonlinear driver operation.
- The drivers are subjected to excessive heat and excursion, which will compromise their life span and may eventually lead to damage over time.

**CAUTION:** The Limit LEDs indicate when a safe, optimum level has been exceeded. If an SB-2 begins to limit before reaching the required SPL, consider adding more units to the system.

**NOTE:** The SB-2 loudspeaker uses optical limiters that add no noise and have no effect on the signal when the limiter is not engaged and the Limit LEDs are not lit.

## INPUT POLARITY SWITCH

The SB-2 includes an Input Polarity switch on its rear panel that toggles the polarity of the source signal. When the switch is in the UP position, pin 2 is hot relative to pin 3, resulting in a positive pressure wave when a positive signal is applied to pin 2. When the switch is in the DOWN position, pin 3 is hot relative to pin 2, resulting in a positive pressure wave when a positive signal is applied to pin 3.

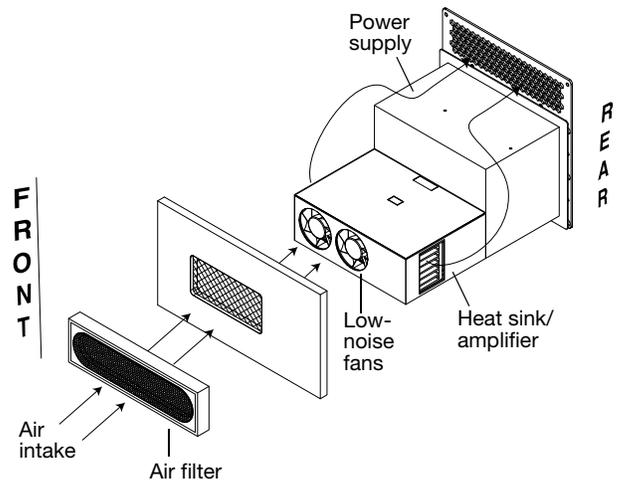


SB-2 Input Polarity Switch

**NOTE:** The Input Polarity switch does not affect the signal coming from the Loop output connector. The Loop output connector is wired in parallel to the Input connector and transmits the unbuffered source signal (even when the loudspeaker is powered off).

## AMPLIFIER COOLING SYSTEM

The SB-2 uses a forced-air cooling system with two fans (one variable-speed, ultra low-noise primary fan and one reserve fan) to prevent the amplifier module from overheating. The fans draw air in through ducts on the front of the cabinet, over the heat sink, and out the rear of the cabinet. Because dust does not accumulate in the amplifier circuitry, its life span is increased significantly.



Airflow for the SB-2

**CAUTION:** To keep the SB-2 from getting too hot, allow for proper ventilation, at least 6 inches, behind the loudspeaker.

When the SB-2 heat sink temperature is below 42° C, the variable-speed primary fan runs continuously at its slowest speed with an inaudible operating noise. The primary fan increases speed when the heat sink temperature reaches 42° C; the primary fan reaches full speed at 62° C and is barely audible near the cabinet, even without an audio signal. If the heat sink temperature reaches 74° C, the reserve fan turns on. The reserve fan turns on if:

- The primary fan has failed (check status immediately)
- High source levels are encountered for extended periods
- Dust has accumulated along the cooling path

The reserve fan turns off when the heat sink temperature lowers to 68° C.

**NOTE:** In the unlikely event that the reserve fan does not keep the SB-2 heat sink temperature below 85° C, the unit automatically shuts down until AC power is removed and reapplied. If the SB-2 shuts down again after cooling and re-applying AC power, contact Meyer Sound for repair information.

## Dust and the Amplifier Module

Operating the SB-2 in dusty environments, or for prolonged, intensive periods, may cause dust to accumulate along its airflow path, thereby preventing normal cooling. Under these circumstances, it may be necessary to periodically remove the air intake foam and use compressed air to clear the dust from the foam and air ducts.

In addition, if the amplifier gets unusually hot, you should remove the amplifier module and use compressed air to clear any dust from its heat sink.

 **CAUTION:** Make sure to unplug the AC power from the SB-2 before cleaning its amplifier.

## CALIBRATION & TEST PORT

The SB-2 includes a Calibration & Test Port, located next to its user panel, that allows the unit's 28 low-frequency drivers to be verified with the included DC test harness. For more information on the test procedure, refer to the *SB-2 Service Information* document (PN 17.108.140.01) available from Meyer Sound Technical Support.



*SB-2 Calibration & Test Port*

## CHAPTER 4: RMS REMOTE MONITORING SYSTEM

The SB-2 is optionally available with the RMS remote monitoring system module, allowing it to be connected to an RMS network. RMS reports, in real time, the status and power usage of multiple Meyer Sound loudspeakers from a Mac® or Windows®-based computer. The RMS host computer communicates with Meyer Sound loudspeakers (equipped with RMS modules) via RMsServer, a compact, Ethernet-based hardware unit with two FT-10 ports that can network up to 50 RMS loudspeakers or twelve MPS-488HP external power supplies. RMsServer stores system configurations internally, eliminating most manual data entry. Systems can be monitored from a laptop at front-of-house or back-stage, or from a tablet computer anywhere within the venue over Wifi.

 **NOTE:** The SB-3F loudspeaker occupies the bandwidth of two normal loudspeakers on RMS networks. Therefore, a maximum of 25 SB-3F loudspeakers can be connected to single RMsServer.

 **NOTE:** For the latest RMS system requirements, visit the Meyer Sound website (<http://www.meyersound.com>).

 **NOTE:** RMS-equipped loudspeakers include a Mute Jumper to enable the loudspeaker's mute and solo capability. Meyer Sound currently ships RMS-equipped loudspeakers with the Mute Jumper installed. These mute-enabled loudspeakers can be identified by the blue "ME" sticker on the face of the RMS module. Older RMS-equipped loudspeakers can easily be mute-enabled by installing the Mute Jumper.

 **NOTE:** RMS does not control AC power.

### COMPASS RMS SOFTWARE

The optional Compass RMS™ software provides extensive system status and performance data for each loudspeaker, including amplifier voltage, limiting activity, power output, fan and driver status, as well as mute and solo capability. Loudspeakers are added to the RMS network and assigned a node name during a one-time commissioning procedure. Once loudspeakers are identified on the RMS network, they appear in the Compass RMS software as icons and data views that can be customized to suit your needs.



Compass RMS Window

Loudspeaker data is updated 2–5 times per second. Individual loudspeakers can be physically identified with the Wink option in RMS, which lights the Wink LED on the RMS module for that particular loudspeaker. Conversely, a loudspeaker can be identified in the RMS software by pressing the Service button on the loudspeaker's RMS module.

Loudspeaker icons and data views can be arranged to represent how the loudspeakers have been deployed in the system. Multiple panels can be saved and recalled for specific performances and venues.

 **NOTE:** When the SB-2 heat sink reaches 85° C (185° F), the On/Temp LED turns red, while its loudspeaker icon in the RMS software turns yellow — indicating the loudspeaker is running hot, but still within safe operating limits. Make sure that the loudspeaker's amplifier and heat sinks are properly ventilated.

## RMS MODULE

The RMS user panel has three LEDs, two buttons, and two Network connectors.



RMS Module

**NOTE:** The LEDs and buttons on the RMS user panel are used exclusively by RMS and have no effect on the acoustical or electrical activity of the SB-2.

### Service LED (Red)

The red Service LED provides the following feedback:

- When unlit, the loudspeaker is successfully connected to the network and commissioned.
- When blinking once every two seconds, the loudspeaker is connected to the network but not yet commissioned in the RMS software.
- When lit continuously, the loudspeaker's RMS hardware has failed and may indicate that the module has been damaged (contact Meyer Sound Technical Support).

### Service Button

Pressing the Service button identifies the loudspeaker on the RMS network and notifies the RMS software that the loudspeaker is connected. You can simultaneously press the Reset and Service buttons to reset the RMS module and decommission the loudspeaker from the network (see “Resetting the RMS Module” on page 20).

### Wink LED (Green)

The green Wink LED lights when a signal is sent from the RMS software by clicking the Wink button on the loudspeaker's icon or on its Text view. This is useful for identifying the physical loudspeaker corresponding to a loudspeaker icon in the RMS software.

### Reset Button

Pressing the Reset button causes the RMS module's firmware to reboot; this will not affect whether the loudspeaker is commissioned (which is stored in flash memory). You can simultaneously press the Reset and Service buttons to reset the RMS module and decommission the loudspeaker from the network (see “Resetting the RMS Module” on page 20).

### Activity LED (Green)

The green Activity LED flashes continuously when the loudspeaker has been successfully commissioned.

### Network Connectors

The two Weidmuller connectors transfer data to and from the RMS network. Two connectors are provided to allow for easy connection of multiple (daisy-chained) loudspeakers on the network. Included with each RMS-equipped loudspeaker are RMS cable connectors and mounting blocks for constructing RMS cables. The RMS blocks allow the cables to be securely attached to the RMS module with screws.

## RESETTING THE RMS MODULE

You can use the Reset and Service buttons to reset the RMS module, which will cause the module to be decommissioned from the network.

To reset the RMS module:

1. Press and hold the Service button for 10 seconds.
2. While continuing to hold down the Service button, press and hold the Reset button for 5 seconds.
3. After releasing the Reset button, continue holding down the Service button for 5 seconds. The RMS module is reset and the loudspeaker is decommissioned. The RMS module's red Service LED blinks.

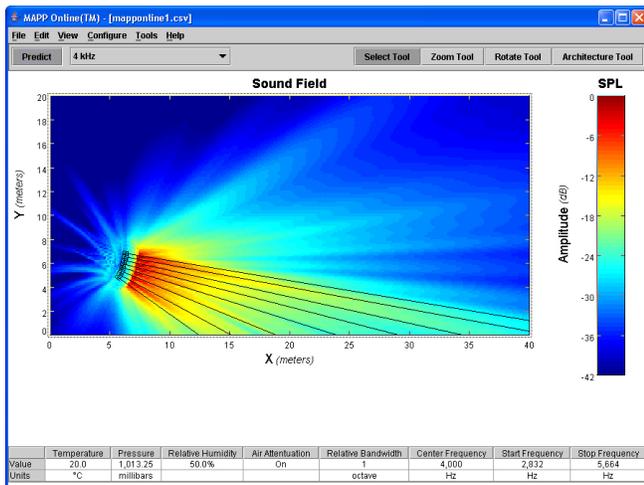
## CHAPTER 5: SYSTEM DESIGN AND INTEGRATION TOOLS

Meyer Sound offers two comprehensive tools to assist with the acoustical and functional requirements of system design and optimization. This chapter introduces MAPP Online Pro, Meyer Sound's patented online acoustical prediction tool, and SIM 3, a comprehensive system for measurement and analysis.

### MAPP ONLINE PRO

MAPP Online Pro 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.

Residing on your local computer, the MAPP Online Pro client lets you configure Meyer Sound loudspeaker systems and define the environment in which they will operate, including air temperature, pressure, humidity, and even the location and composition of walls. CAD (DXF) files containing detailed venue information can also be imported.



MAPP Online Cinema

Whether planning for fixed installations or tours with multiple venues, sound system designers can use MAPP Online Pro 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 Online Pro's accurate, high-resolution predictions ensure that systems will perform as expected, thereby eliminating unexpected coverage problems and minimizing on-site adjustments.

The key to the accuracy of MAPP Online Pro's predictions is its exhaustive database of Meyer Sound loudspeaker measurements. Performance predictions for each loudspeaker are based on 360 1/48th-octave-band measurements taken with a SIM audio analyzer in the Meyer Sound anechoic chamber. The extraordinary consistency between Meyer Sound loudspeakers guarantees that predictions from MAPP Online Pro will closely match their actual performance.

MAPP Online Pro predictions are requested by the client software and sent via the Internet to the high-speed Meyer Sound servers where high-resolution (magnitude and phase) polar data is processed with sophisticated acoustical prediction algorithms. The resulting predictions are then returned to and displayed on the local computer running the MAPP Online Pro client software.

 **TIP:** Meyer Sound offers seminars and webinars on using MAPP Online Pro. For more information, visit [www.meyersound.com](http://www.meyersound.com).

### MAPP Online Pro Applications

With MAPP Online Pro, you can:

- Simulate different loudspeaker configurations to refine system design and zero-in on the best coverage for intended audience areas
- Monitor loudspeaker interactions to locate destructive interferences so that loudspeakers can be re-aimed and repositioned as necessary
- Place microphones anywhere in the sound field and predict their frequency response, impulse response, and sound pressure
- Determine delay settings for fill loudspeakers
- Try out virtual Galileo equalization to determine optimum real-world settings for the best system response
- Automatically calculate load information for arrays to determine rigging capacities, front-to-back weight distribution, and center of gravity
- Generate and export system images for client presentations

## Using MAPP Online Pro

MAPP Online Pro is compatible with the following operating systems:

- Mac OS®
- Windows

For information on which operating system versions are supported, visit [www.meyersound.com](http://www.meyersound.com).

## Downloading and Installing MAPP Online Pro

To use MAPP Online Pro, you must register online at [www.meyersound.com](http://www.meyersound.com). After entering your registration information, an email will be sent to you with your user name, password, and the MAPP Online Pro download location. On-screen instructions will guide you through the download and installation process.

The MAPP Online Pro client software is regularly upgraded to add support for the latest Meyer Sound loudspeakers, as well as to add feature enhancements. Most upgrades are downloaded automatically when logging on to a MAPP Online Pro session. The MAPP Online Pro database includes nearly all of the current Meyer Sound loudspeakers, subwoofers, and processors.



**NOTE:** For information on using SB-2 with MAPP Online Pro, contact Meyer Sound Technical Support at [techsupport@meyersound.com](mailto:techsupport@meyersound.com).

## SIM 3 MEASUREMENT SYSTEM

The SIM 3 audio analyzer is a high-resolution audio measurement system comprised of software, hardware, microphones, and accessory cables. SIM 3 is optimized for measuring audio frequencies with resolutions up 1/48th of an octave, allowing you to apply precise corrections to balance system response using frequency and phase domain information.

## Source Independent Measurement Technique

The SIM 3 audio analyzer implements Meyer Sound's source independent measurement technique, a dual-channel method that accommodates statistically unpredictable excitation signals. Any excitation signal within a desired frequency range can be used to obtain highly accurate measurements for acoustical or electronic systems. For example, concert halls and loudspeaker systems can be captured during a performance and used as a SIM 3 test signal, so you can:

- 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 the SIM 3 Delay Finder

## SIM 3 Applications

SIM 3's main applications are testing and aligning loudspeaker systems, which entails:

- Measuring propagation delays between subsystems to determine appropriate polarities and delay times
- Measuring variations in frequency response caused by the acoustical environment and the placement and interaction of loudspeakers to determine corrective equalization
- Optimizing subwoofer integrations
- Optimizing loudspeaker arrays

SIM 3 can also be used in the following applications:

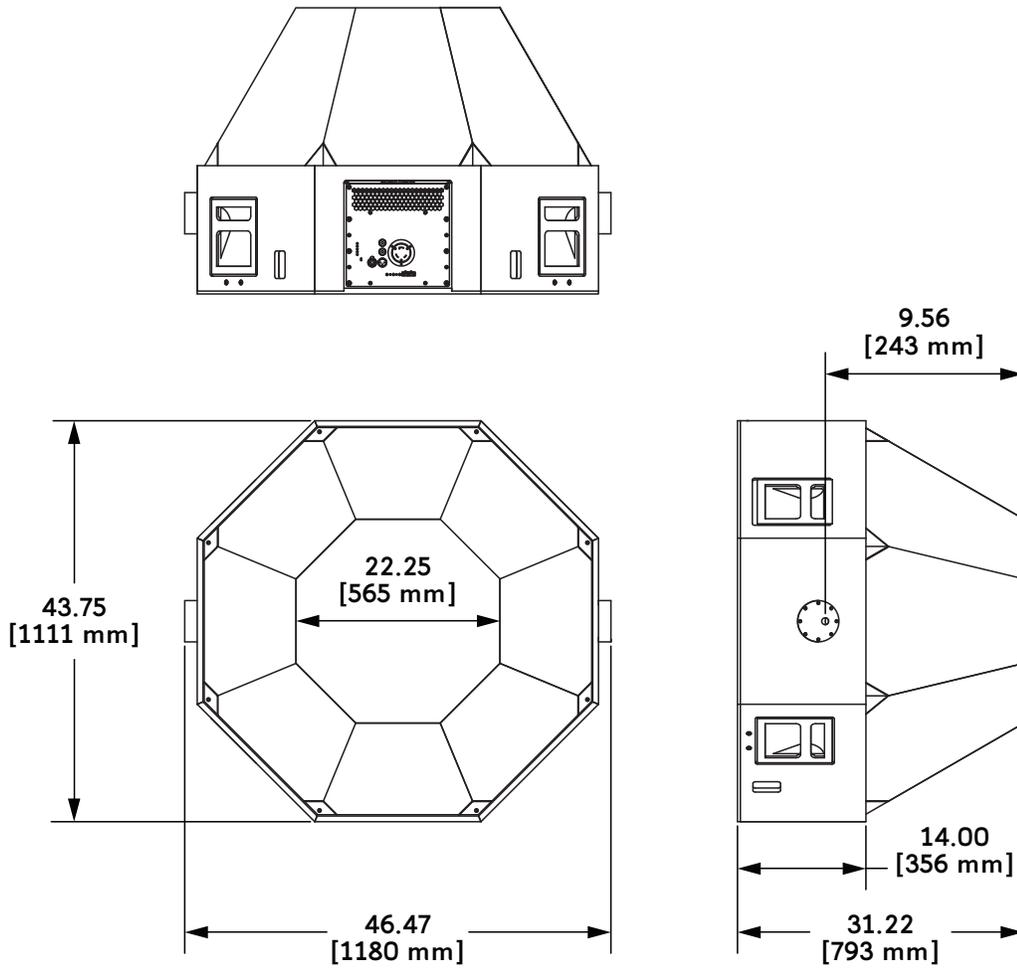
- Microphone calibration and equalization
- Transducer evaluation and correction
- Echo detection and analysis
- Vibration analysis
- Architectural acoustics
- Underwater acoustics

## APPENDIX A: SB-2 SPECIFICATIONS

<b>ACOUSTICAL</b>	
<b>Note:</b> Measured at 4 meters on axis, free field with pink noise in third-octave bands.	
Operating Frequency Range	130 Hz – 18 kHz –6 dB 150 Hz – 13 kHz ±4 dB <b>Note:</b> Recommended maximum operating frequency range. Response depends on loading conditions and room acoustics.
Phase Response	400 Hz – 11 Hz ±35°
Maximum Peak SPL	143 dB at 1 meter
Dynamic Range	>110 dB
<b>COVERAGE</b>	
(–6 dB points)	20° symmetrical at 1 kHz to 16 kHz 40° symmetrical at 500 Hz 90° symmetrical at 250 Hz
<b>CROSSOVER</b>	1.5 kHz
<b>TRANSDUCERS</b>	
Low Frequency	(28) 4" diameter cone drivers
Low Frequency	(1) 2" throat, 4" diaphragm compression driver
<b>AUDIO INPUT</b>	
Type	Differential, electronically balanced
Connectors	XLR 3-pin female input with XLR 3-pin male loop output
Input Impedance	10 kΩ differential between pins 2 and 3
Wiring	Pin 1: Chassis/earth through a 220 kΩ, 1000 pF, 15 V clamped network to provide virtual ground lift at audio frequencies Pin 2: Signal (+) Pin 3: Signal (–) Case: Earth ground and chassis
Nominal Input Sensitivity	+4 dBV (1.23 V rms)
<b>AMPLIFIER</b>	
Type	2-channel complementary MOSFET output stages (class AB/H)
Burst Capability	1240 W total (2 x 620 W) <b>Note:</b> Nominal 8 Ω resistive load, pink noise, 100 V peak.
THD, IM TIM	<.02%
Cooling	One ultrahigh-speed primary fan, one ultrahigh-speed reserve fans
<b>AC POWER</b>	
Connectors	NEMA L6-20, IEC 309, VEAM all-in-one connector <b>Note:</b> IEC 309 connector rated at 16 A available for European installations.
Automatic Voltage Selection	Automatic, two ranges, each with high-low voltage tap (uninterrupted)
Safety Agency Rated Operating Voltage	95–125 V AC; 208–235 V AC; 50/60 Hz <b>Note:</b> Rated at 88–125 V AC and 182–235 V AC, 50/60 Hz, to satisfy EC standards for –10% to +6% AC line voltage.

Turn-on/Turn-off Points	85–134 V AC; 165–264 V AC; 50/60 Hz
<b>Current Draw</b>	
Maximum Long-Term Continuous Current	8 A rms (115 V AC); 4 A rms (230 V AC); 10 A rms (100 V AC)
Burst Current	15 A rms (115 V AC); 8 A rms (230 V AC); 18 A rms (100 V AC)
Maximum Instantaneous Peak Current	22 A peak (115 V AC); 11 A peak (230 V AC); 25 A peak (100 V AC)
Inrush Current	<7 A peak (115 V AC)
<b>RMS NETWORK (OPTIONAL)</b>	Equipped with 2-conductor, twisted-pair network, reporting all amplifier operating parameters to host computer
<b>PHYSICAL</b>	
Enclosure	Fiberglass and multi-ply hardwood birch
Finish	Black textured
Protective Grille	Powder-coated, hex-stamped steel
Rigging	Optional MYA-SB-2 yoke assembly kit; optional VAK-SB-2 vertical array kit; optional HAK-SB-2 horizontal array kit
Dimensions	46.47" w x 43.75" h x 31.22" d (1180 mm x 1111 mm x 793 mm)
Weight	254 lbs (115.2 kg)
Shipping Weight	437 lbs (198.2 kg)
<b>ENVIRONMENTAL</b>	
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 – 55 Hz (0.010 m peak-to-peak excursion)

## SB-2 DIMENSIONS



SB-2 Dimensions

## SB-2 COMPLIANCE



FCC Verified  
Class A

# 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, California 94702-2204  
USA

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Berkeley, California 94702  
USA

T: +1 510 486.1166  
F: +1 510 486.8356

info@meyersound.com  
www.meyersound.com

**Declares that the product**

**Product Name:** SB-2

**Product Options:** All

**Conforms to the following Product Specifications:**

**Safety:** EN 60065:2002/A1:2006 + A11:2008 + A2:2010 +  
A12:2011,  
+ /AC 2007

**EMC:** EN 55103-1: 2009 emission  
EN 55103-2: 2009 immunity

*This device complies with EN 55103-1 & -2 as noted below. Operation is subject to the following 2 conditions: This device may not cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation.*

**Environmental:** EN 50581:2012

**Supplementary Information:**

The product herewith complies with the requirements of the Low Voltage Directive (LVD) 2006/95/EC, EMC Directive 2004/108/EC and the RoHS Directive 2011/65/EU.

**Signature:**

A handwritten signature in blue ink, appearing to read "Margie J. Garza".

**Date of issue:** October 14, 2013

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thinking sound



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SB-2 Operating Instructions, PN 05.108.015.01 A