LYON™ Linear Line Array Loudspeaker

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LYON Operating Instructions, PN 05.232.005.01 B

CONTENTS

CHAPTER 1: INTRODUCTION

HOW TO USE THIS MANUAL

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

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

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

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

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

Information and specifications are subject to change. Updates and supplementary information are available at www.meyersound.com.

Meyer Sound Technical Support is available at:

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- **Web:** www.meyersound.com/support
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LYON LINEAR LINE ARRAY LOUDSPEAKER

The self-powered LYON™ linear line array loudspeaker is a member of Meyer Sound's LEO® Family of linear loudspeakers, designed to reproduce audio faithfully with tremendous power and clarity, without coloring the sound, even when pushed to the limit. LYON delivers the same headroom and precision as the acclaimed LEO-M™ with the same cutting-edge technology housed in a lighter and more compact cabinet. Optimized rigging and self-powered configuration streamlines both setup and breakdown for LYON systems. LYON is ideal for medium- to large-scale array applications that do not require the extreme long-throw capability of LEO-M.

LYON Loudspeaker

For greater flexibility, LYON is available in two models: LYON-M for primary array coverage and LYON-W for wide coverage. LYON-W can be used wherever wide coverage is needed in LYON arrays, at the bottom or in the middle of primary arrays, or even at the top of outfill arrays. Because LYON-W matches the acoustical characteristics and vertical coverage of LYON-M, transitions for horizontal coverage are seamless. Both LYON models are matched acoustically to LEO-M and can be used for downfill and midfill at the bottom of LEO-M arrays, and as supplemental sidefill and outfill arrays in LEO-M systems.

LYON arrays are ideally paired with Meyer Sound's 1100-LFC low-frequency control element for bass reproduction. Entire systems are driven by Meyer Sound's Galileo Callisto® 616 array processor, which provides matrix routing, alignment, and processing for array components. To guarantee optimum performance, including coverage patterns and maximum peak SPL, LYON systems should be designed with Meyer Sound's MAPP™ prediction software.

LYON's high-frequency section is comprised of two proprietary compression drivers coupled to a constant-directivity horn through a patented REM® manifold. The manifold's smooth radiating characteristics afford tight vertical coverage. The low-frequency section includes two long-excursion cone drivers, also proprietary, capable of withstanding high, continuous output levels. Precise phase and magnitude alignment between low- and high-frequency drivers yields consistent and well-behaved system responses.

The unit's onboard power amplifier operates at nominal voltages from 85–134 V AC and 165–264 V AC at 50–60 Hz. TruPower® limiting ensures maximum driver protection, minimizing power compression while yielding high constant output under high continuous and peak power conditions. The amplifier, control electronics, and power supply are contained in a single field-replaceable module located on the rear of the cabinet.

Meyer Sound's RMS™ remote monitoring system comes standard with all LYON loudspeakers and provides comprehensive monitoring of system parameters on a Mac® or Windows®-based computer. Convenient XLR 5-pin connectors allow the use of composite cables carrying both RMS and balanced audio signals. XLR 3-pin audio connectors are also available.

LYON offers intuitive rigging with captive GuideALinks™ that can be set to the desired splay angles while cabinets rest in caster frames. The optional MTG-LYON top grid flies arrays of up to 18 LYONs at a 7:1 safety factor (with some restrictions). The optional MTF-LEO/LYON transition frame flies LYONs at the bottom of LEO-M arrays. Stacks of up to four LYON cabinets can be securely transported with the optional MCF-LYON caster frame; durable nylon covers, accommodating stacks of two, three, or four units, are available to protect the cabinets during transport.

The LYON cabinet is constructed of multi-ply hardwood and coated with a black-textured finish. A hex-stamped, steel grille with acoustical black mesh protects the unit's drivers. Other options include weather protection and custom color finishes for fixed installations and applications with specific cosmetic requirements.

LYON *Array with MTG-*LYON *Top Grid*

CHAPTER 2: POWER REQUIREMENTS

LYON 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 LYON.

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 (or larger) as the neutral and line cables.

CAUTION: Make sure the voltage received by LYON remains within its 85–134 V AC and 165–264 V AC operating ranges. In addition, 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).

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 when using single-phase AC wiring.

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.

120 V AC, 3-Phase Wye System (Single Line)

Line-Neutral-Earth/Ground

Figure 1 illustrates a basic 120 V AC, 3-phase Wye distribution system with the loudspeaker load distributed across all three phases, with each loudspeaker connected to a single line and common neutral and earth/ground lines. This system delivers 120 V AC to each loudspeaker.

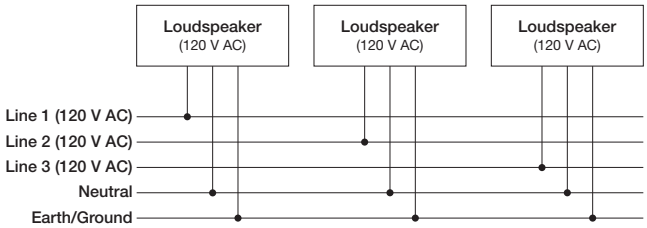


Figure 1: 120 V AC, 3-Phase Wye System (Single Line to Loudspeakers)

120 V AC, 3-Phase Wye System (Two Lines)

Line-Line-Earth/Ground

Figure 2 illustrates a 120 V AC, 3-phase Wye distribution system with each loudspeaker connected to two lines and a common earth/ground line. This configuration is possible because LYON tolerates elevated voltages from the ground line and does not require a neutral line. This system delivers 208 V AC to each loudspeaker.

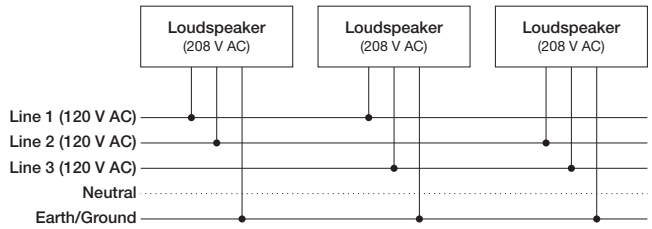


Figure 2: 120 V AC, 3-Phase Wye System (Two Lines to Loudspeakers)

TIP: The 120 V AC, 3-phase Wye system with two lines is recommended because it allows loudspeakers to draw less current than with single-line systems, thereby reducing voltage drop due to cable resistance.

220 V AC, 3-Phase Wye System (Single Line)

Line-Neutral-Earth/Ground

Figure 3 illustrates a basic 220 V AC, 3-phase Wye distribution system with the loudspeaker load distributed across all three phases, with each loudspeaker connected to a single line and common neutral and earth/ground lines. This system delivers 220 V AC to each loudspeaker.

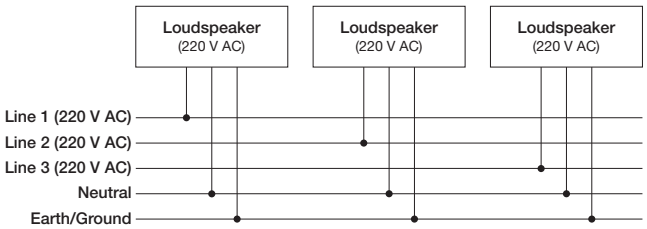
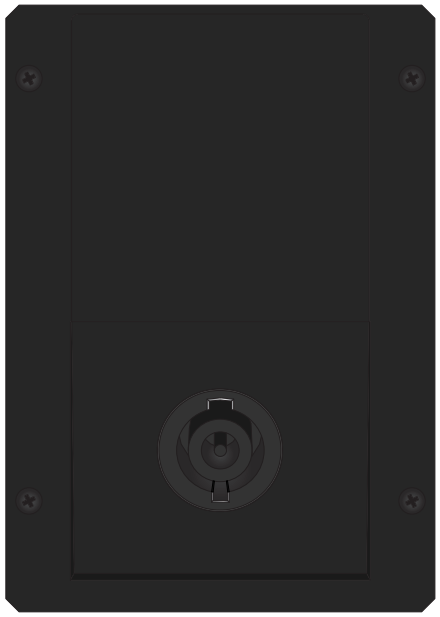


Figure 3: 220 V AC, 3-Phase Wye System (Single Line to Loudspeakers)

CAUTION: For 220 V AC, 3-phase Wye systems, never connect two lines to the AC input of LYON, as the resulting voltage would be higher than the allowable upper voltage range (275 V AC) and would damage the loudspeaker.

AC INPUT

The LYON user panel includes an AC Input connector that supplies power to the loudspeaker. The 3-conductor powerCON 32 is rated at 32 A and uses a locking connector that prevents accidental disconnections.



powerCON 32 AC Input Connector

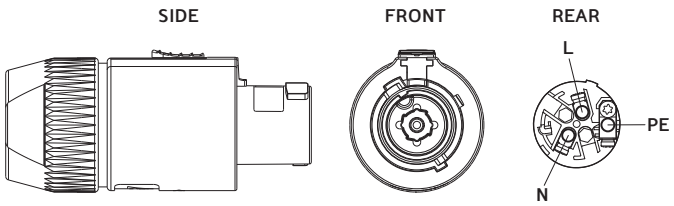
LYON ships with a black powerCON 32 cable mount connector, rated at 32 A, for assembling AC power cables. Make sure to use an AC power cable that is wired correctly (see “Wiring AC Power Cables” on page 8) and equipped with the appropriate power plug (on the other end) for the area in which you will operate the unit.

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

WIRING AC POWER CABLES

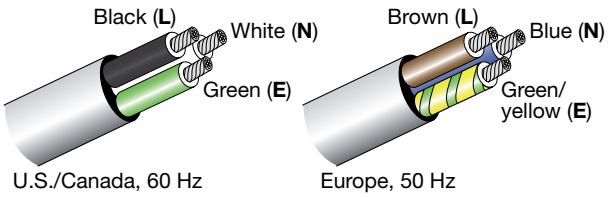
LYON ships with a black powerCON 32 cable mount connector, rated at 32 A, for assembling AC power cables. The pins on the powerCON 32 cable mount connector are labeled as follows:

- L (Line)
- N (Neutral)
- PE (Protective Earth or Ground)



powerCON 32 Cable Mount Connector

How AC power cables are wired is determined by the type of AC power distribution system used (see “AC Power Distribution” on page 7). When wiring AC power cables for single-line systems, use one of the following wiring schemes:



AC Wiring Scheme

Wire Color		Attach to the 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 wiring 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. LYON 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.

Supported Cable Gauges for the powerCON 32

While the powerCON 32 connector supports cable gauges of 14–10 AWG (2.5–6.0 mm^2), due to LYON's current draw, 10 AWG (6.0 mm^2) should be used whenever possible.

LYON VOLTAGE REQUIREMENTS

LYON operates as intended when receiving AC voltage within the following ranges:

- 85–134 V AC, 50–60 Hz
- 165–264 V AC, 50–60 Hz

If the voltage drops below 85 V, the loudspeaker uses stored power to continue operating temporarily; the loudspeaker powers off if the voltage does not return to its operating range.

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

⚠ **CAUTION:** The power source for LYON should always operate within the required operating range, at least a few volts from the upper and lower ranges. This ensures 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.

LYON CURRENT REQUIREMENTS

Current draw for loudspeakers 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, which are recommended for loudspeaker power distribution.
- **Burst Current** — The maximum rms current during a period of around 1 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 (drop) = I pk x R (cable total)
- **Maximum Instantaneous Peak Current** — A rating for fast-reacting magnetic breakers.
- **Inrush Current** — The spike of initial current encountered when powering on.

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

LYON Current Draw

Current Draw	208 V AC	230 V AC	100 V AC
Idle	0.7 A rms	0.6 A rms	1.2 A rms
Maximum Long-Term Continuous	6.2 A rms	5.6 A rms	11.2 A rms
Burst	8.2 A rms	7.5 A rms	15.4 A rms
Maximum Instantaneous Peak	25 A peak	23 A peak	45 A peak
Inrush	<15 A peak	<15 A peak	<15 A peak

The minimum electrical service amperage required by a loudspeaker system is the sum of the maximum long-term continuous current for all loudspeakers. 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 (10 percent at 115 V and 5 percent at 230 V). Make sure that even with AC voltage drops that the voltage always remains within the loudspeaker's operating range.

DO NOT RESET CIRCUIT BREAKERS!

⚠ **CAUTION:** In the unlikely event that one of LYON's circuit breakers trips (the center button disengages), disconnect the AC power cable and contact Meyer Sound for repair information. DO NOT attempt to reset the breaker or reconnect the AC power cable.

INTELLIGENT AC POWER SUPPLY

LYON's Intelligent AC™ power supply automatically selects the correct operating voltage, allowing the loudspeaker to be used internationally without manually setting voltage switches; eliminates high inrush currents with soft-start power up; 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.

Powering on LYON

When powering on LYON, 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. On the user panel, the Active/Status LED flashes multiple colors successively.
6. The Active/Status LED turns solid green, indicating the loudspeaker is ready to output audio.

⚠ **CAUTION:** If the Active/Status LED does not turn solid green, or LYON does not output audio after 10 seconds, remove AC power immediately and verify that the voltage is within the required range. If the problem persists, contact Meyer Sound Technical Support.

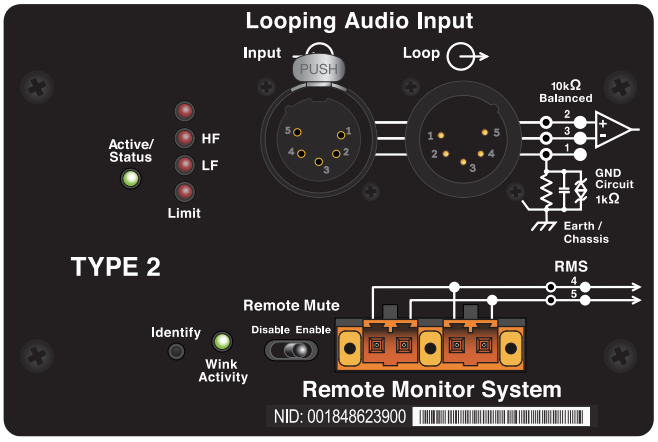
ELECTRICAL SAFETY GUIDELINES

Make sure to observe the following important electrical and safety guidelines.

- The powerCON 32 connector should not be engaged or disengaged when under load or live.
- LYON requires a grounded outlet. Always use a grounded outlet and plug.
- Do not use a ground-lifting adapter or cut the AC cable ground pin.
- 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 LYON loudspeakers to avoid hazards from electrical shock.
- Use the cable rings (see "Cable Rings" on page 12) on the rear of the LYON cabinet to reduce strain on the AC power cable (and audio cables). Do not use the cable rings for any other purpose.

CHAPTER 3: AMPLIFICATION AND AUDIO

LYON's drivers are powered by a proprietary 3-channel amplifier with bridged MOSFET output stages. The audio signal is processed with an electronic crossover, correction filters for flat 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.

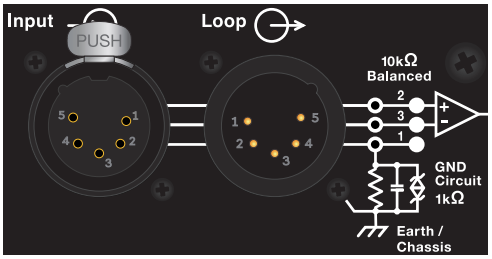


LYON User Panel

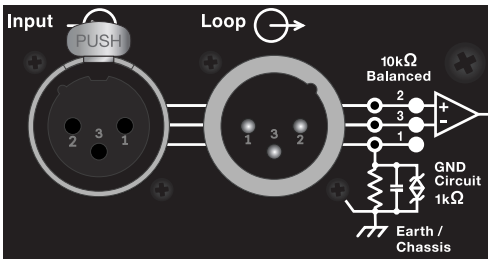
The LYON user panel includes Input and Loop output connectors for audio, Limit and Active LEDs, and RMS connectors and controls (see Chapter 5, "RMS Remote Monitoring System").

AUDIO CONNECTORS

LYON is available with XLR 3-pin or 5-pin connectors for audio Input and audio Loop output. XLR 5-pin connectors accommodate both balanced audio and RMS signals.



XLR 5-Pin Audio Connectors, Input and Loop Output



XLR 3-Pin Audio Connectors, Input and Loop Output

Audio Input (XLR 3-Pin or 5-Pin Female)

The XLR 3-pin or 5-pin female Input connector accepts balanced audio signals with an input impedance of 10 kOhm. The connector uses the following wiring scheme:

- **Pin 1** — 1 kOhm to chassis and earth ground (ESD clamped)
- **Pin 2** — Signal (+)
- **Pin 3** — Signal (–)
- **Pin 4** — RMS (polarity insensitive)
- **Pin 5** — RMS (polarity insensitive)
- **Case** — Earth (AC) ground and chassis

NOTE: Pins 4 and 5 (RMS) are included only with XLR 5-pin connectors.

Pins 2 and 3 carry the input as a differential signal. Pin 1 is connected to earth through a 1 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 balanced XLR audio cables with pins 1–3 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.

Audio Loop Output (XLR 3-Pin or 5-Pin Male)

The XLR 3-pin or 5-pin male Loop output connector allows multiple loudspeakers to be looped from a single audio source. The Loop output connector uses the same wiring scheme as the Input connector (see “Audio Input (XLR 3-Pin or 5-Pin Female)” on page 11). For applications that require multiple LYONs, connect the Loop output of the first loudspeaker to the Input of the second loudspeaker, and so forth.

NOTE: 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.

Calculating Load Impedance for Looped Audio Signals

To avoid distortion when looping multiple loudspeakers, 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 SPL over the operating bandwidth of the loudspeakers.

To calculate the load impedance for the looped loudspeakers, divide 10 kOhms (the input impedance for a single loudspeaker) by the number of looped loudspeakers. For example, the load impedance for 10 LYONs 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 LYONs with other Meyer Sound self-powered loudspeakers.

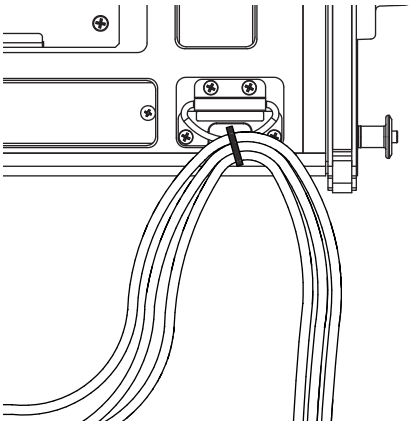
NOTE: Most source devices are capable of driving loads no smaller than 10 times their output impedance.

TIP: Audio outputs from Meyer Sound’s Galileo 616 and Galileo Callisto 616 are rated at 50 ohms, which means that their outputs can singly drive up to 20 Meyer Sound (10 kOhm) loudspeakers without distortion.

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.

CABLE RINGS

Two cable rings are provided on the rear of the LYON cabinet. Power and audio cables should be tied off to the rings to reduce strain on the cables and prevent damage to them during installation. The cable rings should not be used for any other purpose.



Cables Tied Off to Cable Ring

CAUTION: LYON cable rings should only be used to reduce strain on cables. The cable rings should not be used for any other purpose.

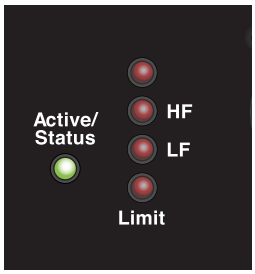
TRUPOWER LIMITING

LYON 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.

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, while also retaining signal peaks. 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.

HF and LF Limit LEDs

The low- and high-frequency drivers for LYON are powered by separate amplifier channels, each with their own limiter. Limiting activity is indicated with two Limit LEDs on the user panel. The HF Limit LED indicates limiting for the high-frequency channel and the LF Limit LED indicates limiting for the low-frequency channel.



LYON Limit LEDs

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

LYON performs within its acoustical specifications at normal temperatures when the Limit LEDs are unlit, or when the LEDs are lit for 2 seconds or less and then turn off for at least 1 second. If the LEDs remain 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
- Drivers are subjected to excessive heat and excursion, thereby compromising their lifespan

⚠ **CAUTION:** The Limit LEDs indicate when a safe, optimum level is exceeded. If a LYON loudspeaker system begins to limit before reaching the desired SPL, consider adding more units to the system.

AMPLIFIER COOLING SYSTEM

LYON employs forced-air cooling with four ultrahigh-speed fans (two primary, and two reserve) to prevent the amplifier from overheating. The fans draw air in through ducts on the rear of the cabinet, over the heat sinks, and out the rear of the cabinet. Because dust does not accumulate in the amplifier and power circuitry, their lifespans are increased significantly.

⚠ **CAUTION:** To keep LYON from overheating, allow at least 6 inches behind the loudspeaker for proper ventilation.

LYON Fans

	Primary Fans		Reserve Fans	
Type	Ultrahigh-speed		Ultrahigh-speed	
Number	2		2	
Location	1 for each heat sink (2)		1 for each heat sink (2)	
Fan speeds and heat sink temp.	<34° C	Half speed	<52° C	Off
	34° – 50° C	Ramps up	>52° C	Full speed
	50° – 84° C	Full speed	<44° C	Off
	>95° C	Audio muted, fans continue at full speed	>95° C	Audio muted, fans continue at full speed
	<86° C	Audio unmuted, fans continue at full speed	<86° C	Audio unmuted, fans continue at full speed

⚠ **CAUTION:** If a LYON loudspeaker system consistently overheats before reaching the desired SPL, consider adding more units to the system.

TIP: When LYON is connected to an RMS network, the Compass RMS software provides additional feedback on the loudspeaker's hardware status and operating temperature. For more information, see Chapter 5, "RMS Remote Monitoring System."

CHAPTER 4: QUICKFLY RIGGING

IMPORTANT SAFETY CONSIDERATIONS!

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

- All Meyer Sound products must be used in accordance with local, state, federal, and industry regulations. It is the owner's and user's responsibility to evaluate the reliability of any rigging method for their application. Rigging should only be carried out by experienced professionals.
- Use mounting and rigging hardware that has been rated to meet or exceed the weight being hung.
- Make sure to attach mounting hardware to the building's structural components (roof truss), and not just to the wall surface.
- Make sure bolts and eyebolts are tightened securely. Meyer Sound recommends using Loctite® on all threaded fasteners.
- Inspect mounting and rigging hardware regularly. Immediately replace any worn or damaged components.

LYON RIGGING OPTIONS

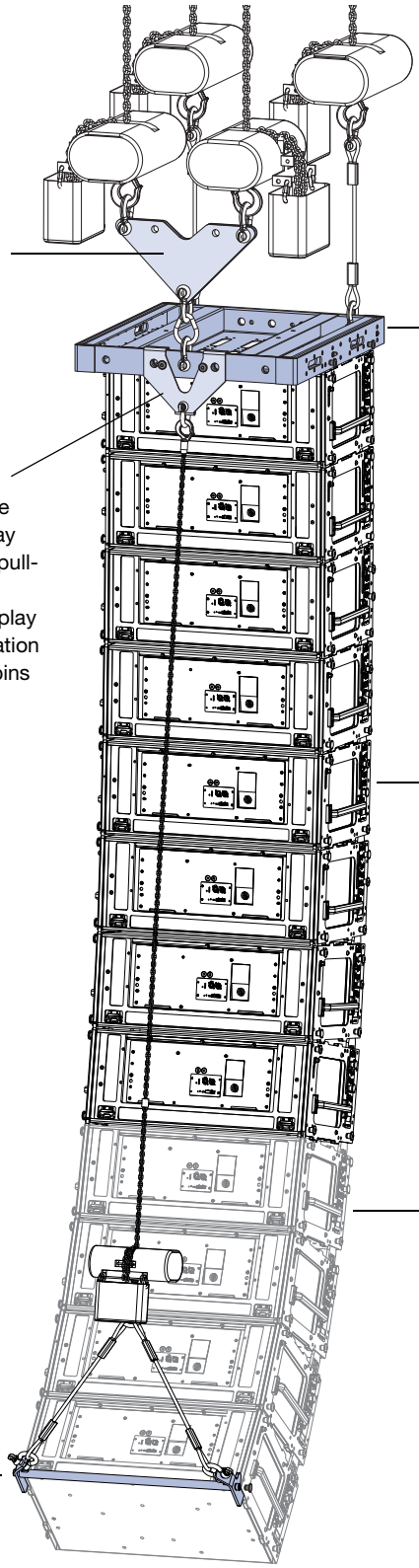
Table 1 summarizes the available rigging options for LYON. For complete information on rigging hardware, including dimensions, weight, configuration, and load ratings, refer to the MTG-LYON Assembly Guide (PN 05.232.097.01) available at www.meyersound.com.

Table 1: LYON Rigging Options

Model	Weight	Features	Required Quick-Release Pins	Required Shackles
MTG-LYON top grid (PN 40.232.038.01)	171 lbs (77.6 kg)	With some restrictions, flies up to 22 LYONs at a 5:1 safety factor, or up to 18 LYONs at a 7:1 safety factor; accommodates a variety of pickup configurations with six pickup points; includes attachment points to accommodate brackets and adapters for lasers and inclinometers	7/16 x 1.50-inch (red button), PN 134.051, qty 4 included	3/4-inch or 7/8-inch
MVP motor Vee plate (PN 40.215.184.01)	20 lbs (9.1 kg)	Fine tunes the horizontal aim of arrays; compatible with MTG-LEO-M, MTG-LYON, MTG-1100, and MG-LEOPARD/900 grids	—	3/4-inch or 7/8-inch
MTF-LEO-M/LYON transition frame (PN 40.215.250.01)	85 lbs (38.6 kg)	With some restrictions, flies up to seven LYONs at a 7:1 safety factor below LEO-M arrays for downfill; includes rear attachment points for pull-back	7/16 x 1.50-inch (red button), PN 134.051, qty 4 included 5/16 x 0.875-inch (red button), PN 134.025, qty 4 included	5/8-inch
MTF-LYON/LEOPARD transition frame (PN 40.232.140.01)	71 lbs (32.2 kg)	With some restrictions, flies up to eight LEOPARDs at a 7:1 safety factor below LYON arrays for downfill; includes rear attachment points for pull-back; collapsible for easy transport on top of LEOPARD stacks	7/16 x 0.90-inch (black button), PN 134.050, qty 0 included 5/16 x 0.875-inch, red button, PN 134.025, qty 8 included	1/2-inch or 5/8-inch
PBF-LYON pull-back frame (PN 40.232.125.01)	9.5 lbs (4.3 kg)	Attaches to bottom of LYON arrays (to the bottom cabinet) and provides pull-back for extreme array downtilt; can also be used for pull-up to expand the array's splay angles during installation so the blue locking pins can be more easily inserted	7/16 x 0.90-inch (black button), PN 134.050, qty 0 included	5/8-inch
RPP-LEO-M rear pull-up plate (PN 40.215.181.01)	6 lbs (2.7 kg)	Helps assemble large arrays with wide splay angles by providing pull-up (with a motor) to expand the array's splay angles during installation so the blue locking pins can be more easily inserted	1/2 x 2.50-inch (blue button), PN 134.007, qty 2 included	5/8-inch
MCF-LYON caster frame (PN 40.232.045.01)	90 lbs (40.8 kg)	Safely transports up to four LYON cabinets, making it easy to assemble and disassemble arrays in blocks of four cabinets	7/16 x 0.90-inch (black button), PN 134.050, qty 0 included	—

NOTE: The MCF-LYON caster frame does not include quick-release pins because it is secured with the quick-release pins included with the loudspeaker.

Rigging Example, LYON Array with Pull-Up



MVP Motor Vee Plate
Attached to rear center of grid with two motors to adjust the horizontal aim of the array

MTG-LYON Top Grid
Oriented for maximum array downtilt with three pick-up points and four motors

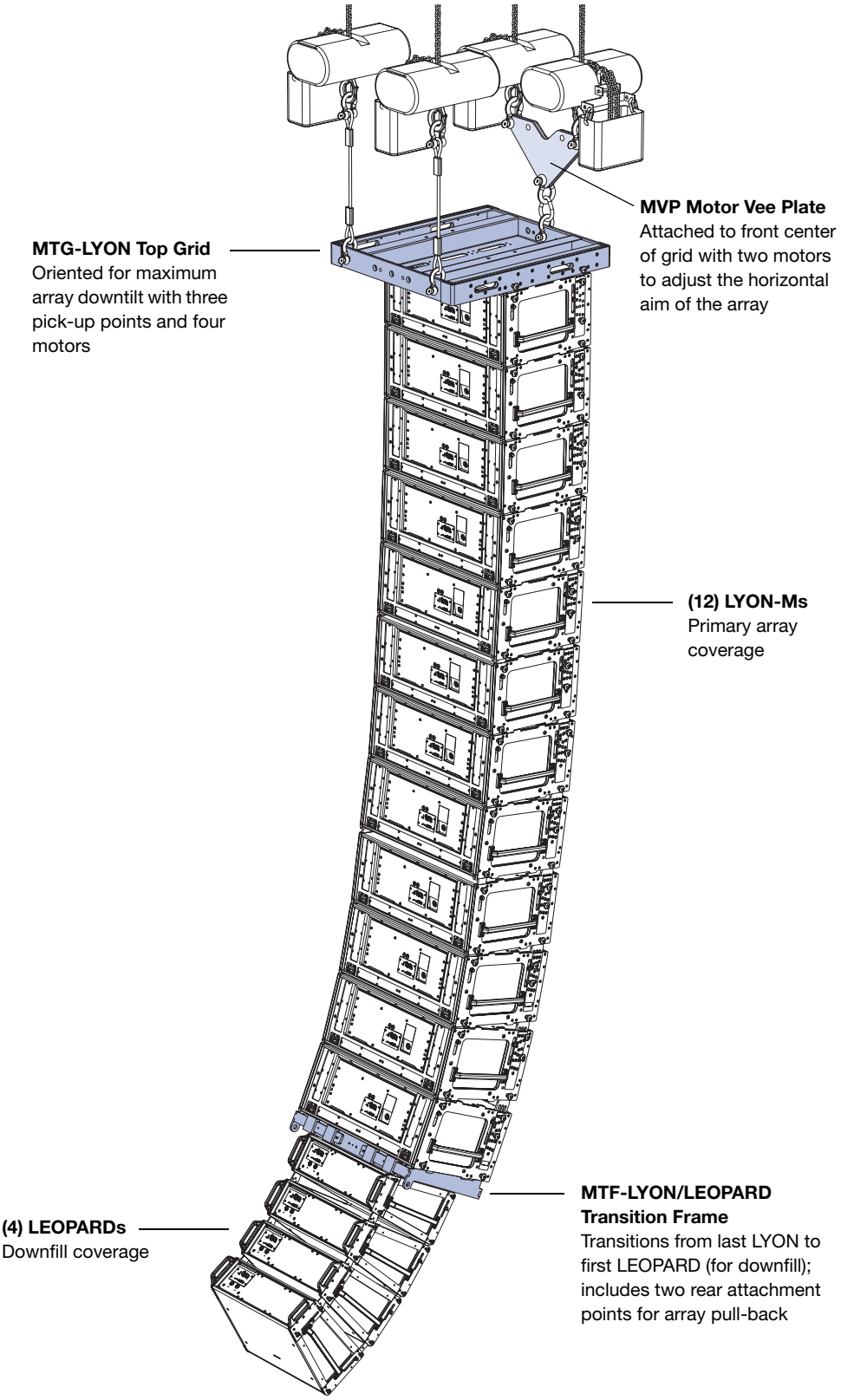
RPP-LEO-M
Rear Pull-Up Plate
Helps assemble large arrays with wide splay angles by providing pull-up (with a motor) to expand the array's splay angles during installation so the blue locking pins can be more easily inserted

(8) LYON-Ms
Primary array coverage

(4) LYON-Ws
Wide coverage

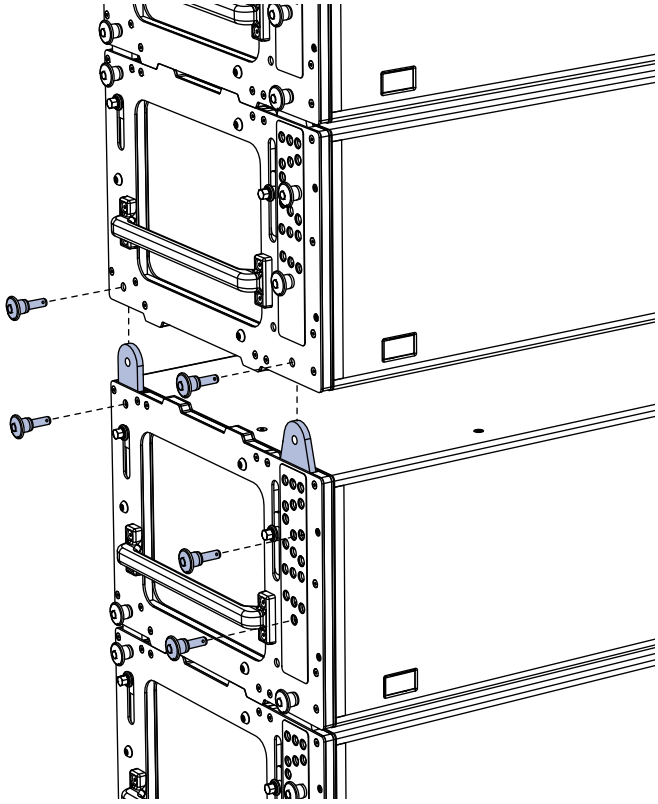
PBF-LYON
Pull-Back Frame
Attached to bottom cabinet to provide pull-back for extreme array downtilt; can also be used for pull-up to expand the array's splay angles during installation so the blue locking pins can be more easily inserted

Rigging Example, LYON Array with LEOPARD Downfill



LYON GUIDEALINKS

LYON is equipped with four captive GuideALinks and four mating link slots that link to adjacent units in flown arrays. Located at the top corners of the cabinet, GuideALinks extend up and into the link slots of the cabinet above it, or into the link slots of the MTG-LYON grid, making it easy to link cabinets once they are stacked. GuideALinks extend and retract with knobs and are secured with two quick-release pins: one each in the top and bottom cabinets. Each LYON loudspeaker ships with 10 7/16 x 0.90-inch quick-release pins (blue button) (black button) (PN 134.050).

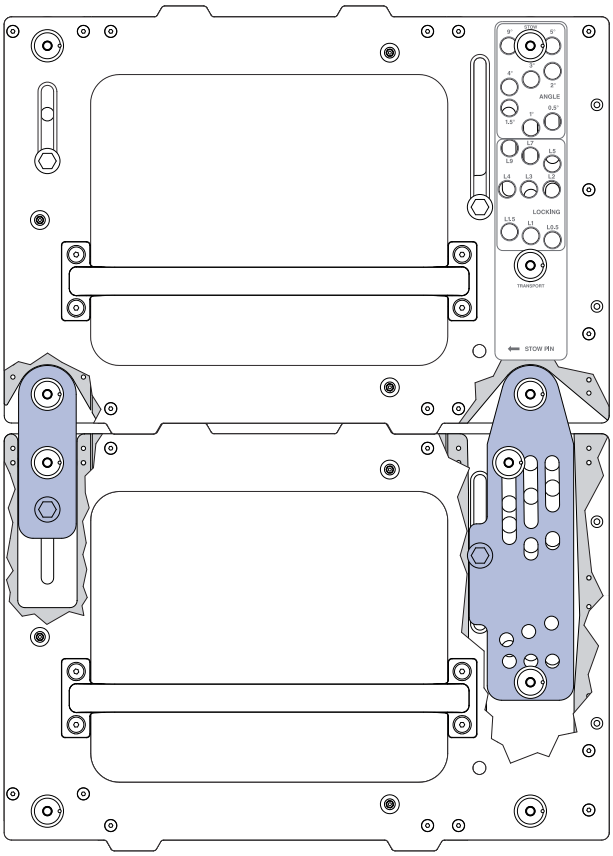


LYON GuideALinks with Quick-Release Pins, Exploded View

⚠ **CAUTION:** GuideALinks must be secured with the included quick-release pins. At no time should the weight of the loudspeaker rest on the GuideALink knobs when the links are fully extended (without the pins inserted). GuideALink knobs are for extending and retracting the links only.

LYON Splay Angles

Rear GuideALinks attach at a fixed splay angle of 0 degrees and act as a pivot point between linked LYONs, with the splay angle between the units determined by the front GuideALink positions. Rear GuideALinks can be pinned in either of two positions: extended or stowed.



LYON GuideALinks (Exposed) Attached at 0 Degrees

Front GuideALinks determine the loudspeaker splay angles and are configured with the yellow ANGLE positions when the cabinets are resting in the caster frame. After the stack is lifted with the motors, the loudspeakers rotate on the axis of the rear GuideALinks and the front GuideALinks slide into position as the weight of the loudspeakers causes the cabinets to shift, at which point, quick-release pins are inserted in the corresponding blue LOCKING positions to lock the splay angles.

Available splay angles for linked LYONs include 0.0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 7.0, and 9.0 degrees and are indicated by the blue and yellow GuideALink labels.

⚠ **CAUTION:** Splay angles of 0 degrees should only be used for the top cabinet attached to the grid. Splay angles of at least 0.5 degrees are recommended for cabinets near the top of the array. If

multiple cabinets are set to 0 degrees and the array is flown with downtilt, the resulting splay angles could be negative because of the gaps in the links and pins that facilitate easy pinning.

NOTE: The splay angles listed on the GuideALink labels are for relative angles between the center axes of the linked units. For example, setting the GuideALinks to 5 degrees yields a 5-degree downtilt of the lower unit to the upper unit. How the loudspeakers relate to the floor, stage, and seating angles in the venue depends on the orientation of the grid, the angles of the loudspeakers in the array above them, and other factors. MAPP prediction software should be used to calculate optimum splay angles for loudspeakers and to predict coverage patterns for arrays.

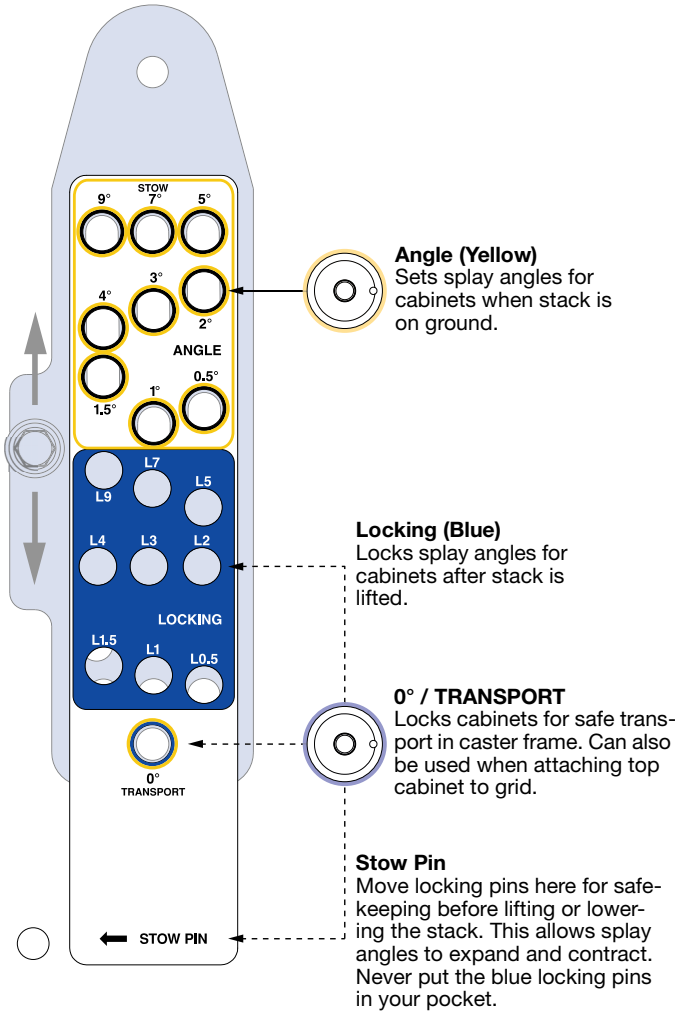


Figure 4: LYON Front GuideALinks Label

NOTE: For more information on GuideALink configurations, refer to the MTG-LYON Assembly Guide (PN 05.232.097.01) available at www.meyersound.com.

WHEN TO MOVE THE LOCKING PINS TO THE "STOW PIN" POSITION

The quick-release pins in the blue LOCKING positions must be moved to the STOW PIN position before either lifting or lowering an array. The removal of the quick-release pins from the LOCKING positions allows the splay angles to expand and contract when assembling and disassembling the array. Moving the pins to the STOW PIN position also keeps them handy so they won't be dropped or misplaced.

TIP: Resist the urge to put the blue locking pins in your pocket. Instead place them in the STOW PIN position before lifting or lowering the array.

CHAPTER 5: RMS REMOTE MONITORING SYSTEM

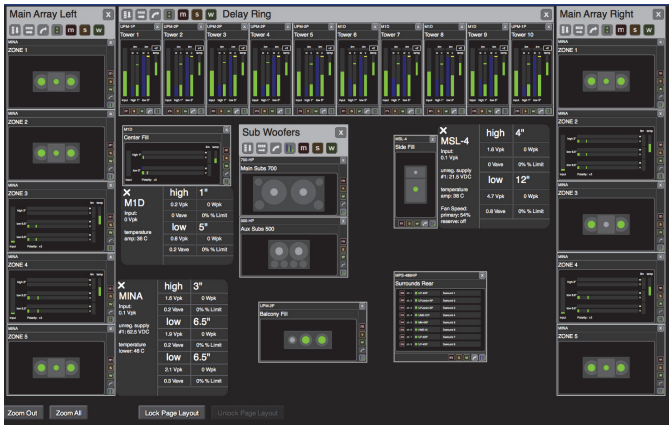
LYON includes an RMS remote monitoring system module, allowing the loudspeaker to be connected to an RMS network. RMS reports, in real time, the status and power usage of multiple Meyer Sound loudspeakers from a Mac or Windows-based computer. The RMS host computer communicates with Meyer Sound loudspeakers (equipped with RMS modules) via RMServer™, a compact, Ethernet-based hardware unit with two FT-10 ports. RMServer stores system configurations internally, eliminating most manual data entry. Systems can be monitored from a computer at front-of-house or backstage, or from a laptop anywhere within the venue over WiFi.

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

NOTE: RMS does not control AC power.

COMPASS RMS SOFTWARE

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 discovery procedure. Once loudspeakers are identified on the RMS network, they appear in Compass RMS as icons that can be customized to suit your needs.



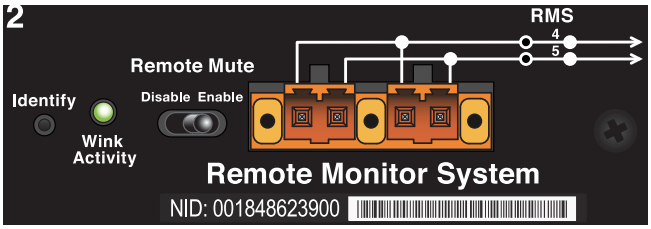
Compass RMS Window

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 Compass RMS by pressing the Identify button on the loudspeaker's RMS module.

Loudspeaker icons can be arranged in Compass RMS and saved as pages to represent how the loudspeakers have been deployed in the system. Multiple pages can be saved and recalled for specific performances and venues.

RMS MODULE

The LYON RMS user panel includes an Identify button, Remote Mute switch, Wink/Activity LED, and two Network connectors.



LYON RMS Module

NOTE: The Identify button and Wink/Activity LED on the RMS user panel are used exclusively by RMS and have no effect on the acoustical or electrical activity of the loudspeaker.

Identify Button

The Identify button serves the following functions:

- If the loudspeaker has not yet been discovered on the RMS network (Wink/Activity LED not lit), press the Identify button to discover it.
- To remove the loudspeaker from the RMS network, press and hold the Identify button during startup (see "Resetting the RMS Module" on page 22).
- To *wink* a discovered loudspeaker, press the Identify button. The Wink LED on the loudspeaker icon in Compass RMS lights up and the Wink/Activity LED on the loudspeaker's RMS user panel turns solid green. Press the Identify button again to unwink the loudspeaker.

TIP: The Wink function is useful for identifying the physical loudspeaker corresponding to a loudspeaker icon in Compass RMS.

TIP: The loudspeaker can also be winked by clicking the Wink button on the loudspeaker icon in Compass RMS.

Wink/Activity LED (Green)

The green Wink/Activity LED indicates the status of the loudspeaker:

- During startup, the LED flashes green 10 times.
- If the loudspeaker has not yet been discovered on the RMS network, the LED is not lit after startup.
- If the loudspeaker has been successfully discovered on the RMS network, the LED flashes green continuously and flashes more rapidly with increased data activity.
- When the loudspeaker is winked, either by clicking the Wink button in Compass RMS or by pressing the Identify button on the RMS user panel, the LED is solid green. The LED remains solid green until the loudspeaker is unwinked.

TIP: The Wink function is useful for identifying the physical loudspeaker corresponding to a loudspeaker icon in Compass RMS.

Remote Mute Switch

The recessed Remote Mute switch on the LYON RMS module determines whether Compass RMS can control muting and soloing of the loudspeaker. LYON ships from the factory with the switch enabled.

Remote Mute Switch

- **Disable:** When the Remote Mute switch is set to Disable (to the left), the loudspeaker cannot be muted or soloed from Compass RMS.
- **Enable:** When the Remote Mute switch is set to Enable (to the right), the loudspeaker can be muted and soloed from Compass RMS.

NOTE: Compass RMS also allows you to disable Mute and Solo functions to eliminate any possibility of accidentally muting loudspeakers.

RMS Network Connectors

The Weidmuller 2-conductor, locking 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 cables to be securely attached to the RMS module with screws.

NEURON ID FOR RMS MODULE

Each RMS module has a unique 12-character Neuron ID (NID) that identifies the loudspeaker on the network. The NID is automatically detected by RMServer but can also be entered manually, if necessary, when configuring RMS systems in Compass RMS without loudspeakers present. The NID label is located on the RMS user panel near the orange Network connectors.

RESETTING THE RMS MODULE

You can use the Identify button to reset the LYON RMS module when powering on the loudspeaker. This will cause the module to be removed from the RMS network.

To reset the RMS module:

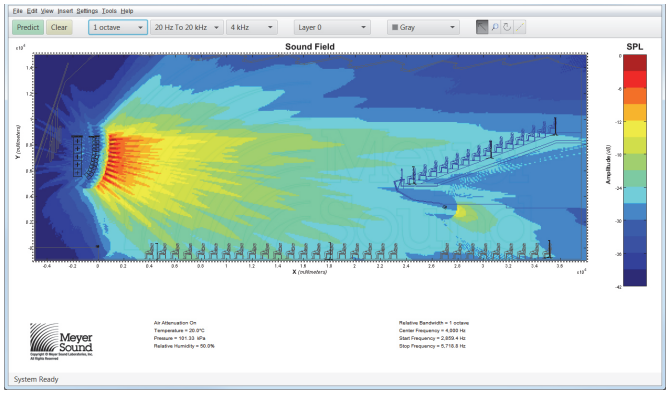
1. Power down the loudspeaker.
2. Press and hold the Identify button.
3. While continuing to hold down the Identify button, power on the loudspeaker.
4. After the Wink/Status LED flashes on and off, release the Identify button. The RMS module is reset and the loudspeaker is removed from the RMS network.

CHAPTER 6: SYSTEM DESIGN AND INTEGRATION TOOLS

This chapter introduces MAPP, Meyer Sound's patented system design tool, and SIM 3, a comprehensive system for measurement and analysis.

MAPP SYSTEM DESIGN TOOL

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



MAPP System Design Tool

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

The key to the accuracy of MAPP's predictions is Meyer Sound's exhaustive database of loudspeaker measurements. Performance predictions for each loudspeaker are based on 720 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 will closely match their actual performance.

MAPP client software lets you configure Meyer Sound loudspeaker systems and define the environment in which they operate, including air temperature, pressure, humidity, and even the location and composition of surfaces. You can also import CAD (.DXF) files containing detailed venue information to act as a visual aid.

MAPP prediction requests are sent by the client software to Meyer Sound servers, where complex, high-resolution (magnitude and phase) polar data is processed with sophisticated acoustical prediction algorithms. The resulting predictions are then displayed in the MAPP client software.

TIP: Meyer Sound offers seminars and webinars on using MAPP. For more information, visit www.meyersound.com.

MAPP Capabilities

With MAPP, you can:

- Simulate different loudspeaker configurations to refine system design and determine the best coverage for intended audience areas
- Monitor loudspeaker interactions to locate constructive and destructive interferences so that loudspeakers can be re-aimed and repositioned as necessary
- Place microphones anywhere in the sound field and predict loudspeaker frequency response, phase response, and sound pressure levels as measured at each microphone position
- Determine delay settings for fill loudspeakers using the Inverse Fast Fourier Transform feature
- Preview the results of Galileo or Galileo Callisto processing to determine optimum settings for the best system response
- Automatically calculate load information for arrays to determine rigging capacity, front-to-back weight distribution, and center of gravity location
- Generate and export system images and full-system PDF reports for client presentations

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 down to 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, during a performance, both the input signal and the measured output of the loudspeaker system can be captured 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:

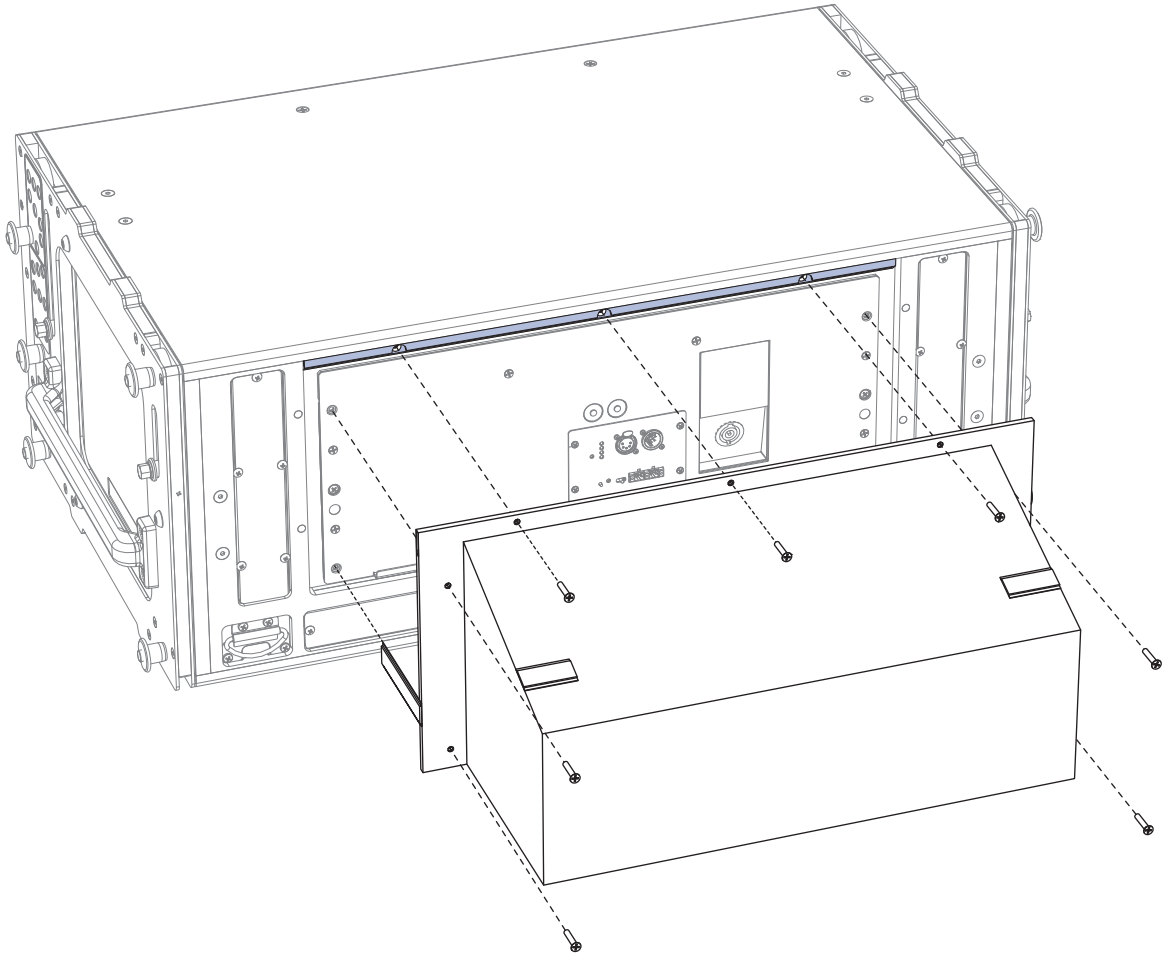
- Microphone calibration and equalization
- Transducer evaluation and correction
- Echo detection and analysis
- Vibration analysis
- Architectural acoustics

APPENDIX A: RAIN HOODS

LYON loudspeakers are optionally available with weather protection for outdoor installations. Weather-protected LYONs are available with either a collapsible rain hood for outdoor touring applications or a quick-clip removable rain hood for indoor/outdoor touring and permanent outdoor installations. Both rain hoods protect the loudspeaker's connectors from water intrusion.

LYON COLLAPSIBLE RAIN HOOD

The LYON collapsible rain hood is factory installed and can be expanded when the loudspeaker is installed and collapsed when the loudspeaker is transported. The collapsible rain hood is ideal for outdoor touring applications.

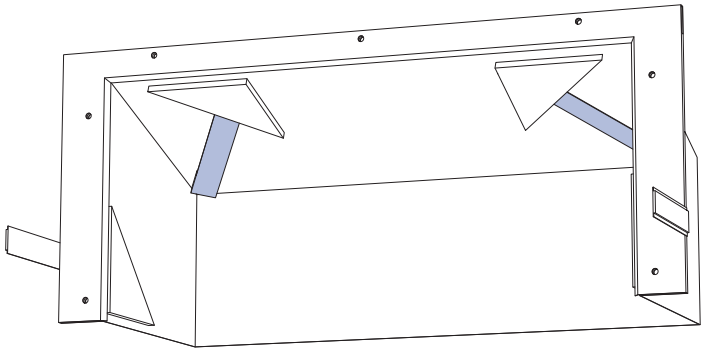


LYON with Collapsible Rain Hood

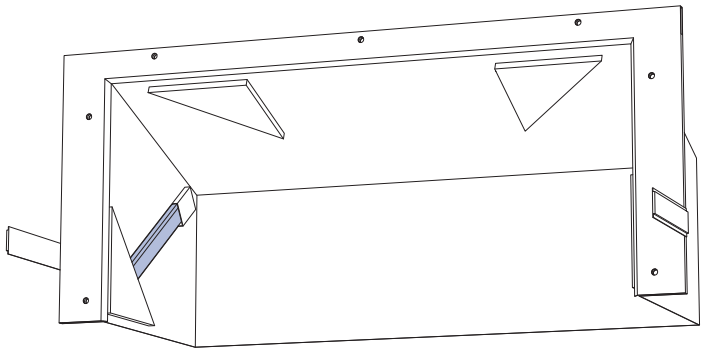
Expanding the LYON Collapsible Rain Hood

To expand the LYON collapsible rain hood:

1. Remove the rain hood's Velcro straps.
2. Expand the rain hood's fabric fully upward and outward.
3. Reach inside the rain hood and free the two struts from the top corner pockets nearest the loudspeaker.



4. Fold the two struts downward and outward and insert them into the two side pockets.

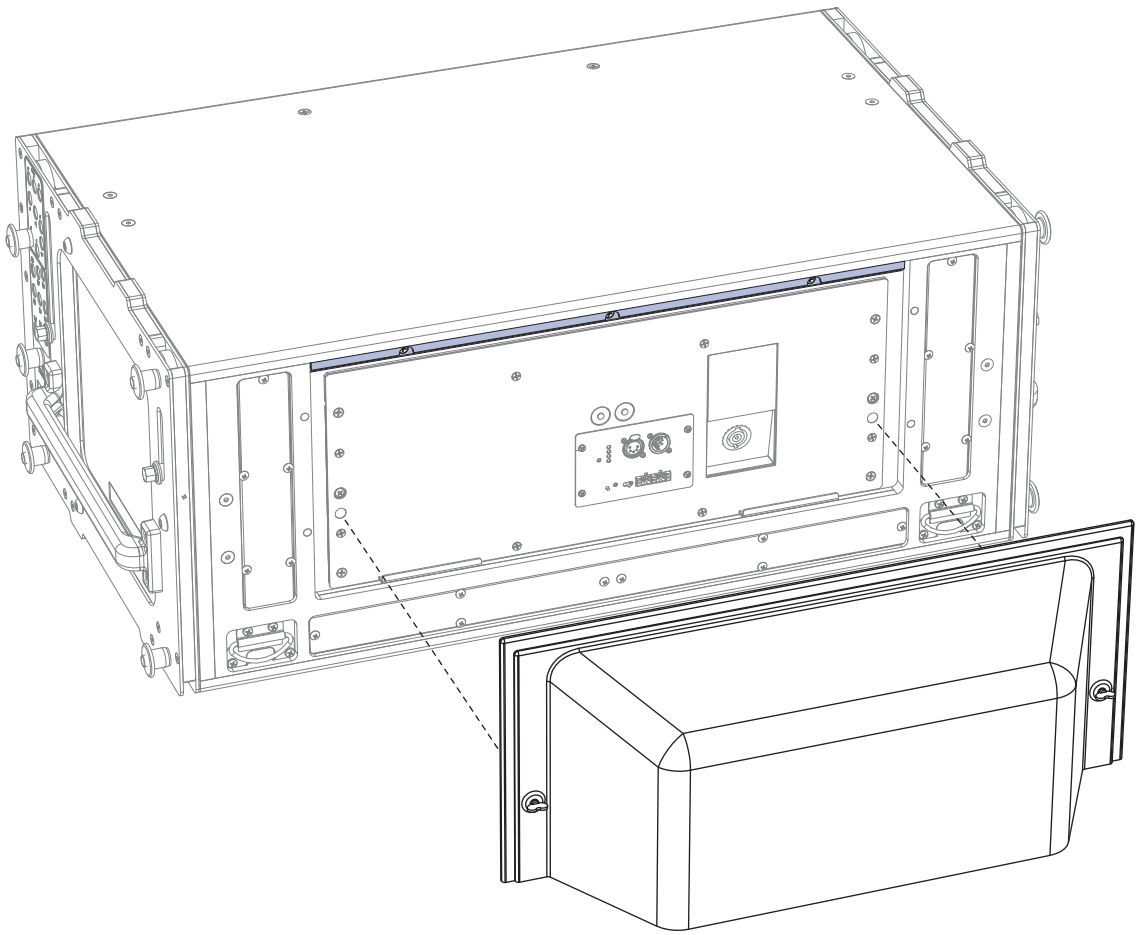


LYON QUICK-CLIP RAIN HOOD

The LYON quick-clip removable rain hood is easily attached and removed with its two winghead studs. The quick-clip rain hood is ideal for indoor/outdoor touring applications and fixed outdoor applications.

To attach the LYON quick-clip rain hood:

1. Attach any required cables to the LYON loudspeaker.
2. Attach the rain hood to the user panel, slipping it under the rain hood retainer's flange at the top of the user panel and securing it to the center of the panel with its two winghead studs.



LYON with Quick-Clip Rain Hood

3. Make sure to tighten the winghead studs one quarter turn so they fully lock.

APPENDIX B: SPECIFICATIONS

NOTE: Loudspeaker system predictions for coverage and SPL are available in Meyer Sound's MAPP prediction software.

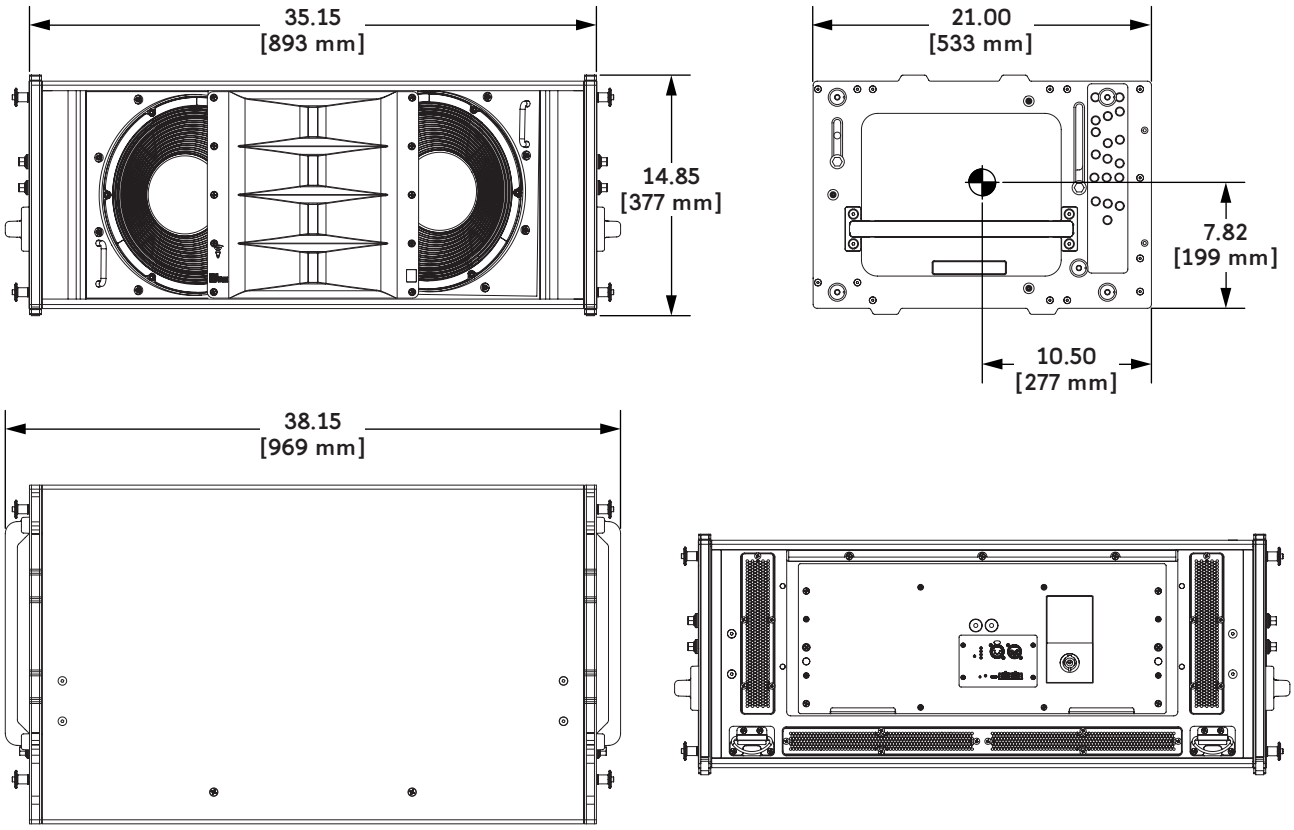
LYON Specifications

ACOUSTICAL	
Operating Frequency Range	55 Hz – 16.5 kHz **Note:** Recommended maximum operating frequency range. Response depends on loading conditions and room acoustics.
Phase Response	80 Hz to 16 kHz ±30 degrees
TRANSDUCERS	
Low Frequency	Two 12-inch long-excursion cone drivers
High Frequency	Two 3-inch compression drivers coupled to a constant-directivity horn through a patented REM® manifold
AUDIO INPUT	
Type	Differential, electronically balanced
Maximum Common Mode Range	±15 V DC, clamped to earth for voltage transient protection
Connectors	XLR 3-pin or 5-pin female input XLR 3-pin or 5-pin male loop output **Note:** XLR 5-pin connectors accommodate both balanced audio and RMS signals.
Input Impedance	10 kOhm differential between pins 2 and 3
Wiring	Pin 1: Chassis/earth through 1 kOhm, 1000 pF, 15 V clamped network to provide virtual ground lift at audio frequencies Pin 2: Signal (+) Pin 3: Signal (–) Pin 4: RMS (polarity insensitive) Pin 5: RMS (polarity insensitive) Case: Earth ground and chassis **Note:** Pins 4 and 5 (RMS) included only with XLR 5-pin connectors.
DC Blocking	Differential DC blocking up to the maximum common mode voltage
CMRR	>50 dB, typically 80 dB (50 Hz – 500 Hz)
RF Filter	Common mode: 425 kHz Differential mode: 142 kHz
TIM Filter	Integral to signal processing (<80 kHz)
Nominal Input Sensitivity	0.0 dBV (1.0 V rms) continuous is typically the onset of limiting for noise and music
Input Level	Audio source must be capable of producing +20 dBV (10 V rms, 14 V peak) into 600 ohms to produce the maximum peak SPL over the operating bandwidth of the loudspeaker
AMPLIFIER	
Type	3-channel, complementary MOSFET output stages (class AB/H bridged)
Cooling	Two ultrahigh-speed primary fans, two ultrahigh-speed reserve fans
AC POWER	
Connector	powerCON 32 input
Safety Rated Voltage Range	95–125 V AC, 50–60 Hz 208–235 V AC, 50–60 Hz
Turn-on/off Points	Turn-on: 85 V AC; Turn-off: 134 V AC Turn-on: 165 V AC; Turn-off: 264 V AC

LYON Specifications

Current Draw			
Idle	0.7 A rms (208 V AC)	0.6 A rms (230 V AC)	1.2 A rms (115 V AC)
Maximum Long-Term Continuous	6.2 A rms (208 V AC)	5.6 A rms (230 V AC)	11.2 A rms (115 V AC)
Burst	8.2 A rms (208 V AC)	7.5 A rms (230 V AC)	15.4 A rms (115 V AC)
Maximum Instantaneous Peak	25 A peak (208 V AC)	23 A peak (230 V AC)	45 A peak (115 V AC)
Inrush	<15 A peak (208 V AC)	<15 A peak (230 V AC)	<15 A peak (115 V AC)
PHYSICAL			
Enclosure	Multi-ply hardwood		
Finish	Black textured		
Protective Grille	Hex-stamped steel with acoustical black mesh		
Rigging	Endframes with captive GuideALinks (0.0 to 9.0-degree splay angles), quick-release pins, and detachable side handles		
Dimensions	38.15 inches (969 mm) W	14.85 inches (377 mm) H	21.00 inches (533 mm) D
Weight	199 lbs (90.3 kg)		
ENVIRONMENTAL			
Operating Temperature	0° C to +45° C		
Non Operating Temperature	–40° C to +75° C		
Humidity	To 95% at 45° C (non-condensing)		
Operating Altitude	To 5,000 m (16,404 ft)		
Non Operating Altitude	To 12,000 m (39,000 ft)		
Shock	30 g 11 msec half-sine on each of 6 sides		
Vibration	10 Hz – 55 Hz (0.010 m peak-to-peak excursion)		

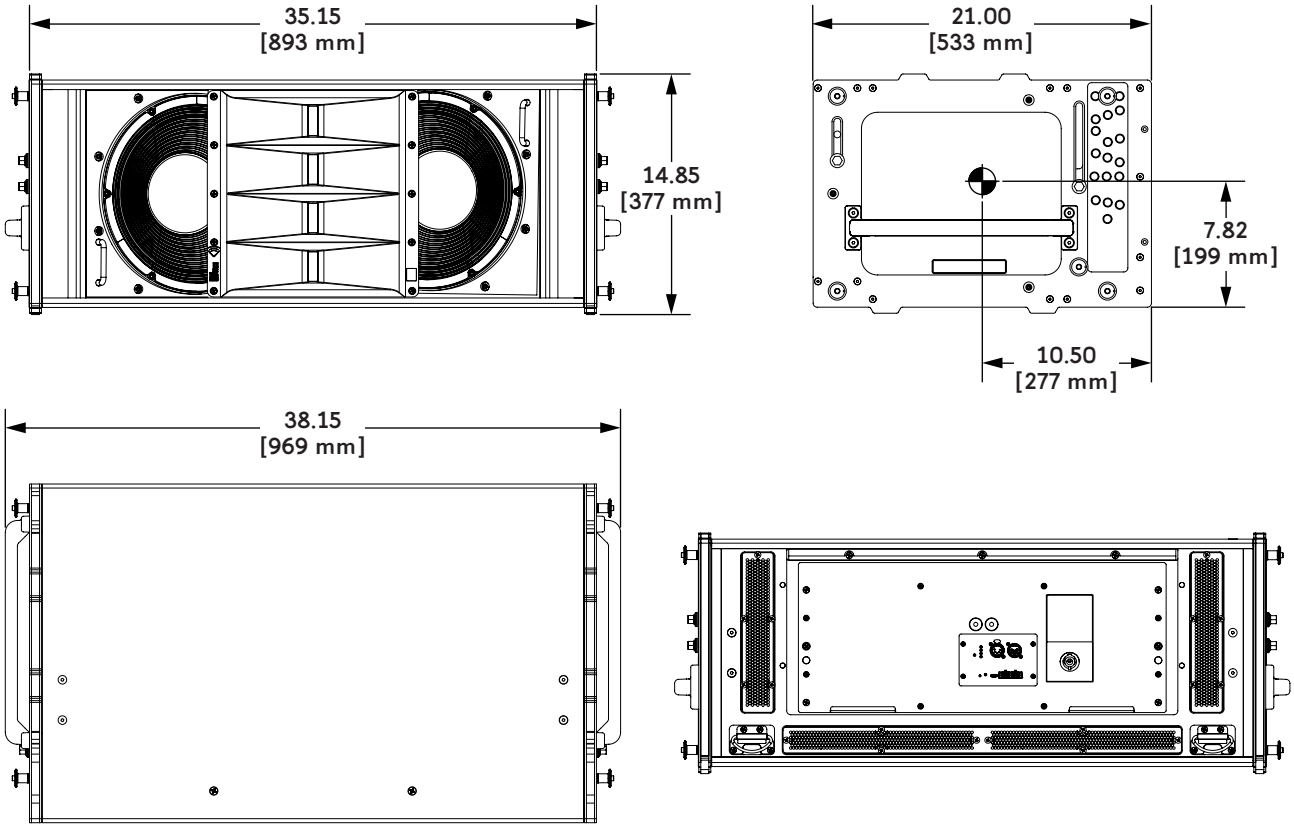
LYON-M DIMENSIONS



LYON-M Dimensions

NOTE: For the dimensions and weight for the MTG-LYON top grid and MCF-LYON caster frame, refer to the MTG-LYON Assembly Guide (PN 05.232.097.01) available at www.meyersound.com.

LYON-W DIMENSIONS



LYON-W Dimensions

NOTE: For the dimensions and weight for the MTG-LYON top grid and MCF-LYON caster frame, refer to the MTG-LYON Assembly Guide (PN 05.232.097.01) available at www.meyersound.com.

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.

EN 55032 (CISPR 32) STATEMENT

Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

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www.meyersound.com

LYON Operating Instructions
PN 05.232.005.01 B