MTD112b

COAXIAL TECHNOLOGY

APPLICATIONS

The L-ACOUSTICS® MTD112b loudspeaker enclosure and its accompanying analog controller provide a highly versatile system that is designed for distributed sound reinforcement. Intended for medium-scale touring, sub-hire or fixed installation, the MTD112b features proven components that are compatible with previous generation MTD enclosures while also benefiting from the economy, packaging and "plug and play" ease of use afforded by it's companion LLC112b-st stereo line level analog controller.

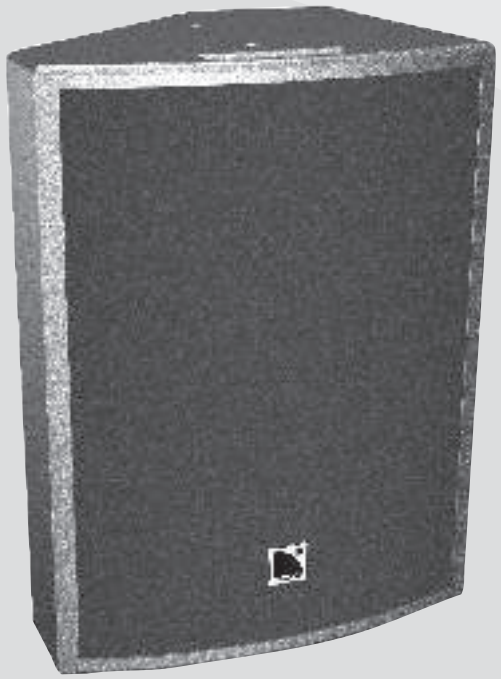
The MTD112b is a passive 2-way loudspeaker enclosure containing a 1.4" exit compression driver that is directly loaded by the 12" loudspeaker in a coaxial configuration. Advantages of the coaxial approach include: single point source radiation and excellent phase response, total wavefront coherency at all frequencies and axi-symmetrical directivity that produces identical horizontal and vertical coverage. Coaxial design also provides LF/HF superimposed dispersion characteristics that are free of polar lobing effects typical of traditional horn and woofer combinations. The end result is natural, studio monitor level sound quality, ideal for proximity use and perfectly matching semi-reverberant environments.

The MTD112b is designed for distributed sound reinforcement and can also be used in medium power front-of-house (FOH) applications for theatres, clubs, multi-purpose venues or corporate events. Examples of distributed systems include delay rings for large-scale installations, surround effects channels for theatre or multimedia, distributed reinforcement for sports venues and delays for speech reinforcement in convention centre ballrooms. Due to its compact, wedge-shaped format, axi-symmetrical directivity and full range passive design, the MTD112b also provides a cost-effective floor monitor solution for live sound reinforcement. When used with additional subwoofers such as the SB115, SB118 or SB218, the MTD112b can be used in side fill or drum monitoring applications.

The L-ACOUSTICS LLC112b-st is a dedicated stereo analog controller that provides optimum processing and sense return protection for the MTD112b. Front panel design of the LLC112b-st allows the unit to function as a patch panel, providing an ergonomic, cost-effective solution for amplifier rack packaging.

A pole mount socket and single stud anchor plate are included as standard on the MTD112b and the enclosure is Omnimount-ready. An adjustable U-bracket is available as an optional rigging accessory for ceiling, wall or scaffold mounting.

L-ACOUSTICS PROFESSIONAL SOUND SYSTEM



- **Passive two-way enclosure (12" LF, 1.4" HF)**
- **High power coaxial driver assembly**
- **Point source radiation (85° conical directivity)**
- **Flexible format for distributed sound reinforcement**
- **Wedge-shaped for floor monitor use**
- **Suitable for medium-power FOH applications**
- **Designed for both fixed installation and touring**
- **Compact, rugged construction, flexible rigging**
- **Analog processor control with sense return protection**

SPECIFICATIONS

L-ACOUSTICS specifications are based on measurement procedures which produce unbiased results and allow for realistic performance prediction and simulation. Some of these specifications will appear very conservative when compared with other manufacturer's specifications. All measurements are conducted under free field conditions and scaled to a 1 m reference distance unless otherwise indicated.

Frequency Response

Frequency response	70 - 14k Hz (±3 dB)	(LLC FRONT position)
Usable bandwidth	55 - 16k Hz (-10 dB)	

Sensitivity[1]

(2.83 Vrms @ 1m)	98 dB SPL	70 - 14k Hz

Power Rating[2] (Long Term)			**Amplification*** (Recommended)	**Impedance** (Nominal)
45 Vrms	250 Wrms	1000 Wpeak	500 W	8 ohms

*Amplifiers must have 32 dB gain in order for LLC112b-st sense return protection to function properly

Nominal Directivity (-6dB)[3]

Axi-symmetrical	85° (± 20°)

System Output[4]	**SPL**		
One enclosure	120.5 dB (cont)	126.5 dB (peak)	FRONT mode
	122.5 dB (cont)	128.5 dB (peak)	X-OVER mode

FRONT LLC setting provides a 3 dB low frequency contour under freefield conditions

X-OVER LLC setting applies a 100 Hz high pass filter

Components

LF 1 x 12" weather resistant loudspeaker (4" voice coil)

HF 1 x 1.4" exit compression driver (titanium diaphragm, 3" voice coil, coaxial assembly)

Enclosure

• Height	540 mm	21.3 in
• Front Width	410 mm	16.1 in
• Rear Width	165 mm	6.5 in
• Depth	375 mm	14.8 in
• Trap Angle	45 degrees with respect to vertical	
• Net Weight	27.5 kg	60.6 lbs
• Shipping Weight	30.5 kg	67.2 lbs
• Shipping Dims	615 x 470 x 465 mm	
	24.2 x 18.5 x 18.3 in	

- Connectors : 2x 4-pin Neutrik speakon
- Material : 18 mm, 30 mm Baltic birch plywood
- Finish : Maroon-gray™
- Grill : Black epoxy perforated steel with acoustically transparent foam
- Rigging : Integrated flying hardware, handles and pole mount socket, Omnimount-ready

Additional Equipment

- L-ACOUSTICS LLC112b-st analog controller
- L-ACOUSTICS SB115, SB118, SB218 subwoofers
- L-ACOUSTICS LA 15a, LA 17a or LA 24a power amplifier

[1] Sensitivity is the average SPL measured over the component's rated bandwidth

[2] Power rating displays the long term RMS power handling capacity using pink noise with a 6 dB crest factor over the component's rated bandwidth

[3] Directivity is averaged over the 1-10 kHz range

[4] System Output gives the unweighted SPL output of the system referenced to 1 m, including preset equalization and band leveling adjustment as measured under freefield conditions.

L-ACOUSTICS® is a registered trademark

ARCHITECT SPECIFICATIONS

The enclosure shall be a passive, two-way, coaxial full range loudspeaker containing one direct radiating, bass reflex-loaded 12 inch low frequency transducer and one 1.4 inch exit, 3 inch voice coil diameter, titanium alloy diaphragm compression driver. As a full range system, the frequency response shall be 70 Hz to 14 kHz with less than ± 3 dB variation and the usable bandwidth shall be 55 Hz to 16 kHz (-10 dB).

The cone body of the low frequency component shall provide pattern control loading of the compression driver and yield an 85-degree conical dispersion pattern that is axi-symmetrical. The 2nd and 3rd order passive filters employed in the enclosure shall provide a 1.2 kHz crossover point between low and high frequency components. Long term power handling shall be 250 Wrms at a nominal 8-ohm impedance. Connection to the loudspeaker shall be made via two parallel 4-pin Neutrik Speakon connectors.

The enclosure shall have a truncated wedge shape with a curved front profile. Dimensions shall be 54 cm (21.3 in) high, 41 cm (16.1 in) wide at the front of the enclosure, 16.5 cm (6.5 in) wide at the rear of the enclosure and 37.5 cm (14.8 in) deep. When used on its rear side, the front baffle of the enclosure shall be oriented at a 45-degree angle with respect to vertical, allowing the enclosure to be used as a floor monitor. Enclosure weight shall be 27.5 kg (60.6 lbs). Cabinet construction shall consist of 18 mm (0.70 in) and 30 mm (1.18 in) Baltic birch plywood with internal steel bracing and joints that are sealed, screwed and rabbeted. The finish shall be maroon-gray high resilient paint. The front of the enclosure shall be protected by a black powder-coated, 1.5 mm (0.06 in) thick steel grill that is covered with 10 mm (0.4 in) thick acoustically transparent open cell foam.

The enclosure shall have a 36 mm (1.42 in) diameter pole mount socket mounted on the bottom side and a single stud anchor plate mounted on the rear side along with four threaded inserts for attachment of an optional Omnimount bracket. Four recessed attachment locations shall be provided (2 each on the top and bottom sides) for rigging the enclosure with an adjustable U-bracket accessory with angular adjustment in steps of 10 degrees.

The enclosure shall be used with a stereo analog controller that monitors power amplifier outputs and employs sense return processing to provide thermal protection and cone excursion limiting for the loudspeaker components. The analog controller shall provide band limiting and corrective component equalization with three settings that are designed for front-of-house, floor monitor or two-way operation with subwoofers. The analog controller shall perform signal summation of the two input signal channels and provide a line level output signal with selectable band limiting and equalization for use of the enclosure in conjunction with three different subwoofer types.

The loudspeaker system shall be the L-ACOUSTICS MTD112b.

The analog loudspeaker controller shall be the L-ACOUSTICS LLC112b-st.

The subwoofer system shall be the L-ACOUSTICS SB115, SB118 or SB218.

ACCESSORIES

ETR1: U-Bracket for ceiling, wall or scaffold mounting of the MTD112b with angular adjustment in steps of 10 degrees. A bracket mount plate is first attached to the 4 mount locations provided on the enclosure (2 each on the top and bottom sides).The U-bracket is then attached to the mount plate using two threaded knobs - one for attachment of the bracket, one for tilt of the enclosure.

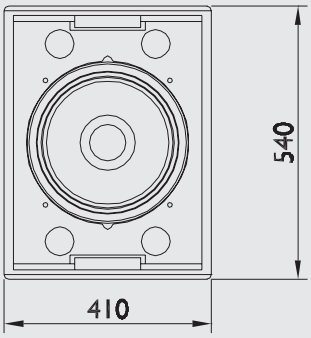
PION1: Single stud Aeroquip flytrack fitting to ring.



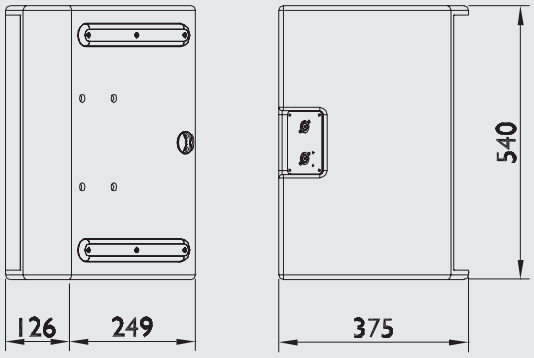
ETR1



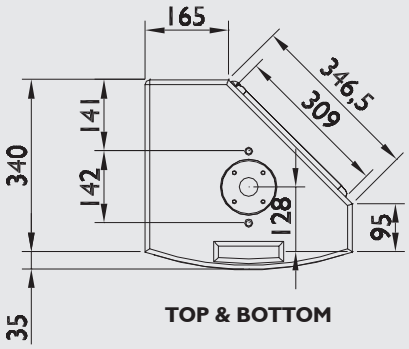
PION1



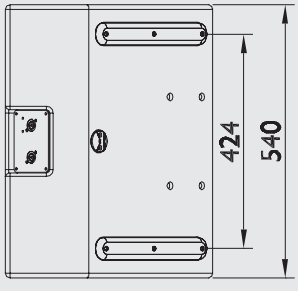
FRONT



LEFT SIDE **RIGHT SIDE**



TOP & BOTTOM



REAR

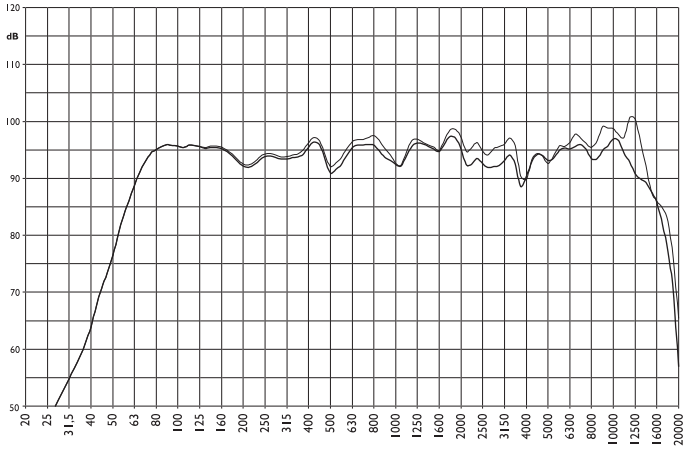
SCALE 1:15

(Dimensions in mm)

MTD112b

PERFORMANCE DATA

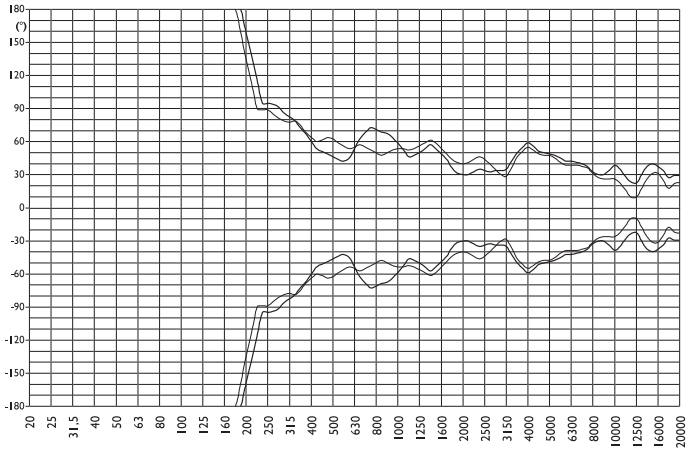
FREQUENCY RESPONSE



On-axis frequency response (LLC112b-st FRONT position)

Frequency response averaged over -3dB beamwidth

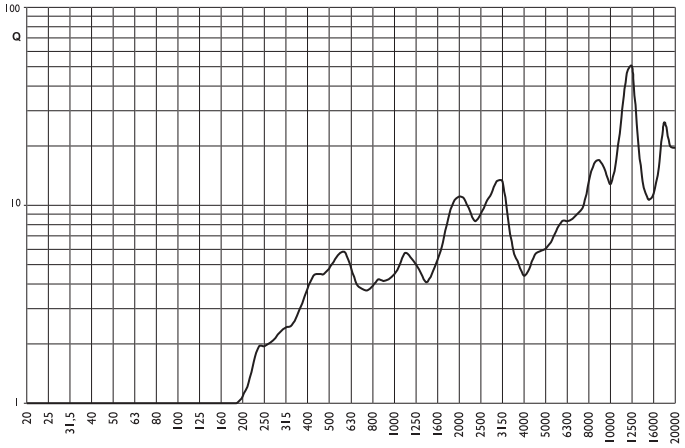
BEAMWIDTH (-6dB)



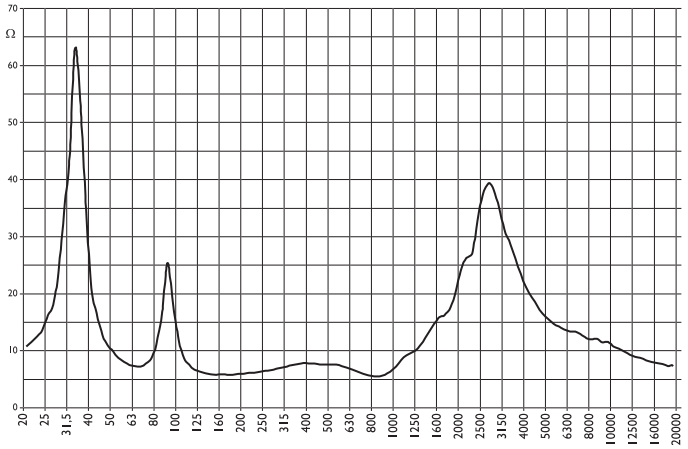
Horizontal

Vertical

DIRECTIVITY FACTOR Q



IMPEDANCE



LLC112b-st

ANALOG CONTROLLER

DESCRIPTION

The L-ACOUSTICS LLC112b-st stereo line level controller is an analog signal processing unit that optimizes the performance of the MTD112b. The controller accepts two signal inputs and provides two processed outputs for the respective input channels plus a filtered, summed output for subwoofer drive. The main functions of the LLC112b-st controller are as follows:

- Bandpass filtering and equalization (3 modes, selectable)
- Mono input summation for subwoofer drive
- Crossover filtering, equalization for subwoofer drive (3 models, switch-selectable)
- Sense Return processing for thermal protection of speaker components and cone excursion limiting (voltage and frequency dependent)

Three different equalization/bandpass filtering modes tailor the frequency response of the MTD112b to suit different applications (selected via front panel switch). In MONITOR mode, high pass filtering is set at 50 Hz and a modest low frequency shelf is applied to provide an equalization contour suitable for floor monitor applications. In FRONT mode, a 50 Hz high pass filter is employed and increased low frequency shelving provides an equalization contour that is more suitable for FOH use. In X-OVER mode, a 100 Hz high pass filter is applied and there is no low frequency shelving equalization since the MTD112b is intended to be used with additional subwoofers.

For subwoofer drive, the second front panel switch allows for selection of bandpass filtering and equalization that is optimized for either SB115, SB118 or SB218 subwoofers. The processed subwoofer signal output is then available on the XLR connectors provided on the front or rear panels of the controller.

In terms of connection, two input signals (Ch A, B) are applied to the line input XLR connectors on the front panel of the LLC112b-st. Rear panel XLR line outputs (Ch A, B) are connected to the power amplifier inputs with the amplifier outputs then connected to the controller "Sense Return" input Speakon connector (Ch A = 1+/1-, Ch B = 2+/2-). Since the amplifier is connected in a loop, LLC sense return protection circuitry can monitor the signal applied to the loudspeakers and provide thermal protection of speaker components plus voltage- and frequency-dependent cone excursion limiting provided that the power amplifier has a gain of 32 dB. The front panel of the LLC112b-st is then used as a patch panel with Ch A, B loudspeakers connected via the two 4-pin Speakon connectors provided.

SPECIFICATIONS

Technical

Inputs	Electronically balanced 10 kΩ input (pin 2 hot)
Outputs	Electronically balanced 50 Ω output (pin 2 hot)
Input Headroom	+20 dBV
Nominal Gain at 200 Hz	0 dB (unity gain) in X-OVER mode
Signal to Noise	> 84 dB
Dynamic Range	> 104 dB
THD	<0.01% (20 to 20k Hz @ 0 dBV)
Bandpass/Equalization Filters	
3 modes	FRONT: 50 Hz LR24 HPF + low frequency shelving eq MONITOR: 50 Hz LR24 HPF X-OVER: 100 Hz LR24 HPF
Low-pass	20 kHz
Subwoofer	25, 26, 40 Hz LR24 HPF (for SB218, SB118, SB115) 100 Hz LR24 LPF
Speaker Protection	RMS limiter & peak limiter

Front & Rear Panel

Indicators	Signal: green LED for each channel Control: yellow LED for each channel
Front Panel Controls	MODE select (FRONT, MONITOR, X-OVER) SUB select (SB115, SB118, SB218) AC power switch
Rear Panel Control	SUB POLARITY (positive, negative)
Front Panel Connectors	Ch A, B XLR inputs with parallel loop through MONO SUB XLR output (in parallel with rear panel XLR) LOUDSPEAKERS OUT Ch A, B: 2 x 4-pin Neutrik speakon (Ch A=1+/1- & Ch B=1+/1-)
Rear Panel Connectors	Ch A, B XLR line outputs MONO SUB XLR output (in parallel with front panel XLR) Sense Return: 1x 4-pin Neutrik speakon (Ch A=1+/1-, Ch B=2+/2-)
Power Requirement	100 V - 240 V 50/60 Hz
Power Consumption	15 W

Physical

Finish		Black anodized front panel, white serigraphy
Net Dimensions		483 x 44 x 305 mm 19 x 1.75 x 12.0 in
Net Weight		3.75 kg 8.3 lbs
Shipping :	Weight	4.8 kg 10.6 lbs
	Dimensions	505 x 80 x 415 mm 19.9 x 3.1 x 16.3 in



FRONT



REAR

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