

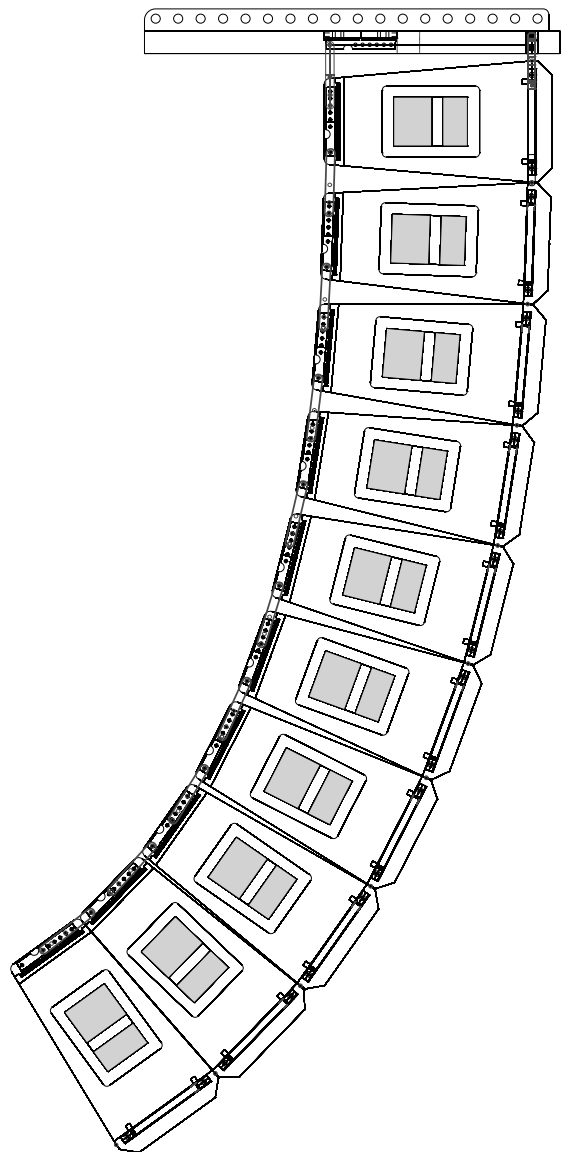
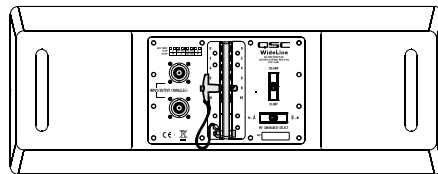
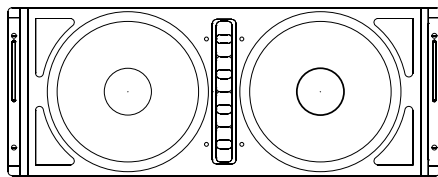
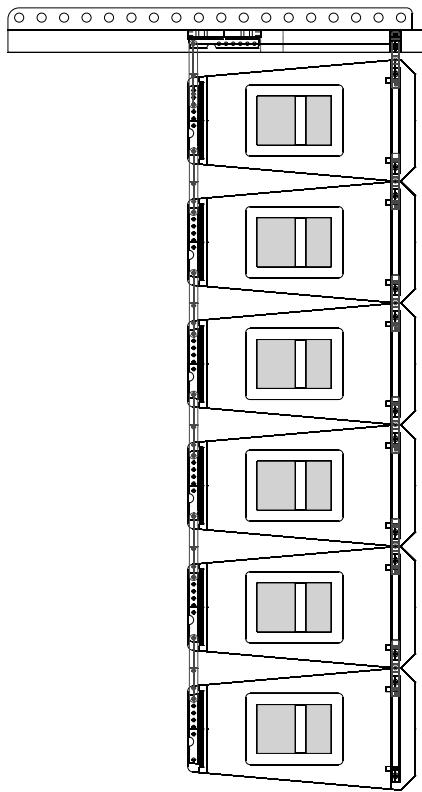
WideLine-10

Loudspeaker User Manual

QSC™

WL2102-w – Birch plywood enclosure

AF2102-LA – Large aluminum array frame



TD-000227-00-D



IMPORTANT SAFETY PRECAUTIONS AND EXPLANATION OF SYMBOLS

Install in accordance with instructions by QSC, LLC instructions and under the supervision of a licensed Professional Engineer.



WARNING!



Before placing, installing, rigging, or suspending any speaker product, inspect all hardware, suspension, cabinets, transducers, brackets and associated equipment for damage. Any missing, corroded, deformed, or non-load rated component could significantly reduce the strength of the installation, placement or array. Any such condition severely reduces the safety of the installation and should be immediately corrected. Use only hardware which is rated for the loading conditions of the installation and any possible short-term, unexpected overloading. Never exceed the rating of the hardware or equipment.

Consult a licensed, Professional Engineer regarding physical equipment installation. Ensure that all local, state and national regulations regarding the safety and operation of suspension equipment are understood and adhered to.

Warranty

For a copy of the QSC Limited Warranty, visit the QSC website at www.qsc.com

Introduction

The WideLine-10 loudspeaker system has been designed to provide a compact system that has unique dispersion characteristics, high-power handling and extended low-frequency response. Its primary uses include ballrooms, theatres, night clubs, houses of worship, and small to medium size events for the corporate and industrial markets.

WL2102-w enclosures are constructed of birch plywood and weigh 83 lb (37.7 kg). The hardware allows for simple vertical splay angle adjustment of 0, 2, 3, 4, 5, 6, 7, 8, 9, and 10° between enclosures.

The AF2102-LA is for suspended or ground stack applications.

The WideLine-10 system is suitable for stand alone applications as a full-range, articulate, high-fidelity, sound reinforcement product with the ability to reproduce many musical programs without subwoofers or bass modules. It has bass response to 55 Hz (-3 dB) in a small format package. Its 3-way, bi-amp or tri-amp design keeps required amplification to a minimum.

WideLine-10's exceptionally wide dispersion practically eliminates the need for "side" or "fill" hangs when used as the main array. Its wide dispersion also provides enhanced coverage when used as a center cluster or as a downfill or underhang enclosure when used with larger format line array systems.

Wide dispersion is accomplished with a 3" (76 mm) diaphragm, 1.4" (36 mm) exit neodymium high-frequency driver mounted on a proprietary, patented* multiple aperture diffraction-slot waveguide. This device is the ideal linear source needed for wide angle line array performance.

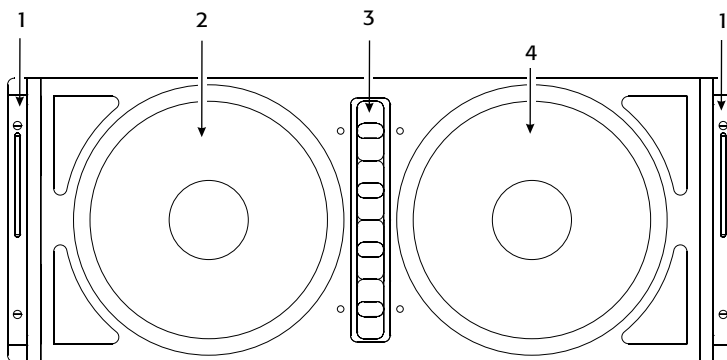
Internal, mid-frequency shading can be switched to either 10" (254 mm) transducer. Both transducers handle the low frequencies, but only the non-shaded transducer handles the mids. This provides smoother pattern control at the mid-high crossover. With selectable shading, the enclosures can be used as house right or left by flipping the switch, not the enclosure.

WideLine-10 users can also use EASE Focus software to aid in the design and implementation of a WideLine-10 array. EASE Focus can calculate the number of enclosures required for a given space (venue), determine the optimum splay angle between those enclosures, calculate at what angle to set the array frame in a single (variable) pick-point or fixed suspension point application, and predict the acoustical response and sound pressure levels throughout the venue in a two-dimensional illustration. The software may be downloaded from the QSC website. Contact QSC for more information.

Like all QSC products, WideLine-10 design focuses on accurate audio performance, rapid set-up, and reduced labor requirements. Ease of transportation, assembly, use, and self contained rigging hardware make WideLine-10 the clear choice.

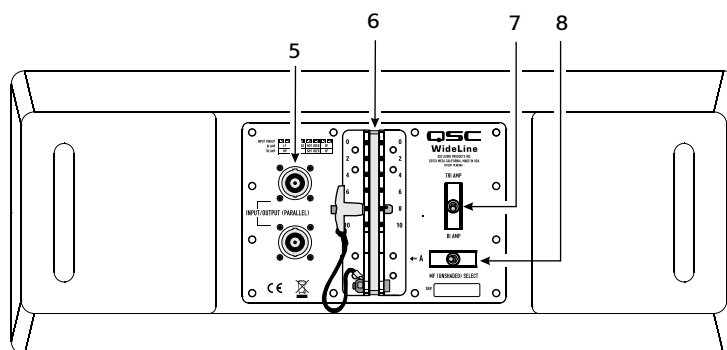
Front (grille removed)

1. Receiver tube (front left and right) with captive articulated joint (inside receiver tube) and ball-lock pins
2. Low-frequency transducer B
3. High-frequency transducer aperture
4. Low-frequency transducer A



Rear

5. Input / output connectors (NL8)
6. Rear link, mounting block, and ball-lock pin
7. TRI AMP / BI AMP selector switch
8. MF (UNSHADED) SELECT switch



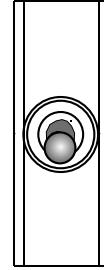
*Patent number 7,177,437

TRI AMP/BI AMP Switch

TRI AMP: Shading network is NOT applied (shading must be provided by upstream signal processing). Connect the full-range input signal to pins 1+ and 1-, connect the shaded (processed) signal to pins 2+ and 2-. To flip shaded transducer location, use the MF (UNSHADED) SELECT switch or alter signal processing. Default MF (UNSHADED) SELECT switch position for three way mode is position A; if put in position B, connections (Table 1) to LF transducers A and B are interchanged.

BI AMP: The “full-range” LF input is applied to pins 1+ and 1- and the -6 dB per octave shading network is applied to one of the LF transducers using the MF (UNSHADED) SELECT switch.

TRI AMP

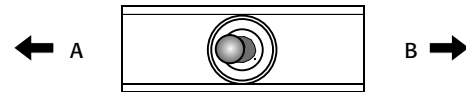


BI AMP

MF (UNSHADED) SELECT Switch

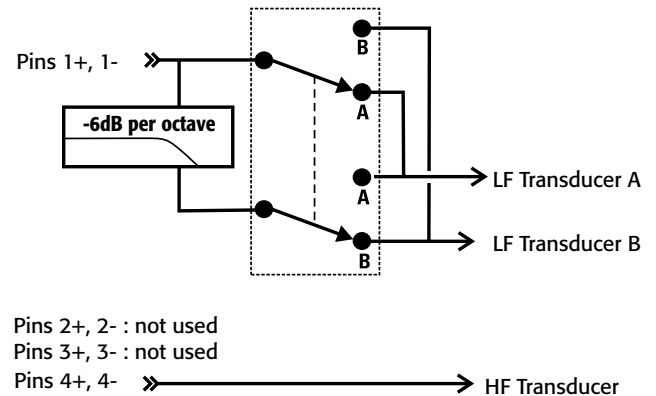
The WideLine-10 is a 3-way design (shaded, non-shaded and high-frequency) with shading provided by a passive network in BI AMP mode or upstream signal processing (DSP) in TRI AMP mode. This allows switch position selection for use as either “house left” or “house right”, without the need to invert boxes.

BI AMP: The shading switch allows either low-frequency transducer to be selected as the shaded unit (bass only) by inserting a -6 dB per octave network. The switch handle points to the side of the unshaded (full-range) low-frequency transducer.



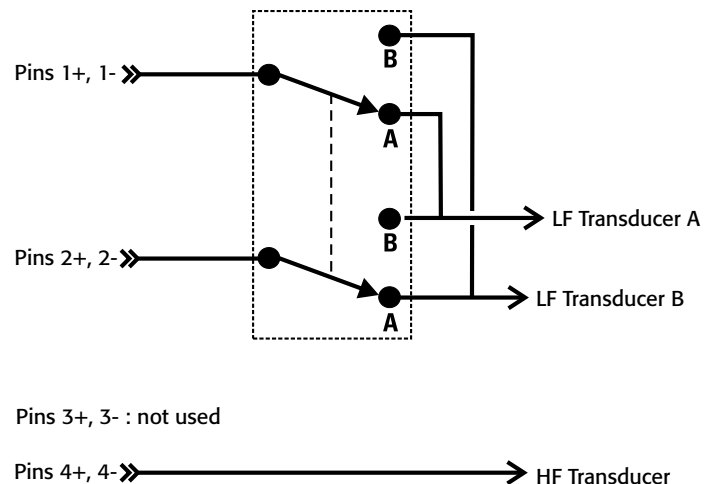
MF (UNSHADED)
SELECT

MF (UNSHADED) SELECT Switch: BI AMP Mode



TRI AMP: The internal -6 dB per octave network is **NOT** applied to either LF transducer. Shading is accomplished with signal processing. The switch handle points to the side of the non-shaded (full-range) low-frequency transducer ONLY IF the full-range signal is applied to pins 1+ and 1- and the shaded signal to pins 2+ and 2-. Default position for TRI AMP mode is position A; if put in position B, connections to LF transducers A and B are interchanged.

MF (UNSHADED) SELECT Switch: TRI AMP Mode



Input Connections

The input connectors are a pair of Neutrik NL8's wired in parallel. Connections for bi-amp and tri-amp vary (Table 1). The pin designations for the NL8FC cable connector is shown for reference, bottom right.

Note! In TRI AMP mode, the MF (UNSHADED) SELECT switch position determines the input connector wiring! Unexpected results may occur if switch positions and wiring are not strictly controlled.

The WideLine-10 loudspeaker is not equipped with a crossover network. All signal processing must be done before connecting audio power to the loudspeaker.

Do not connect full-range audio to the high-frequency transducer or damage may result!

INPUT PINOUT	•1	-1	•2	-2	•3	-3	•4	-4
BI AMP	LF		NOT USED		NOT USED		HF	
TRI AMP	MF		LF		NOT USED		HF	

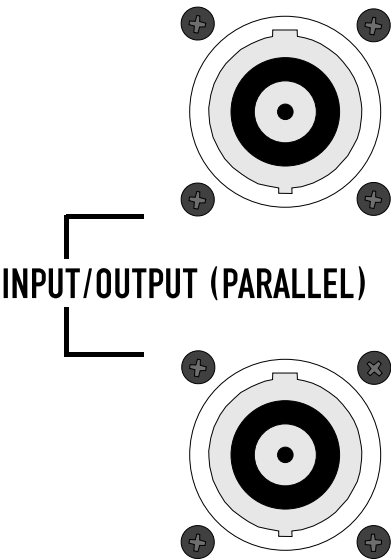
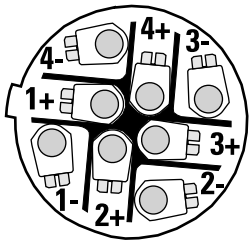


Table 1: Input Connector Wiring, BI AMP and TRI AMP Modes

PIN	BI AMP Internal Shading Network Inserted in Signal Path	TRI AMP MF (UNSHADED) SELECT Switch Position A Use External Processing for Shading,	TRI AMP MF (UNSHADED) SELECT Switch Position B Use External Processing for Shading,
1+	LF +	LF A +	LF B +
1-	LF -	LF A -	LF B -
2+	Not Used	LF B +	LF A +
2-	Not Used	LF B -	LF A -
3+	Not Used	Not Used	Not Used
3-	Not Used	Not Used	Not Used
4+	HF +	HF +	HF +
4-	HF -	HF -	HF -

Neutrik NL8FC Cable Connector Pinout

Shown, at right, is a diagram of the pin designation inside the Neutrik NL8FC connector. This information is for reference only. Diagram is of the connector as viewed from the wire-insertion end.



Rigging

Rules for Suspension

- Correct use of all suspension hardware and components is imperative in sound system rigging and deployment.
- Always calculate suspended loads before lifting to ensure suspension components and hardware are used within their respective load limits.
- Research local codes and regulations to fully understand the requirements for suspended loads in the venue in which the equipment is to be suspended.
- Use only shackle holes for suspension of array.
- Be absolutely certain of the integrity of any structural member intended to support suspended loads. Hidden structural members can have hidden structural weakness.
- Consult a professional mechanical or structural engineer licensed in the jurisdiction of the sound system installation to review, verify, and approve all attachments to the building or structure.
- Never assume anything—owner or third-party supplied suspension attachment points may not be adequate for the loads to be suspended.
- Employ the services of a professional rigger for hoisting, positioning, and attaching the equipment to the supporting structure.
- Always inspect all components (enclosures, suspension brackets, pins, frames, bolts, nuts, slings, shackles, etc.) for cracks, wear, deformation, corrosion, missing, loose, or damaged parts that could reduce the strength of the assembly before lifting. Discard any worn, defective, or suspect parts and replace them with new appropriately load-rated parts.

Shock Loading

When a load is either moved or stopped, its static weight is magnified. Sudden movements can magnify the static weight several times. This magnification of static weight is termed “shock loading”. Shock loading poses a danger to equipment and workers. The effects of shock loading can be instantaneous, or they may remain undetected unless the equipment is visually damaged. Avoiding shock loading requires careful planning and knowledge of equipment, rigging, and lifting practices.

Shock loading of equipment and structures is usually confined to lifting and installation, but natural forces (winds, earthquakes) can impose shock loads several times the static load. This is why structures and suspension equipment must be capable of supporting several times the weight of the equipment suspended.

WideLine-10 Working Load Limits and Design Factors

The following chart (**Table 2**) provides Working Load Limit data at various Design Factors. The tabulated Design Factors are for static loads only. The choice of which Design Factor to use will depend upon the jurisdiction and venue of installation, as well as the conditions of suspension. Dynamic conditions are determined by unknown, installation-specific factors and should be referred to a Licensed Structural Engineer for clarification before proceeding with any suspension of the equipment. The data presented is based upon the listed component weights:

Table 2

Component	Weight	4:1 Design Factor	5:1 Design Factor	7:1 Design Factor	10:1 Design Factor
WL2102-w	83 lb / 37.7 kg	2500 lb / 1130 kg	2000 lb / 909 kg	1400 lb / 649 kg	1000 lb / 455 kg
AF2102-LA	37 lb / 16.8 kg	–	–	1423 lb / 646.8 kg	996 lb / 452.7 kg

Rigging

WideLine-10 enclosures use a three-point suspension system. The system consists of front, left/right, captive articulated joints and a single rear link bar. Articulation is in 2° increments using the first location on the link bar. With the use of the second location, 1° degree increments can be obtained starting at 3°. The total available angular increments are: 0, 2, 3, 4, 5, 6, 7, 8, 9, and 10°. All pieces and locking pins remain with the enclosures. No ancillary items are needed to suspend the enclosures from the WideLine-10 array frame. All ball-lock pins are equipped with a lanyard to help prevent loss.

Front Articulated Joint (Knuckle) Hardware

Expose the end of the articulated joint by locating the joint's retaining screw protruding from the front of the receiver tube and sliding it upward. The front captive joint will slide upward from the enclosure's receiver tube.

The exposed end of the articulated joint can now be inserted into the adjacent enclosure's receiver tube and locked into position by a locking pin. This is repeated for each side of the enclosure. Then the rear link bar can be rotated into position and pinned at the chosen increment.

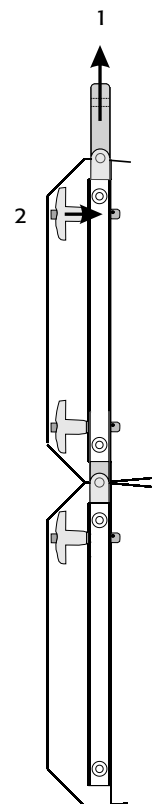
Rear Link (Angle Adjust) Hardware

The rear link is stored with the link folded between the sides of the block. To expose the link, remove the ball-lock pin and rotate the link into the desired position. Once positioned, the link is secured using the ball-lock pin of the adjacent enclosure.

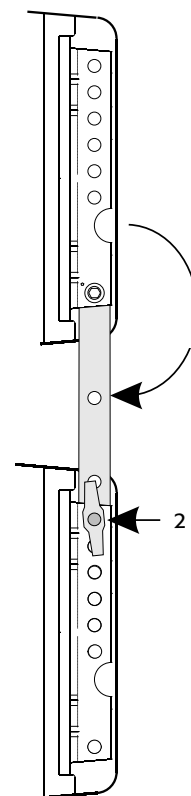
The rear link is marked with a thin, white line at the "normal" (0°) position and with a "+3" at the +3° position.

The additional ball-lock pin hole (located approximately midway on the link) is used for storing the link when folded into the enclosure's block for storage. The link may be pinned in place at the 0° or 8° location on the block when rotated into the storage position.

1. Front Articulated Joint—Slide the joint out of the receiver tube by sliding the retaining screw upward.
2. Then lock in place using the ball-lock pin.



1. Rear Link—Remove the ball-lock pin from the storage position, then rotate the link downward to the adjacent enclosure.
2. Lock in place using the ball-lock pin.



Adjusting the Angle Between Enclosures (Splay)

The illustration shows the rear pin block of two enclosures joined by the upper enclosure's rear link arm.

Use the first pin location (closest to the end) on the link arm for setting in normalized 2° increments. The left-side example shows two enclosures linked for 8° of splay. The ball-lock pin is inserted into the 8° position in the rear block while passing through the "normal" pin hole in the link.

When the "+3" location is used, an additional 3° are added to the "normalized" location. The right side example shows two enclosures linked for 9° of splay. The ball-lock pin is inserted into the 6° position in the rear block while passing through the "+3" pin hole in the link. The total splay is the 6° indicated on the block, plus the 3° additional from the link position, for a total of 9° . In this manner 1° increments can be attained starting with 3° (0° block location and $+3^\circ$ link arm location).

AF2102-LA

The AF2102-LA is used for suspending larger arrays. The AF2102-LA may be inverted and used for ground stacking.

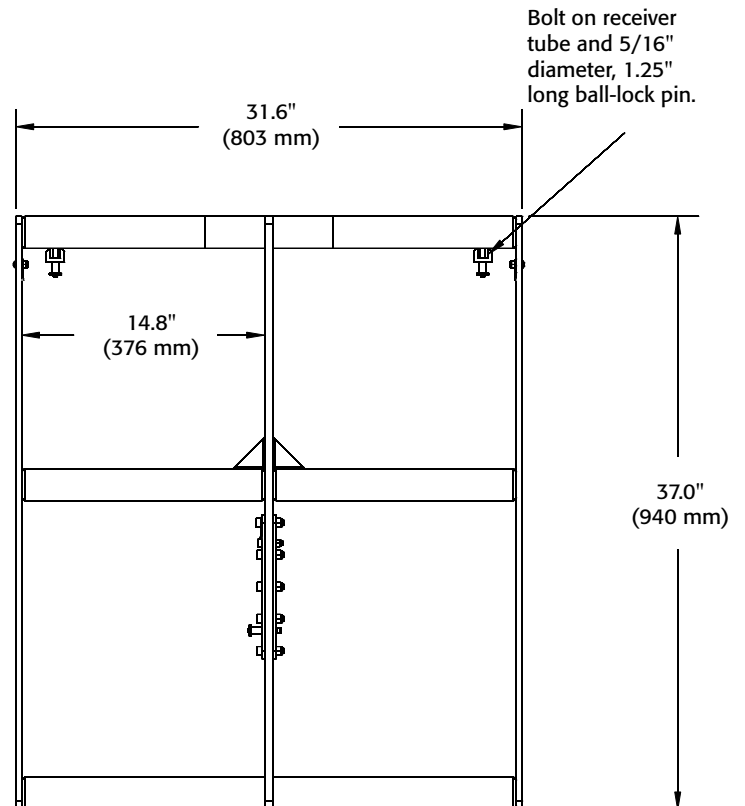
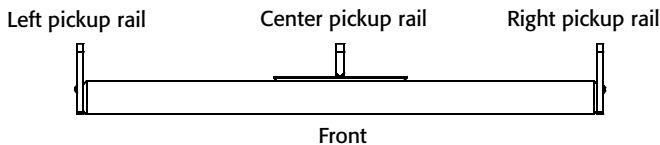
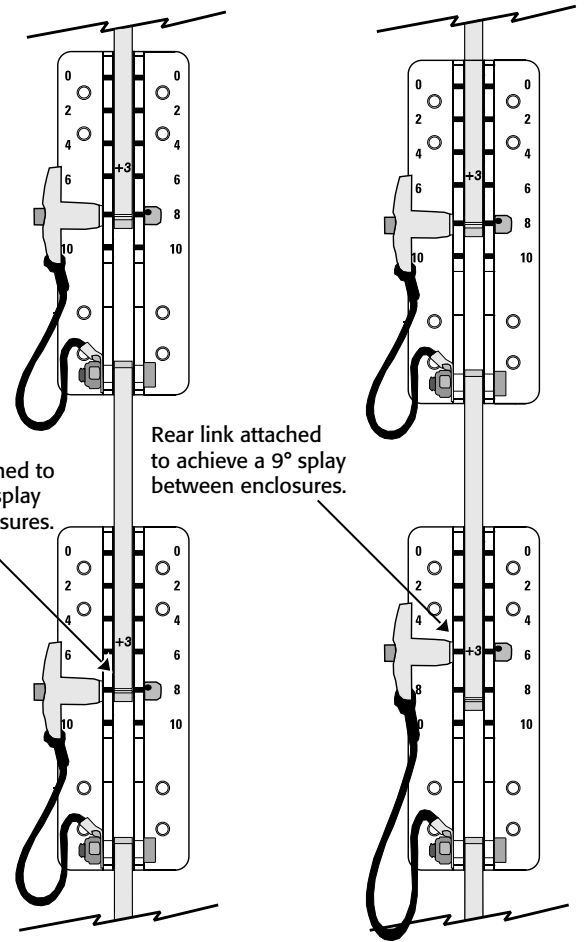


Use only the QSC supplied $5/16"$ diameter x 1.25" long ball-lock pins or equivalents from a reputable source on front receiver tubes.

The three pick up rails allow for any number of rigging solutions to fit the most demanding venues. The rails are drilled for industry standard $5/8"$ shackles.

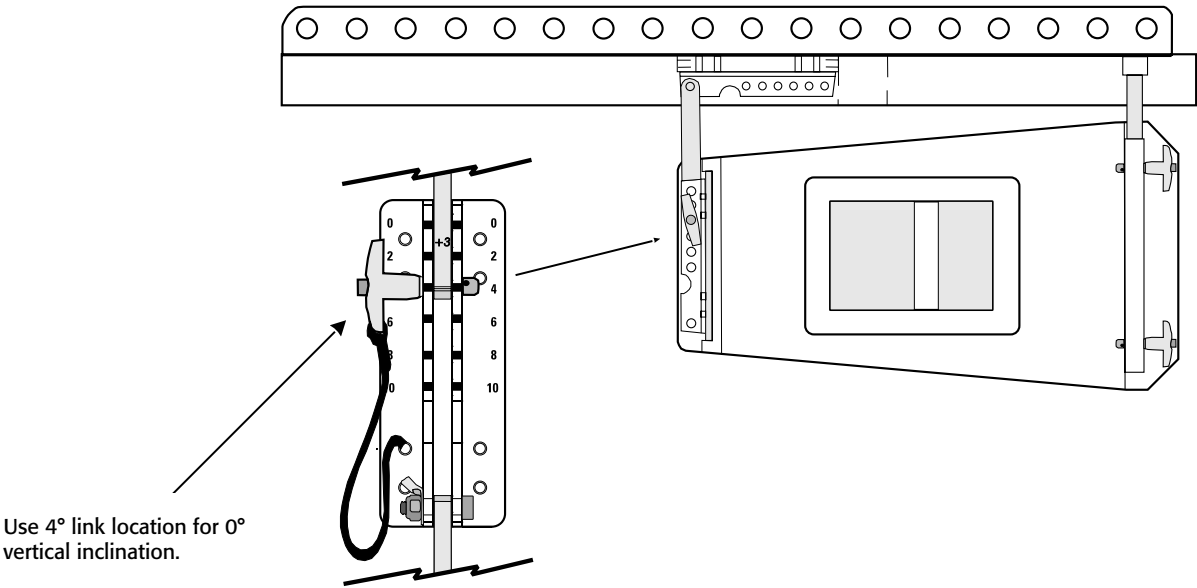


Do not stack more than eight (8) enclosures on the AF2102-LA Frame.

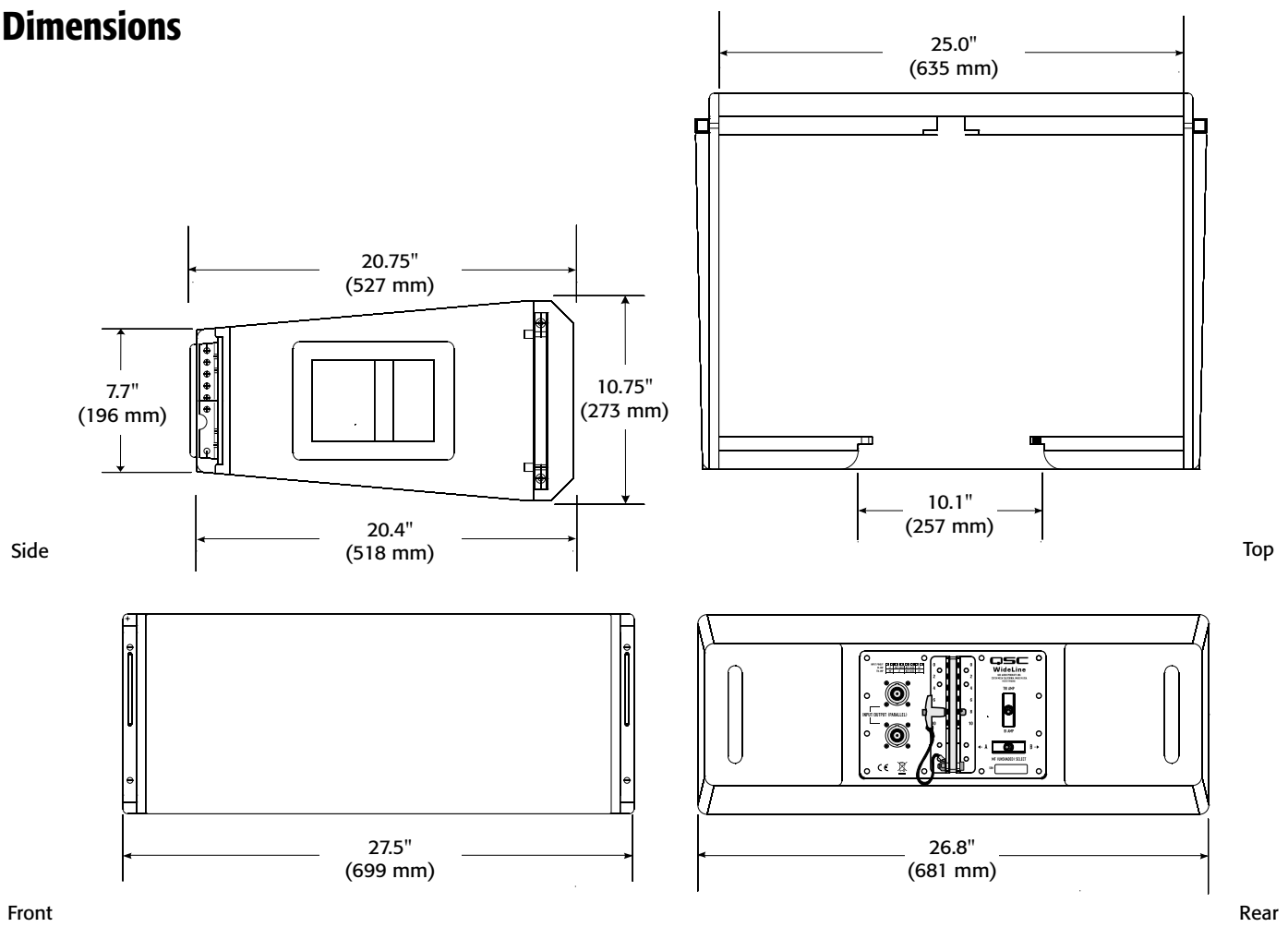


AF2102-LA

The link arm is located on the bottom side of the frame assembly. Use this link for attaching the rear of the first enclosure. The frame allows for up or down angle options for use with either stacking or suspending. The 4° “normal” locations on the link system will yield a net 0° vertical inclination.



Dimensions



Specifications

WL2102-w

Configuration	Bi-amp or tri-amp mode		
Transducers			
Low-frequency	2 x 400 W, 16 Ω 10" woofer, 3" voice coil, ceramic magnet assembly		
High-frequency	1.4" exit, 3" titanium diaphragm, neodymium magnet assembly		
Frequency Response (± 3 dB) ¹	55 Hz – 18 kHz (with recommended DSP processing)		
Frequency Range (-10 dB)	48 Hz – 20 kHz (with recommended DSP processing)		
Nominal Impedance	HF: 16 Ω LF bi-amp mode: 8 Ω LF tri-amp mode: 16 Ω (x 2)		
Continuous Power Capacity / Recommended Power	HF: 80 W / 300 W (2 hours, AES1984-2 method, 1 – 10 kHz) LF bi-amp mode: 600 W / 1400 W (2 hours, AES1984-2 method, 80 – 800 Hz) LF tri-amp mode: 400 W / 700 W (x 2) (2 hours, AES1984-2 method, 80 – 800 Hz)		
Sensitivity (1 W at 1 m)	HF: 107.5 dB (single cabinet measured in free space) LF: 98 dB (single cabinet measured in free space. LF drivers connected in parallel)		
Maximum Output Continuous / Peak (SPL at 1 m)	HF: 127 dB / 133 dB LF: 127 dB / 133 dB		
Nominal Coverage	H: 140° V: dependent on number of elements used		
Cabinet Type	Ported / trapezoidal		
Enclosure Material	Baltic birch plywood		
Finish	Black or white texture coat		
Grille	Perforated, formed powder coated steel		
Connectors	2 x Neutrik Speakon® NL8 in parallel		
Pin Outs	Pins	Bi-Amp	Tri-Amp
	1+/1-	LF	MF
	2+/2-	NC	LF
	3+/3-	NC	NC
	4+/4-	HF	HF
Attachment Points	Integral, adjustable rigging system, vertical splay adjustable in 1° increments from 0° – 10°		
Weight (Net / Shipping)	83 lb (37.7 kg) / 91 lb (41.4 kg)		
Dimensions (HWD)	10.8" x 27.4" x 20.75" (274 mm x 696 mm x 527 mm)		
Available Accessories			
AF2102-LA	Frame used for suspending or stacking applications. Frame weight 37 lb/16.8 kg.		
Software	EASE Focus line array modeling software tool available; visit www.qsc.com or contact QSC's Technical Services for DSP tunings		
Ball-lock Pins			
WL2102-w	7" Stainless steel lanyard 5/16" D x 0.75" W, t-handle: p-n HW-000106-00 (Rear link pin) 5" Stainless steel lanyard 5/16" D x 0.75" W, t-handle: p-n HW-000126-00 (Front link pin)		
AF2102-LA	4" Stainless steel lanyard 5/16" D x 1.25" W, Round head HW-000162-00 (Rear link pin)		

¹) With recommended DSP settings

Specifications subject to change without notice.

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