


**MESSENGER™
PRO**

INTELLIGENT ACOUSTIC SOLUTIONS CATALOGUE



Fully Digital Side-Lobe-Free
Steerable Line Array

CONTENTS



Intelligent Acoustic Solutions

The Messenger Pro™ fully versatile steerable line array series features the latest technology and are based on a patented algorithmic technique, which makes it ideal for high quality speech and background music applications, especially in reverberant acoustic environments where it is difficult to meet contractual speech intelligibility requirements.

LINE ARRAYS

3 **SMARTVOX-II-30/60**
Vertical Line Array Loudspeaker

The new SMARTVOX-II uses the passive phase-shifting, power-shading and filtering technique based on Messenger Pro™ patent algorithm, reducing any additional reflections from other surfaces to the reverberant field, resulting in more clarity and a much higher intelligibility.

4 **MESSENGER G2 / MESSENGER SG2**
Side-Lobe-Free Steerable Digital Line Array

The MESSENGER G2 is with integrated DSP power, variable control of vertical dispersion, two line inputs, speech and BGM, and a intuitive Messenger Pro software for lobe assembler and other advanced functions such as room acoustic simulations etc.. The line arrays are designed to meet the demands of voice evacuation, commercial audio and pro-sound application.

10 **ORBIT**
Omni-Directional Side-Lobe-Free Steerable Line Array

BASS ARRAY

11 **BASS ARRAY**
Active DSP LF-Array System

Designed for difficult acoustic environments where intelligibility and the need for pro-sound performance are a must. The Bass array adds thoroughly the bass-experience to the Messenger range of products due to the low-frequency-constant-directivity concept.

CEILING HORN

12-13 **TH-1000**
Industrial Low Ceiling Long-Throw Horn

The TH-1000 delivers high SPL over long distances due to its special shape and exponential construction.

SMARTVOX-II-30 SMARTVOX-II-60

SMARTVOX-II-30 / SMARTVOX-II-60

Vertical Line Array Loudspeaker

SMARTVOX-II-30/60 is a vertical line array speaker that uses a linear spaced speaker arrangement in combination with passive phase shifting, passive power shading and filtering, to obtain a constant directivity index for multiple frequencies. The fixed Azimuth angle of -12 degrees allows the SMARTVOX-II-30/60 to be placed vertical against any surface, resulting in more clarity and lower reverberant field. Therefore, with a much higher 'direct-to-reverb' ratios has led to a higher intelligibility figure (STI).

The ordinary line-arrays radiates a cylindrical wave front that moves in a straight line from its source. Due to this, the normal column needs to be tilted forward to obtain good coverage of the listening area (figure 1). For most of the installation, it is required to focus the soundwaves in a forward direction into the audience area and avoid the annoying reflections from other surfaces. The loudspeakers in general will produce sound forwards and backwards especially for the lower frequencies. Therefore, the soundwaves will be reflected by the backwall. These waves are mirrored by the mounting angle of the array and will fill the environment with unwanted artificial reverberation energy, leading to lower direct-to-reverb ratio and to a poor intelligibility. By directing the beam of a loudspeaker using passive phase-shifting, power-shading and filtering technique for constant directivity, the SMARTVOX-II-30/60 can place in vertical position against its surface (figure 2), reducing any additional attributed energy to the reverberant field, resulting in more clarity and a much higher intelligibility.

FEATURES

- Filtering technique based on Messenger Pro™ patent algorithm
- Wide dispersion coverage
- Constant sound level and precise sound direction pattern in vertical placement
- With higher 'direct-to-reverb' ratios, and lead to a higher intelligibility gure (STI)
- Built-in 50V/70V/100V transformer

TECHNICAL SPECIFICATIONS

- Voltage: 50/70/100 volts
- Max. power consumption
 - SMARTVOX-II-30: 30W
 - SMARTVOX-II-60: 60W
- Frequency response: 200 Hz ~ 10 kHz
- Horizontal coverage: 120 degrees
- Q factor/Di: 14.1/11.5 dB
- SPL @ 1W/1M, test signal bandwidth 200 ~ 10 kHz
 - 30W: 87.7 dB
 - 60W: 90.2 dB

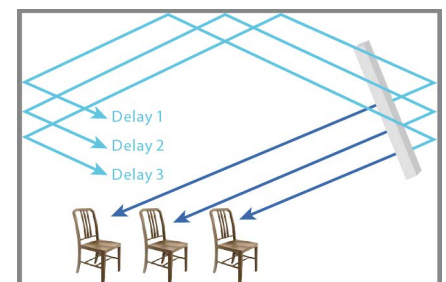
MECHANICAL

- Dimensions (H x W x D)
 - SMARTVOX-II-30: 847 x 100 x 152 mm (33 x 4 x 6 inch)
 - SMARTVOX-II-60: 1416 x 100 x 152 mm (56 x 4 x 6 inch)
- Weight
 - SMARTVOX-II-30: 6.9 kg (15.2 lbs)
 - SMARTVOX-II-60: 9.3 kg (20.5 lbs)
- Colour: RAL 9016
- Finish: Aluminum with stainless steel bracket

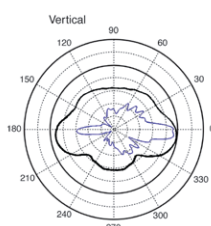
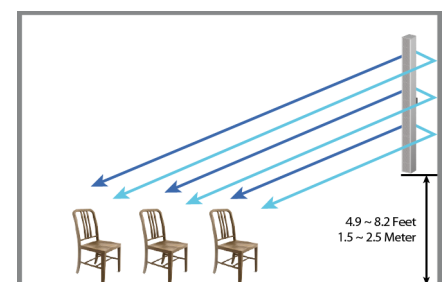
ORDERING INFORMATION

- SMARTVOX-II-30: Vertical Line Array Loudspeaker/30W
- SMARTVOX-II-60: Vertical Line Array Loudspeaker/60W

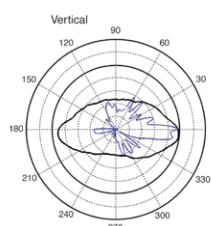
Sound Field of Ordinary Column Line Array (figure 1)



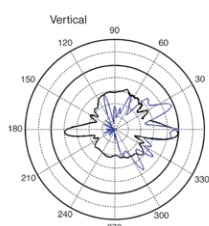
Sound Field of SMARTVOX-II-30/60 Line Array (figure 2)



Octaveband 250 Hz
Octaveband 2000 Hz

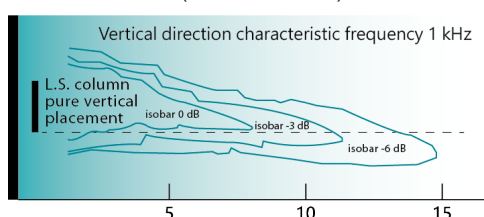


Octaveband 500 Hz
Octaveband 4000 Hz

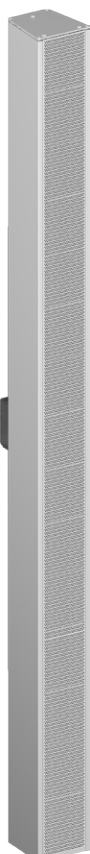
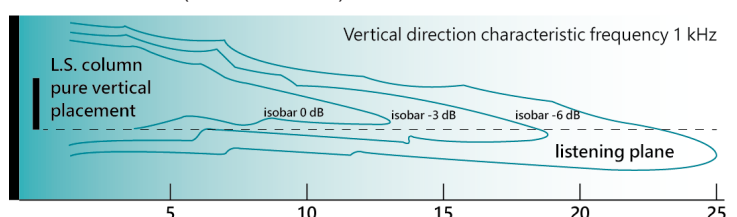


Octaveband 1000 Hz
Octaveband 8000 Hz

Distance in meters (SMARTVOX-II-30)



Distance in meters (SMARTVOX-II-60)



MESSENGER PRO

MESSENGER G2 (ALL IN ONE TYPE)

Our new generation Messenger G2 is a fully versatile steerable line array, providing patent algorithm for side lobe suppression and individual speech and background music reinforcement, enhancing a better music and speech performance in situations where high quality music performance and superior speech intelligibility are demanded.

The Messenger G2 line array has a very tightly controlled beam and signal pattern (stays within 3 dB from 5m to 100m) for 12/18/24/36/48 Class-D amplifier channels (depend on model), and can be shaped for specific applications or environments requiring symmetrical or asymmetrical, single, dual or triple lobe designs. The Messenger G2 is equipped with two line inputs, speech and background music and can be separately adapted for optimum performance.

The BGM input has sound directivity which provides an easy and quick setting while keeping the high quality music. These filters also enhances the low frequency performance of the Messenger G2. For speech mode, there will be 3 standard filters available for quick setup, in more demanding situations, the intelligibility can be fine tuned manually.

The ADI DSP chipset and a sampling rate of 48 kHz ensure a wide frequency response, up to 22 kHz for crystal-clear sound quality and an impressive low frequency response. With the patented algorithm and the side lobe free suppression for speech reinforcement, making the Messenger G2 a fully versatile steerable line array which meets the demands of today's market for pro-sound and speech reinforcement.

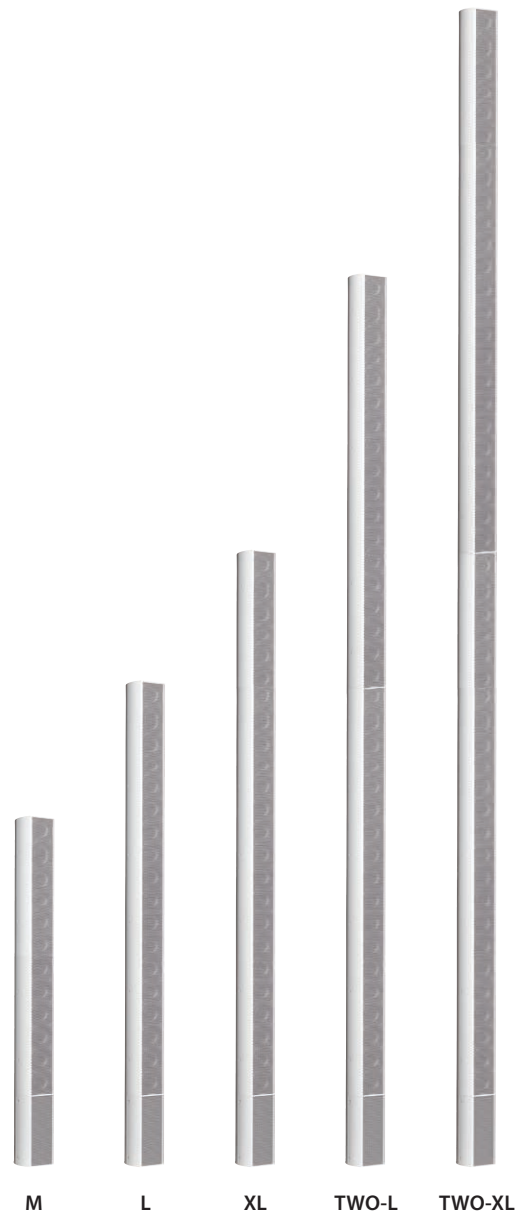
The Messenger G2 is entirely software controlled. The lobe control and variable acoustical centre can compensate for architectural requirements and accommodate various 4" ~ 13" (1.2m ~ 4m) mounting heights.

FEATURES

- Triple-lobe feature for the ultimate accuracy in lobe design
- Beam steering ± 45 degrees
- Designed for high quality speech and BGM applications in reverberant acoustic environments
- Variable vertical dispersion controllable between 45 and 5 degrees
- Variable acoustic centre in 9 steps (from asymmetrical to symmetrical)
- The asymmetrical lobe has the ability to keep the sound deviation within 3 dB from 5m to 100m
- Integrated DSP control with 8 band PEQ, noise gate, delay and peak limiter
- VOX-control on priority input and ambient noise sensing function
- 24VDC input for battery backup, 20 kHz input surveillance
- Internal HF carrier loudspeaker surveillance ambient noise sensor, temperature sensor with frost protection
- Support EASE DLL for room acoustic simulations
- Audio and data transmission via Ethernet for detailed status report
- The Messenger G2 is available for separated type, which the power supply box and DSP control box are separated from the loudspeaker

Side-Lobe-Free Steerable Digital Line Array

MESSENGER G2 (ALL IN ONE)	
M	12 Active Channels - 5.6ft (1.7m) 94 dB to 82ft (25m)
L	18 Active Channels - 7.9ft (2.4m) 94 dB to 98.4ft (30m)
XL	24 Active Channels - 10.2ft (3.1m) 94 dB to 131.2ft (40m)
Two-L	36 Active Channels - 15.4ft (4.7m) 94 dB to 196.9ft (60m)
Two-XL	48 Active Channels - 20.3ft (6.2m) 94 dB to 229.7ft (70m)



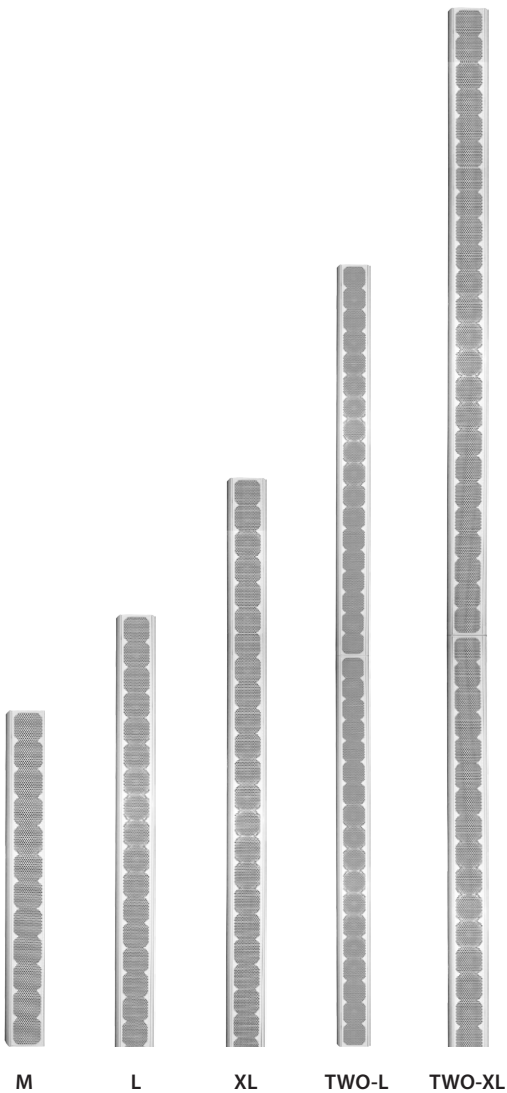
MESSENGER PRO

MESSENGER SG2 (SEPARATED TYPE)

Side-Lobe-Free Steerable Digital Line Array

MESSENGER SG2 (SEPARATED TYPE)	
M	12 Active Channels - 4.6ft (1.4m) 94 dB to 82ft (25m)
L	18 Active Channels - 6.6ft (2.0m) 94 dB to 98.4ft (30m)
XL	24 Active Channels - 8.9ft (2.7m) 94 dB to 131.2ft (40m)
Two-L	36 Active Channels - 13.5ft (4.1m) 94 dB to 196.9ft (60m)
Two-XL	48 Active Channels - 17.7ft (5.4m) 94 dB to 229.7ft (70m)

CONTROL BOX & POWER SUPPLY BOX	
MSGPSU-CB	External Power Box
MSGPRO-CB	External DSP Control Box



MESSENGER PRO

TECHNICAL SPECIFICATIONS

ELECTRICAL

- AC power input: 210 ~ 230 VAC (5%/-10%)
- Power consumption (AC)

M	211W
L	277W
XL	343W
2L	554W
2XL	686W

- DC power input: 16 VDC ~ 27 VDC
- Power consumption (DC)

M	201W
L	263W
XL	326W
2L	526W
2XL	653W

AUDIO CHARACTERISTICS

- A/D-D/A bit resolution: 24 bit
- Sampling rate: 48 kHz
- Internal processing: 32 bit (floating points)
- Frequency response: 100 ~ 22 kHz
- Max. SPL: 93 dBA ± 1 dB
- Max. input/output level: 18 dBu
- Input impedance (balanced): 10k ohm
- Output impedance (balanced): 90 ohm

INTERNAL AMPLIFIER

- Type: 24 Class-D amplifier channels
- Power rating: 70W
- Amplifier quantity: 4 x 6 pcs (6 channels per amplifier board)

DSP PROCESSING

- Component: Input, Output, PEQ, Ethernet IGMP, Audio Stream, VoIP Receive, Standard Mixer, Ducker, DNM, Limiter, Selector, Delay
- Pre-delay: 1,000 ms
- Equalizing: 8 bands PEQ
- Peak limiter: Level adjustable
- Mute: audio on/off
- Signal indicators: Clipping/audio/limiter/noise-gate
- Input signal surveillance
- Input line detection: 20 kHz, 18 kHz and 20 kHz standard on-board surveillance

MECHANICAL

- Coverage angle
 - Vertical 5, 7, 10, 15, 20, 25, 30, 35, 40, 45 degree
 - Horizontal 145 degree (for all units)
- Lobe shaping (centered on driver): 1, 4, 6, 9, 13, 16, 19, 21, 24
- Lobe steering: -45° to 0° to 45°
- Speaker type: 4.25" (dual-cone with inverted surround, weatherproof, aluminum)
- Dimension

	Messenger G2	Messenger SG2
M	12 Loudspeakers 1700 mm	12 Loudspeakers 1361 mm
L	18 Loudspeakers 2400 mm	18 Loudspeakers 2033 mm
XL	24 Loudspeakers 3100 mm	24 Loudspeakers 2705 mm
2L	36 Loudspeakers 4700 mm	36 Loudspeakers 4066 mm
2XL	48 Loudspeakers 6200 mm	48 Loudspeakers 5410 mm

- Weight (net/shipping)

	Messenger G2 (all in one type)	Messenger SG2 (loudspeakers only)	Messenger SG2 (total gross weight)
M	27/35 kg	24.2/29 kg	50.3 kg
L	38/47 kg	36.5/41 kg	62.4 kg
XL	48/58 kg	44.5/51.9 kg	73.2 kg
2L	76/94 kg	71.1/82.1 kg	124.7 kg
2XL	96/116 kg	88.9/103.8 kg	146.4 kg

- Weight (net/shipping)

	MSGPRO-CB	MSGPSU-CB
M/L/XL	14/15 kg	5.4/6.3 kg
2L/2XL	28/30 kg	10.8/12.6 kg

- Mounting: 1 set of wall bracket
- Color: RAL9016

ENVIRONMENTAL

- Temperature range: 0 °C ~ +40 °C (+32 °F ~ +104 °F)
- Operating environment: -10 °C ~ +55 °C (+14 °F ~ +131 °F) relative humidity, non-condensing

MESSENGER PRO

APPEARANCE AND DIMENSIONAL DIAGRAM

ORDERING INFORMATION

• Messenger G2 (All in One Type)

MESSENGER-M	DIGITAL LINEAR SPK ARRAY-M all in one(G2)
MESSENGER-L	DIGITAL LINEAR SPK ARRAY-L all in one(G2)
MESSENGER-XL	DIGITAL LINEAR SPK ARRAY-XL all in one(G2)
MESSENGER-2L	DIGITAL LINEAR SPK ARRAY-2L all in one(G2)
MESSENGER-2XL	DIGITAL LINEAR SPK ARRAY-2XL all in one(G2)

• Messenger SG2 (Separated Type)

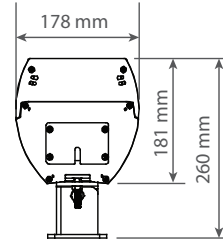
MSGPRO-M	DIGITAL LINEAR SPEAKER ARRAY-M External BOX & PSU
MSGPRO-L	DIGITAL LINEAR SPEAKER ARRAY-L External BOX & PSU
MSGPRO-XL	DIGITAL LINEAR SPEAKER ARRAY-XL External BOX & PSU
MSGPRO-2L	DIGITAL LINEAR SPEAKER ARRAY-2L External BOX & PSU
MSGPRO-2XL	DIGITAL LINEAR SPEAKER ARRAY-2XL External

• Control Box & Power Supply Box

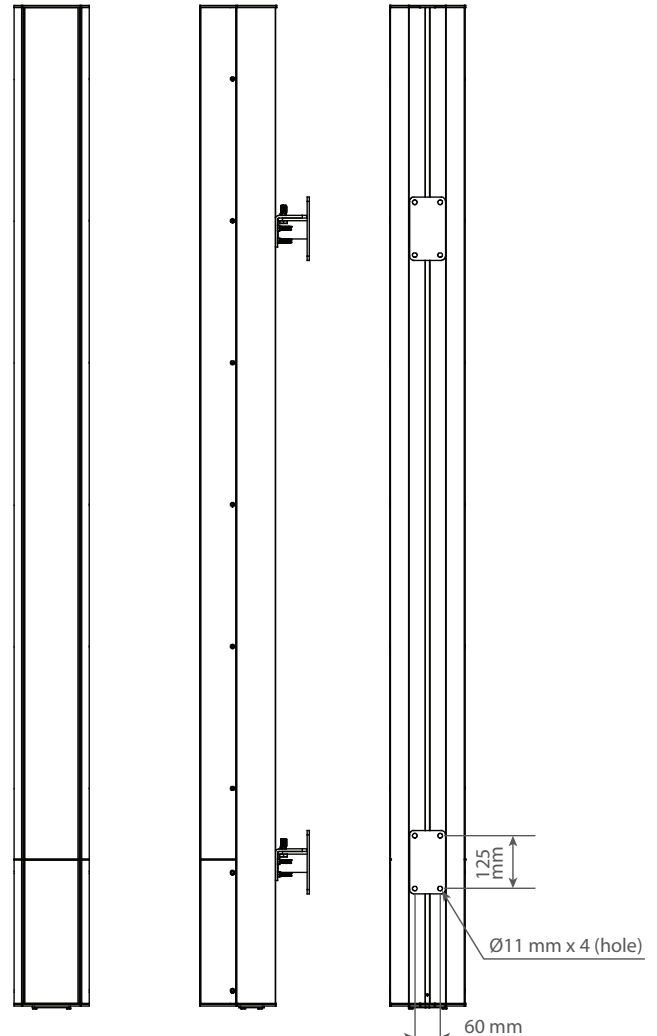
MSGPRO-CB	Messenger External DSP Control Box
MSGPSU-CB	Messenger External Power Box

* MSGPRO-CB and MSGPSU-CB are applicable for Messenger SG2 (separated type) only.

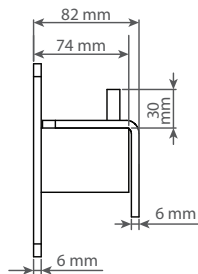
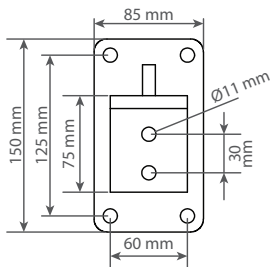
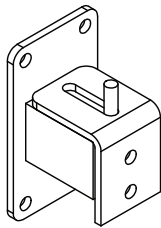
TOP VIEW



FRONT VIEW SIDE VIEW REAR VIEW



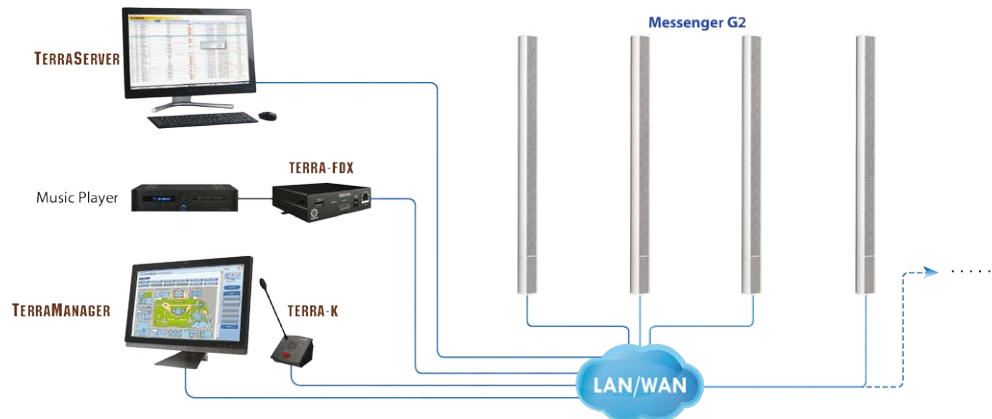
MOUNTING BRACKET



MESSENGER PRO

APPLICATIONS

- Hotels
- Shopping malls
- Stadiums
- Airports
- Train stations
- Large scale halls
- House of worship, church, mosque etc.



MESSENGER PRO SOFTWARE

Windows-Based PC Setup

The software allows to control the lobe shaping with Messenger Pro lobe assembly program. The acoustical centre can be moved over the array to match and compensate in relation to the required installation, mounting height and environmental needs.

Each driver is separately powered and processed, therefore all the lobe shape variations between a symmetrical and an asymmetrical arrangement can be made with the simple push of a button.

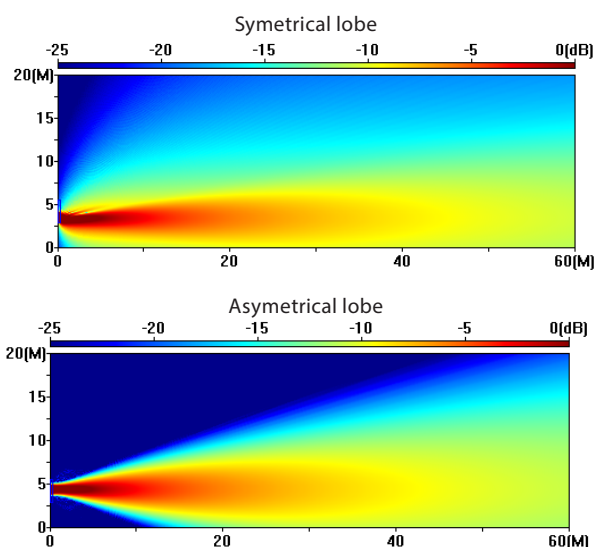
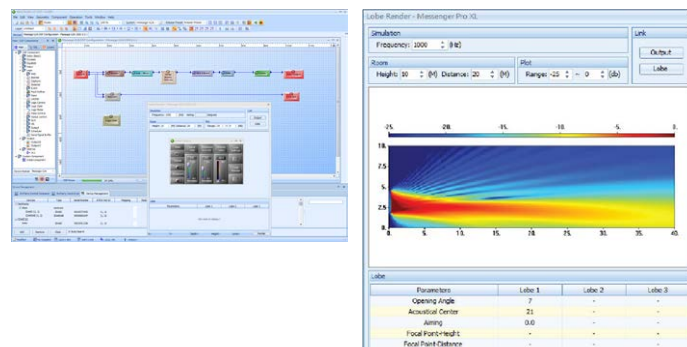
This beneficial feature separates the Messenger Pro from other line-array speakers, making it one of the most flexible options available with its unique software controlled directivity pattern with the Messenger's lobe assembler software.

The symmetrical lobe is centred in the middle. The asymmetrical lobe is centred at the bottom or the top of the array. Any other position of the acoustical centre between the middle and the bottom of the array is fading the lobe-shape from a purely symmetrical shape to an asymmetrical shape.

Symmetrical lobes are often used for field coverage in combination with an asymmetrical lobe for the near field area. The combination allows for individual level control for both near and field. Symmetrical lobes are also ideal to address high raised balcony seating areas.

Asymmetrical lobes are used for mounting heights between 2.5 and 4 m from the floor and results in a lobe that starts at 5 m distance from the array at ear level and ends in a sharp lobe at 60 m and further.

The asymmetrical lobe has the ability to keep the sound deviation within 3 dB from 5 to 100 m. Its mounting height is NOT critical and therefore it is the most used system solution. The vertical opening angle can be adjusted in steps from 5 to 45 degrees.



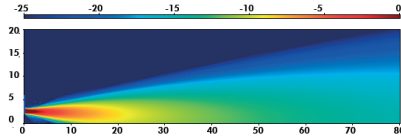
Nine-steps from Asymmetrical to Symmetrical for the Variable Acoustic Centre.

MESSENGER PRO

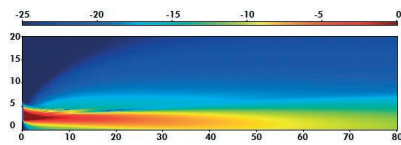
MESSENGER PRO SOFTWARE

VARIABLE VERTICAL DISPERSION FROM 20° DOWN TO 5°

Symmetrical lobe with 20 degrees opening angle

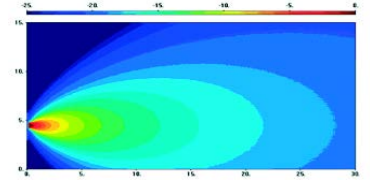


Asymmetrical lobe with 5 degrees opening angle

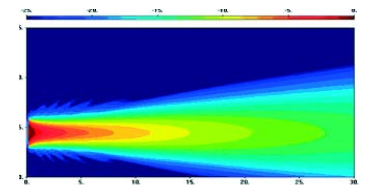


VERTICAL DISPERSION 45° DOWN TO 5°

45 degree opening angle

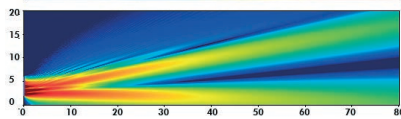


5 degree opening angle

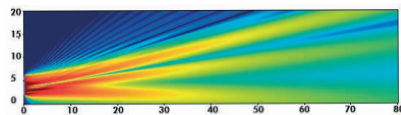


BEAM STEERING

Dual lobe serving ground floor and balcony

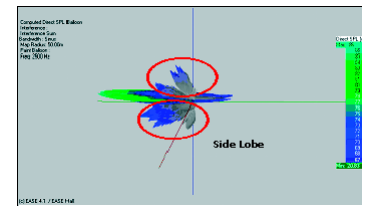


Triple lobe serving ground floor and two balconies

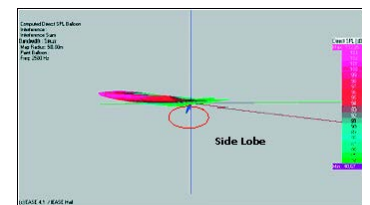


SIDE LOBE SUPPRESSION

Conventional DSP Line arrays

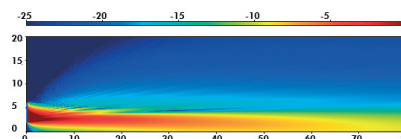


Messenger™ with patented algorithm

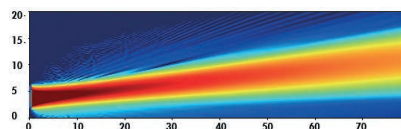


MULTIPLE LOBES UP TO 3 SIMULTANEOUS LOBES

Symmetrical lobe serving groundfloor audience area



Symmetrical lobe steered upwards



ORBIT

Omni-Directional Side-Lobe-Free Steerable Line Array



A new generation range of steerable line-arrays, the ORBIT have an omni-directional and steerable radiation pattern, which is fully redesigned to meet the highest architectural demands and equipped to handle the requirements for the voice alarm industry, commercial audio and pro-sound.

Each ORBIT omni-directional array has a very tightly controlled beam, which can be shaped for specific applications or environments requiring symmetrical or asymmetrical, single, dual or triple lobe designs where the ORBIT can be placed free-hanging from the middle of the venue.

The availability of high power audio DSP's such as the analogue devices makes it possible to provide 24 channels of powerful processing that leads to precise beam control and even signal pattern that stays within 3 dB over a distance of 100 m radius in a 360 degrees wave!

FEATURES

- Designed for high quality speech and background music applications in reverberant acoustic environments
- Tightly controlled beam up to 3 degrees, and can be shaped in 9 steps
- Asymmetrical and symmetrical arrangement by means of software control
- Integrated DSP control with 8 band of PEQ, noise gate, delay rooms, peak limiter, VOX-control on priority input and level raising microphone for ambient noise sensing
- Adaptable acoustic centre can be freely moved over the array to match lobe shape with the listening area
- 24VDC input for battery back-up, 20 kHz input surveillance
- Internal HF carrier loudspeaker surveillance
- Ambient noise sensor and temperature sensor with frost protection
- Battery surveillance
- Fault report contact
- Audio and data transmission via Ethernet for detailed status report
- PC based setup (up to 32 x Orbit units on the bus)
- Support EASE DLL & CATT DLL for room acoustic simulations
- SPL stays within ± 2 dB variation over a distance of at least 60m

CHARACTERISTICS

- 24 Class-D amplifier channels with 70 watt
- SPL coverage stays within 1dB variation
- Variable acoustic centre
- Triple lobe control
- RS485 link
- Remote access by TCP/IP interface
- Dual mode power supply + battery backup (24 VDC)
- Frequency response: 90 ~ 18000 Hz
- Max. SPL: 93 dBA \pm 1dB
- Dual audio input: 0 dB with contact
- DSP module: ADSP21369-400 2.4 G ops 400 tabs/filter/24 CH

TECHNICAL SPECIFICATIONS

- AC power input: 230 VAC
- DC power input: 24 VDC
- Pre-delay: 1000 ms
- Equalizing: 8 band PEQ
- Peak limiter: level adjustable
- Mute: audio on/off
- Signal indicators: Clipping/Audio/Limiter/Noise-gate
- Surveillance: amps, input signal, router, processor watchdog, active feedback on drivers (optional), emergency backup
- Input line detection, 18 ~ 20 kHz (adjustable)
- Noise-sensing: on-board

ORDERING INFORMATION

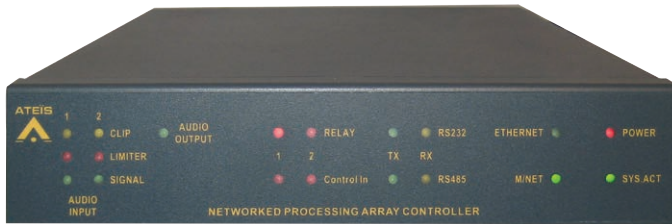
- ORBIT-M: Orbit-M with External Box
- ORBIT-L: Orbit-L with External Box

ORBIT	
M	3 rows of 12 loudspeakers 1003 mm, 94 dB to 10 m radius
L	3 rows of 18 loudspeakers 1669 mm, 94 dB to 15 m radius



BASS ARRAY

BASS ARRAY



BASSRACK-08

By applying the same patented Messenger technology to the Bass Array, this makes it the first array of its kind that carries bass frequencies over long distances and keep the signal deviation within 2 dB over 100m.

The Bass Array offers the perfect solution for speech and musical performance in any difficult acoustic environment.

TECHNOLOGY

The Bass Array is modeled with frequency shading, full directivity control and side lobe suppression. Upper and lower frequencies of this controlled directivity concept are defined by means of extending the total length for the lower frequencies by having multiple sources of which their acoustic centres are within 1/2 distance of the upper frequencies spaced. With a total length of 14 meter and only 8 cabinets, lobe steering and directivity control can be achieved down to 35 Hz up to 400 Hz.

With the use of the powerful Messenger lobe assembler software, you can create and shape the lobe of Bass Array to fit perfectly in the acoustic difficult environment. By using a dual or triple lobe and the lobe of Bass Array, it can cover both ground level and balcony with the highest possible directivity and with the lowest signal deviation. Variable opening angles for variable throws and symmetrical and/or asymmetrical lobes can be constructed. By changing the 1/2 distance, the Bass Array can be adapted to fit with required cross-over frequencies with any mid-high tone array available in the market.

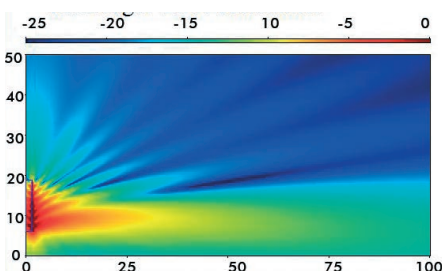
The bass cabinets used in the Bass Array can be of any brand and size. The lobe assembler software can be easily adapted to any size and brand. In addition, we can adapt the lobe assembler software to meet the 3rd party brand specifications. The processor for the Bass Array is delivered as 19-inch rack-mount frame that provides analogue as well as AES interfacing with the self-powered 3rd party Bass-cabinets.



LOBE ASSEMBLER

In this example we have constructed a 14m array with 8 bass-cabinets. Each spacing is set to 2m. The lowest cabinet is positioned at a height of 4m above ear level. The lobe has an asymmetrical base-FIR that is centred at speaker no. 3.

With an opening angle of 7 degrees and an azimuth of -2 degrees, this lobe has only 2 dB variation from 5 to 100m, measured at a listening height of 1.80m. This would result in an SPL @ 100m of 94 dB at 120 Hz. The signal that reach the ceiling at a height of 30m is more than 10 dB down from the signal level at listening plane.



Active DSP LF-Array



FEATURES

- High clarity
- Controlled directivity
- Low and sub-low steering
- Variable opening angles
- Controlled frequency: 25 ~ 400 Hz

TECHNICAL SPECIFICATIONS

- Rated power: 8 x 500W (built-in amp)
- Max SPL @ 125 Hz: 95 dB @ 5 ~ 100m ±2 dB
- High SPL: 97 dBA @ 100 m
- Signal decay: ± 1dB @ 100 m
- Effective height: 7 to 14 m
- 3rd party engine: 15" long excursion cone driver, ferrofluid cooled. Cabinet resonance < 45 Hz

LENGTH 700 CM

- Frequency response: 50 ~ 340 Hz, Delta - spacing: Δ 100 cm
- Width: 43.6 cm
- Steering: 10 ~ 25

LENGTH 1400 CM

- Frequency response: 35 ~ 200 Hz, Delta - spacing: Δ 200 cm
- Width: 43.6 cm
- Steering: ± 10°
- Vertical opening: 5°~ 25°

ORDERING INFORMATION

- BAss Array: Active DSP LF-Array

TH-1000

TH-1000



The TH-1000 is a typical exponential horn that is designed to be used in placed with restricted ceiling heights and where far throws are requested.

The TH-1000 is made of reinforced fibre/epoxy and equipped with a strong and powerful 2" compression driver, capable of producing a fabulous 117 dB. The shape and structure can be utilized in highly demanding environments like traffic tunnels and car parks. Also train tubes that need to be addressed during the voice evacuation which are the typical examples where the TH-1000 would fit perfectly.

Due to its dimensions, its throw can reach from 40 up to 70m, reducing amplifiers and delay lines when compared to conventional distributed sound systems for tunnels. This will bring the total costs down and due to a lower number of horns, it will bring the Q-factor up and so the intelligibility of the overall evacuation system.

The TH-1000 has an extended frequency range that runs up to 8 kHz allowing for high-fidelity speech messages in situation where the acoustics are limited and therefore the demands on the sound system is high. Highly directional horns will result in a bigger in between, repeating distance, reduced soundpoints as well as the reduced number of amplifiers and delay-lines, thus, it results in a better overall performance.

The TH-1000 is a typical symmetrical exponential horn (where the horn length is exponentially related to the horn area) that uses the mounting surface as a wave guide. This way a "half cell" construction can be used to reduce its mouth height which is important when used in environment with height restrictions. Once in the proper band pass region for a given size, the TH-1000 exponential horn presents a fairly consistent acoustical load to its driver. This helps both output level and evenness of frequency response, making this horn design simple and effective.

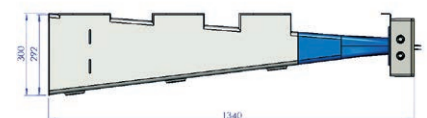
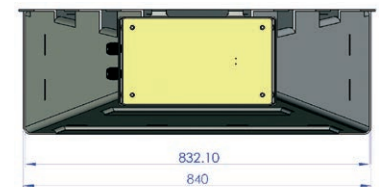
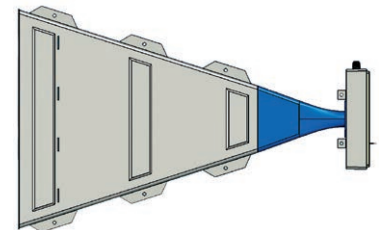
The TH-1000 can be fixed against a large and flat surface that acts as a waveguide and mirror. The small horizontal opening angle of only 30 degrees guarantees that the sound will stay unaffected by lateral distortion and so will increase the in-between distance of the horns.

Industrial Low Ceiling Horn



FEATURES

- Boundary effect, low-spill
- Increased repeating distance
- Long-horn, straight patterns
- 2-inch compression driver
- High-SPL
- High-directivity
- High intelligibility (STIPA)
- SPL: 104 dBA @ 20 m



Mechanical drawing with 8 x 12 mm fixation holes and vertical-ribs for extra stability

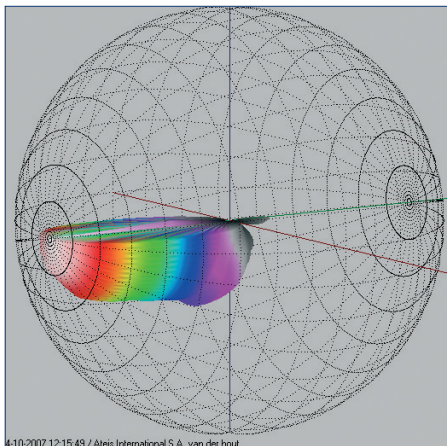
TH-1000

TH-1000

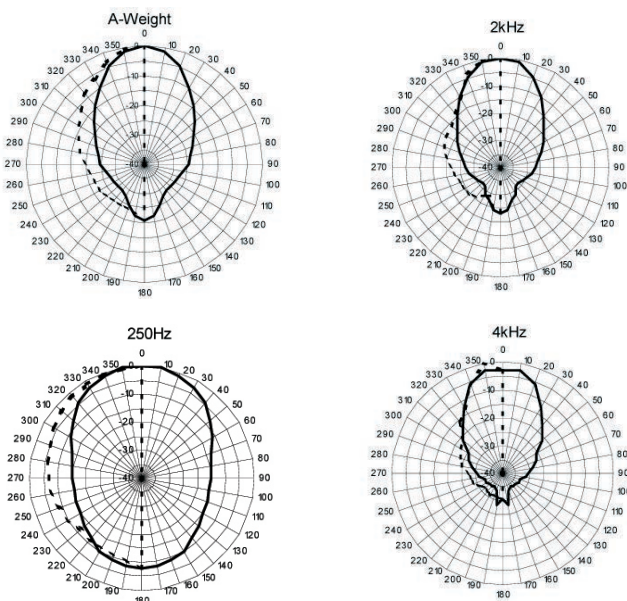
Industrial Low Ceiling Horn



POLAR PLOTS



Polar plots 250 Hz, 2 KHz, 4 KHz and A-weight



ELECTRICAL

- 100/70/50 Volt line transformer
- Max. power consumption: 70 watt rms - dual ceramic connector blocks with M20 PG12 glands
- Max. SPL: 132 dBA @ 70 watt
- Frequency response: 300 Hz ~ 8 kHz
- Horizontal opening angle @ 1 kHz: 30 degrees
- Vertical opening angle @ 1 kHz: 15 degrees
- Sensitivity (1W/1M)
 - 112 dB @ 500 Hz
 - 120 dB @ 1 kHz
 - 116 dB @ 2 kHz
 - 108 dB @ 8 kHz
- Q-factor @ 1 kHz
 - 250 Hz = 7.3
 - 500 Hz = 14
 - 1 kHz = 30.5
 - 2 kHz = 38
 - 4 kHz = 38
 - 8 kHz = 38
- External high-pass filter requirements: 250 Hz, 2nd order (filter not included)

MECHANICAL

- Material: glass fibre reinforced epoxy flame-retardant polyester
- IP rating: IP56
- Color: RAL7004 (dark grey)
- Dimensions (L x W x H): 1340 x 840 x 300 mm (53 x 33 x 12 inch)
- Weight: 35 kg (77 lbs)
- Mounting: 8 x M12 spacings
- Finish: Stainless steel mesh grill (spay water protection on mouth)

ORDERING INFORMATION

- TH-1000: Low Ceiling Long-Throw Horn



MESSENGER[™] PRO



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