



# Active audio

L'acoustique active

Public Address products

# Public address in large volumes

intelligibility  
active  
acoustics  
acoustic  
comfort  
technical  
assistance  
design  
simplicity  
directivity

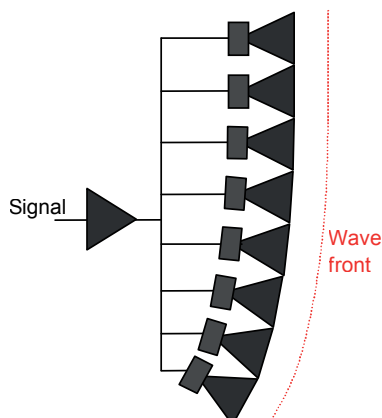


# DGRC principle

Introduced in 2006 and patented by Active Audio, the DGRC (Digital & Geometric Radiation Control) principle is the basis of the StepArray and Ray-On column loudspeakers. Thanks to an ingenious mix of geometric and electronic Line-Array principles, DGRC generates a wave front using an arbitrary number of loudspeakers assigned to a small number of electronic channels.

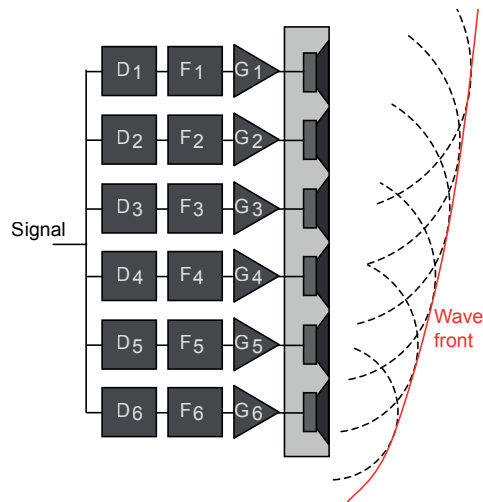
## Geometric Line-Array

In a geometric array, loudspeakers are aligned to follow the shape of the wave front to be generated, usually a J shape.



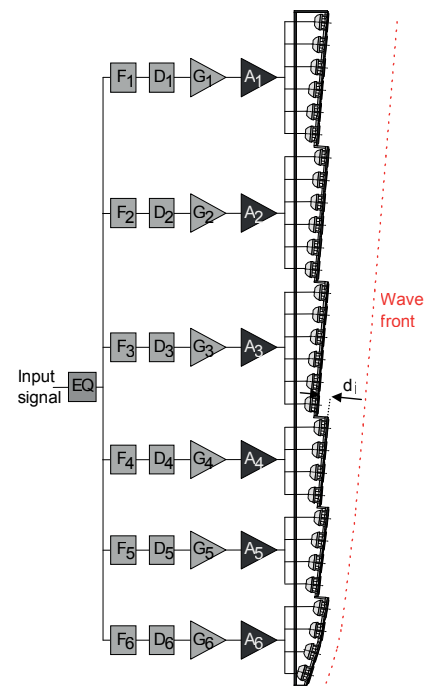
## Electronic Line-Array

In an electronic array, loudspeakers are aligned vertically and the J-shaped wave front is created by adjusting delays  $D_i$ , filters  $F_i$  and gains  $G_i$  relating to **each loudspeaker**.



## DGRC Principle : Geometric + Electronic

With the DGRC principle (Digital and Geometric Radiation Control) used in StepArray and Ray-On columns, the wave front is shaped and controlled by both the geometric positioning and orientations of the loudspeakers, and the electronic adjusting of delays  $D_i$ , filters  $F_i$  and gains  $G_i$  of **each channel**.



The aim of these column loudspeakers is to deliver perfect speech intelligibility. In order to do so, it is crucial to reduce to the maximum the reverberations on the walls and ceiling of the emitted sound, and to have a strong direct sound. In other words, it is necessary to control the directivity of the sound, with respect to the enclosed space to be covered.

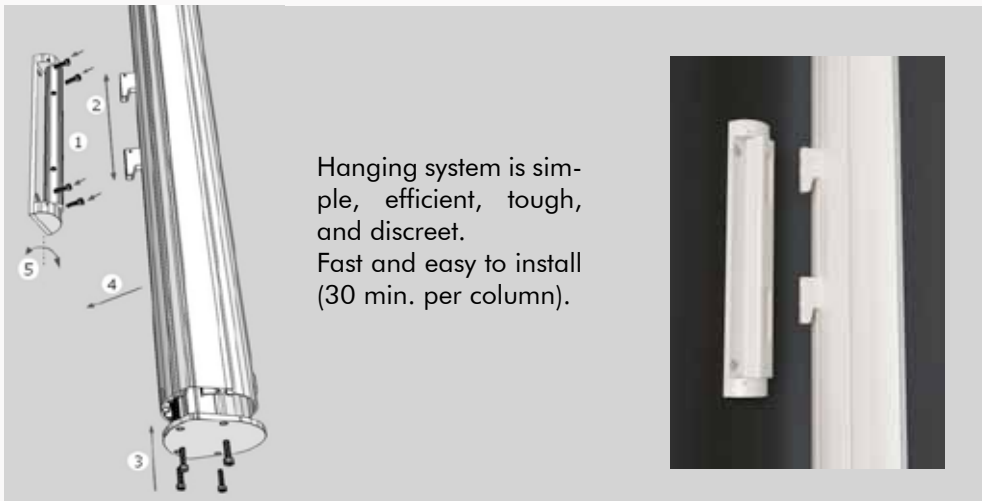
The main advantage of DGRC is that it decreases the number of channels to be controlled, compared to a system where every loudspeaker must be controlled independently. This means that it becomes possible to separate the electronics from the columns, giving further advantages: reduced weight, facilitated maintenance of the electronics, cost efficiency, an asset for firestop security.



### Passive DGRC column for speech and music

Ray-On 100 is a 1m passive column based on the DGRC principle :

- **Unsurpassed speech intelligibility and SPL homogeneity.** Ray-On 100 radiates a J shape wave front in the same way DSP columns do.
- **Excellent architectural integration.** Ray-On 100 is designed for vertical mounting, thus avoiding the ugliness of tilted columns.
- **8Ω and 100V** versions
- **Indoor and outdoor** use
- **Easy modeling** with DLLs and on [www.activeaudio.fr](http://www.activeaudio.fr)
- **3 years guarantee**



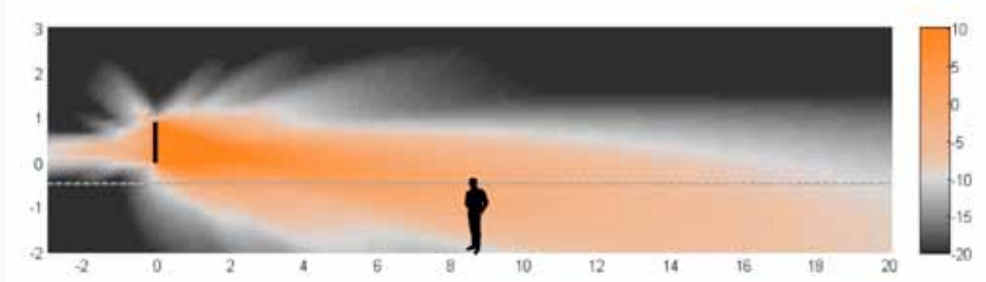
Physical Data	
Dimensions (H x W x D)	1014 x 128 x 117mm
Weight	9kg   10kg
Materials	Aluminium body / steel grid rustproof and UVproof
Drivers	12 drivers 70x70mm, tropicalized
Colours	White (RAL9016 repaintable) and Black (RAL9005)

#### Installations :

*Airports, Railway stations,  
Places of worship,  
Amphitheatres,  
Conference rooms,  
Shopping malls,  
Amusement parks,  
Reverberating spaces*



Electroacoustic Data	8Ω version	100V version
Sensitivity 1W/8m (equivalent 1W/1m)	71dB at 1W / 8m (89dB / 1W / 1m)	
Continuous power	150W	25W / 50W / 100W
Max SPL at 8m	93dB	85dB / 88dB / 91dB
Max SPL equivalent 1m	111dB	103dB / 106dB / 109dB
Frequency response at -3dB / -10dB	115Hz - 20kHz / 130Hz - 16,5kHz	
Vertical directivity	Wave front control	
Range on reflecting floor	15m at +/-3dB, 23m at +/-5dB	
Horizontal opening angle at -6dB	+/- 100° to 1kHz, +/-70° to 4kHz	
Nominal impedance	8Ω	400Ω / 200Ω / 100Ω
Recommended EQ	6 parametric cells	
Protection	Thermal fuse and overload protection	



## Accessories

### R100EQ

R100EQ is an equalizer box for Ray-On 100 column loudspeakers. This equalizer delivers two equalization curves: one with reinforced bass frequency, suitable for music, while the other is recommended for speech signals. No parameter or control software is needed.



Characteristics	
Inputs	2 Analog Audio Balanced inputs, plug-in terminal block type
Outputs	4 Analog Audio Balanced outputs, plug-in terminal block type
Clipping	±5.6V (14dBu)
Range	> 98dB
Power supply	12VDC (200mA Max)
Dimensions (H x W x D)	16 x 75 x 110mm

### R100CEQ

EQ card for Ray-On 100 column loudspeakers on **Cloud** power amplifiers and mixers, more particularly the CXV225 and CXV425 amplifiers.

### R100SM

Ray-On 100 stand mounting for standard telescopic 35mm diameter mast. Ideal for events.



# The StepArray range

The StepArray columns have 2 standard colours: black and white. In order to blend the columns into the decor, you can order a specific colour for your columns – all we need from you is the exact RAL / Pantone code.

## Technical data of the StepArray columns :

Model	Height	Audience	Range ±3dB	Range ±5dB	Frequency band- width (-10dB)	Max SPL (noise CEI268-16) with amplifier MPA6150	Horizontal opening angle	Weight
<b>SA100P</b>	1.00m	Flat	15m	21m	110Hz – 19kHz	95dB SPL at 10m	180°	9kg
<b>SA180P</b>	1.80m	Flat	30m	40m	110Hz – 19kHz	95dB SPL at 15m	180°	17kg
<b>SA180S</b>	1.80m	Tilted	22m	29m	110Hz – 19kHz	95dB SPL at 15m	180°	17kg
<b>SA250P</b>	2.50m	Flat	35m	45m	110Hz – 19kHz	95dB SPL at 20m	180°	24kg
<b>SA250S</b>	2.50m	Tilted	28m	36m	110Hz – 19kHz	95dB SPL at 20m	180°	24kg
<b>SA400P</b>	4.00m	Flat	68m	90m	110Hz – 19kHz	95dB SPL at 30m	180°	39kg

## SA100P

It's often coupled with another SA100P for stereo sound using the same processor and amplifier. It is the right solution for medium length spaces with high ceilings such as conference halls, lecture theatres, and court houses.

### Acoustical data

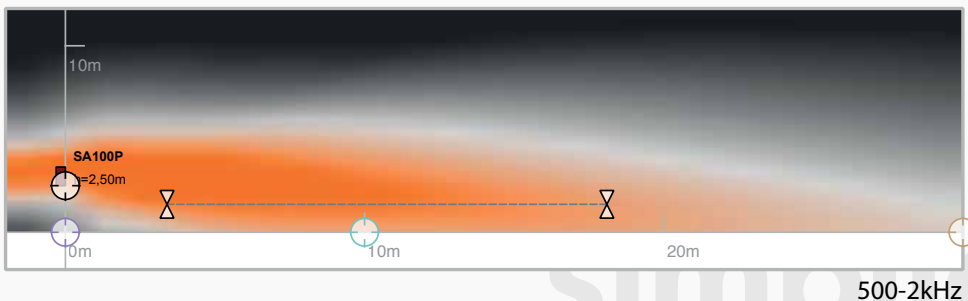
Angle of audience	0-5°
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### Electrical data

Loudspeakers connectors	Supplied 12 pins
Recommended length of cable	Up to 300m with 4G 1.5mm <sup>2</sup> cable Up to 500m with 4G 2.5mm <sup>2</sup> cable
Impedance	3 channels, 8Ω

### Mechanical data

Dimensions (H x W x D)	1024 x 124 x 131mm
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## SA180P

1.80m column for a horizontally seated audience. Its 30m range is perfectly adapted for places of worship, large halls, etc.

### Acoustical data

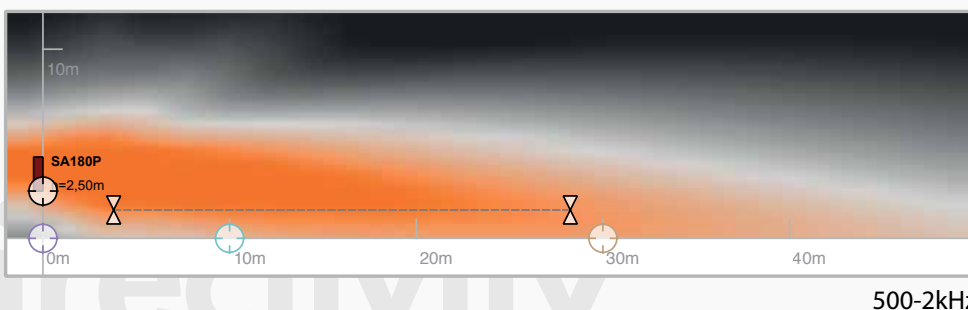
Angle of audience	0-5° (SA180P) / 5-20° (SA180S)
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### Electrical data

Loudspeakers connectors	Supplied 12 pins, through cable-gland
Recommended length of cable	Up to 300m with 4G 1.5mm <sup>2</sup> cable Up to 500m with 4G 2.5mm <sup>2</sup> cable
Impedance	3 channels, 8Ω

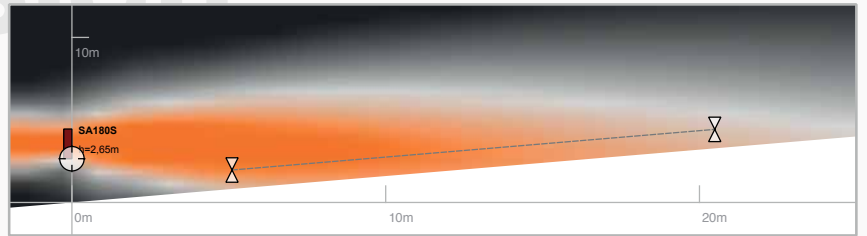
### Mechanical data

Dimensions (H x W x D)	1840 x 124 x 135mm
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## SA180S

Specifically designed for step-seated audience rooms such as conference rooms or amphitheatres, this column loudspeaker is mounted parallel to the wall.



500-2kHz

### Acoustical data

Angle of audience 0-5° (SA250P) / 5-20° (SA250S)

### Electrical data

Loudspeakers connectors Supplied 12 pins

Recommended length of cable Up to 300m with 7G 1.5mm<sup>2</sup> cable  
Up to 300m with 7G 2.5mm<sup>2</sup> cable

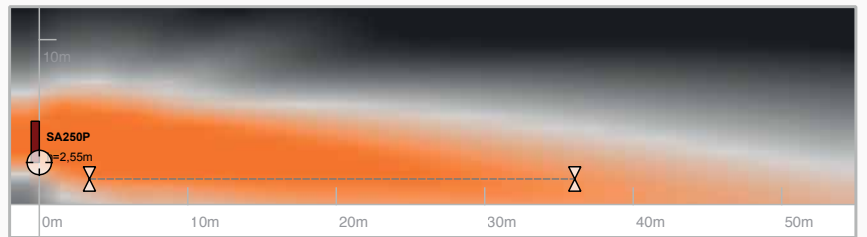
Impedance 6 channels, 4- 8Ω

### Mechanical data

Dimensions (H x W x D) 2505 x 124 x 159mm

## SA250P

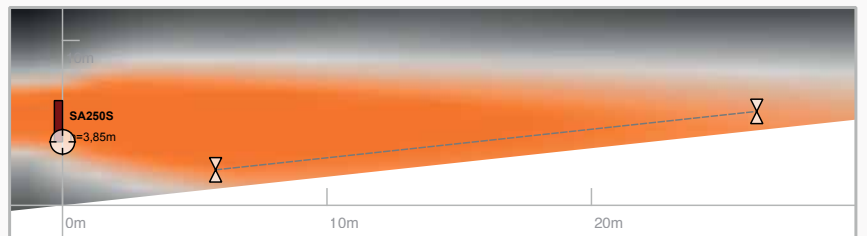
2.50m column for a horizontally-seated audience. Its range of 40m, makes it suitable for very large and flat volumes such as railway stations, airports, places of worship, shopping malls, museums, historical buildings.



500-2kHz

## SA250S

A 2.5m high column for a step-seated audience. A range of over 30m makes it an ideal solution for lecture halls, railway stations, and auditoriums.



500-2kHz

### Acoustical data

Angle of audience 0-3°

### Electrical data

Loudspeakers connectors Supplied 12 pins, through cable-gland

Recommended length of cable Up to 300m with 7G 1.5mm<sup>2</sup> cable  
Up to 300m with 7G 2.5mm<sup>2</sup> cable

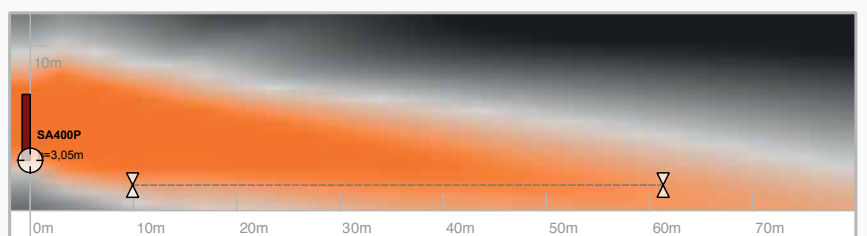
Impedance 6 channels, 8Ω

### Mechanical data

Dimensions (H x W x D) 4096 x 124 x 135mm

## SA400P

4m high column, with a 90m range, for huge buildings like an airport or a train station platform, or even a really deep cathedral.



500-2kHz

SA400P

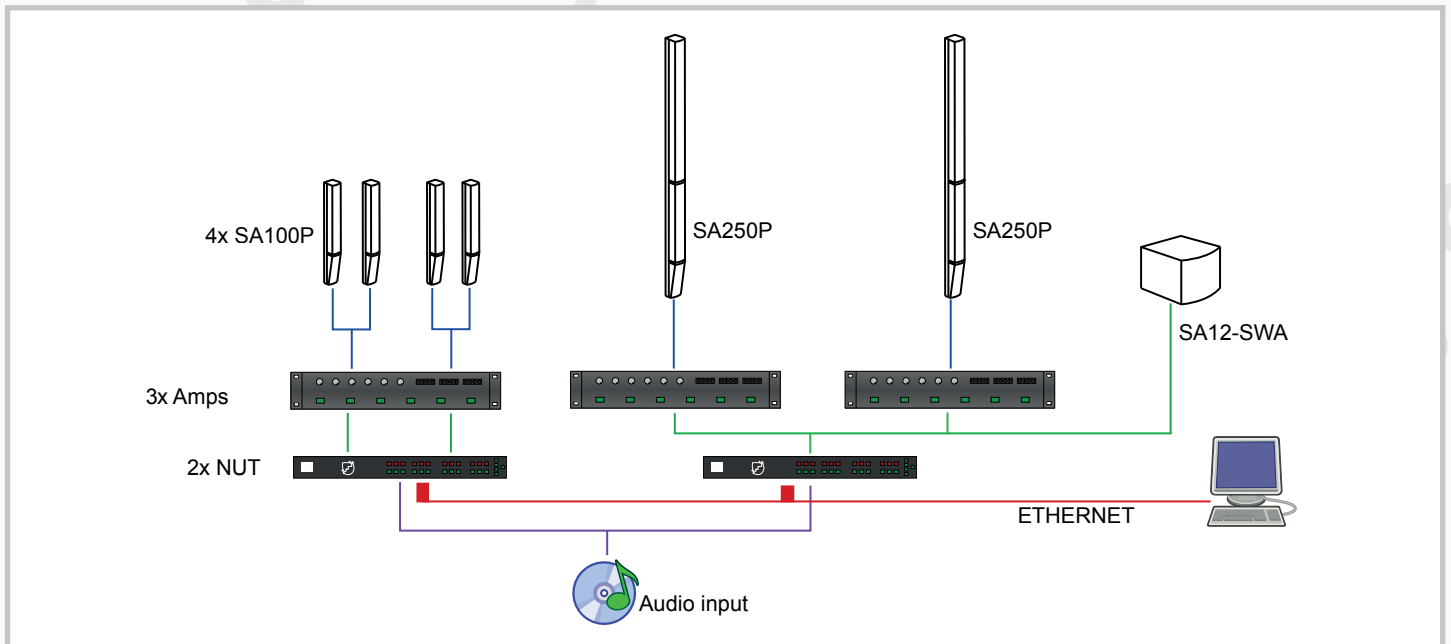
SA250P

SA250S



# Installation and recommendation

## Typical installation



Standard StepArray architecture including a subwoofer for music diffusion, in the zone covered by the SA250P columns.

The SA100P columns are connected in parallel, work in pairs, and are in stereo mode.

Both NUT processors can be linked to PCs, smartphones, and tablet computers thanks to their Ethernet connection.

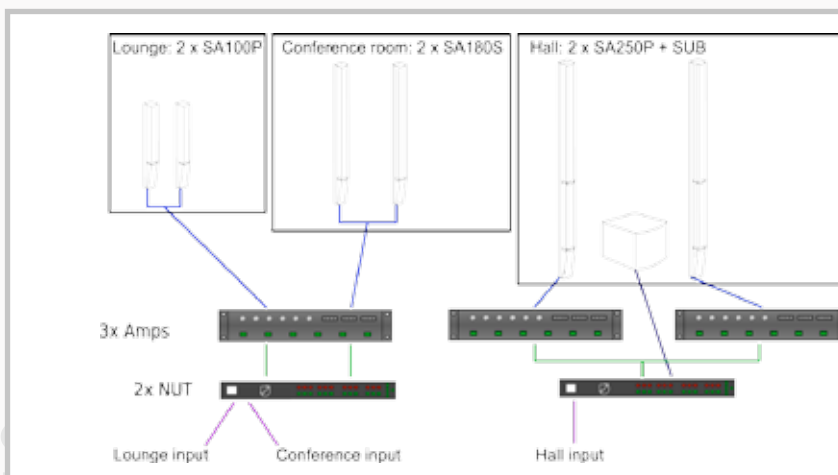
## StepArray specificity : shared electronics

One of the advantages of using external electronics is that several columns can be connected (via their amplifier) to the same processor.

A NUT processor features 8 analog symmetrical outputs. Therefore a single processor can be used to deliver signals for :

- a 6 channel column,
- one or two 3 channel columns.

Moreover, a NUT processor can be connected to one or several StepArray amplifiers (to feed several columns with the same signal).



In this example installation, three independent rooms are equipped with StepArray columns. Each room receives its own signal and can have independent parameters.

For a total of 6 columns, only 2 processors and 3 amplifiers are needed.



## NUT software

The NUT software is primarily used to tune the operating parameters of StepArray columns, but it is also a great simulation tool. The software can be downloaded for free on Active Audio's website : [www.activeaudio.fr/en](http://www.activeaudio.fr/en)

The main feature of NUT software is the directivity control, which allows the user to change the radiation pattern of StepArray columns in real-time.



## Simulation models

A simulation model of the sound coverage of the StepArray columns can be done with the acoustic simulation software CATT-Acoustic™ and EASE. The corresponding DLL are available for free download at [www.activeaudio.fr](http://www.activeaudio.fr).



## Security Sound System (SSS)

StepArray columns comply with the EN60849 standard (acoustic quality in public places). For further details, please refer to the option SSS described on [www.activeaudio.fr/en](http://www.activeaudio.fr/en).

# NUT processor

Digital Signal Processor, 8 inputs / 8 outputs

One processor,...



...many free apps  
...



All the available apps are automatically updated on your computer.

You'll find all the apps you need to suit your installation.

A specific need?  
Give us your installation's details and we'll create the app YOU need!

**StepArray application**  
2 colonnes 3 canaux 2 aux.

...for PA, sound reinforcement, live, conferences, etc.



NUT interacts with PC, Smartphones, and tablets thanks to their Ethernet and standard RS232 connection, whether they're in the same room as the processor or not! A remote control panel will also be available for fall 2012.

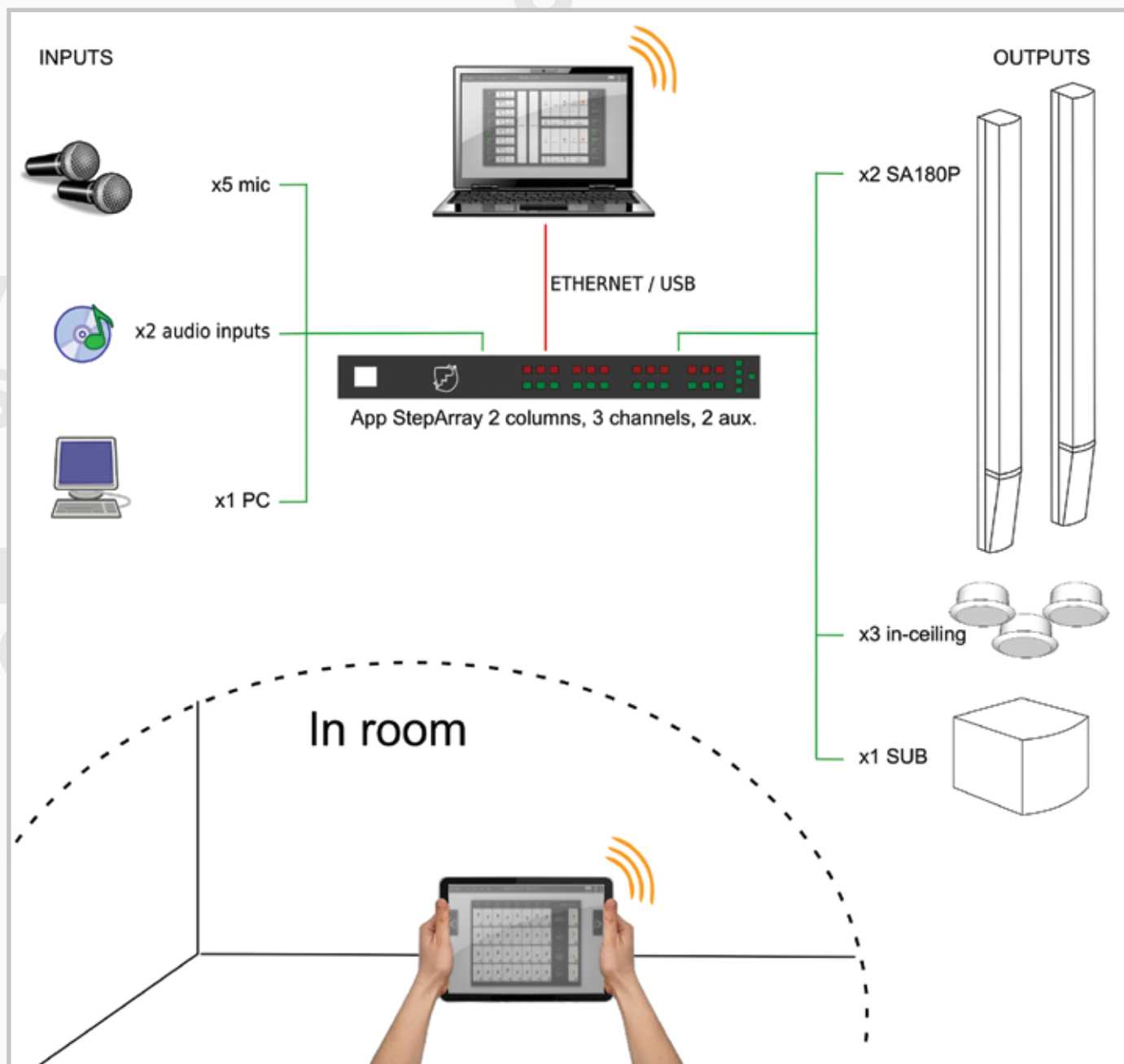


NUT is really easy to use, it doesn't need any learning period, which allows to focus only on the audio.



Every standard functionalities are included in NUT (Mixer, Equalizer, Feedback killer, etc.), as well as an intelligent Automix and Directivity control.

## Example of an installation in a conference room



### Technical data

Inputs	8 balanced analog inputs, with switchable mic / line level and phantom power
Outputs	8 balanced analog outputs
Control	Application based control through : driverless USB 2.0, Ethernet 100M
Dynamic range	114dB
Power	24VDC external power supply
Dimensions (H x W x D)	44 x 480 x 251mm
Input / output levels	Balanced 8Vrms (20 dBu)
Audio connectors	Phoenix (Euroblock) terminal blocs
Weight	3.5kg
Sample frequency	48 to 192kHz
Signal processing	Large choice of apps available

## Amplifiers

### MPA6150



#### Technical data

6 independent channels	
6 x 100W under 8Ω, 6 x 150W under 4Ω	
Inputs	3 poles female connectors
Outputs	Screw terminal blocks
Sensitivity	1 Veff
Signal-to-noise ratio	95dB
Damping factor	> 300
Harmonic Distorsion THD	0,1% at 1kHz

### CXV225 / CXV425



#### Technical data

2 / 4 independent channels	
100V RMS; 250W under 40Ω min. charge (per channel)	
Inputs	3 poles female connectors
Outputs	Euroblock and cable gland
Sensitivity	1,25V RMS -> 100V out
Signal-to-noise ratio	-96dB full band re. 100V RMS
Harmonic Distorsion THD	0,04% at 1kHz

EQ card for Ray-On available

## Subwoofers

The SA12-SW (passive) and SA12-SWA (active) subwoofers are meant to be coupled with StepArray column loudspeakers, for installations where music is supposed to be broadcast as well as speeches.



#### Technical data

Power handling	450W
Type	Bass-Reflex
Frequency bandwidth	40-500Hz
Impedance	8Ω
Sensitivity	97dB / W / m
Connector	Speakon
Dimensions (H x W x D)	435 x 400 x 440mm
Weight	19kg



## Stand-alone amplified loudspeaker for public places



The SAG32PA loudspeaker is an amplified loudspeaker that allows :

- Superior acoustical comfort and perfect intelligibility
- Activated by a motion sensor, or a remote up to standard NF S32-002
- Storage of pre-recorded audio messages in its memory
- Store up to 5 messages for a maximum of 2 minutes 30s
- Use indoor and outdoor
- Easy set up thanks to the user friendly software, available on : [www.activeaudio.fr/en](http://www.activeaudio.fr/en)

### There are 2 types of loudspeakers :

- The master loudspeaker receives the set off signal and manages temporizations and audio levels. It contains the pre-recorded messages, and embeds all electronics.
- The satellite loudspeaker broadcasts the message sent by the master loudspeaker. It acts as a passive loudspeaker.



### Installations :

*Museums, Amusement parks, Shops, Hospitals, Shopping centers, 5 senses gardens*

Technical data	
External dimensions (H x W x D)	180 x 205 x 135mm
Weight	Master loudspeaker : 3kg Satellite loudspeaker : 1.9kg
Maximum audio level	97dB SPL at 1m
<ul style="list-style-type: none"> <li>• Loudspeaker set up with our software downloaded on your PC and connected to the loudspeaker via Ethernet cable.</li> <li>• Loudspeaker synchronisation possible when in the same detection field.</li> <li>• Can be used inside and outside.</li> </ul>	

#### To install, prepare :

- A 230V power supply (possible option: solar power)
- A support on which to secure the loudspeaker at 3m high (wall, pillar...)

# Active Audio in the news

intelligibility



St Etienne Mosque

*" Back on the show floor, the Ray-On 100 column loudspeaker is one of the highlights of Active Audio's presence at ISE 2012. "*

Installation Europe – 2012

Acoustic



Soissons Cathedral







Nanterre University



Carrousel du Louvre

design

*" The comparison between a StepArray column and the existing traditional system of about fifteen columns is without question in favour of the Active Audio system. "*

**Acoustique & Techniques**

*" Revolutionary StepArray products, all of which have the DSP outside the column, which [...] allows for a more versatile and easy-to-set-up product range. "*

**ProSoundNews Europe – 2011**

technical assistance



Montparnasse Train Station





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