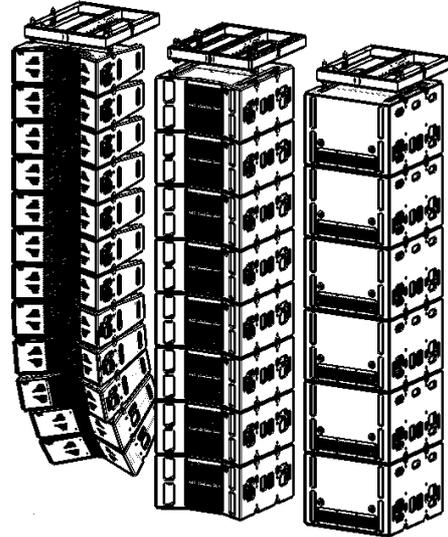


## UNILINE System Technical Brochure

V2.3 – Sept 2014



Line Array APG UNILINE System

### Presentation

The APG Uniline is a highly versatile line array system consists in a very powerful and efficient tool for professional sound reinforcement. The system comprises four models: **UL210, UL210/D, UL115B, UL118B.**

UNILINE has been developed as a highly modular system and can be used in **4 modes: "standalone" mode** (bi amp UL210/D only), the **"extended" mode** (tri amp UL210/D with UL115B or with subwoofer), or en **the "complete" mode** (quadri amp UL210/D combined with UL115B and infra bass subwoofers).

The UL210 speaker provides a consistent 85° acoustic coverage. The UL210/D speaker is designed for near field and "downfill" application thanks to its 105° acoustic opening in constant directivity. The UL115B dedicated bass speaker allows the extension in low frequencies increasing the SPL capacity.

The Uniline is useful in a very wide field of applications: from very small size configuration system for vocal reproduction to high power long throw systems for musical reproduction.

In mid/high, UL210 and UL210/D speakers are fitted with the APG ISOTOP™ exclusive technology and benefit of high efficiency, great linearity, minimum distortion and flawless line source type coupling.

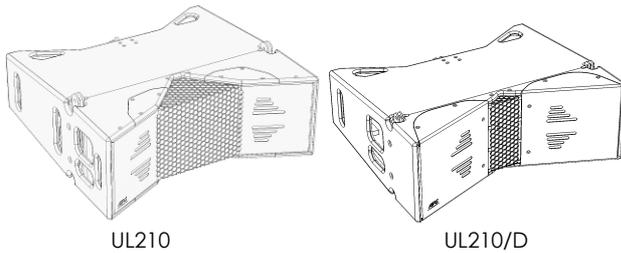
UNILINE also benefits from our intensive research on handling and transport features to significantly reduce rigging time and still provide maximum security.

Presets are available for the digital processors and a complete system installation protocol has been developed in order to achieve perfect results every time. For the acoustic simulation APG provides speaker datas and files for EASE and EASE Focus softwares and all others calculation tools and technical support to achieve the best acoustic model for each site.

### Benefits

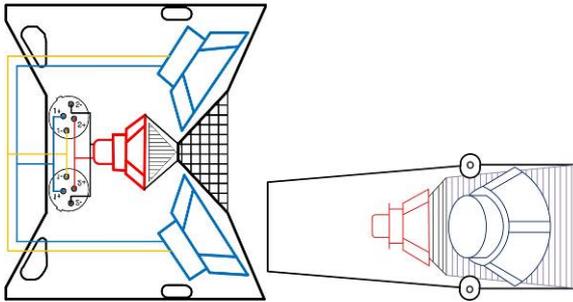
- High level of sonic and acoustic performance
- Real 85° constant directivity (UL210) or 105° (UL210D) across all the mid-high frequency bands
- Acoustic modularity: 4 different modes of use :
- Mechanic modularity: ground-stacked or flown, separated dedicated bass speaker, single or dual integrated rigging points choice.
- Sophisticated transport and rigging systems for quick and intuitive set up
- Sophisticated ergonomics optimized for storage and transport to reduce handling manipulation
- Flexibility for hanged UL115B bass and UL118B subbass speakers configuration: omnidirectional or cardioid directivity clusters.
- 10 recessed handles on every Uniline speakers
- Low weight : 100° neodymium cone drivers fitted speakers

## 1. UL210 and UL210D Medium/high speakers



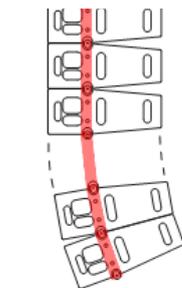
UL210

UL210/D

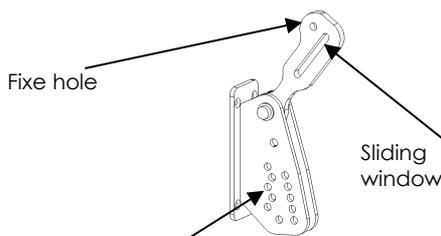


UL210/D top view

UL210/D side view



Acoustic source line



Adjustment angulation

**UL210** is the main "line array" element of UNILINE designed for mid and long throw coverage. The horizontal acoustic opening is **85°** in constant directivity, the impedance is **16 ohm** for both low mid and mid/hi sections.

The UL210D uses the same technologies and components as the UL210 and it is designed and optimized for short/mid throw and "downfill" applications.

The Horizontal acoustic opening is **105°**, impedance of **8 ohm**.

The rest of the acoustic characteristics are common.

UL210 and UL210/D have two sections of amplification: **Lo/Mid (70 - 450 Hz)** and **Mid/Hi (450 Hz - 19kHz)**.

The speakers are connected to the amps via 2 Speakon™ connectors 4-point:

- 1+/1- on Lo/Mid
- 2+/2- on Mid/Hi

The low/mid section comprises two 10" speakers located on either side of the Isotop mid/hi section. The complex acoustic load combines bass reflex with front compression. The mid/hi section comprises a coaxial 17cm/HF1" speaker assembly loaded with the exclusive APG ISOTOP™ waveguide that produces a wavefront which combines extremely coherently between loudspeakers right up to the very high frequencies.

The advantages of this technology compared to a traditional compression driver are significantly improved frequency response, constant and improved SPL and greatly reduced distortion.

UNILINE's remarkable directivity control from 350Hz on the horizontal plane is thanks to the large frontal horn (the full front panel of speakers)

The real constant directivity in the mid/hi range (85° for the UL210 and 105° for the UL210/D) allows very wide and consistent coverage horizontally. That guaranties the stereo effect sensation to the main part of listening area.

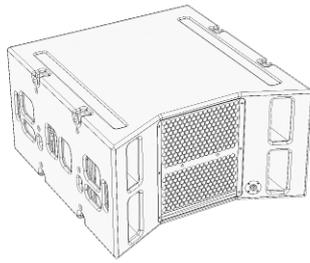
On the vertical plane, the directivity index is progressive and the acoustic opening depends on the configuration of the array.

The pivot axis of the cabinets is located on the same plane as the throat of the ISOTOP™ driver, It guarantees a continuous acoustic source independently of angulation ("ribbon type"). Therefore the SPL and range are fully adaptable according to the geometry of the audience area, only by setting the angles between speakers, (no need for separate electronic treatment and dedicated amplifiers)

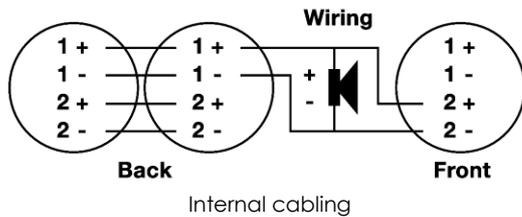
The 3-point rigging system enables the system to be either flown or ground-stacked only.

The angle is adjusted from ONE point at the back of the cabinets in 1° increments from 1° to 10° (10 positions).

## 2. UL115B Bass speaker



UL115B



**UL115B** is the dedicated low frequency subwoofer of the UNILINE system.

The UL115B subwoofer has been designed for low frequency reinforcement from 45 – 160 Hz. The frequency cross-over with UL210/D is at 110 Hz.

The UL115B subs are connected to the amps via 3 Speakon™ connectors 4-point:

- 1+/1- on the back
- 2+/2- on the front for cardioid configuration.

Concerning the 2+/2- on the back, it is linked between the two connectors but is not connected to the speakers.

The bandpass acoustic load allows increasing the acoustic efficiency in the bandwidth and limiting the excursion of the cone driver in the same time.

The front chamber opens onto a K-Horn design resulting in a 2dB gain in the high frequencies.

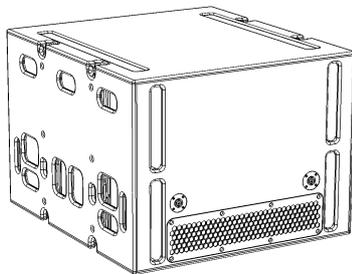
The rear chamber (tuned with bass-reflex) increases the efficiency in the low frequencies reducing the volume of load.

Furthermore, the forced ventilation design of the neodymium driver reduces thermal compression by 2dB.

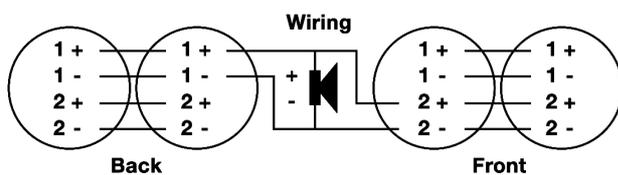
This combination results in a superior dynamic capacity and an SPL gain of over 6dB compared to a traditional direct-radiating vented enclosure.

The ergonomic 4-point rigging system makes it easy to fly or ground stack the UL115B. Cardioids configurations are also made possible thanks to this 4-point system.

## 3. UL118B Subwoofer



UL118B



The **UL118B** model is the very low frequency subwoofer dedicated to Uniline system

The UL118B subwoofer has been designed for low frequency reinforcement from 25-80 Hz. The frequency cross-over with UL210/D is at 80 Hz and 63 Hz with UL115B.

The UL118B subs are connected to the amps via 4 Speakon™ connectors 4-point:

- 1+/1- on the back
- 2+/2- on the front for cardioid configuration.

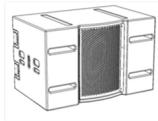
This model combines two technologies (the forced ventilation design of the neodymium driver and bandpass acoustic load), which assures it a wide dynamics capacity as well as a very high SPL level

The ergonomic 4-point rigging system makes it easy to fly or ground stack the UL118B. Cardioids configurations are also made possible thanks to this 4-point system.

## 4. Low and very low frequency reinforcement TB

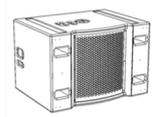


TB115S

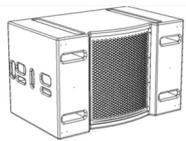


TB215S

Use for indoor application and extended



TB118S



TB218S

Use for outdoor application, extended and complete

In general, APG recommend with UNILINE the use of UL115B and/or UL118B speakers to extend system operating range down to the very low frequencies.

Nevertheless, in some application cases, it is also possible to use TB subwoofers with UNILINE systems, when application doesn't require any rigging system, so when subwoofers will be groundstacked only.

### Extended mode 1

In this mode, TB 115S and TB215S can be used instead of UL115B.

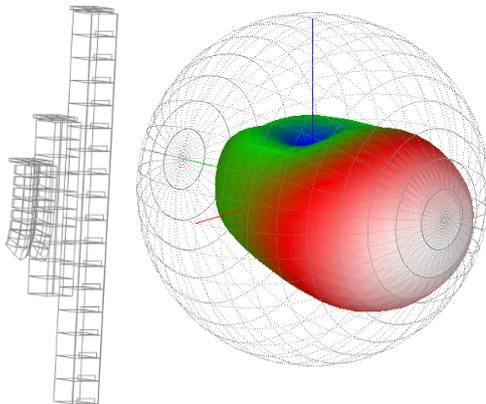
### Extended mode 2

In this mode, TB118S and TB218S can be used instead of UL118B

### Complete mode

Although not optimal, TB118S and TB218S can also be used instead of UL118B

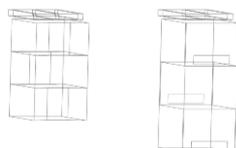
## 5. Modularity of low frequencies directivity and throw



Playing with arrays lengths to match directivity thru the whole spectrum



Two UL115B column  
D'Apolito coupling



3x UL115B and 3x UL118B  
cardioid arrays

UNILINE uses the principle of modular line array, that means that every frequency band (subbass, bass, medium-high) has a dedicated speaker.

It permits a much better control of the system directivity according to the frequency, and a mastered overlap and aperture between each frequency bands.

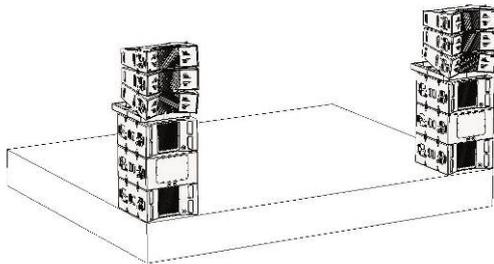
So it's possible to play with different element array length and positions to match the directivity pattern and throw at different frequency bands.

For example if we want a uniform aperture for  $f = 40$  Hz (UL118B), 80 Hz (UL115B), 160 Hz (UL210), we simply have to create three lines with respectively the following number of enclosure : 8 UL210, 10 UL115B, 17 UL118B.

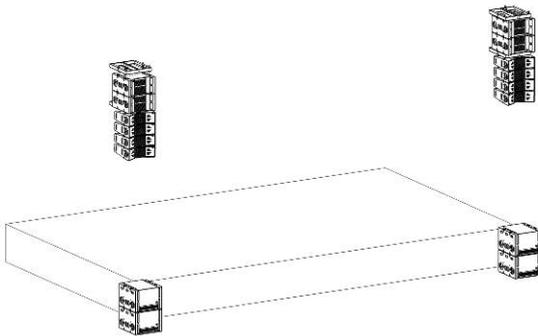
Another example will be with two UL115B clusters, half of the higher wavelength distance between them, to build a big dipole that bring quite figure of height directivity pattern.

At the end, it's also possible to control directivity even for small configuration due to cardioid array possibilities..

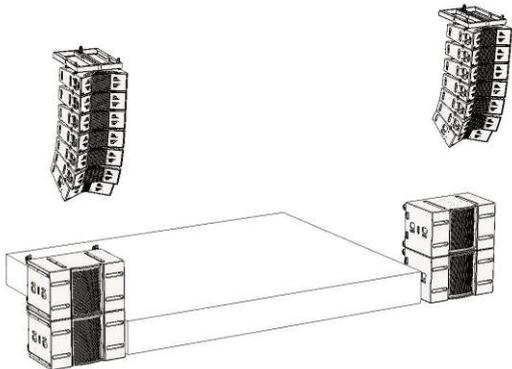
## 6. System modularity



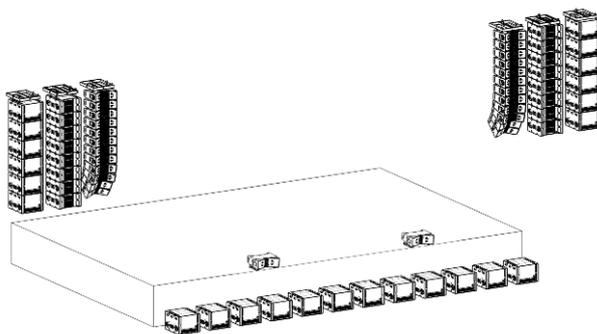
1. Stacked compact system, extended mode with cardio



2. Hanged compact system, complete mode



3. Medium throw system, extended mode with subs



4. High power system, complete mode

The UNILINE system is designed for applications that justify the use of a « line array » system events and show venues from medium to large size, in touring and fixed installations.

It offers a highly mechanic and acoustic modularity because it can be configured as both a compact low power system as a medium range system or as a system of high power and long range.

Equivalent System	2x 5"-6.5" Very Small	2x 8" Small	2x 10" Medium	2x 12" Medium Large	2x 15" Large	2x 18" Very large
Theater, Voice	1:0:0	1:0:0	1:0:0	1:0:0	3:2:0	3:0:2
Ambiance	1:0:0	1:0:0	2:0:1 3:2:0	3:2:0	3:2:0	3:0:2
Acoustic live	3:2:0	2:0:1 3:2:0	1:1:0 2:0:1	2:0:2	3:2:2	3:2:2
Amplified music live	1:1:0	1:0:1	2:0:1	3:2:2	3:2:2 1:1:1	1:1:1

It fits perfectly in 450-seat theatre with 3 cabinets per side, just as it will comfortably handle an open air festival for 10,000 people using 12 boxes per side.

The Uniline technology can be describe as a big system with 15" that has been cut in two: one main medium/high speaker UL210, one bass speaker UL115B and UL210/D for downfill use.

The three speakers have been separated and optimized to bring a maximum modularity of configuration between them.

### Example of configurations :

#### 1. Stacked compact system, extended mode with cardio

- 1x ULTRUSS
- 3x UL210
- 3x UL115B (cardioïd setting)
- 1 x Unirack or 1/2 x Tourrack

#### 2. Hanged compact system, complete mode

- 2x ULTRUSS
- 4x UL210
- 2x UL115B
- 2x UL118B
- 1x Unirack or ½ x Tourrack

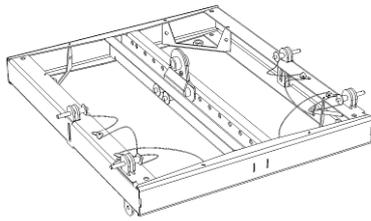
#### 3. Medium throw system, extended mode with subs

- 1x ULTRUSS
- 6x UL210
- 1x UL210/D
- 2x TB218S
- 2x Unirack or 1x Tourrack

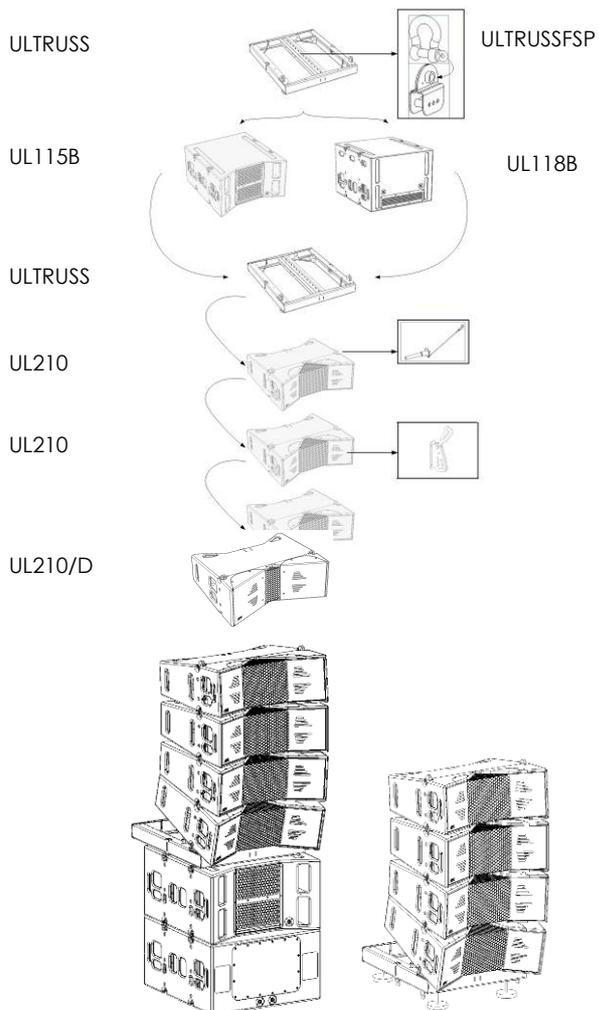
#### 4. High power system, complete mode

- 6x ULTRUSS
- 2x ULSTACK
- 10x UL210
- 4x UL210/D
- 8x UL115B
- 12x UL118B
- 5 x Unirack or 2.5 x Tourrack

## 7- ULTRUSS mechanical accessory



ULTRUSS



Ground-stacked with or without UL115B



Optional ULTRUSS accessories refs

The **ULTRUSS** element is an unique and versatile mechanical accessory allowing all mechanical connections and coupling between the different UNILINE system speakers:

- Hanging of UL210/D clusters
- Hanging of UL115B clusters
- Link between hanged UL115B and UL210/D
- Link between stacked UL115B and UL210/D
- Ground stacking part for UL210/D
- Ground stacking part for UL115B

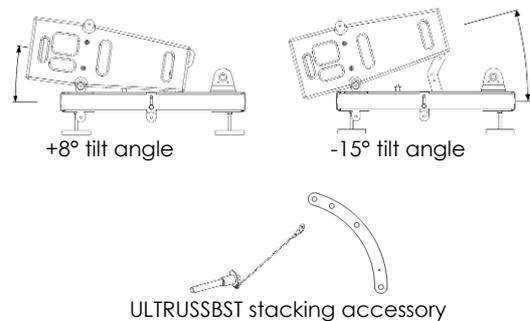
The mobile rigging part (Ref ULTRUSSFSP) is fitted with two connected pins and allows 1 point hanging cluster up to 1 ton.

The double pin rigging principle offers a 25 steps great precision of tuning of the vertical angle of clusters even with only one hanging point. The acoustic and mechanical simulation tool Ease Focus 2 calculates the gravity center and indicates the right rigging position for pins.

Using two pick points, it is possible to hang a Uniline cluster with two hoists. That's allows getting maximum precision of tuning in vertical cluster aiming.

APG recommends to always secure your APG system with a security sling connected to the ULTRUSS, and to set orientation angle of your array with a halyard to maintain his value and avoid swaying.

For ground stacked set up, a specific additional part (ULTRUSSBST) has to be used in order to tune the vertical angle of UL210 /D clusters from -15° to +8° (axis of the bottom speaker).



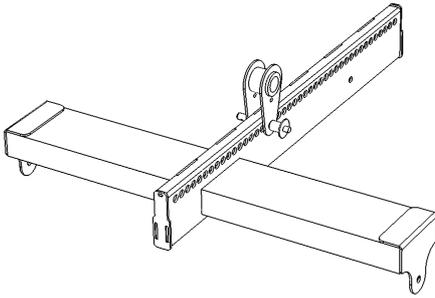
There are two options for ground-stacked configurations :

1/ using UL115B/UL118B speakers in the bottom directly on the ground or fixed on a second ULTRUSS bumper.

2/ without bass speaker using a ULTRUSS equipped with ULTRUSSBST part and the four feet option (ref ULTRUSSFFS) screwed into the bottom of the bumper.

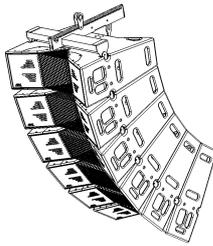
**NB:** These ULTRUSSBST and ULTRUSSP are optional. The ULTRUSS is delivered with one ULTRUSSFSP only.

## 8. ULRAIL



The ULRAIL lifting/flying accessory stands for the perfect alternative to ULTRUSS, for hanging small clusters. It permits to hang up to 6 UL210 or UL210D speakers, for a maximum weight of 250 kg (550 lbs).

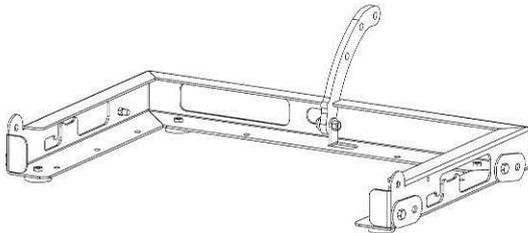
IIIDΔII



Lighter and more affordable than the ULTRUSS, this accessory will guarantee you to be more and more competitive on small and medium setting (for rental or permanent installation). His structure permits an easy fixing on every type of truss.

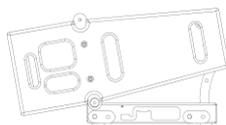
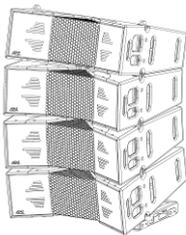
6xUL210 (max WLL 2500 daN 260 kg)  
with a security factor of 6

## 9. ULSTACK



Another alternative to the ULTRUSS universal rigging accessory, the ULSTACK is design to stack Uniline systems. It permits to stack directly on the ground UL210/D speakers, or to assure the mechanical coupling between UL210/D speakers and UL115B/UL118B speakers.

ULSTACK



It becomes also possible to secure a stack of Uniline speakers on the TB serie (subwoofers) with straps.

ULSTACK (UL210 stacked on UL115B)

## 10. Electronics



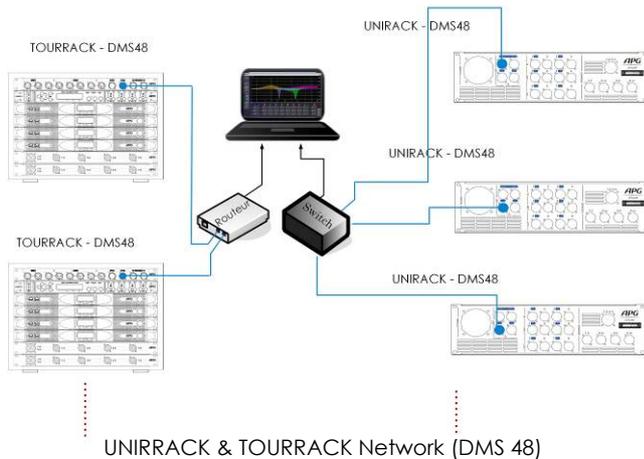
DMS26 Digital Processor



DMS48 Digital Processor



PWAPG Digital Interface



Amplifier SA20:2



Amplifier SA30:2

### Signal processing : digital processors DMS26 or DMS48

APG DMS26 and DMS48 processors ensure the management and treatments of multicast system (such as Uniline), which cannot work without them.

**DMS26** : 2 analog inputs, 6 analog outputs, digital converters 96kHz/24bits, 50 presets

**DMS48** : 4 inputs, 8 outputs, both analog or digital (AES3) digital converters 96kHz/24bits, 50 presets

Full banks of presets are available for all Uniline configuration modes for DMS26 and DMS48.

Numerous DMS26 and DMS48 can be easily remote controlled with a single computer, thanks to the software **PWAPG**.

Wiring is done with the BVNET Card for one or many DMS26 daisy-chained, or with Ethernet network for DMS48

### DMS26 :

- RS232 as standard
- Optional BvNet network with BVNETCARD

BvNet network adapters includes :

- USB to BvNet (BVNETADAPT)
- Ethernet to BvNet (ETHERBRIDGE)
- Dante to bvNet with 2 audio outputs (DANTEBRIDGE)

### DMS48 :

- Ethernet port as standard
- Optional NetAudio card (DANTECARD)

### Amplification

APG recommends using SA20:2 and SA30:2 for touring and rental. Nevertheless it is possible to use other adapted professional amplifiers for permanent installation, regarding the following values :

<b>UL210 Section Low/Mid :</b>	800 W in 16 Ohms 3200 W in 4 Ohms
<b>UL210 Section Mid/Hi :</b>	600 W in 16 Ohms 2400 W in 4 Ohms
<b>UL210D Section Low/Mid :</b>	800 W in 8 Ohms 1600W in 4 Ohms
<b>UL210 Section Mid/Hi :</b>	600W in 8 Ohms 1200W in 4 Ohms
<b>UL115B :</b>	1150W in 8 Ohms 2300W in 4 Ohms
<b>UL118B :</b>	800W in 8 Ohms 1600W in 4 Ohms

For further information please consult :

- Technical Brochure DMS26 or DMS48
- Application note wireless BvNet
- User manual DMS26
- User manual DMS48
- Instruction for setup UNIRRACK & TOURRACK

## 11. Standard modular amp racks



UNIRACK



TOURACK

### Unirack & Tourrack

APG provides two standardized platforms for electronic treatments and amplification : UNIRACK and TOURACK, they have respectively **four and eight amplifying channels**, adapted to every type of configuration (truthful to the modularity of Uniline System), such as : Touring, fixed installations, corporate events,...

Wiring and patching is also a lot easier thanks to their wiring plates, which permits a great gain of time, and a straight view on your connectors.

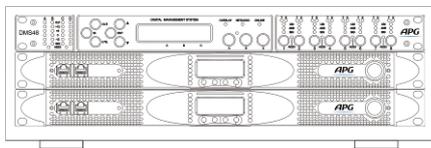
These 2 racks includes :

#### UNIRACK :

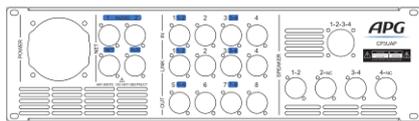
- TFC3U : Universal rack 3U
- 1 x CP3UAP : Wiring plate (rear)
- 1 x DMS48 : Digital processor
- 2 x SA30:2 : 2 amplifiers with 4 amplifying channels

#### TOURACK :

- TFC10U : Flight Case 10U
- 1 x CP1UMI : Wiring plate (front) for inputs
- 2 x CP1UMO : Wiring plate for outputs
- 1 x DMS48 : Processeur numérique
- 4 x SA30:2 : 4 amplifiers with 8 amplifying channels

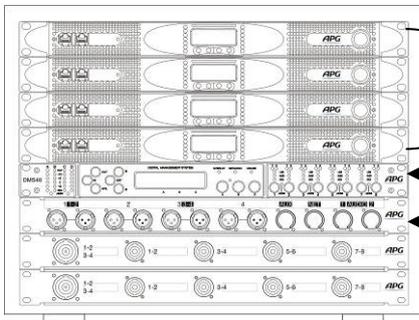


Front



Rear

UNIRACK



TOURACK

4 amplifiers  
SA30:2

DMS48  
DMS48

C1PUMI

2 x  
C1PUMO

#### Wiring plates for UNIRACK

Equipment of CP3UAP :

1. 4 inputs XLR 3 Female + 4 links XLR3 Male
2. 1 output Speakon™ 8 points (1-2-3-4)
3. 2 outputs Speakon™ 4 points (1-2 , 3-4)
4. 4 RJ45 bases (2 audio, 1 net, 1 aux)

#### Wiring plates for TOURACK

Equipment of CP1UMI :

1. 4 inputs XLR3 Female + 4 links XLR3 Male
2. 4 RJ45 bases (2 audio, 1 net, 1 aux)

Equipment of CP1UMO

1. 1 output Speakon™ 8 points (1-2-3-4)
2. 2 outputs Speakon™ 4 points (1-2 ; -3-4)

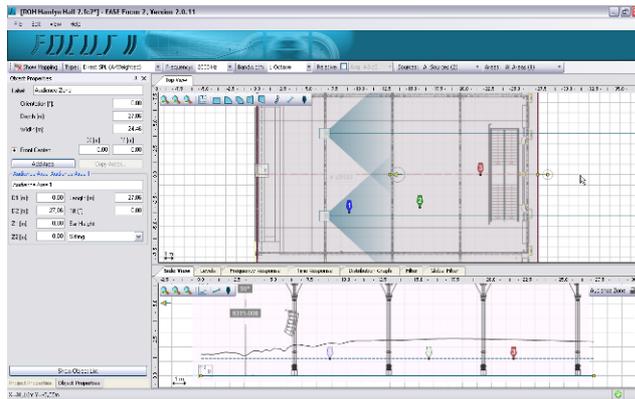
#### Recommended number of speakers per amplification channel with SA30:2 (bi-amplified)

	UL210	UL210D	UL115B	UL118B
Rec*	4	2	2	2
Max**	8	4	4	4

\* Recommended value corresponds to a 4 Ω load

\*\* The maximum acceptable value, used for directivity control, when your system doesn't have to reach his max SPL.

## 12. Modeling Tools



1

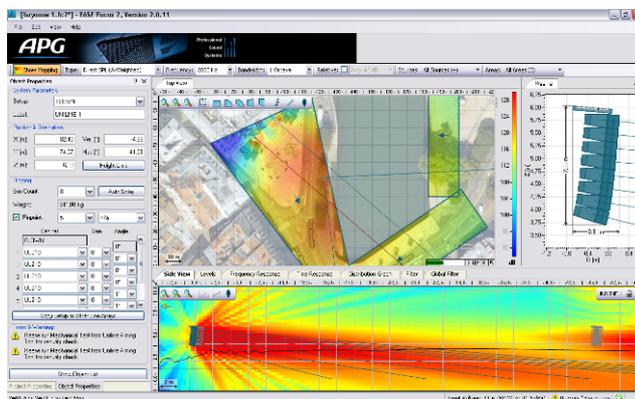
### Acoustic simulation : Ease Focus V2

Ease Focus V2 is 3D acoustic modeling software developed by AFMG to simulate the acoustic and mechanic of line array systems.

It allows to get quickly a simulation in direct level (up to 16 clusters).

It is available in free download at : [www.afmg.eu](http://www.afmg.eu)

NOTE: The .GLL files are compatible with EASE 4.3 as long as the room acoustic has been fully modeled. This allows getting complete results: more than 8 sources, 3D models and mappings, direct or total level simulation including reflections and reverberation of the room.

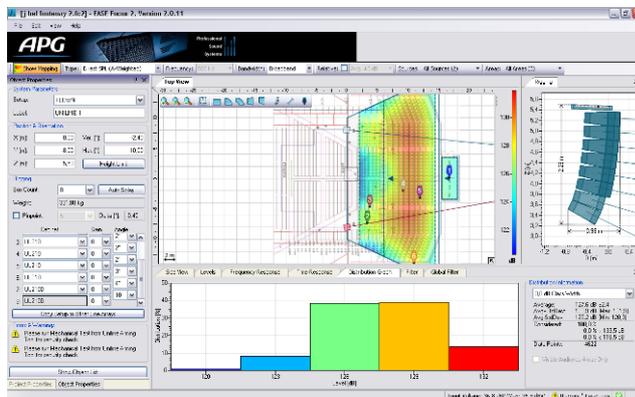


2



1 : model of the site or venue.

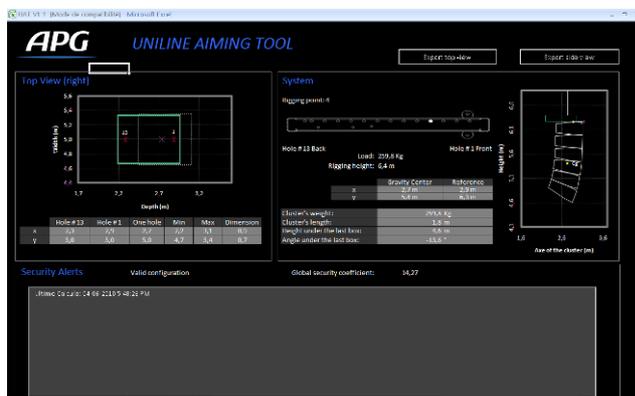
In order to get a quick and precise model of the site and audience geometry it is possible to load a drawing or internet map or photo in background of the screen...



3

2 : Screen view of the acoustic simulation.

3 : Ease Focus allows to simulate SPL, mapping, frequency responses, to get measurements by virtual microphones and to get statistic level distribution.



4

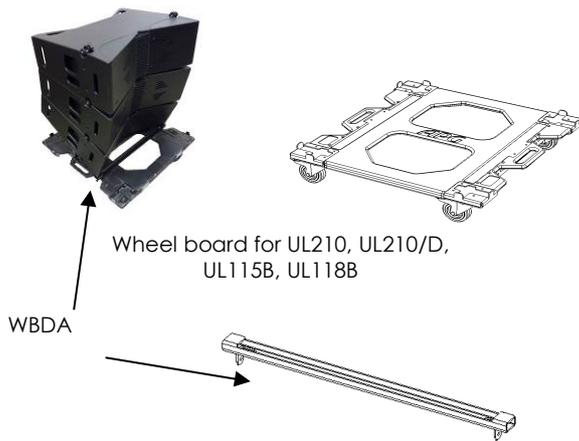
### Mechanic certification : Uniline Aiming Tool (UAT)

The **Uniline Aiming Tool** is designed to accurately calculate the stresses on each mechanical system component in order to determine the safety factor for each cluster.

Its use is optional and only reserved for certified Uniline system engineers or APG support engineers.

Image 4 : The mechanical simulation enables you to print out a full report, including a mechanical certification for the structure, together with the geometrical characteristics.

## 13. Flight cases & Transport



APG has developed a dedicated transport system based on dollies, designed to be covered with a bell-type flight case cover.

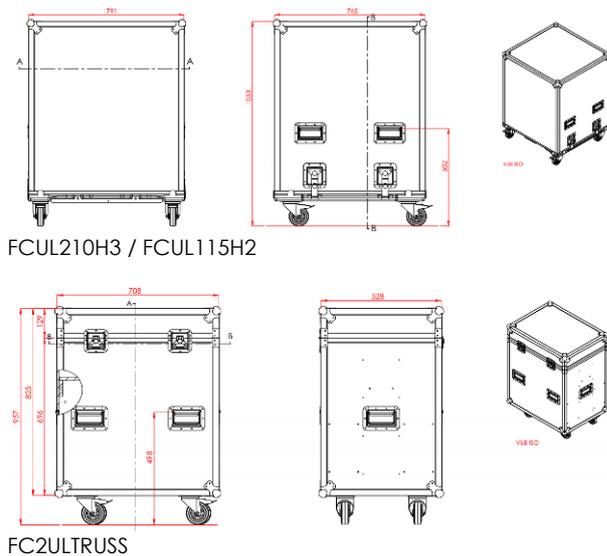
This transport system has been designed simultaneously with the mechanical and rigging system to get a perfectly optimized set up principle in all types of use. This transport system is the international standard solution for touring and rental companies.

Storage of UL210/D by 3 speakers on the UL210WB dolly and covered by the FCUL210H3 bell. If an **UL210D** is at the bottom of your cluster, you will need a **WBDA** accessory to fix the speaker to your dolly.

For the transportation of the UL210/D the specific flight case **FCUL210DV2** is also available (only 2 speakers).

The UL210WB dolly authorized up to 6 UL210/D speakers. You can store 2 UL115B speakers on the UL115BWB dolly and cover them with the FCUL115BH2 bell. A dolly is also available for UL118B and can store 2 speakers as well.

The UL115BWB dolly authorized up to 4 UL115B speakers. Flight case covers have same dimensions (77x80x89cm) and same height on dollies (108cm) what corresponds to internal truck storage space.



	dolly	bell	Soft cover
UL210	UL210WB	FCUL210H3	-
UL210D	UL210WB (+WBDA)	FCUL210DV2	-
UL115B	UL115BWB	FCUL115H2	-
UL118B	UL118BWB	FCUL118H2	SCUL118B
ULTRUSS	x	FC2ULTRUSS	-
ULRAIL	-	-	-
ULSTACK	-	-	-

Reference for storage accessories

## 14. Set up & Breakdown



Set up in a narrow place



Or two rigging points,  
« motor rigging »



Hanging on one rigging point. 24 discreet angles available for your configuration



Angle setup on the back before lifting : one man setup



Breakdown

### Set up principal

Only qualified operators trained on rigging systems and the Uniline system are allowed to install flown rigs. In case of doubt about these essential safety issues, please refer to knowledgeable technician.

Assembly of a Uniline system is done vertically.

This type of assembly has the advantage of requiring little space (2 m x 2 m environ). It is also very practical on all types of field (grass, ground, sand...)

The three top array speakers are brought on their wheel plate under the motor point. Then the ULTRUSS bumper is put on top, and fixed to the speakers and motor's hook. It is possible to hang an array on one or two points, according to settings and capacities of the area (see page 4)

Angles between speakers are set with oblong spots, and the speaker wires must be plugged at the rear (this can be done before the event, during the setup before transport, which stands for a great gain of time).

Lift up the whole to 1 meter, and take off the wheel plate. Put the three next speakers (on their wheel plate) under the equipment.

Lift down the whole in order to put the three top speaker on the three bottom ones.

Link the 2 clusters with the three safety pins, finish the wiring and the angulation setup.

Lift up the whole, and keep following this procedure until your final cluster is complete.

The 3-point mechanical coupling system offer one single point at the rear of UL210/D speakers. It offers the choice between a fixed point or an oblong slotted point which makes it very easy to adjust the angles whilst the speakers are on the floor and even before to hang the clusters.

### Breakdown

The breakdown follows the same process as the set up, but in the opposite way. When the array is layed upon the ground with his wheel plate, angles come back automatically to their 10° position (their maximum), frame against frame. There are no supplementary work to do on equipment, which makes this operation quite easy, and fast enough.

## 15. Tools



Inclinomètre

### Inclinometer :

This tool enables you to measure very precisely the absolute and relative angles of surface inclination. It is an essential tool for checking the global angulations of the cluster taking into account all possible influences (weight of cables, variations due to the wind etc...)



Décamètre

### Decameter :

This tool is used for the installation of the system, as well as tuning measurements.

Fixed onto the bumper, it can measure the height of speakers when lifting the cluster to determine the final hang height.

On the floor it measures the distance to and positions of the microphones for system tuning.



Télémètre

### Telemeter :

The telemeter is sometimes combined with the inclinometer in a single tool. It is useful to measure and dimensions of site and venues (much more precise and practical than decameter most part of time).



Système de mesures acoustiques

### The acoustic measurement system:

A full package system is required: computer, software, acoustic measurement card, microphone(s), etc...

It is necessary to use it to control the directivity of the array, to tune the time alignment of clusters and additional speakers, and to make the room equalization...

APG provides a full standard protocol of tuning of the Uniline.



Sonomètre

### SPL meter :

This tool measures acoustic sound pressure level (SPL) for the respect of applicable laws.

It is often available in acoustic measurement systems

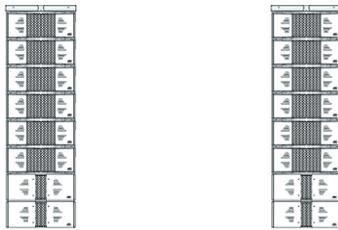


Testeur de phase

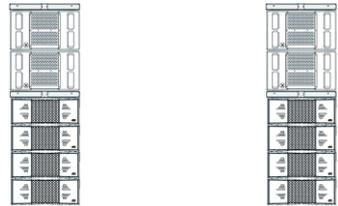
### Phase tester :

This simple tool is the base line of a system setup. It measures the electric and acoustic phase of the system, once installed and cabled.

## 16. Configurations



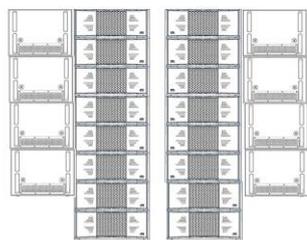
2 way model « standalone »



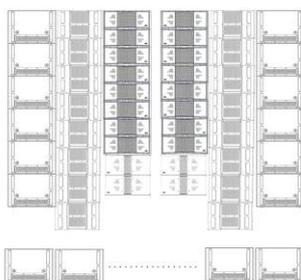
« extended mode » (3 way with UL115B)



« extended mode » (3 way with UL115B cardioid mode)



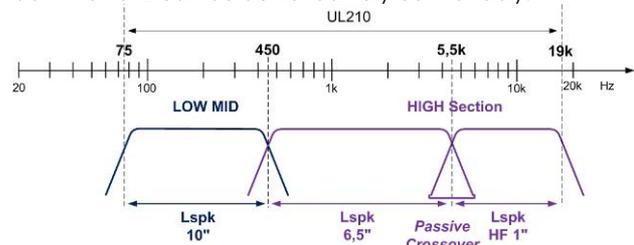
« extended mode » (3 way with UL118B)



« Complete mode » (4 way)

In this configuration, the UL210 speakers work as a standalone 2-way system without additional bass or infra bass subwoofers. The system is thus constituted by one or more columns UL210 speaker only.

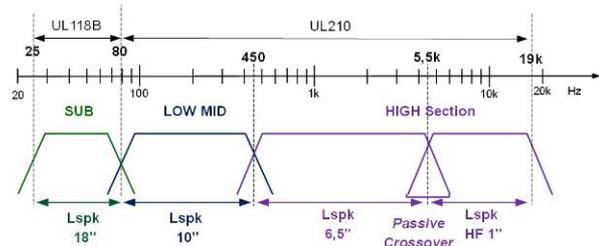
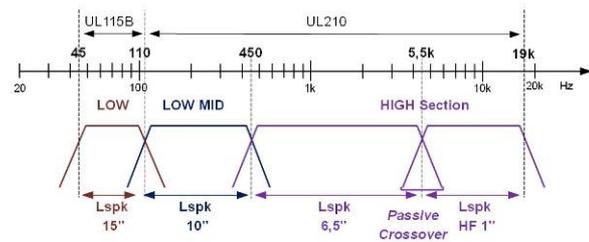
Low-end power and efficiency is determined by the number of speakers. Using a large number of UL210s linked together (either ground-stacked or flown), an extended frequency response down to 75Hz can be achieved very comfortably.



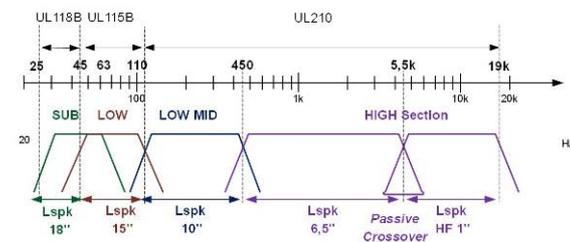
The extended mode (3-way) offers two possibilities:

- UL210 coupled with UL115B
- UL210 coupled with subwoofers

Here again, it is the number of UL210 speakers and the size of the resulting source that determines the dynamic capacity in the low and low/mid.



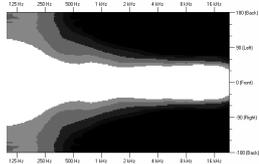
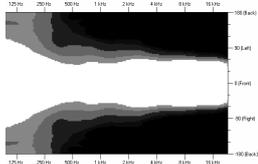
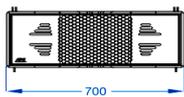
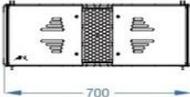
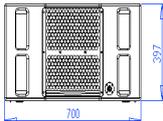
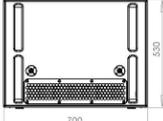
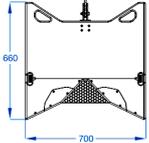
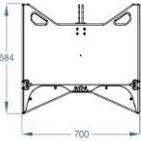
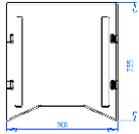
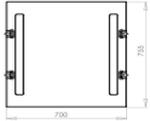
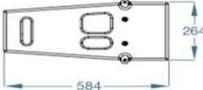
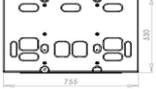
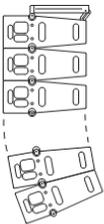
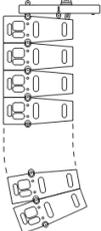
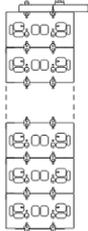
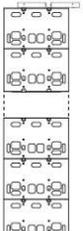
The complete mode (4-way) is the configuration that utilises every type of enclosure : UL210, UL115B and infra-bass subwoofers This mode offers the widest dynamic range right down to the infra low frequency.



In "extended" or "complete" modes, UL115B can be used in vertical flown or horizontal stacked networks also with cardioid directivity control.

Cardioid configuration of APG subwoofers can be managed by DMS26 and DMS48 for which the corresponding presets have been developed.

## 17. Specifications

Composants	UL210		UL210/D		UL115B	UL118B
	Low/Mid	Mid -Hi	Low/Mid	Mid -Hi	Bass	Low-Bass
Transducer	2 x 25 cm (10")	1 x 17 cm (6,5") 1 x HF 1"	2 x 25cm (10")	1 x 17 cm (6,5") 1 x HF 1"	1x 38 cm (15")	1x46cm (18")
Impedance	16 Ohms	16 Ohms	8 Ohms	8 Ohms	8 Ohms	8 Ohms
Coil Diameter	75 mm (3")	50 mm (2") et 45 mm (1.75")	50 mm (2")	50 mm (2") et 45 mm (1.75")	100 mm (4")	100 mm (4")
2 way response*	65 - 450 Hz	0,45 - 19 KHz	80 - 450 Hz	0,45 - 19 KHz	-	-
3 way response*	110* - 450 Hz	0,45 - 19kHz	110* - 450 Hz	0,45 - 19kHz	45 - 110* Hz	25 - 80 Hz
SPL @ 1W /1m	99 dB	108 dB	101 dB	105 dB	102 dB	102 dB
Power(AES)	800 W	300 W	400 W	300 W	1150 W	800 W
Max SPL @ 1m continuous	129 dB	131 dB	127 dB	131dB	132 dB	131 dB
Max SPL @ 1m peak		135 dB		133 dB	138 dB	137 dB
Horizontal Directivity						
(First line at -3 db then -6, -9, ...)						
Dimensions (mm)	264 x 700 x 660		264 x 700 x 584		397 x 700 x 755	530 x 700 x 755
						
						
						
Weight	38 Kg		34 Kg		45 Kg	56 Kg
Max Configuration						
	<b>ULRAIL</b> 6 x UL210		<b>ULTRUSS</b> 24 x UL210/D		<b>ULTRUSS</b> 20 x UL115B	<b>ULTRUSS</b> 16 x UL118B

**NB – Must not be exceeded. These configurations represent the maximum load limit of the flying system. However, in certain cases depending on the angles used in the configuration, the maximum number of loudspeakers may be inferior! The UNILINE Aiming Tool simulation software will calculate the loads for you to ensure that all of the necessary safety standards are respected and that load limits are not exceeded.**

\*The crossover filtering is carried out by the DMS26 digital processor which also temporally aligns the two sections. In certain configurations, the frequency crossover between the hi-bass and the subwoofers can be made at 80Hz, instead of 100Hz

### Exploitation

Both acoustic and mechanical simulations must be done correctly before the set up of a line array system. All simulations, set up and tunings must be done only by technicians and engineers trained and certified by APG. APG takes no responsibility for errors committed on behalf of the users of their products.

### Training

APG organises a number of training days on the use of its product aimed at different areas of specialisation within the world of professional sound reinforcement. There are two levels of training: sound technician and sound engineer.

### Documentary resources

To complete this brochure, we invite you to consult the following documents :

- **UNILINE preset list**  
Notices and banks of presets for DMS26 and DMS48
- **Instructions for set up**  
User and set up notices for each mode of using
- **"TB" subwoofer technical brochures**  
Technical user notice for low frequency and infra bass sound designs
- **DMS26 technical brochure and manual**  
Detailed technical information and description of DMS26 using modes (configurations, options, etc.)
- **DMS26 wireless solution**  
User notice for wireless control of digital APG processors
- **DMS48 technical brochure and manual**  
Detailed technical information and description of DMS26 using modes (configurations, options, etc.)

### Technical support

APG's technical support engineers offer an advanced level of ongoing technical support with the aim of finding the optimum solution from both a technical and economic point of view.

### General information

APG has a comprehensive research and development policy for the continual improvement of its products and service. Due to this, new materials, manufacturing methods and technological changes may be introduced without prior notice.

As a result, an APG product may differ from its published description in certain areas. However, unless otherwise indicated, its characteristics will always equal or better the published specifications.

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The logo for APG, consisting of the letters 'APG' in a bold, italicized, sans-serif font. A horizontal blue line is positioned below the letters.