www.amateaudio.com

User's manual

n208

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#purelynitid

December 2018

Amate Audio S.L.

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Safety Instructions

1. All safety instructions must be read before using this device.

2. Keep and follow these instructions

3. Heed all warnings

4. The exclamation mark in the triangle indicates internal components which if replaced can affect safety.

5. The lightning symbol within the triangle indicates the presence of dangerous uninsulated voltages.

6. Only clean the device with a dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install the device near heat sources such as radiators, heaters or other heat-emitting elements.

9. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus

10. The equipment must be repaired by qualified technical service personnel when:
A. The mains supply cable is damaged, or
B. Any object or liquid has damaged the device; or
C. The equipment does not function normally or correctly; or
D. The equipment has been exposed to the rain; or
E. The chassis is damaged

11. Disconnect the device in the case of electric storms or during long periods of disuse.

12. WARNING – To reduce the risk of fire or electric shock, do not expose this device to rain or moisture

13. The equipment shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the device.

14. For hanging and installation, use manufacturer recommended accessories only.

1 INTRODUCTION

1.1 General

Amate Audio would like to thank you for your confidence in our NITID Series. We suggest you to carefully read the following instructions in order to obtain the best results in performance.

1.2 What is a line array?

The trend in sound reinforcement has been to increase both the sound pressure level (SPL) and the size of the audience to be covered. This leads to an increase in the number of cabinets and, as a result of this, an increase in the total size and weight.

A line array is a group of independent sound sources which are vertically stacked in order to transform the spherical wavefronts generated by individual sources into a single flat wavefront.

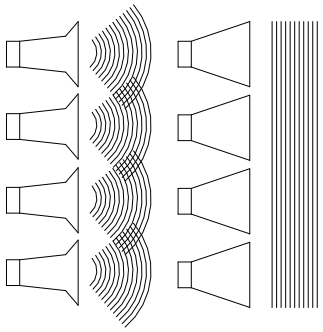


Fig. 1. Wavefield interference for different wavefronts.

To carry out effectively arraying individual sound sources the system must follow the acoustic coupling conditions based on the wavelength, the shape of each source, the surface area of each transducer and the relative source separation.

An assembly of individual sound sources arrayed with regular separation between the sources on a plane or curved continuous surface is equivalent to a single sound source having the same dimensions as the total assembly if the following conditions are fulfilled:
1) The step of source separation, defined as the distance between the acoustic centres of the individual sources, is smaller than half the wavelength over the bandwidth of operation.

$$d <= \lambda/2$$

It is not difficult to fulfil this first condition for the low and mid frequencies. For example, two 7" loudspeakers that are separated by 17 cm will reproduce a cylindrical wave up to 1015 Hz.

This condition is difficult to be fulfilled for the high frequencies, as their wavelengths are too small to make the adjacent acoustic centres any smaller than $\lambda/2$. Here comes the second "arrayability" criterion.

2) The wavefronts generated by the individual sources are planar and the combined surface area of the sources fills at least 80% of the total target surface area:

$$H_1 \cdot W + H_2 \cdot W + ... + H_n \cdot W >= 0.8 \cdot H \cdot W$$

This is achieved by using waveguides, which are coupled to the compression drivers output. We achieve flat wavefronts with a constant phase. By vertically assembling these waveguides we fulfil the second criterion of line array construction.

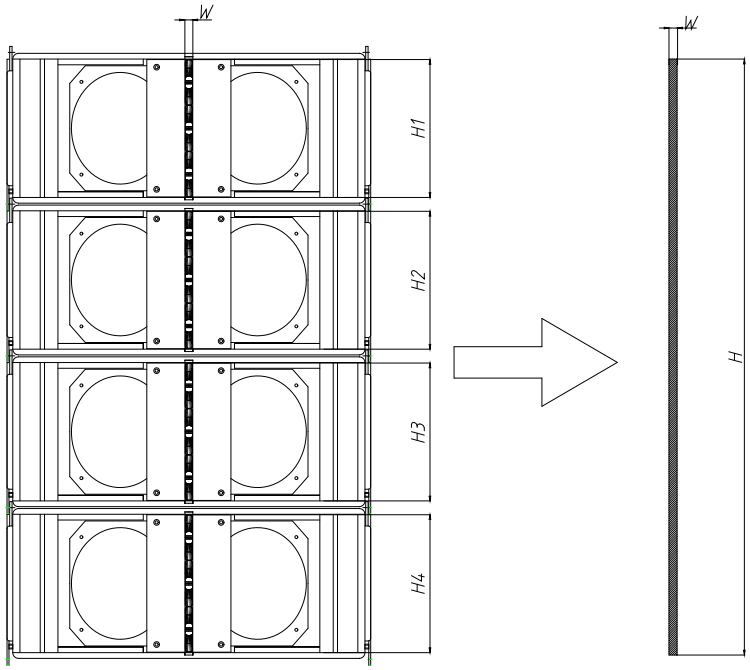


Fig. 2. Second criterion of "arrayability"

3) The deviation from a flat wavefront must be less than λ/4 at the highest operating frequency (this corresponds to less than 5 mm curvature at 16kHz).

This third condition can be explained through our property waveguide. Thanks to some complex mathematical calculations we have obtained a component which is able to adapt the circular section of the compression driver to a rectangular section, getting on-phase waves at the end of the guide. This flat wavefront is ideal for vertical configurations.

Fig. 3. High frequency waveguide (half piece)

Sound engineers use line arrays to obtain narrow directivities on the vertical plane. For configurations with many cabinets (big height) and at high frequencies it is not unusual to achieve narrow angles- in some cases they may be grade fractions. This

can be useful in venues where both a high sound pressure level and long throw are required; nevertheless, this means less coverage of the audience area.

It is sometimes useful to achieve an asymmetrical coverage pattern on the vertical plane, which can be obtained by aiming some of the cabinets through their hinging points. We are now ready to define the last two criteria of "arrayability".

4) For curved arrays, the tilt angles should vary in inverse proportion to the listener distance (this is geometrically equivalent to shaping variable curvature arrays to provide equal spacing of individual element impact zones).

5) There are limits given the vertical size of each cabinet and their relative tilt angles. In our case the maximum tilt angle (between cabinets) is 10º.

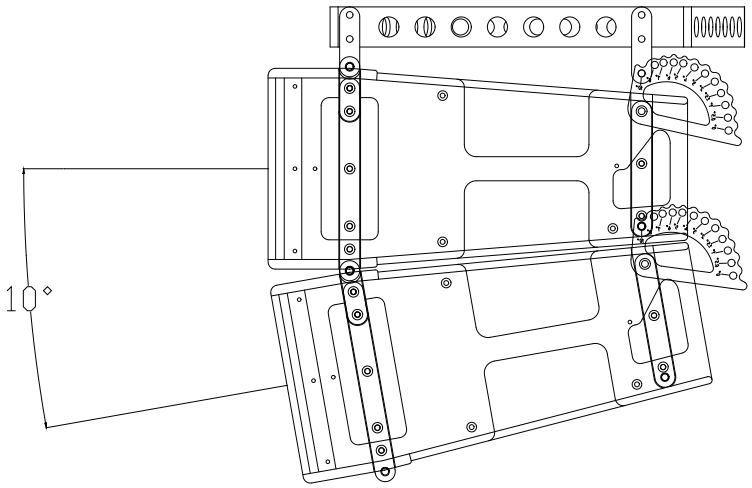


Fig. 4. Tilt angle between cabinets (10º maximum)

1.3 Fresnel Region (Near Field) and Fraunhofer Region (Far Field)

As our system is able to fulfil the previous conditions it will produce cylindrical waves to a maximum frequency. The wave will be flat up to a certain distance where it will start to become spherical (depending on the frequency and the size of the array).

The limit distance between the zone of cylindrical waves (Fresnel) and spherical waves (Fraunhofer) can be calculated through the following formula

$$d_c = \frac{3}{2} H^2 f \sqrt{1 - \left(\frac{1}{3Hf} \right)^2}$$

where

d_c= limit distance between near field and far field (in metres)
H = height of the array (in metres) f= frequency (in kHz)
In the near field region (Fresnel), the wavefront is cylindrical and waves only expand on the horizontal plane (110º in N208). The height of the wavefront is, in this case, the total height of the array.

In the far field region (Fraunhofer), the wavefront is spherical and expands both on the horizontal and vertical planes. The horizontal coverage is 110º and the vertical coverage is defined by the frequency and the height of the array.

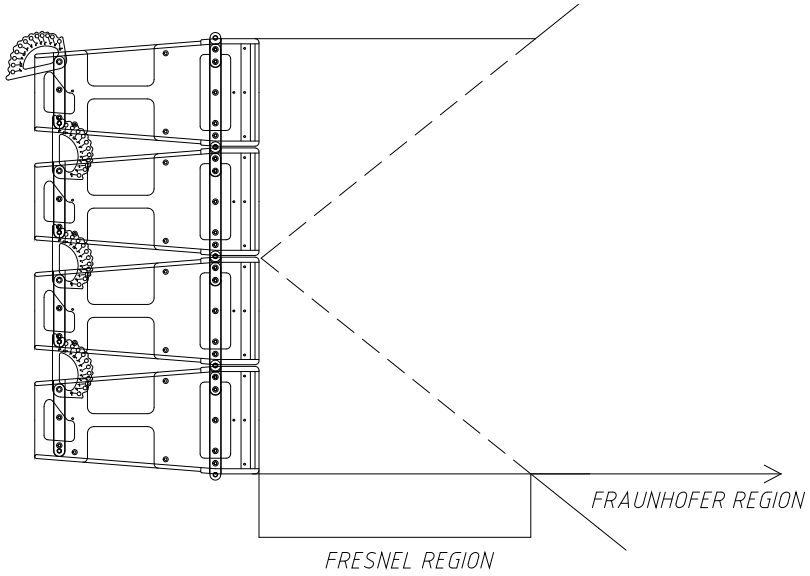


Fig. 5. Limits of Fresnel-Fraunhofer Regions

We can create a chart with some of the basic configurations and their performance regarding wave propagation.

Frec (Hz)	**4x N208 d_c(m)**	**8x N208 d_c(m)**	**12x N208 d_c(m)**	**16x N208 d_c(m)**
100	Esférica	Esférica	Esférica	1.3
125	Esférica	Esférica	0.7	2.2
250	Esférica	1.1	3	5.6
500	0.5	2.8	6.6	11.8
1k	1.4	5.9	13.3	23.8
2k	2.9	11.9	26.8	47.9
4k	5.9	23.9	54	95.9
8k	11.9	47.9	107.9	191.9
10k	14.9	59.9	134.9	239.8

Fig. 6. d_c Calculation

An 8-cabinet array has a near field extending to 12 metres at 2kHz. Beyond this distance the wavefront will be spherical.

In the first zone (Fresnel), sound pressure loss is only 3 dB per doubling of distance, whereas in the second zone (Fraunhofer) the loss is 6 dB. In long throw and high SPL configurations it is very important to produce cylindrical waves.

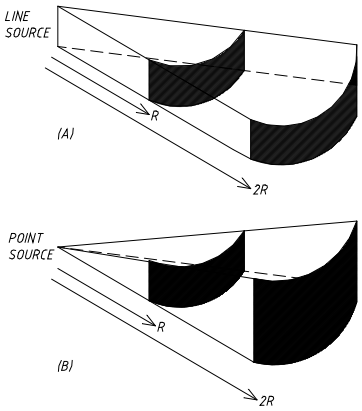


Fig. 7. Cylindrical wave (A) vs Spherical wave (B)

(A): -3 dB / doubling of distance
(B): -6 dB / doubling of distance

1.4 Features and presentation

N208

- Self-powered acoustic system
- XLR electronically balanced input & XLR parallel output
- AC PowerCon input and link
- Speakon NL4FX output
- 1000 W Class-D amplifier for low-mid range
- 500 W Class-D amplifier for high range
- 24-bit AD/DA converters, 48 kHz sampling rate
- Self amplifier diagnostics: output power, temperature, clipping
- DSP Controls (delay, volume, PEQ, presets and limiter)
- 2 x 8" neodymium woofers with 2.5” voice coil
- 2 x 1.7” voice coil diameter, 1” exit PEN diaphragm compression drivers
- High frequency planar waveguide
- 110º horizontal directivity

N208P

- Passive acoustic system
- Speakon NL4MPR input
- AC PowerCon input and link
- 2 x 8" neodymium woofers with 2.5” voice coil
- 2 x 1.7” voice coil diameter, 1” exit PEN diaphragm compression drivers
- High frequency planar waveguide
- 110º horizontal directivity

N18W

- Self-powered subwoofer
- XLR electronically balanced input & XLR parallel output
- AC PowerCon input and link

- 2500 W Class-D amplifier
- 24-bit AD/DA converters, 48 kHz sampling rate
- Self amplifier diagnostics: output power, temperature, clipping
- DSP Controls (delay, volume, PEQ, presets, polarity and limiter)
- 18” woofer with 4” voice coil

N218W

- Self-powered subwoofer
- XLR electronically balanced input & XLR parallel output
- AC PowerCon input and link
- 2500 W Class-D amplifier
- 24-bit AD/DA converters, 48 kHz sampling rate
- Self amplifier diagnostics: output power, temperature, clipping
- DSP Controls (delay, volume, PEQ, presets, polarity and limiter)
- 2 x 18” woofers with 4” voice coil

1.5 Presets on N208

The N208 includes several manufacturer presets for different types of application.

PRESET 1: 2BOX_FR
Two enclosures, full range

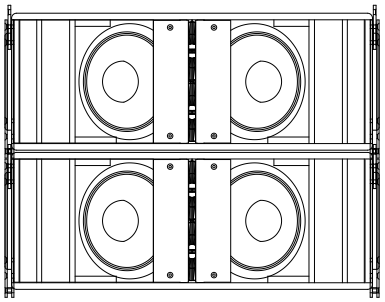


Fig. 8. Preset [2BOX_FR] configuration

PRESET 2: 2BOX_SW
Two enclosures with subwoofer

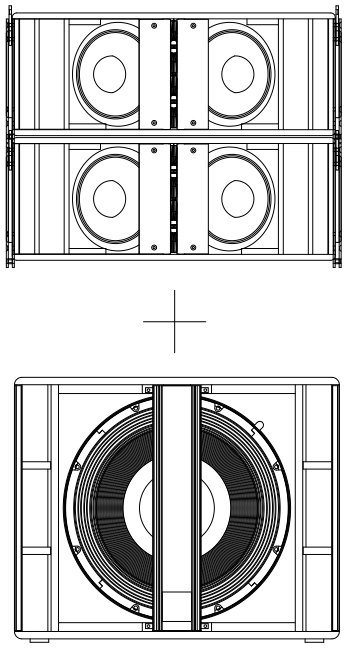


Fig. 9. Preset [2BOX_SW] configuration

PRESET 3: 4BOX_FR
Four enclosures, full range

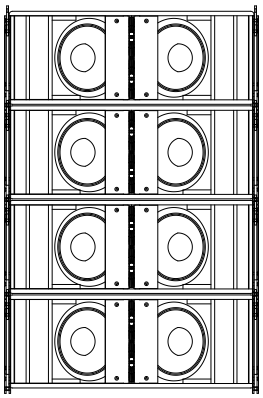


Fig. 10. Preset [4BOX_FR] configuration

PRESET 4: 4BOX_SW
Four enclosures with subwoofer

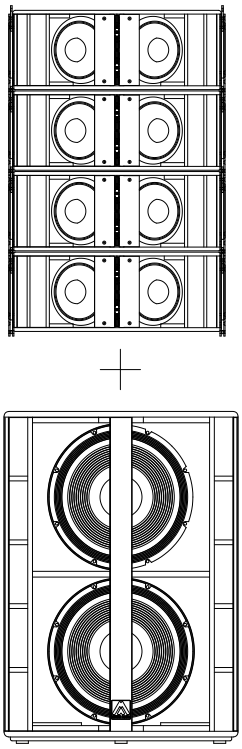


Fig. 11. Preset [4BOX_SW] configuration

PRESET 5: 8BOX_FR
Eight enclosures, full-range

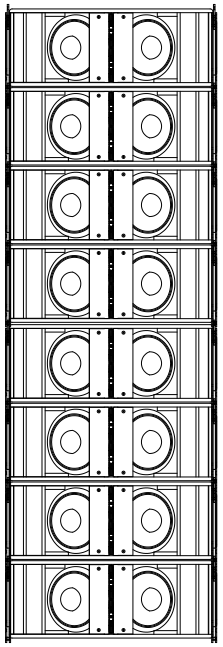


Fig. 12. Preset [8BOX_FR] configuration

PRESET 6: 8BOX_SW

Eight enclosures with subwoofer

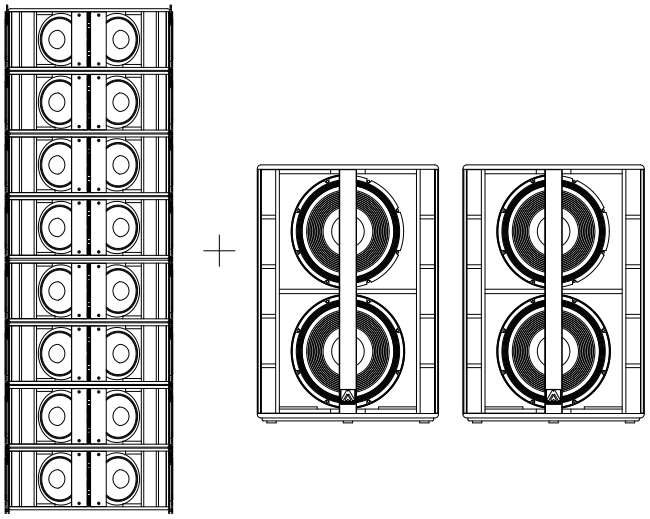


Fig. 13. Preset [8BOX_SW] configuration

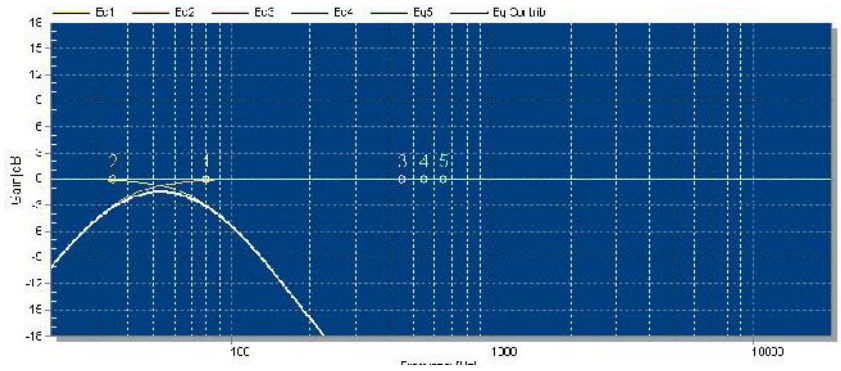
1.6 Presets on N18W, N218W

The N18W and N218W include several manufacturer presets for different types of applications.

ATTENTION: When the N18W or N218W are used in conjunction with the N208 NITID system in 2BOX_SW, 4BOX_SW or 8BOX_SW presets, the N18W and N218W must operate in positive polarity.
When the N18W or N218W are used in conjunction with the N208 NITID system in 2BOX_FR, 4BOX_FR or 8BOX_FR presets, the N18W and N218W must operate in negative polarity.

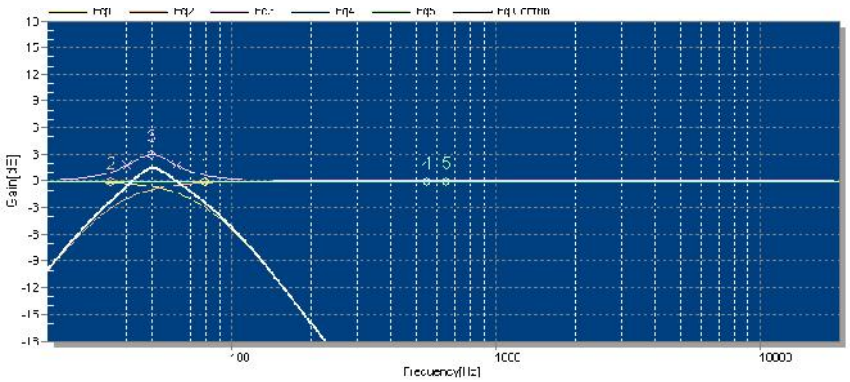
LPF80

80 Hz low pass filter



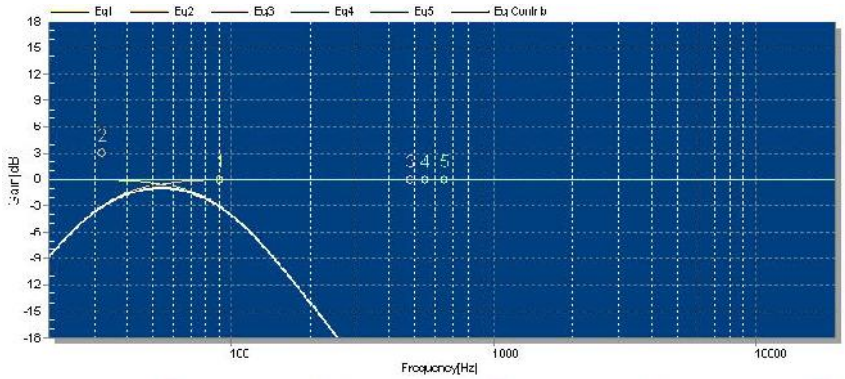
LPF80+3

80 Hz low pass filter
A) +3dB boost
at 50Hz (N18W)
B) +3dB boost
at 44Hz (N218W)



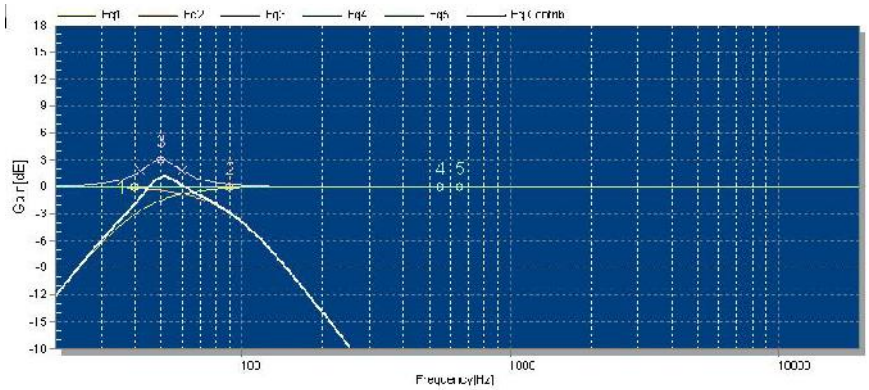
LPF90

90 Hz low pass filter



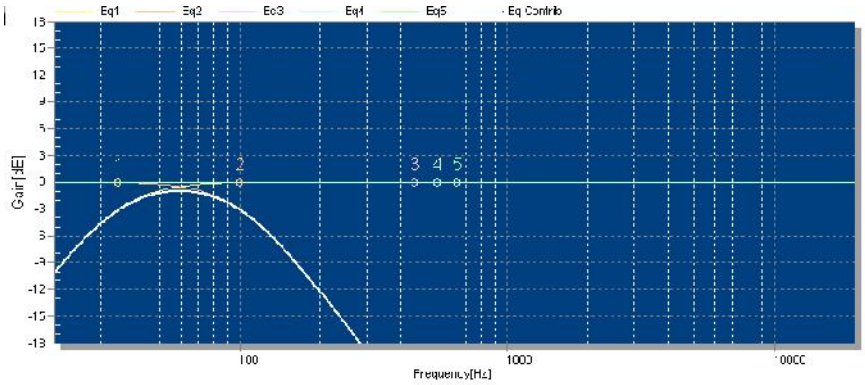
LPF90+3

90 Hz low pass filter
a 90Hz
A) +3dB boost
at 50Hz (N18W)
B) +3dB boost
at 44Hz (N218W)



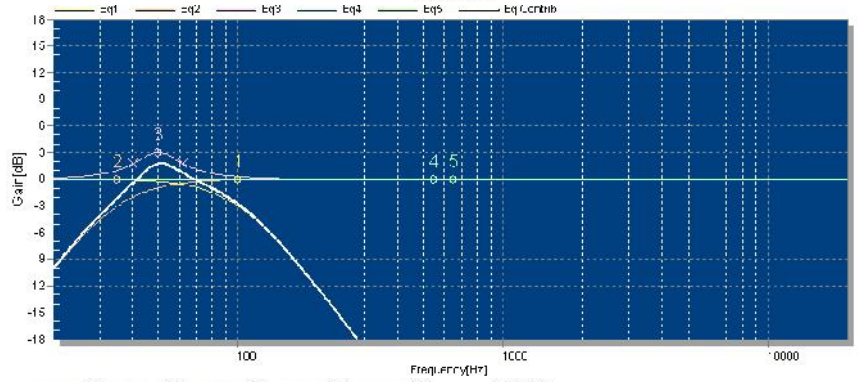
LPF100

100 Hz low pass filter



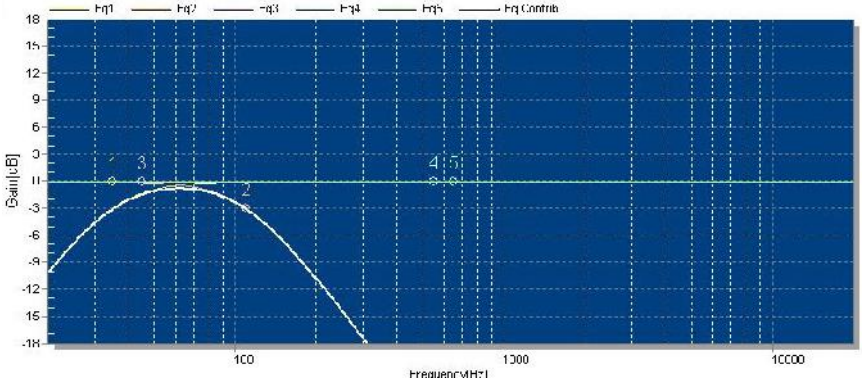
LPF100+3

100 Hz low pass filter
A) +3dB boost
at 50Hz (N18W)
B) +3dB boost
at 44Hz (N218W)



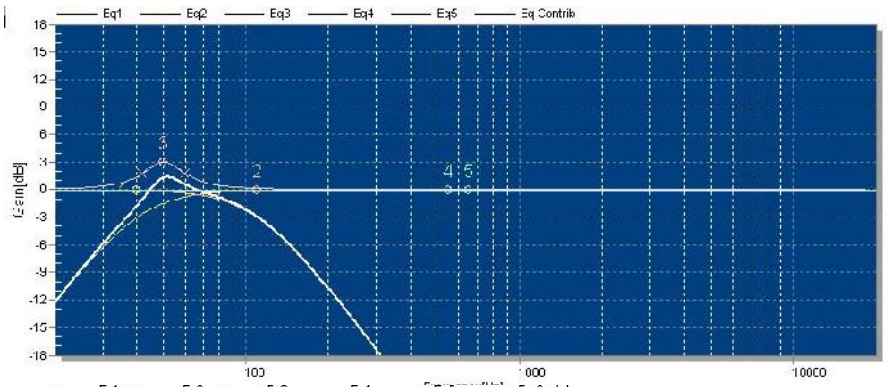
LPF110

110 Hz low pass filter



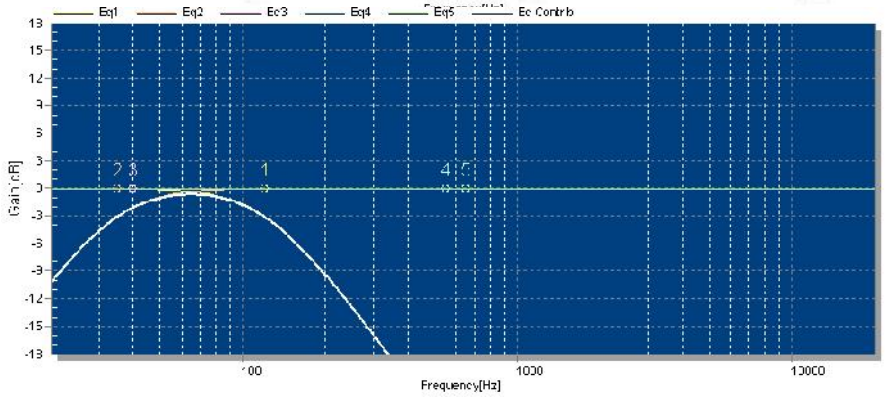
LPF110+3

110 Hz low pass filter
A) +3dB boost
at 50Hz (N18W)
B) +3dB boost
at 44Hz (N218W)



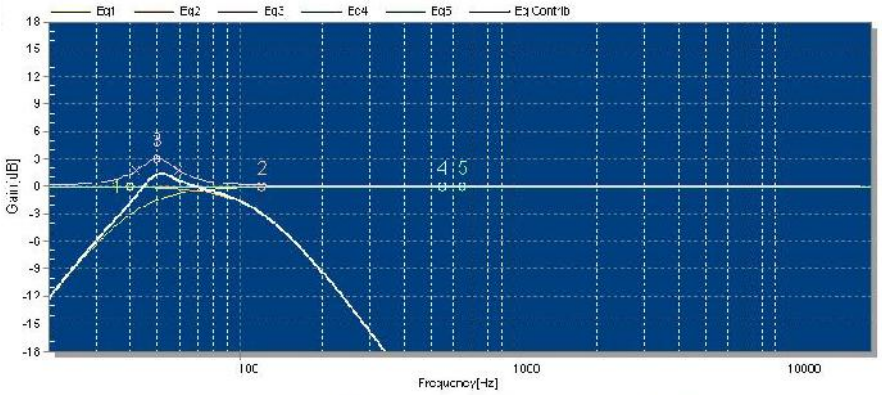
LPF120
(only for N18W)

120 Hz low pass filter



LPF120+3
(only for N18W)

120Hz low pass filter
with +3dB boost
at 50Hz



CARD80/90/100/110/120*
(*120 only for N18W)

Cardioid polar pattern, with processing, delay and inverse polarity

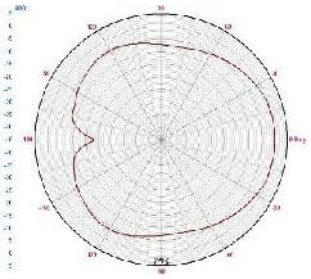


Fig. 14. Presets for N18W and N218W

2 CONNECTIONS

2.1 Connection Panel N208 and N208P

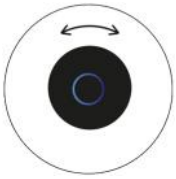
The power and audio connections are located on the unique panel, shown in Fig. 15 (N208) and Fig.16 (N208P). The different parts of the panels are explained in detail in the following sections of the manual.

Control:

A) LCD: Displays information about the system status. The main screen shows the following information.

- Current preset
- Input Level
- Output Level LF Channel
- Output Level HF Channel
- Amplifier temperature
- ALC mode enabled/disabled
- ECO mode enabled/disabled
- Keypad locked/unlocked

B) KEYPAD: Allows the user to perform basic operations on the DSP such as Preset selection, audio settings and user preferences. There are three keys available:

MENU key:  **OK key:**  **Circular key:** 

To enter the menu the keypad must be unlocked by pressing simultaneously the MENU and OK keys.
The central circle of the circular key will light up in blue when this key is active.

C) PROTECTION LED: This led lights up when the amplifier is in a protection situation (such as temperature excess, overcurrent, or other situations that can compromise the amplifier's integrity). It will also light up when the amplifier is in standby mode. This happens for a couple of seconds at start-up.
The Protection led will light off when the amplifier recovers from the abnormal situation. Shall the Protection led keep up lighted on even after a system restart, please contact an authorized service.

D) LIMITER ON LED: The limiter led lights up to indicate that the amplifier is delivering the maximum power set by the limiter circuit. The limiter prevents the loudspeaker from receiving excessive or distorted signal. Continuous lightning of this led indicates that the signal is being massively compressed. In this case, the input level should be reduced in order to get a proper dynamic headroom.

Model Specifications:

E) MODEL DATA: The basic data of the model is found here:
- Model reference
- Amplifier program power (Watts)
- Maximum Sound Pressure Level Continuous delivered by the system (dB SPL)

F) AUTHENTICATION QR CODE: This QR code is a smart label that ensures that the product is an original Amate Audio product. To verify the authenticity, please follow the instructions in the following link:

http://www.amateaudio.com/en/product-authentication/

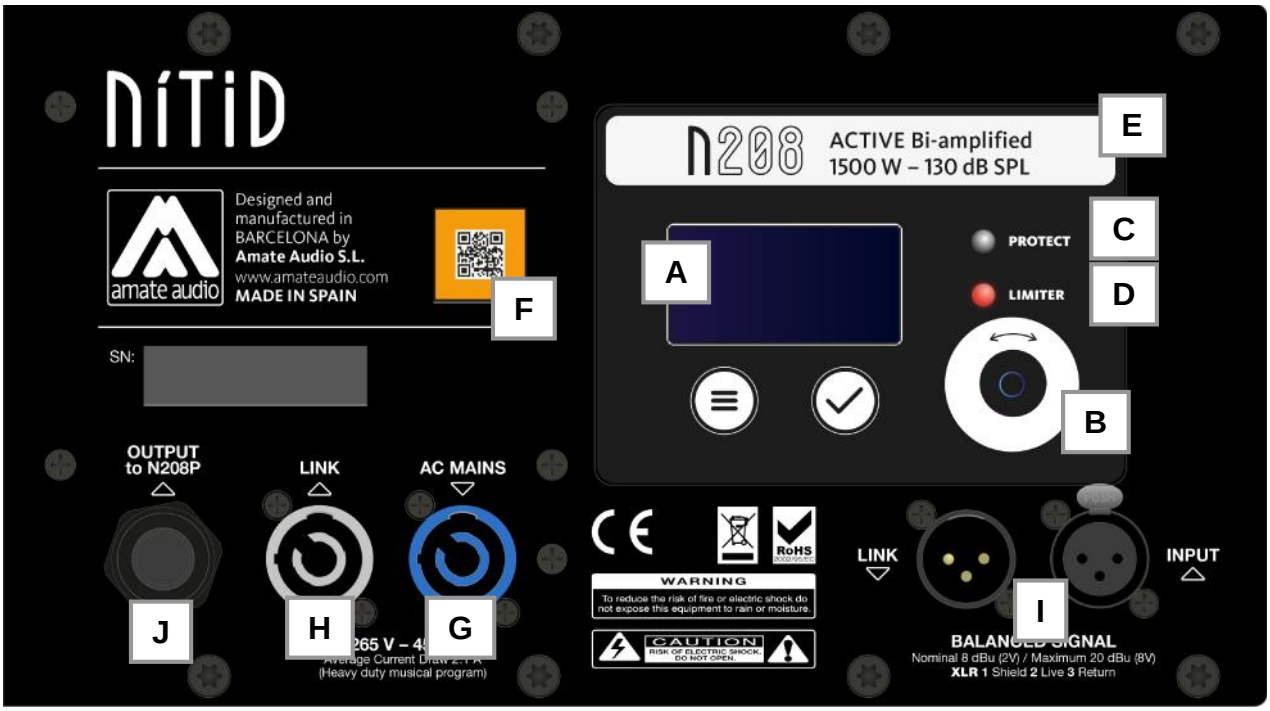


Fig. 15. N208 control and connection panel

Fig. 16. N208P connection panel

Connections:

G) AC MAINS INPUT: Mains supply connection via PowerCon. Use the blue connector for AC input.

Always use mains power cable supplied by manufacturer.
Never connect the NITID cabinets to an unearthed mains supply or by using an unearthed mains cable.

H) AC LINK: Grey connector to feed other units in parallel. Linking up to 3 units is possible, provided that a quality cable of a minimum section of 3x2.5mm^2 is used. Connecting more than 3 units in parallel may lead to a voltage drop in the cable that will reduce the equipment performance.

I) BALANCED INPUT/LINK: XLR-3 Female balanced signal connector for signal input and XLR-3 Male connector for parallel connection of various cabinets with the same input signal.

Please always use balanced microphone cable with the following pin assignment:

1. Shield 2. (+) Live 3. (-) Return

J) SPEAKON OUTPUT TO N208P: 4P-Speakon output connector used to feed a passive N208P Line Array Element. In order to assure proper operation always follow these instructions:

- Link up to ONE unit of N208P with each N208.
- Do not connect a loudspeaker different than N208P to this output.
- Do not change or manipulate this connector.
- Always follow the polarity if the 4-pole connector
    - 1+/1-: LF+/LF-
    - 2+/2-: HF+/HF-

Misusing the slave output for N208P may lead to serious damage for all involved equipment, and will not be covered by the warranty.

K) SPEAKON INPUT FROM N208 : 4P-Speakon input connector. Input signal coming from N208 active cabinet.

PIN+1: POSITIVE LOW
PIN-1: NEGATIVE LOW
PIN+2: POSITIVE HIGH
PIN-2: NEGATIVE HIGH

WARNING: Respect the polarity +/-

2.2 Connection Panel N18W and N218W

The power and audio connections are located on the unique panel, shown in Fig.17. The different parts of the panel are explained in detail in the following sections of the manual.

Control:

A) LCD: Displays information about the system status. The main screen shows the following information.

- Current preset
- Input Level
- Output Level
- Amplifier temperature
- Polarity (+) or (-)
- ECO mode enabled/disabled

- Keypad locked/unlocked

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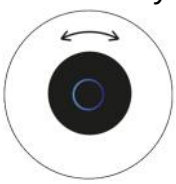
MENU key:  **OK key:**  **Circular key:** 

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http://www.amateaudio.com/en/product-authentication/

Connections:

G) AC MAINS INPUT: Mains supply connection via PowerCon. Use the blue connector for AC input.

Always use mains power cable supplied by manufacturer.
Never connect the NITID cabinets to an unearthed mains supply or by using an unearthed mains cable.

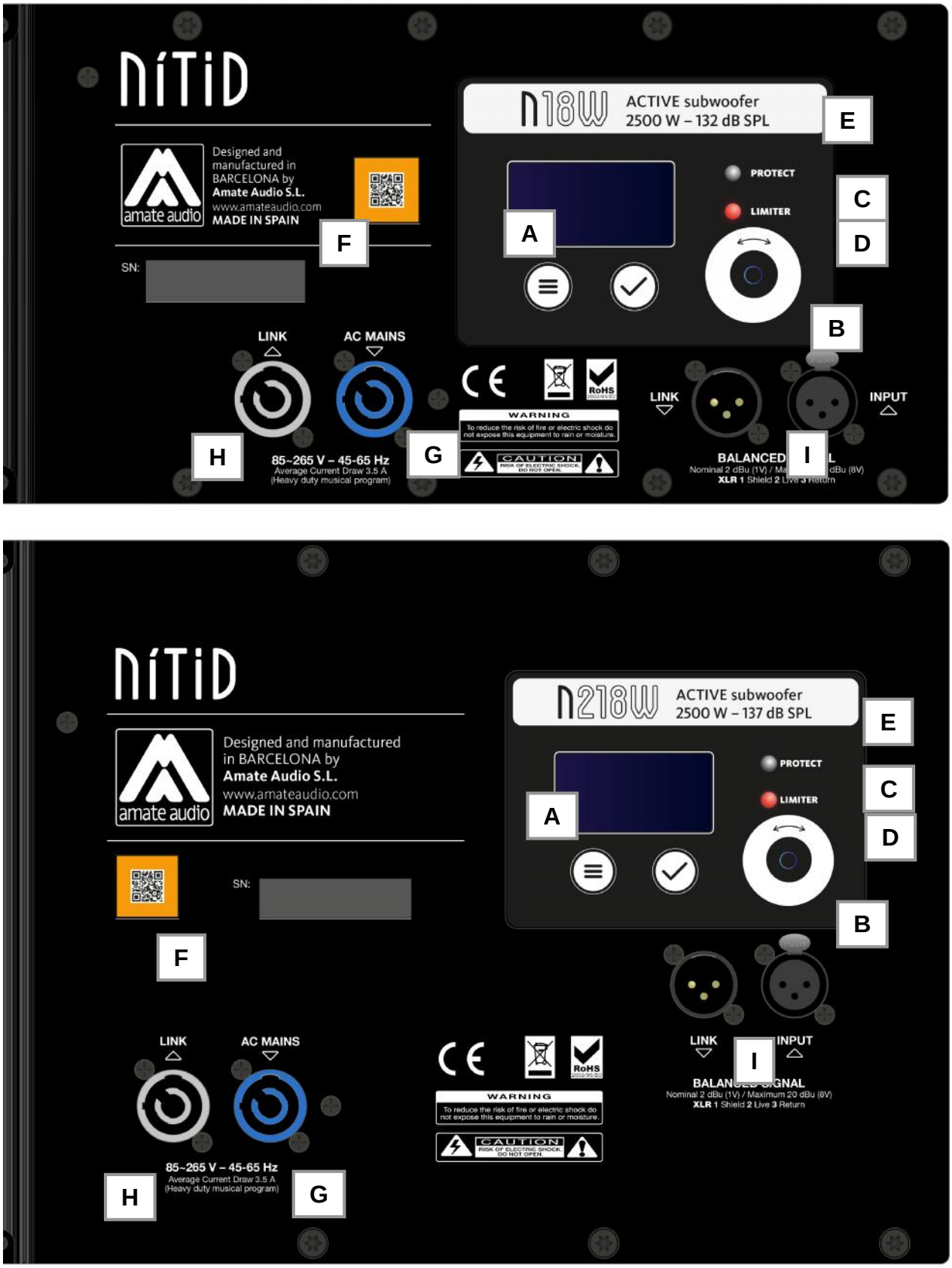


Fig. 17. N18W and N218W control and connection panel

H) AC LINK: Grey connector to feed other units in parallel. Linking up to 2 units is possible, provided that a quality cable of a minimum section of 3x2.5mm^2 is used.

Connecting more than 2 units in parallel may lead to a voltage drop in the cable that will reduce the equipment performance.

I) BALANCED INPUT/LINK:
XLR-3 Female balanced signal connector for signal input and XLR-3 Male connector for parallel connection of various cabinets with the same input signal.

Please always use balanced microphone cable with the following pin assignment: 1.Shield 2. (+) Live 3. (-) Return

2.3 Configurations

2.3.1 Parallel connection of 2 units N208

Connect the signal (mixing desk output) to INPUT on the active N208 unit. Use the SPEAKON LINK output (“To N208P”) to transfer the INPUT signal to the passive N208P unit. The active unit must be switched on. For the mains connection use the cable with the blue Neutrik PowerCon NAC3FCA. Do not connect NITID active units using PowerCon without earth.

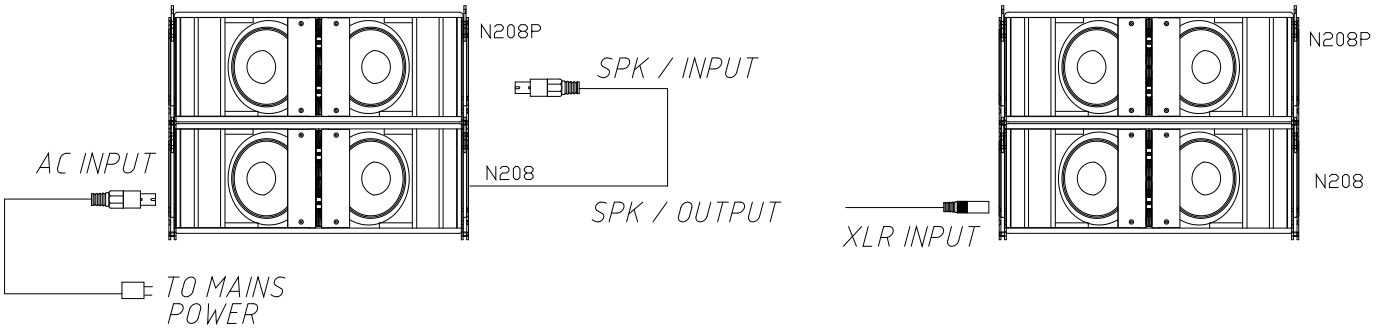


Fig. 18. Connection of 2 units of N208 (signal and mains)

2.3.2 Parallel connection of 4 units N208

Connect the signal (mixing desk output) to INPUT on the first active N208 unit. Use the LINK output to transfer the INPUT signal to the second active N208 unit. All of the units in this chain must be switched on.

Use the SPEAKON LINK output (“To N208P”) to transfer the INPUT signal to each passive N208P units.

For the mains connection use the cable with the blue Neutrik PowerCon NAC3FCA. Use the LINK output to transfer the AC signal to the second active unit. Do not connect NITID active units using PowerCon without earth.

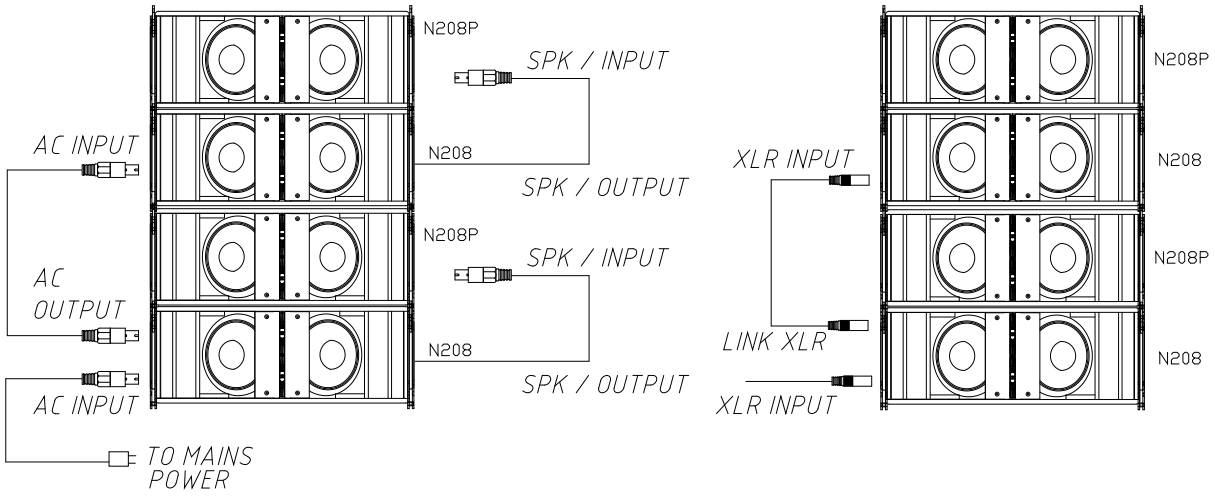


Fig. 19. Connection of 4 units of N208 (signal and mains)

2.3.3 Connection of more than 4 units

Connect the signal (mixing desk output) to XLR INPUT on the first active N208 unit. Use the LINK XLR output on the first active N208 unit to transfer the INPUT signal to the second active N208 unit and thus sequentially for further units. All of the units in this chain must be switched on.

Use the SPEAKON LINK output (“To N208P”) to transfer the INPUT signal to each passive N208P units.

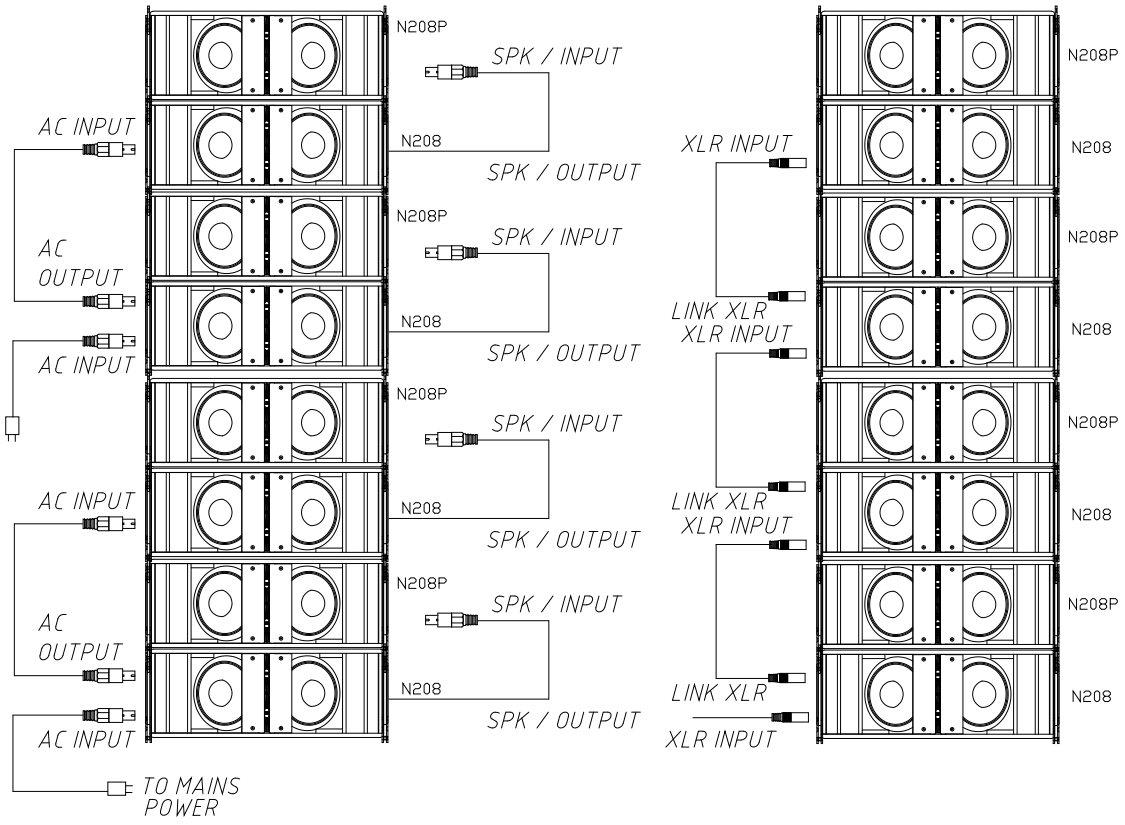


Fig. 20. Connection of 8 units of N208 (signal and mains)

For the mains connection use the cable with the blue Neutrik PowerCon NAC3FCA. Use the LINK output to transfer the AC signal to the second active unit and thus sequencially for further units. Do not connect NITID active units using PowerCon without earth.

Do not connect more than three N208 units using the AC Stacking output connector (this is the maximum number of units that can be linked). Nevertheless, we recommend to link two units whenever is possible.

2.3.4 Parallel connection with subwoofers

You can connect N18W and N218W subwoofers in parallel with N208 cabinets. Please, follow the same parameters as explained in Fig. 20.

3 MOUNTING AND PLACEMENT N208

Flying a NITID Line Array system is easy, fast and secure. To perform any operations related to flying the system, read the present document, and act on the warnings and advice given.

Only experienced installers with adequate knowledge of the system and local safety regulations should fly speaker cabinets.

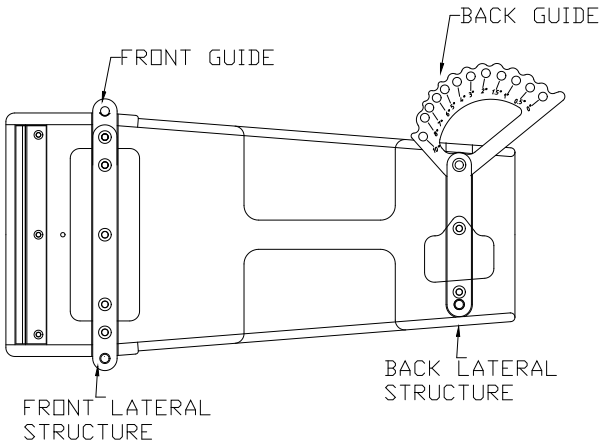
It is the user's responsibility to ensure that the systems to be flown and the flying accessories (such as chains, eyebolts, lock pins...) comply with state and local regulations. They should be regularly inspected and replaced if in doubt.

When flying enclosures from ceiling support structures, extreme care should be taken to assure the load bearing capabilities of the structures. **Do not fly systems from unsafe structures.**

All flying accessories that are not supplied by Amate Audio are the user's responsibility. Use at your own risk.
Remember that no risks should be taken with regards to public safety.

3.1 Description

Each N208 cabinet includes two structures on each side of the enclosure, one on the front-lateral side and the other on the back-lateral side. These structures are manufactured from 4mm black painted stainless steel; they are affixed to an internal plate with special crop resistant screws. There is a guide (front guide) assembled on the front-lateral structure (which is used to vertically join the cabinets); a second guide (back guide) assembled on the back-lateral structure is used to vertically join the cabinets and to tilt them.



Angles can be changed from 0º to 10º. To safely lock both guides, the lock pins supplied must be used. Use the “10º” hole to join one N208 with TA-X208R frame.

To tilt the cabinets, both the back-lateral structure and the back guide must be used.

Fig. 21. Flying hardware (lateral view)

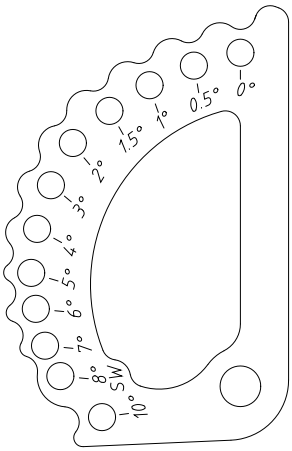
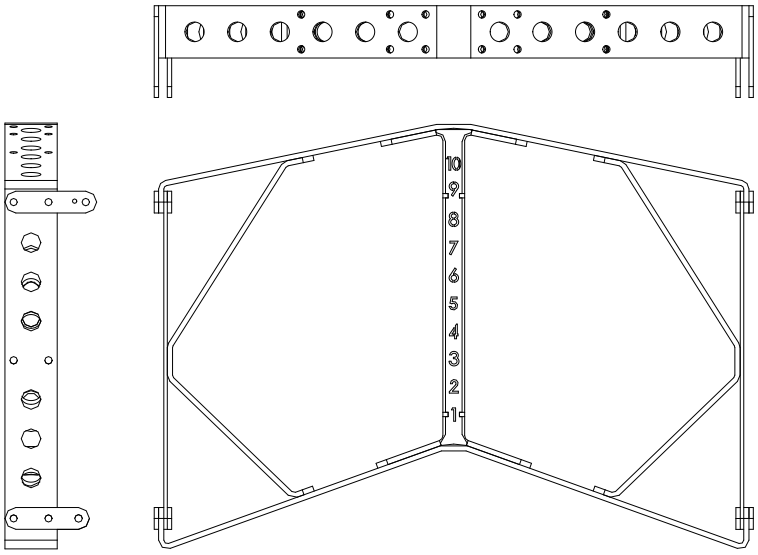


Fig. 22. Back guide with graduation

To block the guides, highly resistant 8mm pins are used with ball safety lock.



To fly N208 units use the TA-X208R frame. It is made from stainless steel. It includes a centre bar to reinforce the whole structure. The bar has a series of holes that provide a pickup point for the steel chain slings or the hoists. The pickup point chosen will determine the tilt angle of the whole array system.

Fig. 23. TA-X208R Frame

The numbers on the central bar are those corresponding to Ease Focus3 calculations.

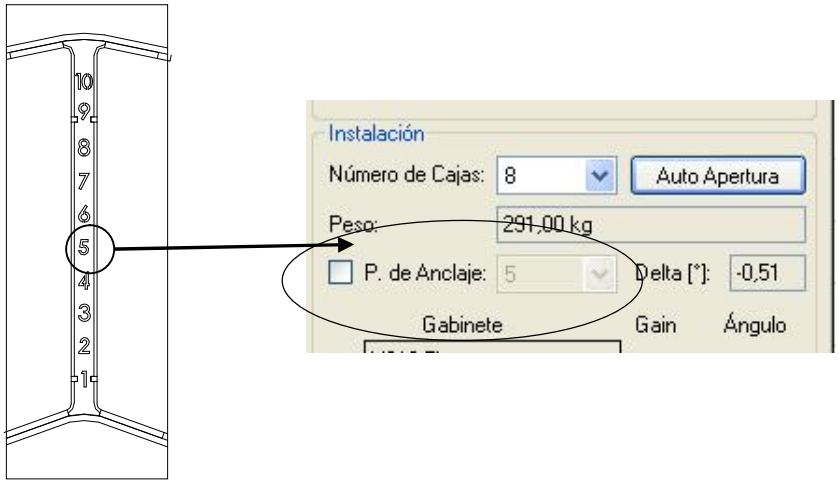
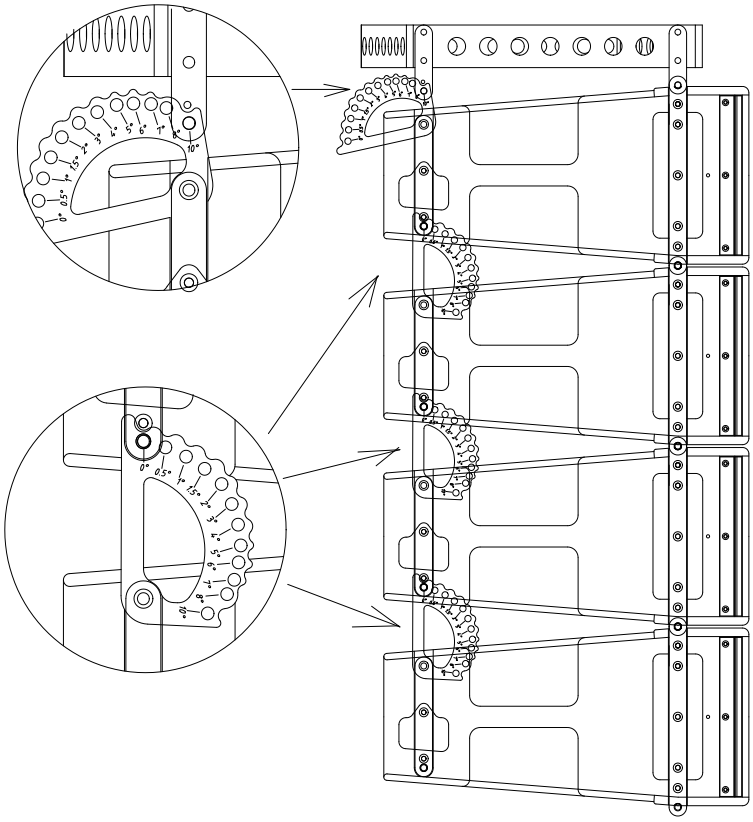


Fig. 24. Pin points

3.2 N208 Flying



Use the back guide to choose the desired tilt angle (0º, 0.5º, 1º, 1.5º, 2º, 3º, 4º, 5º, 6º, 7º, 8º, 10º). Set the back guide between the back lateral structures of the cabinet that is placed above. Lock the guides with the safety pins.

Fig. 25. N208 Flying. Flat Line Array (Cabinet 1 Back Guide = 10º)
(Cabinet 2/3/4 Back Guide = 0º)

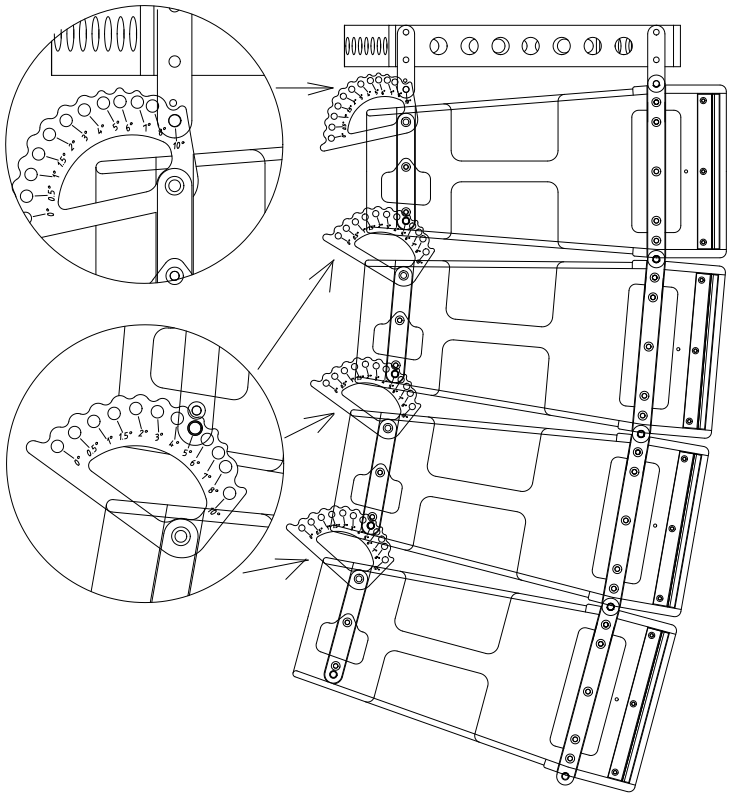
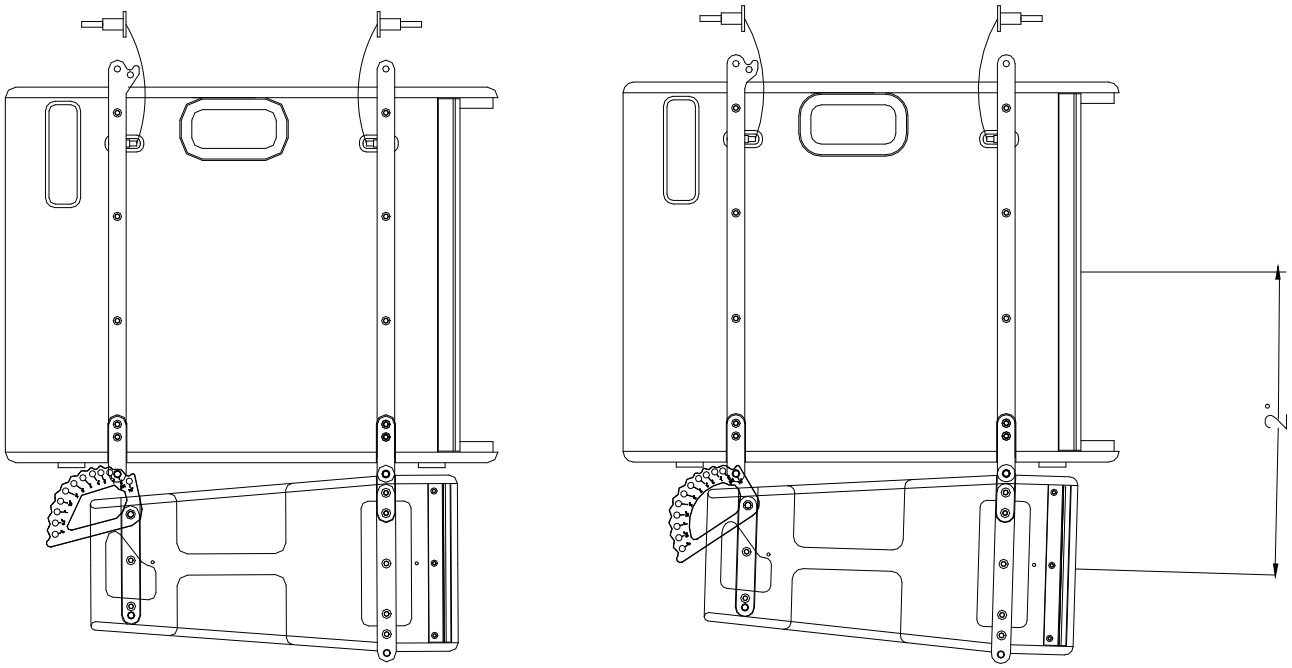


Fig. 26. N208 Flying. 5º Curved Line Array (Cabinet 1 Back Guide = 10º)
(Cabinet 2/3/4 Back Guide = 5º)

3.3 N208 + N18W Flying

It is useful to fly low frequency reinforcement units on the top of the system, as they are the heaviest enclosures. Place the subwoofers and cabinets as has been explained in KR-18T user's manual.



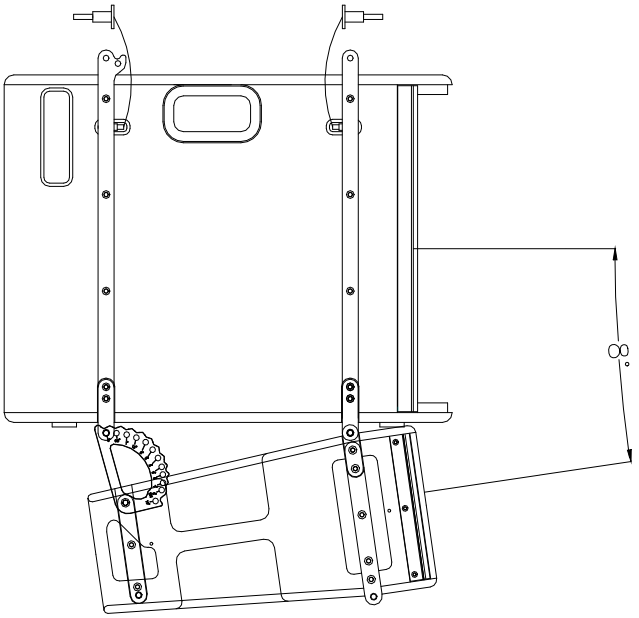


Fig. 27. N208 + N18W flying with KR-18T accessory

4 MOUNTING AND PLACEMENT

For a proper installation of the acoustic cabinet systems, it is strongly recommended to carefully read the following advices.

4.1 N18W and N218W with full-range systems

The N18W incorporates a M20 base-plate on its upper side for the attachment of a standard 35mm diameter bar or the FR-208R stacking frame.

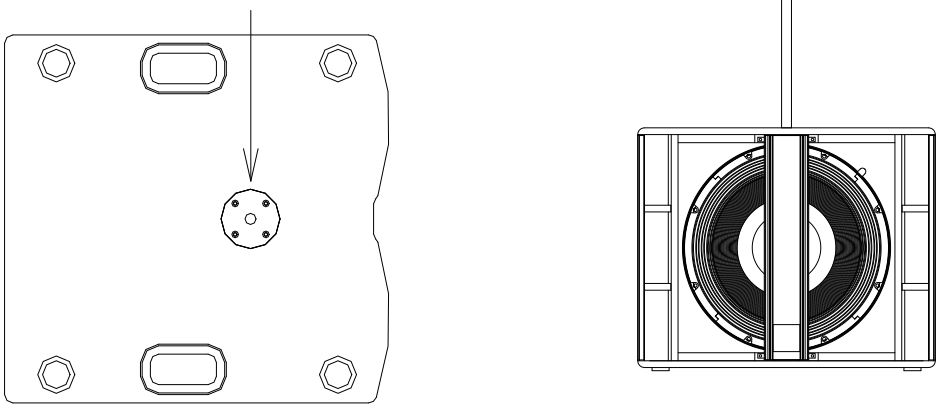


Fig. 28. N18W socket

The N218W incorporates a M10 base-plate on their upper side for the attachment of a stacking frame (FR-208R)

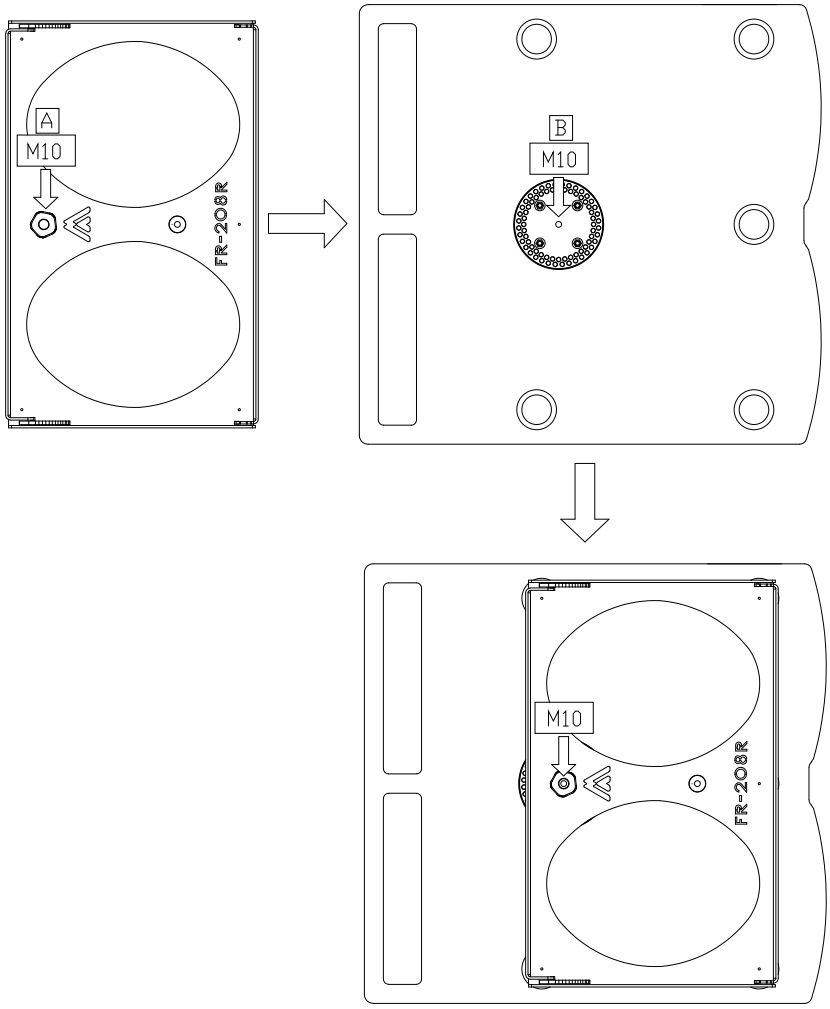


Fig. 29. N218W socket

The PA-2010 is an optional accessory to adapt an M20 thread distance rod bar to the N218W subwoofers.

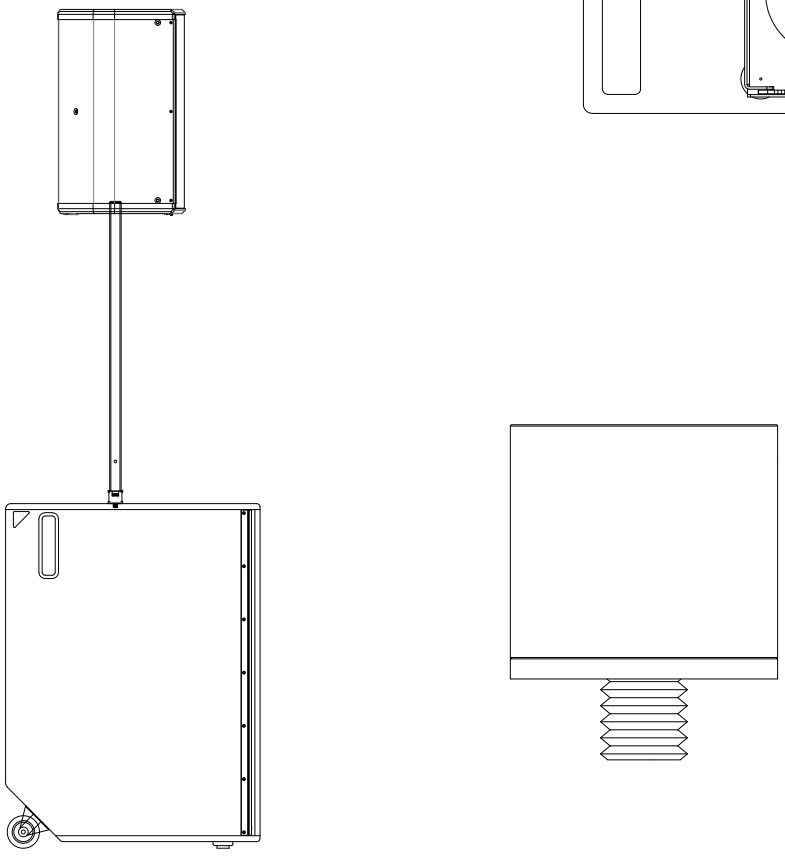
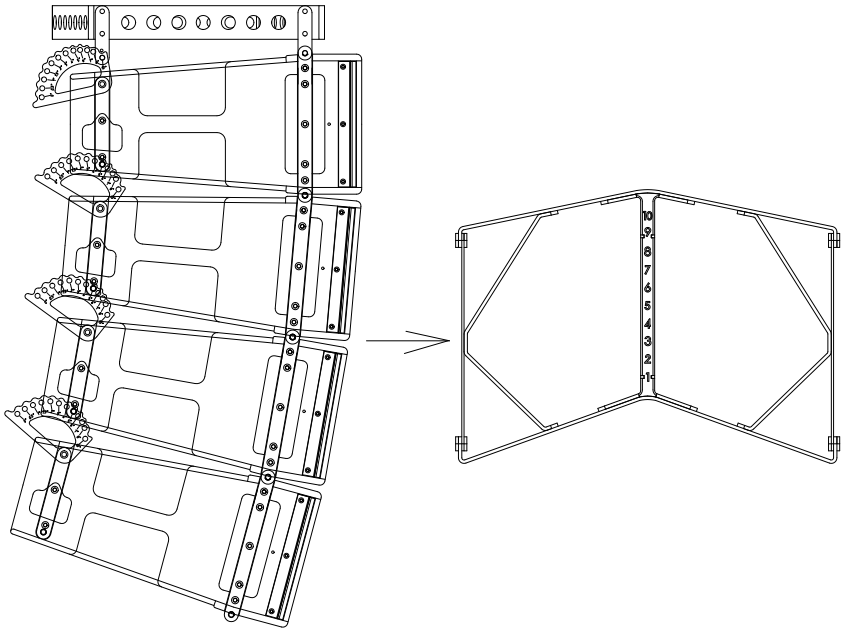


Fig. 30. PA-2010

5 FLYING & STACKING ACCESSORIES

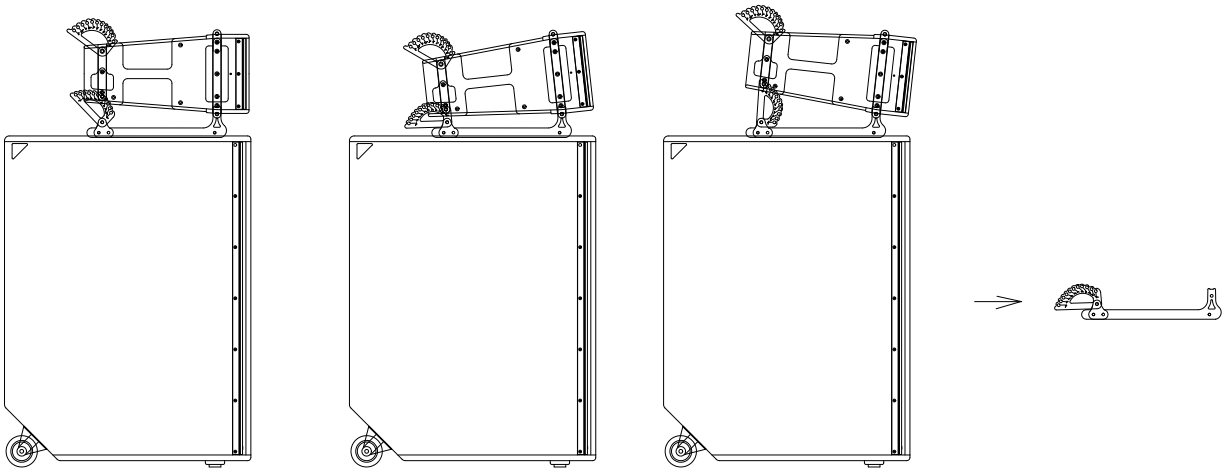
a) N208 Flying

You need: TA-X208R frame



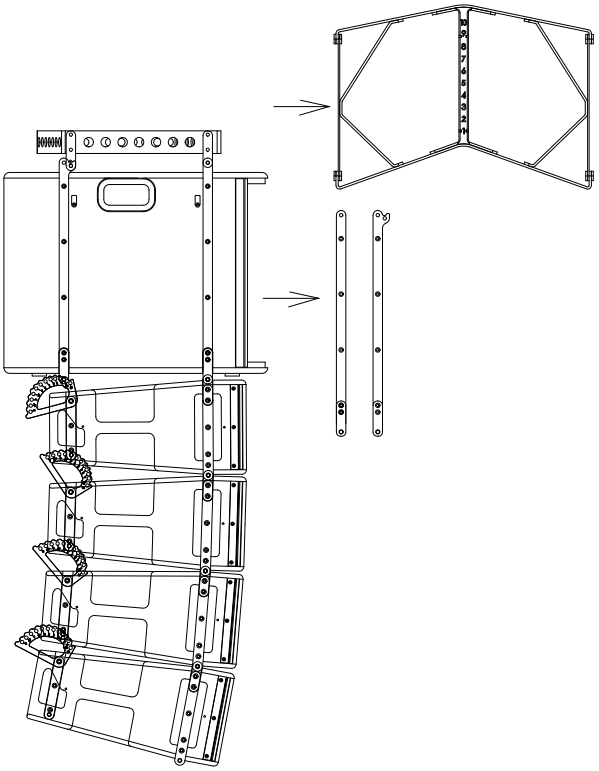
b) N208 Stacking on N218W

You need: FR-208R stacking frame



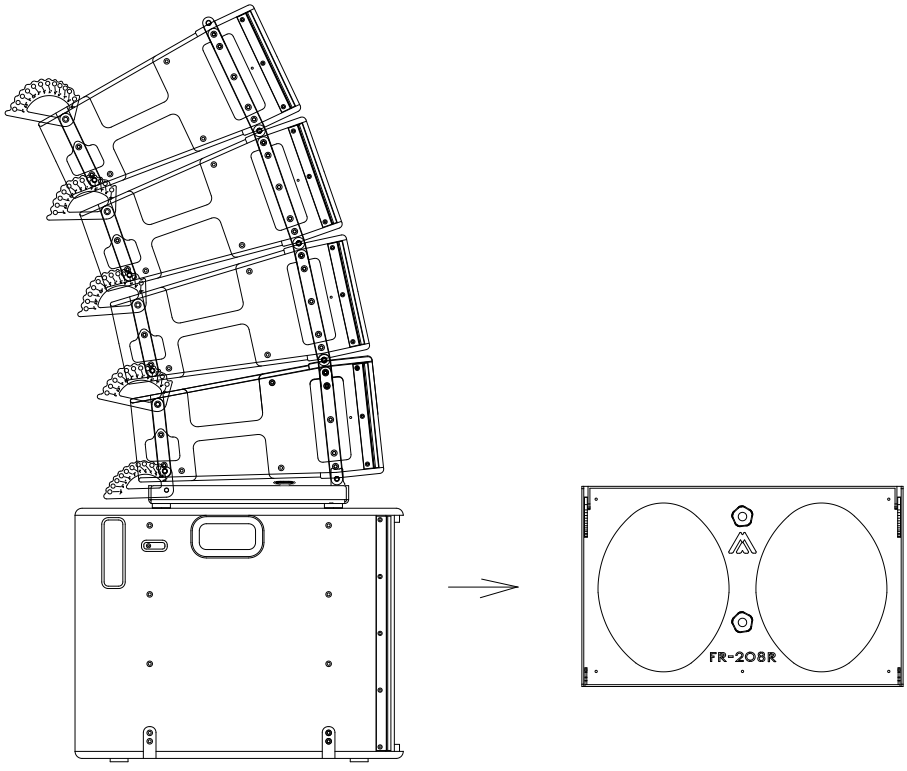
c) Flying N208 + N18W

You need: TA-X208R flying frame
KR-18T rigging kit



d) Stacking N208 + N18W

You need: FR-208R stacking frame



6 DSP SYSTEM SETUP

Thanks to their internal microcontroller and DSP System, the NITID Active cabinets can be configured for different applications. This section explains all the possible configurations.

The LCD and keypad on the cabinet's back panel are used for the setup. The available keys are:

MENU key: **OK key:** **Circular key:**

To enter the Menu, the keypad must be unlocked

Press and simultaneously to unlock the Keypad

6.1 Start-up and Main Screen

At start-up the LCD screen will show the Amate Audio and NITID logo. After a few seconds, the main screen shown in Fig.31 will be displayed:

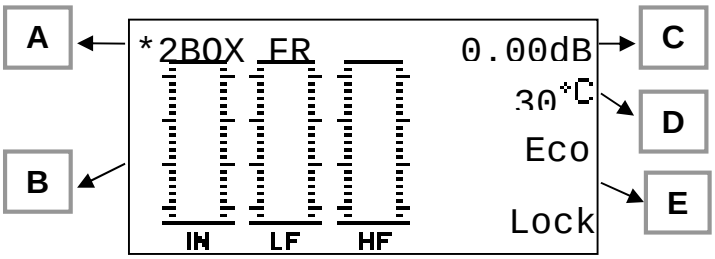


Fig. 31. Main screen display

The following information is displayed on the screen:

- **A)** Current preset. An asterisk (*) is shown when the preset has been modified using the Audio Settings menu.
- **B)** Input and Output levels
- **C)** Gain level
- **D)** Temperature of the power stage
- **E)** Special features
  - Eco: when ECO Mode is enabled
  - Lock: shows when the keypad is locked

When they keypad is unlocked, you can use the circular key (sliding your finger along the white circle area) to directly access the Main Gain Control

6.2 Browsing the menus

To browse the menus, the MENU and OK keys are used. Always remember to unlock the keypad to perform an action.

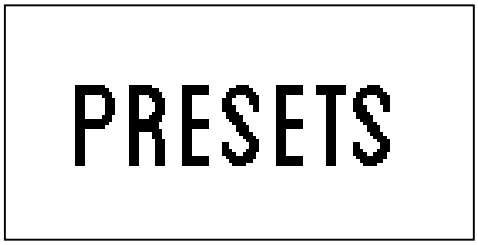


Fig. 32. Presets option in Main Menu

Press the MENU key once to access the main menus. The first option displayed will be “PRESETS”. Press MENU again to browse the different available menus, as following:

- PRESETS: To change the factory preset of the DSP
- AUDIO: To change different settings related to audio performance, such as Gain, PEQ, Limiter and Delay
- SETUP: To change the interface settings, such as the Eco Mode, keypad lock, etc.
- INFO: Displays all the system information. In this menu is possible to change the language and restore the settings to the factory default.
- BACK: Return to main screen

To enter one of the above listed sub-menus, press OK.

To return to the main screen from any menu screen, press MENU continuously for more than two seconds.
Additionally, after 30 seconds of inactivity, the system will go automatically back to the main screen, saving all the values that have been changed.

6.3 PRESETS Menu

When the word PRESETS is displayed, press OK. The current preset will be displayed.

Press MENU to browse the available presets. Each time a Preset is displayed, it will be loaded to the DSP. When the desired Preset is on screen, press OK to leave the menu.

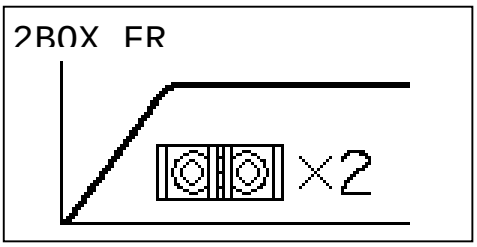


Fig. 33. Preset selection

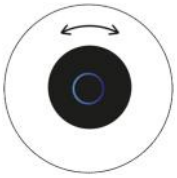
6.4 AUDIO Menu

When the word AUDIO is displayed, press OK. The Gain screen will show up. At this point, use the MENU key to browse all the audio options: Gain, Parametric EQ, Limiter and Delay.

Press OK or slide your finger on the Circular key to start editing.

At this point, the Circular Key will be highlighted (blue ring in its center) to show that is active. To use the Circular Key, slide your finger over the white surface: clockwise to increment the value of the displayed parameter and counter-clockwise to reduce the value.

Circular key:



Slide finger clockwise to increment the value
Center blue ring is illuminated when they key is active
Counter clockwise to decrement the value

An asterisk (*) beneath the preset name means that the preset has been modified using the audio settings. When a new preset is loaded, all the changes made in the AUDIO Menu will be reverted.

6.4.1 Gain Menu

Inside the Gain menu, the Main, HF and LF input gains may be modified. Press OK to start editing the Main Gain (left bar). The cursor will blink to show that the value is being edited. Use the Circular key to modify the value.

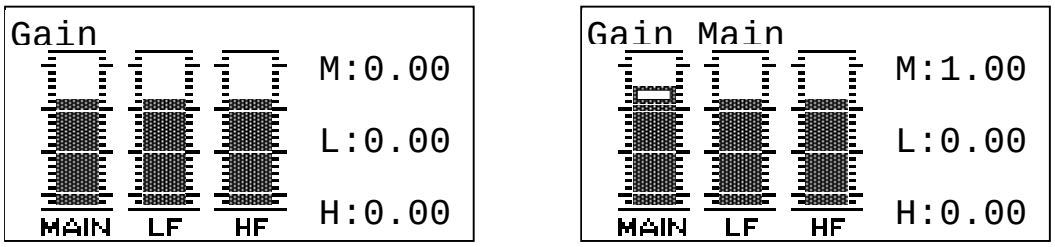


Fig. 34. Gain display (left) and Gain Main while editing (right)

At this point use the MENU key to change between the available gain settings: Main, LF and HF. Press OK to finish editing:

Gain Main: changes the overall gain of the system.
Gain LF: change the level of the Low Frequency way (woofer)
Gain HF: change the level of the High Frequency way (driver)

The gains can be adjusted between +3dB and -6dB. The current values are displayed on the right side of the display (in dB).

When changing the Main Gain settings, the actual sensitivity of the system is being changed too. When setting the value to +3dB, the input sensitivity will be reduced by 3dB (from nominal +8dBu to +5dBu).

6.4.2 5-band EQ Menu

Inside the EQ menu, five parametric equalizers with fixed Q (Q=1) are available: Low (L), Low-Mid (LM), Mid (M), Mid-High (MH) and High (H). The central frequency for each band is: 100Hz, 250Hz, 1kHz, 2.5kHz and 10kHz, respectively.

It is possible to modify the gain of each band between +3dB and -6dB. The current edited value is displayed in the top right side of the display.

Press OK to start editing the EQ Low (left bar). The cursor will blink to show that the value is being edited. Use the Circular key to modify the value.

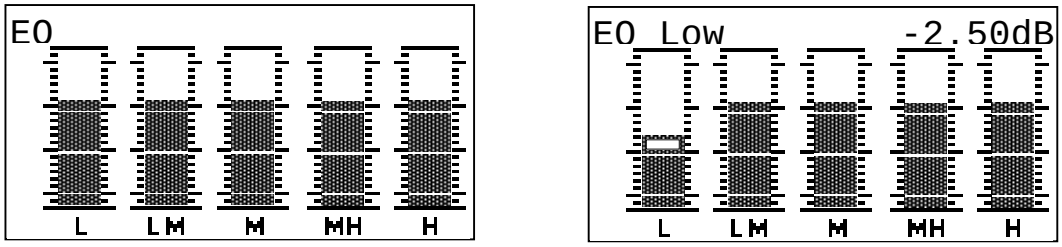


Fig. 35. EQ display (left) and EQ Low while editing (right)

At this point use the MENU key to change between the available EQ. Press OK to finish editing.

6.4.3 Limiter Menu

In the Limiter Menu, it is possible to modify the Threshold setting of the internal DSP peak limiter. Press OK to start editing the THRESH value (left bar). The cursor will blink to show that the value is being edited. Use the Circular key to modify the value, and press OK to finish editing.

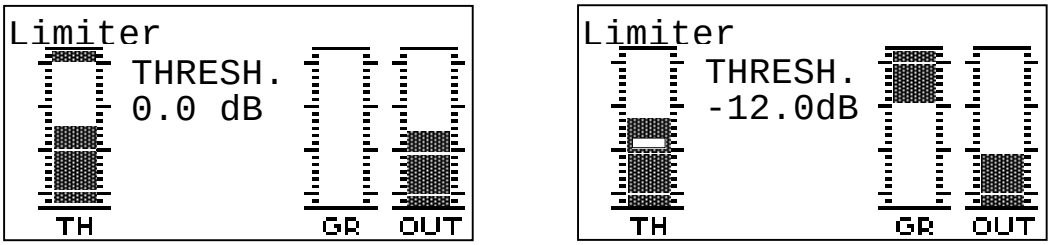


Fig. 36. Limiter display (left) and Limiter Threshold while editing (right)

The level bars TH, GR and OUT provide additional information when an input signal is connected to the device.

- TH (Threshold): Shows the actual value of the limiter threshold (cursor). Additionally, the bar will display the input level. The level of the threshold in dB is also displayed next to the bar in figures.
- GR (Gain Reduction): This bar shows when the limiter is active (the threshold value is being exceeded by the input level). The gain reduction level will display as an inverted VU bar (see Fig. 36, right).
- OUT: output level after the limiter. This is the actual signal level after the signal goes through the limiter. If the threshold is not reached, it will be the same as the input level. If the threshold is exceeded, there will be a reduction.

The limiter acts over the Peak limiter value. The system has also an internal RMS limiter that is fixed (see Section 6.7.1).

6.4.4 Delay Menu

In the Delay Menu, it is possible to add a Delay to the signal in the internal DSP. Press OK to start editing the Delay value. The cursor will blink to show that the value is being edited. Use the Circular key to modify the value, and press OK to finish editing.

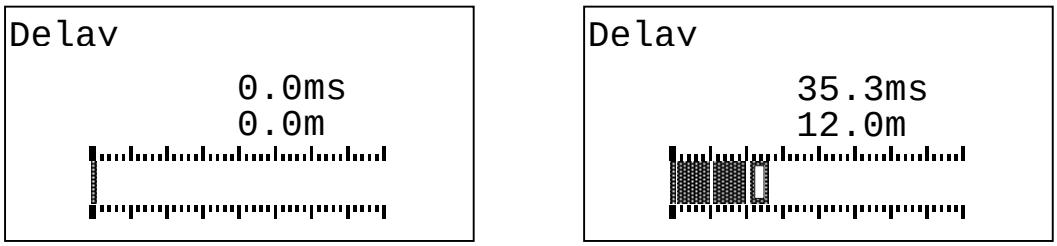


Fig. 37. Delay display (left) and Delay while editing (right)

The value of the Delay is displayed in milliseconds (ms) and meters (m). The value of the delay ranges from 0 to 40 meters (0 to 117.6ms).

The delay value is applied short after a value has been selected with the Circular key. When the delay is applied a short fade in / fade out of the output signal will be performed.

The center led of the circular key will light off while this process is performed, and will light on again when the new value has been loaded.

6.5 SETUP Menu

When the word SETUP is displayed, press OK. The ECO Mode on/off selection will show up as in Fig. 38.

Here, use the MENU key to browse all the setup options: ECO Mode, Mute, LCD Backlight and Keypad Lock.

Press OK to change the value for the displayed selection (switch between ON/OFF).

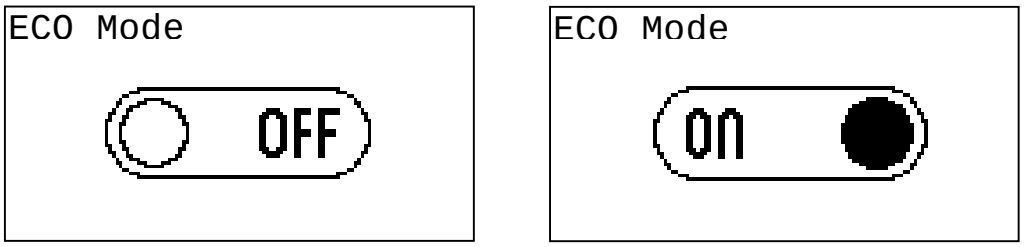


Fig. 38. ECO Mode option inactive (left) and active (right).

The options available under the SETUP Menu are summarised in the following table. For further information on each option, please read the following sections in this chapter.

	OFF	**ON**
ECO Mode	System will never go in low power mode	System will go in low power mode after 1 minute without input signal
Mute	Normal operation	Amplifier is MUTED
LCD Backlight	Backlight dims after 30 seconds	Backlight is always ON
Keypad Lock	Keypad will never lock	Keypad will lock after 30 seconds of inactivity

6.5.1 ECO Mode

When the ECO Mode is ON, the system will continuously analyse the input signal. When no input signal is present after 1 minute, the system will go in a low power consumption mode (standby). This condition will be indicated by a message in the LCD. When the audio signal is present again, the system will wake up and continue playing.

When the ECO Mode is active, the word Eco will be displayed in the main screen.

The system needs about 2 seconds to wake up from the low power consumption mode. It is not recommended to use it for time-critical applications.

6.5.2 Mute

Select ON to Mute the amplifier. The MUTE condition will be shown in the main screen.

6.5.3 LCD Backlight

Select how the backlight of the LCD in the back panel will behave. When set to ON, the backlight is always active. When set to OFF, works in automatic mode: the backlight lights up after a key press, and light off after 30 seconds of the last key press.

6.5.4 Keypad Lock

When set to ON, the Keypad automatically locks after 60 seconds of inactivity. When set to OFF, Keypad remains always active.

Remember that to unlock the Keypad, the keys MENU and OK must be pressed simultaneously.

6.6 INFO Menu

This option provides a quick overview of all the current settings of the system. Press MENU to browse the different information pages, or OK to leave.

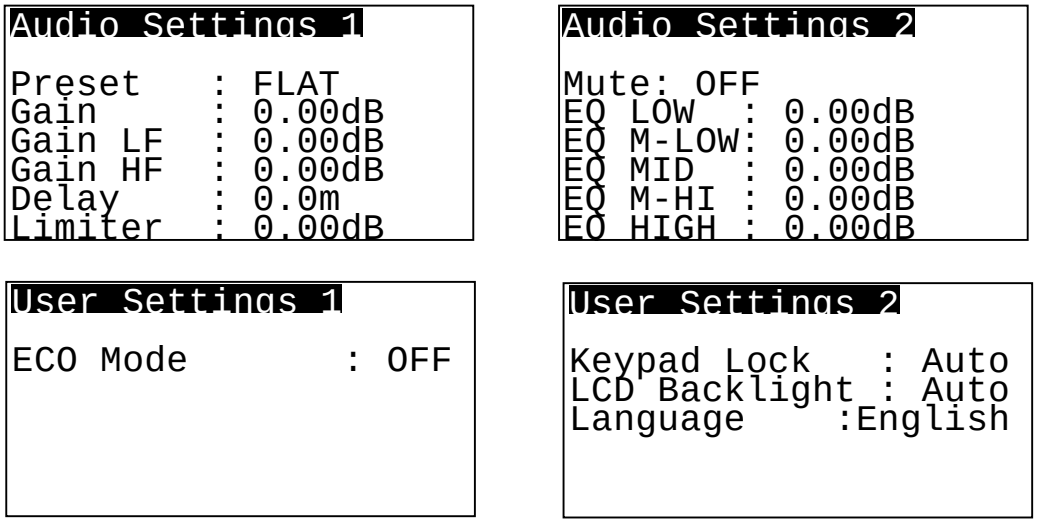


Fig. 39. Information screen for AUDIO and SETUP settings

After the information screens, the Language selection Menu will appear. Press OK if you want to change the language of the interface, or MENU to leave.

If you press OK, the menu will be active. Use MENU to select the desired option and OK to confirm.

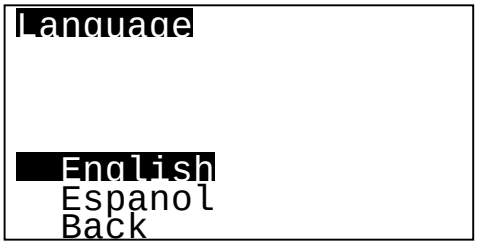


Fig. 40. Language setting Menu

Further languages will be available in future firmware releases.

On the last screen (System), it is also possible to reset the system to the factory values by clicking OK. In the Factory Setting Menu, press MENU to highlight the option Restore. Then press OK to confirm.

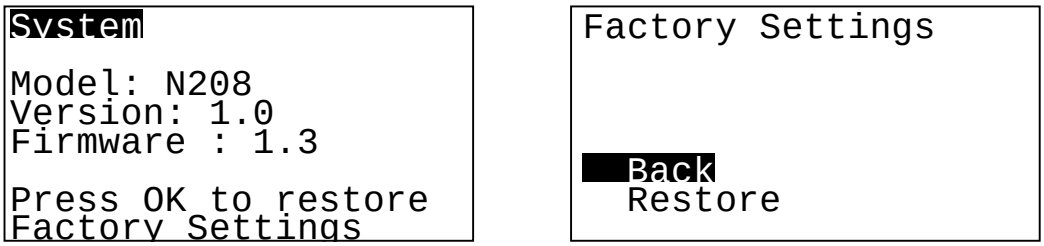


Fig. 41. System information (left) and Factory Settings Restore Menu (right)

6.7 Special DSP Features

6.7.1 RMS Limiter

NITID systems combine a carefully designed dual limiter system to independently protect each transducer against power overload: a peak Limiter and a RMS Limiter.

The RMS Limiter prevents long term exposition of the transducer to high RMS levels (abnormal when the music has a correct dynamic headroom). When the limiter led lights up continuously, it means that the RMS limiter is active. On the other hand, the Peak Limiter has an ultrafast attack to control the highest peaks of the music and only makes the Led blink.

Thanks to the large experience of Amate Audio on DSP algorithms and limiters, these limiters are highly effective but yet unnoticeable for the listener.

6.7.2 Automatic Temperature Limiter

Under normal operation, NITID amplifiers are able to perform during many hours at full power. However, should the temperature in the amplifier rise abnormally, the system will automatically adjust the limiter threshold to try to compensate for the temperature raise. The system will progressively lower the output gain.

When the temperature lowers again, the system will recover its normal operation. Should the temperature continue rising and reach 90ºC at the amplifier's heatsink, the system will shut down in Protection mode.

6.7.3 Input Dynamic Compressor

NITID systems have a nominal input voltage of +8dBu / 2V (+2dBu / 1V in subwoofers) for full power performance; nevertheless, in order to respect the highest dynamics of the music, the input is capable to hold a high input voltage (+20dBu / 8V). This avoids undesirable effects from sound sources and mixers capable of delivering a higher output voltage.

It must be noticed that **driving a system continuously over its nominal input level may drastically decrease the sound quality**, normally because of the lack of headroom (dynamic response). In the long term, it might also produce unnecessary damaging of the transducers and reduce their reliability. The **maximum power of the system** is obtained at its **nominal input level.** Under this condition, the limiter LED may blink occasionally. Working continuously above this level is never translated into better results.

To avoid loudspeaker damage because of input overload issues, NITID systems build in an **input monitoring system that prevents the cabinet from being continuously operated at excessive input signal levels**.

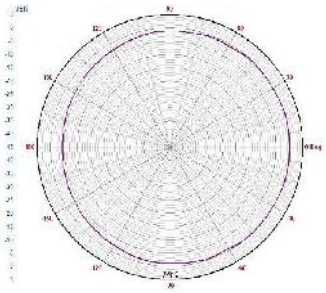
After a period of exposure to high average input levels (over +2.5Vrms), a dynamic compressor will **progressively reduce the output power**, to protect the transducers.

The higher the voltage at the input is, the higher the reduction of the output power, being maximum reduction 18dB. While the dynamic compressor is active, the LIMITER ON LED will blink constantly.

To get back to the normal operation mode, the input level should be reduced to below 2 Vrms. After the level reduction, the system needs about 5 seconds to recover the normal operation mode.

7 CARDIOID SUBWOOFERS

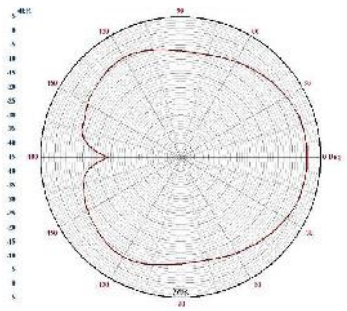
N18W and N218W enable the combination of three or multiple of three subwoofer cabinets in an array to provide exceptional directivity at low frequencies. High directivity at low frequencies has two main effects on the sound field: firstly, the low frequency level behind the subwoofer cabinets is greatly reduced; secondly, in closed venues the diffuse sound field at low frequencies is reduced so the low frequency reproduction is much more precise.



The typical operating range of a traditional subwoofer tends to be like a monopole, i.e. tends to radiate with the same energy in all directions. This behaviour implies that the control of radiation at low frequencies is very difficult because the wavelengths are very large compared to the size of the source (8.5 m at 40Hz).

Fig. 42. Traditional polar pattern of a subwoofer at 40Hz

To increase the directivity at low frequencies we must transform the omnidirectional performance into a cardioid performance. This can only be achieved by various sources, arranged in a certain position, to which we apply a specific phase, filtering and delay. That is, we need to reproduce two signals with the same frequency and similar amplitude which will have a difference in phase of approximately 180º at a certain point of the sound field.



If the phases and delays are well calculated the result is a system in which we cancel the energy of the back and not the one of the front.

This can only be achieved with cabinets that incorporate independent delay units on their DSP, as N18W and N218W.

Fig. 43. Cardioid pattern

7.1 The CARDIOID preset

N18W and N218W can generate an uncompromised cardioid behaviour, which means that there is no need for special cabinets, enabling the use of the system's full efficiency with just "one finger".

n its minimum and standard configuration a Cardioid setup consists of a stack of three subwoofer cabinets (for N18W) and of a horizontal line of three subwoofer cabinets (for N218W).

Only one subwoofer is needed to compensate for the energy of the other two radiating to the front. Then, the cabinet facing to the back (to the stage) should be located in the centre of the column.

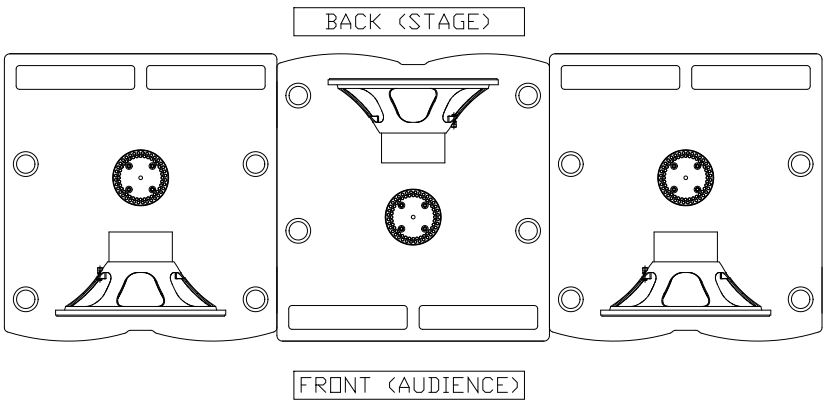


Fig. 44. Cardioid configuration for N218W subwoofer

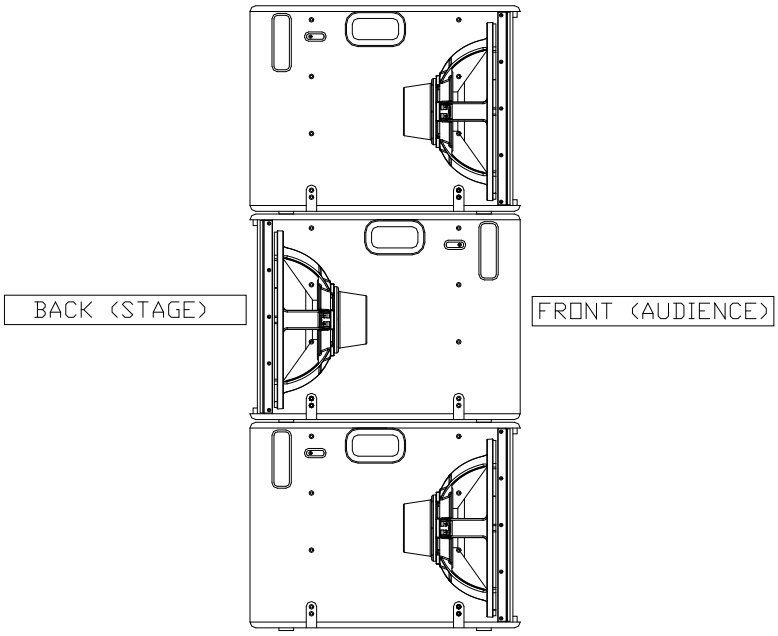


Fig. 45. Cardioid configuration for N18W subwoofer

When using N218W choose one of the following options:

a) The front facing subwoofers must be driven with [LPF80] preset and the back facing subwoofer must be driven with [CARD80] preset.
b) The front facing subwoofers must be driven with [LPF90] preset and the back facing subwoofer must be driven with [CARD90] preset.
c) The front facing subwoofers must be driven with [LPF100] preset and the back facing subwoofer must be driven with [CARD100] preset.
d) The front facing subwoofers must be driven with [LPF110] preset and the back facing subwoofer must be driven with [CARD110] preset.

IMPORTANT NOTE: **Due to the internal set-up of the cardioid presets, the threshold level (limiter) of the front facing subwoofers must be reduced by -3dB.**

When using N18W choose one of the following options:

a) The front facing subwoofers must be driven with [LPF80] preset and the back facing subwoofer must be driven with [CARD80] preset.
b) The front facing subwoofers must be driven with [LPF90] preset and the back facing subwoofer must be driven with [CARD90] preset.
c) The front facing subwoofers must be driven with [LPF100] preset and the back facing subwoofer must be driven with [CARD100] preset.
d) The front facing subwoofers must be driven with [LPF110] preset and the back facing subwoofer must be driven with [CARD110] preset.
e) The front facing subwoofers must be driven with [LPF120] preset and the back facing subwoofer must be driven with [CARD120] preset.

IMPORTANT NOTE: **Due to the internal set-up of the cardioid presets, the threshold level (limiter) of the back facing subwoofers using must be reduced by -1dB.**

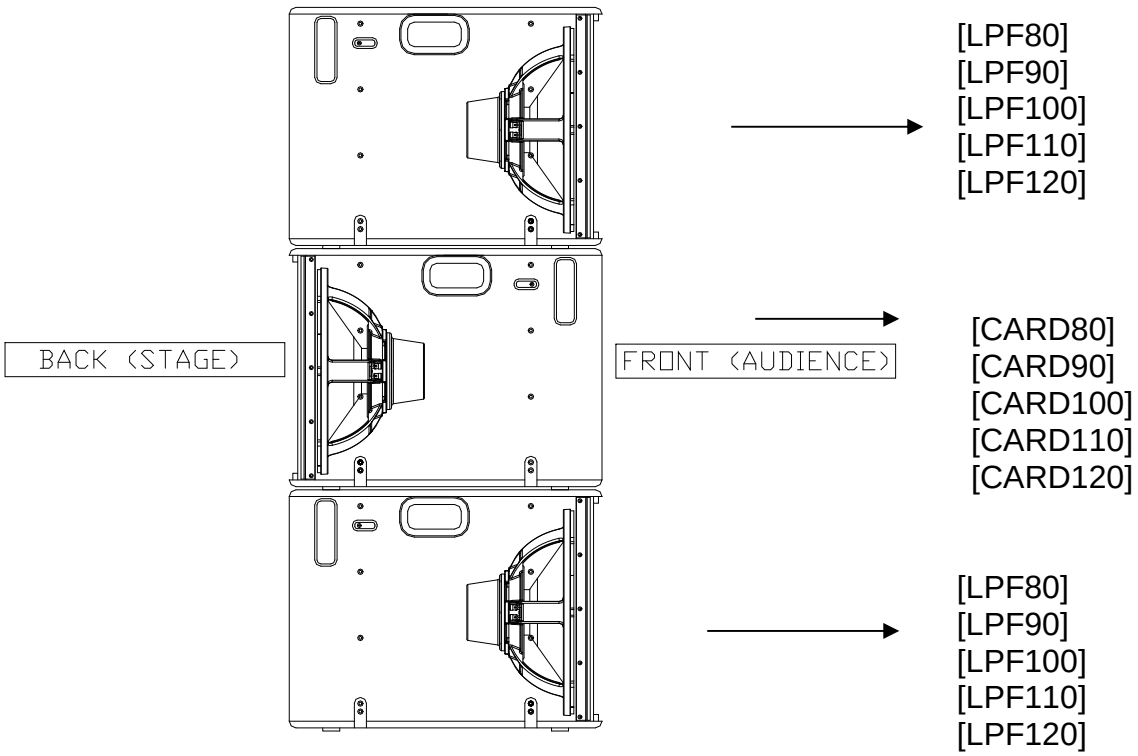


Fig. 46. Cardioid presets for N18W subwoofer

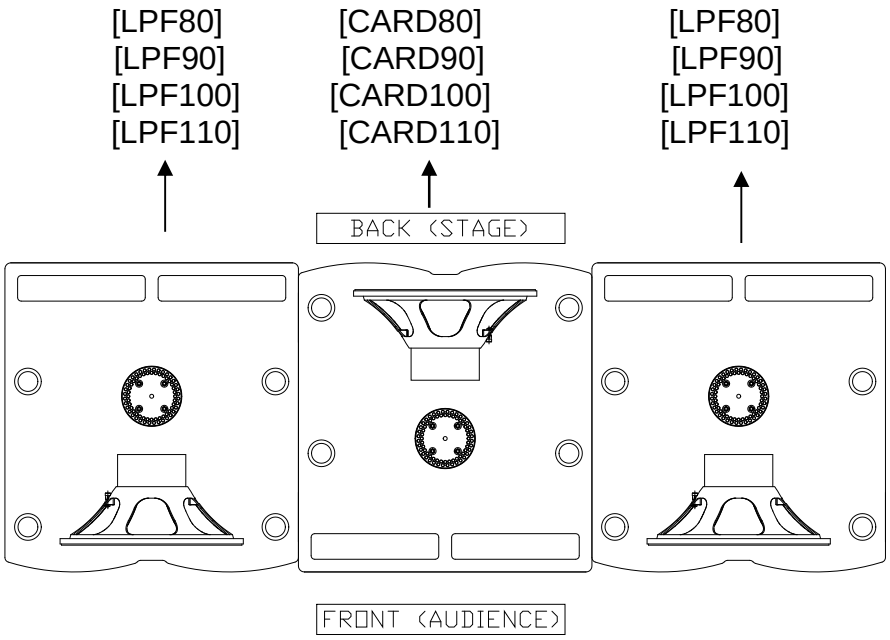


Fig. 47. Cardioid presets for N18W subwoofer

When placing the subwoofers in a cardioid configuration keep a distance to walls of at least 60 cm in order not to affect the radiation of the central reversed cabinet.

8 TECHNICAL FEATURES

	N208
Audio Input	
Sensitivity	+8 dBu – 1.94 V
Maximum Input Level	+20 dBu – 8 V
Impedance	20 kΩ
Type	Electronically balanced
Power Amplifier	
Program power	1500 W
Mains supply	Universal switching power supply 85-265VAC / 45- 65Hz
Avg. current draw	2.1 A @ 230 VAC, heavy duty musical program
Standby mode consumption	< 5 W
Connectors	2 x AC PowerCon (input, link) 2 x XLR (input, link) 1 x Speakon NL4FX output
Digital Audio Parameters	
Analog converters	24 bit / 48 kHz
DSP architecture	48 bit
Built-in delay line	118 ms / 40 m
Audio Performance	
Frequency response (-10 dB usable bandwith)	78 Hz – 18k Hz
SPL (1m)	129 dB continuous, 132 dB peak
Nominal directivity (-6dB)	110º x 11º
Components	
LF	2 x 8” neodymium woofers (2.5” voice coil)
HF	2 x 1.75” PEN diaphragm neodymium drivers mounted on exclusive high frequency waveguide
Cabinet	
Type	Bass-reflex
Height	279 mm
Width	684 mm
Depth	522 mm
Weight (net)	23 Kg
Material	Multilayer birch plywood
Finish	Hi-resistance black matt Polyurea coating 1.5 mm steel front grille with black acoustic mesh

Note: Specifications subjected to change without prior notice.

	N208P
Impedance	
LOW	16 Ω
HIGH	12 Ω
Power	
LOW r.m.s	500 W
HIGH r.m.s	100 W
LOW program	1000 W
HIGH program	200 W
Connectors	1 x Speakon NL4MPR input
Audio Performance	
LOW Frequency response (-10 dB usable bandwith)	78 Hz – 2k2 Hz
HIGH Frequency response (-10 dB usable bandwith)	1k2 Hz – 18k Hz
LOW SPL (1W / 1m)	100 dB
HIGH SPL (1W / 1m)	108 dB
Nominal directivity (-6dB)	110º x 11º
Components	
LF	2 x 8” neodymium woofers (2.5” voice coil)
HF	2 x 1.75” PEN diaphragm neodymium drivers mounted on exclusive high frequency waveguide
Cabinet	
Type	Bass-reflex
Height	279 mm
Width	684 mm
Depth	522 mm
Weight (net)	21 Kg
Material	Multilayer birch plywood
Finish	Hi-resistance black matt Polyurea coating 1.5 mm steel front grille with black acoustic mesh

	N18W	N218W
Audio Input		
Sensitivity	+2 dBu – 1 V	
Maximum Input Level	+20 dBu – 8 V	
Impedance	20 kΩ	
Type	Electronically balanced	
Power Amplifier		
Program power	2500 W	2500 W
Mains supply	Universal switching power supply 85-265VAC / 45- 65Hz	
Avg. current draw	3.5 A @ 230 VAC, heavy duty musical program	
Standby mode consumption	< 5 W	
Connectors	2 x AC PowerCon (input, link) 2 x XLR (input, link)	
Digital Audio Parameters		
Analog converters	24 bit / 48 kHz	
DSP architecture	48 bit	
Built-in delay line	118 ms / 40 m	
Audio Performance		
Frequency response (-10 dB usable bandwith)	35 Hz – 150 Hz	30 Hz – 140 Hz
SPL (1m)	132 dB continuous, 135 dB peak	137 dB continuous, 140 dB peak
Nominal directivity (-6dB)	omnidirectional	omnidirectional
Components		
LF	1 x 18” woofer (4” voice coil)	2 x 18” woofers (4” voice coil)
Cabinet		
Type	Bass-reflex	
Height	540 mm	1046 mm
Width	664 mm	740 mm
Depth	700 mm	780 mm
Weight (net)	52 Kg	100 Kg
Material	Multilayer birch plywood	
Finish	Hi-resistance black matt Polyurea coating 2 mm steel front grille with black acoustic mesh	

CERTIFICATION

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Great sound from Barcelona since 1972

DECLARATION OF CONFORMITY

In accordance with EN 45014:1998

Manufacturer's Name: "AMATE AUDIO S.L."

Manufacturer's Address: C/ Perpinyà 25, Polígon Industrial Nord
08226 Terrassa, (Barcelona), SPAIN

Brand: "AMATE AUDIO"

We declare under our own responsibility that:

Product: Active speaker systems with DSP. Audio apparatus for professional use

Name: NITID N208

Conforms to the following product specifications:

Safety: IEC 60065-01 + A1

EMC: EN 55022:2006
EN 55103-1:2009
EN 55103-2 2009
FCC Part 15

WARNING:

In accordance to EN55022, this is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Supplementary Information:
The product herewith complies with the requirements of the:

Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC
RoHS Directive 2002/95/EC
WEEE Directive 2002/96/EC

With regard to Directive 2005/32/EC and EC Regulation 1275/2008 of 17 December 2008, this product is designed, produced, and classified as Professional Audio Equipment and thus is exempt from this Directive.

Date of issue: October 30, 2017

Signature:

AMATE AUDIO S.L.
N.I.F: B59103481
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08222 – Terrassa
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General Manager

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Conformity Marking

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CERTIFICATION

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DECLARATION OF CONFORMITY

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08226 Terrassa, (Barcelona), SPAIN

Brand: "AMATE AUDIO"

We declare under our own responsibility that:

Product: Active speaker systems with DSP. Audio apparatus for professional use

Name: NITID N18W, N218W

Conforms to the following product specifications:

Safety: IEC 60065-01 + A1

EMC: EN 55022:2006
EN 55103-1:2009
EN 55103-2 2009
FCC Part 15

WARNING:

In accordance to EN55022, this is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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export@amateaudio.com

The **NITID** powered loudspeaker systems have been designed, engineered and manufactured in Barcelona – SPAIN by

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