USER MANUAL

SW121HLA

horn loaded active subwoofer

KEY FEATURES

- Very High Output
- Compact size for a very good output-toweight ratio
- Horn-loaded configuration
- High-strength, water repellent cone
- 96KHz / 40 bit floating point CORE processing with PRONET remote control
- Digitally controlled Class D amplifier module with SMPS

INTRODUCTION

The SW121HA subwoofer is designed to deliver high quality low frequency reproduction where very high output is a key requirement, together with well defined deep bass response and fast transient response. Its compact size and light weight make it suitable for several different uses, ranging from touring applications to fixed installations and high-level dance clubs.

The SW121HLA is a high-performance powered subwoofer with a special configuration based on a small cavity behind the speaker and a very compact horn. With this special design and a particular digital processing, the SW121HLA can be used as an infra-sub and it can provide an impressive low-frequency extension and a “punchy” feeling in the upper bass range.

The SW121HLA is equipped with a 21” (533mm) transducer capable of long excursion (up to 70mm peak-to-peak) and controlled by a Double Silicon Spider. The robust copper 135mm (5.3”) voice coil is wounded in four different layers both outside and inside the coil support, then improving the long term thermal capacity of the loudspeaker. Cones are made in cellulose with a special carbon fiber treatment to increase resistance and durability.

TECHNICAL SPECIFICATION

Acoustical	
System type	Horn-Loaded Subwoofer
Transducer	Single Neodymium 21” (530mm), 5.3” (135mm) VC, carbon fiber reinforced treated cellulose cone, split winding four layers ISV copper coil, triple silicon spider suspension.
Frequency response (±3 dB)	32 Hz – 85 Hz (Processed)
Maximum Peak SPL @ 1m	145 dB
Electrical	
Input Impedance	20 kΩ balanced
Input Sensitivity	+4 dBu / 1.25 V
Signal Processing	CORE processing, 96kHz / 40bit floating point SHARC DSP, 24 bit AD/DA converters
Direct access Controls	4 Presets: Standard, InfraSub, Cardioid, User. Network Termination, GND Link
Remote Controls	PRONET control software
Network protocol	CANBUS

Amplifier Type	Class D with Variable Switching Frequency, SMPS and PFC
Output Power	4000 W
Mains Voltage Range (Vac)	100-240 V~ 50/60 Hz
Mains Connector	PowerCon TRUE1 - NAC3PX (In/Out)
Consumption*	600 W (nominal) 1800 W (max)
IN / OUT Connectors	Neutrik XLR-M / XLR-F
IN / OUT Network Connectors	ETHERCON® (NE8FAV)
Mechanical	
Width	589 mm (23.18”)
Height	801 mm (31.53”)
Depth	1022 mm (40.23”)
Depth Including Wheels	1122 mm (44.17”)
Construction	15 mm, reinforced Phenolic Birch
Paint	High resistance, water based paint
Wheels	4 heavy-load 100 mm ø
Transport	5 handles
Net Weight	82.2 Kg (180.8 lbs.)

** Nominal consumption is measured with pink noise with a crest factor of 12 dB, this can be considered a standard music program.*

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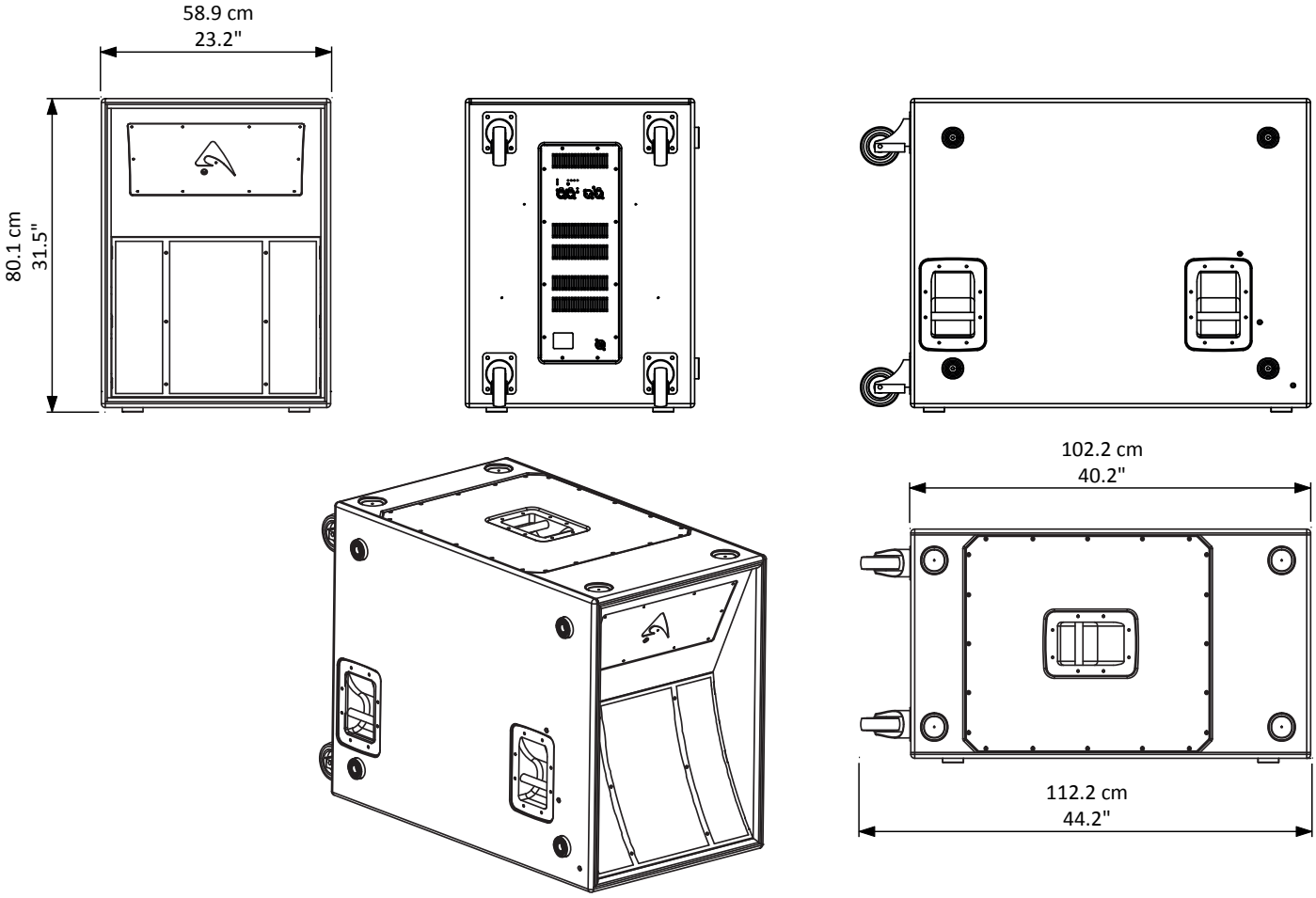
AXIOM

MECHANICAL DRAWING



NOTE: This product is designed to work on floor and is not equipped with rigging flying points, do not suspend the loudspeakers from the handle.

OPTIONAL ACCESSORIES

NAC3FXW	Neutrik Powercon® TRUE1 (for power in)
NAC3MXW	Neutrik Powercon® TRUE1 (for power out)
HTAC	Hand tool for tightening the bushing of the powerCON TRUE1
CAT5SLU01/05/10	LAN5S - Cat5e - RJ45 plugs and NE8MC1 connectors. 1/5/10 m Length
AR100LUxx	Hybrid cable 1x Cat6e - 1x Audio with NEUTRIK connectors 0.7/1.5/2.5/5/10/15/20 m Length
AR200LUxx	Hybrid cable 1x Cat6e - 2x Audio with NEUTRIK connectors 20/30/40/60/80 m Length
AVCAT5PROxx	Cat5e on cable drum, RJ45 plugs and NEUTRIK connectors 30/50/75 m Length
NE8MCB	Neutrik Ethercon PLUG
NC3MXXBAG	Neutrik XLR-M
NC3FXXBAG	Neutrik XLR-F
USB2CAN	PRONET network converter
USB2CAND	PRONET network converter with dual RJ45 outputs

*see **http://www.axiomproaudio.com/** for detailed description and other available accessories.*

Note:
*See assembly instruction downloadable from NEUTRIK WEB site at: **http://www.neutrik.com/***

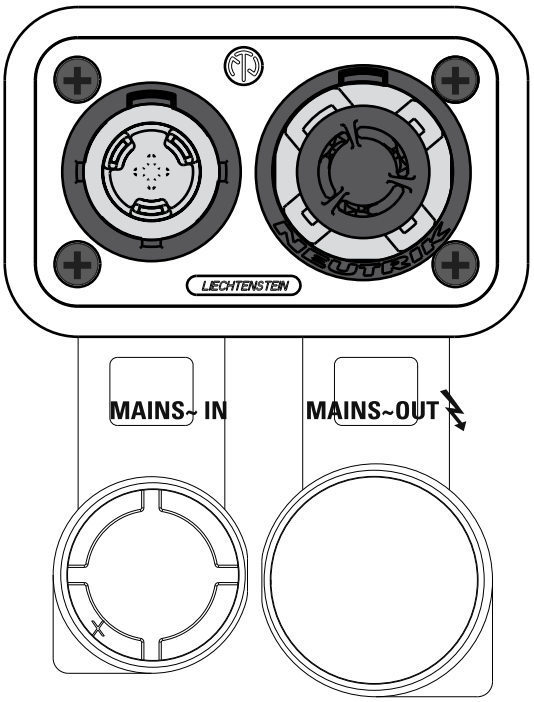
SPARE PARTS

AC103GS	100 mm Swivel castor without brake	**91DA4000**	DA4000 Amplifier module
AC115DN	Black steel handle	**91PCAGLED1**	Position Check LED PCBA
98EDG21SW8	21'' woofer - 5.3" VC - 8 ohm	**91PCAG00031**	DSP Interface PCBA
NAC3PX	Neutrik Powercon® TRUE1 Appliance in-out combination	**91DSPKT3**	DSP PCBA and Control PCBA
SCNACPX	Neutrik Rubber Sealing for NAC3PX	**91CRAX2010**	XLR Input PCBA
99SWRT121SV	Loudspeaker horn metal grid	**95SW121PLS2**	Input/Control Panel (only mech)

POWER INPUT

MAINS~ IN - Powercon® NAC3PX power inlet connector. To switch the amplifier on, insert the Powercon® connector and turn it clockwise into the ON position. To switch the amplifier off, pull back the switch on the connector and turn it counter-clockwise into the POWER OFF position.

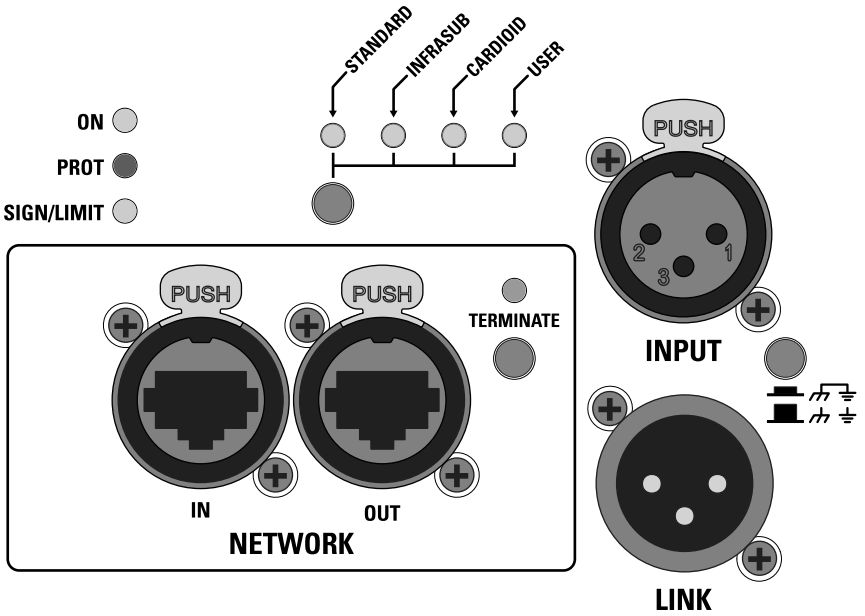
MAINS~ OUT - Powercon® NAC3PX power outlet connector. This is connected in parallel with the MAINS~ IN.



WARNING! Connect no more than one subwoofer unit to the MAINS~ OUT connector.
WARNING! If you use the MAINS~ OUT turn on each subwoofer unit one a time.
WARNING! In the case of product failure or fuse replacement, disconnect the unit completely from the mains power.
WARNING! Use a suitable power cable and mains plug to build the power cable, it must only be connected to a socket corresponding to the specifications indicated on the amplifier unit.
See assembly instruction downloadable from NEUTRIK WEB site at: http://www.neutrik.com/

CONTROL PANEL

ON - This LED indicates power on status.
PROT - This red LED lights when the amplifier module is in protect mode for an internal fault and, consequently, the amplifier is muted.
SIGN LIMIT - This LED lights in green to indicate the presence of the signal and lights in red when an internal limiter reduces the input level.
INPUT - Audio signal input with locking XLR connector. It has a fully electronically balanced circuitry including AD conversion for the best S/N ratio and input headroom.
LINK - A direct connection from the input connector to link other speakers with same audio signal.
GND LIFT - This switch lift the ground of the balanced audio inputs from the earth-ground of the amplifier module.



PRESET BUTTON - This button has two function:

1) Pressing it while powering on the unit:

ID ASSIGN the internal DSP assigns a new ID to the unit for the PRONET remote control operation. Each loudspeaker must have a unique ID to be visible in the PRONET network. When you assign a new ID, all the other loudspeakers with the ID already assigned must be ON and connected to the network.

2) Pressing it with the unit ON you can select the DSP PRESET. The selected PRESET is indicated by the corresponding LED:

STANDARD This PRESET is suitable for any application where low frequency reinforcement is required. It features a 90Hz cut off frequency and it can be used in almost any environment in combination with any vertical array or point source system.

INFRA This PRESET can be used when a deeper bass response is required (Note that when this preset is used the sound pressure level of the system is slightly reduced). NOTE: INFRA and STANDARD PRESET must NOT be used together in close units.

CARDIOID This special PRESET, combined with the STANDARD PRESET, gives the advantage to reduce the low frequencies at the back of an array of three subs, in order to obtain a more comfortable level for the performers on the stage without losing level for the the audience in front of the array. The cardioid configuration is also useful in situation where you want to reduce the bass frequency feedback due to many microphones on stage, for example for acoustic and jazz ensemble, classic orchestra, musicals. Further in this manual you can find some example how to set up a cardioid array.

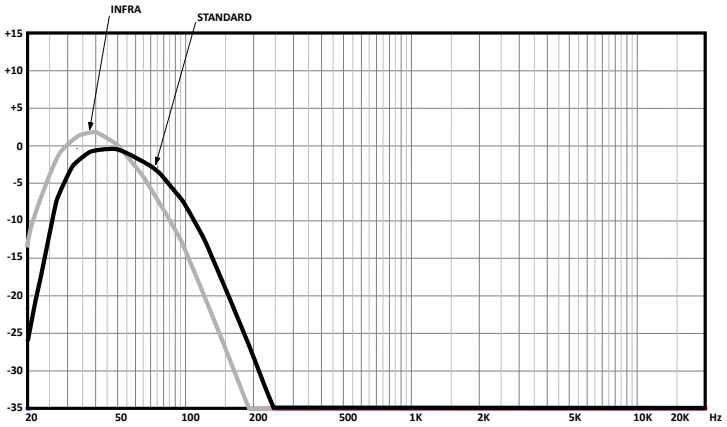
USER This LED lights when the USER PRESET is loaded. This preset corresponds to the first USER MEMORY (Preset 4-U) of the DSP and, as a factory setting, it's the same to STANDARD. If you want to modify it, you have to connect the unit to a PC, edit the parameters with PRONET software and save it into **"Preset 4-U-your_preset_name" (see also further in this manual)**.

NETWORK IN/OUT - These are a standard RJ45 CAT5 connectors (with optional NEUTRIK NE8MC RJ45 cable connector carrier), used for PRONET network transmission of remote control data over long distance or multiple unit applications.
TERMINATE - In a PRONET network the last loudspeaker device must be terminated (with an inner load resistance) especially in a long run cabling: press this switch if you want to terminate the unit.

POWER AMPLIFIER

The DA4000 module employed for powering the SW121HLA includes a universal regulated switch mode power supply with PFC (Power Factor Correction) that delivers in an ultra-compact package a maximum power of 4000W in any condition of mains supply variance.
The innovative technology used for this amplifier (including also the use of a variable switching frequency) offers performances at the top of the range, such as a superior sound definition at any audio frequency, very high dynamics also for low level signals and very low distortion even at the maximum power. The superior sound quality can be compared with top-of-the-range AB-class analog systems, while the DA modules feature a higher dynamics, very compact size and light weight and efficiency above 90%.

SW121HLA - PRESET RESPONSE



SIGNAL PROCESSING

The system processing is based on the CORE DSP platform, which has been designed by the PROEL R&D Laboratories using one of the most advanced SHARC DSP for audio application. It features 40bit, 96kHz floating point resolution and high quality 24bit AD/DA converters, for a perfect signal integrity, a dynamic range in excess of 110dB and a superior sonic performance. Thanks to its massive processing power, the CORE platform is capable of providing the most sophisticated algorithms for speaker processing, together with remote control and networking capability.
The PRONET control software, working on a solid and reliable CANBUS based network protocol, provides an intuitive interface for the remote control of the whole system, with the possibility of eqing, delaying, increasing the protections and monitoring the status of the amplifier.

PRONET

PRONET software has been developed in collaboration with sound engineers and sound designers, in order to offer an “easy-to-use” tool to setup and manage your audio system. With PRONET you can visualize signal levels, monitor internal status and edit all the parameters of each connected device.

Download the PRONET app from the AXIOM website at http://www.axiomproaudio.com/ clicking on downloads section of the product.

The SW121HLA loudspeaker devices can be connected using the network connection, in this case the PROEL USB2CAN converter optional accessory is needed. The first time you connect a device with the USB2CAN converter, Windows O.S. will ask you to install the driver files, which you can find in the Driver folder within the Pronet application folder (by default is C:\Program Files\Proel\Pronet\Driver, or if you changed it <your path>\ Driver). Please refer also to “Installation” and “Drivers” paragraphs in the Pronet documentation.
The PRONET NETWORK is based on a robust, reliable and fast communication protocol called CANBUS. The devices in a PRONET NETWORK are connected together with a “linear bus topology”. The USB2CAN converter must be connected to the network input of the first device, the network output of the first device is connected to the input of the second and so on. For the network connections simple RJ45 cat.5 or cat.6 ethernet cables can be used (please don’t confuse a ethernet network with a PRONET network these are completely different and must be fully separated also both use the same kind of cable).
The beginning and the end of a PRONET NETWORK must be terminated. One side is terminated by the USB2CAN converter, the other side must be terminated pressing the TERMINATE switch on the last device. All devices between these two points must have the TERMINATE switch lifted.

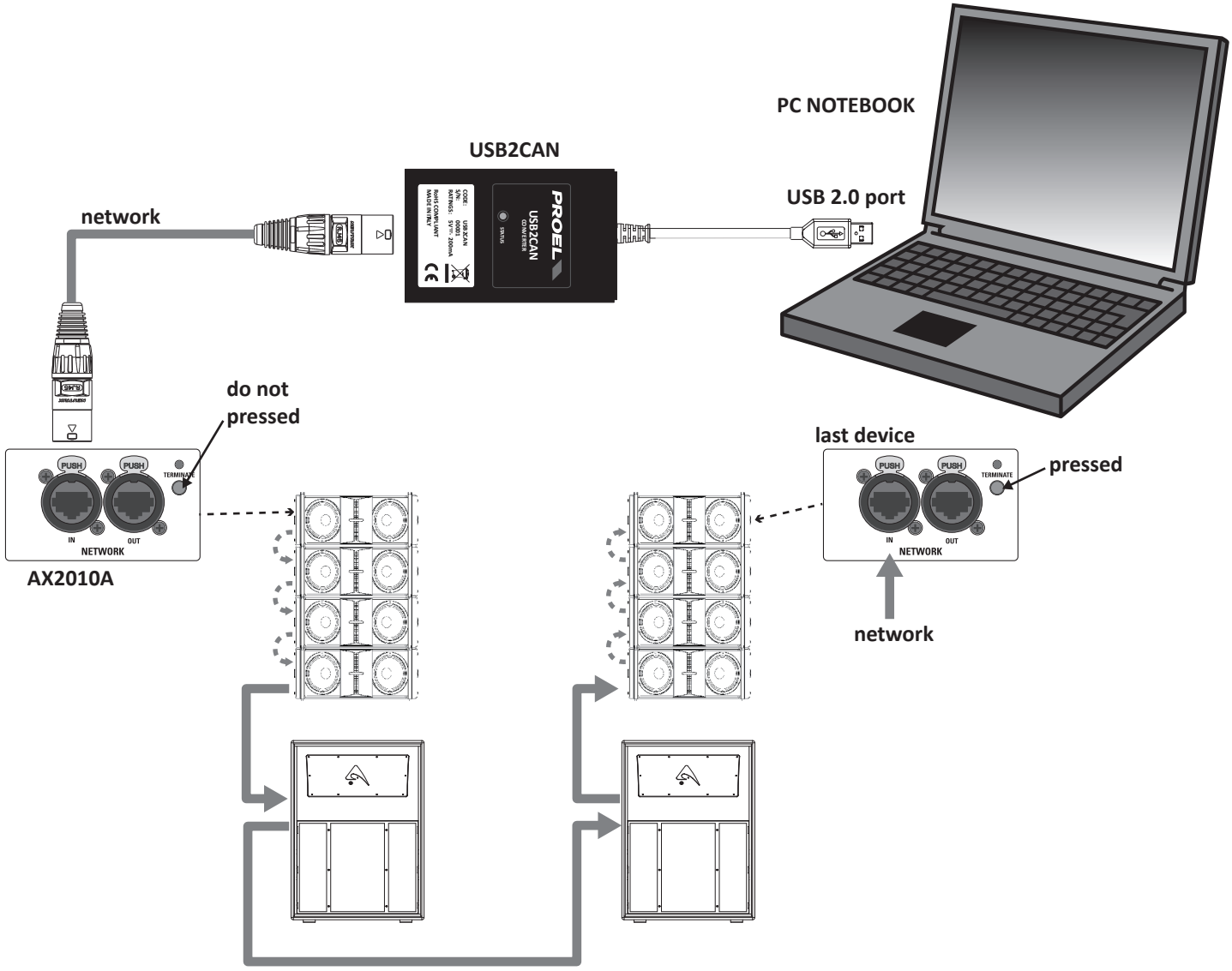
Assign the ID number

To work properly in a PRONET network each connected device must have a unique identifier number, called ID. By default the USB2CAN PC controller has ID=0 and there can be only one PC controller. Every other device connected must have its own unique ID equal or greater than 1: in the network cannot exist two devices with the same ID.
An ID number is assigned automatically to each devices when they are turned on for the first time connected to a network.
In order to correctly assign a new available ID to each device for working properly in a Pronet network, follow these instructions:

1. Switch off all the devices.
2. Connect them correctly to the network cables.
3. “TERMINATE” the latest device in the network connection.
4. Switch on the first device keep pressed “PRESET” button on the control panel.
5. Leaving the previous device switched on, repeat the previous operation on the next device, until the latest device is turned on.

The “Assign ID” procedure for a device makes the internal network controller to perform two operations: reset the current ID; search the first free ID in the network, starting from ID=1. If no other devices are connected (and powered on), the controller assume ID=1, that is the first free ID, otherwise it searches the next one left free.
These operations ensure that every device has it’s own unique ID, if you need to add a new device to the network you simply repeat the operation of step 4. Every device maintains its ID also when it is turned-off, because the identifier is stored in the internal memory and it is cleared only by another “Assign ID” step, as explained above.
This means that if your network is made always of the same devices the assigning ID procedure must be executed only the first time the system is turned on.
For more detailed instruction about PRONET see the PRONET USER’S MANUAL included with the software.

EXAMPLE OF PRONET NETWORK WITH AX2010A AND SW121HLA



Useful tools to set up properly a vertical array system using the SW121HLA subwoofer
This is a list of tools that can be very useful to set properly a vertical array system with the SW121HLA active subwoofers.

CABLE TESTER
It is a good practice to check all cables before each installation, because even one faulty cable can compromise heavily the system performance.

INCLINOMETER WITH LEVER
This tool can be used to verify the vertical array angle. It can be used at the top or at the bottom of the array In this case you have to sum all splay angles, so the maximum precision is needed for aiming the vertical array, particularly for long throw applications.

LASER DISTANCE METER
This instrument can be useful to measure the height of the vertical array and to know the distance between FOH-Subs and FOH-Array for setting the delay time.

Smaart v.7 Di

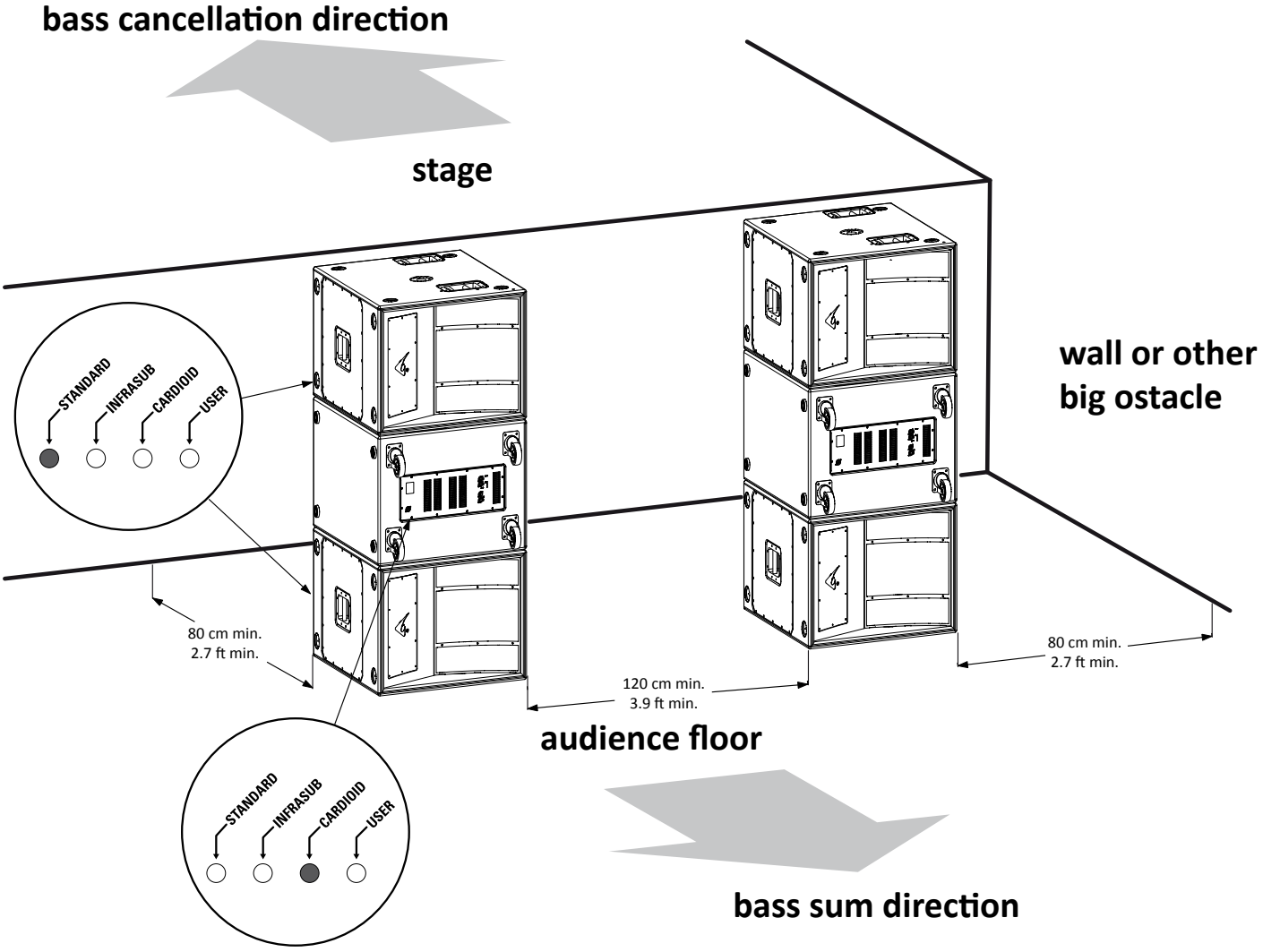
SMAART or similar acoustic measurement system
These are useful to measure delays, phase and response of the system.

CARDIOID PRESET

The cardioid preset must be used in a sub array of three SW121HLA. Two box must be oriented towards the audience and one must be turned in the opposite direction (typically the box in the centre of the array). The bottom and the top boxes must have the STANDARD PRESET, the box in the middle must have the CARDIOID PRESET. The audio signal sent to all boxes is the same.

The CARDIOID PRESET has the same response of the STANDARD PRESET, but to obtain the maximum cancellation on the back side of the array it has the phase inverted and a proper level and delay setting.

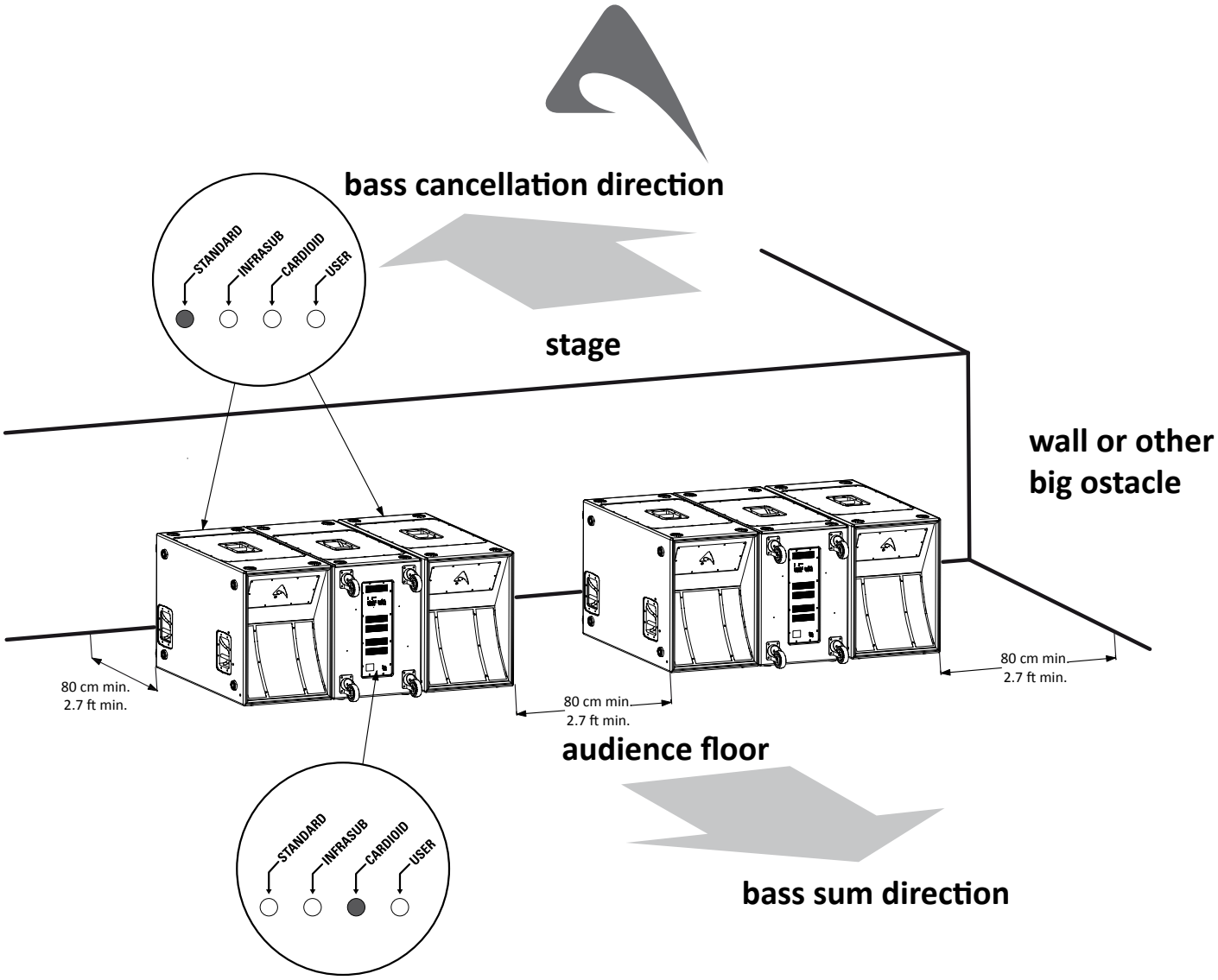
The figure below shows two typical displacement of the array. The first with all the boxes in horizontal position for a total height of 1770 mm and a width of 801 mm. The second one with all the boxes in vertical position for a total height of 801 mm and a width of 1770 mm.



NOTES:

When placing the cardioid array keep a distance to walls or other obstacles of at least 80 cm (2.7 ft) in order not to affect the radiation of the reversed cabinet.

When placing multiple cardioid arrays keep a distance between them of at least 120 cm (3.9 ft) in order not to maximize the combined radiation of whole arrays.



NOTES:
When placing the cardioid array keep a distance to walls or other obstacles of at least 80 cm (2.6 ft) in order not to affect the radiation of the reversed cabinet.
When placing multiple cardioid arrays keep a distance between them of at least 80 cm (2.6 ft) in order not to maximize the combined radiation of whole arrays.

LIMITED WARRANTY

Proel warrants all materials, workmanship and proper operation of this product for a period of two years from the original date of purchase. If any defects are found in the materials or workmanship or if the product fails to function properly during the applicable warranty period, the owner should inform about these defects the dealer or the distributor, providing receipt or invoice of date of purchase and defect detailed description. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse. Proel S.p.A. will verify damage on returned units, and when the unit has been properly used and warranty is still valid, then the unit will be replaced or repaired. Proel S.p.A. is not responsible for any “direct damage” or “indirect damage” caused by product defectiveness.

• This unit package has been submitted to ISTA 1A integrity tests. We suggest you control the unit conditions immediately after unpacking it.
• If any damage is found, immediately advise the dealer. Keep all unit packaging parts to allow inspection.
• Proel is not responsible for any damage that occurs during shipment.
• Products are sold “delivered ex warehouse” and shipment is at charge and risk of the buyer.
• Possible damages to unit should be immediately notified to forwarder. Each complaint for package tampered with should be done within eight days from product receipt.

SAFETY INSTRUCTIONS

– To reduce the risk, close supervision is necessary when the product is used near children.
– Protect the apparatus from atmospheric agents and keep it away from water, rain and high humidity places.
– This product should be site away from heat sources such as radiators, lamps and any other device that generate heat.
– This product should be located so that its location or position does not interfere with its proper ventilation and heating dissipation.
– Care should be taken so that objects and liquids do not go inside the product.
– The product should be connected to a power supply mains line only of the type described on the operating instructions or as marked on the product. Connect the apparatus to a power supply using only power cord included making always sure it is in good conditions.
– WARNING: The mains plug is used as disconnect device, the disconnect device shall remain readily operable.
– Do not cancel the safety feature assured by means of a polarized line plug (one blade wider than the other) or with a earth connection.
– Make sure that power supply mains line has a proper earth connection.
– Power supply cord should be unplugged from the outlet during strong thunderstorm or when left unused for a long period of time.

CE CONFORMITY

Proel products comply with directive 2004/108/EC (EMC), as stated in EN 55103-1 and EN 55103-2 standards and with directive 2006/95/CE (LVD), as stated in EN 60065 standard.

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