

XCELLENCE SERIES

X-12C - X-15C - X-18W Systems



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User's manual

ENGLISH



WARNING:
To reduce the risk of fire or electric shock do not expose this equipment to rain or moisture



Safety Instructions

1. All safety instructions must be read before using this device.
2. The exclamation mark in the triangle indicates internal components which if replaced can affect safety.
3. The lightning symbol within the triangle indicates the presence of dangerous uninsulated voltages.
4. This device must not be exposed to rain or humidity. It must not be used for example near swimming pools, fountains or any other place where it might be affected by liquids.
5. Only clean the device with a dry cloth.
6. Do not situate the equipment where its ventilation system might be interfered with.
7. Do not install the device near heat sources such as radiators, heaters or other heat-emitting elements.
8. 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
9. Disconnect the device in the case of electric storms or during long periods of disuse.
10. Never hang the equipment by its handle.
11. Only use manufacturer recommended accessories.

1. INTRODUCTION

1.1. General product information

Master Audio thank you for the trust placed in our **Xcellence** loudspeaker system.

The Xcellence series combines the benefits of its coaxial point sound sources, the convenience of a self-powered system and the flexibility of the DSP (digital system processing) for cabinet control.

More than 35 years' experience in amplifier and acoustic cabinet design using the highest technology and components come together to give you a product ideal for a multitude of applications, from sound back-up systems for theatres, clubs or TV channels to even churches, corporate events or concert halls.

Coaxial technology achieves a sound distribution system which is totally coherent and in phase (as a point source). This is due to the fact that the directivity of the high and low frequency transducers couples up perfectly with the crossover frequency from the filters. This results in very smooth transitions between the bass and high frequency zone and the elimination of secondary null zones due to polar lobbing, typical of those systems using separate woofer and horn.

The directivity of the cabinets with coaxial transducers is totally symmetric in the horizontal or vertical plane.

We suggest you read the following information with attention, assured that it will be of maximum use in helping you to achieve the best results and optimum performance.

1.2. Features and appearance

X-12C & X-15C

- Self-powered cabinet.
- 750W amplifier for mid range.
- 250W amplifier for high range.
- DSP with 48 bit bus and 28 bit filter coefficients.
- DSP Controls (parametrics, delay, volume and limiters).
- RJ45 output for control via computer.
- Overvoltage protection (>250V-400V).
- 2 way coaxial speaker with 80° symmetry, including one 12" / 15" woofer in neodymium and one 3" voice coil diameter, titanium diaphragm compression driver.
- Birch plywood construction.
- Varnished finish. Optional black textured paint finish: totally ecological.
- Frontal steel grille with acoustically transparent grey cloth.

X-18W Subwoofer

- Self-powered cabinet.
- 1500W amplifier for bass range.
- DSP with 48 bit bus and 28 bit filter coefficients.
- DSP Controls (parametrics, delay, volume and limiters).
- RJ45 output for control via computer.
- Overvoltage protection (>250V-400V).
- 18" speaker in neodymium, 4" voice coil and demodulation rings to reduce distortion and the transitory response.
- Birch plywood construction.
- Varnished finish. Optional black textured paint finish: totally ecological.
- Frontal steel grille with acoustically transparent grey cloth.

2. XC Systems. Features

The X-12C & X-15C cabinet are ideal for a multitude of applications. They include 750W bi-amplification for the mid range woofer, 250W for the high range compression driver and digital signal control by DSP. The manufacturer presets FACTORY, NEARFIELD, SPEECH, MONITOR, and XOVER make it easy, flexible and user-friendly.

In terms of its electro-acoustic qualities, the coaxial transducer gives a totally symmetrical response free of null zones from polar lobbing effect. It comprises a 12" or 15" woofer with a 3" voice coil and a compression driver with 3" voice coil and titanium diaphragm.

The result is a clean, high quality sound whether for nearfield listening or at full power in larger sites.

Thanks to its wedge shape it can be used as an onstage monitor, obtaining stable, homogeneous response and coverage.

The upper and lower surfaces incorporate a pole mount socket for a standard 35mm tripod, which at the same time allows for the use of a UBX hanging support (see accessories).

2.1. Technical description

The XC cabinets come with DSP control, full range sound delivery thanks to their direct radiation coaxial transducer and acoustic bass reflex cabinet. As a full range system, its response is 58-18kHz (+/- 3dB) with a usable bandwidth between 50Hz-20kHz (-10dB) for X-12C and 53Hz-18kHz (+/- 3 dB) with a usable bandwidth between 45Hz-20kHz (-10dB) for X-15C.

It has 1000W continuous amplification (750W + 250W), thermal protection, anti-short circuit protection at the output, maximum power limiters for each channel, and protection against overvoltage. The DSP includes 5 presets which can be selected either accessing the cabinet's rear control panel or via the computer with RJ45 connection for the RS485 bus. The FACTORY preset gives a maximum flat response in free field conditions; NEARFIELD has +3dB in high and low frequencies, -3dB in

mid range for medium volume, close range listening; SPEECH has -9dB bass, -6dB high for voice use with a microphone; MONITOR gives a flat response in half space (floor position); XOVER has a high pass filter at 100Hz for bass frequency back up (subwoofer).

The XC cabinets are connected using the XLR balanced connector. Mains supply is through PowerCon at 230V.

Built in birch plywood, which has a high resistance to vibrations and humidity. Varnished finish and optional (by order) textured water-based acrylic resin black paint which is totally ecological. The front face is protected by a 1.5 mm thick steel grille with acoustically transparent grey cloth.

Wedge shape. As onstage monitor, the front baffle is oriented at 35° from vertical.

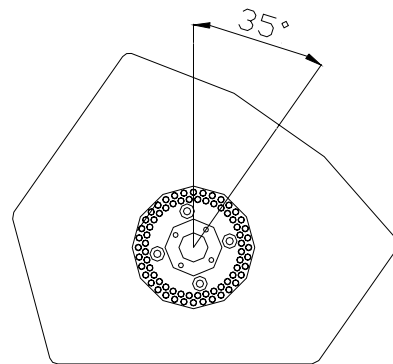


Fig.1. XC as onstage monitor

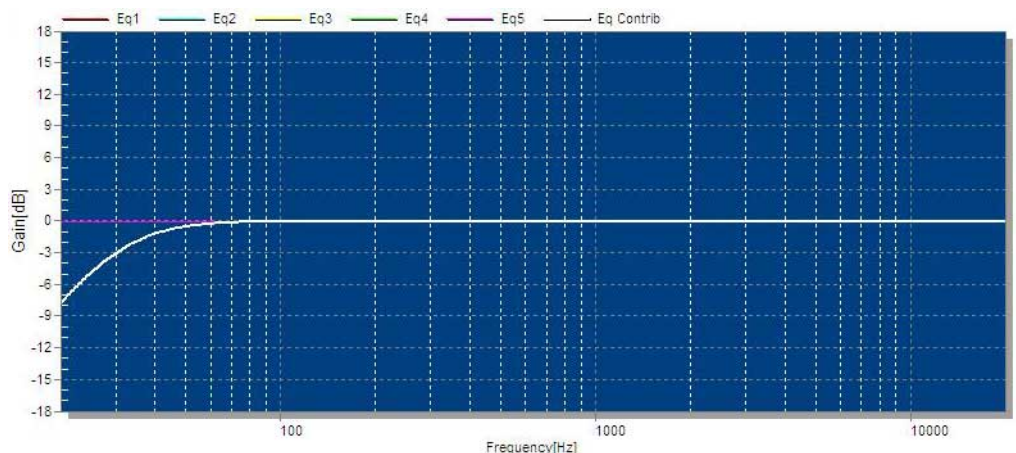
2.2. Presets

The XC include five manufacturer presets for different types of application. The DSP system can also store up to 16 other presets, depending on user requirements

P1-FACTORY

Flat response

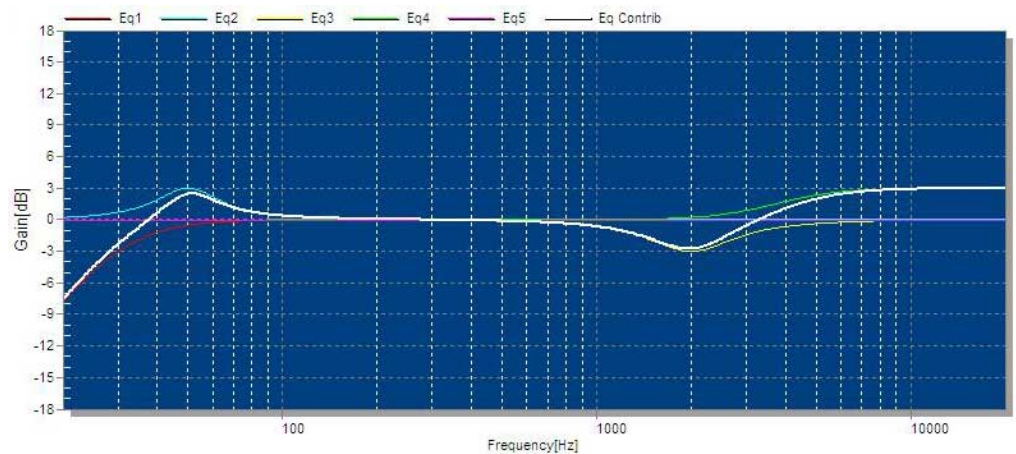
(freefield)



P2-NEARFIELD

+3dB Low
+3dB High
-3dB Mid

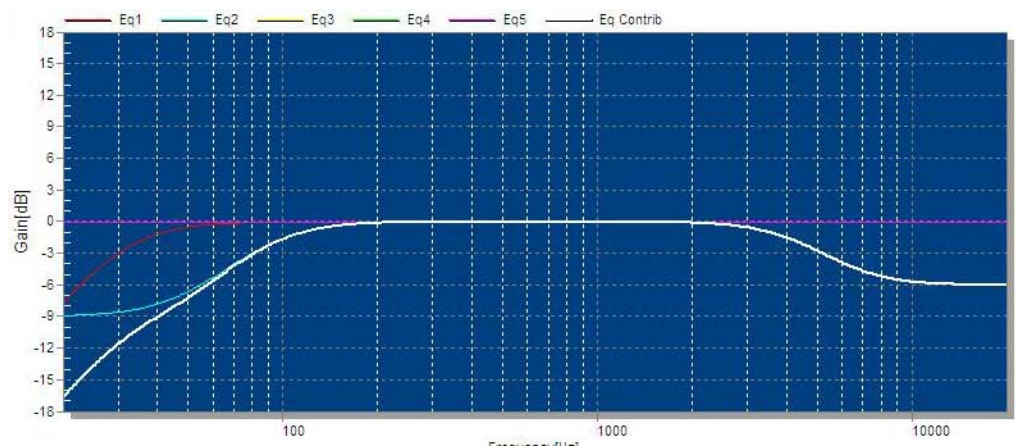
(nearfield)



P3-SPEECH

-9dB Low
-6dB High

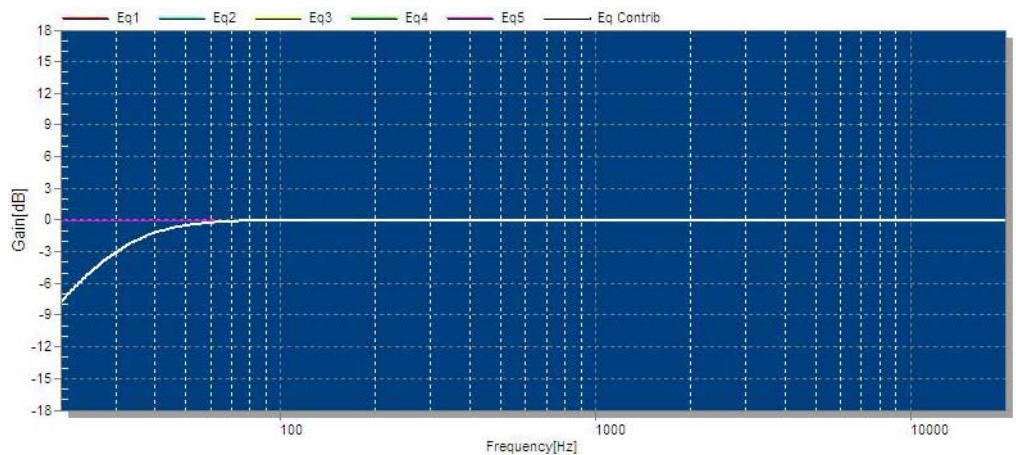
(speech)



P4-MONITOR

Flat response

(half space/floor)



P5-XOVER

HFP 100Hz

(with subwoofer)

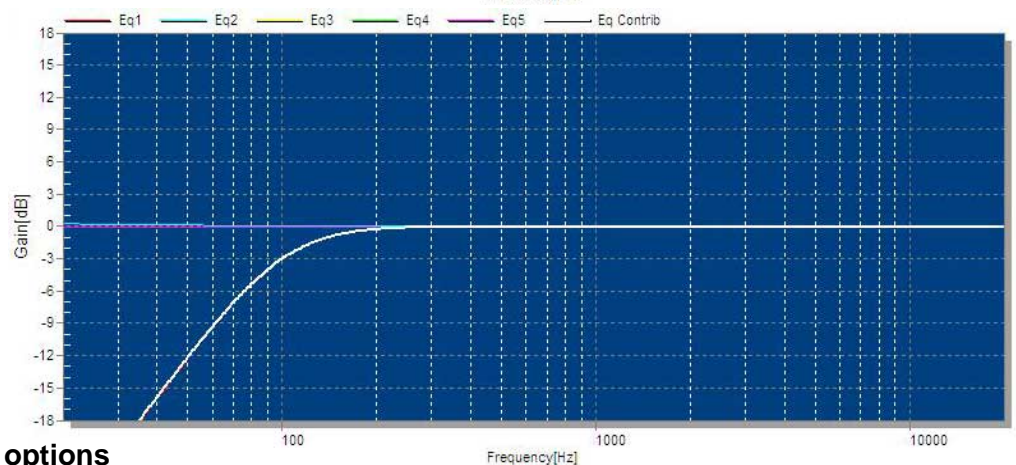


Fig.2. XC PRESET options

2.3. Connection Panel (for all Xcellence models)

Each unit contains a rear panel comprising:

- a) **RJ45 INPUT:** Computer connection input.
- b) **RJ45 LINK:** Computer signal link.
- c) **INPUT SIGNAL:** XLR balanced signal connector.
1= Shield 2= Live 3= Return
- d) **LINK INPUT SIGNAL:** XLR connector for parallel connection of various cabinets with the same input signal.
1= Shield 2= Live 3= Return
- e) **AC INPUT:** Mains supply via PowerCon.
- f) **AC LINK:** Power link for PowerCon connector to feed other units in parallel (up to a maximum of 3 extra units).
- g) **AC INDICATORS** (Power supply)
 - **ON:** lights up with correct AC signal.
 - **STAND BY:** lights up during switch on sequence.
 - **OVERVOLTAGE PROTECTION:** lights up if the AC input signal exceeds 250VAC. The system shuts down automatically and cannot be connected until the AC level is correct. This protects against erroneous connection to 400V or neutral voltage drop.

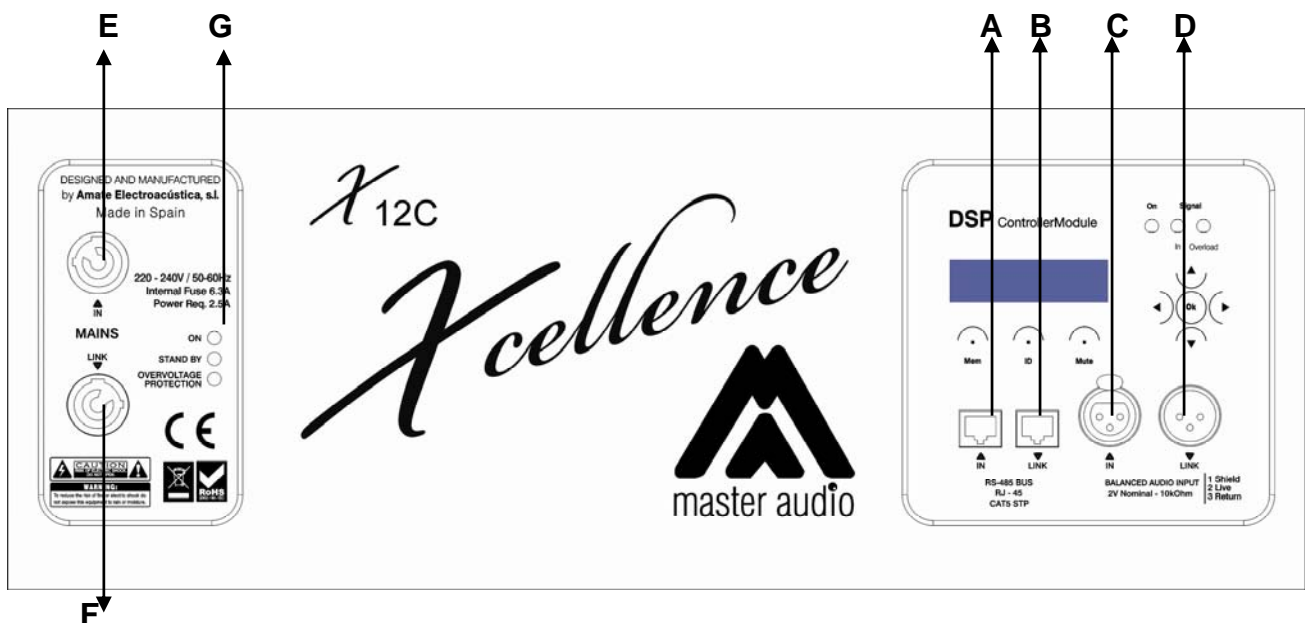
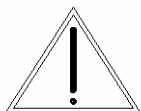


Fig.3. X-12C/X-15C connection panel



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

3. DIMENSIONS:

X-12C has height 56 cm, width 41 cm, depth 40.1 cm

X-15C has height 65 cm, width 46 cm, depth 42.9 cm

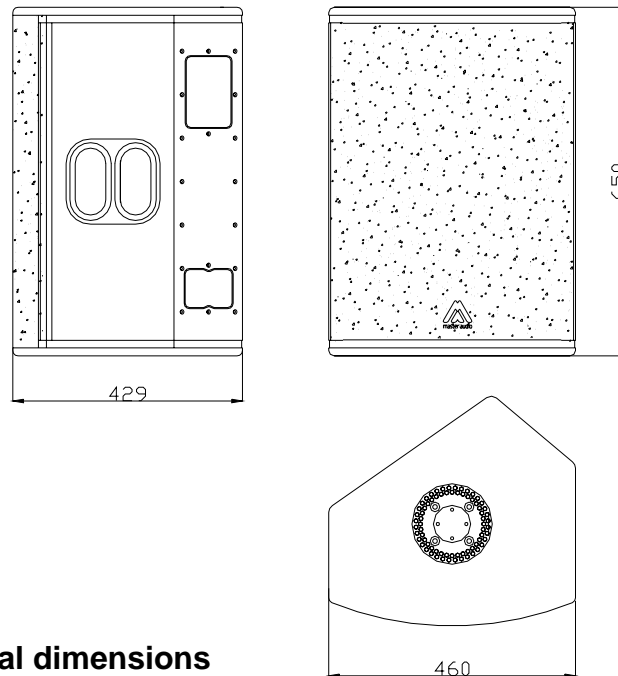


Fig.4. X-15C cabinet. External dimensions

As a low frequency reinforcement, we offer the X-18W subwoofer which is totally compatible with X-12C or X-15C top cabinets.

4. X-18W Subwoofer

The X-18W cabinet is ideal for bass reinforcement in general and specifically in combination with models X-12C and X-15C. It includes 1500W amplification for the woofer and digital signal control by DSP. The manufacturer presets (LPF90+, LP110+, LPF130+, LPF90-, LPF110-, LPF130-) make it easy, flexible and user-friendly.

The 18" neodymium woofer used, thanks to its exclusive magnetic design, combines excellent bass frequency response, high performance and low distortion. These features are mainly due to the presence of demodulation rings which drastically reduce the inter-modulation and third order distortion and considerably improve the transitory response. There is excellent heat dissipation due to the external positioning of the magnet set. Without any doubt one of the finest bass transducers currently available.

The result is a clean, high quality sound.

The upper surface incorporates a pole mount socket for a standard 35mm bar.

4.1. Technical description

The X-18W cabinet comes with DSP control, with direct radiation transducer and acoustic bass reflex cabinet. As a bass reinforcement system, its frequency response is 35Hz-130Hz (+/- 3dB) with a usable bandwidth between 30Hz-140Hz (-10dB, preset LPF130).

It has 1500W continuous amplification, thermal protection, anti-short circuit protection at the output, maximum power limiters for each channel, and protection against overvoltage. The DSP includes 6 presets which can be selected either accessing the cabinet's rear control panel or via the computer with RJ45 connection for the RS485 bus. The LPF90+ and LPF90- presets mean low pass filter at 90Hz; LPF110+ and LPF110- mean low pass filter at 110Hz; LPF130+ and LPF130- mean low pass filter at 130Hz.

By upping the low pass filter a greater 'boom' sensation can be achieved, but clarity is lost. It is down to the user to decide on the most suitable preset.

The X-18W is connected using the XLR balanced connectors. Mains supply is through PowerCon at 230V.

Built in birch plywood, which has a high resistance to vibrations and humidity. Varnished finish and optional (by order) textured water-based acrylic resin black paint which is totally ecological. The front face is protected by a 1.5 mm thick steel grille with acoustically transparent grey cloth.

Dimensions: Height 56.7 cm, width 61 cm, depth 65 cm.

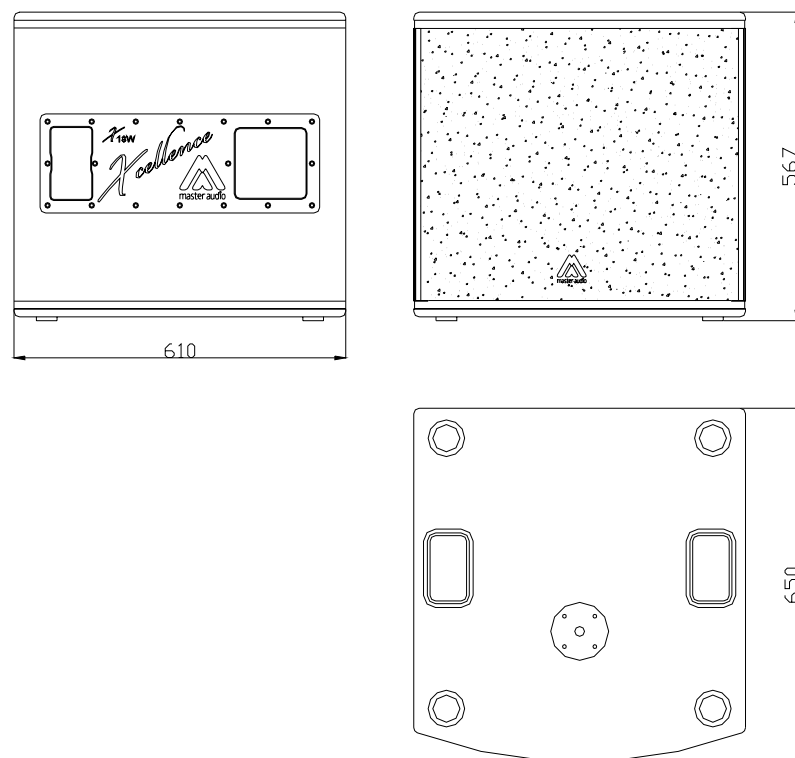


Fig.5. X-18W cabinet. External dimensions

4.2. Presets

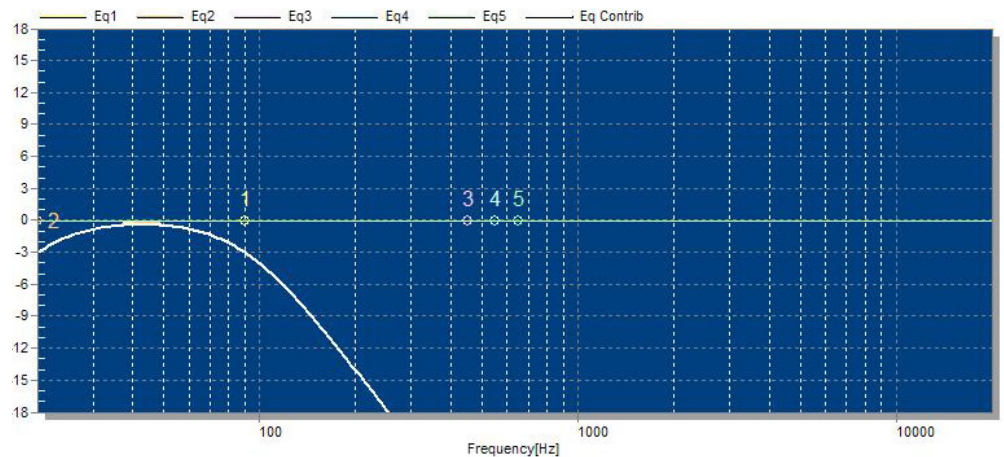
The X-18W includes six manufacturer presets for different types of application. The DSP system can also store up to 16 other presets, depending on user requirements.

ATTENTION: When the X-18W is used in conjunction with the X-12C and X-15C in XOVER preset, the X-18W must operate in positive polarity (LPF90+, LP110+, LPF130+).

When the X-18W is used in conjunction with the X-12C and X-15C in FACTORY, NEARFIELD, SPEECH or MONITOR presets, the X-18W must operate in negative polarity (LPF90-, LP110-, LPF130-).

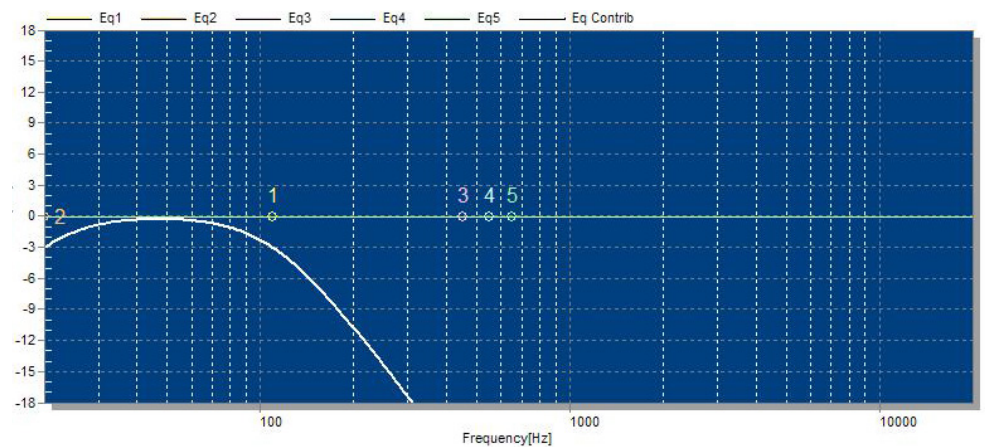
P1-LPF90+ P4-LPF90-

Low pass filter
at 90Hz



P2-LPF110+ P5-LPF110-

Low pass filter
at 110Hz



P3-LPF130+ P6-LPF130-

Low pass filter
at 130Hz

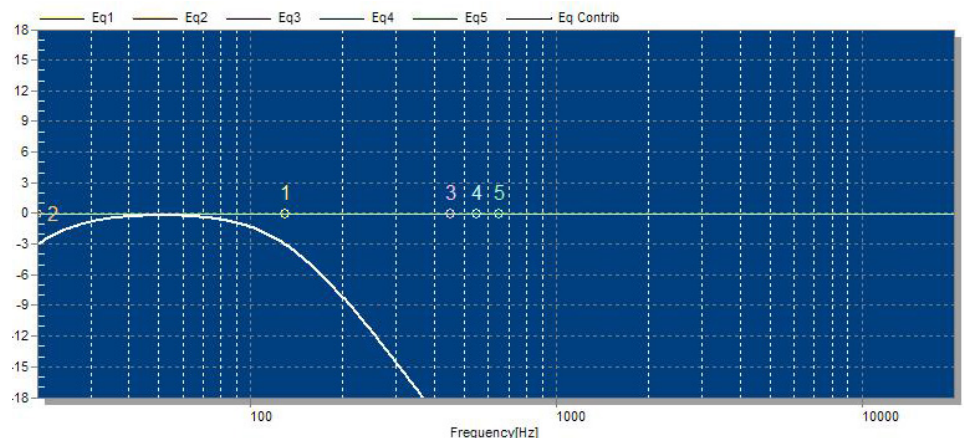


Fig.6. X-18W PRESET options

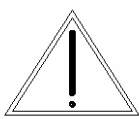
4.3. Connection Panel: Exactly the same as XC Full-Range Systems

5. CONNECTING

5.1. Parallel connection

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

For the mains connection in parallel use the cable with grey Neutrik PowerCon NAC3FCB at one end and the blue Neutrik PowerCon NAC3FCA at the other end.



Do not connect more than 4 X-12C or X-15C units using the AC Stacking output connector.
Do not connect Xcellence series units in parallel using PowerCon-PowerCon without earth.

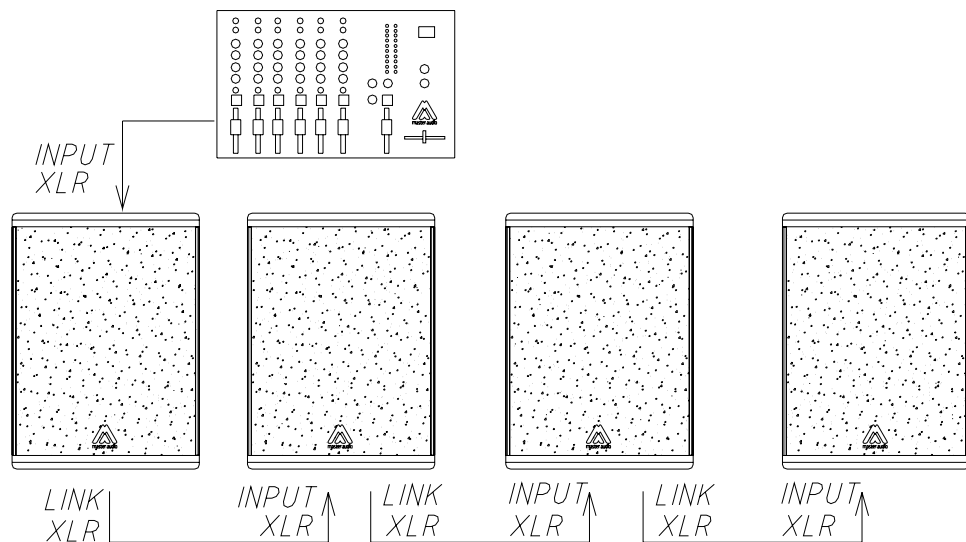


Fig.7. Parallel connection for the Xcellence series(signal)

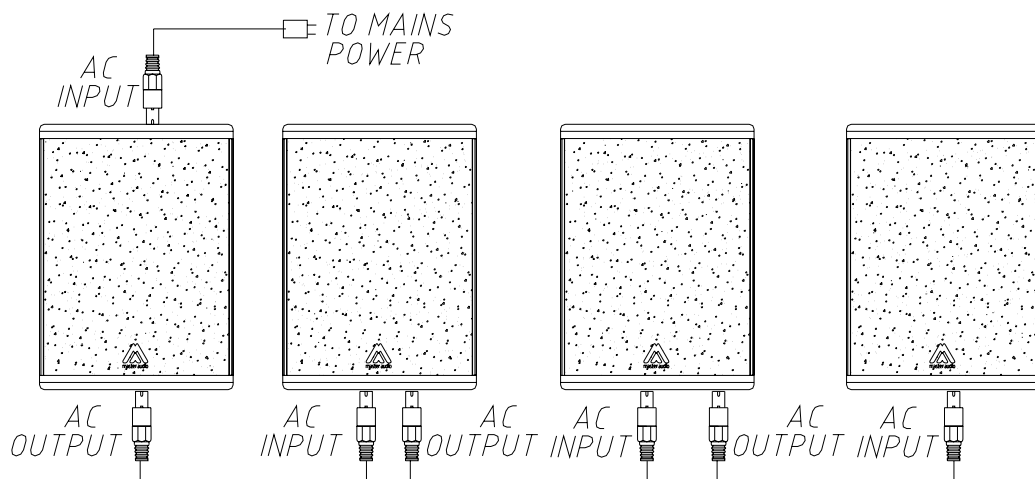


Fig.8. Parallel connection for the Xcellence series (mains)

5.2. Parallel connection with subwoofer

You can connect the X-18W subwoofer in parallel with both X-12C and X-15C cabinets. Please, follow the same parameters as explained in figures 7 and 8. Never connect more than 4 units using the AC Stacking.

6. OVERVOLTAGE PROTECTION

The Xcellence series models incorporate protection against mains voltage overload.

In the mains input an electronic circuit compares the actual voltage with a reference value. When the input tension exceeds 250 Volts, the circuit reacts by blocking the input tension until it returns to its correct limits (230V +/- 10%).

When the overvoltage LED lights up red, the unit stops running, until the correct voltage is re-established.

Generally the cause of such an anomaly tends to be a neutral voltage drop or incorrect connection of the equipment to 400V supply. Whenever the overvoltage LED lights up, check the tension of the electrical phases: other devices in the sound system are also at risk of electrical fault.

7. FUNCTIONS of the INTERNAL DSP

All the XCELLENCE series are equipped with an internal DSP unit, which can be operated by the LCD and keypad located at the rear panel of the cabinet and/or by an external PC (RJ45 connector)

a) Through keypad and without PC, the following functions will be accessible:

Gain Control, independent for each way (low and high).

Limiter Adjust, also independent for each way.

Delay Adjust, in meters or milliseconds.

Mute: temporary signal cut-off

Load a configuration: one of the 5 factory pre-loaded presets or one of the 16 available user memories

To gain access to these functions it is necessary to unlock the keypad, which is automatically locked after some time of inactivity to avoid accidental or undesired manipulation. To unlock the keypad, press the MEM key followed by OK. The LCD will light up and show the current settings:

Name of the unit, ID: -- (*Bus identification, only used for PC connection*) and PR (*loaded preset*) FACTORY.

X12C	ID: --
P01:FACTORY	

At this point, all described functions are accessible. Use the OK key to enter the main menu and OK again to enter the Audio settings. Then with the left-right cursors the Gain, Delay, Limiter and Mute are selected:

Main Menu
Audio Settings



Enter Audio Settings Menu



Select option

Audio Settings
Gain



Enter option menu

Click OK to select the desired setting. With the up-down cursors the numerical parameters can be changed. Press always OK to confirm. Please note that any change will be lost if the unit is powered off. To prevent that it is necessary to store the modified settings using the SAVE function. The new settings will be stored in a memory slot which will be identified by an 8-character name given by the user:

Save
M01:-empty-



Select target memory slot



Confirm

Once this step is completed, the settings will be stored in the internal memory. Next time this setting is required, it can be loaded using the MEM key:

Memory List
P01:FACTORY



Select Memory



Confirm and back to main screen

Once a memory or preset is loaded, it will remain in the memory even is the equipment is powered off. Next time the unit is powered on, the last loaded memory will be used. After some seconds of inactivity of the keypad, the keypad and LCD will automatically lock.

b) With external PC. Once the required connections between the cabinets and PC are made, the cabinets can be controlled by the PC. All functions described above plus 5 parametric EQ or filters (Butt-LR-Shelf) can be configured.

For more information about the software and the connections required, please refer to the DSPController Manual or Quick Installation Guide, available at your dealer or at Master Audio's technical service: sat-amate@master-audio.com

8. MOUNTING AND INSTALLATION

Whenever possible, mount the Full Range units in a high position (between 2 and 3 meters above ground), angled towards the audience. If the units are mounted close to the ground the back row listeners will receive low quality sound.

Due to the coaxial technology design the cabinets must be oriented so that the central angle axis (0°) is directly focused at the rear part of the audience. Thus all the high frequency energy is directed towards the furthest spectators; those the front rows will receive high frequencies generated beyond the acoustic axis, with a more acute yet balanced, equalized level in respect to the back rows.

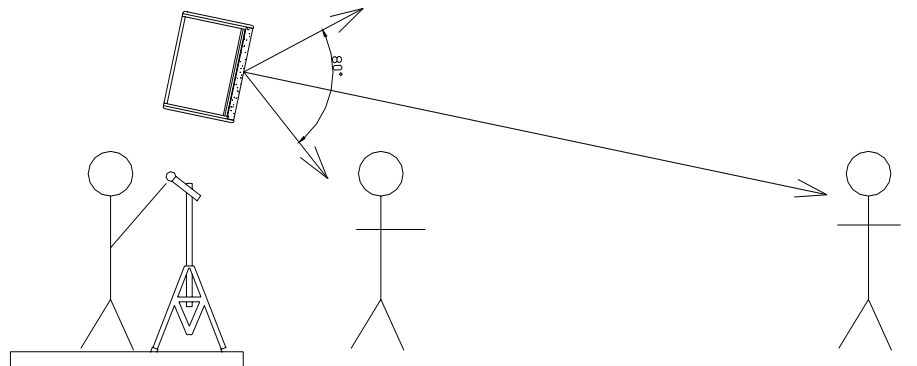


Fig.9. Orientation of Xcellence full range units(X-12C, X-15C)

The X-12C and X-15C models incorporate a 35mm pole mount socket for standard tripod in the upper and lower sides.

To use the socket, unscrew the four bolts on the central face plate.

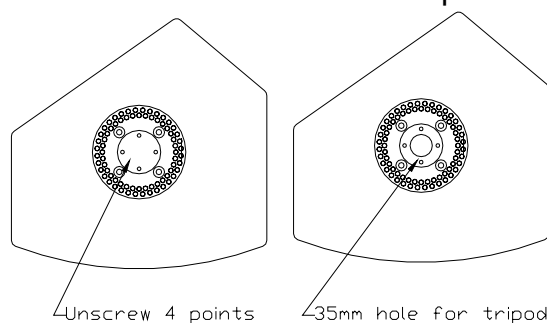


Fig.15. Socket for tripod

Do not use the tripod on sloping surfaces nor mount the cabinets too high to avoid total instability of the system.

The wedge shape of X-12C and X-15C units allows for use an onstage monitor without the need of incorporating any other accessory. Remember to use the MONITOR preset in this case.

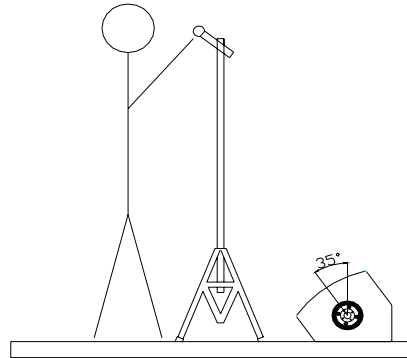


Fig.11. Use as onstage monitor

The brand logo can be turned for use in the horizontal position.

The X-18W incorporates a base-plate on its upper side for the attachment of a standard 35mm diameter bar.

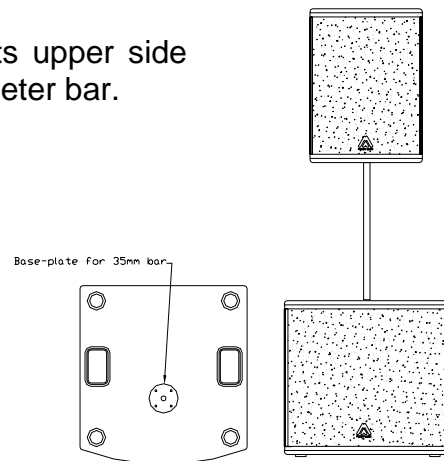


Fig.12. Combination with subwoofer

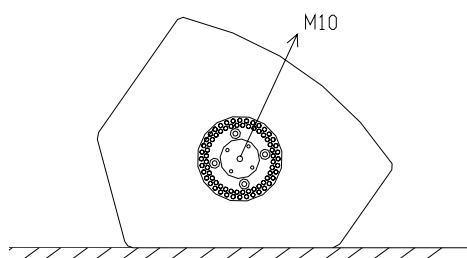
9. MOUNTING ACCESSORIES

The UB-X12 is an optional U-bracket accessory for wall (horizontal orientation) and truss mounting (horizontal orientation) of the X12C.

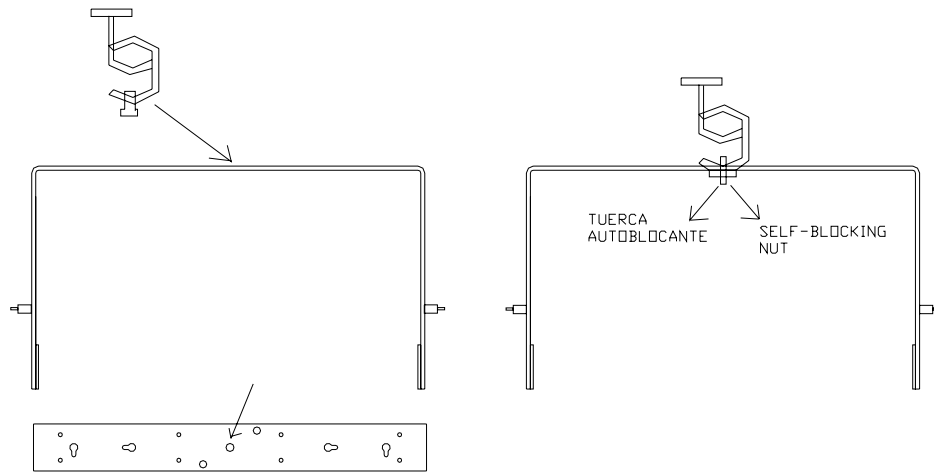
The UB-X15 is an optional U-bracket accessory for wall (horizontal orientation) and truss mounting (horizontal orientation) of the X15C.

9.1 TRUSS MOUNTING

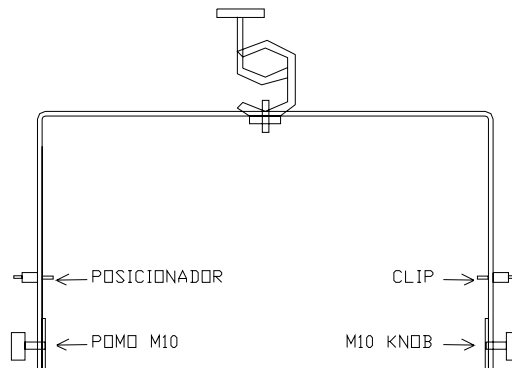
1- Place the box on the floor or in a comfortable working position. The lateral sockets must include the M10 small plates.



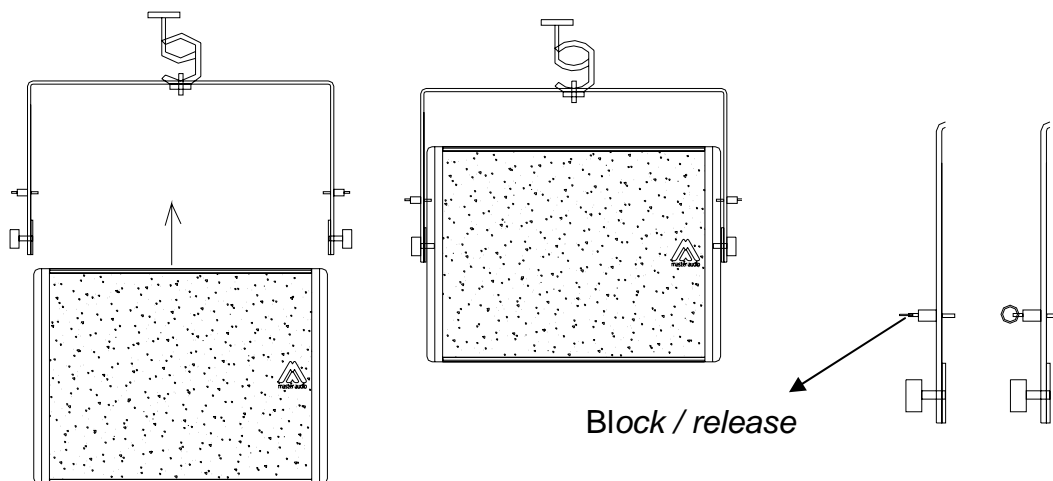
2- Set the optional accessory HC-X (hook clamp) on the UB-X bracket. Block it with a self-locking nut. Use the central hole (marked with an arrow).



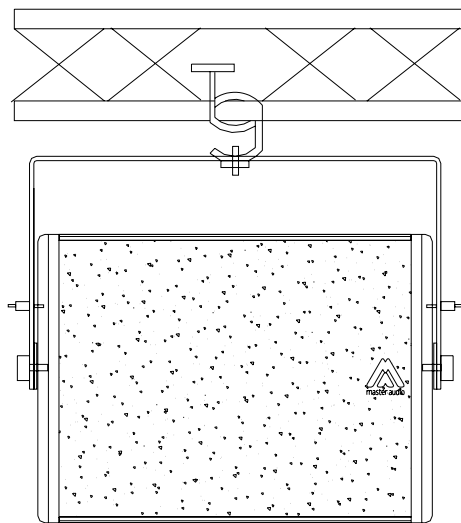
3- Set the M10 knobs on both laterals.



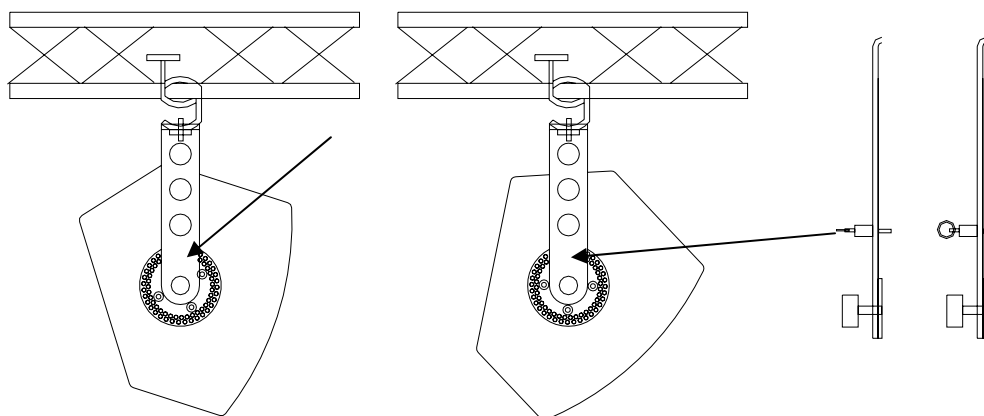
4- Set the UB-X bracket onto X12/15C cabinet. Block both laterals with the M10 knobs. Put the lateral clips in a random position (later you will adjust the desired angle). Turn the clip's ring to block/release it.



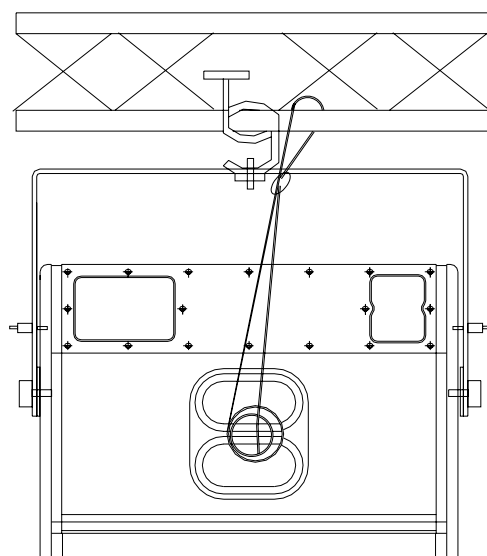
5- Place all the system on the Truss bar. Block the hook clamp.



6- Use the lateral clips to choose the desired tilt angle.

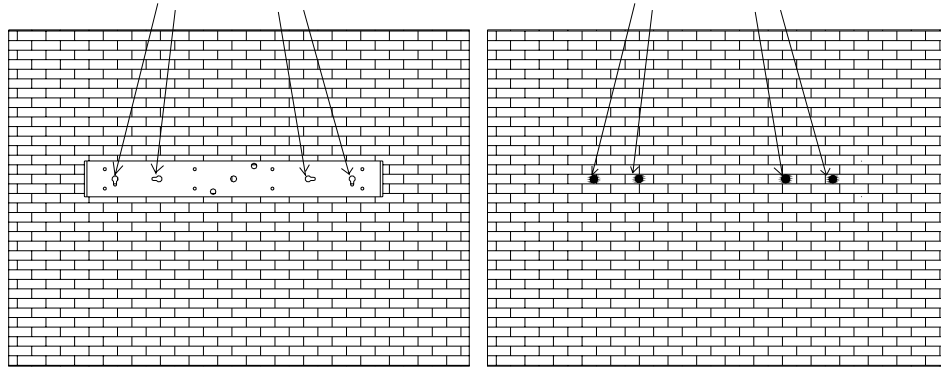


7- You can use the safety cable around the cabinet's handle and the truss bar.

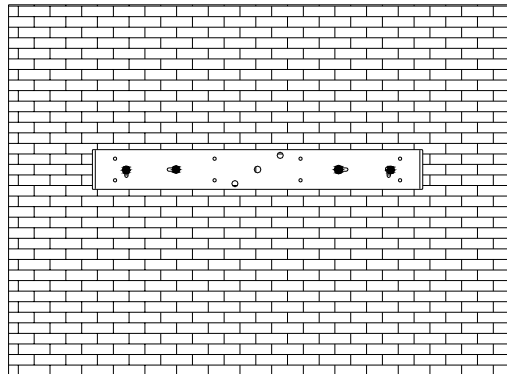


9.2 WALL MOUNTING

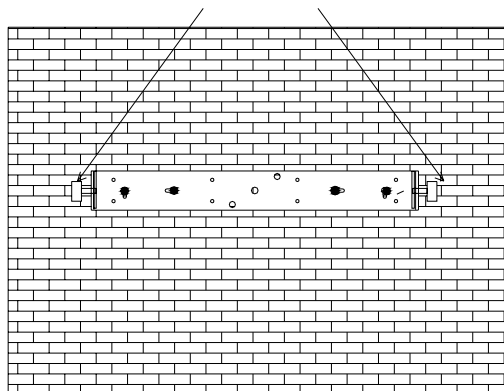
1- Place the UB-X bracket in front of the mounting surface, so you can mark the locations of the mounting holes.



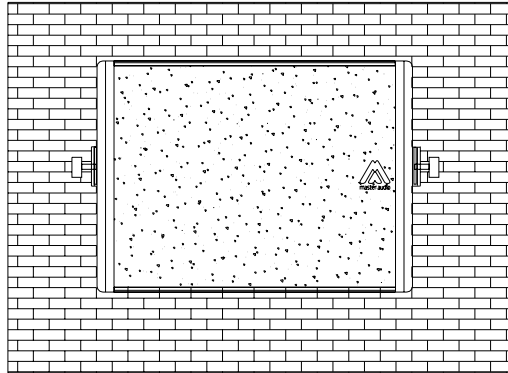
2- Drill some corresponding pilot holes on the wall and fix the bracket with some screws.



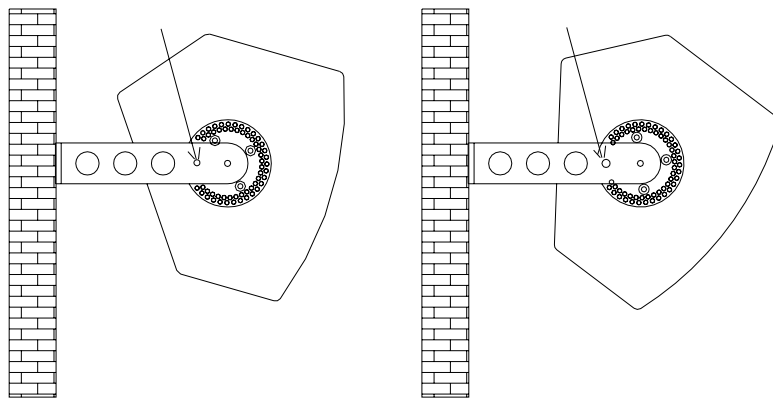
3- Set both M10 knobs on the bracket's laterals.



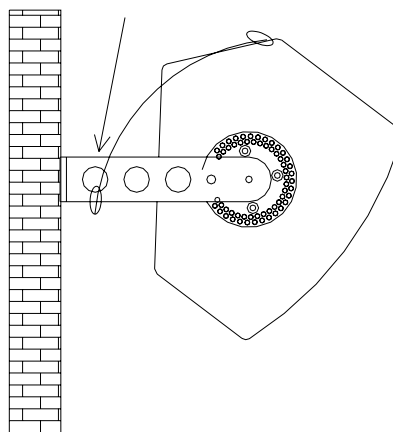
- 4-** Set the cabinet on the bracket and fix it with both M10 knobs.



- 5-** Use the lateral clips to choose the desired tilt angle.



- 6-** You can use the safety cable around the cabinet's handle. In this case, fix the safety cable on the lateral hole of the bracket.



10. TECHNICAL SPECIFICATIONS**10.1. X-12C & X-15C Specifications****Balanced line input:** 1,8 V **Impedance:** 10k ohm**Mains:** 230V +/- 10% / 50-60Hz (overvoltage protection >250V)**Maximum power consumption:** 3A

Frequency response	X-12C	X-15C
Frequency response (+/-3 dB)	58Hz-18kHz	53Hz-18kHz
Usable bandwidth (-10 dB) (1W, preset FACTORY)	50Hz-20kHz	45Hz-20kHz

Maximum output level (PR FACTORY) 127 dB SPL**Total amplifier power** 1500 W (2 x 750 W/4 ohm)**Power delivered to transducers**

LF	750 W
HF	250 W

Nominal directivity (-6dB) Axis-symmetrical 80°**Components**

LF	1 x neodymium woofer (3" voice coil)	12"	15"
HF	1 x neodymium driver, titanium diaphragm (3" voice coil)		

Cabinet

Height	560 mm	650 mm
Width	410 mm	460 mm
Depth	401 mm	429 mm
Angle (monitor)	35° to vertical	
Weight (net) Kg.	19,2	23,2

Connectors

2 x AC PowerCon (input, link)
2 x XLR (input, link)
2x RJ45 for computer connection (input, link)

Material	Birch plywood, Steel frontal grille with grey acoustic cloth
Finish	Varnished. Optionally with ecological acrylic resin base black paint
Rigging	Optional "U" bracket

Accessories: Flight-Case (TouringSet) for TWO units (optional)

10.2. X-18W Specifications

Balanced line input

1.8 V

Impedance

10k Ω

Mains

230V +/- 10% / 50-60Hz (overvoltage protection)

Maximum power consumption

3A

Frequency response

Frequency response (+/-3 dB)

35Hz-130Hz

Usable bandwidth (-10 dB)

30Hz-140Hz

(1W, preset LPF130)

Maximum output level

128 dB SPL

(preset LPF130)

Total amplifier power

1500 W

Nominal directivity (-6dB)

Horizontal

omnidirectional

Vertical

omnidirectional

Components

LF 1x18" neodymium woofer (4" voice coil)

Cabinet

Height 567 mm

Width 610 mm

Depth 650 mm

Weight (net) 43 Kg

Connectors

2 x AC PowerCon (input, link)

2 x XLR (input, link)

2x RJ45 for computer connection (input, link)

Material

Birch plywood, Steel frontal grille with grey acoustic cloth

Finish

Varnished. Optionally with ecological acrylic resin base black paint

11. TROUBLESHOOTING

No power

- Check the device is connected to mains
- Check mains cable is in good condition.
- The thermal fuse may be activated. The replacement of this fuse must be carried out by specialized personnel as it is an internal component of the amplifier module.

No sound

- Check with the indicators that the signal is being sent from the mixer.
- Check that the signal cables are in good condition and connected at both ends
- The mixer output level must not be at minimum.
- Check that the mixer is not in Mute mode.

Distorted output signal

- The system is being saturated with a very high input signal, frequently caused by the same mixer. Check the output level or mixer gain channels.

Poor bass levels

- Check the polarity on the signal connections between the mixer and cabinets. If any of the Pins (1, 2 or 3) have been inverted at the cable ends, this will cause significant performance and sound quality loss.

Noise and Hum

- Check that all the connections to the active units are in good condition.
- Avoid intertwining between mains supply cables or proximity to transformers or Electromagnetic (EMI) emitting devices.
- Check there is no light intensity regulator in the same AC circuit as the unit. ALWAYS connect the sound and light circuits in different phases.

Overvoltage LED light (RED)

- Check that the mains voltage is within the limits (230+/-10%)