

C-series

Active Line Array System

Item ref: C-118S Sub Cabinet - 171.118UK
C-208 Array Cabinet - 171.208UK
C-Rig Flying Frame - 171.201UK
User Manual



Version 2.0



Caution: Please read this manual carefully before operating
Damage caused by misuse is not covered by the warranty

Introduction

Thank you for choosing the C-series line array system for your sound reinforcement requirements. The C-series comprises a modular array of sub and full-range cabinets to offer a matched system for each application. Please read the following information to ensure safe and correct operation of this equipment.

Components

- C-118S Active 18" subwoofer.
- C-208 2 x 8" + HF array cabinet.
- C-Rig flying or mounting frame.

Each enclosure is fitted with angle-adjustable flying hardware and may be suspended or free-standing. The C-Rig flying frame provides a stable fixing platform, which can in turn be suspended at height via 4 included Eyebolts and straps or mounted to a flat surface.

Up to 4 x C-208 cabinets per C-118S sub unit can provide targeted coverage with high-output full-range sound. For high energy bass and dynamics, use 2 x C-208 cabinets for every C-118S sub unit. For higher SPL requirements, increase the number of both C-118S sub units and C-208 enclosures at the same ratio.

Warning

To prevent the risk of fire or electric shock, do not expose any of the components to rain or moisture. Avoid impact to any of the components. No user serviceable parts inside - refer servicing to qualified service personnel.

Safety

- Please observe the following warning conventions



**CAUTION: RISK OF ELECTRIC SHOCK
DO NOT OPEN**



This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

- Ensure that the correct mains lead is used with adequate current rating and mains voltage is as stated on the unit.
- C-series components are supplied with Powercon leads. Only use these or equivalents with the same or higher spec.
- Avoid ingress of water or particles into any part of the housing. If liquids are spilled on the cabinet, stop using immediately, allow the unit to dry out and have checked by qualified personnel before further use.

 **Warning: these units must be earthed**

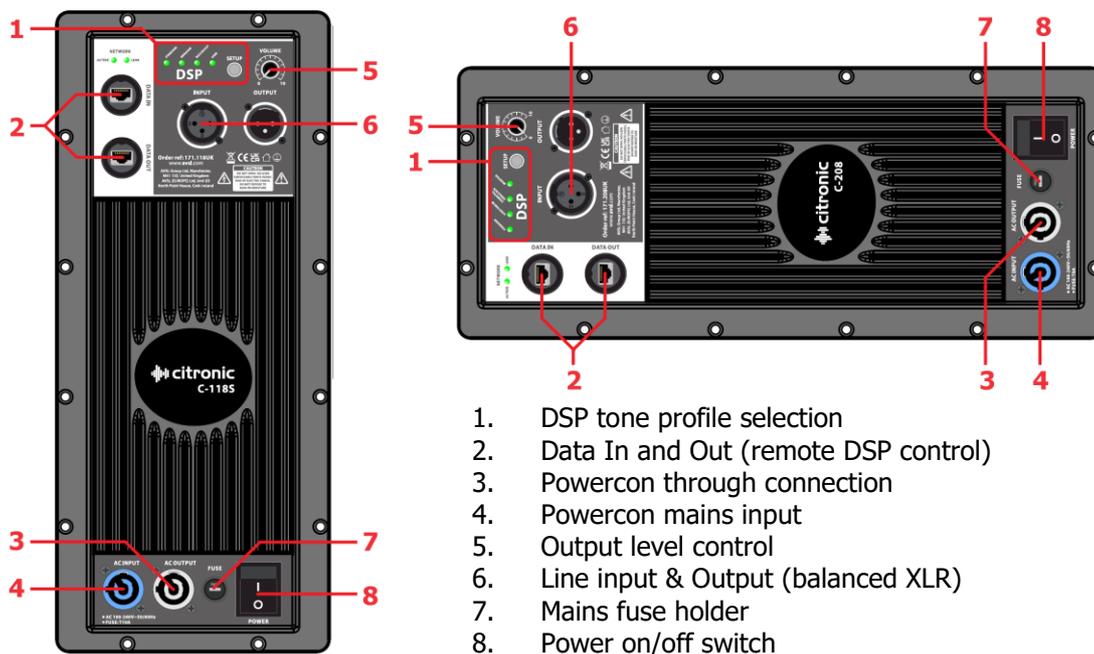
Placement

- Keep the electronic parts out of direct sunlight and away from heat sources.
- Position the cabinet on a stable surface that is adequate to support the weight of the product.
- Allow adequate space for cooling and access to controls and connections at the rear of the cabinet.
- Keep the cabinet away from damp or dusty environments.

Cleaning

- Use a soft dry or slightly damp cloth to clean surfaces of the cabinet.
- A soft brush can be used to clear debris from controls and connections without damaging them.
- To avoid damage, do not use solvents to clean any parts of the cabinet.

Rear panel layout – C-118S & C-208



Line array principle

A line array provides an efficient method of addressing an auditorium by efficiently distributing sound to target areas. Sub cabinets are not as directional as higher range cabs and are effective when stacked straight, close to the audience. Array cabinets deliver full-range or mid-top frequencies which are much more directional. Each array cabinet is designed to provide a wide sound dispersion using a ribbon tweeter and mid-range drivers in a horizontal enclosure. The vertical dispersion of array cabinets is narrow and focused. For this reason, covering an auditorium with many rows of seats requires several array cabinets in a parabolic, angled formation to address several rows of listeners each.

Configuration

The C-series line array system can be operated in various configurations to suit the environment.

- A free-standing full stack with the sub cabinet(s) forming the base and the array cabinets mounted on top and angled backwards to address different lateral zones of the auditorium at varying heights.
- Fully suspended, using the optional C-Rig frame, one or more sub cabinets are attached to the C-Rig and array cabinets are flown beneath the subs in a curved formation.
- Array suspended (again the C-Rig is recommended) the sub cabinets are free-standing on the floor and array cabinets are suspended overhead in a curved formation.

Assembly

The C-Rig frame is supplied with 4 large eyebolts, which must be fixed to each corner of the frame. In each of these, one of the supplied D-shackles should be attached for connecting to flying gear, such as a hoist, fixed wire rope or the included lifting straps. In each case, ensure that the flying assembly has a safe working load that can handle the weight of the components that are being suspended.

Each C-118S sub and C-208 array cabinet has 4 metal flying castings at the sides of the enclosure. Each has a channel running through it and a sliding spacer bar inside. This bar has multiple fixing holes for different spacings to set the required angle between each enclosure during setup. Similar holes are punched into the C-Rig for fixing a sub or array cab to it. Ball lock pins are fitted by a wire to the sides of each enclosure, which peg through the casting into the fixing holes to set the position of the spacer bar. To set a pin, line up the holes at the required spacing and press in the button at the end of the pin to unlock it and slide the pin through the holes to the end. To remove a pin, press the button again to unlock the pin and slide it out. Each spacer bar is also fixed into the casting with a hex set screw, which can be removed and replaced to re-set the position of the spacer bar.

Connections

Each sub and array enclosure has an internal class-D amplifier and DSP speaker management system. All connections are located on the rear panel.

Power to each cabinet is supplied via blue Powercon mains input (4) and fed through to subsequent cabinets via the white mains output (3). Powercon are twist-lock connectors that will only fit the socket in one position and must be pushed in and rotated clockwise until the lock clicks for connection. To release the Powercon, pull back the silver release grip and rotate anticlockwise before withdrawing the connector from its socket.

Connect mains power to the first component (usually sub) and cascade mains from output to input to power all cabinets using the supplied Powercon input and link leads. If leads are to be extended, use only equivalent or higher rated cable.

Each cabinet also has signal input and output (through) on 3-pin XLR connections (6). These accept balanced line level audio (0.775Vrms @ 0dB) and, as with power connection, the signal for an array should be connected to the first cabinet (usually sub) and then out from that cabinet into the next until a daisy-chain of the signal is connected to all cabinets.

The last remaining connectors are RJ45 input and output for data (2), which is for future DSP control development. A PC is connected into the first cabinet and then data is cascaded from output to input until all cabinets are linked.

Operation

Before powering up, it is advised to turn the output level control (5) fully down on each cabinet. Switch on the power (8) and turn the output level up to the required setting (normally full, as volume is usually controlled from a mixing console).

On each rear panel, there is a DSP speaker management section with 4 selectable tone profiles for different types of application. These presets are labeled for the application they are most suitable for and are selected by pressing the SETUP button to step through them. DSP presets are designed to be controllable and editable via RJ45 data connection from a laptop in future development.

For safety, it is recommended to turn the output level of each cabinet fully before powering down to avoid loud pops through the speakers.

The sections on the following pages cover remote control and adjustment of each line array speaker component via USB to RS485 connection. This is only necessary for very specific adjustment and is aimed at providing full functionality for experienced audio professionals. It is recommended to save current DSP settings as files on a PC using the free software prior to over-writing any internal pre-sets.

Remote RS485 device management

The C-series line array speakers can all be accessed remotely by daisy-chaining the data connections via RJ45 network cables (CAT5e or above). This enables in-depth editing of EQ, dynamics and crossover filters for each amplifier on each line array cabinet or subwoofer.

In order to control the C-series speakers remotely from a PC, download the Citronic PC485.RAR package from the product page on the AVSL website - www.avsl.com/p/171.118UK or www.avsl.com/p/171.208UK

Extract (unpack) the RAR file to your PC and save the folder with "pc485.exe" to the PC in a convenient directory. The application runs directly from the software by double-clicking pc485.exe and selecting "YES" to allow the application to make changes on the PC (this simply allows the application to function).

The first screen shown will be a blank **Home** screen. Select the **Quick Scan** tab and the screen below will be displayed.

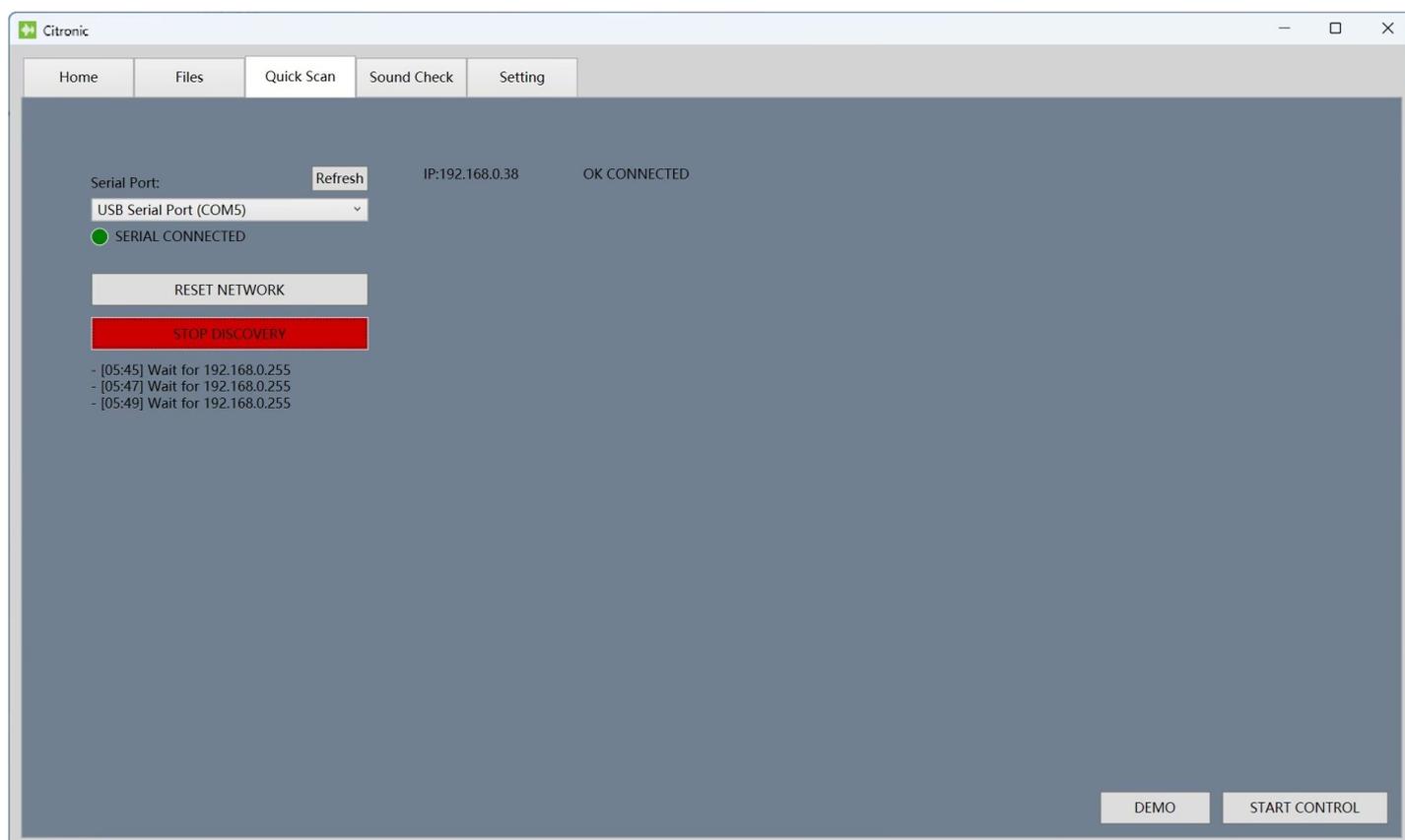
Connect the first speaker of the line array from the PC using the USB to RS485 adaptor and then link further speakers in a daisy-chain, connecting RS485 output from one cabinet to the RS485 input of another in succession using CAT5e or above network leads.

Click the Refresh button and if speaker(s) are connected, the connection will show as a USB Serial Port (COM*), where * is the communications port number. There may be other COM ports open for unrelated devices, in which case the correct COM port for the speakers in the drop-down list will need to be selected. To determine which is the correct COM port might require disconnecting the line array, checking the COM ports, reconnecting the line array and re-checking COM ports to make a note of which number has appeared in the list.

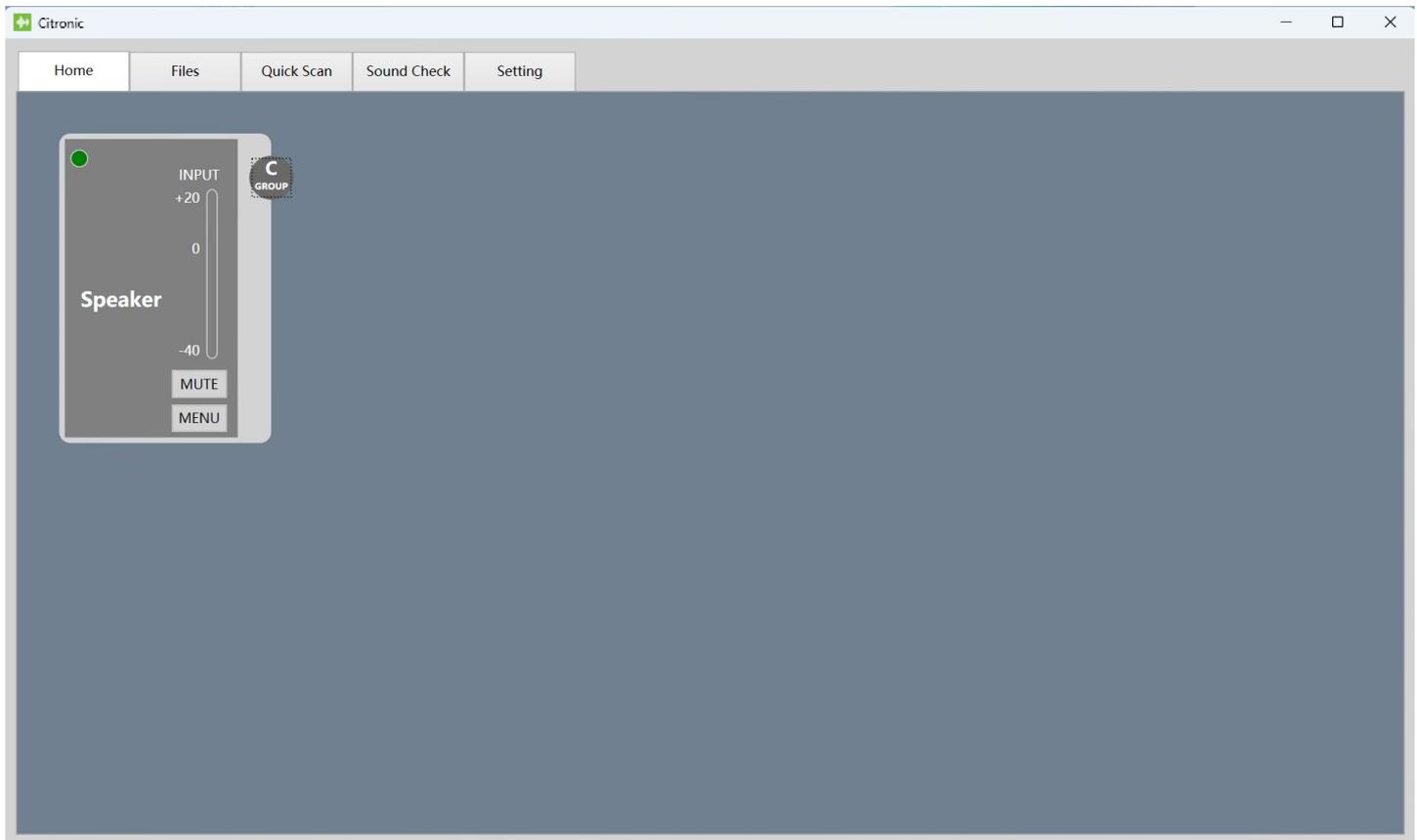
When the correct COM port is selected, click on **DEVICE DISCOVERY** and the PC will begin to search for the C-series speakers.

When Device Discovery is completed, click on **START CONTROL** at the bottom right side of the window.

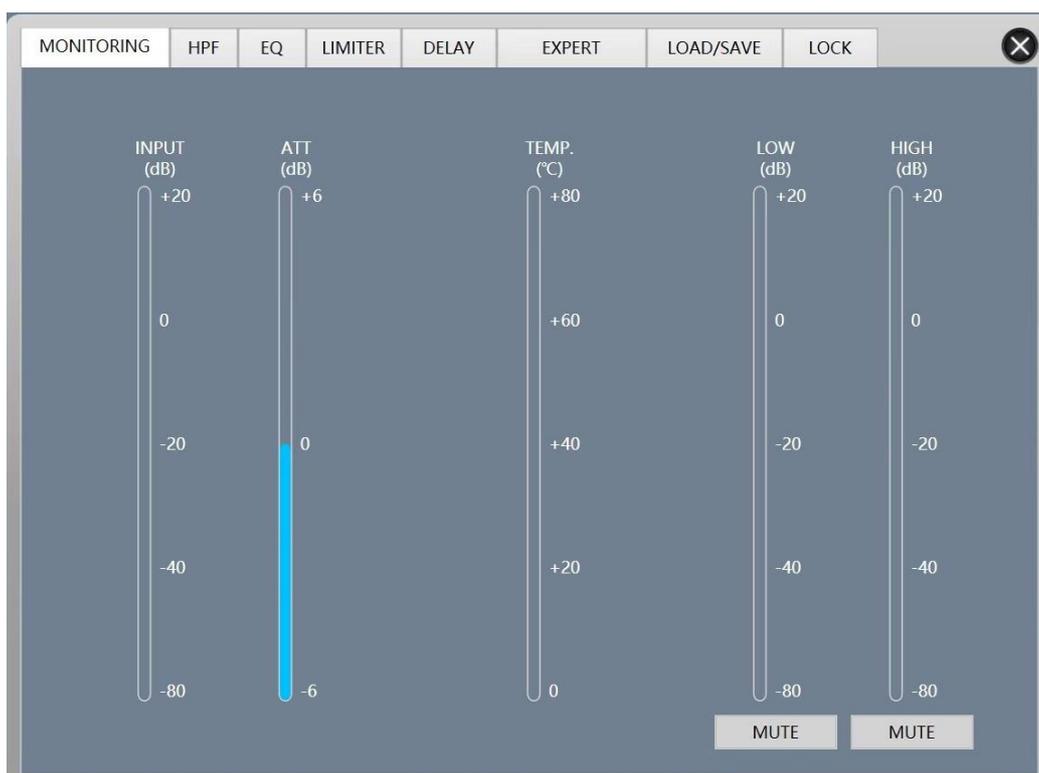
There is also a **DEMO** option to check the features of the application without connecting a line array.



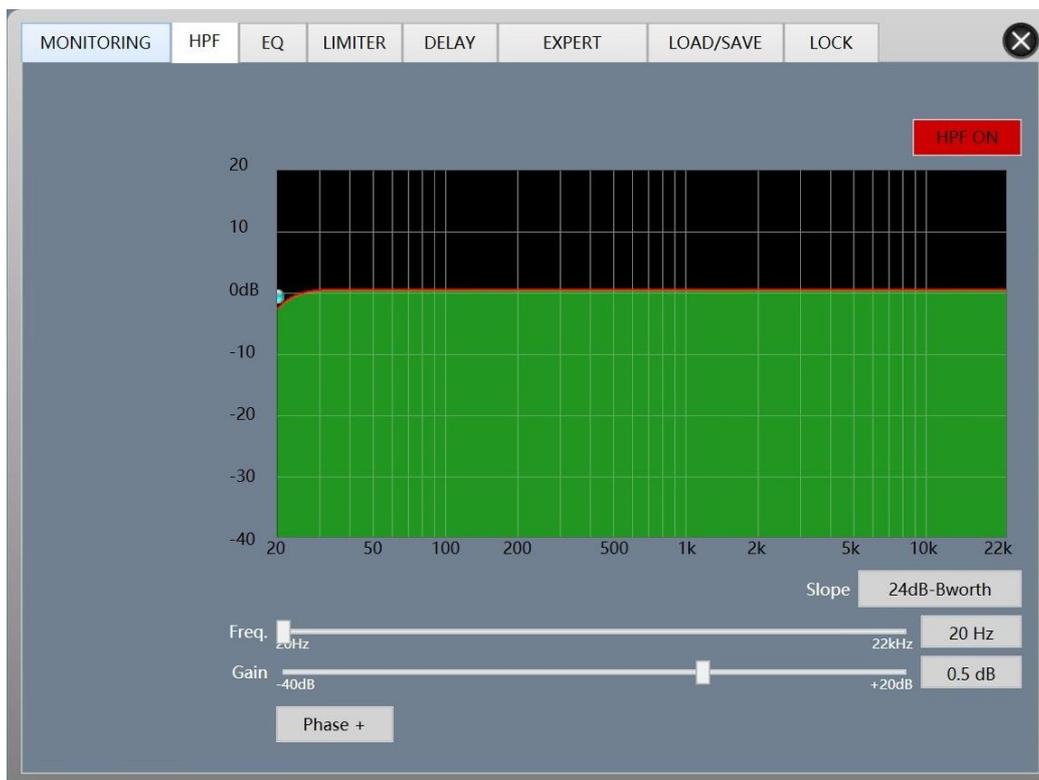
After selecting the START CONTROL or DEMO option, the window will revert to the Home tab, showing the available array speakers as floating objects in the window, which can be grabbed and moved around the window for convenience.



Each object can be allocated a Group (A to F) and has a **MUTE** button for use when testing and identifying speakers within the array. Clicking the **MENU** button opens a sub-window for that array speaker to enable editing. The **MONITORING** tab shown below displays the status of the speaker with **LOW & HIGH** frequency **MUTE** buttons.



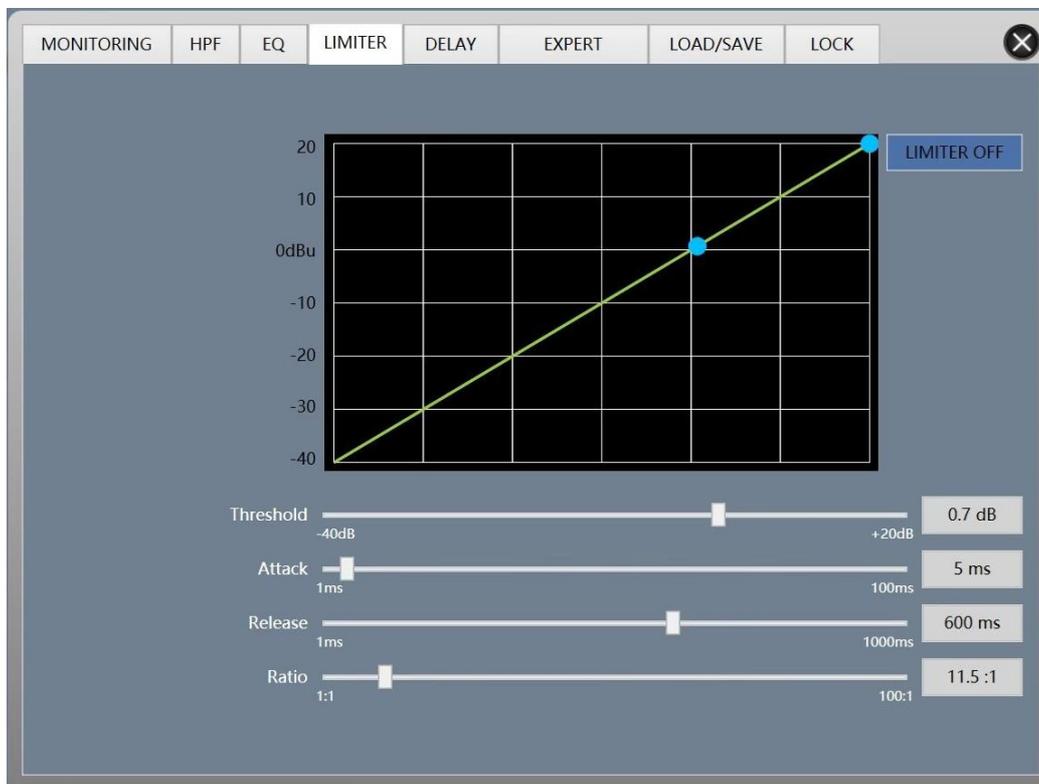
The next tab along is for the High Pass Filter (**HPF**) to remove any sub frequencies that are too low for an array component to reproduce, adjustable by filter type, cutoff frequency, gain and also includes a phase switch (+ is in-phase)



Moving right to the next tab opens the 6-band parametric equalizer (**EQ**) with frequency, gain and Q (bandwidth or resonance) adjustable by clicking on the filter number to edit, and adjusting virtual sliders, typing values directly into the text boxes or clicking and dragging the virtual EQ points on the graphic display. Options for Band pass (Bell), Low Shelf or High Shelf can be selected via a row of buttons beneath the sliders. Settings can be entered for each MODE (DSP profile) stored in the speaker, which can be restored to the original settings or set flat at the press of a button beneath the graphic display.



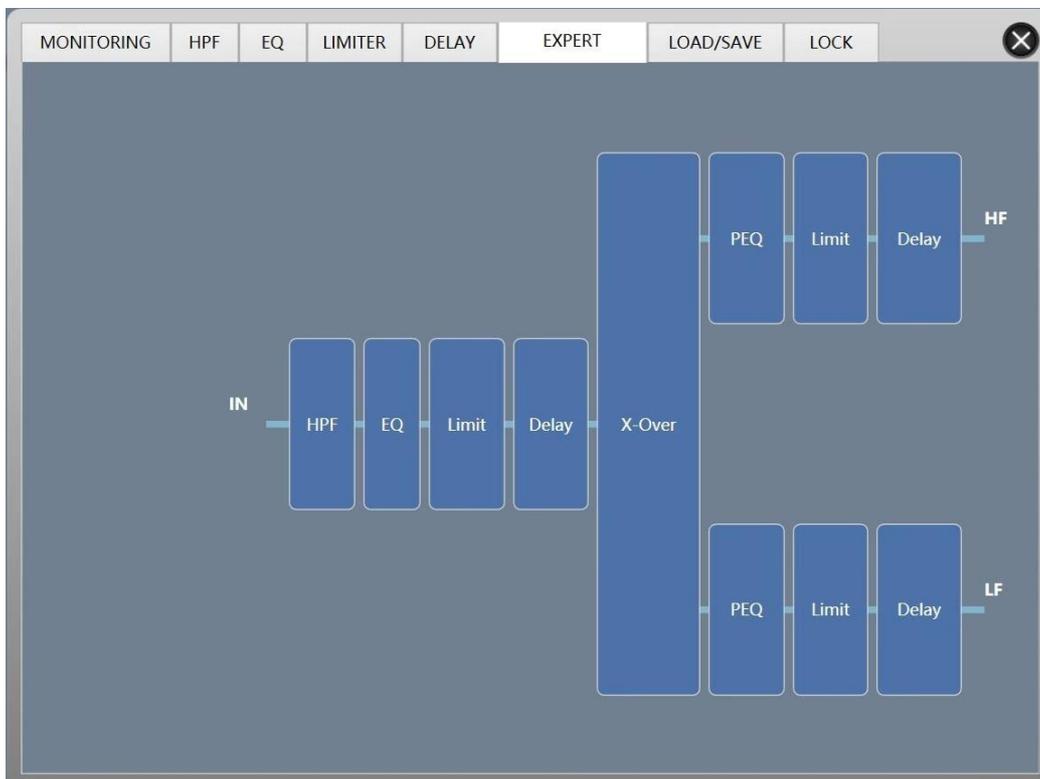
The next tab along handles the Inbuilt **LIMITER**, which sets a ceiling level for the audio signal to help protect the speaker from overload. If the top button shows "LIMITER OFF", click this same button to enable it. Limiter settings are also editable via virtual sliders, by entering values directly into the text boxes or by dragging the virtual Threshold and Ratio points on the graphic display. Attack & Release times of the limiter may also be adjusted by virtual sliders or entering values directly.



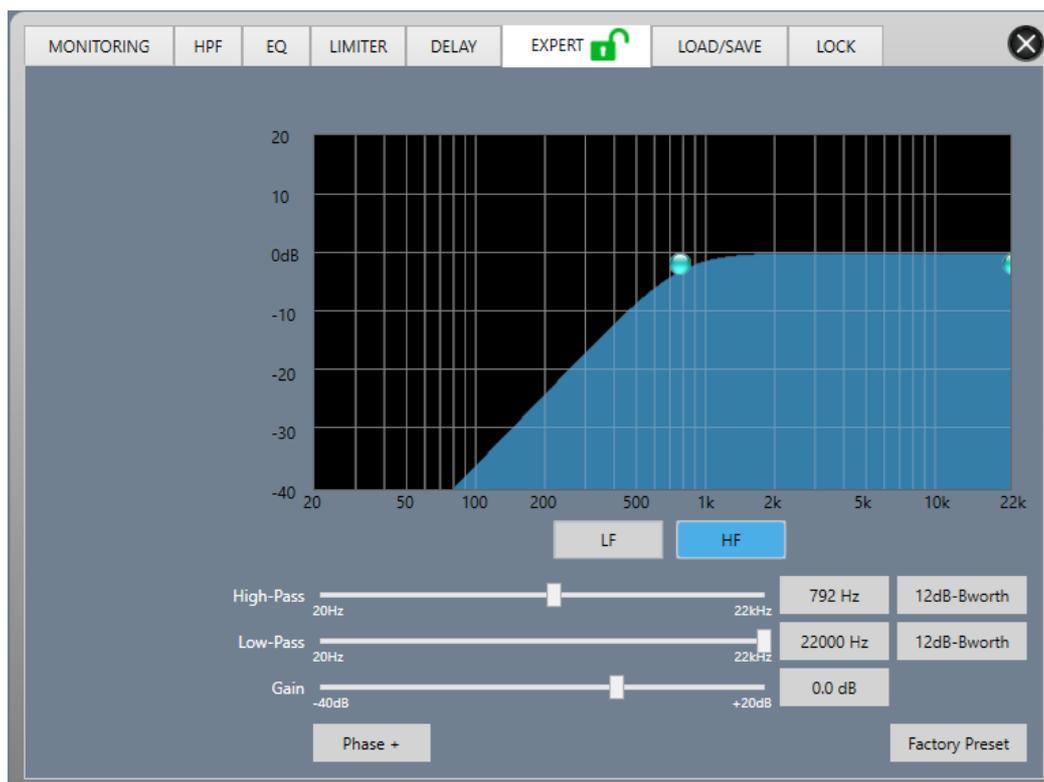
The next tab deals with **DELAY**, which is used to time-align speaker stacks that are at large distances apart. The DELAY setting is managed via a single virtual slider or by directly entering values in text boxes in measurements of feet (FT), milliseconds (ms) or metres (M).



The next tab along is labelled **EXPERT** and gives a block diagram of the signal flow through the speaker including the four sections described above for signal input which can be accessed again by clicking the block on the diagram. The system crossover (or sub filter) and subsequent processors can also be accessed in the same way from this screen but may be locked by the installer to avoid unauthorized changes to critical settings, requiring a password to be entered. By default, this password is **88888888**, but may be changed under the **LOCK** tab if required.



A graphic display is switchable between **HF** and **LF** drivers (woofer/tweeter) in the speaker and shows **High-Pass** and/or **Low Pass** filters for each driver path (enabling shelving or band pass) and their filter type, frequency and **Gain** level. Again, settings can be adjusted on virtual sliders, entering values as text, or by dragging points on the display.



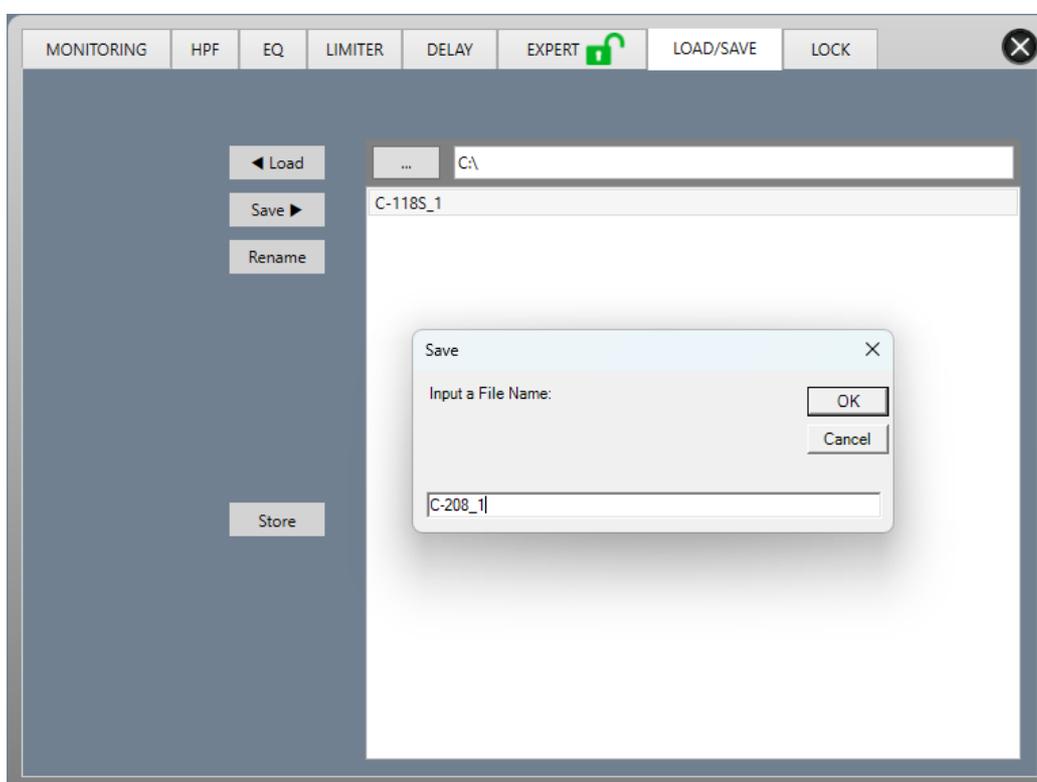
After crossover settings for LF and HF components are completed, the path for each in the **EXPERT** menu is shown with individual PEQ, LIMIT and DELAY blocks.

Note: There will only be a single path for C-118S sub cabinets because there is only one driver. However, the C-208 cabinet will have two paths for LF and HF drivers in the cabinet.

Adjust PEQ, LIMIT and DELAY for each output path in the same way as for the EQ, LIMIT and DELAY of the input signal. As with the input section, parameters can be adjusted using virtual sliders, entering values as text or by dragging points across the graphic interface.

It is useful to return to the **MONITORING** tab when all settings have been adjusted to preference to check that the speaker drivers and amplifier are not overloading or even if the settings are too restrictive to the signal, making it quiet. This might benefit from using the inbuilt Pink Noise Generator (described below)

Once all settings are finalized, the file for this speaker can be saved to and loaded from the PC via the **LOAD/SAVE** tab. Click the 3 dots ... to browse for a location to save to on the PC, click **Save ▶** and enter a file name and then click **OK**. The file for that speaker will now be saved to the PC in the directory chosen with the name that was entered for it. Any files that have been saved this way can be recalled later by selecting it from the list and clicking **◀ Load**.

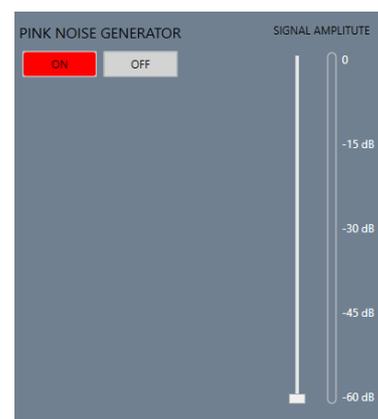


Closing the menu window for the speaker returns to the HOME tab of the main menu window. One especially useful tab in the main menu is **SOUND CHECK**. This opens up a panel for a pink noise generator for testing the speakers.

Pink noise is a random mix of all audible frequencies mixed together to create a specially formulated "hiss" and "rumble" that is ideal for testing output from speakers. Within this window is a **SIGNAL AMPLITUDE** slider and **ON/OFF** switches for the noise generator.

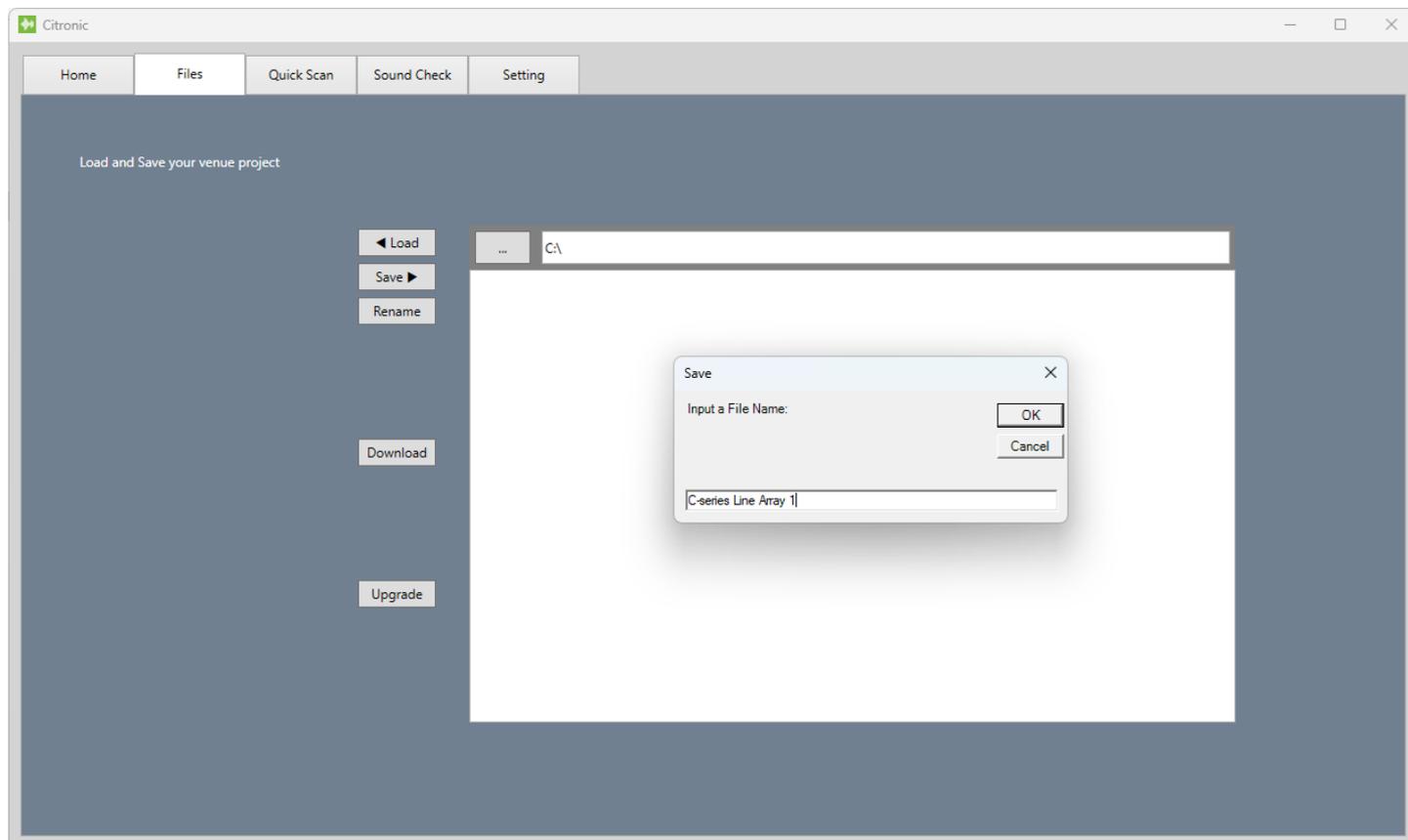
The maximum output of the pink noise generator is 0dB (i.e. unity gain).

The end tab in the main menu is labelled **Setting**, which displays the software version and serial port connection status.



When all speaker files have been finalized and saved, the full set of files can be saved as a project for the specific venue or application under the **Files** tab of the main menu.

As with saving and loading individual speaker files on the PC, the project can be named and saved to a preferred location on the PC for retrieval at a later time.



Specifications

Component	C-118S	C-208
Power supply	230Vac, 50Hz (Powercon® in + through)	
Construction	15mm plywood cabinet, polyurea coated	
Amplifier: construction	Class-D (inbuilt DSP)	
Frequency response	40Hz - 150Hz	45Hz - 20kHz
Output power rms	1000W	600W
Output power peak	2000W	1200W
Driver unit	450mmØ (18") driver, Al frame, ceramic magnet	2x200mmØ (8") LF + HF ribbon (Ti CD)
Voice coil	100mmØ (4")	2 x 50mmØ (2") LF, 1 x 75mmØ (3") HF
Sensitivity	98dB	98dB
SPL max. (1W/1m)	131dB	128dB
Dimensions	710 x 690 x 545mm	690 x 380 x 248mm
Weight	54kg	22.5kg
C-Rig SWL	264kg	



Disposal: The "Crossed Wheelie Bin" symbol on the product means that the product is classed as Electrical or Electronic equipment and should not be disposed with other household or commercial waste at the end of its useful life. The goods must be disposed of according to your local council guidelines.

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