TWAUDIO®

# A3.9

## Preset Guide
## Powersoft X4
## EN

## General information

Operation manual: A3.9 Preset Guide
Version 1.1 EN, 01/2019, TG / WW
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All information in this preset guide has been compiled to the best of our knowledge at the time of writing and relates to Armonia Software 2.11.4.

TW AUDiO reserves the right to update this document based on recent developments.

We are looking forward to suggestions that allow us to improve this preset guide. Just send your suggestions via e-mail.

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# 1. Presets and Preset Structure

The following chapters cover presets from preset list A3.9. The procedures described here are valid for A3.9 preset list version and higher. They are not downwards-compatible.

## 1.1. Basics

- The Damping Control section can be adjusted for all subwoofers. Using it will activate a low-pass filter at approximately 400 Hz maximum.
- For full-range speaker presets, a CUT / FLAT / FULL mode can be set using PEQ # 1 of the Speaker EQ (see Table 1).
- Filters 2 - 6 are free for user configuration in Speaker EQ.

Table 1: X4 Speaker EQ Filter

| Filter | Function |
|---|---|
| PEQ#1 *<br>Fullrange Top Loudspeaker | FULL / FLAT / CUT mode*<br>OFF, GAIN 0 dB – full mode<br>ON, GAIN -6 dB – flat mode<br>ON, GAIN -15 dB – cut mode<br>*The filter gain can also be adjusted individually.* |
| PEQ#7<br>VERA10 biamp, VERA10 passive: | High shelving correction of array length |
| PEQ#7<br>T24N: | 90° Horn Correction (Filter 1 of 2) |
| PEQ#7 ALP<br>(=All-pass filter) | For uniform phase adjustment of all TW AUDiO products.<br>(Not required as ALP for VERA10 presets) |
| PEQ#8<br>VERA10 biamp, VERA10 passive: | 120° Horn Correction |
| PEQ#8<br>T24N: | 90° Horn Correction (Filter 2 of 2) |

* PEQ # 1 is not available for subwoofers and T24 passive / biamp.

If you reload a preset, all previously made Speaker EQ settings are reset!

# 2. Transferring Presets (*.spk2) to X4 Memory (Board)

## 2.1. Armonia Pro Audio Suite

Please download the latest Armonia Pro Audio Suite software using the following link:

**https://www.twaudio.de/en/product/amplifiers-software/armonia-software-everything-is-under-control/**

When the software has been installed, it will check for updates on every launch (Internet connection required). Available updates can then be automatically downloaded and installed.

Starting with Armonia Pro Audio Suite 2.5.0, which was released in October 2014, Powersoft X series is supported. TW AUDiO X4 Presets (*.skp2 files) are compatible with Armonia version 2.11.4. TW AUDiO recommends that you always run the latest version of the Armonia Pro Audio Suite.

## 2.2. Establishing a network connection

Connect your Powersoft X4 amplifier (directly or using an Ethernet switch) to your PC using Ethernet CAT5E connection cables. Do not use crossed cables.

The factory default setting for IP addressing on Powersoft X4 amplifiers is DHCP / AutoIP. Make sure that the network adapter or PC that you want to connect to the amplifier is part of the same local network. Check the TCP/IPv4 settings of the PC network adapter in your computer's networking and sharing control panel.

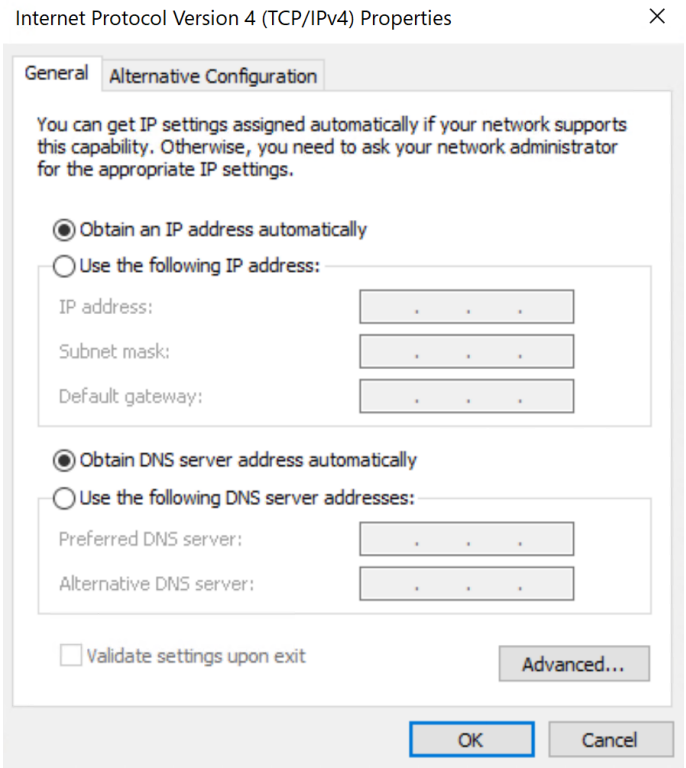


Figure 1: TCP / IPv4 settings

## 2.3. Transfer of presets to the X4 unit using the Preset Manager

All official TW AUDiO X4 Presets are already included in the download of Armonia Pro Audio Suite 2.11.4.

In case of updating presets, you can transfer preset data into the Armonia software as explained in this chapter. Please take into account that the procedure will take some minutes to accomplish:

1. Copy your TW AUDiO X4 presets to this folder:

   C:\Users\Public\Documents\Powersoft\Armonia\SpeakersLibrary

2. Make sure that your network is connected and configured properly as described in section 2.2.

3. Launch the Armonia Pro Audio Suite software.

4. In the “Remote Entities” window, click “Discovery”. All connected devices should now be displayed in this window. If they aren’t, please check all steps listed in section 2.2 again.

Figure 2: Armonia Remote Entities

5. Add all found devices to your Workspace using the “Add all” button.

6. Under the “View” tab, open the Preset Manager.

7. In the Preset Manager, select the X I DSP + D tab.

8. Click the “Spk Presets” box.

9. Select the presets (*.spk2) you want to transfer to the memory (Board) of the Powersoft X4 amplifier. Set the “Upload” and “Lock” check boxes ensure these presets won’t be overwritten.

10. Enter 081268 in the “Unlock Password” field and 081268 in the “Lock Password” field.

11. Click “Apply to All” to initiate transfer of the presets to all devices.

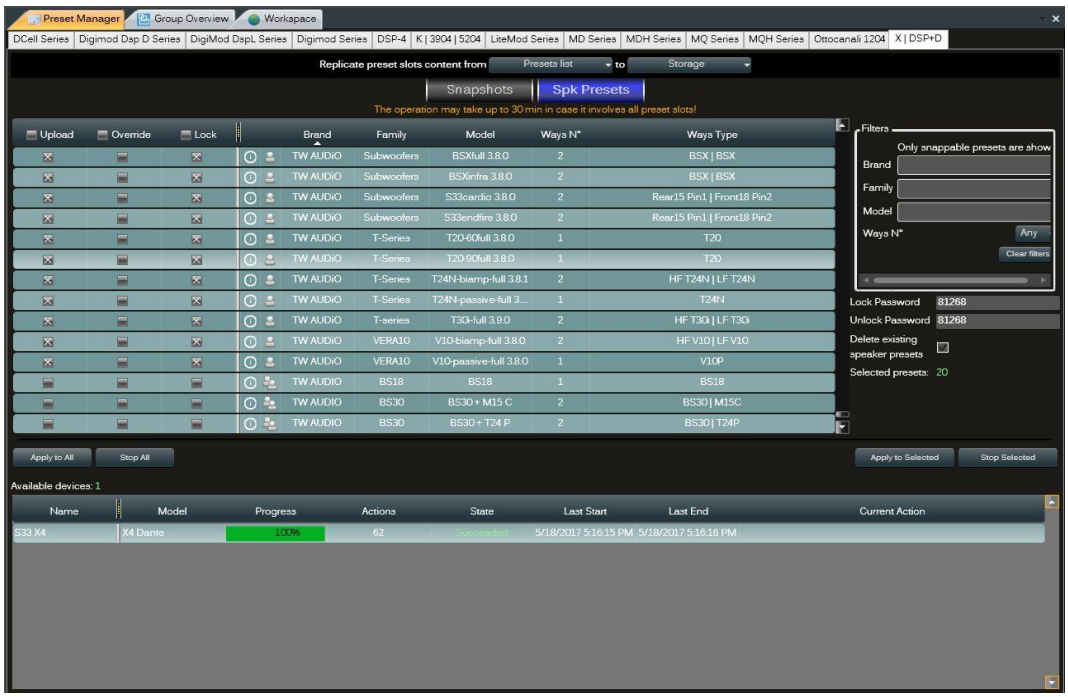


Figure 3: Armonia Preset Manager

# 3. Using Presets (* .spk2) in the Armonia Pro Audio Suite

## 3.1. Loading presets into X4 using Armonia Pro Audio Suite

HINT

In order to load presets with the Armonia Pro Audio Suite into a Powersoft X4 amplifier, a network connection must be established between the computer and the Powersoft X4 amplifier. Please proceed as described in section 2.2.

Also make sure that the respective Powersoft X4 amplifiers have been added to the Workspace as described in section 2.3.

In general, TW AUDiO recommends resetting your Powersoft X4 amplifier before usage.

To do so, right-click on the desired Powersoft X4 amplifier. Under “Device”, you’ll see a “Reset” field. Click on this field and confirm the procedure by clicking “OK”.

HINT

Please make sure that during reset there is no input signal present or no loudspeaker being connected to the amplifier. After reset, the X4 will be unmuted!

Loading Presets: Double-click the Powersoft X4 amplifier the (*.spk2) preset should be transferred to. The window for the selected Powersoft X4 amplifier will now open.

Click the icon highlighted in Figure 4 to enter the Speaker Configuration menu.

Figure 4: Armonia Powersoft X4 Menu

You will now see all presets (*.spk2) which are included with the Armonia Pro Audio Suite on the right side of the window, as well as all presets which you have previously copied to “C:\Users\Public\Documents\Powersoft\Armonia\SpeakersLibrary” as described in section 2.3.

If you are missing the previously copied presets in the list please click the Refresh button at the middle. Armonia will search for new presets in your local folders.

Select the desired preset (*.spk2) and drag the preset line to the desired output (blue circle) in the “Physical Output” of your Powersoft X4 amplifier. Dual-channel presets can only be dragged to Physical Outputs 1 and 3.

Click “Apply” to confirm your selection.

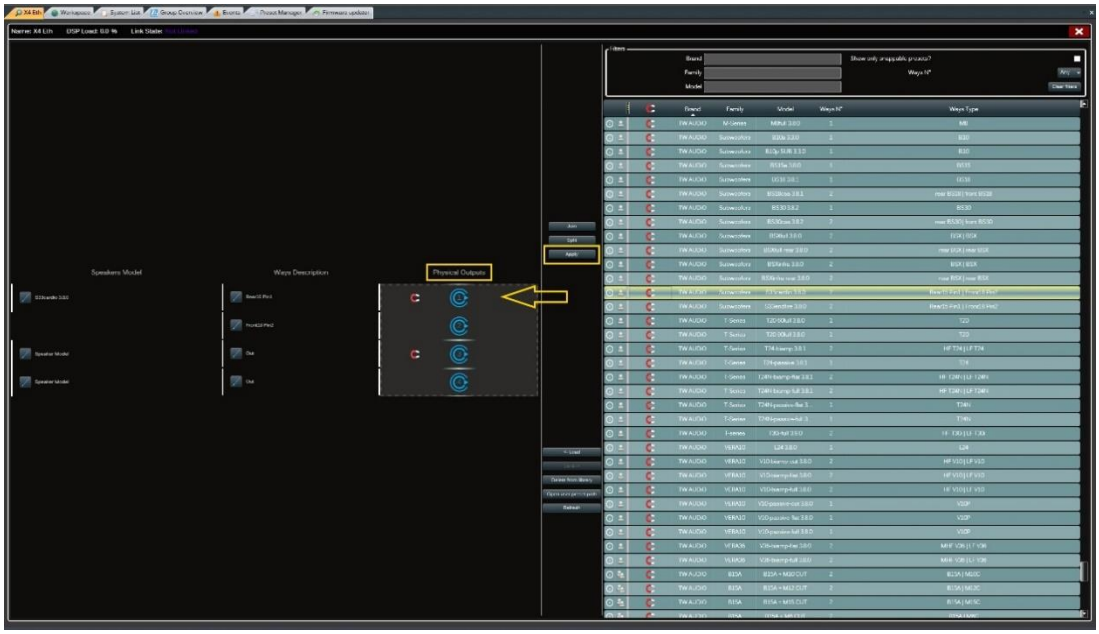

Figure 5: Armonia Speaker Preset Configurator Menu

## 3.2. Changing Operation mode using Armonia Pro Audio Suite

Click on the desired Spk EQ section in the Powersoft X4 amplifier window to set the operating mode (Cut, Flat, Full) of the connected loudspeaker. This can be changed here also independently from the currently loaded operating mode using PEQ1 as described in **Fehler! Verweisquelle konnte nicht gefunden werden.**.

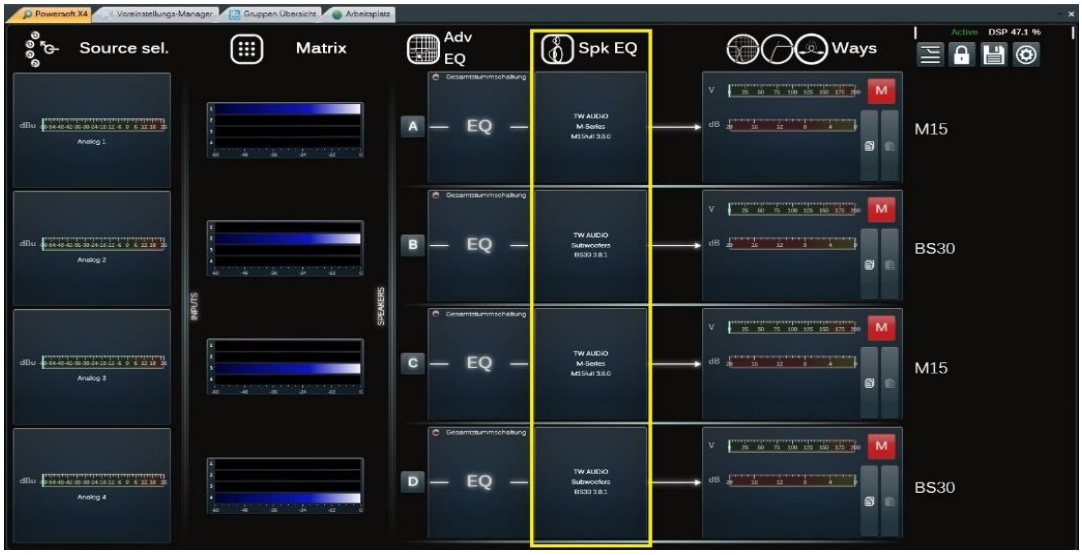


Figure 6: Armonia Spk EQ Menu

### 3.2.1. Operating Modes

For maximum headroom when operating subwoofers, TW AUDiO recommends CUT mode.

- The neutral FLAT mode can be used both in stand-alone mode and in combination with subwoofers.

For pronounced bass reproduction in stand-alone mode, TW AUDiO recommends using FULL mode.

The operating modes are set via PEQ#1 Gain according to the following specifications. You can also adjust the filter individually using other gain values.

### 3.2.2. Armonia – CUT Mode

For CUT mode, activate PEQ # 1 (ON) and set Gain to -15 dB.

Figure 7: Armonia – CUT Mode

### 3.2.3. Armonia – FLAT mode

Activate PEQ#1 for CUT mode (ON) and set Gain to -6 dB. The resulting EQ attenuation results in a neutral bass reproduction.

Figure 8: Armonia – FLAT mode

### 3.2.4. Armonia – FULL Mode

For FULL mode, turn off PEQ#1, or set Gain to 0 dB. This linear EQ setting will result in pronounced bass reproduction.

Figure 9: Armonia – FULL Mode

## 3.3. Input routing in Armonia Pro Audio Suite

### 3.3.1. Source Selection

In the Powersoft X4 Amplifier window, click the desired channel in the “Source Sel.” column to adjust the input priorities for the channel strip.

Figure 10: Armonia Source Select Menu

By default, input priorities are set as follows:

| | Priority 1 | Priority 2 | Priority 3 | Priority 4 |
|---|---|---|---|---|
| Channel 1 | Dante Ch 1 | Dante Ch 9 | AES Ch 1 | Analog Ch 1 |
| Channel 2 | Dante Ch 2 | Dante Ch 10 | AES Ch 2 | Analog Ch 2 |
| Channel 3 | Dante Ch 3 | Dante Ch 11 | AES Ch 3 | Analog Ch 3 |
| Channel 4 | Dante Ch 4 | Dante Ch 12 | AES Ch 4 | Analog Ch 4 |

Here, you can change the priority levels of connected input signals, or you can use the “Disable” button to disable the four-stage input signals redundancy and limit the system to one input per channel strip.

HINT

If you intend to operate your system with an analog signal, changing settings in this menu item is **not** required! The Powersoft X4 amplifier checks all input signals in order of priority. If no proper signal (clock) is present on a high priority input, the Powersoft X4 amplifier will automatically switch to the input with the next lower priority level and check this input. If no signal is present at the inputs with priority levels 1 to 3, the input signal with priority level 4 is automatically selected.

### 3.3.2. Matrix

In the Powersoft X4 amplifier window, click on the desired channel in the “Matrix” column to route input signals to the channel strips of your Powersoft X4 amplifier. You can also route mixed input signals at different levels to the channel strips. See Figure 11 and Figure 12.

Figure 11: Armonia – Matrix menu

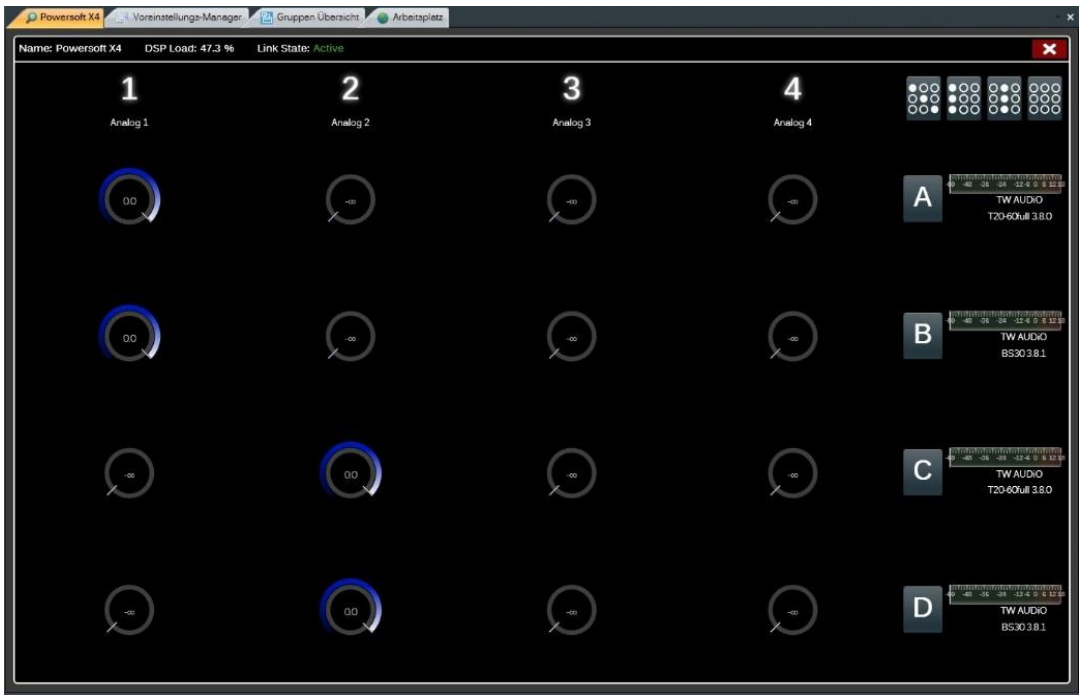


Figure 12: Armonia – Matrix Routing

## 3.4. Output Load Detection

Load detection is activated in presets by default. With an incoming audio signal but no load detected (i.e. no connected loudspeaker), the corresponding channel will be shown in red in the Armonia Pro Audio Suite. To disable load detection, double-click the output module in the “Diagnostic” section.

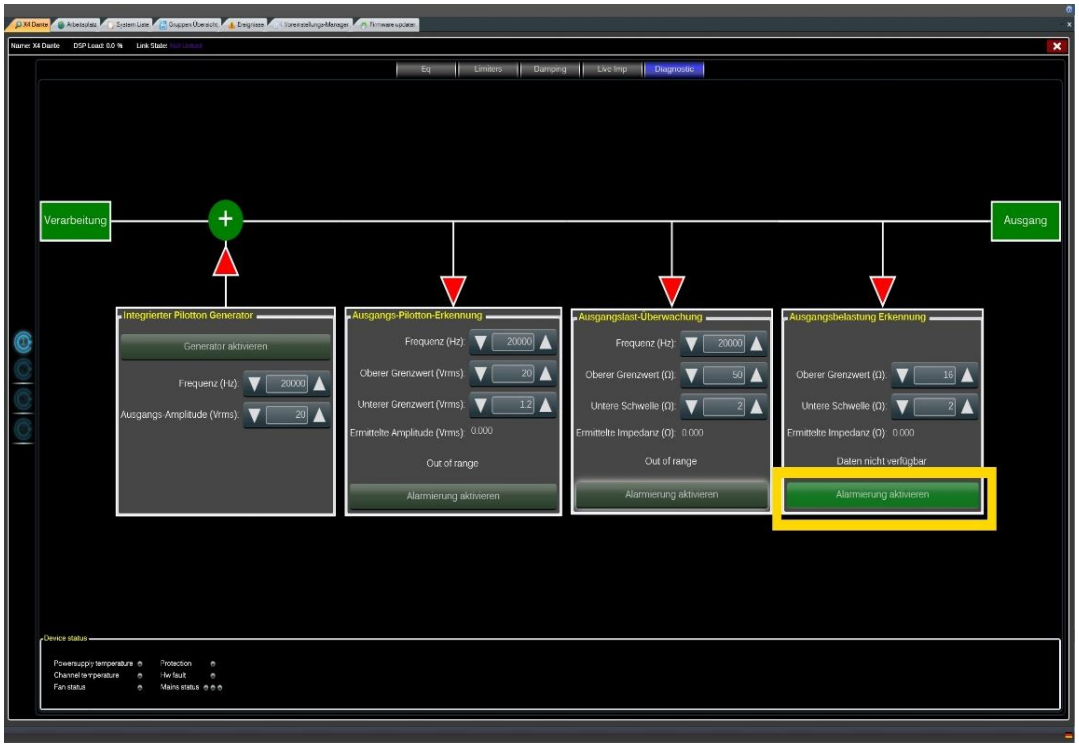


Figure 13: Enabling / Disabling Load Detection

# 4. Working with presets in the browser (mobile device)

Every Powersoft X Series amplifier can create its own WiFi network. This allows the user to change basic settings using the browser on his mobile device. Initial preset upload only requires a USB stick, no other applications or smartphone apps are required. If you did buy the X4 from TW AUDiO, the presets already have been factory installed instead.

## 4.1. Supported browsers

Apple iOS devices: Safari

Android or Windows: Google Chrome

## 4.2. Establishing a WiFi connection

**To establish a WiFi connection to your Powersoft X4 amplifier:**

1. Turn on the Powersoft X4 amplifier by pressing the large center button on the front panel.
2. Press the button on the far left of the Powersoft X4 amplifier's front panel. When this button is lit permanently, a WiFi network has been established. The SSID of this network will be as follows:

   Powersoft-MODELNAME-SERIAL (e.g.: Powersoft X4-71520)

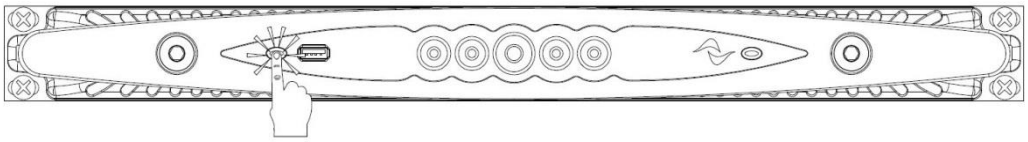

Figure 14: X4 WiFi button

3. Open the WiFi settings on your mobile device.
4. Select the amplifier's WiFi network with the above SSID.
5. Enter the following WiFi password: 0123456789
6. Open your browser and enter the following IP address in the address line: 192.168.0.1
7. The amplifier's user interface will now be displayed in your browser. You can now start managing your amplifier.
8. You will probably want to bookmark this page and keep it on your mobile device's home screen to you can easily reconnect to the amplifier's WiFi network later. E.g., on an iOS device, you would click the Sharing icon and then select "Add to Home Screen".
9. Turn off the local WiFi network after use. To do this, press the button on the far left of the front of the Powersoft X-Series amplifier again.

## 4.3. Loading Presets (* .spk2)

You can also load presets using your mobile device's web browser. However, this will only give you limited editing possibilities. Changes to presets as described in Table 1 cannot be made here.

Open the amplifier Home window in your browser as described in section 4.2. The Home screen looks like this:

Figure 15: Home window in the browser

In general, TW AUDiO recommends resetting your Powersoft X4 amplifier before usage. To perform a reset, press the "Reset" button in the lower right corner of the Home screen and confirm with "OK". You can now use the "Speaker" column to load presets (*.spk2) into the respective channel. Press the field corresponding to a channel (A, B, C, or D).

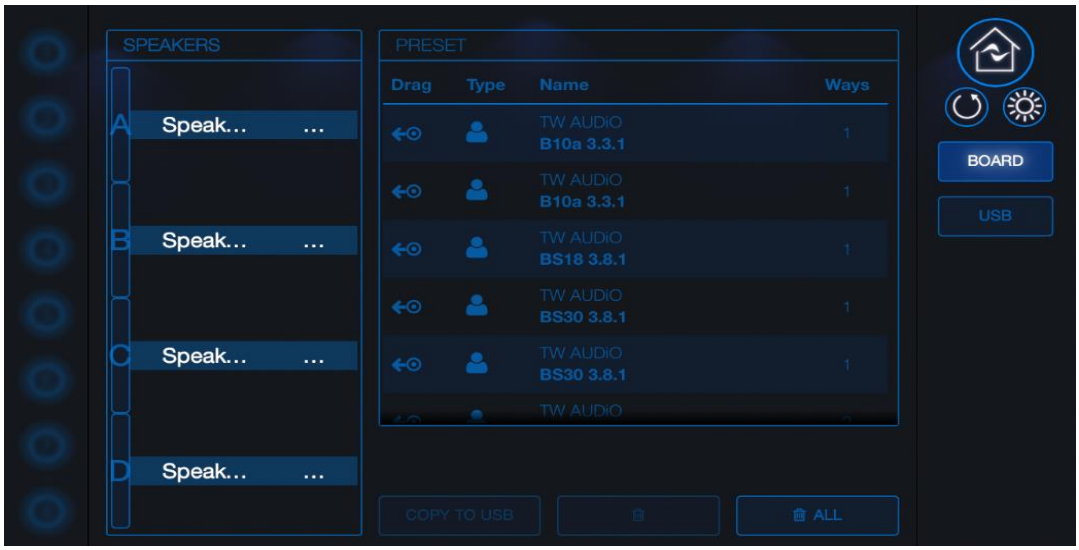


Figure 16: Presets in the browser (1)

You will now see the "Speakers" column on the left side of the screen. In this view, you can load presets into the respective channels A to D. On the right side of the screen you will see the "Preset" column. It shows the existing presets (*.spk2) for the selected storage location. Use the buttons on the right side of the window to select a storage location. Here, you can choose between the internal memory of the X4 amplifier ("BOARD") and an external USB drive ("USB") inserted into the slot on the front of the Powersoft X4 amplifier.

Select the preset you want to load (*.spk2) in the “Preset” column by clicking on its name. The preset name will now be highlighted (white text on a blue background). Drag the preset to the desired channel (A to D).

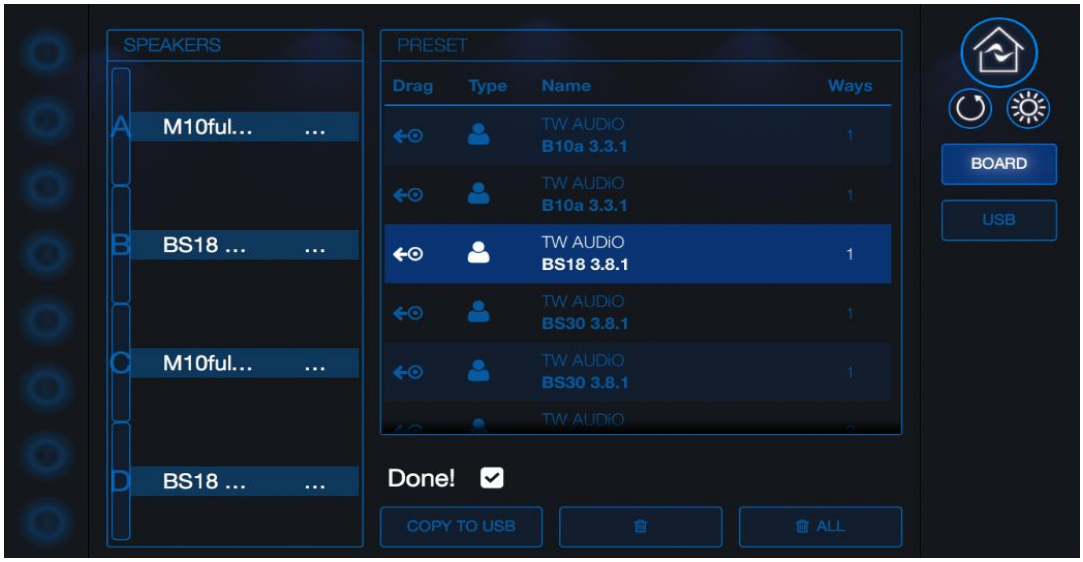


Figure 17: Presets in the browser (2)

TW AUDiO also offers two-channel presets (*.spk2) for operation of biamped speakers. These presets can only be loaded into channels A or C, as this will load the settings into channels B and D respectively.

Figure 18: Two-channel presets in the browser

## 4.4. Input routing in the browser

### 4.4.1. Input

To adjust input priorities of a channel strip, click in the “Input” column of the respective Powersoft X4 amplifier window.

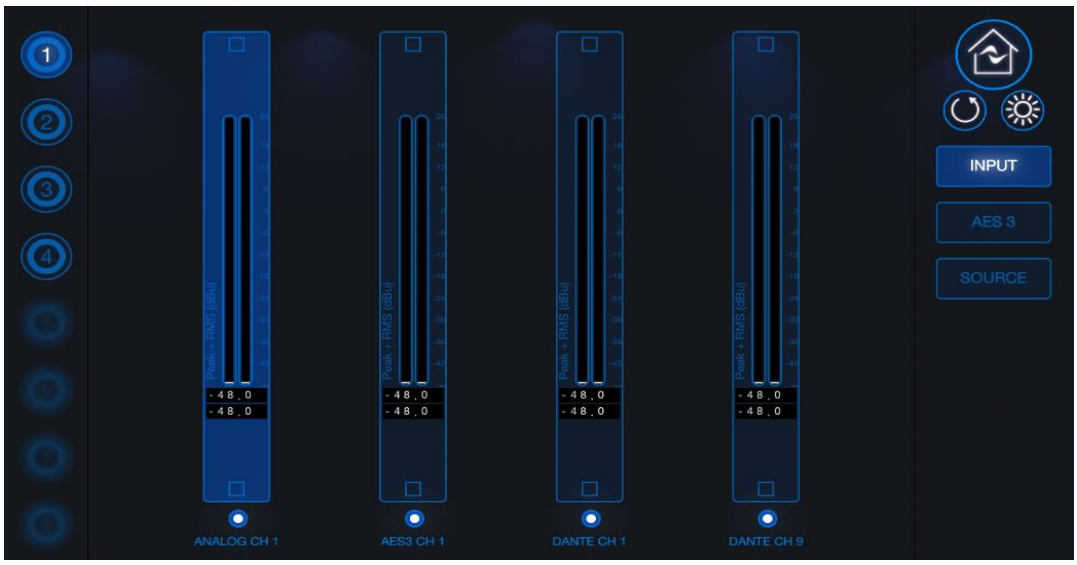


Figure 19: Input window in the browser

By default, input priorities are set as follows:

| | Priority 1 | Priority 2 | Priority 3 | Priority 4 |
|---|---|---|---|---|
| Channel 1 | Dante Ch 1 | Dante Ch 9 | AES Ch 1 | Analog Ch 1 |
| Channel 2 | Dante Ch 2 | Dante Ch 10 | AES Ch 2 | Analog Ch 2 |
| Channel 3 | Dante Ch 3 | Dante Ch 11 | AES Ch 3 | Analog Ch 3 |
| Channel 4 | Dante Ch 4 | Dante Ch 12 | AES Ch 4 | Analog Ch 4 |

You can change the priority levels of the input signals here, or switch off the four-stage input signal redundancy by using Disable in the “Source” window, limiting the channel strip to one input.

HINT

If you intend to operate your system with an analog signal, changing settings in this menu item is not required! The Powersoft X4 amplifier checks all input signals in order of priority. If no proper signal (clock) is present on a high priority input, the Powersoft X4 amplifier will automatically switch to the input with the next lower priority level and check this input. If no signal is present at the inputs with priority levels 1 to 3, the input signal with priority level 4 is automatically selected.

### 4.4.2. Matrix

To route input signals to the channel strips of your Powersoft X4 amplifier, click on the respective field in the “Matrix” column.

Figure 20: Matrix router in the browser

You can also route mixed input signals at different levels to the channel strips using the “Channel” submenu. See Figure 21.

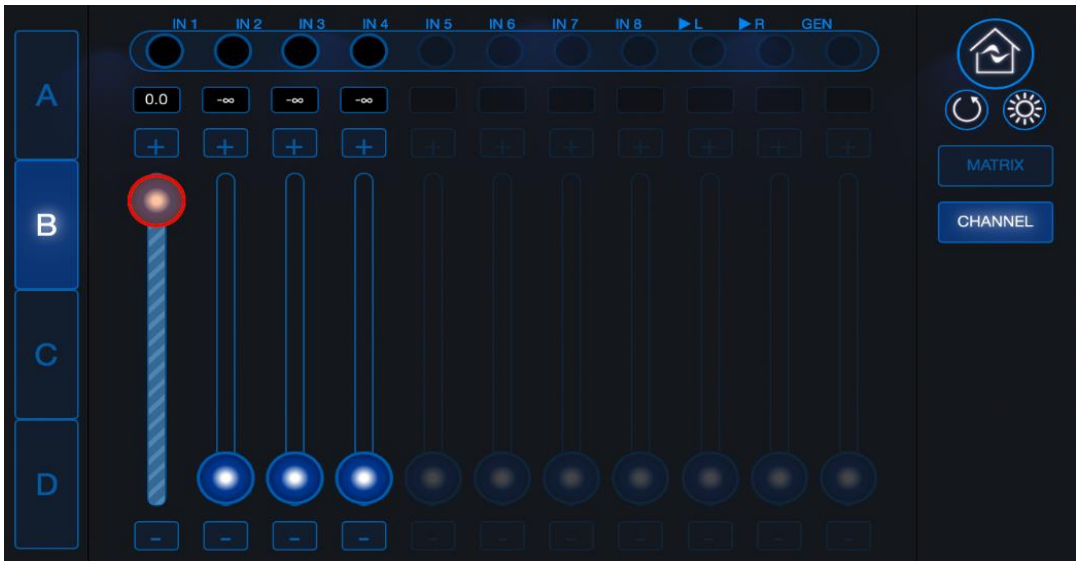


Figure 21: Matrix Channel in browser

# 5. Preset Usage

## 5.1. Point-source and subwoofer presets

### 5.1.1. End fire subwoofer arrays

In an end fire array, a number of low frequencies sources (subwoofers) are placed in line, one behind the other with specific spacing and delay strategy. It is the easiest way to achieve best possible sound pressure addition in the front with simultaneous partial energy reduction at the rear. This setup usually doesn't require any (acoustical) measurements.

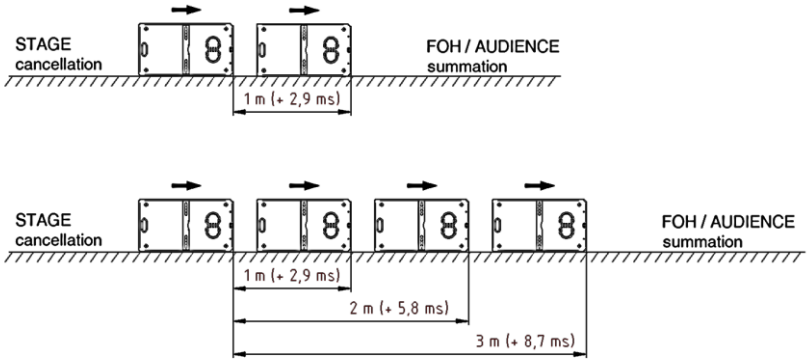


Figure 22: End fire array - basic delay strategy

For full-range source to end-fire subwoofer setup alignment be sure that distance is measured to subwoofer with zero delay set. Be aware of the delay you inserted to the source you measure distance to.

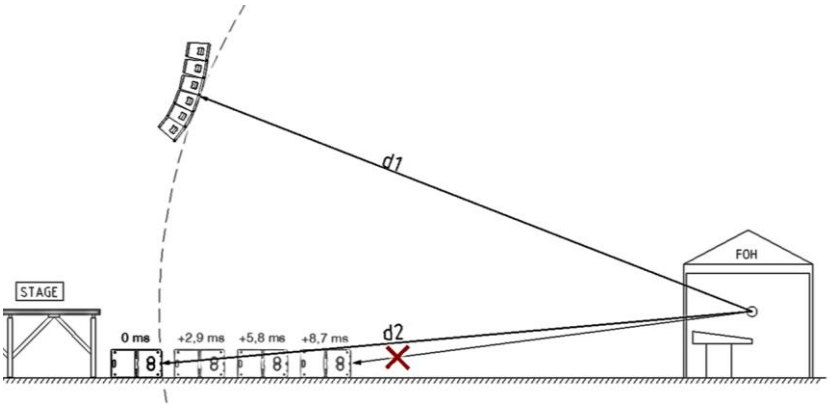


Figure 23: Time alignment for end fire setup

HINT

For BSX distance between the subwoofers may be 1,2m. In this case delay value should be recalculated (1,2m x 2,9ms) to 3,5ms

### 5.1.2. Cardioid subwoofer arrays

Cardioid subwoofer – the cardioid setup is to achieve a maximum cancelation on wide frequency bandwidth at the rear side of the source.

Cardioid subwoofer array (CSA) – a configuration of standard subwoofer elements in a manner that creates cardioid dispersion (maximum cancelation on wide frequency bandwidth at the rear side of the source)

BS17, BS18, BS30 cardioid presets were optimized with conditions:

- array of 3 subwoofers, two facing front, one facing back
- cardioid array was placed directly on the reflecting surface (floor)
- facing front subwoofers are driven by standard preset while rear facing sub has to be driven by preset having in the name suffix “csa”

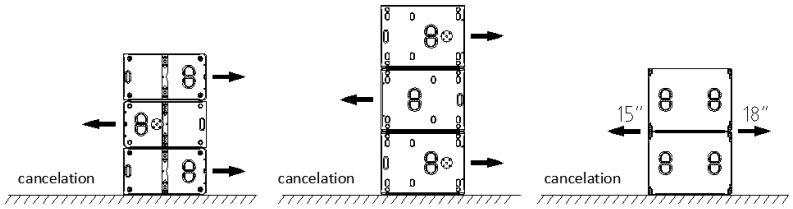


Figure 24: CSA setup for BS30, BS18 and VERA S33

VS32/VS33 cardioid preset was optimized with conditions:

- two boxes one top on the other
- each subwoofer uses 14 inch or 15 inch driver facing back and 18 inch driver facing front
- cardioid subwoofer stack was placed on a dolly directly on the reflecting surface (floor)

BSX cardioid setup:

- array of 3 subwoofers, placed upright, two facing front, one facing back
- cardioid array was placed directly on the reflecting surface (floor)
- In BSX cardioid subwoofer array two facing front subwoofers are driven by standard (full or infra) preset while only rear facing BSX must be driven by preset having in the name suffix “rear”.

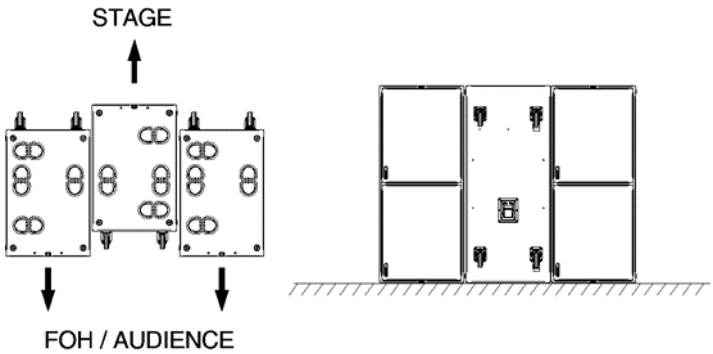


Figure 25: CSA setup for BSX

HINT

For best cardioid operation destructive reflections should be avoided, keep cardioid setup away from hard reflecting surfaces, especially at the rear. If stage or different surfaces close to cardioid setup defect cardioid operation usually end-fire choice would be more senseful or further measurements are required.

## 5.2. Vertical array presets

### 5.2.1. Vertical array behavior

Vertical arrays do need different frequency corrections depending on the array size, array curvature, room acoustics and weather conditions.

The longer the array, the more level below 1 kHz will gain up because of summation / coupling effect. Figure 26 shows different frequency response for different arrays size. As might note coupling effect causes unbalanced frequency response between low-mid and high frequency energy.

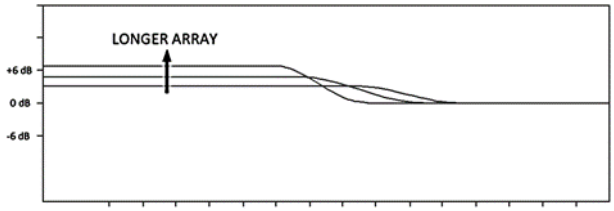


Figure 26: Coupling effect – the longer the array the more low-mid energy below 1 kHz

In order to achieve balance frequency response should be corrected, mid-high energy in array has to be boosted. Furthermore less number of boxes in array results less coupling effect. Cross-over frequency between subwoofers and array is maintained as well and HF has to be reduced.

For all vertical array products of TW AUDiO there are preconfigured "…-array-correction" overlay EQ available. You can insert these filters in dedicated groups or advanced EQs for your vertical array elements.

EQ overlays are located in:
C:\Program Files\Powersoft\Armonía\Plugins\SpeakersLibrary\TW AUDIO\EQ Overlays

### 5.2.2. VERA10 biamp array length correction

The VERA10-biamp X4 preset has been optimized for an array with six speakers, with angles optimized (from top to bottom) at 1°, 3°, 5°, 7°, and 10°. The frequency response of the 6 elements was pre-configured for 4 subwoofers (B30, B18, VERA S30 or VERA S18). This corresponds to a VERA-SYS-ONE with a total of 12 VERA10 elements and 8 VERA S30 subwoofers.

If you change the number of loudspeakers or the angles between the line array elements, you should adjust HF settings in the preset accordingly. The high-shelving correction method for modified array lengths can be used in presets using PEQ#7. The following settings can be used here:

1. If the line array is shorter than 6 speakers / angles have been changed: Activate PEQ#7 in all HF amplifier channels and attenuate by up to -6 dB.

2. If the line array is longer than 6 speakers / angles have been changed: Usually, a standard press will be used. However, if correction is required, gain can be activated in PEQ#7 in all used HF amplifier channels and raised by up to +4 dB.

### 5.2.3. VERA10 passive array length correction

The VERA10 passive X4 preset has been optimized for two speakers with an opening angle of 5° to 10°. An array with additional loudspeakers or other angles requires additional adjustments for all active amplifier channels.

PEQ#7 is used for adjustments in larger arrays. For arrays with more than two boxes, the HF range should be raised:

Activate PEQ#7 and increase filter gain by up to +6 dB, depending on the length of the array.

### 5.2.4. VERA10 120 degree horn correction

The broader the directivity of a speaker horn, the less energy is produced on the horn's axis. This is shown in Figure 27 by means of an 80 ° and a 120 ° horn. The area over which energy is dispersed is unequal for both horns. Accordingly, the 120° horn will produce about 2 dB less energy on the axis than the 80° horn, but more energy on the sides.

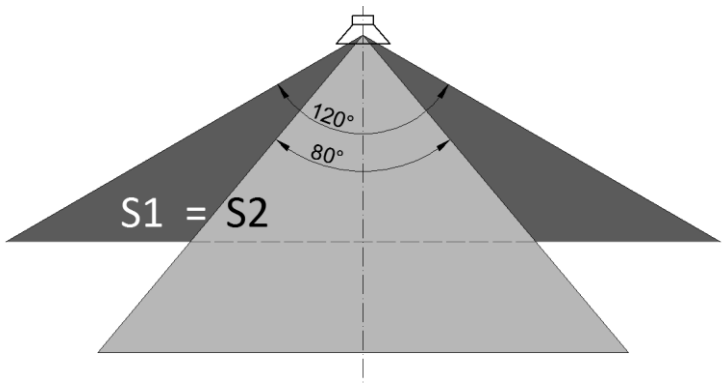


Figure 27: Horizontal directivity of 80° and 120° horns

Due to the wider directivity, VERA10 loudspeakers with 120° horns can be used for near-field applications. As near-field sound reinforcement with line arrays usually requires lower levels for high frequencies (HF) is required, a minor HF range adjustment for the 120° horns will usually suffice.

- VERA10 biamp, Vera10 passive: Activate PEQ#8 to compensate the 120° horn's level loss.
- EQ settings can be applied by an overlay EQ "V10-120-degree" also

Please note:

VERA10 biamp, VERA10 passive: PEQ#7 changes high shelving for the entire array length, whereas the PEQ#8 compensates HF for 120° near-field applications.

### 5.2.5. VERA20 single element EQ

When using a single line array element it is necessary to compensate the frequency response for high frequencies.

For single element usage of VERA20 please insert the preconfigured overlay EQ "V20-single-element". TW AUDiO suggests to use this filter in a dedicated group for your near field application. Otherwise it is possible to insert the filter in the advanced group of the speaker.

Insert the filter via "Load Filters" in your dedicated group or advanced EQ.

Figure 28: Inserting overlay filter

Apply to overwrite the current settings and you can see the magnitude response of the filter.

Figure 29: VERA 20 single element EQ

The overlay EQ contains a preconfigured filter to setup your VERA20 in flat mode. Per default this filter is inactive. You can also change the filter gain to -15dB to run the VERA20 in cut mode. If you are using this filter structure make sure that a full preset is loaded!

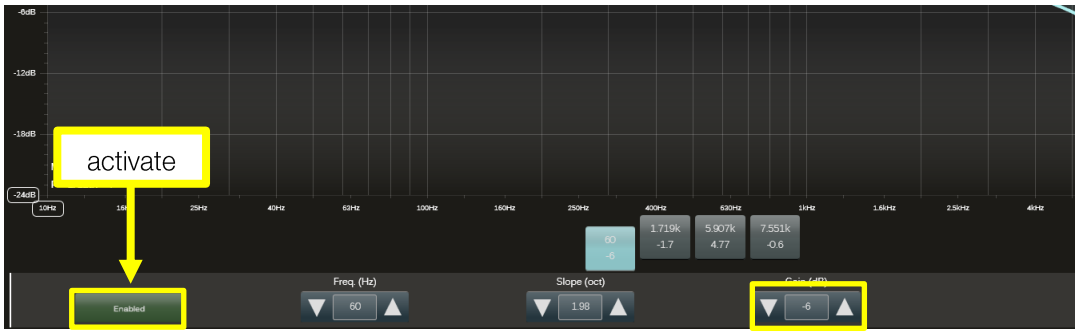


Figure 30: Preconfigured filter for flat mode