



# NTA3.4DSP

4-CHANNEL NETWORK DSP POWER AMPLIFIER



USER MANUAL



MODE AUDIO

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## IMPORTANT SAFETY INSTRUCTIONS

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be kept for future reference.
3. Read and understand all warnings listed on the operating instructions.
4. Follow all operating instructions to operate this product.
5. This product should not be used near water, i.e. Bathtub, sink, swimming pool, web basement etc.
6. Only use dry cloth to clean this product.
7. Do not block any ventilation openings, it should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
8. Do not install this product near any heat sources, such as, radiators, heat registers, stove or other apparatus (including heat producing amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The side blade or the third prong are provided for your safety if the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord being walked on or pinched particularly at Plugs, convenience receptacles and the point where they exit from the apparatus. Do not break the ground pin of the power supply cord.
11. Only use attachments specified by the manufacturer.
12. Use only the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used use caution when moving cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation ports or any other openings.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way; such as, power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.
16. WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
17. When the MAINS plug, or an appliance coupler is used as the disconnect device, the disconnect device should remain readily operable.
18. Protective Ground Terminal: The apparatus shall be connected to an AC main socket with a protective earth ground connection.



## IN THE PACKAGE

NTA3.4DSP AMPLIFIER	x 1
POWER CABLE	x 1
USB CABLE (type A to Type B)	x 1
USB flash drive (Mconsole software installer & Manual)	x 1

## Contact Our US-Based Support Team

Got questions? We're here to help! For any inquiries or assistance, reach out to our dedicated support team. We're committed to providing excellent service swiftly.

Email: [info@modeaudio.us](mailto:info@modeaudio.us)

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# 1. INTRODUCTION

NPA3.4DSP is a 4in4out network DSP power amplifier, integrated with DSP processor, IPS colorful display and other powerful functions. This amplifier supports analog inputs or Dante network. Support constant resistance  $8\Omega/4\Omega$  and constant voltage  $100V/70V$ . The amplifier comes with the standard FIR automatic linear magnitude and phase function, user can easily preset the speaker parameters to achieve the ideal system setting.

Real time power, current, voltage, temperature and impedance can be monitored and shown in the LCD display. With RJ45\USB and common series connectors, the PC software 'Mconsole' provides a easy way to control multiple devices, identify device, remotely turn on/off and set DSP function. RS232/RS485/GPIO connectors support device being controlled from third-party system.

## Applications

- Sports stadium
- Colleges and universities
- Meeting Room
- Shopping mall
- Hotel
- Airport terminal

## Features

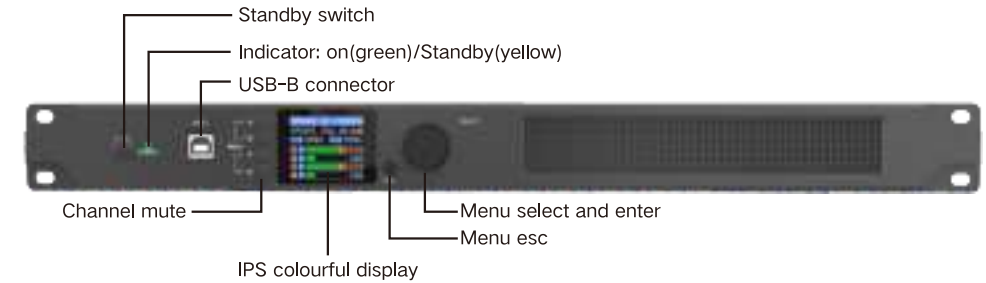
- Dante network audio and Dante-Analog backup
- Built-in DSP processor
- Friendly 'Mconsole' GUI software for windows7/8/10/11
- FIR automatic linear magnitude and phase
- Remote on \ standby, call amplifier
- Support  $100V \setminus 70V \setminus 8\Omega \setminus 4\Omega$
- Free setting to limit power and voltage
- IPS colorful display
- Monitoring temperature \ power \ voltage \ current \ resistance

## 2. TECHNICAL PARAMETERS

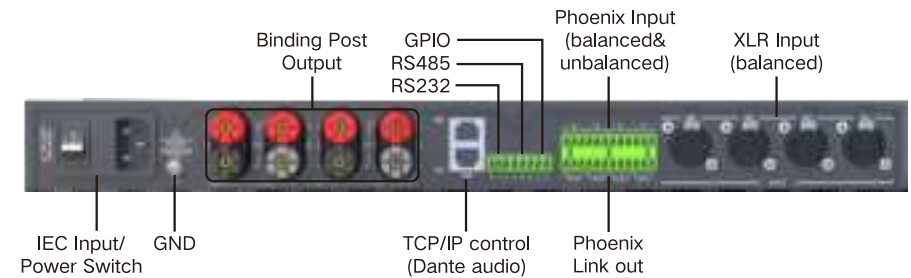
Product	NTA3.4DSP	
Amplifier channels	4	
Output power	4Ω	8Ω
	4 x 450watts	4 x 300watts
		bridge 2*900watts@8Ω
100V output power	bridge mode, 100V(2*max 900W)	
70V output power	bridge mode, 70V(2*max 612.5W)	
Input connector	4*XLR + 4*Phoenix input + link out	
Output connector	4*binding post	
Max. input level	6dBu sensitivity (14dBu, 3.88V) 0dBu sensitivity (8dBu, 1.94V)	
Sensitivity	6dBu sensitivity (30dB, x29.5) 0dBu sensitivity (36dB, x31.1)	
SNR	6dBu sensitivity (94dB) 0dBu sensitivity (94dB)	
Frequency response	20Hz to 20kHz (±0.5dB) @1W, 8Ω	
THD+N	<1%@1W, 8Ω	
Sampling	48k / 24bit	
Dante	4 channels	
Display	320*240 IPS colourful display	
EQ	15-bands input, 10-bands output	
Matrix	4 x 4	
Noise Gate	Start: 1~2895ms, Release: 1~2895ms, Start level: -120~0dBu	
Delay	Input: 4*80ms, Output: 20ms	
Presets	30 presets	
Control Through	Ethernet, USB, RS485, RS232	
Network Spec.	TCP/IP, 1000 base-T/100base-TX, RJ45	
Protections	DSP limiter, high temperature, DC, high frequency, short circuit, back EMF, peak current limiter, Back EMF, Surge current limiter, startup delay, power circuit breaker protection, power over voltage/under voltage protection	
PC control software	Mconsole	
Power requirement	VAC100~240 50/60Hz	
Dimensions	19"*12"*1.75" (Standard 1U) / 483*305*44.5mm	
Package Size	21.3"*17.8"*3" / 542mm*453mm*77mm	
Weight	N.W.: 8.8lbs / 4kg; G.W.: 11lbs / 5kg	

## 3. FUNCTION STRUCTURE AND PANELS

### Front panel



### Rear panel



## DESCRIPTION OF DISPLAY

### Main page

Long press "Enter" 2 second to unlock

Device name: Device Default

Temperature: TP 30.0°C VOL -30.0 dB

Current preset: Default

Device volume: VOL -30.0 dB

Mute status: M

Channels gain: +15.0, -60.0, +15.0, -60.0

Gain level: +15.0, -60.0, +15.0, -60.0

### PC control

Device: Device Default

Temperature: TP 30.0°C VOL -30.0 dB

PC control: PC control

status: M

Limiter: LIM

### Menu

MENU

- VOLUME
- PRESET
- SOURCE
- STATUS
- RENAME
- IP SETTING

MENU

- STATUS
- RENAME
- IP SETTING
- LOCK: ON
- INFO
- SCREEN

## DESCRIPTION OF DISPLAY

### Volume

Channels: IN A, IN B, IN C, IN D, OUT 1

Mute: M

Channels gain: 0.0, 0.0, 0.0, 0.0, 0.0

### Presets

PRESET

1. Default Preset

### Source

Input: Analog/Dante

Sensitivity: 0dBu, 0dBu, 6dBu, 0dBu

0dBu, 6dBu

## DESCRIPTION OF DISPLAY

### Status



## 4. MCONSOLE SOFTWARE

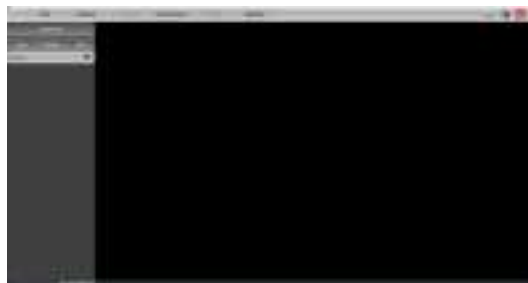
Mconsole software provides users with a variety of connection options that allow multiple devices to interact quickly, including TCP/IP, USB and common serial port (RS232). Easily set DSP functions of device and check central control codes. The configuration parameter can be stored in presets, convenient for various applications.

### 4.1 Operating Enviroment

Mconsole is suitable for Win7/8/10/11 x86/x64 PC system with Microsoft.NET Framework 4.0. A USB flash drive is included in the package, and it will run automatically when it's inserted into the PC. Users only need to unzip the 'Mconsole' package and no need to install it.



Then Double click the **Mconsole.exe** file, the main interface will pop up as below.



## MCONSOLE SOFTWARE

### 4.2 Connection Options and Setting



1. For ethernet cable connection: First click **Setting** in Device List, then choose **TCP** in Connection windows.



2. For USB cable connection (type A to typeB): First click **Setting** in Device List, then choose **USB** in Connection windows.



3. For Rs232 to USB (type A) cable connection: First click **Setting** in Device List, then choose **COM** in Connection windows. Please check the port and baud rate carefully for this connection.

After setting, the system will start scanning, and the device name will be shown in the device list if the connection is successful. For linked connection, all device names will be shown.



User can mute device, refresh connecting, or delete device in this window. Single click 'Device' to load the function interface.





## MCONSOLE SOFTWARE

### IP Address Setting



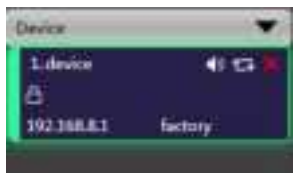
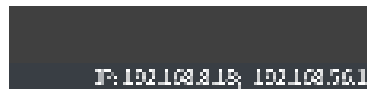
In a TCP connection, if the device list does not show the correct device name but only a dot as shown in left figure, then user need to change the IP address that matches the PC.



Right-click the device enclosure area, a 'Net Setting' window will show.



The IP address of the PC is displayed in the lower left of the screen, in the 'Net Setting' window, reset the first three paragraphs same with the IP of the PC.



Click 'OK' and then the device can be successfully scanned and connected, and device name will be shown correctly in the device list.

## MCONSOLE SOFTWARE

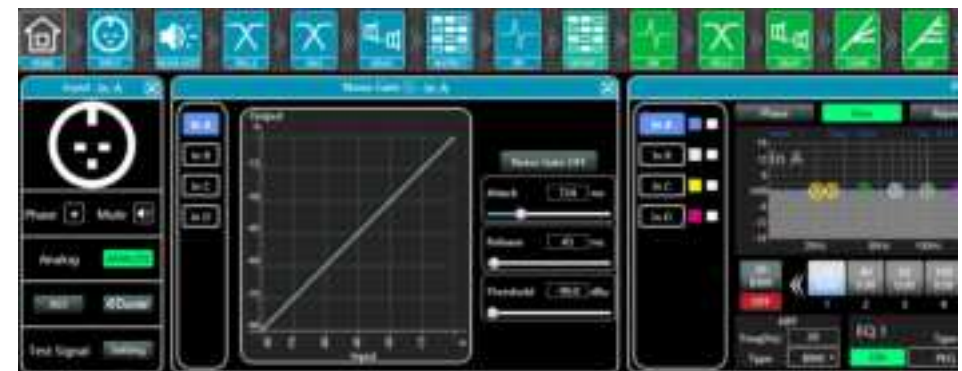
Multiple same devices can be linked in a group by clicking 'Link' icon, then in the 'Net Link' window, user can set the group name, main device, link mode and parameter according to needs.



### 4.3 DSP Functions Setting



Double-click 'HOME' icon to load the all functional interfaces, or double-click a specific function icon separately to load the corresponding sub-interface. When multiple function windows opened, users can drag the windows to switch position when needed.





## MCONSOLE SOFTWARE

### 4.3.1 Input Setting



- Set source of each channel;
- Set sensitivity of each channel 0/6dBu;
- Set gains, phase or mute in each channel;
- When choosing test signal, user can select from Sine / Pink Noise / White Noise and adjust the signal parameter from below 'Test Signal' window.



### Dante and analog signal backup

1. Connect both analog and Dante signal input interface, and select AnalogPri as source, analog signal would be in priority for using. In events of disconnecting analog source, the amplifier would switch Dante signal automatically.
2. Connect both analog and Dante signal input interface, and select DantePri as source, Dante signal would be in priority for using. In events of disconnecting Dante source, the amplifier would switch analog signal automatically.



**Remark: Backup mode only supports when analog signals and Dante signals are from the same audio (pause during playback is the same way).**

### 4.3.2 Noise Gate




- Attack time: 1 to 2895ms adjustable;
- Release time: 1 to 2895ms adjustable;
- Threshold level: -120 to 0dBu adjustable;
- Click 'Noise Gate ON' to enable the setting.

## MCONSOLE SOFTWARE


### 4.3.3 PEQ-X (for both input and output)



### High Pass Filter (HPF on lower left of the window)

Enter the frequency value under the 'HPF' and select type, then press  to enable the setting. Type options: Butterworth 6/12/18/24/36/48, Bessel 12/24/36/48, Linkwitz-Riley 12/24/36/48.

### Low Pass Filter (LPF on lower right of the window)

Enter the frequency value under the 'LPF' and select type, then press  to enable the setting. Type options: Butterworth 6/12/18/24/36/48, Bessel 12/24/36/48, Linkwitz-Riley 12/24/36/48.

### PEQ 15 bands for input channel

Type options: PEQ/LSLV/HSLV/ALLPASS-1/ALLPASS-2/3 kinds of high/low pass, Phase, Band pass, Band stop, Notch filter; Freq(Hz)/Q/Gain(dB): enter the value or use mouse pulley to set value; Users can also drag the frequency dot on the curve to adjust.

### PEQ 10 bands for output channel

Type options: PEQ/LSLV/HSLV/ALLPASS-1/ALLPASS-2/3 kinds of high/low pass, Phase, Band pass, Band stop, Notch filter; Freq(Hz)/Q/Gain(dB): enter the value or use mouse pulley to set value; Users can also drag the frequency dot on the curve to adjust.



## MCONSOLE SOFTWARE

**Phase curve:** display the phase curve of the current channel.

**View:** show or hide all balance control points.

**Bypass:** turn on or off all EQ of the current channel at the same time

**Preset:** save all the setting parameters of the EQ of the current channel to the computer, and recall the channel EQ parameter of the computer, which can be recalled across channels and devices.




**Copy:** copy the current channel EQ parameter value, which can be pasted to other similar channels (Note: input channel parameter can only be copied to other input channels).

**Paste:** used in combination with the copy button to paste the last copied EQ parameter value to the current channel.

**Reset:** reset the EQ parameter to the default parameter values.





As shown in the figure above, the left side   is the interface switching button for each channel. Click to switch the EQ channel, and the colored one is the currently selected channel.

 is the curve color of the EQ channel.  is to show or hide each channel's EQ curve, on the interface of selected channels, curves of other channels can be displayed when the  is clicked.

### 4.3.4 Delay Setting (input and output)



- Max 2000ms for input channel;
- Max 2000ms for output channel;
- Click  to enable the setting;
- Click  to reset the setting;
- Different measurement ft/cm/ms are selectable.

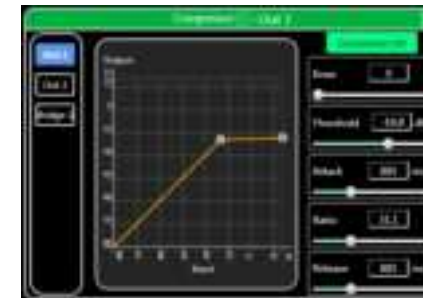
## MCONSOLE SOFTWARE


### 4.3.5 Matrix Mix



In the figure above, input channels (on top side) corresponds to output channels (on left side). Double-click any small value box to change its status, when the value box is green, the input signals on the vertical axis are routed to the corresponding output channel on the horizontal axis. The right part of the above figure contains the Gain, Reset, and Clear button of the matrix mix. Click the value box on the left, and then drag the sliding fader or enter a value to adjust the gain. Click the Reset button to reset the matrix mixing function to the initial one-to-one status; click the Clear button to clear all the matrix mixing setting.

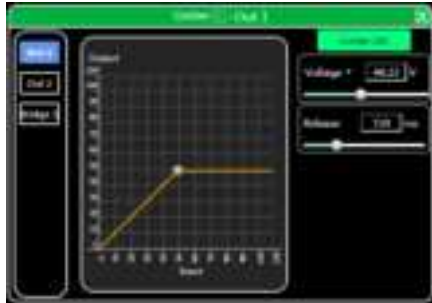
### 4.3.6 Compressor



- Soft knee: 0 to 30 adjustable;
- Threshold: -90 to 21 dB adjustable;
- Attack: 1 to 2895 ms adjustable;
- Ratio: 1 to 100 adjustable;
- Release: 1 to 2895 ms adjustable;
- Click  to enable the setting;

## MCONSOLE SOFTWARE

### 4.3.7 Limiter



- Voltage: 0.01 to 42.43V adjustable;
- Power: 0.01 to 450W adjustable;
- Release time: 1 to 2895 ms adjustable;
- Click **Limiter ON** to enable the setting;

### 4.3.8 Output Setting



- Set phase of signal;
- Set mute of output channel;
- Set gain level of output channel.
- M.Vol is used for setting total volume for the device.

## 4.4 Monitoring and Setting of Channels



User can monitor gains level of input and output channels.

## MCONSOLE SOFTWARE

### 4.4.1 Channel Gain Level



Input the value, drag the gain fader or use mouse pulley to set the gain level of each channel.

The device support different types of input signals: ANALOG, DANTE network audio, and testing signal. Each of the different input signals is distinguished by a tag in this window.

### 4.4.2 Quick Buttons of DSP in Channels

#### Inputs



- M** Mute
- +** Phase
- N** Noise Gate
- E** PEQ
- D** Delay

#### Outputs



- M** Mute
- E** PEQ
- D** Delay
- C** Compressor
- L** Limiter
- +** Phase

### 4.4.3 Group and Channels Link



User can quickly set channels in groups for opening or closing Mute, Phase, Noise gate, PEQ and Delay.

## MCONSOLE SOFTWARE



<b>M</b> Mute	<b>M</b> Mute
<b>+</b> Phase	<b>E</b> PEQ
<b>N</b> Noise Gate	<b>D</b> Delay
<b>E</b> PEQ	<b>C</b> Compressor
<b>D</b> Delay	<b>L</b> Limiter
	<b>+</b> Phase
Linked Channels for Input	Linked Channels for Output

When click link button, Channels Link window would show as below



Select the corresponding channels to link, they will be in group for user to set parameter.

### 4.5 Menu - File



- New project:** Restored to the initial open state.
- Demo Device:** User can view all the functions of the device without affecting the specific device connected.
- Open:** Open an existing device management project from the computer disk.
- Save:** Save the current equipment management project in the computer disk.
- Save as:** Save the current equipment management project to the computer disk.

## MCONSOLE SOFTWARE

### 4.6 Menu - Device (including Device lock)



- Devices:** View or modify the software version, device name and device IP address of the upper and lower computer of the device. Set password of the device.
- Channel name:** Set the name of each input and output channel, with memory function.
- Channel copy:** Copy the parameter of the input and output channel, can be cross-device copy (Note: the same type of device is required).
- Central control and GPIO:** Provides a quick way to inquiry code of Center Control setting. For more details, please refer to another user manual <GPIO and Center Control Code User Manual>.



### 4.7 Menu - Connection



- Port:** Set the connection mode, port number and baud rate, confirm the connection mode and then select the corresponding port.
- Connect:** Connect and download the device parameter.
- Disconnect:** Disconnect the connected device.
- Connect all:** Connect and download the device parameter of all the devices in the device list.
- Disconnect all:** Disconnect all connected devices in the device list.



## MCONSOLE SOFTWARE

### 4.8 Menu - Preset



**Save:** Select a preset gear from 2~30, and save all the parameters of the current auto gear to the selected preset gear.

**Recall:** Recall the selected preset to the current auto gear position.

**Delete:** Delete the existing preset, the default file cannot be deleted, over written or saved.

**Clear:** Delete all presets in the device.

**Boot:** Select a certain preset and set it as the boot file, each time when the device is restarted, it will automatically recall the save the parameter; when setting the auto file to the boot file, the last set parameter will be recall when device is restarted.

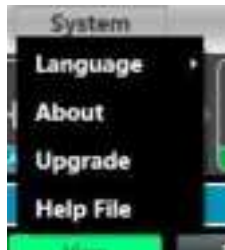
**Import preset:** Import a single preset file on the computer.

**Export the preset:** Export all the parameter of the current state to the computer, and generate a single preset file.

**Import preset package:** Import the preset package file containing multiple presets on the computer.

**Export preset package:** Pack multiple presets into one preset package and export it to the computer.

### 4.9 Menu - System



**Language:** Supports simplified CN, traditional CN and ENGLISH.

**About:** Software and device firmware version information.

**Upgrade:** For user to upgrade the firmware, a upgrade.bin file will be needed from maufacturer.

## MCONSOLE SOFTWARE

### 4.10 FIR Filter and Function

#### 4.10.1 FIR Filter and Applications

When user uses PEQ to adjust audio signal and set a linear magnitude, he may find the phase of signal changed due to the IIR filter. However, a useful tool FIR filter is provided to adjust the audio signal with a linear phase.



Some calculations:

$$\text{Frequency resolution} = \text{Sampling/Taps}$$

$$\text{Available min. frequency} \approx \text{Frequency resolution} \times 3$$

Means when we adjust audio signal with 48kHz, 1024 taps, the FIR filters will take effect in frequency above 141Hz. The taps value more high, the FIR filter curve more steep.

FIR filter processing audio signal will produce a certain delay:

$$\text{Delay} = (1/\text{Sampling Hz}) \times \text{Taps}/2$$




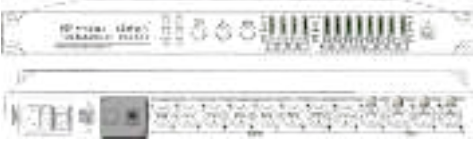

Taps Sampling	48kHz	96kHz
256	2.67ms, LF 563Hz	1.33ms, LF 1125Hz
512	5.33ms, LF 279Hz	2.67ms, LF 558Hz
768	7.99ms, LF 188Hz	4.00ms, LF 375Hz
1024	10.67ms, LF 141Hz	5.33ms, LF 281Hz
2048	21.33ms, LF 70Hz	10.67ms, LF 141Hz

## MCONSOLE SOFTWARE

### Applications:

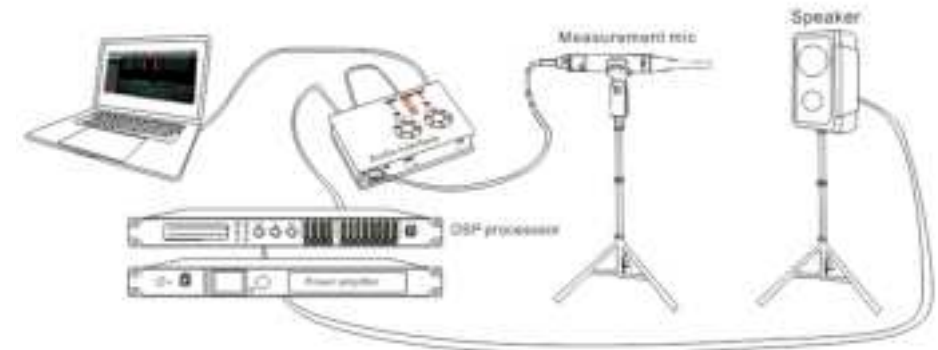
- Linear of the phase curve of the speaker;
- Match the phase and magnitude of different speaker models within the same product line, as well as different speaker models in the installation project to make it easier to debug speaker groups and arrays;
- Dealing with line array systems (for audience area coverage optimization);
- Frequency division optimization to improve the consistency of frequency response of multi-division speakers over their coverage Angle range.

### Devices required:

Measurement Microphone	×1	
Audio Interface	×1	
Windows PC (installed software including Smaart, rePhase or FIR Designer, Mconsole)	×1	
FIR audio processor or DSP network power amplifier	×1	
Speaker	×1	

## MCONSOLE SOFTWARE

### Connection schematic



### 4.10.2 Using FIR Designer in Mconsole to Adjust FIR Magnitude and Phase

Beside using a third party software, Mconsole provides a more convenient way to adjust FIR magnitude and phase of each channels.

There are two ways to open the FIR DESIGNER interface:

- 1 Click 'FIR' and then click 'Designer' button.
- 2 Or click 'FIR DESIGNER' in the main interface, which can quickly help user to return to the page of last setting.





## MCONSOLE SOFTWARE



### 4.10.2.a FIR Designer - Import



**Load:** Load speaker measurement file from Smaart, usually it's a .txt file.

**Import Clipboard:** Load ASCII data directly from Smaart.

**Clear:** Clear measurement data.

**Normalise magnitude to max** or **Magnitude offset (dB):** Can help user to adjust a certain dB of magnitude, in order to adjust magnitude curve as little as possible.

## MCONSOLE SOFTWARE

### 4.10.2.b FIR Designer - FIR-EQ

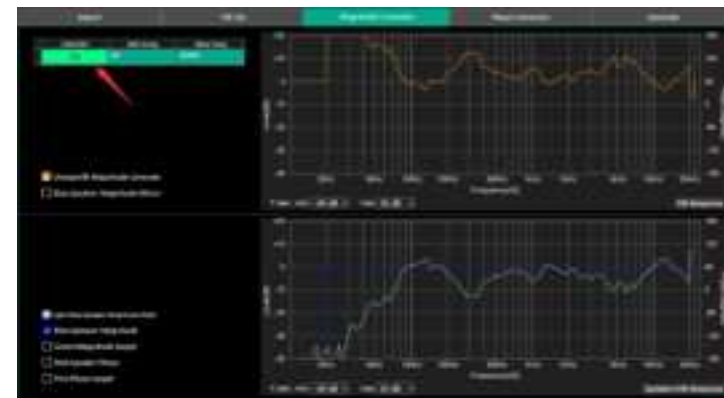


There are High pass filter and low pass filter for setting frequency divider, and 15 bands of PEQ \ LSLV \ HSLV to adjust magnitude. Try to set a linear magnitude of the target speaker.

**Mark:** changing FIR magnitude doesn't effect its phase.

### 4.10.2.c FIR Designer - Magnitude Correction and Phase Correction

When there are too many speakers to be adjusted, user might have to spend a long time for manually adjusting their magnitude. In this case, Magnitude Correction will be more useful. Just enable **ON** button for frequency.



## MCONSOLE SOFTWARE

After adjusting magnitude, set linear phase of the speaker.



### 4.10.2.d FIR Designer - Generate

Select **Taps** (such as 512) of this adjustment, and store it in a FIR channel. User can also name this FIR adjustment and export it to a .KF file. After finish all settings, return back to FIR interface. Cancel the BYPASS button to enable the setting.



## MCONSOLE SOFTWARE

