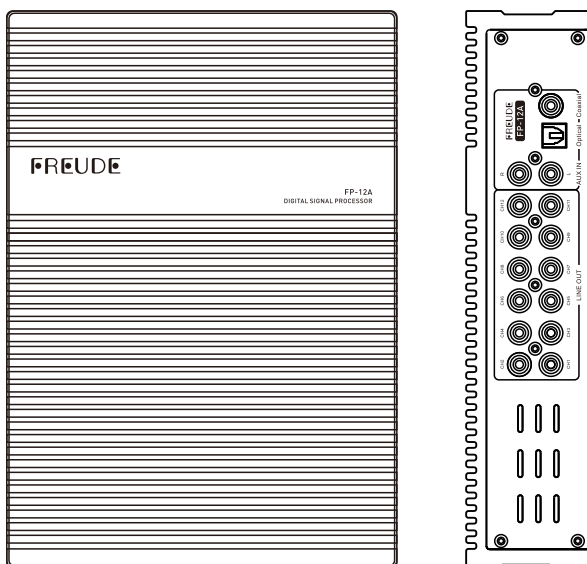


FREUDE

OWNER'S MANUAL



FP-12A

12 CHANNELS DSP + AMPLIFIER

WARNING

PLEASE READ CAREFULLY BEFORE INSTALLING OR OPERATING THIS UNIT,
AND KEEP IT WELL FOR NECESSARY REFERENCE DURING USE.

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WARNING

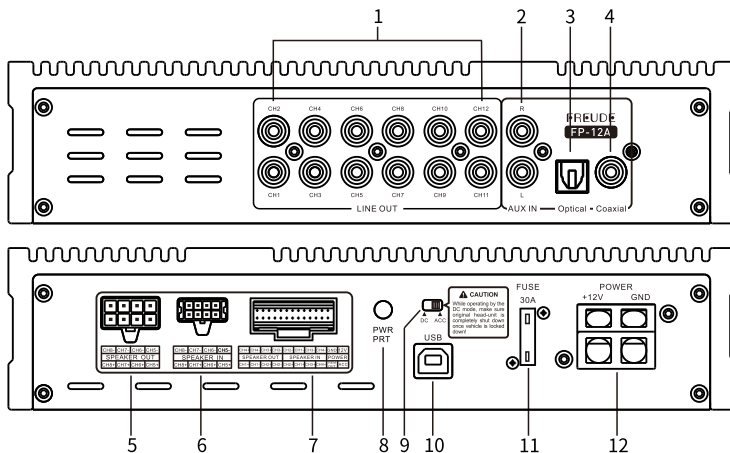
- To prevent short circuit, please keep the device away from water or wet places.
- If water or any other liquid soak into the device, cut off the power immediately, and call our service engineer of inspection, in case of emergency.
- There is no repairing unit inside for user, please do not try to disassemble the bottom cover. Any problem please contact our service engineers in time.
- This DSP amplifier should be powered by the battery pack directly in the vehicle. When you already connect the DSP amplifier by a 20 pin power+high level composite cable, please remove the fuse on the cable, or cut off the '12V' wire(Yellow) and tape it, make it safety.

| Packing List

The following items should be placed in the gift box according to the model you purchased. If there is any missing, please inform the seller or manufacturer as soon as possible.

· FP-12A	· 1pc
· User Manual (English)	· 1pc
· Power+high level composite cable Mounting	· 1pc
· High level input plug	· 1pc
· High level output plug	· 1pc
· Mounting Bracket	· 4pcs
· Tapping Screws	· 4pcs
· Machine Screws	· 8pcs
· FUSE	· 1pc

Hardware Interface Introduction



1. Line out put: up to 12-channel line out put.

2. Line input: 2-channel line input.

3. Digital-Optical input: 1 Optical input (stereo L/R)

4. Digital-Coax input: 1 Coax input (stereo L/R)

5. High level output jack(CH5-CH8)

6. High level input jack(CH5-CH8)

7. Power+high level composite connector:

'+' is positive terminal, '-' is negative terminal, 'GND' is negative terminal of the power supply or ground, "12V" is positive terminal of the power supply.

'REM OUT' is the output control terminal and 'ACC' is the input control terminal.

Only the special cable for the original vehicle is selected, or it can be defined by user.

Attention! This amplifier should be powered by Battery Pack directly, while the amplifier is connected by the 20 pin composite cable. The fuse on the cable should be removed, or cut off the '12V' wire(Yellow) and tape it, make it safety. Refer the Point 12 below for more details.

CH4+	CH4-	CH3+	CH3-	CH2-	CH1-	CH3-	CH4-	GND	12V
SPEAKER OUT				SPEAKER IN				POWER	
CH1+	CH1-	CH2+	CH2-	CH2+	CH1+	CH3+	CH4+	REM OUT	ACC

8. Power/Protection LED indicator:

The LED green shows the amplifier are working normally and the red shows in protection or fault.

9. The turn on/off mode switch

Set the switch on 'ACC' mode to start the device by ACC, and set the switch on 'DC' mode to start the device by high level FL IN+/FL IN- input signal ,witch from the head unit speaker out. While operating by DC mode, make sure original head-unit is completely shut off once locked down vehicle.

10. USB Port:

By the USB port, this amplifier can be controlled by an PC which has the user interface software installed for tuning, and the amplifier is driver free designed and can be identified automatically as it is connected with the PC.

11. FUSE: Please replace FUSE with the same specification as it failed.(One spare fuse provided)

12. Power supply terminal:

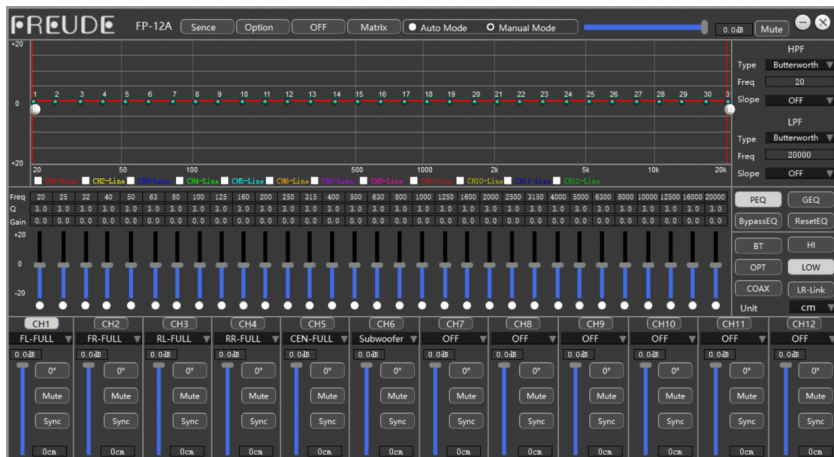
The 12V terminal connected to the battery pack '+' by an AWG 8# (or larger) cable , meanwhile a 30A fuse near the batter pack should be in series with this"+"cable.Before connecting the power supply, you must confirm that the power supply meets the designed power requirements and connect in strict accordance with the equipment instructions. Otherwise, the equipment may be damaged and may cause accidents such as fire, electric shock, etc.

User Interface Software Introduction

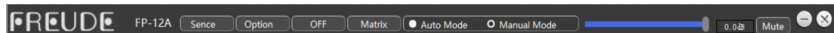
User Interface (we call“UI”in the following)

System requirements:

Screen resolution higher than 1366x768, otherwise the UI is displayed incomplete, only suitable for windows operation system laptop, desktop and pads with Windows 7 or higher.



1. Main menu



Main features: Scenes, Option, Online status, Mtrix, Auto/Panel mode, Main Vol/Mute

(1) Scenes: save preset sound effects to the amplifier or computer, and load from the computer.

(2) Option: This menu contains Noise gate, Chinese and English switching, System reset, About and Machine firmware upgrade.

(3) Online Status: It shows if the DSP amplifier connected/disconnected to the PC.

(4) Matrix: Set the input signal to the output router.

(5) Auto / Panel mode: this function for the input signal sour

controller connects to the DSP amplifier, please set to the Auto mode.

The difference between the 2 modes -- Panel mode: Can switch the input signal among High level- Low level-BT-OPT.-COAX. Auto mode: The input signal switch among Low level- BT-OPT.-COAX automatically.

(6) Main Volume/Mute: To turn the system main the adjusting the output volume, or muting.

2. The output channel diagram shows the frequency response curve in the edit area

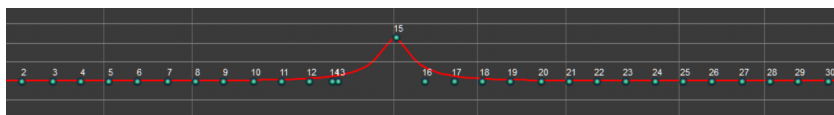


Figure 1

User Interface Software Introduction

EQ is adjustable in 31 bands of the frequency response curve display edit area in the output signal channel diagram. In figure 1, press and hold the left button of mouse when the cursor moves to the point of EQ band, and drag the mouse up and down to adjust the equalizer gain; Drag the mouse around to adjust the equalizer frequency. When the mouse moves to the left or right little blue triangle, press and hold and drag left or right to adjust the Q value of the equalizer. All the above adjustments will display the parameters of the current equalizer in real time in the parameter display and edit area corresponding to the sequence number below, and also update the values in the parameter edit area of the equalizer. The parameter display and edit area are shown in figure 2.

3. Output channel gain, Q value, frequency editing area

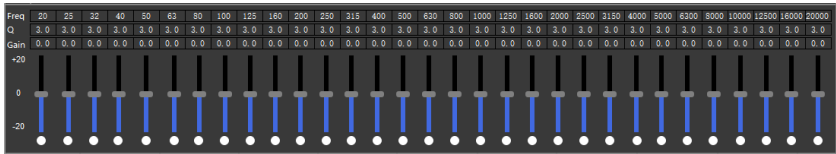
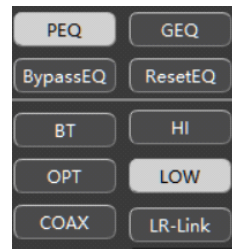


Figure 2

- (1) Frequency: In the edit area, you can enter values directly, scroll the mouse wheel and the up and down keys on the keyboard to adjust the frequency.
- (2) Q value: In the editing area, the Q value can be adjusted by directly entering the value, the mouse wheel and the up and down keys on the keyboard.
- (3) Gain: In the edit area, you can enter values directly, scroll the mouse wheel and the up and down keys on the keyboard to adjust the gain.

4. Setup the equalizer

- (1) PEQ: The parameter EQ, all parameters can be adjusted by user.
- (2) GEQ: The graphic EQ, only Gain can be adjusted, the other parameter are locked.
- (3) EQ Bypass: Click to by pass the EQ effect, (Generally to compare the sound quality of the EQ on/off)
- (4) EQ Flat: To reset the parameters of EQ to the factory preset mode.
- (5) LR-Link: This function allows user to copy parameters of EQ or filter between L and R
- (6) Input signal selection: It can switch the input signal source for system turning.

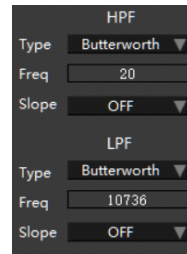


User Interface Software Introduction

5. Filter editing area

There High & Low Pass Filters for each channel:

- (1) Click the slope drop down list, and you can select
6dB/Oct, 12dB/Oct, 18dB/Oct, 24dB/Oct, 30dB/Oct,
36dB/Oct, 42dB/Oct, 48dB/Oct, and Bypass.
- (2) Frequency adjustment range: 20Hz~20KHz.
- (3) Types: Bessel, Linkwitz-Riley and Butterworth.

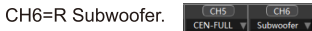


6. Output channel adjustment area



The alias of output channel can be edited: As the above picture shows:

CH1=FL full range, CH2=FR full range, CH3=RL full range, CH4=RR full range, CH5=L Subwoofer, CH6=R Subwoofer.



Each output channel can be adjusted independently:

- (1) Volume: -60dB ~ 0dB
- (2) Delay: 0cm ~ 500cm / 0mS ~ 15mS
- (3) Phase: 0° / 180°
- (4) Mute: On / Off
- (5) Synchronize: It can make the checked channels synchronized for Vol. and Delay.

*Note: this function is changed based on the original value.

Technical Specification

· Dynamic Range(RCA Input):	· $\geq 96\text{dB}$
· S/N (RCA Input):	· $\geq 96\text{dB}$
· THD:	· $\leq 0.01\% @ 1\text{KHz } 1\text{V}$
· Frequency Response:	· $10\text{Hz} \sim 22\text{kHz} (-1\text{dB})$
· Decoding Capability:	· 24bit/96kHz
· Input Impedance:	· Low Level input: $15\text{K}\Omega$, High Level input: 39Ω
· Low Level Output Impedance:	· 82Ω
· Output Rms Power:	· $8 \times 30\text{W}(\text{RMS } @ 4\Omega \text{ } 13.8\text{VDC})$, Load impedance: 20Ω
· Output Max Power:	· $8 \times 60\text{W}$
· Signal Input Range:	· RCA input: 1.2Vrms ; High level input: 9Vrms
· Signal Input Range:	· RCA output: 2Vrms ; High level output: 12.5Vrms
· Working Temperature:	· $-20 \sim 45^\circ\text{C}$
· Power:	· DC $10\text{V} \sim 16\text{V}$
· REM Input:	· High Level Input Signal: FL+/FL- or ACC control cable
· REM Output:	· DC $12\text{V} (\geq 0.2\text{A})$
· Standby Power:	· $\leq 0.1\text{W}$
· Gross Weight:	· Approx 1.9KG
· Product Dimension:	· $247(\text{L}) \times 178(\text{W}) \times 55(\text{H})\text{mm}$

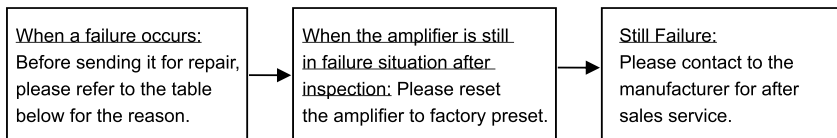
The Functions of DSP

· Input Signal Type:	· 8 Channel high level, 2 Channel Low Level , Digital Bluetooth 5.0, Optical, Coaxial
· Output Signal Type:	· 8 Channel power amplifier, 12 Channel low level output
· Output Signal Gain:	· Gain Range: Mute, $-60\text{dB} \sim 0\text{dB}$
· Output Signal EQ:	· 31 Levels EQ · 1.Frequency Range $20\text{Hz} \sim 20\text{kHz}$, 1Hz Accuracy · 2.Q Value(Slope) $0.4 \sim 10$ · 3.Gain $-20.0\text{dB} \sim +20.0\text{dB}$, 0.1dB Accuracy
· Output Signal Crossover:	· Each channel is Equipped with a multi-order high-low pass independent filter. · 1.Professional filter type: Butterworth, Linkwitz-Riley · 2.Filter Crossover Point: $20\text{Hz} \sim 20\text{kHz}$, Resolution 1Hz · 3.Filter Slope Setup: $6\text{dB}/\text{Oct} \sim 48\text{dB}/\text{Oct}$.
· Output Phase and Time Alignment:	· Phase and time alignment adjustable for every output channel. · Phase: In Phase or Out Phase ($0^\circ \sim 180^\circ$) · Time Alignment: 0.000 to 15.000ms, 0 to 500cm
· Presets:	· Save 9 presets into the device.

| Troubleshooting

Troubleshooting:

Check all the cables and connectors/terminals are corrected before powering on absolutely safe before you switch on the power. General troubleshooting procedure:



Troubleshooting method:

No.	Malfunction	Reason and Solution
1	No Power	① Check and ensure correct power connection ② Check the ACC/DC connection
2	No Sound	① Is it in mute mode? ② Make sure the correct input channel.
3	Unable to connect USB	① Check the USB connection. ② Check if the driver "HID-compliant device" has been installed in your PC.

FREUDE

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The contents of this manual and the specifications of this product are subject to change without notice.
SICHERHEIT Company reserves the right to make changes to the specifications and materials contained therein without notice.