LUCASACS

DM16

16 CHANNEL DIGITAL MIXER

Operating Instruction

Version 1. 1



www.lucasacs.co.uk

LUCAS ACOUSTIC INTERNATIONAL ELECTRONIC LTD.
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Thank you very much for purchasing our products!

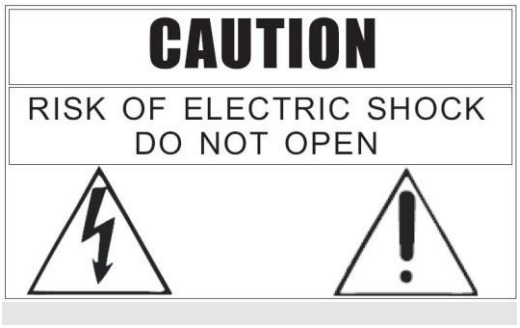
Before installing and officially using this product, please read this manual thoroughly to fully understand this device and be proficient in how to use it properly. After you have read this manual, please keep it in a safe place for future reference.

Based on the product strategy of continuous development, some newly added or modified functions about this device may not be included in this manual, please pay attention to relevant supplementary instructions.

For other information about this product, please call your service provider.

Safety Matters

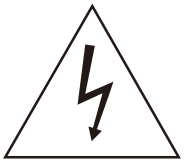
Please read these concise rules. Violating these rules may cause dangers. More detailed information on safety matters is provided in this manual. Please check it carefully.



Note: There are no user-available spare parts inside the machine! To prevent electric shock, do not remove the cover by yourself! It should be repaired by a professional if necessary!

Warning: To prevent the risk of fire or electric shock, do not expose this machine to rain or moisture!

l Graphic symbol description



The lightning graphic with an arrow in an equilateral triangle is intended to remind the user of the presence of uninsulated "dangerous voltages" in the case, which may be suf☒cient to pose a risk of electric shock to persons.



The graph with exclamation mark in equilateral triangle means there are important operation and maintenance instructions in the machine accessories, please refer to the operating manual.

Warning!

In order to avoid possible personal injury due to electric shock, short circuit,damage, fire or other dangers, be sure to observe the following basic precautions.These precautions include but are not limited to the following cases:

Important Safety Matters

- Read these instructions and keep them, and follow all instructions.
- Pay attention to all warnings on the device or in the manual.

Power / Power Line

- Use only the voltage specified by this device. The required voltage is printed near the power connector of this device.
- Turn off the power switch of the device before plugging or unplugging the power connector.
- Do not place the power cord near heat sources, do not bend or damage the power cord excessively, do not put heavy objects on the power cord, and do not place it in a place where it may be stepped on or crushed.

Do Not Open

- There are no user-available spare parts inside the device. Do not disassemble or modify it in any way.
- In case of special abnormal conditions, it must be overhauled by a professional approved by the manufacturer.

Warning about Humidity

- Do not use the device in a humid environment. Do not place containers filled with liquids near the device to prevent liquid from splashing in.
- Clean only with a dry cloth.
- Never plug or unplug the power plug with wet hands.

To avoid possible personal injury, equipment, or property damage to you or othersaround you, be sure to observe the following basic precautions. These precautions include but are not limited to the following:

Device Connection

- Be sure to connect to a properly grounded power source.
- When connecting this device to other external devices, use a connection cable approved by the manufacturer.
- Be sure to disconnect all connecting cables before moving the device.

Operation / Placement

- Do not use the device with the protective case open.
- Before operating this device, you can prevent static electricity by discharging electricity.
- Install the device in a well-ventilatedplace.
- Do not place the device in a humid placeor expose it to rain.
- Do not place beverages, food, and firesources on the device to prevent liquid, solid residues and open flames from damaging it.

Other Matters

- Do not use the headphones at high volume for a long time, otherwise it may cause hearing damage.
- Avoid using excessive force when operating buttons, knobs, and other parts of this device.
- To avoid possible noise, do not use mobile phones nearby.

Contents

Welcome!
Note!

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(1). Introduction and Characteristics

This digital sound mixer is designed for professional live performance, and is very suitable for stage sound reinforcement, live audio program recording, multi-functional conference hall and other application environments due to its excellent timbres and stability. This product is flexible, portable and easy to operate, ensures professional effects and can help users with less experience quickly obtain high-quality experience effects.

Main Characteristics

- 16 channel inputs include: 8 microphone inputs, 6 stereo inputs, and 2 hybrid stereo inputs (including 3.5 analog stereo, stereo Bluetooth, USB/OTG sound card, USB flash disk playback).
- 4 SUB group output channels, 3 AUX auxiliary outputs, 1 FX effects ending, 1 stereo main output, 1 stereo monitor/headphone output, and 2 stereo digital outputs (USB/OTG sound card, USB flash disk recording).
- The microphone input channel has independent gain control, low cut, phantom power, PEQ equalization, compressor, feedback inhibition, left and right balance adjustment, AUX sending, FX effect sending, SUB group and main output L/R sending switches.
- The stereo input channel has independent gain control, PEQ equalization, left and right balance adjustment, AUX sending, FX effect sending, SUB group and main output L/R sending switches.
- The SUB group output channel has independent compressor, 7-section PEQ equalization, left and right balance, mute, main output sending switch and mute, etc.
- The stereo main output channel has independent compressor, 7-section PEQ equalization and mute, etc.
- The AUX output channel has independent compressor, 7-section PEQ equalization and mute, etc.
- The FX channel has independent professional stereo effect, independent sending bus (with adjustable volume), 16 effect combinations to be selected, of which detailed parameters of each effect can beset.
- All input channels are available for any customized channel copy parameter function.
- The panelis available for USB flash disk player for previous, next, play and pause, aswellas real-time stereo recording function.
- The built-in USB sound card is available for PC-connected real-time recording and play functions.
- It is available for high-quality stereo Bluetooth V5.0 input, and compatible with Bluetooth V4.2 and V2.1+EDR, and input volume can be controlled.
- It has independent customized user password protection function, realizing safe and reliable operation and management of system.
- 7-inch HD800*480 display screen,19 high-precision 100MM stroke analog faders control the volume of all channels.
- The architecture of machine refers to the design of analog mixer, which is easy to understand and easy to operate, also has the flexible application of the digital DSP core.

(2). Technical Indexes

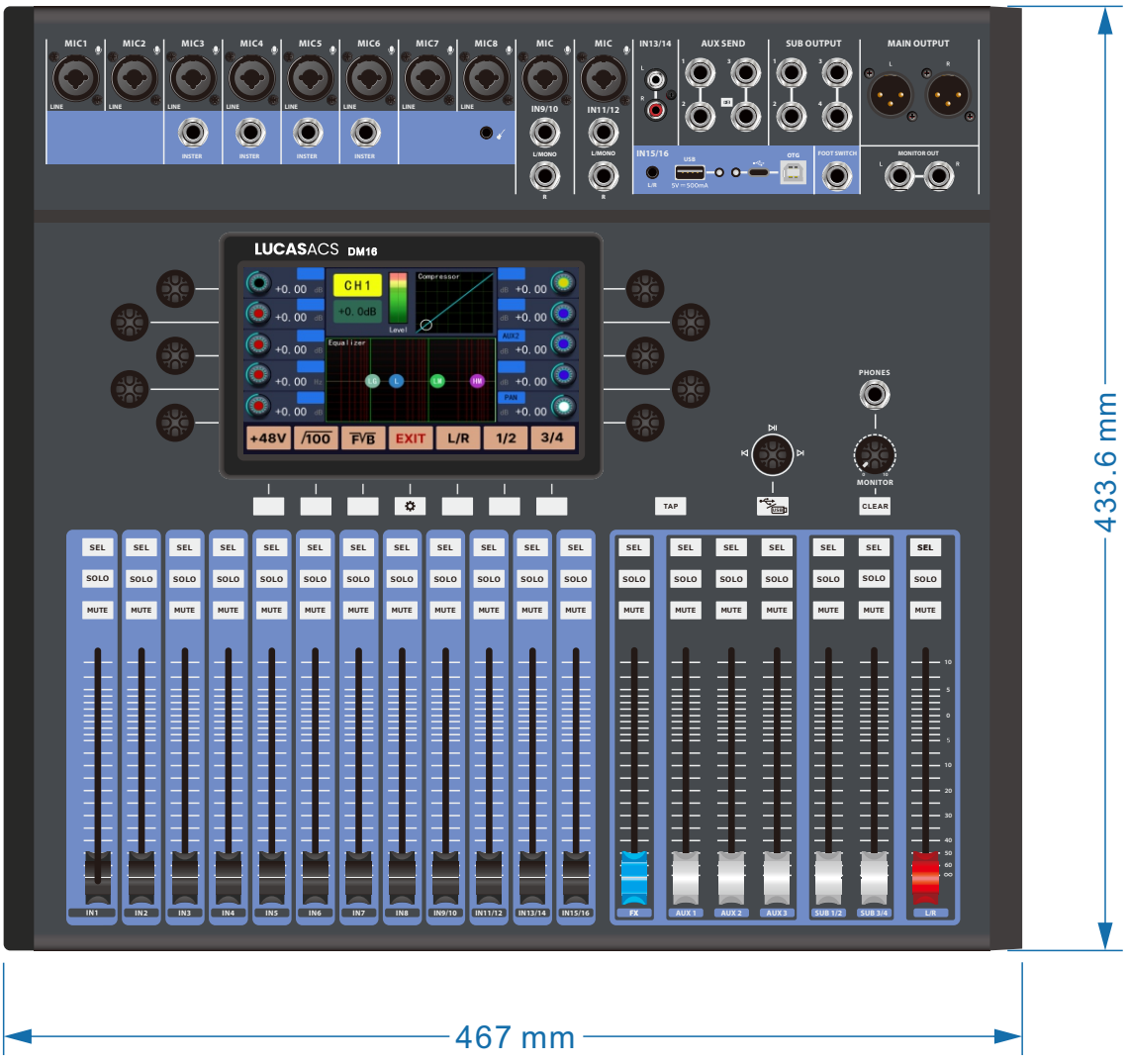
Hardware Indexes:	
Input channel	16 channel inputs include: 10 microphone inputs, 8 stereo inputs, and stereo digital inputs (USB sound card, USB flash disk playback, Bluetooth playback).
Output channel	2 stereo main outputs, 4 SUB group outputs, 3 AUX auxiliary outputs, 1 FX effect output, 2 stereo monitoring outputs, 2 stereo digital outputs (USB sound card, USB recording).
Recording interface	Dual-track USB sound card recording and playback
	Dual-track USB flash disk audio playback and storage
Input gain:	Microphone/line gain: 0dB+50.0dB; line gain: -80dB to +10dB
Input and output impedance	Microphone: 2 KΩ, line input: 5KΩ; output: 100Ω
System:	32-bit SHARC DSP chip processing, 48kHz sampling rate, 24-bit AD/DA conversion
Frequency response	20Hz-20kHz: +/-0.5
Total harmonic distortion plus noise:	-20dBFS@ 1kHz:<0.01%
Noise:	Noise level (20/20k bandpass): -85dBFS
Input and output level	Maximum input and output 20dBu
Dynamic range	>-105dB
Crosstalk:	Inter-channel isolation (1k): -83dBu
Phase difference:	Inter-channel phase difference (+4dB 1k): <0.5°
Delay	<3ms
USB:	Maximum current: 500mA
Screen:	7-inch HD 800x480 display screen
Phantom power:	Positive 48V software control management
Power consumption	<30W (typical value)
Power supply:	AC input voltage range: 100-240V, AC automatic induction, AC frequency: 50-60Hz
Operating condition:	Temperature range: -20ºC to 55ºC

Function Indexes	
Effect	Independent effect channels, 16 effect combinations to be selected
Input/output channel compressor	Threshold: -60dB- +20dB, automatic compression ratio
Input channel equalizer	High, medium and low 3-band parameter equalizer
	Frequency of medium frequency band: 20Hz-20kHz
	Gain: -12dB- + 12dB
Input channel filter	HPF: 80Hz, 90Hz, 100Hz (-24dB/oct)
Input microphone anti-howling	Self-adaptive phase shift feedback inhibition function
Output channel equalizer	7-band parameter equalizer
	Gain: -12dB- + 12dB
Preset storage and call:	

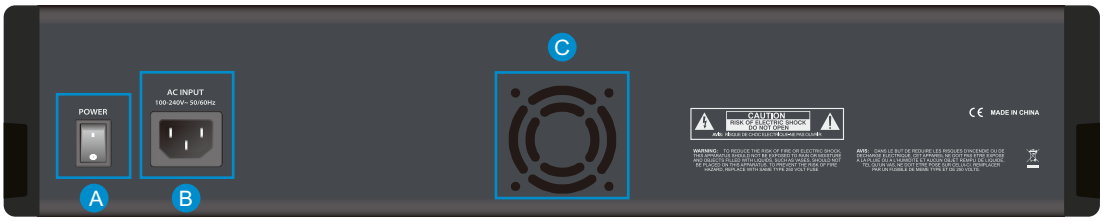
(3). Hardware Structure and Installation

1. Structure and Dimension





2. Interface Description



A. ON/OFF

It is used to turn on and off the power switch of the machine.

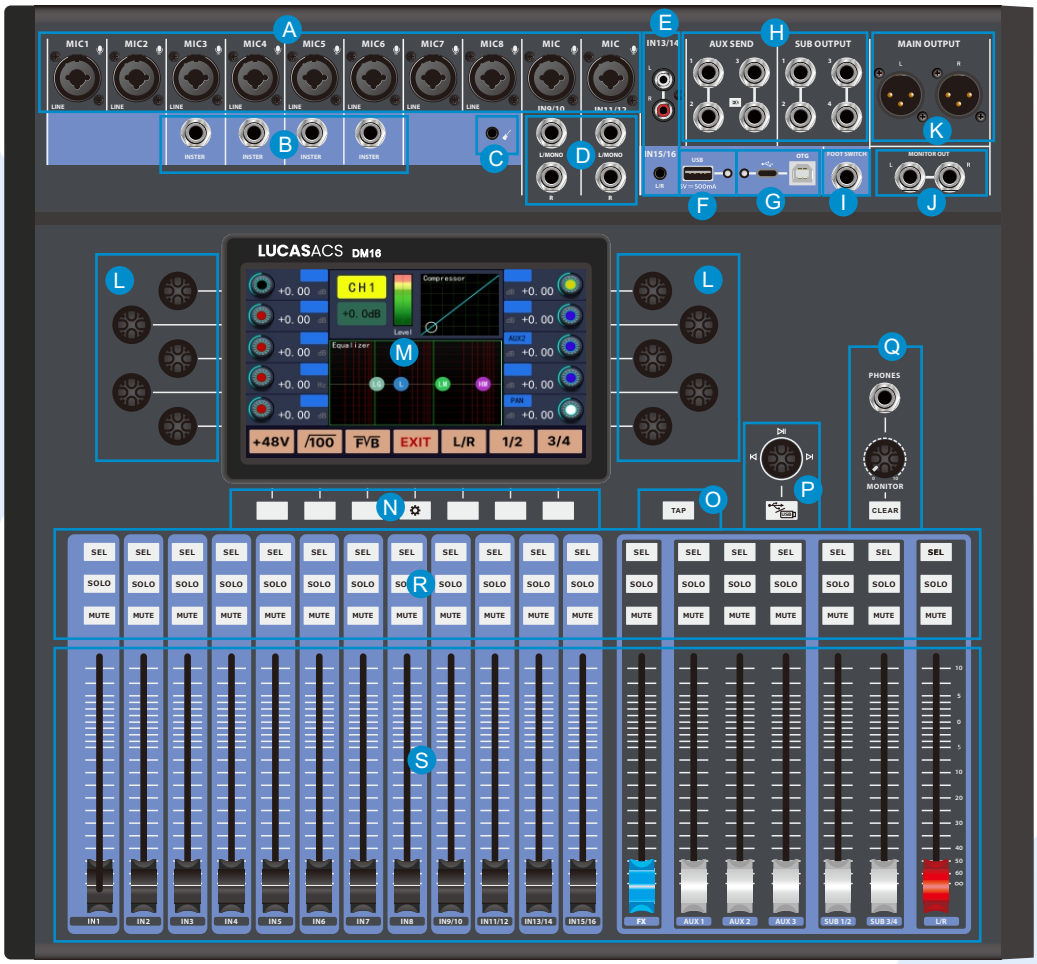
B. Power socket

Connect 100V-240VAC power.

C. Fan

Cooling port for the machine, need to keep the ventilation smooth.

3. Operation Panel Description



A. 1-10 input interface

Input signals used to connect microphones or balance analog lines,+48V phantom power is available in all XLR interfaces.

B. Insert port

Connection port for inserting professional effects, 2PIN is input and 3PIN is output.

C. High resistance switch

Impedance matching switch for connecting Musical Instruments.

D. 6.3mm Stereo input

Stereo 9-12 channel balanced input interface, can also be connected to the L port of the mono signal input.

E. RCA&3.5mm Stereo input

Stereo 13-16channel unbalanced input interface

F. USB flash drive port and indicator

When the indicator lights up, the mixer can read music files in the USB flash disk and play them in sequence (available for mp3 and wav, etc.)

Note: Some USB flash disks may read/store music files slowly. After recording, please confirm that record files have been completely stored before removing the USB flash disk, in order to avoid damage to such files.

G. OTG port and indicator

When the indicator light is on, you can connect the computer to the TYPE-B and TYPE-C interfaces for stereo music playback and recording.

H. AUX and SUB output

AUX1-4 bus balanced output XLR interface, connect the auxiliary sound reinforcement system, SUB1-4 bus balanced output XLR interface, connected to the main or auxiliary sound reinforcement system.

I. FOOTSWITCH port

The foot switch can be connected for mute control of the effect.

J. MONITOR port

Monitor the left and right channel output interface of the system.

K. MAIN output

The main sound reinforcement system is connected to the balanced output XLR interface for the L/R signal.

L. Parameter editing button

It is used to control and edit all parameters displayed in the screen, and channel parameters correspond to left and right en coders.

M. Screen

It is used to monitor various working states of the sound mixer and set the parameters of the sound mixer by parameter button.

N. Channel function selection button and main menu button

SEL can be pressed to enable and disable corresponding channel functions. The buttons in the middle can be pressed to enable functions in the main page, e.g. preset call, preset save, channel copy and system menu page, etc.

O. TAP button

It is used to control the delay time of effect and skip to a suitable speed with beat. When this function is enabled, effect type with Delay parameter should be selected, and TAP switch should be turned on.

P. Player button and option button

It can be turned left and right to play the previous and next music in the USB flash disk. Press it for play and pause music. Press and hold it for recording. The following buttons can be pressed to switch between USB flash disk and OTG.

Q. Earphone monitoring interface and monitoring channel volume knob

They are used to monitor any channel and control volume of earphones. Click on CLEAR to clear the monitoring mode of all channels.

R. Channel editing button

SEL button is used to select a channel editing interface for adjusting channel functions; SOLO button is used to monitor the channel corresponding to this button (note: SOLO button can be used by all input channels simultaneously, and it can also be used by all output channels simultaneously, but it cannot be used by input channels and output channels simultaneously); MUTE button is used to control mute of corresponding channels.

S. Volume fader

The volume of all input and output channels can be controlled, each channel corresponds to a potentiometer fader.

(4). System Settings

1. Software Update

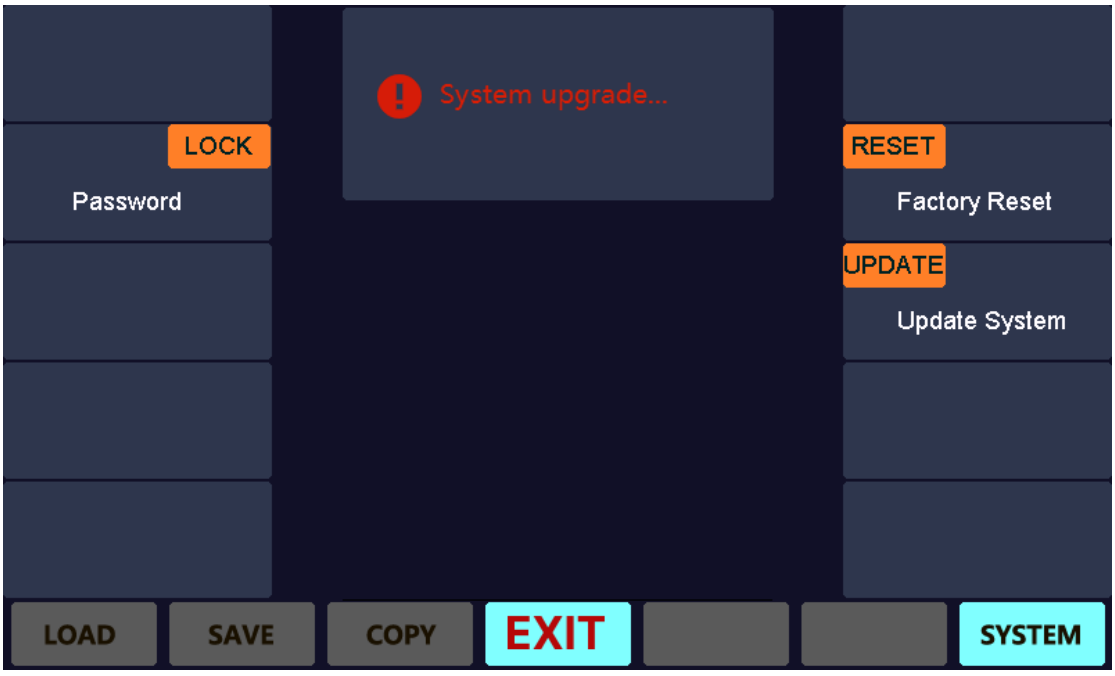
Software upgrade method: (USB flash disk upgrade)

A. Copy the upgrade package file (suffixed with. bin) to the folder MIXER in the root directory of the USB flash disk;

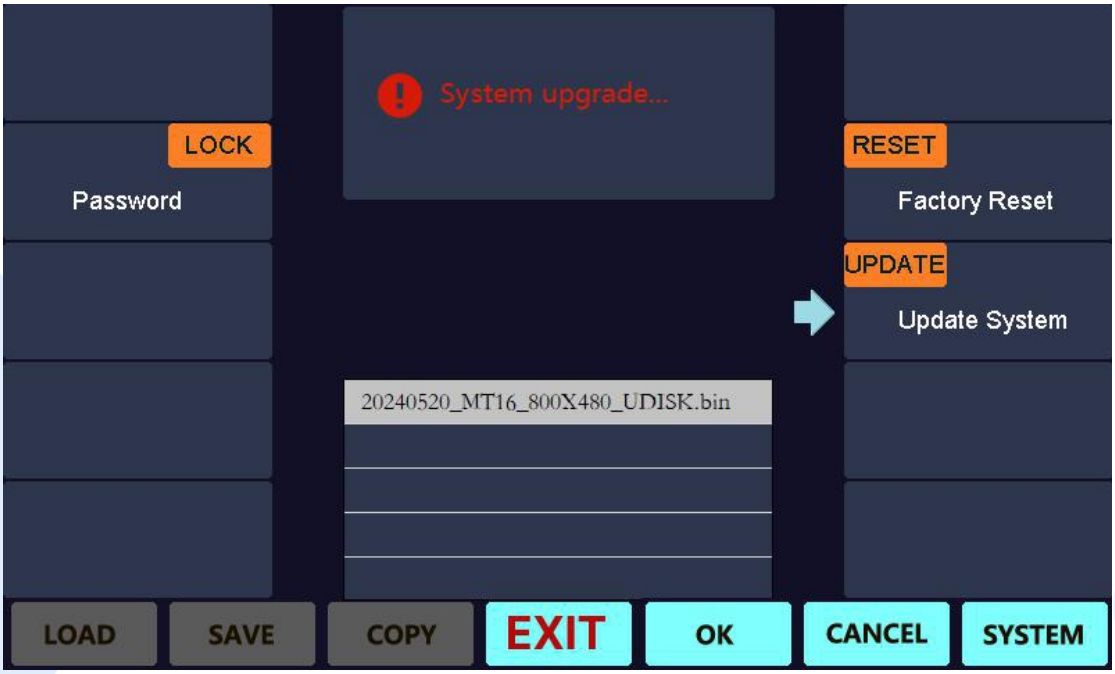
B. Turn on the sound mixer;

C. Connect the USB flash disk to the TYPE-A port of the sound mixer;

D. Click on SYSTEM on the menu in the main interface;



E. Click on the encoder button corresponding to Update System to enter the USB flash disk upgrade interface. All updatable data packets in the USB flash disk are automatically searched and displayed on the operation interface. Rotate the encoder to select the bin file of the data package to be upgraded and click on OK to start upgrading.



F. Wait for about 1-2 minutes. After the program is updated, the sound mixer will be restarted and updated.

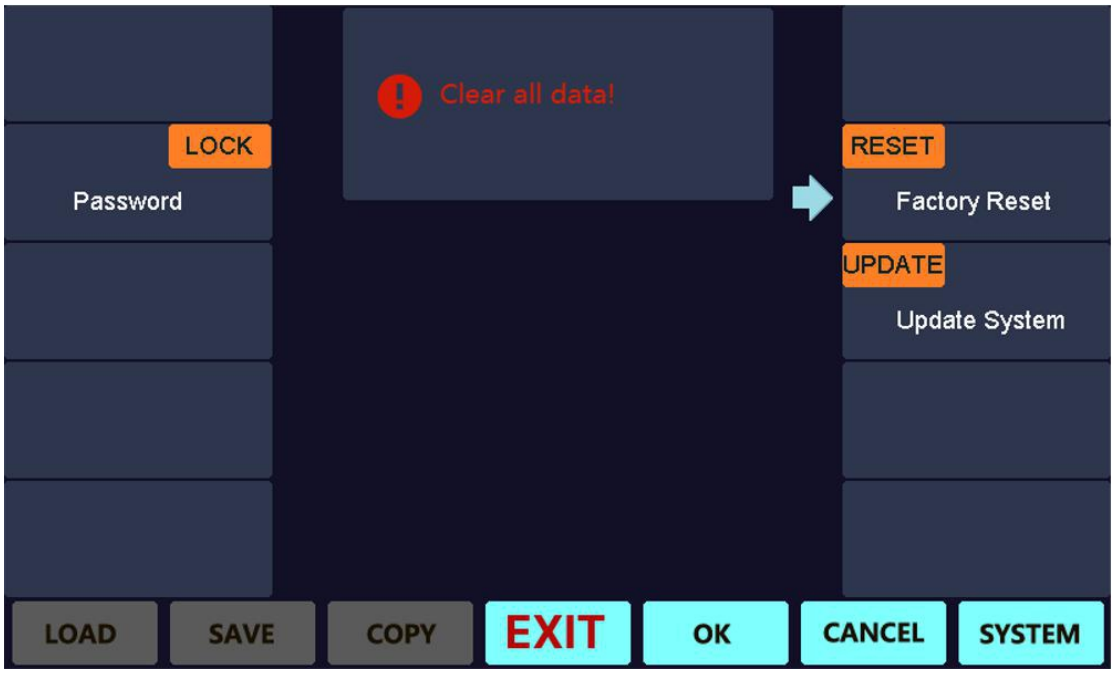
Note: Do not cut off the power supply in the update process;

2. Factory Reset

The sound mixer offers factory reset function. Please clear all user data.

Click on Factory Reset encoder button on the SYSTEM interface in the main menu of the sound mixer, and click on OK to reset the sound mixer. All channel settings, preset parameters, scenes, user files and user passwords will be cleared.

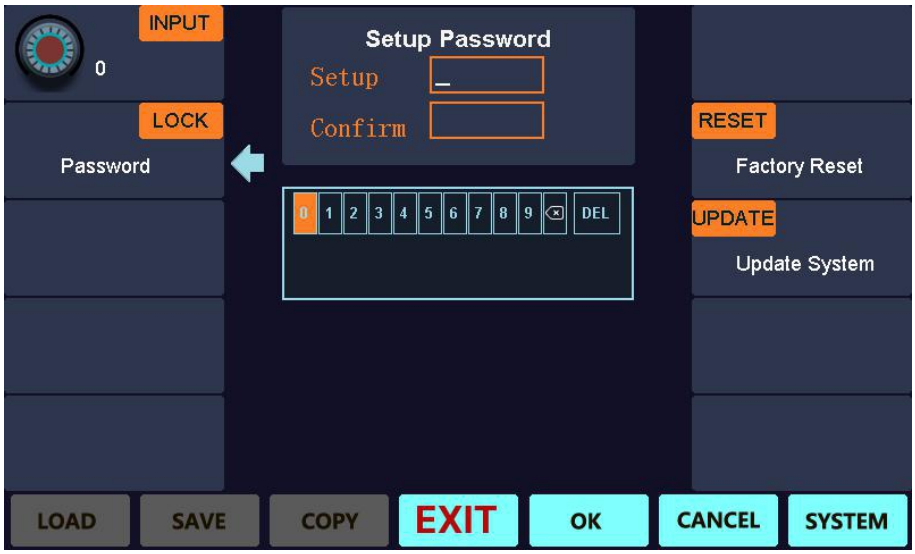
Note: The cleared parameters including all saved preset parameters will no longer exist.



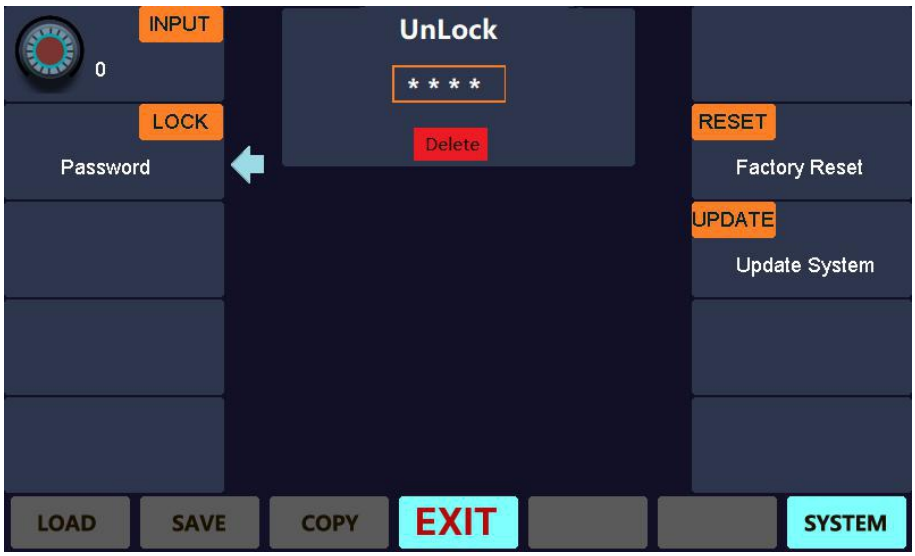
3. Account Settings

This product is configured with a user password system, which canprevent the playback accident caused by the accidental touch of the sound mixer. There is no factory password by default.

A. Click on the Password encoder button on the SYSTEM interface in the main menu of the sound mixer, and a password setting window will pop up. Rotate the INPUT encoder to choose a 4-digit password, enter the password twice and click on OK.



B. The password will be validated after the system is restarted, all other functions than USB flash disk playback are not available, and they will be enabled after unlocked. To delete the password, unlock and click on Del to delete it. The system will not be locked when it is powered on subsequently.



(5). Operation and Use

1. Channel Overview Interface

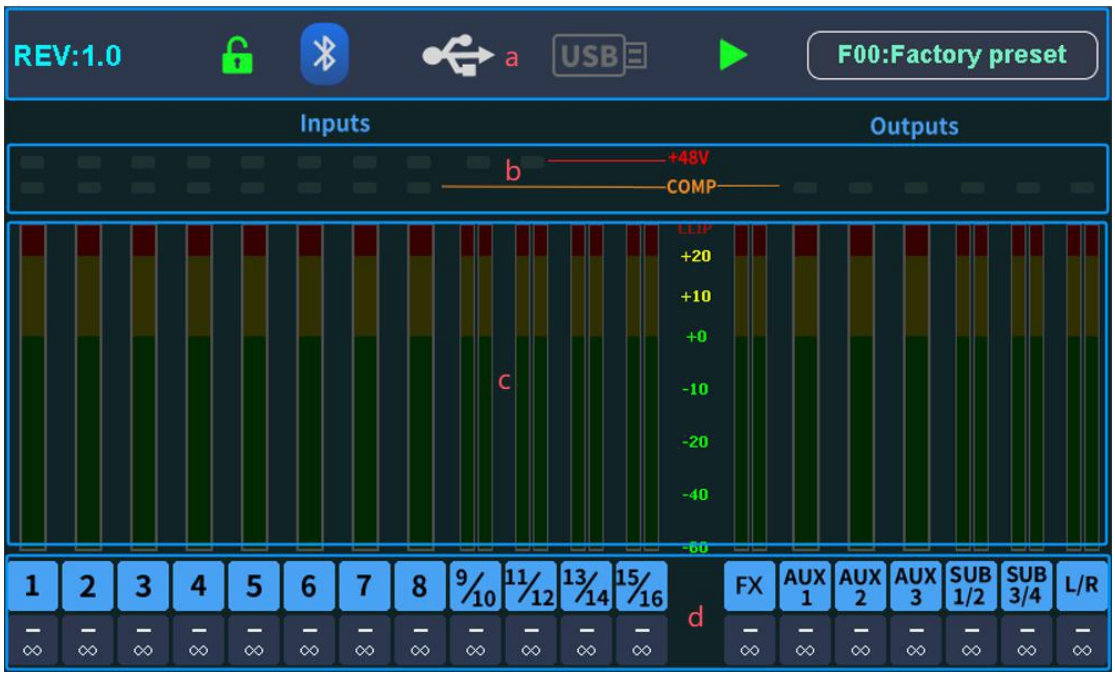
Power on the system and enter the level and status overview page,

A: Version number, machine lock status (red means locked and green means unlocked), Bluetooth status (Bluetooth symbol is displayed after Bluetooth connection) OTG status (orange is displayed after switching to OTG and monitored), USB flash disk status (orange is displayed after switching to USB flash disk and monitored), USB flash disk playback and pause status, and preset message bar will be displayed in the leader-headed position.

B: 48V phantom power light of input channel and compressor light of input and output.

C: Level light of input and output channels.

D: Name and volume display values of input and output channels.



2. Channel Function Editing Interface

A. Click on SEL of channels 1-8 to enter the channel function editing interface,

a): Microphone gain adjustment range: 0-50dBu.

b): Compressor threshold range of input channel: -50-+20dBu, corresponding to the variation chart of the compressor curve on the right.

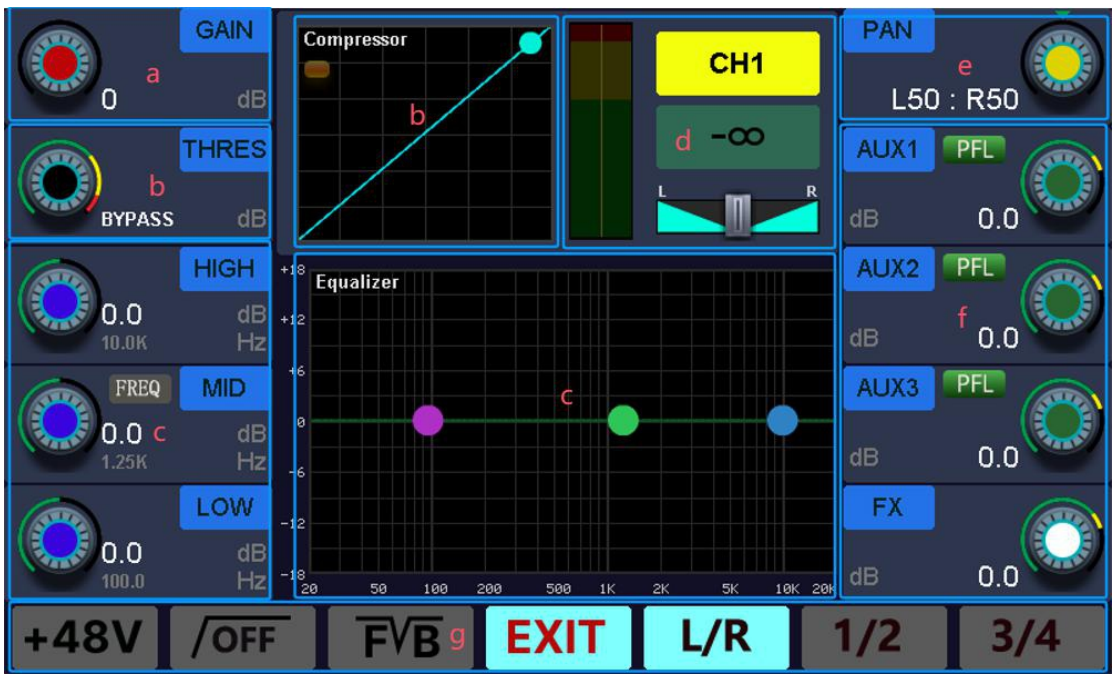
c): High, medium and low balanced adjustment of input channel, adjustable gain: -12dBu-+12dBu, click on the encoder button corresponding to the medium frequency band to switch to FREQ frequency adjustment within 20Hz-20KHz. The 3-section balanced curve will be displayed in real time on the right.

d): Display volume level, channel name and volume value of input channel as well as balanced potentiometer status.

e): The value of the balanced potentiometer on the right and left of channel PAN can be adjusted.

f): The adjustable range of the volume value sent to AUX1-3 is -80-+10dBu. Press corresponding encoder button to choose AFL after faders and PFL before faders, and the volume value sent to the FX effect channel is adjustable.

g): ON and OFF of +48V phantom power of input microphone channel, low cut OFF/80Hz/100Hz selection, self-adaptive feedback inhibition ON and OFF, ON and OFF of volume sent to main L/R channel, and ON and OFF of volume sent to SUB1-4.



B. Click on SEL of stereo channels 9-12 to enter the channel function editing interface,

a): The adjustable range of the microphone gain is 0-50dBu.

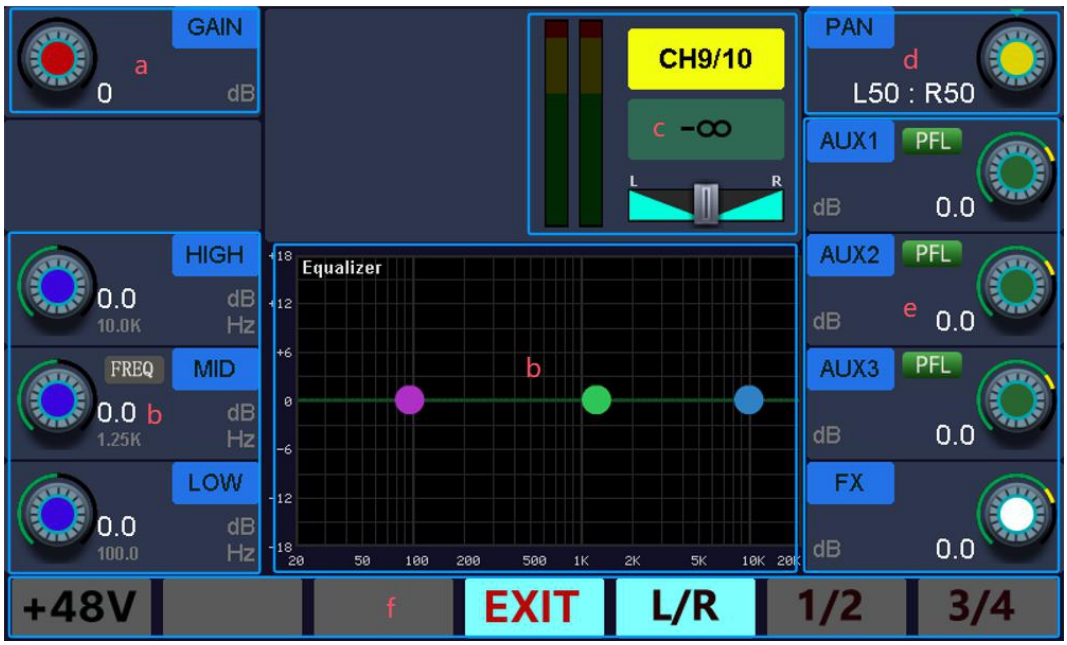
b): High, medium and low balanced adjustment of input channel within -12dBu- +12dBu, click on the encoder button corresponding to medium frequency band to switch to FREQ frequency adjustment within 20Hz-20KHz. The 3-section balanced curve will be displayed in real time on the right.

c): Display volume level, channel name and volume value of input channel as well as balanced potentiometer status.

d): The value of the balanced potentiometer on the right and left of channel PAN can be adjusted.

e): The adjustable range of the volume value sent to AUX1-3 is -80-+10dBu. Press corresponding encoder button to choose AFL after faders and PFL before faders, and the volume value sent to the FX effect channel is adjustable.

f): ON and OFF of +48V phantom power of input microphone channel, low cut OFF/80Hz/100Hz selection, self-adaptive feedback inhibition ON and OFF, ON and OFF of volume sent to main L/R channel, and ON and OFF of volume sent to SUB1-4.



C. Click on SEL of stereo channels 13-14 to enter the channel function editing interface,

a): The adjustable range of analog input sensitivity TRIM is -20dBu-+20dBu.

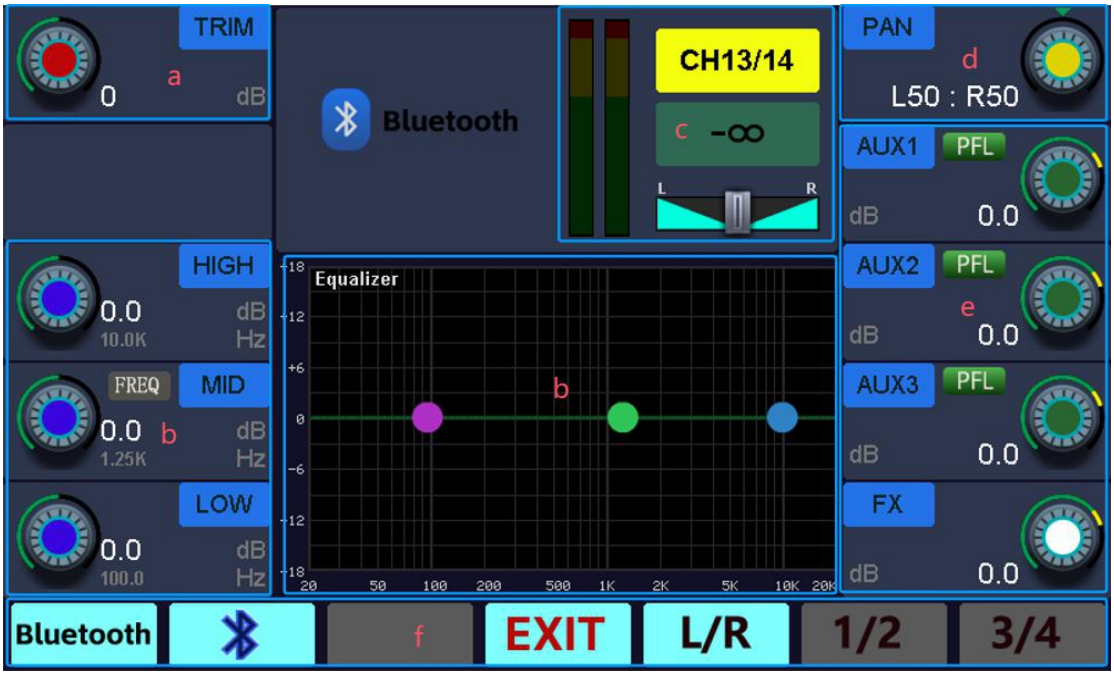
b): High, medium and low balanced adjustment of input channel within -12dBu-+12dBu, click on the encoder button corresponding to medium frequency band to switch to FREQ frequency adjustment within 20Hz-20KHz. The 3-section balanced curve will be displayed in real time on the right.

c): Display volume level, channel name and volume value of input channel as well as balanced potentiometer status.

d): The value of the balanced potentiometer on the right and left of channel PAN can be adjusted.

e): The adjustable range of the volume value sent to AUX1-3 is -80-+10dBu. Press corresponding encoder button to choose AFL after faders and PFL before faders, and the volume value sent to the FX effect channel is adjustable.

f): Master switch of Bluetooth (communication equipment cannot search any Bluetooth information cannot be searched after this switch is turned off), Bluetooth frequency matching switch (turn on the frequency matching switch to connect a mobile phone, and Bluetooth 16 MIXER BT will be displayed. Once it is connected, it can be directly connected next time with no need for frequency matching. After successful connection, the Bluetooth symbol will not flicker), ON and OFF of volume sent to main L/R channel, and ON and OFF of volume sent to SUB1-4.



D. Click on SEL of stereo channels 15-16 to enter the channel function editing interface,

a): The adjustable range of analog input sensitivity TRIM and OTG/USB gain is -20dBu - +20dBu.

b): High, medium and low balanced adjustment of input channel within -12dBu- +12dBu, click on the encoder button corresponding to medium frequency band to switch to FREQ frequency adjustment within 20Hz-20KHz. The 3-section balanced curve will be displayed in real time on the right.

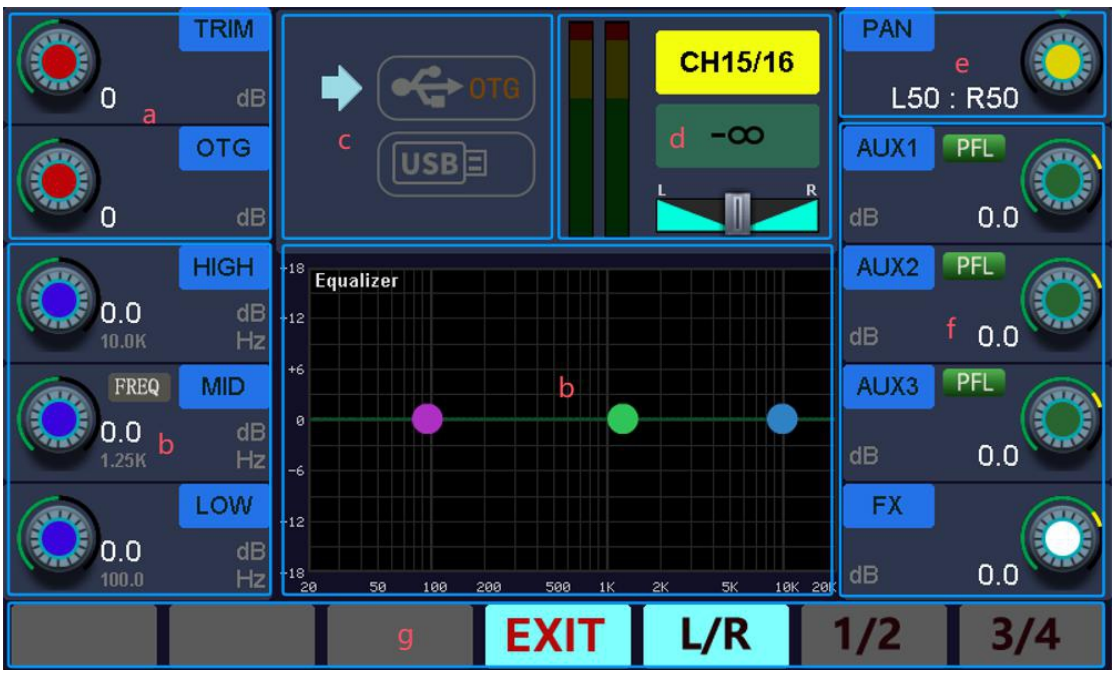
c): OTG and USB switch display status.

d): Display volume level, channel name and volume value of input channel as well as balanced potentiometer status.

e): The value of the balanced potentiometer on the right and left of channel PAN can be adjusted.

f): The adjustable range of the volume value sent to AUX1-3 is -80 - +10dBu. Press corresponding encoder button to choose AFL after faders and PFL before faders, and the volume value sent to the FX effect channel is adjustable.

g): ON and OFF of volume sent to main L/R channel, and ON and OFF of volume sent to SUB1-4.



E. Click on SEL of FX channel to enter the effect setting interface,

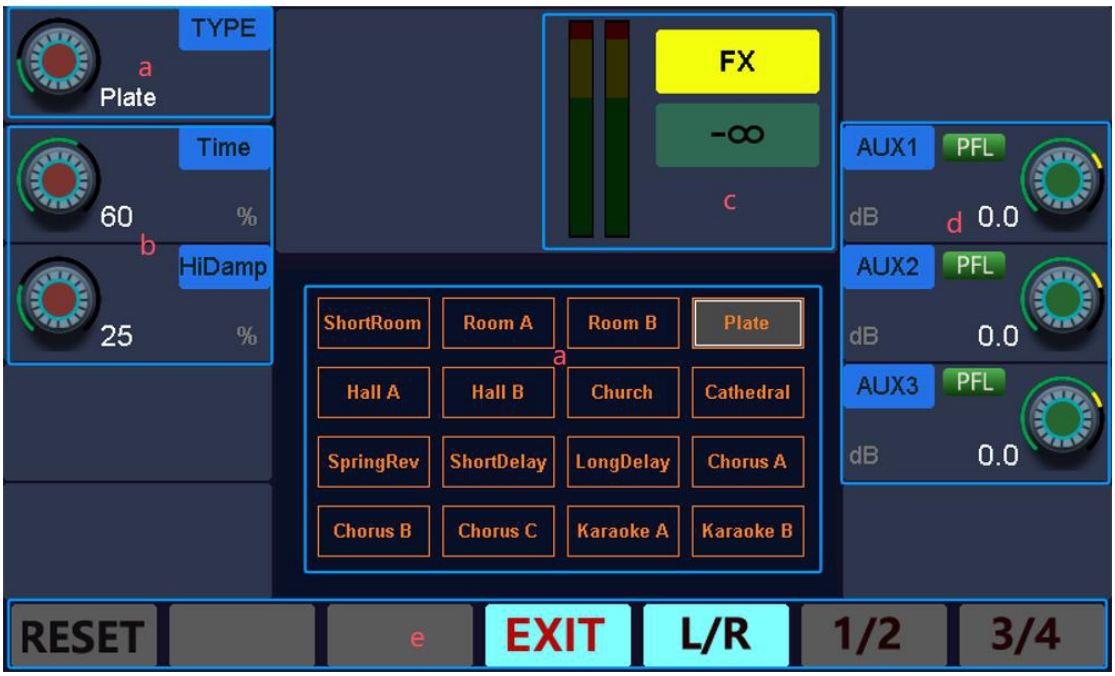
a): TYPE refers to 16 types to be selected for the effect. When rotating the encoder, the curser in the effect name box will move. Then, click on the effect type selection encoder button to confirm the effect. When Delay effect and Karaoke effect are selected, the effect parameters will contain BPM value, which corresponds to TAP metronome button on the panel of the sound mixer. Click on TAP at different speeds to reach a different delay effect.

b): Display parameters of current effect type, and rotate corresponding encoder to modify the parameter values. The values of all effect types can be memorized separately after modified.

c): Display level of current effect channel, name of effect channel and volume value of effect channel.

d): The adjustable range of the volume value sent to AUX1-3 is -80 - +10dBu. Press corresponding encoder button to choose AFL after faders and PFL before faders.

e): ON and OFF of main channel L/R sent by the effect to the bus, and ON and OFF of SUB 1-4 sent to the group channel.

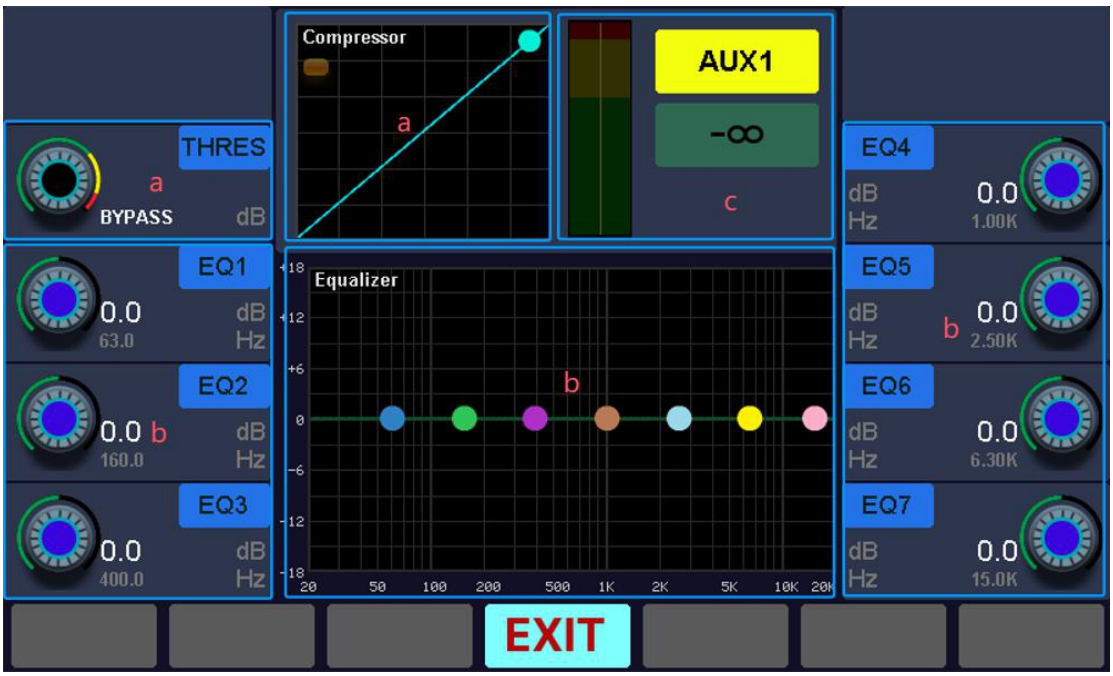


F. Click on SEL of AUX1-3 channel to enter the auxiliary channel setting interface,

a): The compressor threshold of AUX output channel is adjustable within -50dBu-+20dBu, which corresponds to the variation chart of the compressor curve on the right.

b): The 7-section balanced adjustment range of AUX output channel is within -12dBu - +12dBu, and the 7-section balanced curve will be displayed in real time.

c): Display volume level, channel name and volume value of AUX channel.



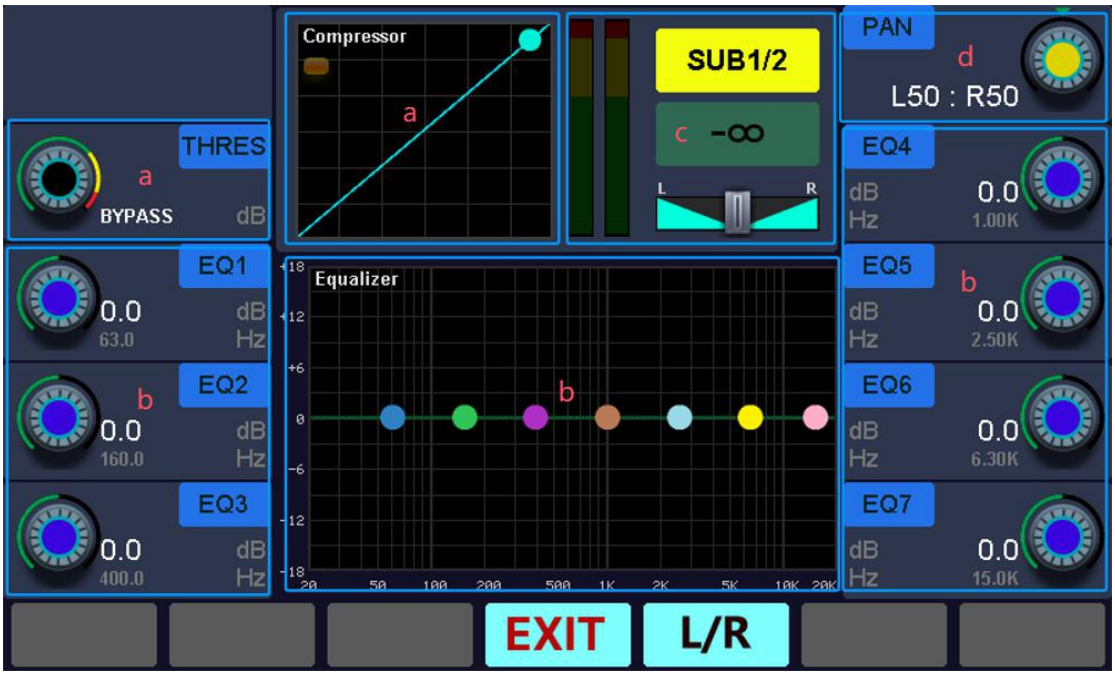
G. Click on SEL of SUB1-4 channel to enter the group channel setting interface,

a): The compressor threshold of SUB output channel is adjustable within -50dBu - +20dBu, which corresponds to the variation chart of the compressor curve on the right.

b): The 7-section balanced adjustment range of SUB output channel is within -12dBu - +12dBu, and the 7-section balanced curve will be displayed in real time.

c): Display volume level, channel name and volume value of SUB channel as well as Balance balanced potentiometer.

d): PAN balance volume value adjustment of SUB stereo output channel.



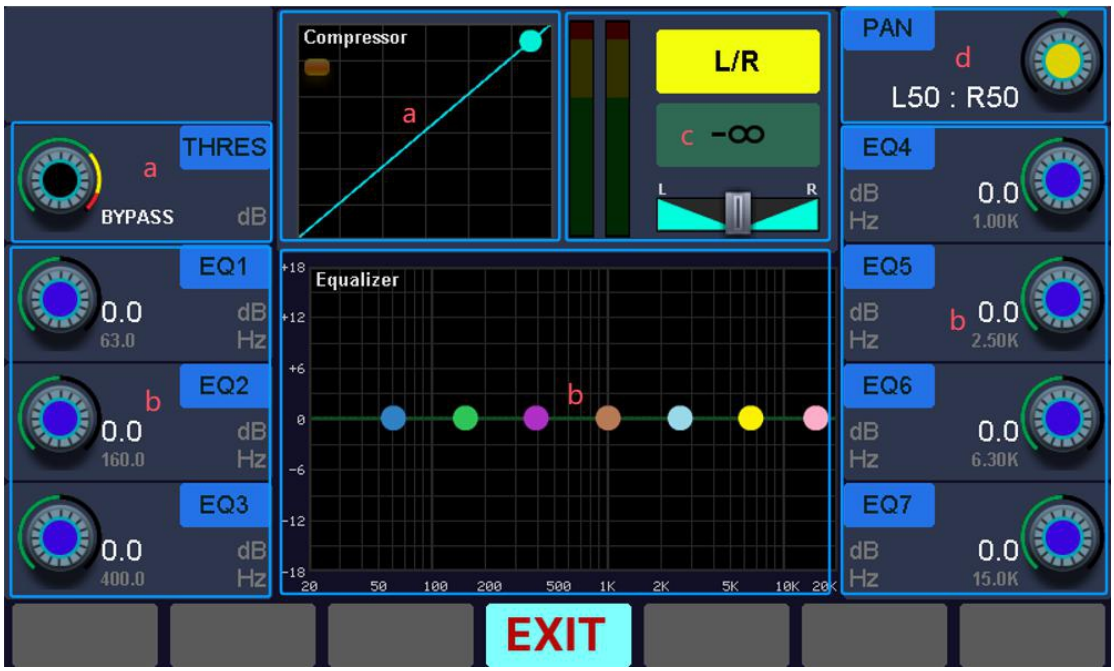
H. Click on SEL of L/R channel to enter the main channel setting interface,

a): The compressor threshold of L/R output channel is adjustable within -50dBu-+20dBu, which corresponds to the variation chart of the compressor curve on the right.

b): The 7-section balanced adjustment range of SUB output channel is within -12dBu - +12dBu, and the 7-section balanced curve will be displayed in real time.

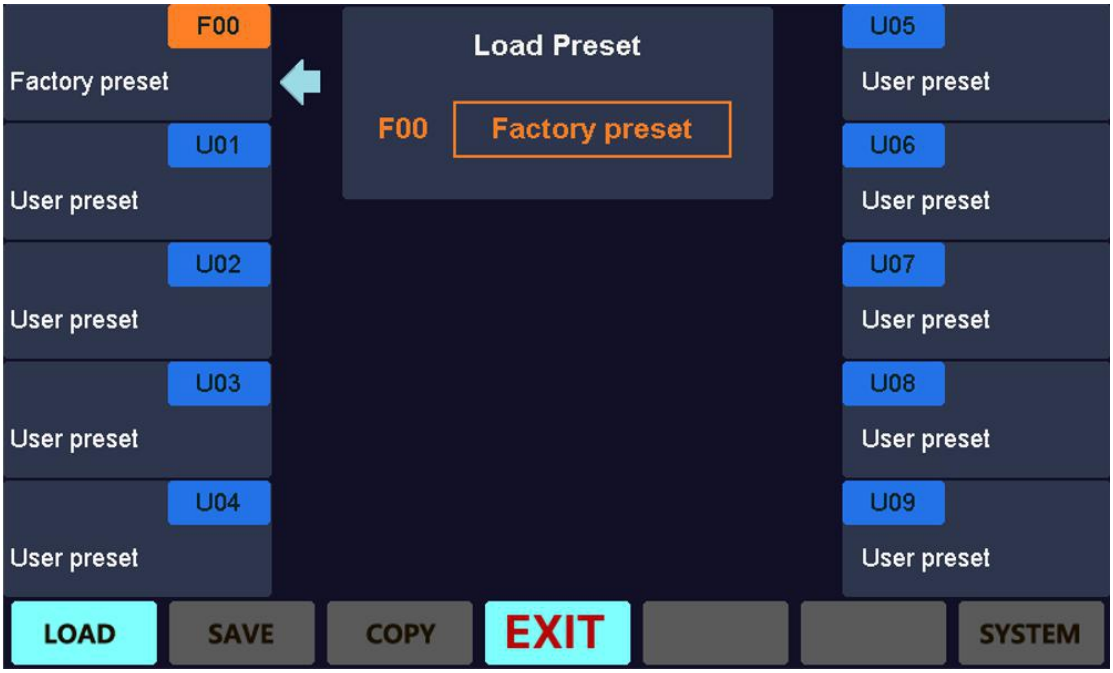
c): Display volume level, channel name and volume value of SUB channel as well as Balance balanced potentiometer.

d): PAN balance volume value adjustment of SUB stereo output channel.



3. Call Preset Scene Operation

A. Click on corresponding LOAD button in the main menu to enter the preset call interface, in which there are 10 user preset modes to be selected.



B. Click on corresponding encoder button to select a preset. Click on OK and the equipment will display the progress bar. The message bar will display a new preset name after call.



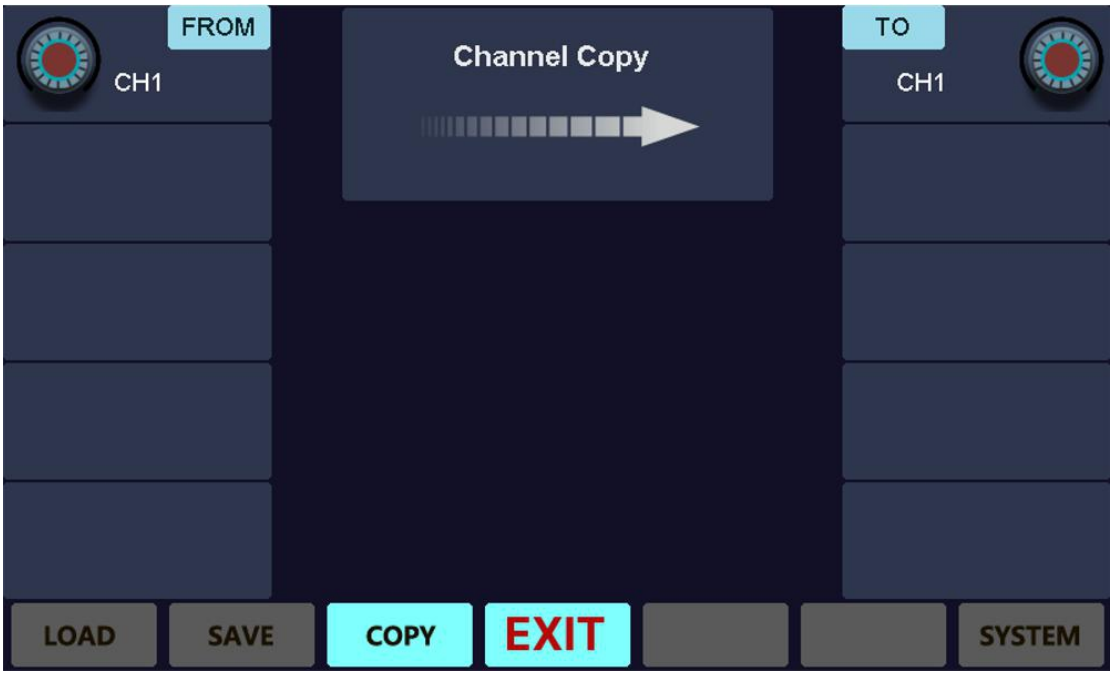
C. Click on the button corresponding to Save function in the main menu to enter the preset saving interface. The debugged parameters can be saved in the 9 presets.



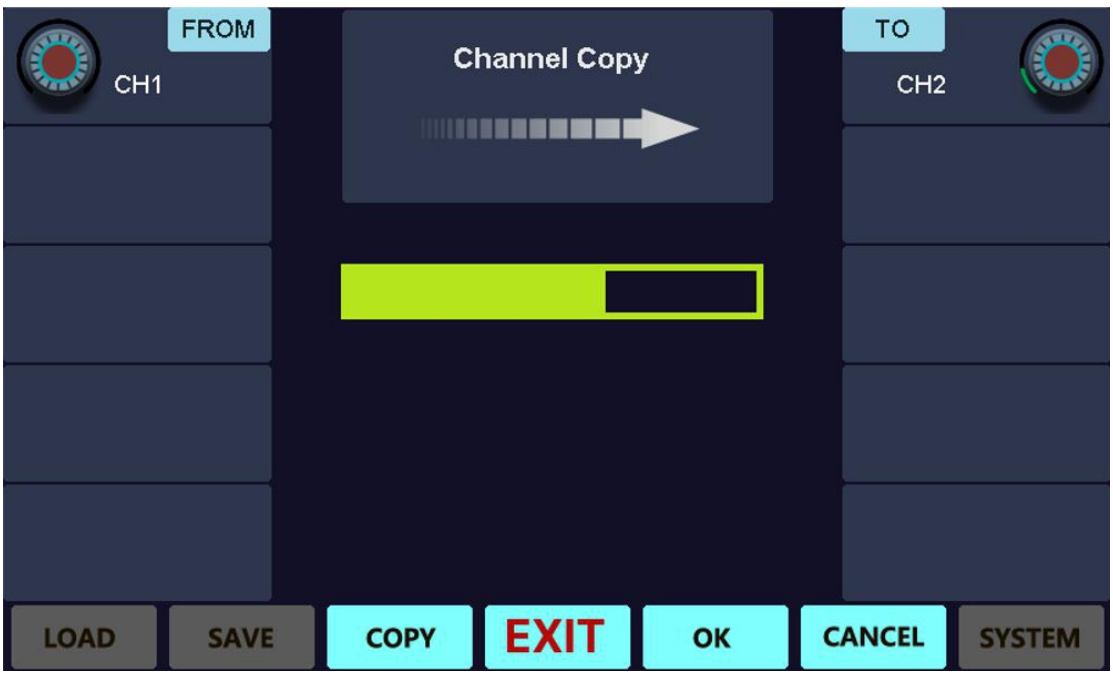
D. Click on the encoder button corresponding any preset, and the preset name window and the entry keyboard will pop up. Rotate INPUT encoder to modify name, and click on OK to save them. The storage time is related to storage parameter value. The more parameters are saved, the longer the storage time is. Parameters are saved only after corresponding preset name is modified.



E. Click on the button correspond to Copy function in the main menu to enter the channel copy interface. Choose the left and right en coders to select a channel to copied. Parameters of CH1-8 input channel can be copied and used arbitrarily.



F. Click on OK and the progress bar will pop up. Parameters will be copied after the progress bar is over.



(6). Accessories list

1. Power cord -1

2. USB cable-1

3. USB Flash Disk-1

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