



---

# **FEEDBACK SUPPRESSOR**

## **USER MANUAL**

**TS-224D**

Please read this user manual in detail before use

## Notification



### WARNING

To ensure the reliability of the equipment and the safety of personnel, please observe the following when installing, using and maintaining:

- If any of the following conditions are found, please immediately turn off the power, plug out and quickly contact your nearest dealer. Do not continue using this unit, which may cause a fire or electric shock.
  - If you find smoke or have a strange taste from the machine.
  - If water or metal falls into the machine.
  - If the unit is dropped or the case is damaged.
  - If the wire is damaged (wire core exposure, broken wire, etc.).
- If the machine contains high-pressure parts, in order to avoid the fire or electric shock, absolutely don't open the case, if any questions please inform your nearest dealer.
- Do not place cups, bowls, vases or metal and other water-filled substances on the unit. Serious spilled liquid may cause a fire or electric shock.
- Never expose the unit to rain and any moisture or water, which may cause electric shock or fire.
- Do not place metal objects or flammable materials from the vents on the machine cover, nor place coins, which may cause fire or electric shock.
- Do not place heavy objects on the unit to avoid personal injury or property damage when the unit is slipping.
- Make sure that the volume is turned on at the beginning of the boot, and the high volume of the boot may cause hearing problems.
- Make sure that the volume is turned on at the beginning of the boot, and the high volume of the boot may cause hearing problems.
- For long-term accumulation of dust to be cleaned, please inform your dealer to regularly clean the machine, so as to avoid damage to the machine or cause a fire.
- The battery must be replaced with the same type of product and the correct installation should be made in order to avoid electrical damage and explosion hazard.
- The product is a Class I device. The device must be well connected to ground. The power plug must be connected to a power outlet with a grounding device to ensure that the equipment is fully grounded.

- This product uses a power plug or appliance input socket as a disconnecting device with the power supply, and must be disconnected if necessary for safety reasons.



- This equipment is only suitable for safe use at altitudes under 2000 meters.

## Precautions

### 1. The installation environment

When installing the unit, in order to ensure the normal cooling of the host, should avoid the poor ventilation of the place or high temperature environment, to avoid direct sunlight.

Recommend to install cabinet or other well-ventilated place indoor. If you use the machine in the outdoors, please pay attention to waterproof, moisture, lightning protection measures.

Avoid installing in a violent place of vibration; do not place other equipment on the machine.

### 2. To avoid electric shock and fire

Do not touch the hands and the source with wet hands

Do not spill liquid on the machine, so as to avoid short-circuit or fire inside the machine.

Do not place other equipment directly on the top of the unit.

Non-professional service personnel Do not disassemble the unit yourself to avoid damage and electric shock.

### 3. Transport and handling

The packaging of the machine is designed and tested to ensure that the host will not be accidentally damaged during transport. It is best to use the original packaging when handling the unit.

Do not move the host device between the place or cold or over hot to avoid condensation inside the machine, affecting equipment life.

### 4. Please follow the warning instructions on this product, the warning signs on behalf of:

	Applicable to 2000 meters above sea level and below safe use
	Safe use only in non-tropical climates

### 5. Agreement

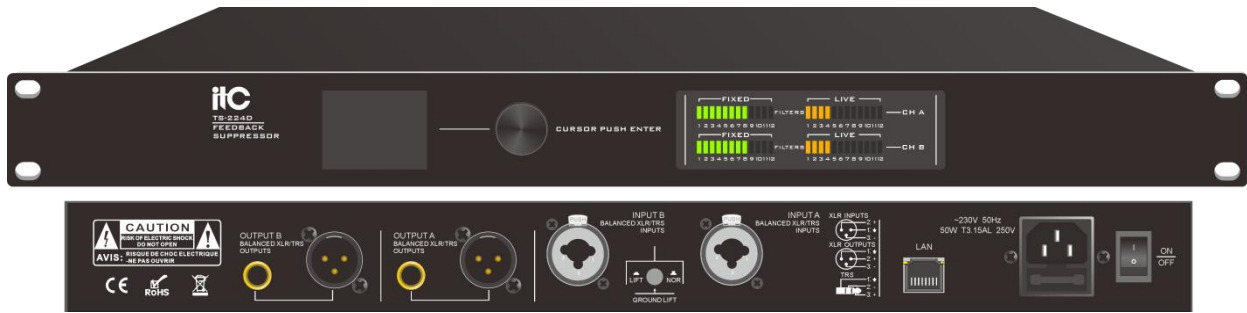
Please strictly follow the instructions in this manual. The software, hardware and appearance of this product will be upgraded and updated continually. The above changes will be made without notice.

Non-professional maintenance personnel, do not remove the product, to avoid damage and electric shock.

# CONTENT

<b>1. Product Description.....</b>	<b>- 1 -</b>
<b>2. Product Features.....</b>	<b>- 2 -</b>
<b>3. Function Introduction.....</b>	<b>- 3 -</b>
3.1. Front and rear panel.....	- 3 -
<b>4. Display Operating Instructions.....</b>	<b>- 4 -</b>
4.1. Scene switching.....	- 4 -
4.2. Signal level display.....	- 4 -
4.3. Channel bypass.....	- 5 -
4.4. Reset notch point.....	- 5 -
4.5. Screen lock.....	- 6 -
4.6. Language switching.....	- 6 -
<b>5. Schematic Block Diagram.....</b>	<b>- 7 -</b>
<b>6. Product Specifications.....</b>	<b>- 8 -</b>

# 1. Product Description



The feedback suppressor integrates howling suppressor, equalizer, noise gate, clipper and other technologies.

**Howling suppression:** The sound signal collected by the microphone includes the sound signal amplified by the speaker. The signal is continuously superimposed and amplified in the acoustic feedback loop, and the positive feedback produces oscillation and howling. By analyzing the real-time audio signal, the frequency of the howling is obtained, and the amplitude and phase of the audio are changed by using a notch filter or a frequency shift filter to achieve howling suppression.

**Equalizer:** It can adjust the amplification/reduction of electrical signals of various frequency components separately, so as to compensate for the defects of speakers and sound fields, and compensate and modify various sound sources and other special effects through the adjustment of electrical signals of various frequencies.

**Noise gate:** In the sound reinforcement system, the audio equipment has a noise floor and will introduce certain environmental noise. The noise gate is mainly used to eliminate noise. By setting the signal threshold by the user, the channel is automatically closed when the signal level is lower than the threshold, and the channel is automatically opened when the signal level is higher than the threshold.

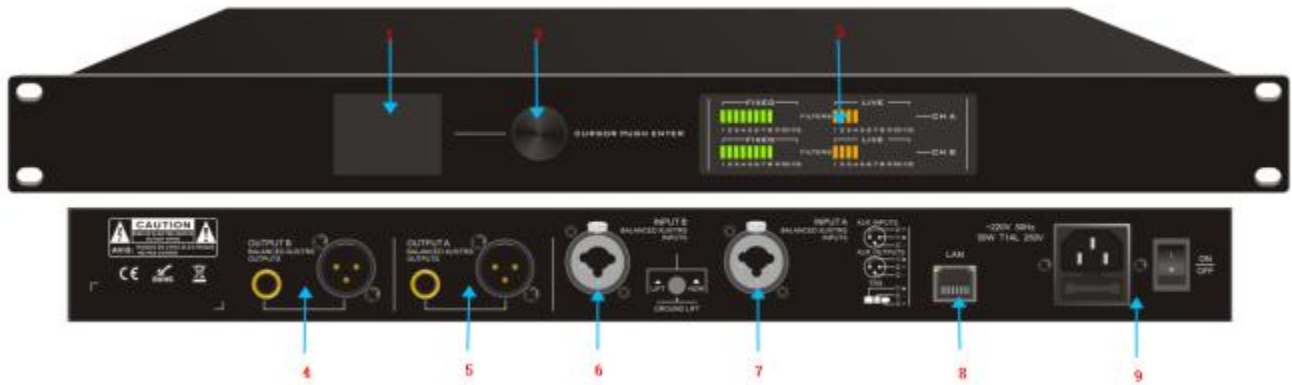
**Clipper:** It can limit the extreme peak signal in the audio signal, and protect the amplifier in the sound reinforcement system from being damaged. The clipper mainly protects the amplifier system. By setting the signal threshold by the user, when the signal level is higher than the threshold value, the signal is clipped.

## 2. Product Features

- 1) High-performance 40-bit DPS processor (clocked at 400M), providing 32-bit/48kHz excellent high-quality sound.
- 2) Diversified audio processing functions: notch filter, frequency shifter, noise gate, clipper, crossover and equalizer.
- 3) The equalizer supports a 31-band graphic equalizer and an 8-band parametric equalizer.
- 4) The crossover supports Bessel, Butterworth, Linkwitz-riley and other octaves.
- 5) Designed with a 2-inch IPS true color screen with a resolution of 320\*240; support Chinese and English switching display.
- 6) With 48 LED indicators for real-time display of the notch filter status, and 12 static + 12 dynamic notch filters per channel.
- 7) With dual-channel bypass, one-key reset of notch point configuration function.
- 8) Support 4-scene switching.
- 9) With factory reset function.
- 10) With device positioning function.
- 11) With power-off automatic memory protection function.
- 12) With Ethernet multi-use data transmission and control port, it can support real-time management of single and multiple devices.
- 13) With intuitive and graphical software interface; support XP/Windows7, 8, 10 and other system environments.

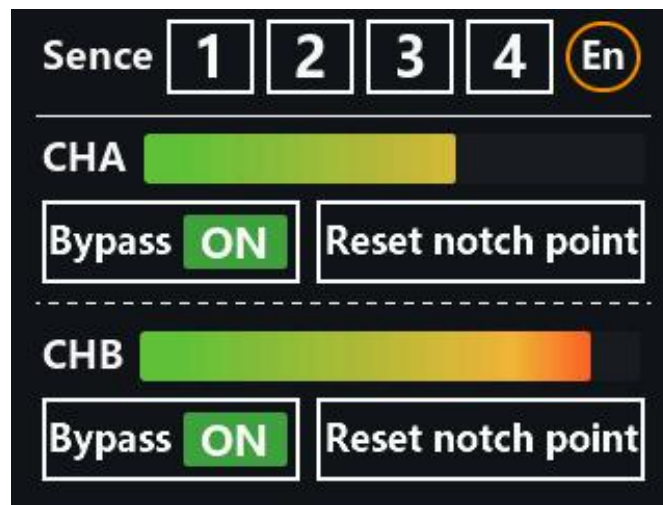
### 3. Function Introduction

#### 3.1. Front and rear panel



NO.	Interface name	Interface function
①	Display screen	Display the status of the Feedback Suppressor function
②	Setting knob	Control the display interface
③	Notch filter indicator	Display the status of the notch filter automatic capture point
④⑤	2 XLR female outputs + 2 TRS female analog outputs	A, B channel output
⑥⑦	2 XLR female inputs + 2 TRS female analog inputs	A, B channel input
⑧	RJ45 network port	PC upper computer control
⑨	Power socket & power switch	Device power supply, switched power supply

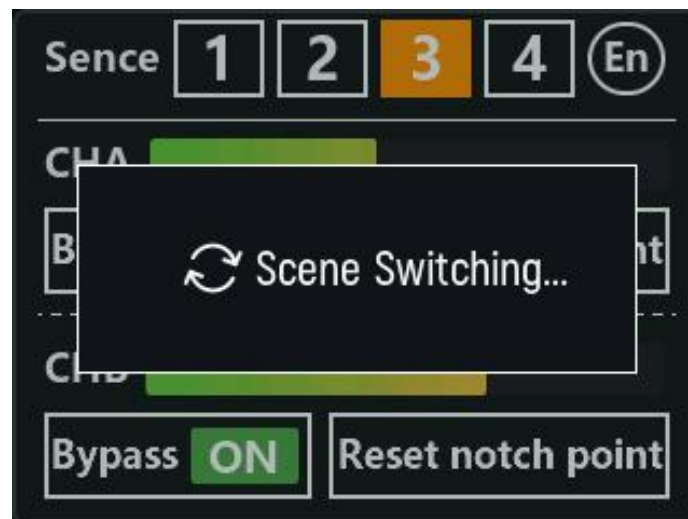
## 4. Display Operating Instructions



This interface mainly includes scene switching, signal level display, channel bypass, reset notch point, screen lock, language switching.

### 4.1. Scene switching

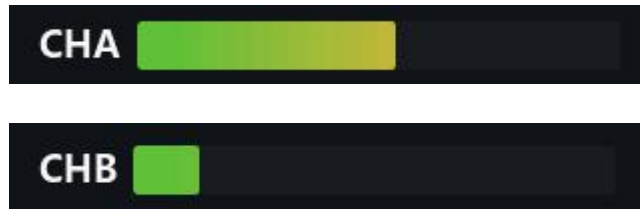
By clicking the button to select the scene number, you can switch to the corresponding scene and change the parameters of the scene.



### 4.2. Signal level display

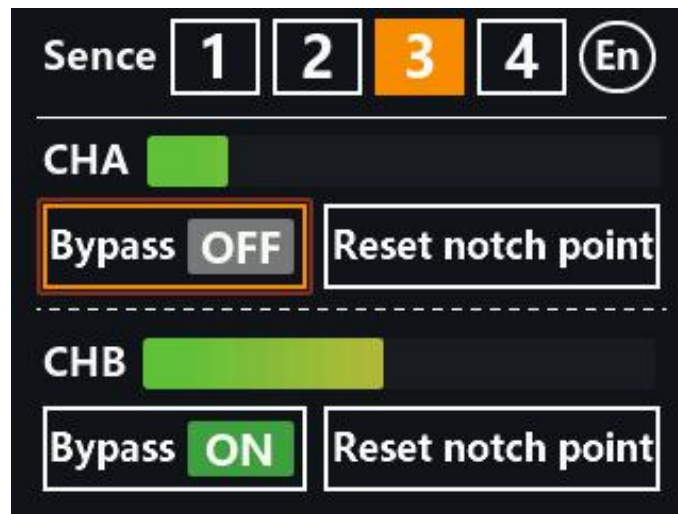
The progress bar on the right of the channel number indicates the signal level of the current channel, and the signals of the two channels are updated in real time.





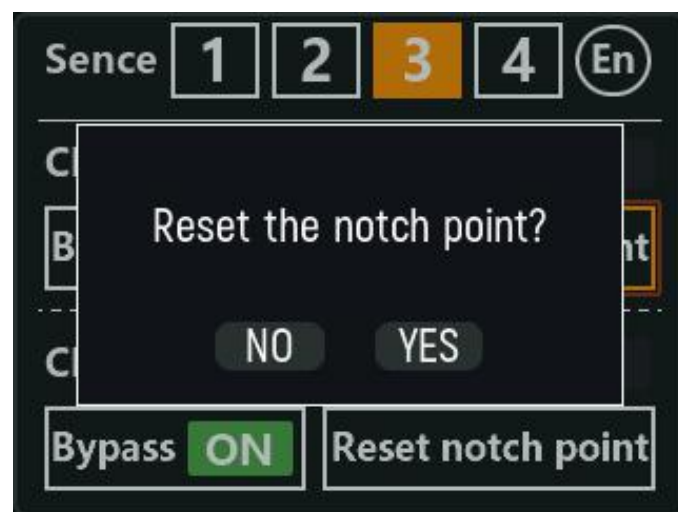
### 4.3. Channel bypass

Click the Bypass button of the corresponding channel to disable or enable all the audio effects of the channel, and the button displays "On" or "Off".



### 4.4. Reset notch point

Reset the notch point captured by TS-224D, click it and there will be a pop-up window to prompt whether to reset the notch point.



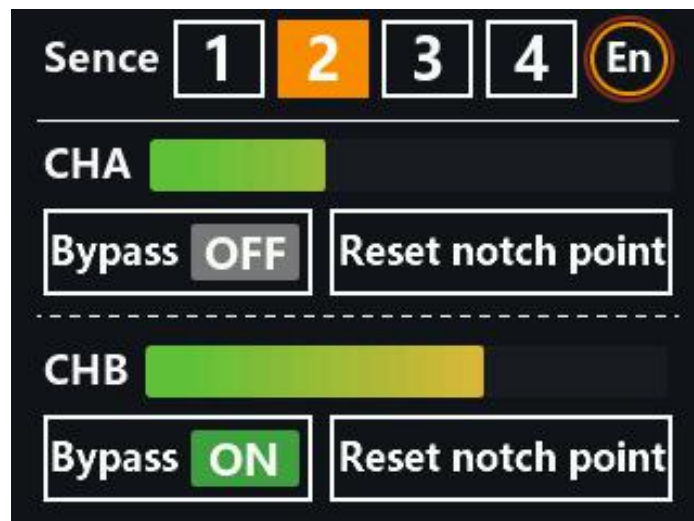
## 4.5. Screen lock

After 30 seconds of no operation on the display panel, when the user operates the panel, a pop-up window will prompt that the screen is locked. You need to press and hold the screen for 3 seconds to unlock the device before you can operate.

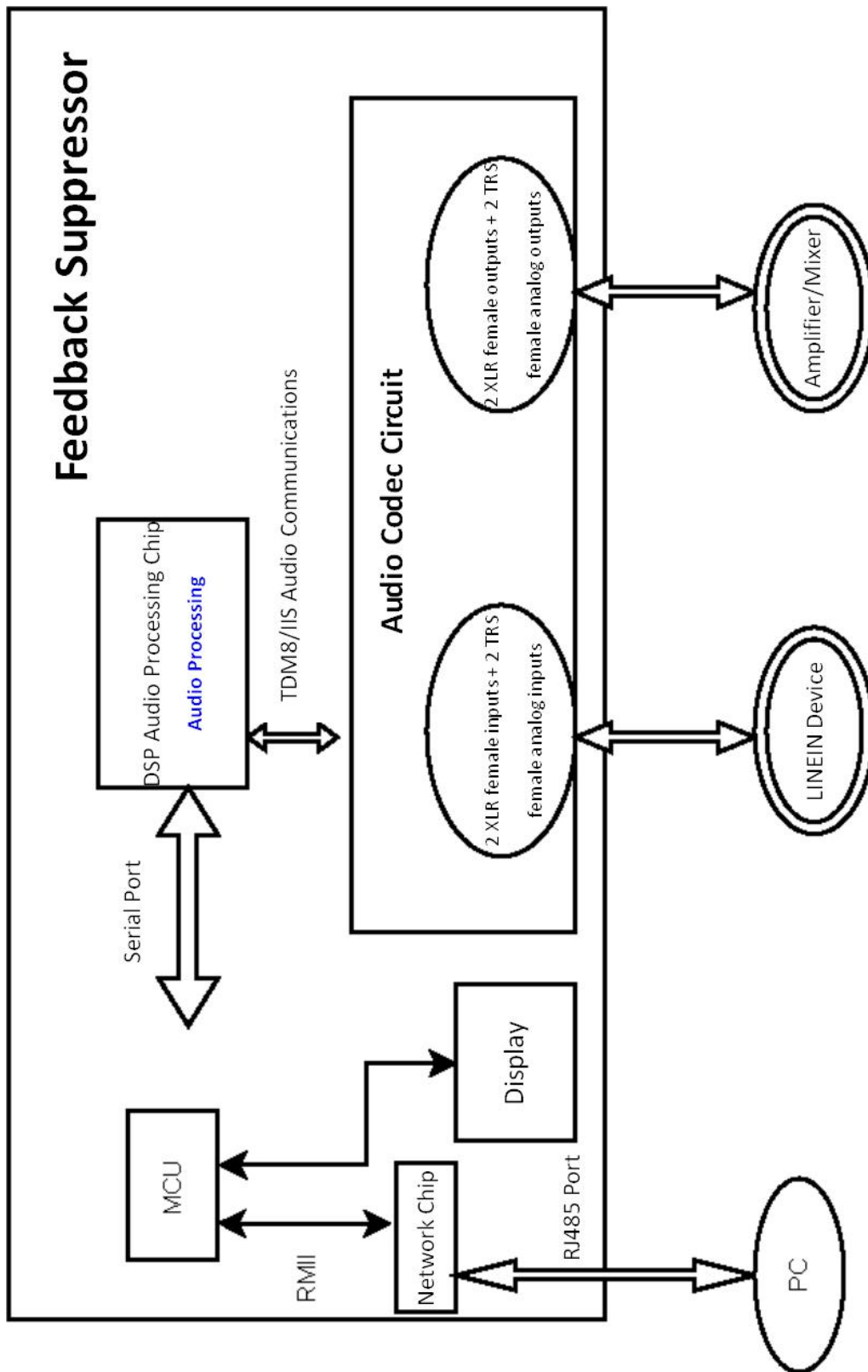


## 4.6. Language switching

Click the round button in the upper right corner to switch languages between Chinese and English.



## 5. Schematic Block Diagram



## 6. Product Specifications

<b>Model</b>	<b>TS-224D</b>
Input channel	2 XLR and TRS multi-use analog inputs
Output channel	2 XLR male plugs + 2 TRS male analog outputs
Input impedance	Balance: 20K $\Omega$
Output impedance	Balance: 100 $\Omega$
Input range	$\leq$ +20dBu
Frequency response	20Hz-20KHz ( $\pm$ 0.5dB)
SNR	$\geq$ 103dB@1kHz 20dBu (A-weighted)
THD	<0.012% OUTPUT=0dBu/1KHz
Channel separation	>82dB (1KHz)
Howling search and suppression	Fully automatic notch
Filter	24/CH
Q value range	10-50
Frequency resolution	1Hz
Howling search time	0.1~0.5S
FFT length	1024
Acoustic gain	4~8dB
System gain	0dB
Notch filter	Dual channel, 12 static + 12 dynamic points for each
Crossover	With three high and low pass filters: Bessel, Butterworth, Linkwitz-riley
Equalizer	31-band graphic equalizer + 8-band parametric equalizer
Display	2-inch IPS true color screen, 320*240 resolution; 48 LED indicators for notch filter status
Processor	48kHz sampling frequency, 40-bit DSP processor; 32-bit A/D and D/A conversion
Dimension (L×D×H)	484×206×44mm
Weight	2.4Kg

# FEEDBACK SUPPRESSOR

