

DIGITAL AUDIO PROCESSOR

USE MANUAL

Preface:

Thank you for purchasing our product. Please read this manual to be familiar with the product.

Note:

- this manual is written to provide all the relevant information for the series of models. Due to the different signal
- configurations, the actual product configuration may differ from the instructions.
- This manual to use the method of full function audio processor matrix as the example, and can be used as other processors using reference

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Important Safety Precautions

(Instructions for Fire, Electric Shock or Personal Injury)

Note- The following basic precautions are provided for the use of the electrical appliance:

1. You should read Safety precautions carefully before using the products.
2. This product shall be grounded. In case of any fault, the current will flow to the earth through the grounding resistance so as to reduce electric shock. The power cord and plug of product shall be properly grounded. The plug shall be inserted into a proper socket, which shall be installed and grounded in accordance with local regulations.

Warning- Improper grounding can cause electric shock.

If you have any question on proper grounding of product, ask a qualified electrician or service personnel to check. Please do

not try to change the power plug of product. If it is not fit for the socket, ask a qualified electrician to install an appropriate power socket.

3. To reduce injury risk, closely supervise kids when using the appliance near them.
4. Do not use the machine in a very humid place, for example, near a bathtub, wash basin, kitchen sink, and humid basement or near a swimming pool or lake.
5. The product shall be installed in a well-ventilated place.
6. The product shall be kept away from heat sources such as electric heaters, electric blankets or other heat-generating products.
7. The type of power supply for the product must conform to the type indicated on the appliance
8. Take care not to allow any foreign substance or liquid to fall into the appliance.
9. In case of the following, turn to qualified service personnel for repair:
 - A. Power cord or plug is damaged.
 - B. Some foreign substance or liquid has fallen into the machine.
 - C. The product is exposed to rain.
 - D. The product is not working properly or significant changes occur in the performance.
 - E. The product has been broken or its appearance is damaged.
10. In case of any situation not mentioned in the User Maintenance Guide, do not attempt to repair by yourself. Turn to qualified service personnel for repair.
11. **Warning** - Do not allow heavy articles to stay on, or anybody step on, pull or twist any power cord. Do not abuse the cord. A damaged power cord may cause fire or harm to human.

1. Product overview

1.1 Function introduction

The equipment support analog channel 16 and 1 USB extended recording channels, high-quality 21 pre amplification circuit, DSP processing bus structure, built in function of feedback canceller, noise canceller, the echo canceller etc., reducing quality sound, is mainly used in various kinds of large sites, can satisfy the application requirements of theatre, music hall, remote video conferencing, gymnasium, Chapel, conference centers, theme parks and other public sound reinforcement system etc.. The operation is simple, intelligent control:

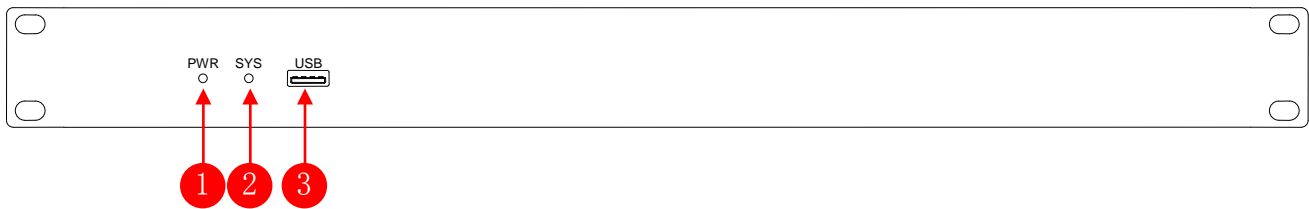
1. 24bit/48KHz sampling frequency, high performance A/D D/A converter and 32-bit floating point DSP processor, full function matrix Remix features a clear voice for the user to provide superior.
2. Adjust the input sensitivity of 2, high precision, a total of 21 stalls, step 3dB, the maximum input gain 60dB.
3. efficient processing algorithm: AFC, AEC, ANS, AUTOMIXER, EQ, GATE, AGC etc..
4. rich interface extension: GPIO supports 8 channels can be custom input output GPIO, level support external input 3.3~24V; USB interface supports recording, the scene preservation etc.; RS-485 support automatic camera tracking function, easy realization of video conference; RS-232 bidirectional serial control interface: control or receiving control equipment, such as video matrix, camera etc..
5. support the functions of presupposition of multi group scene, humanized operation interface software.
6. fast operation: web control mode, support Android, IOS system.
7. 1 group of USB record-play channel.
8. The IOS application has been launched .

1.2 Device parameters

Number of input channel	16
Number of output channel	16
Number of 232	1
Number of 485	1
Number of GPIO	8, Freely configurable input and output
Number of RJ45	1
Number of USB	1, Support recording
Maximum analog gain	51dB
Phantom	48V
Sampling rate	48KHz/24bit
A/D Dynamic range	120dB
Input CMRR	80 dB @ +24dBu @60Hz
Input impedance	20k Ω balance, 10k Ω unbalance
Maximum input gain	24dBu
D/A Dynamic range	120dB
Channel isolation	100dB
Frequency Response	20~20kHz (± 0.25 dB)
(THD+N)	$\leq 0.002\%$ @1kHz, +4dBu
Output Impedance	100 Ω balance, 50 unbalance
Maximum output gain	24dBu
Power supply	AC 110V/220V 50Hz/60Hz
Working temperature	0~40°C

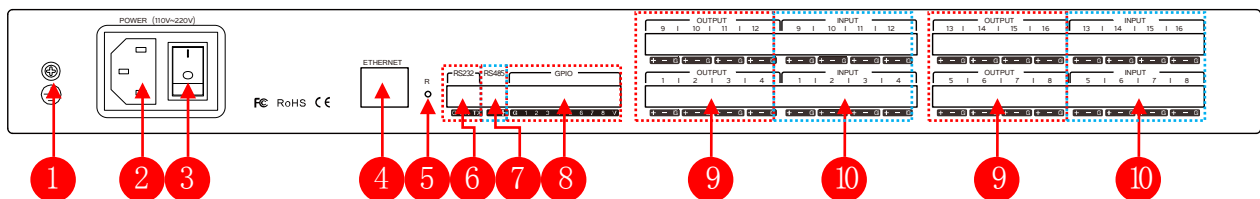
2. Device interface

2.1 Front panel



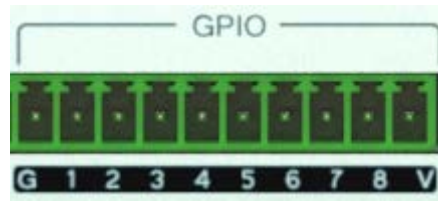
- (1) PWR: after the power supply is switched on, light indicates power status.
- (2) SYS: the system will run normally if the indicator is flickering and the indicator will be off for a long time during Starting.
- (3) USB: the system supports USB recording.

2.2 Rear panel



- (1) Chassis ground;
- (2) Power plug, supporting AC 100V~240V power supply, 50~60Hz;
- (3) Power switch;
- (4) network interface, connect PC, on-line editing and command receiving and sending control;
- (5) RESET: System reset button;
- (6) RS232: communication interface, to connect the external central control equipment/ support camera tracking;
- (7) RS485: support camera tracking;
- (8) GPIO: order transfer. For the specific connection mode, see GPIO setting in the 2.3 & appendix;
- (9) OUTPUT: Analog audio MIC \ LINE input interface;
- (10) INPUT : Analog audio output interface;

2.3 GPIO



G: Ground

1~8: Port 2-8 are freely configurable input or output, port 1 only input function.

V: The default GPIO power output pin(5V).

GPIO state of software:



Note: ● Output high; ● Input high; ● Output low; ● Input low ● Disable

Port output: each output port is OC output, the default reference voltage 5V and the reference voltage can also be

external is less than 15V, take the default reference voltage, the total output ports is 200mA:

Input port: lowest level of input high $> 2V$, highest level of input high $< VCC + 0.7V$; highest level of input low $< 0.3V$.

Use of GPIO:

the output: is a parameter matrix of internal changes (such as mute), cause the change of the output level of a

GPIO output pins, to drive an external circuit.

Audio matrix internal change \rightarrow GPIO pin level change \rightarrow external driving circuit.

input: GPIO is an input pin level due to changes in the external circuit is changed, thus a parameter matrix trigger changes.

The external circuit state changes \rightarrow GPIO pin level change \rightarrow audio matrix internal change.

The operation details see Appendix 2.

3. Software Operation

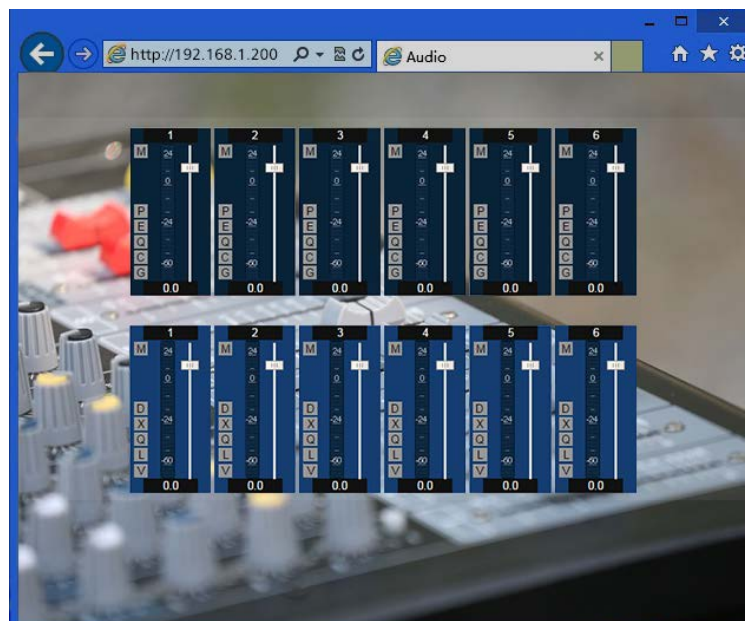
3.1 Web Control and Software Download

Device default IP address ex factory is 192.168.1.200, please add IP address fallen into the same network segment as the device.

After the device started, input address, in webpage <http://192.168.1.200/>:



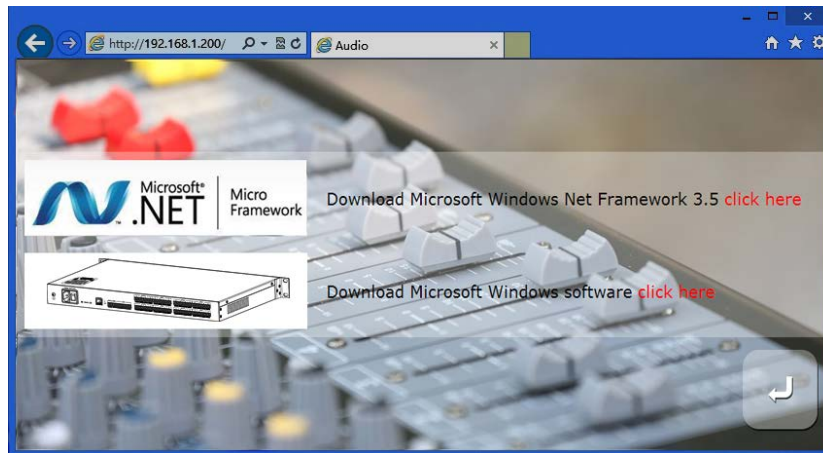
Control: Control channel parameters and the opening and closing of each processor.



Scene : Fast call and save equipment scene.



Download: Download the control software, the software supports XP, Win7, Win8 operating system.



Before you install the software, please ensure that the PC terminal has been installed Net Framework3.5 or above version.

Note: in some systems (such as WIN8) to install the software, will pop-up operation "user account control information", please click "OK" to run upgrade the software permission.

Software installation is completed, open the PC control software are as follows:



1.The menu bar and toolbar menu bar: various functions of software menu

2. The processor parameters control area: the hidden part can drag or scroll the mouse display, supports copy / paste function.

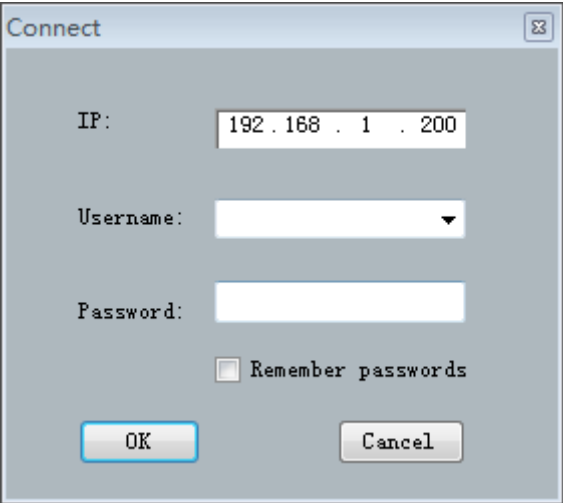
3. Process control area: audio data flow chart, click icon to set the parameters of each treatment with.

4. Input / output channel rapid control area: display level and gain of each channel, and each processor quickly enable the on / off set, to support the copy / paste function.

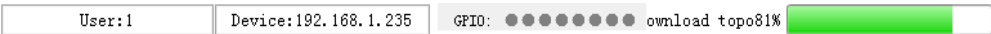
5. The equipment list and scene control: controlling the current scene and the current line equipment display equipment.

6. The status bar: display the current connection equipment login user name, IP, GPIO state, the scene the download progress.

Click on the lower right corner of the "search equipment" button. Double click on the list of devices corresponding to the IP device, the popup authentication frame:

A "Connect" dialog box with a title bar. It contains fields for "IP:" (192.168.1.200), "Username:" (a dropdown menu), and "Password:" (a text field). There is a checkbox labeled "Remember passwords" which is unchecked. At the bottom are "OK" and "Cancel" buttons.

Enter the user name and password (default username “admin”\ password “123456”), click the landing, the status bar indicate the following:

A status bar with three main sections: "User:1", "Device:192.168.1.235", and "GPIO: " followed by ten dots. To the right of the dots is the text "ownload topo81%" and a green progress bar that is approximately 81% full.

You can be controlled equipment after the scene is downloaded.

3.2 System flow

Signal processing flow chart

Standard configuration	Input: Test signal / Mute / Expander /5EQ / Compress / AGC Output: Delay / XOVER/31 band graphic equalizer / Limiter / Output invert / Mute
Advanced configuration	AFC/AEC/ANS/AutoMixer

3.3 Software features

Switching between flow chart and processor control module:

Window 2 detailed parameter display area for the processor, window 3 for processing flow chart, is also a fast channel opening and closing the processor.

Double-click on the window of 3 processor, can open/close the window 2 corresponding control module, such as double click on the "input/expander/output" :

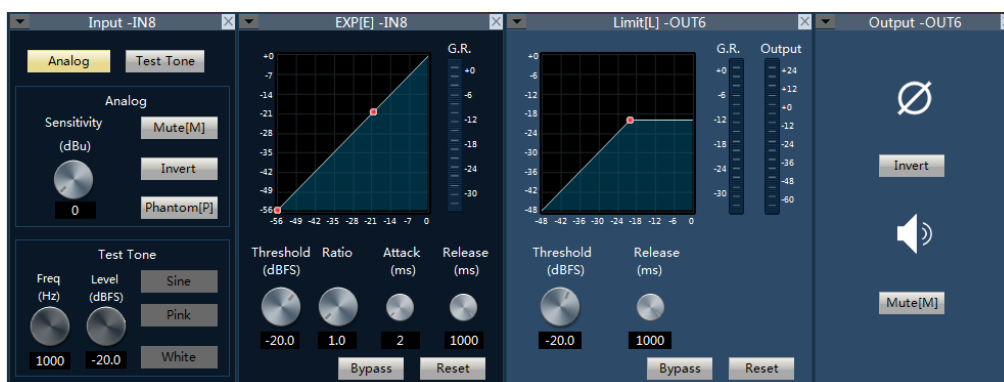


Pictured above, "input" and "extension", "output" set interface according to the flow chart of order 2 in the window, at the same time is open in the window 3 processor will with red check mark in the upper right-hand corner; Such as the selected processor as output, the corresponding window 3 modules will box marked in red.

Already open detailed parameter setting module, can double-click in the flow chart of the module is closed the corresponding parameter Settings interface in detail.



Identified in the upper part of the detailed Settings window area, display the current control of the channel number, have shown above, input and output channels of 1 parameter.



Above the input part of a display channel 8 parameters control, the output part of a display channel for six parameters control.



When the channel name revised, detailed parameters control module channel names will change accordingly.

Fast control area:

Part 4 is input and output channel fast control mode, each channel of the processor can quickly bypass and active, select different channels, automatically switching the display part 2 channel information.

If the channel number is more than can display area, you can drag or rolling middle mouse wheel to display a hidden part;

Input:

- 1) You can modified channel name in edit box.
- 2) M、P、E、Q、C、G is shortcut operation mode:

M show mute state	Q show EQ state
P show phantom state	C show compress state
E show EXP. state	G show AGC state

Output:

- 3) M、D、X、Q、L、V is shortcut operation mode:

M show mute state	Q show EQ state
D show delay state	L show limiter state
X show XOVER state	V show invert state

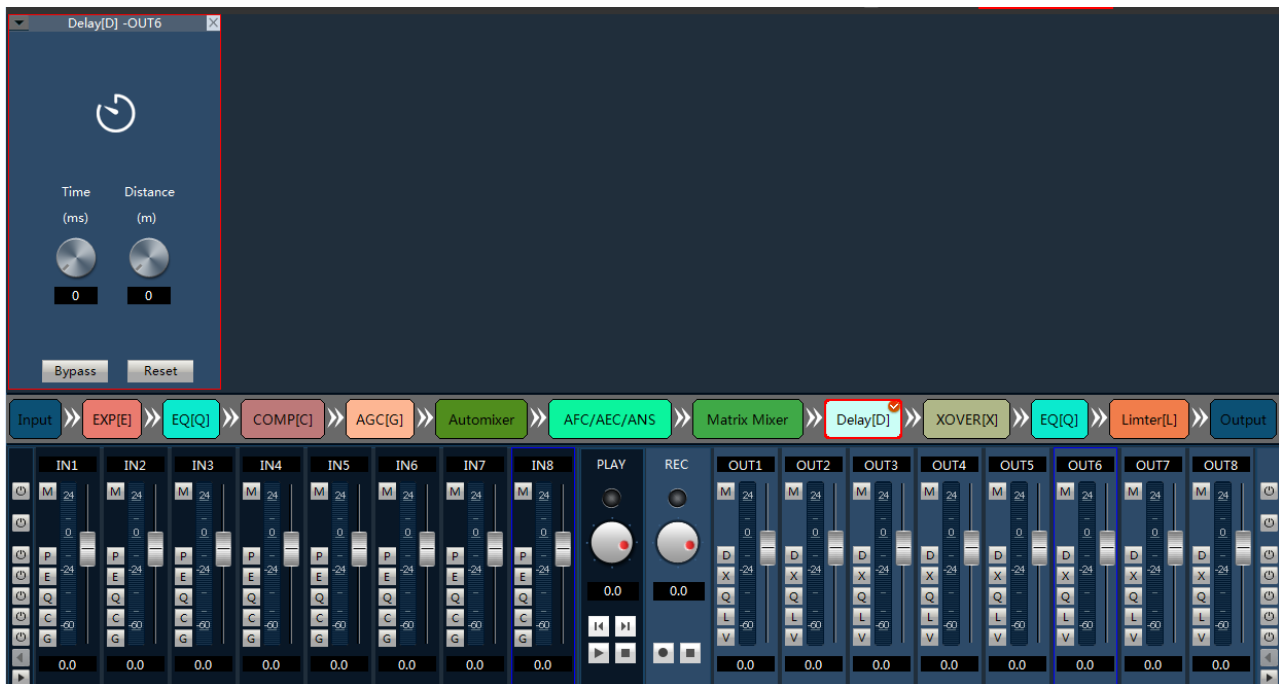
4) Along on the left button said rapid control of all input channels corresponding to the opening and closing of function on the right side of the button said rapid control of all output channel corresponding to the opening and closing of function at the bottom of the left and right arrows can quickly switch output channel.

5) Level meter shows the input level of the current input channel.

6) Digital gain adjusting current input channel fader.

7) Drag or rolling around middle mouse button can display hidden channels.

Example: open delay mode of all output channel.



3.4 Menu and Status

3.4.1 Files

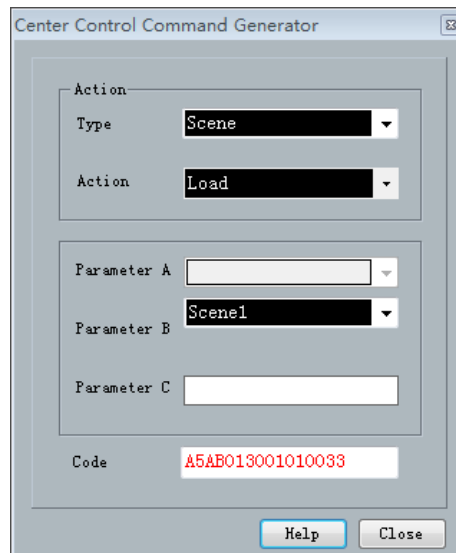
1. New : Create a new scene, parameters for the factory configuration, available offline.
2. Open : Open the local scene file, available offline.
3. Save as: Save the current configuration to a local file, available offline.
- 4.0Exit: Close the software.

3.4.2 Setting

1. Center control

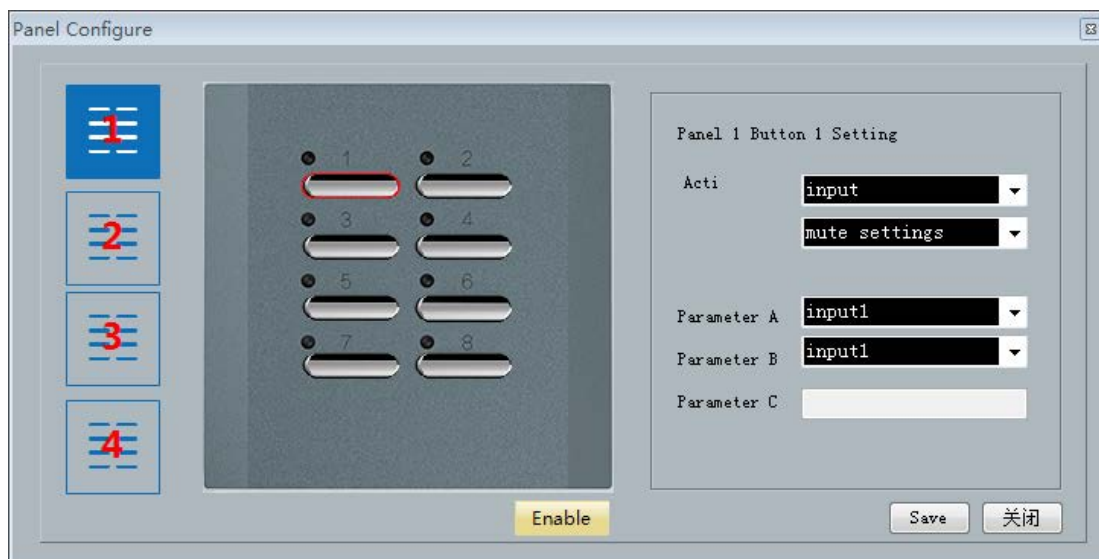
Central command generator can be often used operation into a 16 characters command code, call for an external equipment. Within each command contains three groups of different parameters.

Control command types: Scene, Input, Output, Mixer, PEQ, GEQ, EXP, COMP, AGC, Delay, XOVER, Limiter.



2. Panel configure(Optional)

When the processor successfully connect the control panel, we offer also need to be here to set control panel above the keyboard.



Currently up in series four groups panel, according to the panel series automatic sequence number from 1 to 4 panel, select the panel need to set up, then choose the middle panel on the corresponding button, and then in the right setting bar Settings of the buttons.

For example: selected in panel 2 above the first button, select "input" "volume increase", choose "enter 1 channel" in the parameter 1, 2 in parameters, select the "input 4 channel", input "1" in the parameter 3, save the panel is completed for 2 feature set of the first buttons, press this button, the input all increase the volume of the 1 to 4 channel 1 db.

3. Device setting

Device Settings include User Setting, Network Setting, Port Setting, Scene Setting, Camera Tracking, GPIO.

1) User Setting

The screenshot shows a 'Device Setting' window with a 'User Setting' tab. On the left is a sidebar with a tree view containing: User Setting, Net Setting, Serial Setting, Scene Setting, Voice Setting, USB Config, GPIO, and Dante. The main area displays 'Current user: admin' and 'User type: Admin'. Below this is a table with columns ID, User, and Type. The table contains two rows: ID 1 with User 'admin' and Type 'Admin', and ID 2 with User '1' and Type 'User'. To the right of the table are input fields for 'User type' (a dropdown menu showing 'Admin'), 'User name' (a text box with 'admin'), and 'Password' (a masked text box with '*****'). At the bottom of the main area are three buttons: 'Add', 'Modify', and 'Delete'. A 'Close' button is located at the bottom right of the window.

ID	User	Type
1	admin	Admin
2	1	User
3		
4		
5		
6		
7		
8		
9		
10		

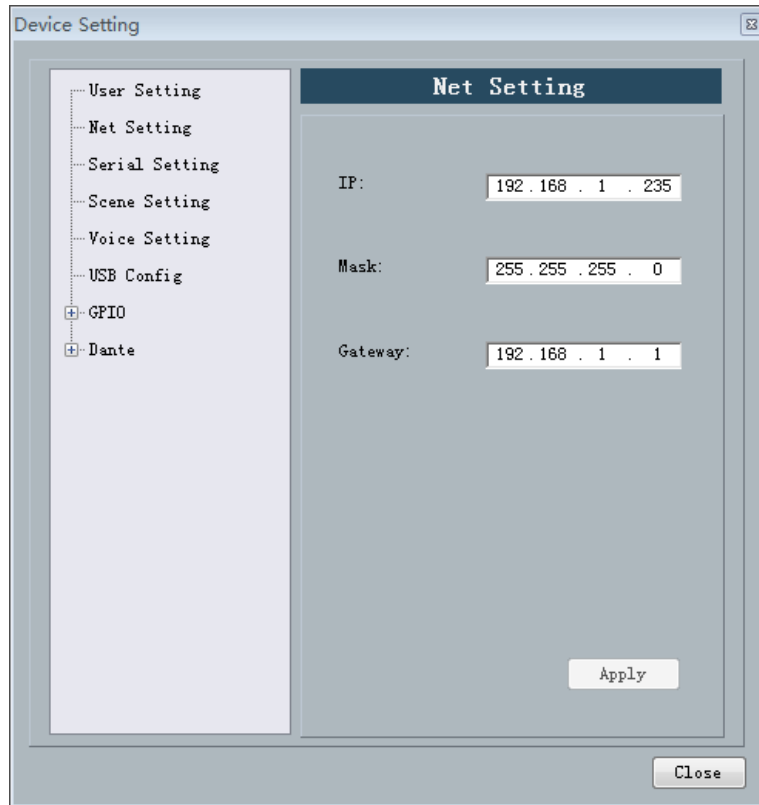
1, equipment initial admin user name/password 123456. Administrators can add, delete, modify, all user information; Ordinary users can only modify personal information.

2, modify user: first, the user list, select the user to modify the user name and password edit box shows the currently selected user information, enter the new information, and click "modify" button.

3, delete users: select the user want to delete rows in the list, click on the "delete" button to delete the user.

4, add users: on the left list is empty, and in the user name and password edit box on the right (should be empty) input the new user's information, click the "add" button to add a new user.

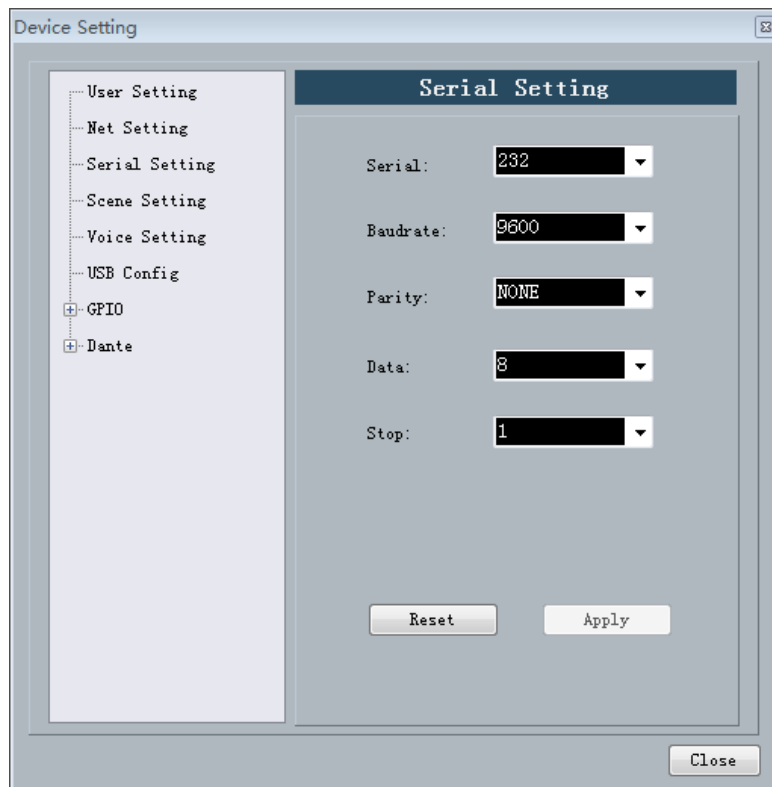
2) Network Setting



The screenshot shows a 'Device Setting' window with a sidebar on the left containing a tree view of settings: User Setting, Net Setting, Serial Setting, Scene Setting, Voice Setting, USB Config, GPIO, and Dante. The 'Net Setting' tab is selected and highlighted in a dark blue header. The main area contains three text input fields: 'IP:' with the value '192.168.1.235', 'Mask:' with the value '255.255.255.0', and 'Gateway:' with the value '192.168.1.1'. At the bottom right of the main area is an 'Apply' button. At the bottom right of the entire window is a 'Close' button.

To view and modify the equipment of network address information, in the position of the corresponding input IP address, subnet mask, gateway, click apply button modification is completed.

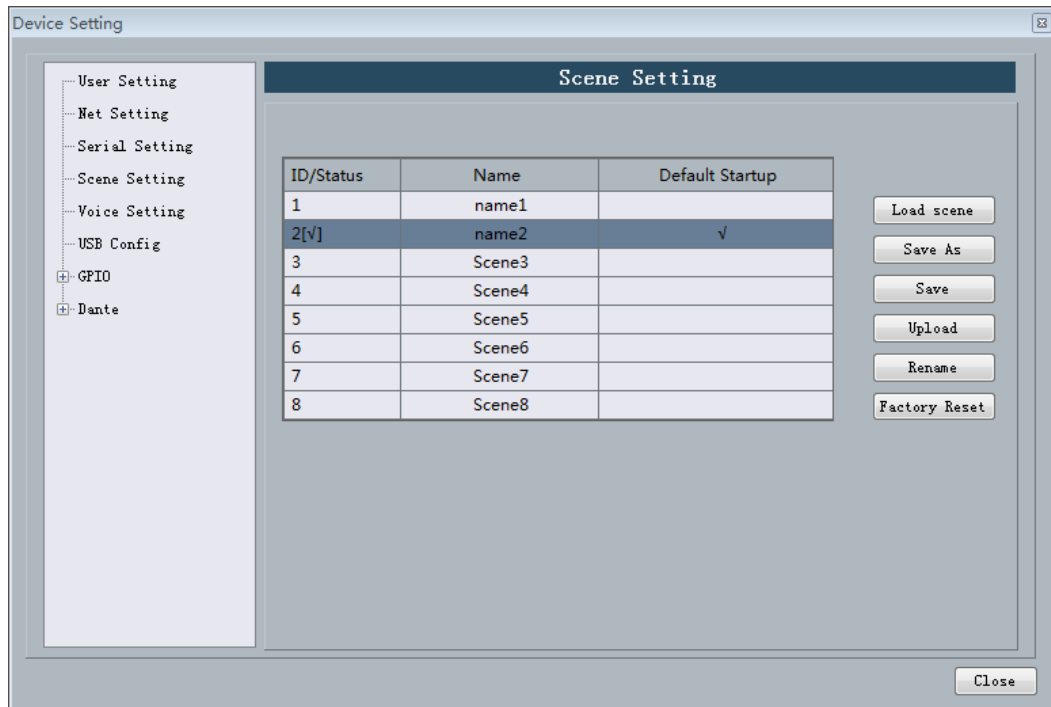
3) Serial Setting



The screenshot shows the same 'Device Setting' window, but with the 'Serial Setting' tab selected and highlighted in a dark blue header. The main area contains five dropdown menus: 'Serial:' with the value '232', 'Baudrate:' with the value '9600', 'Parity:' with the value 'NONE', 'Data:' with the value '8', and 'Stop:' with the value '1'. At the bottom of the main area are two buttons: 'Reset' and 'Apply'. At the bottom right of the entire window is a 'Close' button.

To view and modify the current equipment serial port information, set up and then click the "apply" button to modify the current equipment serial port information; If you want to return to the default, just click "reset" button, Settings cannot be empty.

4) Scene Setting



1, modify the name: modify the selected scenario name.

2, upload scene: a scene on the PC side to upload and cover the selected scenario.

3, save the scene: to save the currently running parameters to the selected scenario.

4, save as: will the currently running parameter save to PC in the form of the scene.

5, loading scene: enable the currently selected scenes, usually used for scene change.

6, restore factory Settings: return all scene configuration for the default configuration.

This equipment is offline save scenario and online save scenario in two ways.

Saved offline is stored in the PC will set up a good scene, facilitate subsequent calls and scene replication between different devices.

Online save scenario is to save scene directly on the device, after the next opening device can be called directly.

Example 1: Offline save scene

1.1 Open the software, disconnect device, modify the parameters; If modify the mixer as below:

	1	2	3	4	5	6	7	8	PLAY	TEL
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
REC	0	0	0	0	0	0	0	0	0	0
TEL	0	0	0	0	0	0	0	0	0	0

1.2 Click “File” ->“Save as”, Named “ test”。

1.3 Next time offline using this scenario, only need to open in the absence of any device connected to (" file "menu bar - >" open ").

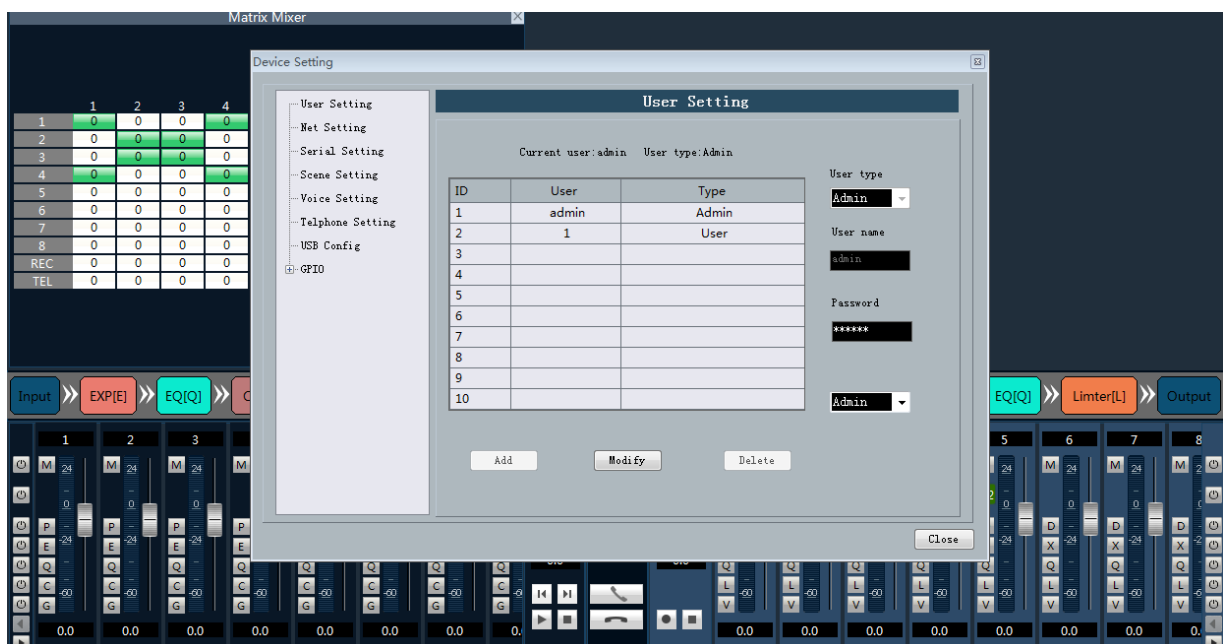
Note: due to the file open and save as operation offline operation. So don't on any device to take effect immediately, about offline

Scenarios of how to use please see example 2 on the device.

Example 2: How the scene that Offline saved to loaded into the device

2.1 Such as example 1 saved offline after good scene. In the search at the right hand side and connect the corresponding equipment:

2.2 Connection after good equipment, set up in the menu bar - > Settings - > setting equipment, choose you need to set the scene, such as choosing the current scenario 5, click the "upload" to the right, select save the test file in example 1, save the parameters in example 1 automatic loading, the results are as follows:



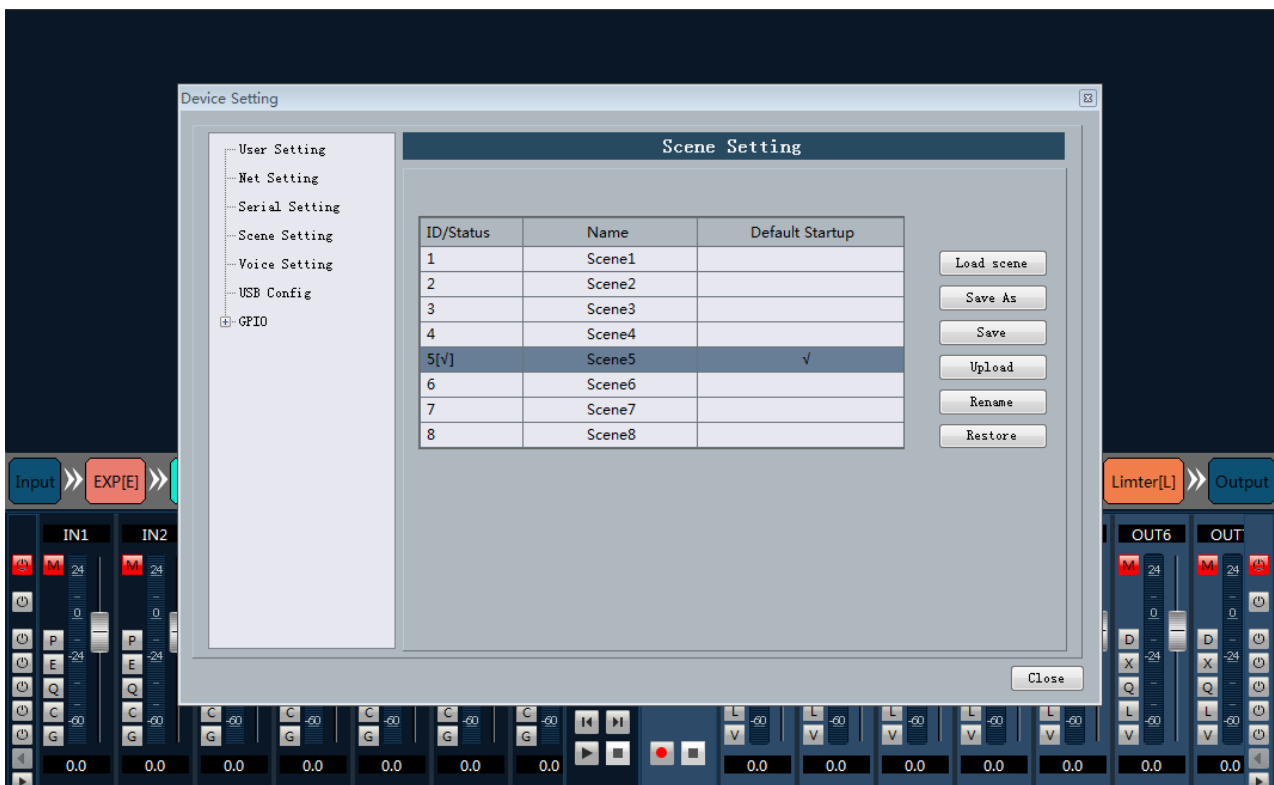
Example 3: Save the scene online

3.1 If only on a certain device operating scenarios, you don't need to saved offline first, then load, can be directly use online save scene, steps are as follows.

3.2 After connecting device, parameter change scene, open all the mute as follows:



3.3 In the menu bar Settings -> device Settings -> setting -> click "save"

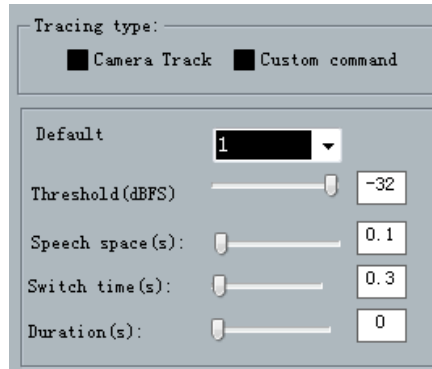


3.4 Saved after the success, either restart your device or switching scenarios, scenario 5 mute button is

always open, scenario 5 has been successfully saved.

5) Voice tracking

Voice tracking parameters: each scene trace parameters of different language, voice track set after the completion of the interface, click on the "application"; Then click "save" in "control scene", voice track parameters are automatically saved to the corresponding scenario.



1、 Camera tracking type: a camera tracking and custom orders. Camera tracking for channel input signal control camera rotation. Custom commands to send is to control the channel input signal to the corresponding port at the corresponding custom commands.

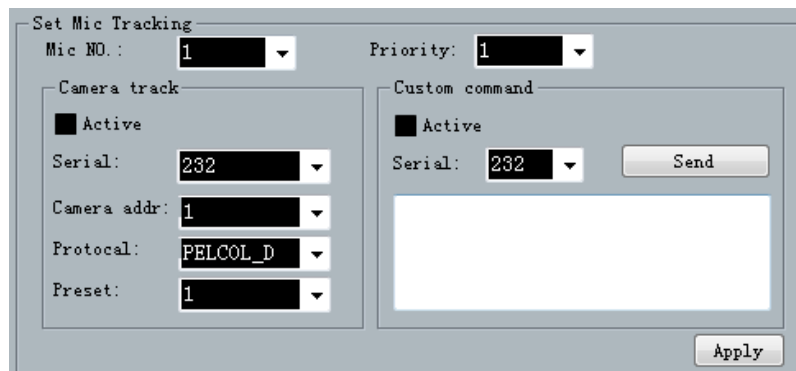
2、 Tracking threshold refers to detect the threshold value of the input signal must be greater than or equal to tracking system automatically enabled trace parameters.

3、 The default microphone: refers to all mike no input, turn the camera to the position or send default MIC Settings mike definition associated command. Among them with # said for the virtual number, only is used to set the default MAC.

4、 Reaction time, maximum intermittent time effective signal. If use a microphone to talk, set the response time for 3 seconds, speech pause between still within 3 s as the sustained and effective signal, more than 3 s, is regarded as the signal is invalid.

5、 The switch time: camera switch to an effective position need to speak the shortest time. Such as using the microphone, the length of the speech must be greater than "switch time", is regarded as the effective channel signal, and then the position of the camera automatically transfer to set. Usually "switch time" than "reaction time".

6、 Wheel send time: send camera switching command or custom time interval, such as 0 said special processing, triggers only once.



7、 The serial number of the microphone, generally with the input channel for equipment, is the channel number of the MAC is connected. Among them with # # said mike number for a virtual number, can only be used to set the default MAC.

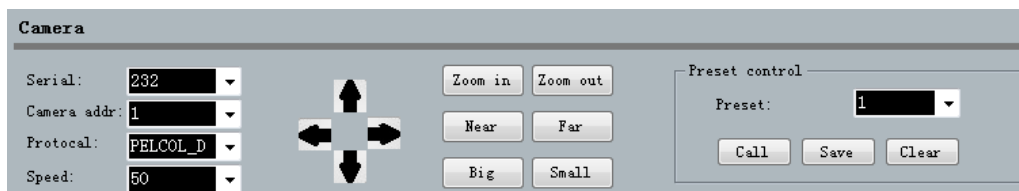
8、 Priority series is smaller, the higher priority level, when the priority phase at the same time, according to the trigger priorities; As two MAC address at the same time, the camera automatically turn to the first series of small (i.e., is a high priority level) of bits or send mike the corresponding preset preferred series small (i.e., is a high priority level) of the corresponding command mike; But if both mike's priority is the same, subject to first check the signal.

9、 Enable this MIC Settings: you can set all parameters of mike all good, but when used according to the actual situation, only enable one part.

10、 Preset point, serial number, camera address, protocol and the camera, must be the actual connection and video cameras.

11、 custom command refers to the mike check matrix to have when the input signal (usually someone speaking), automatically send corresponding commands to the serial port defined, second can also be set in advance orders, but not check the "enable custom orders", the device will not automatically send, but can still point "send" button, will at any time in the input box commands sent to the specified serial port.

12、 click "save" to save parameters to the device, when the channel of the MAC address associated with the corresponding cameras. And then through the "enable the microphone Settings" option to determine when to enable tracking the microphone Settings are valid.



13、 camera Settings is a camera debug interface, general debugging good camera position before the start of the track, the last part of the parameters will be stored in the camera.

14、 a serial port Settings, first serial port has 2 (232, 485), with that of the back port after the cradle head camera is connected.

15、 addresses and protocol type, followed by the camera, video camera, actual address please refer to the camera, the protocol and the camera model.

16、 Preset point number is defined the camera, and then adjust the up, down, left, right, and parameters such as focal length, aperture, will define the camera Settings;

17、 Click "save" to save parameters on the camera, click on the "remove" to delete the current precast point information, click the "call" point of view the current preset saved by the camera position.

Note: the address of a video camera can contain multiple preset points, but a preset point only address corresponding to a camera. Camera Settings and mike Settings are preset point, serial number, address of the camera, protocols, several parameters, the application needs to consider the actual situation.

232 and 485 how to switch

If a video camera connected to the audio processor in the 232 mouth and debugging is ok, location does not change and disconnect an audio processor with another 485. The parameters of the camera keep don't need to reset, you just need to adjust the microphone Settings, but at the moment, port should choose 485.

6) GPIO Setting

Please refer to the appendix.

3.5 Module of Device

3.5.1 Input Source

Input signal has two options: external analog signals and the test signal inside the equipment, including analog signal adjustable parameter is as follows:

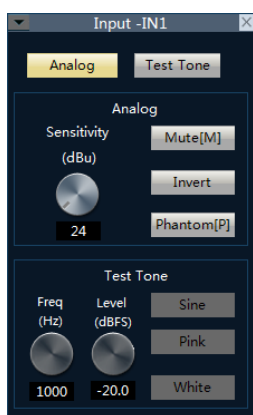
Sensitivity: adjust the analog input; -60 ~ 0dBu, step by 3dB;

Mute: select the channel mute;

Reverse phase: will be 180 degree phase signal processing;

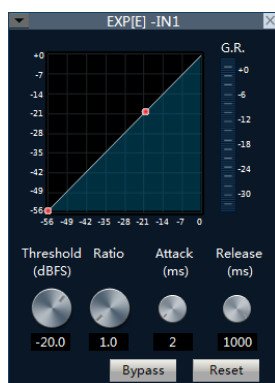
Phantom power supply: used in capacitive microphone power supply, input line or the capacitive microphone do not open, in case of fire.

The test signal including sine, pink, white noise signal, enabling the test signal system will automatically block analog input signal.



3.5.2 Exp/Gate

The expander will add dynamic range to the input according to needs of the user. When the signal input is less than “threshold”, the expander amplifies and outputs the signal input by the “ratio” set. Level output = threshold – (threshold–level input)/ratio; when the signal input is more than “threshold”, it is output by 1:1. Level output = level input, when the ratio is adjusted by the maximum value (∞), the expander becomes a noise gate.



Bypass: the signal input is bypassed and the signal will go directly to the next processing module. If it is pressed the expander will not be enabled; otherwise, the expander will be enabled.

Ratio: the dB of dynamically changed signal input of the expander/the dB of dynamically changed signal output of the expander.

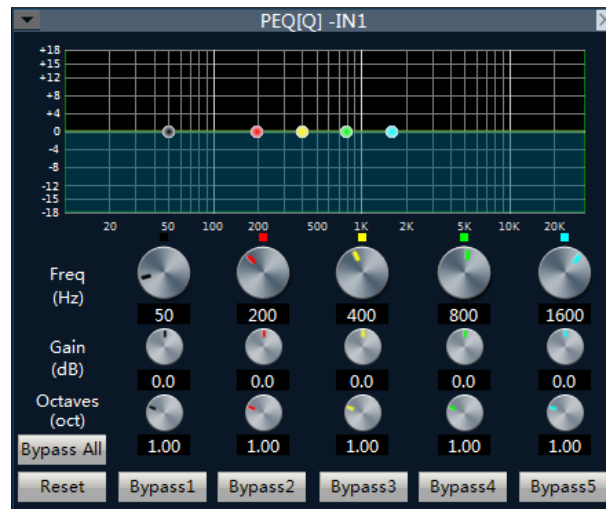
Attack time: less than the time needed of the signal input of “threshold” of the expander from the entering into the expanding status to output by the setting of expanding ratio.

Release time: the time needed for the signal input returning to the original non-expanding status from the expanding status.

All reset: all parameters are reset to the factory settings.

3.5.3 EQ

The equalizer is used to compensate and modify the frequency characteristics, so that it can achieve the characteristic of relatively flat frequency response. Different models of equalizers are of different types, and the specific type shall be subject to the actual model of the device.



5 band parametric EQ

It is to compensate and correct the frequency characteristics to make it reach a true and straight frequency response characteristic.

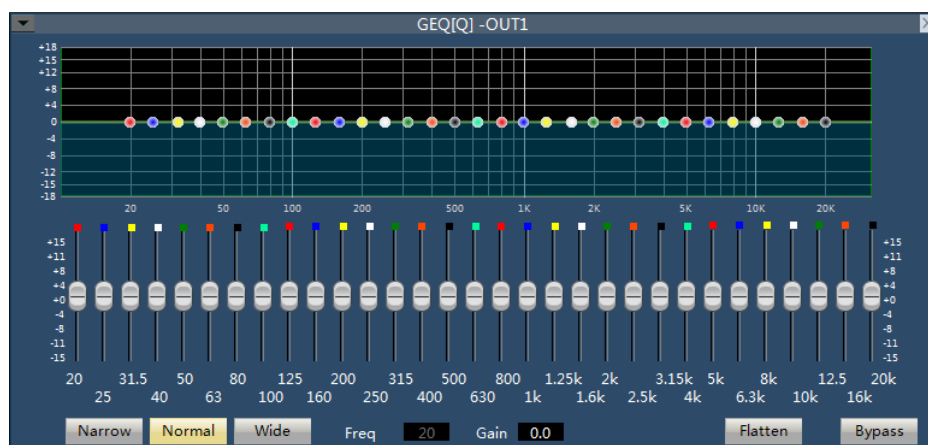
Bypass All: bypass all bands, the signal directly to the next processing module. Press down shows that EQ is disabled, when popped up shows the EQ is enabled.

Band Bypass: Range through-pass: after equalizer adjustment, you can cancel the bypass of certain set frequency ranges. As long as you click to select the corresponding frequency range button, you can restore the original 0dB status, inactivating the bypass of this band without affecting others.

Center frequency: the frequency that needs equalization processing shall be between 20Hz and 20000Hz. When we change the value, the icon of equalizer will also react synchronously.

Gain: the gain/attenuation at the center of frequency. When the value is 0, the center frequency and Q value shall be invalid.

Q value: It means the bandwidth of frequency point. The more the value, the larger the bandwidth will be.



31 band graphics EQ

31 frequency points can be individually adjusted gain, so as to achieve the purpose of strengthening and weakening of some frequency points, to achieve different effects.

Bypass: the signal input is bypassed and not be processed.

Gain: the gain/attenuation at the center of frequency. When the value is 0, the center frequency and Q value

shall be invalid.

Flatten: all band gain recovery to 0dB.

Narrow Band: bandwidth (Q), value is smaller than normal.

Normal: bandwidth (Q), value is common bandwidth.

Wide Band: bandwidth (Q), value is larger than normal.

3.5.4 Compress



The compressor is to compress the signal by the preset ratio when input signal level more than threshold. When the input level is more than the preset threshold, the output level is compressed by the ratio set. $\text{Signal Output} = \text{Threshold} + (\text{Signal Input} - \text{Threshold}) / \text{Ratio}$; if the input level is less than preset threshold, the signal will be directly output. $\text{Signal Output} = \text{Signal Input}$; when the ratio is adjusted by “ $+\infty$ ”, the compressor becomes as a limiter.

Bypass: the input signal is bypassed and will not be processed. If it is pressed, the compressor will be disabled. Otherwise, the compressor will be enabled.

Threshold: is the initial level of compression. When the signal is more than this limit value, the compression processing module will be enabled to compress the signal; when the signal is less than this limit value, the compression processing module will be disabled and the signal input will be fed directly to the output.

Ratio: the compression ratio of signal over threshold.

Release time: the time from the level input is less than preset value to that the compressor fully stops operating.

Attack time: the time from the level input reaches the threshold to that the compressor starts.

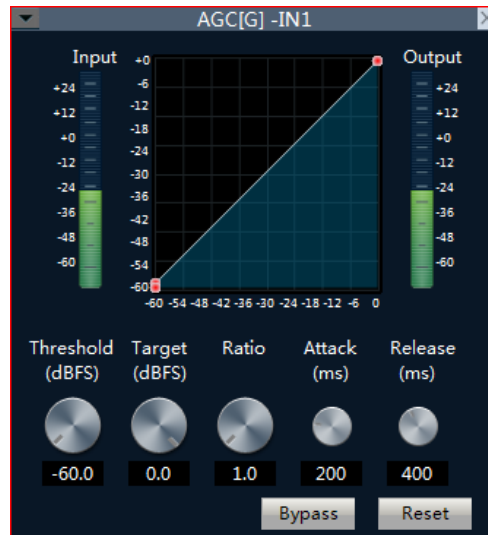
Output: the actually compressed level value.

3.5.5 AGC

First, the function of AGC is described. For example, when the user speaks facing towards the microphone, the distance between the mouth and the microphone will fluctuate, causing fluctuating volume output. Though setting the threshold, AGC outputs the signal input by 1:1 if the level less than threshold while the level over the

threshold will be directly raised by ratio. The target level is properly set so that the sound signal may be output stably.

AGC control is to automatically control range of gain through changing I/O compression ratio. When the weak signal is input, the signal will be amplified to ensure the strength of the sound signal output; when the signal strength input reaches to the certain extent, the signal will be compressed to lower the range of output.



Input: the level of input automatic gain controller.

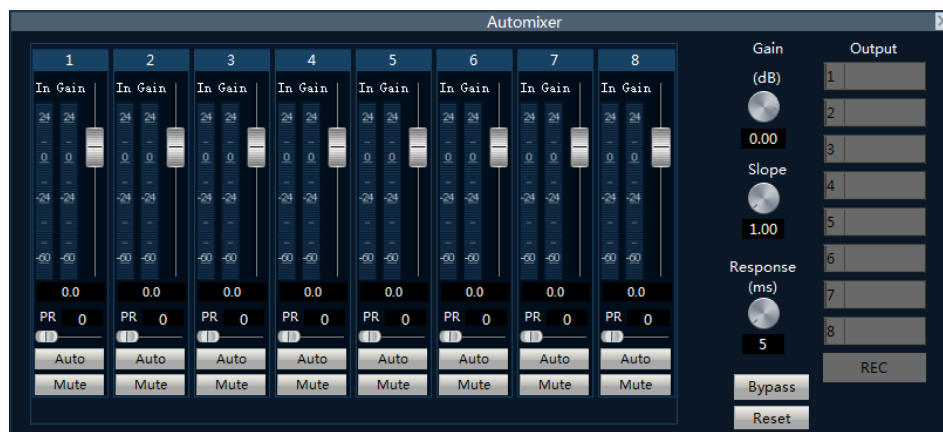
Output: the level of output automatic gain controller.

Threshold: it is the initial level of automatic gain. When the signal is less than this limit value, the automatic gain processing module will be enabled to gain the excessively small signal.

Bypass: the signal input is bypassed and not be processed.

3.5.6 Auto Mixer

Automatic mixer adjust gain from each input channel in real-time to adapt the general level, through improving the high signal gain, reducing low level signal gain to maintain the overall system gain.



Each channel of automatic mixer has input, gain level meter and an automatic gain, channel fader, priority, and channel muting.

Channel control: each channel has an automatic "AUTO" button, turn on the channel into the automatic mixing. If you need a background music channel at a fixed level, or need to be a "chairman" Mic always remains in the open state, then you need to push the "AUTO" off button on the automatically key. When a channel to select "AUTO"

off the automatically key, the gain will be automatically regulated, the channel signal level will not affect the other channel gain (such as no longer affects automatic mixer gain calculation).

Channel mute and fader are automatic gain type, i.e., no matter how you act; there is no effect on automatic mixer. It means that a particular channel is silent, if the high level signal on the channel is present, the remaining channels' level would also reduce. In order to mute a signal and prevent the signal effect automatic mixing, please open the mute and turn "AUTO" off

automatic mixer. Each channel of the mute function is to mute the channel in mix and mute the output channel directly.

Channel fader control the channel mix level and output level directly.

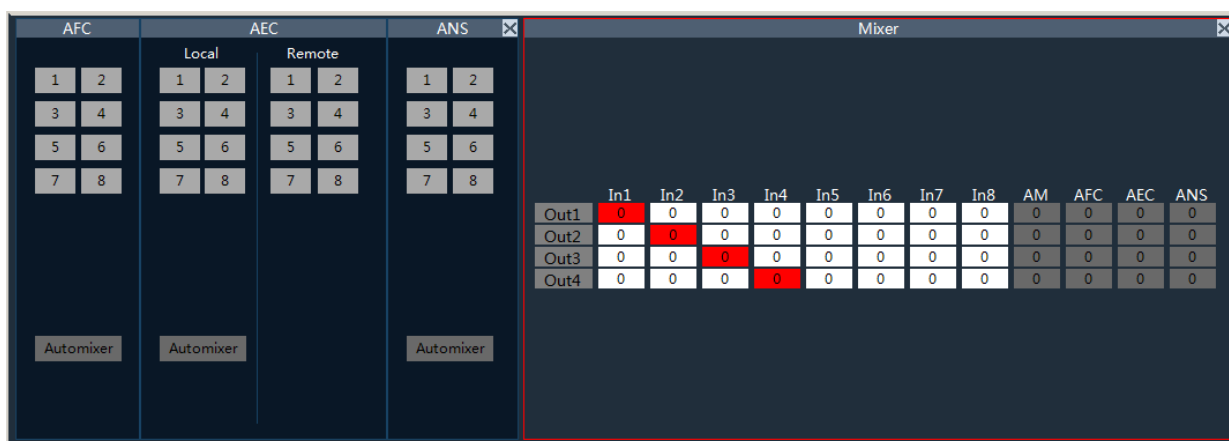
Priority control PR: allows the priority level high channel exceeding level of low passage, thus affecting the automatic audio mixing algorithm.

The control grades from number 0 (lowest priority) to 10 (highest priority) the numerical definition of priority, the default value is 5 (standard priority). User can control priority through the slider, also click on the edit box and enter the number between 0 - 10 data adjusting priority. If the 2 channels are receiving a signal having the same level, high priority channel will be a higher gain. Channels between each difference of 1 priority" units", the gain will differ 2dB (if Slope is set in 2).

For example, in channel 1's priority is set to 6, channel 2 priority is set to 3, when the two channel receiving the same level signal, channel 1 is 26dB more gain than channel 2. Obviously, the slope setting affects the priority weights. When Slope is set to 3.0, difference between each channel is 1 priority" units", the gain will differ 3dB. If all channels of equal priority, please set all channel priority to 5.

Note: when the channel priority differences for extreme cases, such as 1 and 10, must be more circumspect. High priority from the speaker up to very large signal, background noise, will "masking" out the low priority channel, even when it is not in use, higher slope value will further exacerbate the problem.

3.5.7 AFC/AEC/ANC/Mixer (Optional)



AFC: select input channel which need the AFC processed, then choose output channel in the mixer.

AEC: select input channel which need the AEC processed, then choose output channel in the mixer.

LOCAL: local MIC output, which requires signal echo processing

Remote: reference signal

ANC: select input channel which need the ANC processed, then choose output channel in the mixer.

Mixer:

IN 1~16:input channel

AM: signal after auto-mixer treatment

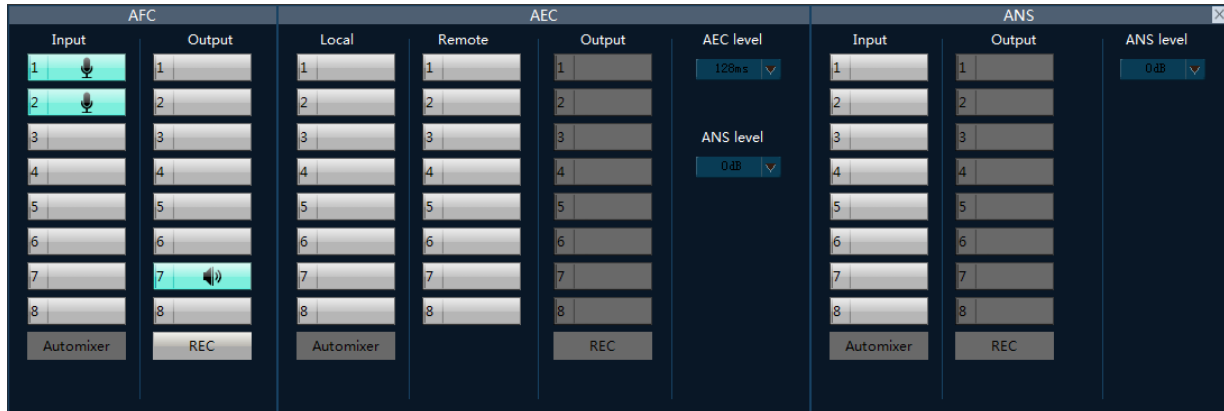
AFC: signal after AFC treatment

AEC: signal after AEC treatment

ANS: signal after ANS treatment

Example 1: AFC

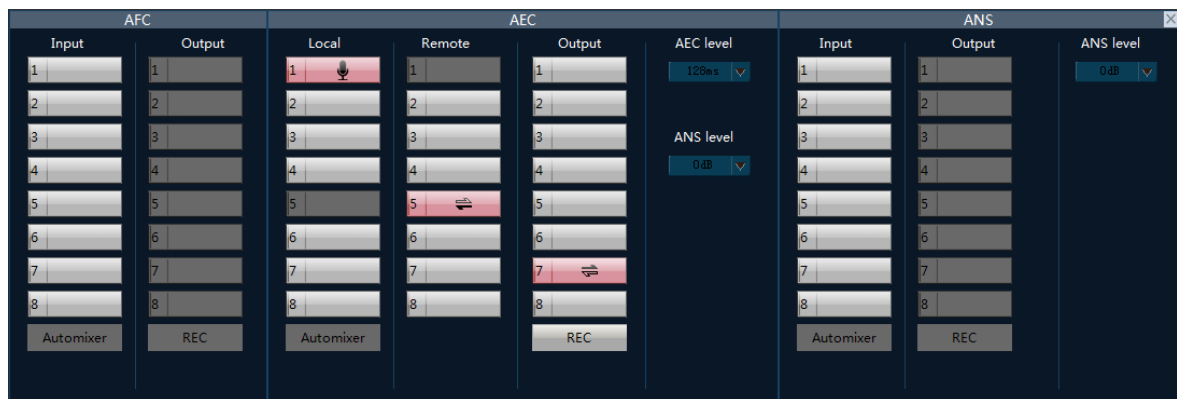
Signal using an AFC of channel 1 and 2, and output in the channel 7, set up as follows:



1. the selected input channel 1 and 2, said signal using an AFC of channel 1 and 2.
2. the selected output channel 7, said the results from channel 7 output.

Example 2: AEC

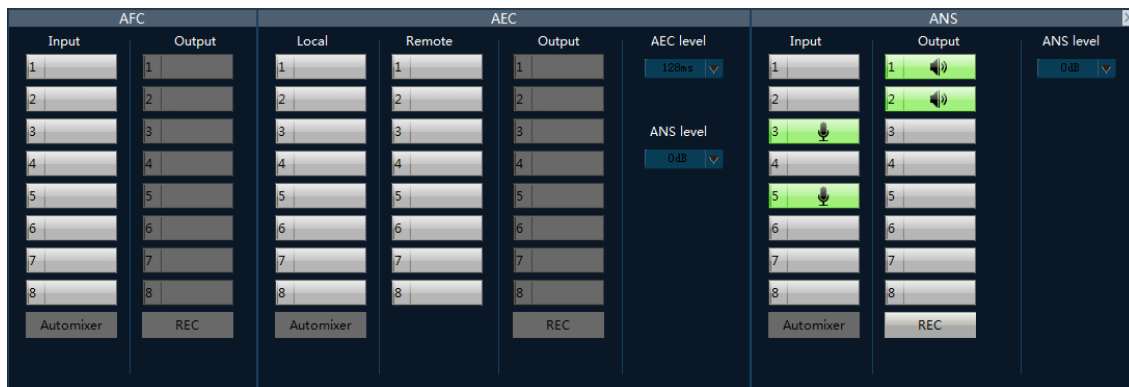
Local signal as the input channel 1, remote signal as the input channel 5, from channel 1 signal filtering channel 5 signal, and output in the channel 7, the configuration is as follows:



1. select the local signal input channel and remote signal channel 5.
2. the results from the channel 7 output.

Example 3: ANC

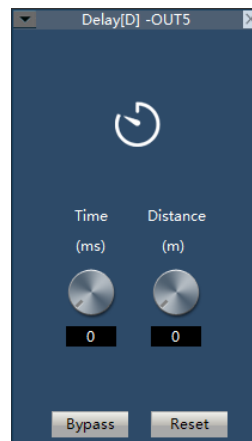
Opening the ANC to channel 3 and 5 of the signal, and output in the channel 1 and 2, the configuration is as follows:



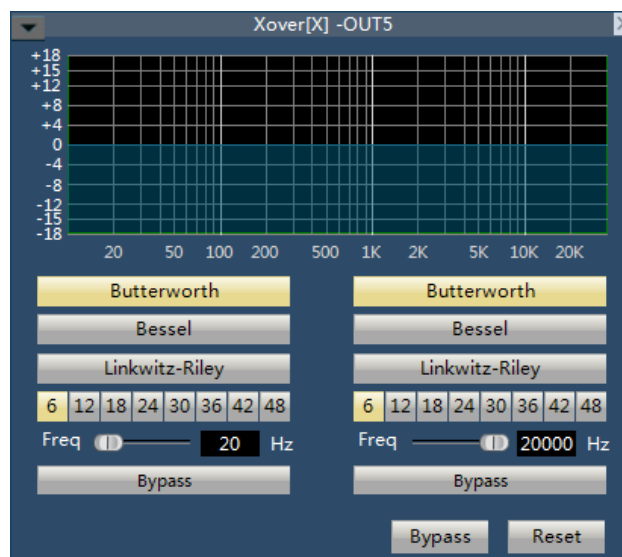
1. open the input channel 3 and 5, 3 and 5 signals using a channel of the ANC.
2. select output channel 1 and 2, said the results output to channel 1 and 2.

3.5.8 Delay

Signal from the input to the output of the processor, the processor time interval, usually used to produce reverb or echo effects. Also it can be used for the auxiliary speaker with a larger processing.



3.5.9 XOVER (Crossover)



Xover can distinguish the sound signals of different frequencies.

High-Pass Flat: bypass switch to prevent signal from being processed by a high pass filter; the selection of this item indicates the channel does not start the filter.

Low-Pass Flat: bypass switch to prevent signal from being processed by a low pass filter; the selection of this item indicates the channel does not start the filter.

High-Pass Gain: the gain/attenuation output by a high-frequency signal after processed.

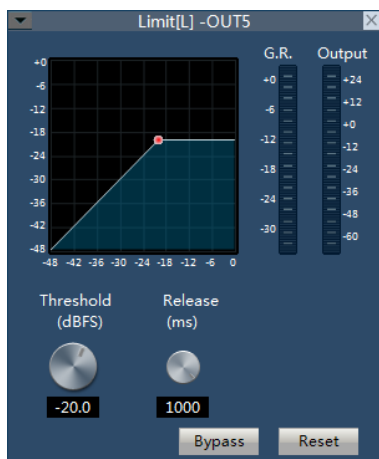
Low-Pass Gain: the gain/attenuation output by a low-frequency signal after processed.

High-Pass Frequency: frequency settings for high pass filter.

Low-Pass Frequency: frequency settings for low pass filter.

3.5.10 Limiter

The limiter is to limit the signal more than threshold. When the signal input is more than threshold, the signal output is equal to threshold. When the signal input is less than threshold, the signal output is equal to the signal input.



Bypass: The signal input is bypassed and not be processed.

Threshold: the initial level for limiter; when the signal is above this limit, the limiter processing module will start to limit excessively large signal.

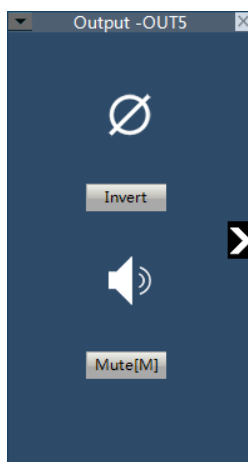
Release Time: if the input signal is lower than the threshold, it will not immediately turn off the sound channel but rather delay the closing time according to the specified value. As long as some signal is larger than “Threshold” during the delay, the sound channel will continue to open.

Output Sensitivity: is used to adjust the sensitivity of output level.

Audio Effect Level: is used to show the processing effect of signal after the limiter.

Output Level: used to show the output signal after processed by the limiter.

3.5.11 Output setting



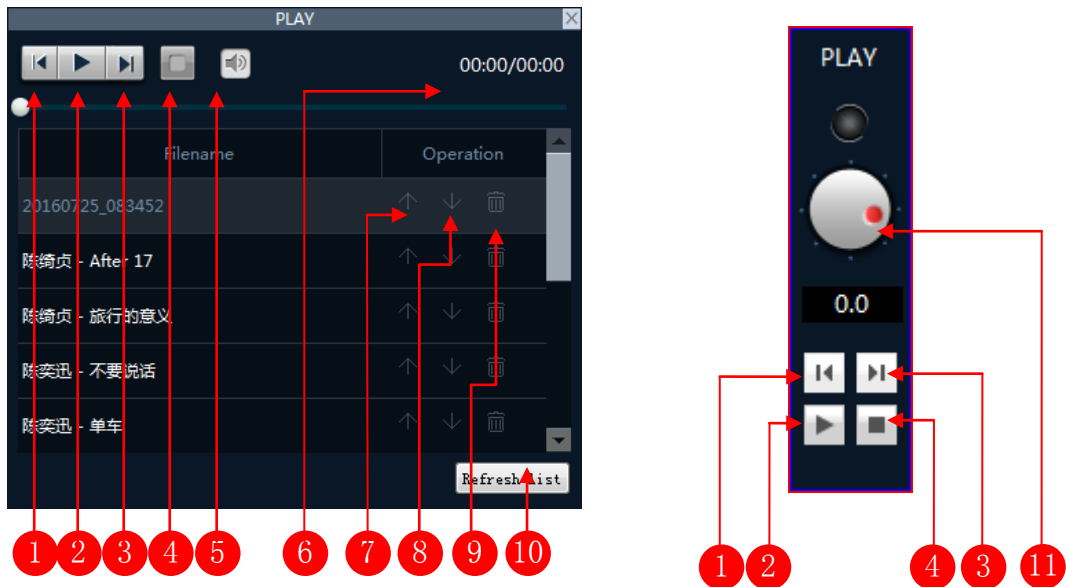
Phone output: the function is limited to the device with a phone module, to output the output channel signal to the remotetelephone device.

3.5.12 USB function (Optional)

1) USB Playback: The processor read automatically and select USB drive MP3 and WAV format audio files.

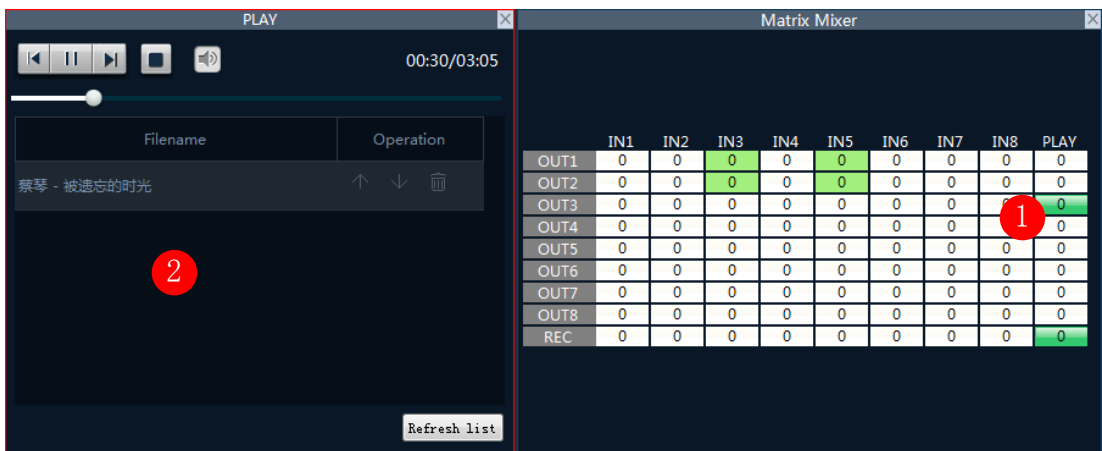
USB interface open mode:

USB Playback:



1. Previous
2. play and pause button
3. Next
4. stop button
5. Mute and volume control button
6. Play list
7. Up button
8. Down button
9. Delete button
10. Refresh play list
11. Volume control button

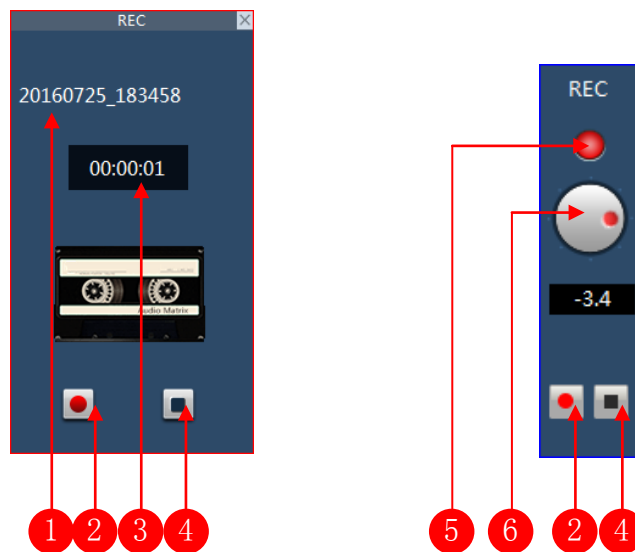
Example: Play the song on the U disk and send the sound to the output channel 1.



1. Choose "1" switch output corresponding to the matrix in the mixing interface "play" column
2. Double click the name of the song or play button and start playing the song.

2) USB sound recording

USB recording interface:



1 file name.

3 recording time. The

5 lights have three states: Gray said the device don't connected the U disk, red said the device connected to the U disk, flashing that is recording.

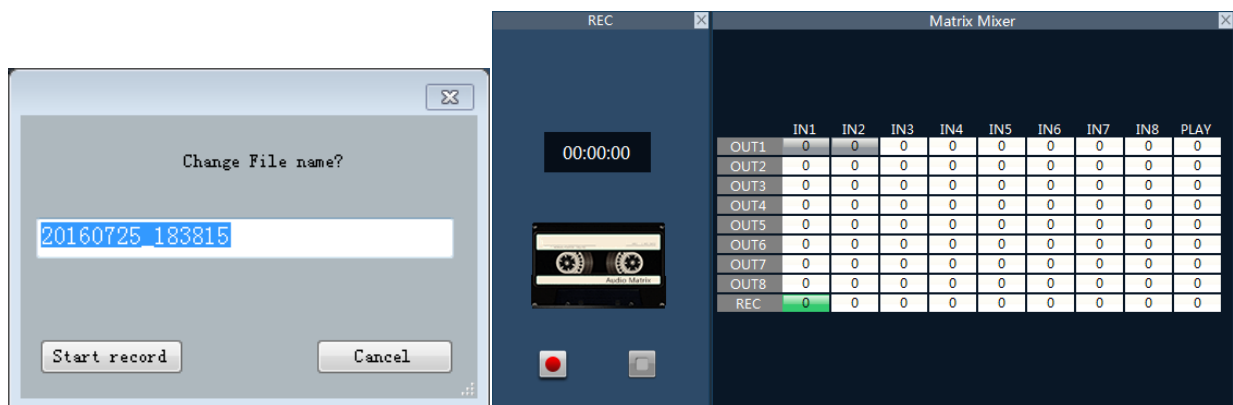
6 record volume control button.

2 start recording pause button.

4 button to stop recording.

Example: Record the sound of the input channel 1 to the U disk.

1. in the REC output line interface mixing matrix selected input 1 corresponding points.
2. Click the start recording button, enter the recording file name, and then click start.



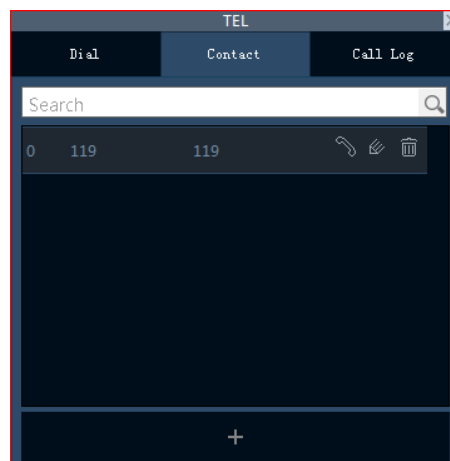
3.5.13 Phone model (Optional)

Interface:



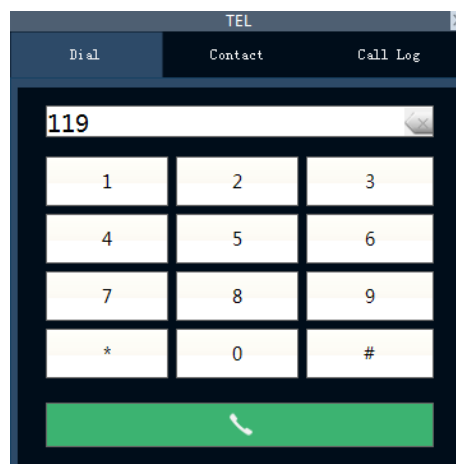
1. Input the mute button and input volume control pusher on the left.
2. Output the mute button and output volume control pusher on the right.
3. After clicking this interface, parameter control area will display the main interface of the telephone.

Contact:



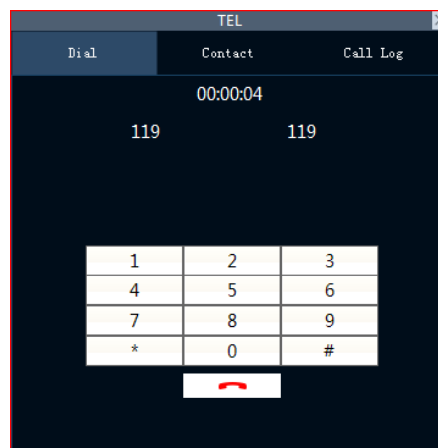
1. Click on the + button below to add contact, up to 200 can be added to contact.
2. The interface shown in the middle is the contact list, the list of each line shows the contact id, name and number, click the three buttons on the right can call the contact number respectively, modify the contact information, delete the contact.
3. The interface is the top contact search box, in the search box input contact, and then click search. Then you will find the contact person.

Keypad:

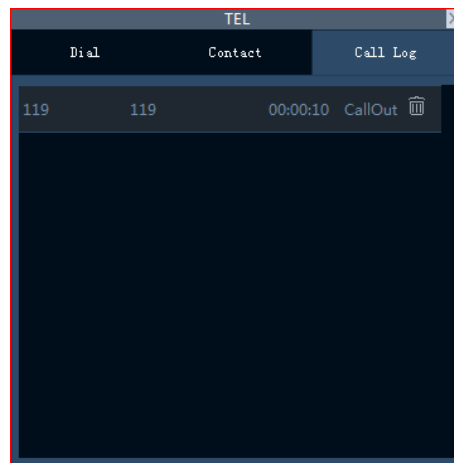


Enter the number, click on the dial icon can dial the phone.

The phone call interface is as follows:



Call log:



1. The recent call records is on the top of the list, It display up to 32 call records.
2. Every records show the contacts, number, call time and incoming and outgoing information, click the delete button can remove the call records.

Phone setting:



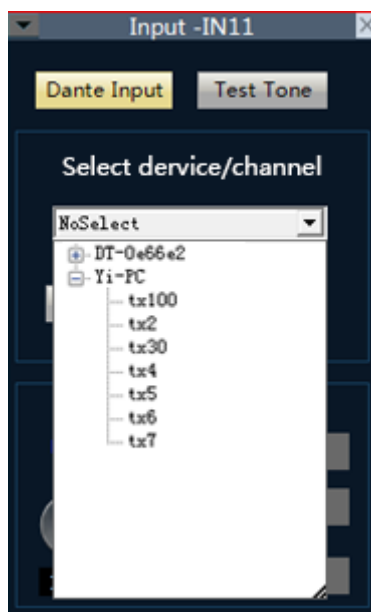
1. Automatic answer: incoming call will be automatically answer .

3.5.14 Dante model (Optional)

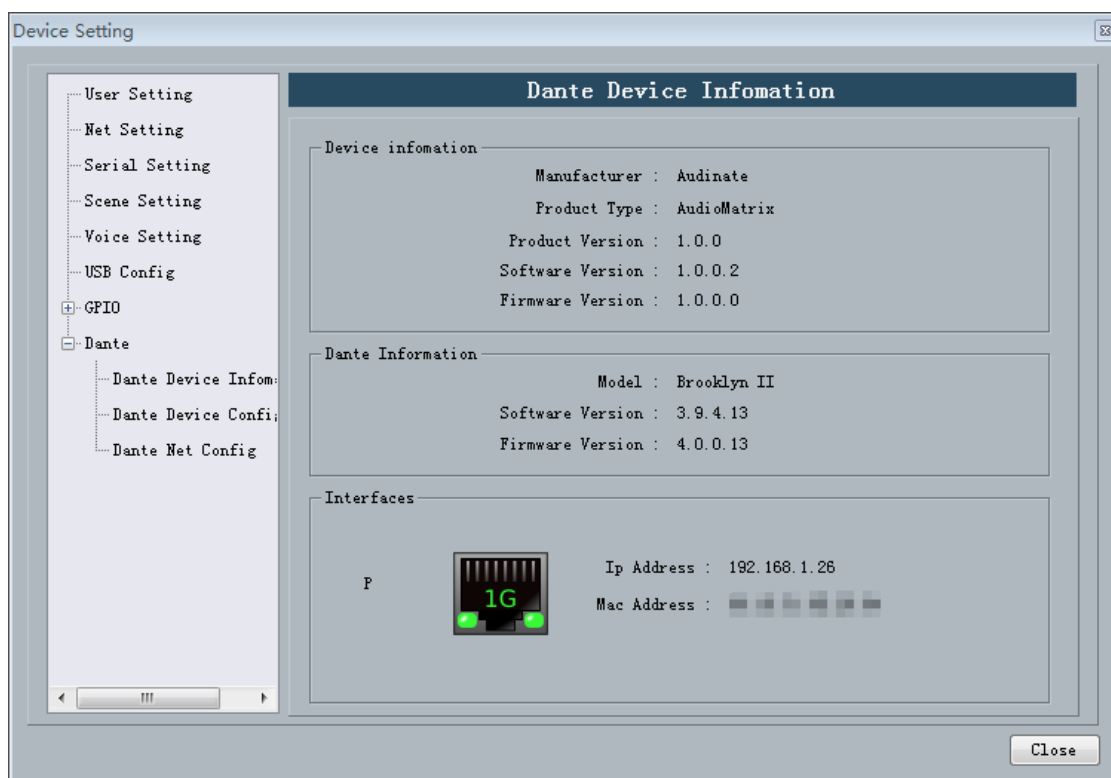
Integrated Dante module serial products in the input / output channel fast control area has a part of the channel is marked as the Dante channel, the interface is as follows:



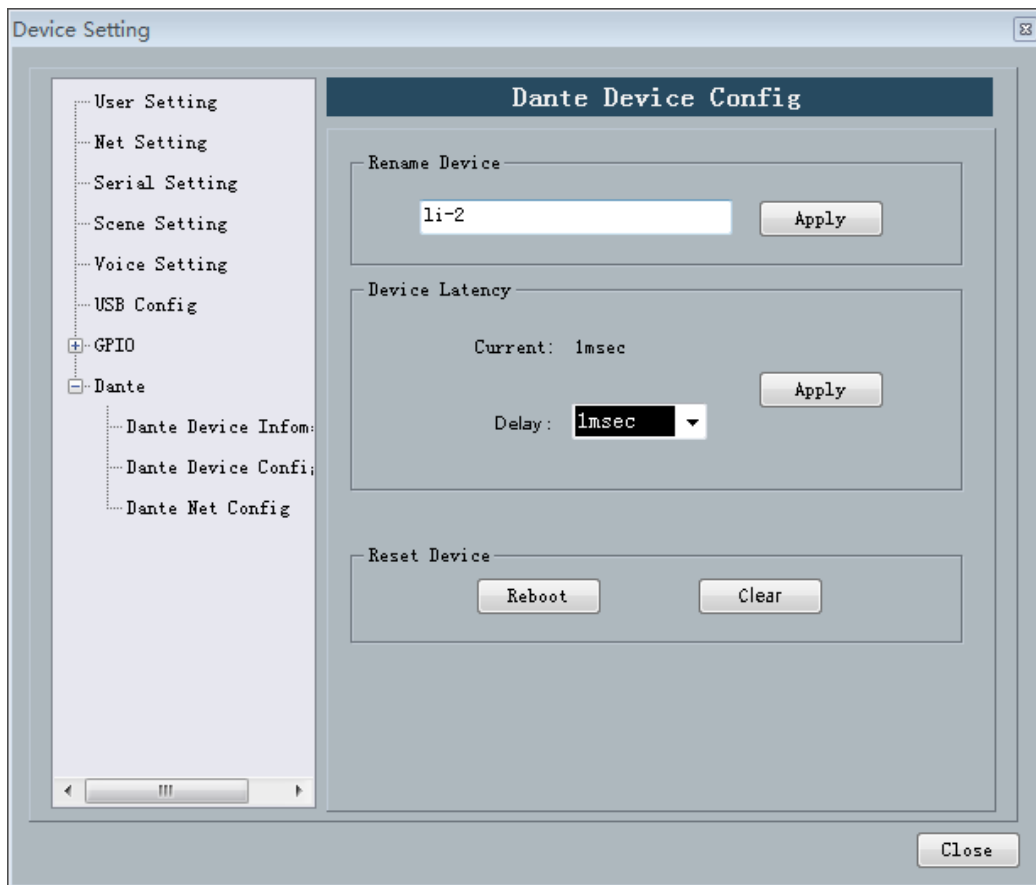
Select the input section of the Dante channel, open the input control, in the "select device / channel" drop-down box can be seen in the current network has been connected to the Dante device and channel list. Select the channel number corresponding to the device to complete the current channel Dante access, the corresponding device of the output channel will be through the Dante module into the current device input signal source.



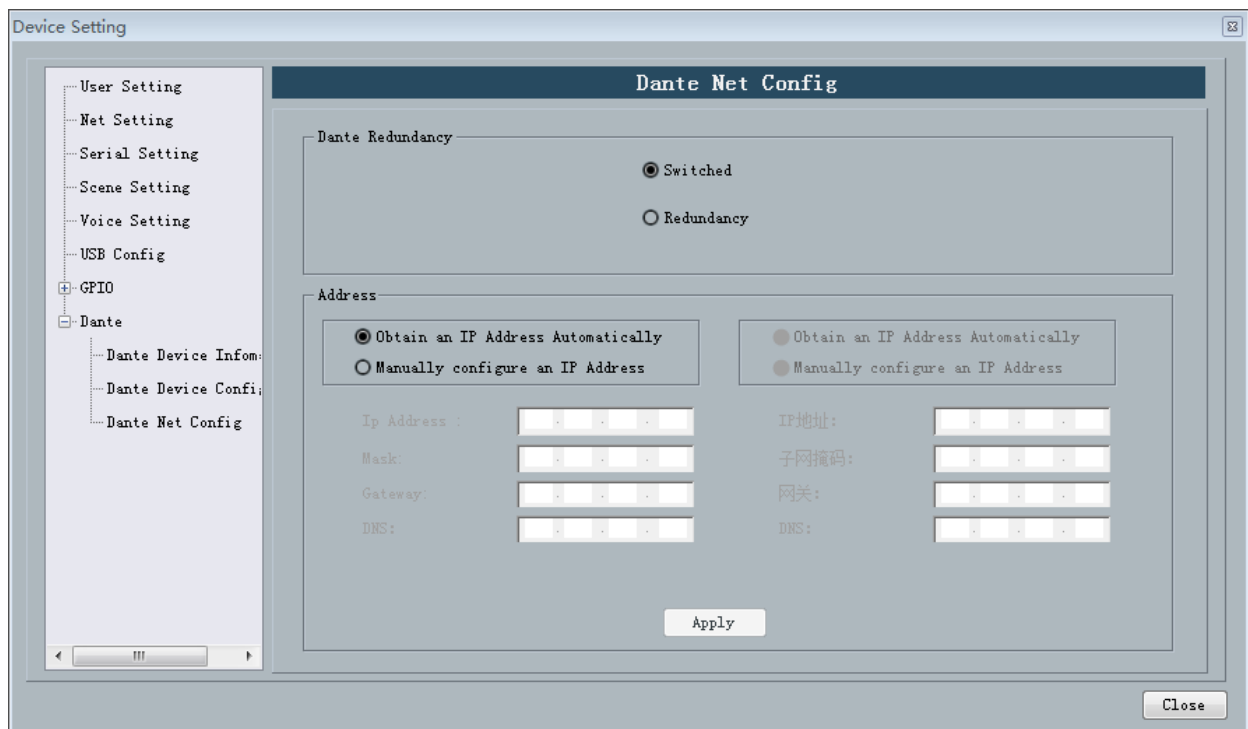
In the output section of the Dante channel will also be the same as other Dante devices in the network to search, and according to the needs of each other is set to become the source of its input signal.



In the settings menu, you can view the current device Dante module information and set the Dante module. As shown in the following figure:



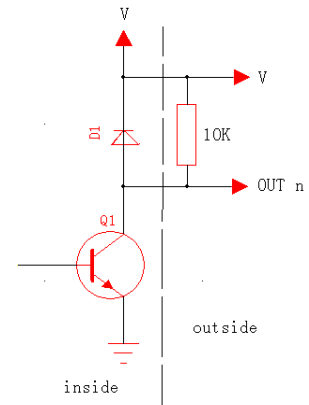
The higher the device latency is, the higher the network bandwidth requirement is, the default value of 1 milliseconds is recommended. Restart the Dante module about 10s or so, the whole machine will not restart, but all the channels will be temporarily banned.



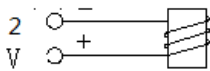
Dante backup when the "select" switch, equipment of two Dante network will use the same configuration; select "backup", two Dante network for the device will be divided into primary and secondary, can also received two networks, power grid communication fault signal discontinuous transmission.

Appendix: GPIO

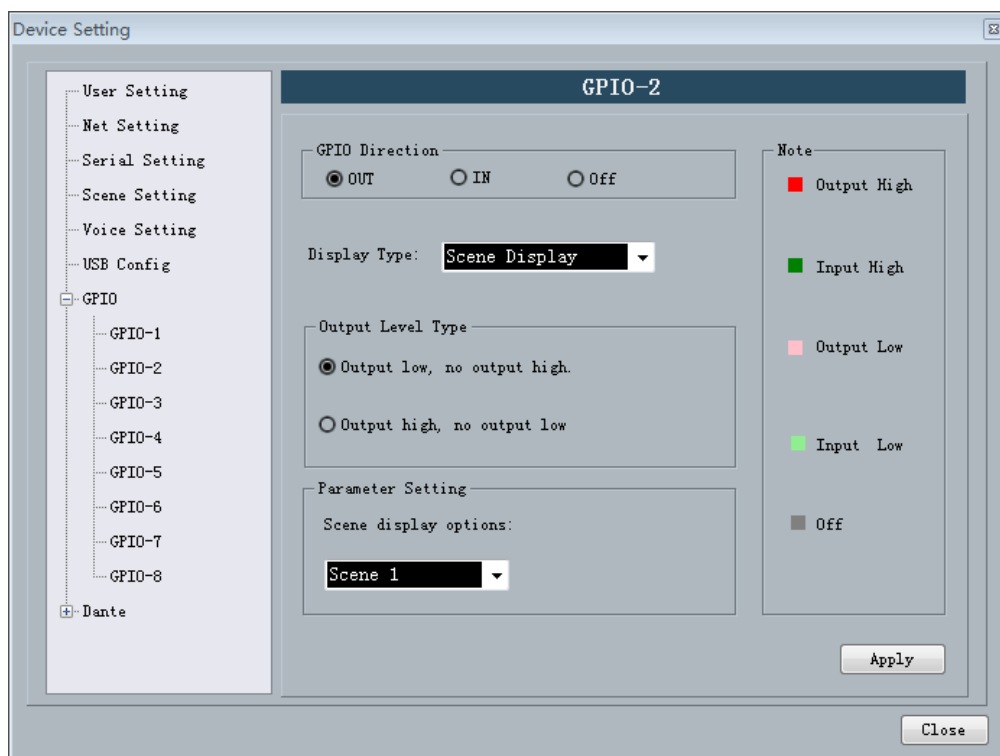
Output connection method 1: the first pin on the device in a GPIO(such as port 2) resistance in a 10K/0.25W connection, this pin according to the matrix of state change output low level 0 or 1 high level, the level can be used to trigger another GPIO or other equipment.



Output connection method 2: Drive relay: relay can be used to control the alarm device, built in the continued flow diode.



In accordance with the above method is also need to follow the following settings on the Software:
Settings ->Device settings ->Select GPIO channel (gpio-2 in this case) -> Set GPIO direction as "output":



a) If the Scene Display is selected, the scene loading is selected.

Display Type: **Scene Display** ▼

Output Level Type

☒ Output low, no output high.

☐ Output high, no output low

Parameter Setting

Scene display options:

Scene 2 ▼

the scene parameter is “Scene 2”, the output electrical level is “output low, no output high”, and the GPIO Enabled State is “ON”. The settings will become effective after the “Apply” button at the bottom is clicked, If Scene 2 is loaded on the scene management interface, PIN-2 will output 0, and remain the same before other scenes are loaded, at which time PIN-2 will output 1;

b) The specific settings are as follows if Level Display is selected:

Display Type: **Level Display** ▼

Output Level Type

☒ Output low, no output high.

☐ Output high, no output low

Parameter Setting

I/O Options: ☒ Input ☐ Output

Channel Selection: **Input 1** ▼

Maximum level (dBu): **-28**

As the level of input channel 1 of the audio matrix reaches -28 dB, PIN-2 will output 0, and remain the same before the level decreases, at which time PIN-2 will output 1.

c) The specific settings are as follows if Mute Display is selected:

Display Type: **Mute Display** ▼

Output Level Type

☒ Output low, no output high.

☐ Output high, no output low

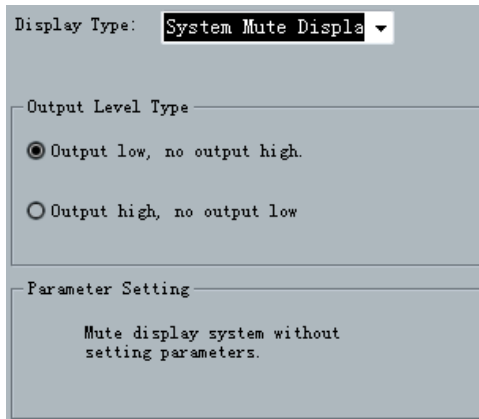
Parameter Setting

I/O Options: ☒ Input ☐ Output

Channel Selection: **Input 3** ▼

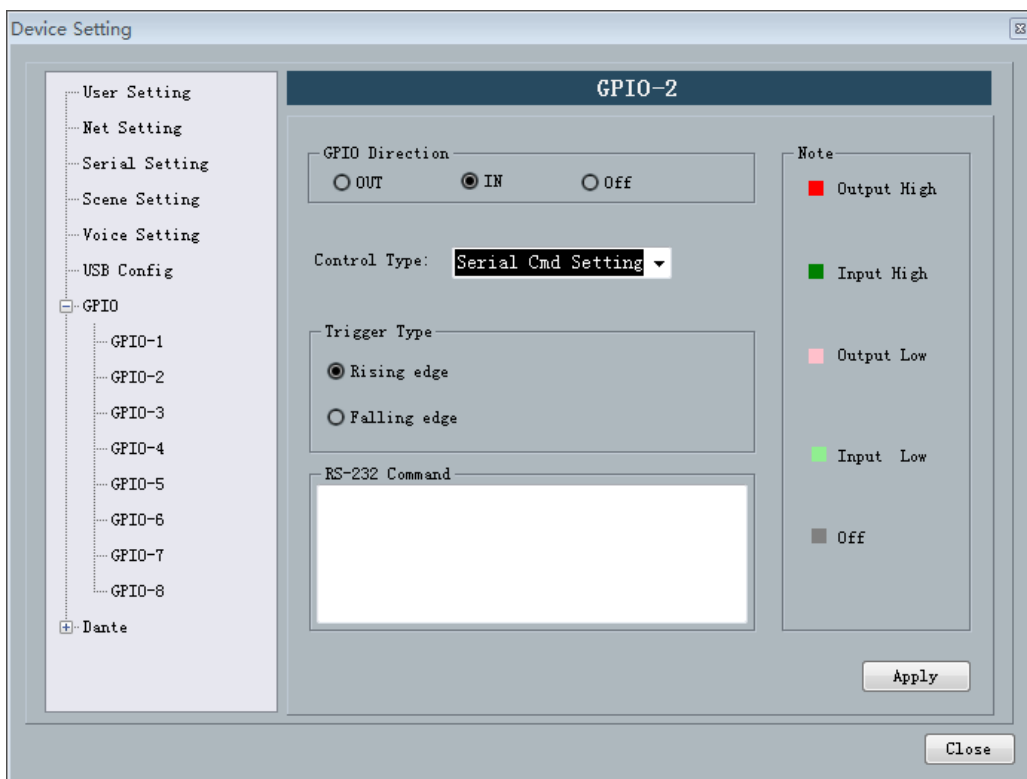
As the input channel 3 of the matrix is muted, PIN-2 outputs 1 and remains the same before the input channel 3 is not muted, at which time PIN-2 outputs 0.

d) he specific settings are as follows if System Mute Display is selected:

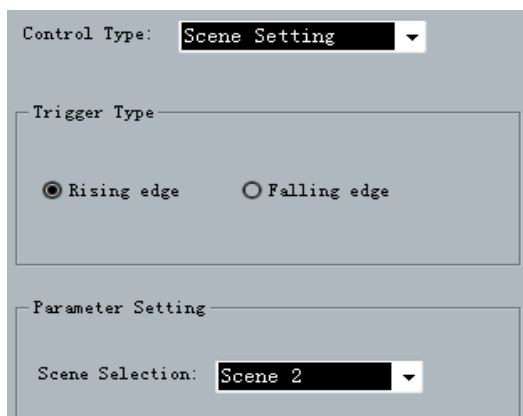


The output channels of the audio matrix are muted, PIN-2 outputs 0, and remains the same before any channel is not muted,at which time PIN-2 outputs 1.

Settings ->Device settings ->Select GPIO channel (gpio-2 in this case) -> Set GPIO direction as "input":



a) Scene Setting



As is shown in the above chart, the audio matrix will load Scene 2 automatically when the level of GPIO input channel 2 is changed from low to high.

b) Mixer Setting

Control Type: **Mix Setting**

Trigger Type

- ☒ Rising edge of the open.
- ☐ Falling edge of the open.
- ☐ Rising edge of the open, falling off.
- ☐ Falling edge of the open, rising off.

Parameter Setting

Input Channel: **Input 3**

Output Channel: **Output 5**

When the GPIO Channel is input 2, the mixer setting should be selected as the Control Type. As is shown in the chart, when the level of GPIO input channel 2 is changed from low to high, the sound mixing contacts corresponding to input channel 3 and output channel 2 will be opened, and the signals of input channel 3 will be mixed and transmitted to output channel 2 and then the signals will be output. If the trigger type is trigger mode 4 (Falling edge of the open, rising off), the contacts corresponding to the input channel 3 and output channel 2 of the key sound mixer will be closed when electrical level of the pin of GPIO input channel 2 is changed from low to high.

c) Volume Setting

Control Type: **Volume Setting**

Trigger Type

- ☒ Rising edge
- ☐ Falling edge

Parameter Setting

I/O Options: ☒ Input ☐ Output

Channel Selection: **Input 1**

Gain Step (dB): **5**

Effect: ☒ Increase ☐ Reduction

Input/output type refers to the input sound volume/output sound volume of the control system. Gain Step refers to the dB change corresponding to the step of the adjusted sound volume due to each trigger; and there are two effects, i.e. Increase and Decrease, which refers to the increased or decreased sound volume caused by each trigger.

As is shown in the chart, the level of input channel 1 will be increased by 5 dB when electrical level of GPIO input channel 2 is changed from low to high.

d) Channel Mute Setting

Control Type: **Channel Mute Setting**

Trigger Type

- ☒ Rising edge of the quiet.
- ☐ Rising edge of the quiet, not falling silent.
- ☐ Falling edge of the quiet.
- ☐ Falling edge of the quiet, not rising silent.

Parameter Setting

I/O Options: ☐ Input ☒ Output

Channel Selection: **Output 6**

As is shown in the chart, output channel 3 is muted when the level of the pin of GPIO input channel 2 is changed from low to high.

e) System Mute Setting

Control Type: **System Mute Setting**

Trigger Type

- ☒ Rising edge of the quiet.
- ☐ Falling edge of the quiet.
- ☐ Rising edge of the quiet, not falling silent.
- ☐ Falling edge of the quiet, not rising silent.

As is shown in the chart, all the system output channels are muted when the level of GPIO input channel 5 is changed from low to high.

f) Serial Command Setting

Control Type: **Serial Cmd Setting** ▼

Trigger Type

☒ Rising edge

☐ Falling edge

RS-232 Command

Parameter setting: input hexadecimal orders (0~9 and A~F). Two characters constitute one effective order, and if there is only one character, a 0 should be added before such bit, such as 03, 0A, etc. Blank space will be added after each two characters for the convenience of reading automatically by the interface. The blank spaces will be filtered off before the orders are transmitted, so the transmitted orders consist of successive hexadecimal characters.

As is shown in the above chart, the system will perform the hexadecimal order when the level of GPIO input channel 2 is changed from low to high.

Notes: the input characters must be hexadecimal characters, otherwise the order will not be approved, and such transmission will fail.