LAX®

Instructions

DA0404   DA0808   DA1212   DA1616
DA0404N DA0808N DA1212N DA1616N

Important safety instructions

1. Please read these instructions in detail.

2. Take good care of these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use the product near a water source or in an area with high humidity.

6. Clean only with a dry cloth.

7. Do not block the vent, and reserve at least 50mm ventilation space for the left and right vents .

8. Do not install near any heat source, such as radiators, heat regulators, furnaces, or other products that release heat, including loudspeakers.

9. Do not damage the grounding plug used for safety purposes. The ground plug has two blades and a third ground pin. The third terminal pin is provided for your safety. If the included plug does not fit in your outlet, have the outlet replaced by an electrician.   10. Prevent the power cord from being stepped on or pinched, especially at plugs, electrical outlets, and around and in and out of the product. Do not pull, unplug, or forcibly twist the power cord.

11. Use only the accessory devices/accessories specified by the manufacturer.

12. Use only with cabinets, racks, or equipment tables designed to provide adequate mechanical strength, heat dissipation, and stability to the building structure.

13. Unplug the power cord of the product when lightning occurs outdoors or the product has not been used for a long time.

14. Contact qualified service personnel for all repair services. Repair is necessary when the product is damaged in any way, such as the power cord or plug is damaged, contaminated with liquid or foreign matter falling into the product, the product is exposed to rain or wet environment, does not work properly or has been dropped on the ground and damaged.

Explanation of graphic symbols:

⚠ Lightning: This equipment operates with dangerous live voltage. Do not touch the terminal with this symbol when the device is connected to the power supply.

⚠ Exclamation point: Replace components (e.g. fuses) only according to the specifications specified by the manufacturer. Failure to do so will reduce the operational safety of the equipment.

⚠ Dangerous Moving Fan Blades: Please disconnect power and keep your distance from the moving fan blades before providing service.

Warning － To reduce the risk of fire or lightning shock, do not expose the product to rain or moisture or to liquid dripping or splashing, and do not place objects containing liquid (such as vases) on the product.

Warning － Products powered by the mains supply use safety grounding technology and must be connected to a properly grounded mains socket to provide safety grounding protection.

Disconnect the device － An AC power plug or appliance coupler is a device that disconnects the AC mains and needs to be readily available after installation.

Careful - Unless you are a professional technician, you cannot perform any service that is not included in the operating instructions. Before opening the product, the specialist must disconnect the AC mains supply.

Careful - Any steps regarding the installation and removal of the physical equipment should be performed by skilled personnel only, and all local regulations must be followed.

Table of contents

Foreword

Thank you for purchasing our product. Please read this manual first to familiarize yourself with the product.

Note: This manual provides the relevant information of all models in this series. As different models have different configurations, the actual configuration and function of the product you purchased are covered in this manual.

一、Device architecture

This series consists of two categories of products, one with network audio transmission function and the other without network audio transmission function. According to the number of physical interface channels, the equipment can be divided into 4 in and 4 out, 8 in and 8 out, 12 in and 12 out, and 16 in and 16 out. It can be flexibly used in conference rooms, multimedia classrooms, concert halls, command centers and other multimedia scenes.

The equipment architecture is introduced by taking 16 in and 16 out as an example:

Figure 1

Device front panel indicator:

(1) POWER: power indicator, after the power is connected, the light is on, indicating that the equipment power supply is normal, and the light is off, indicating that the equipment power supply is abnormal;
(2) STATUS: status indicator, the flashing light indicates that the system is running normally, and the light will stay on during the upgrade process;
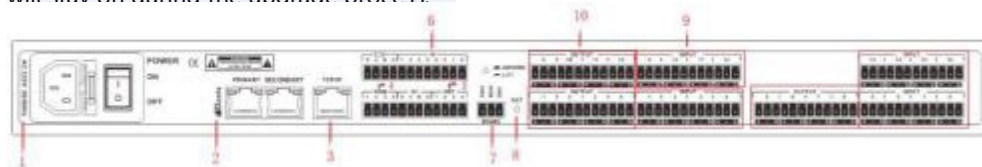

Figure 2

Device rear panel connector:

- (1) The power supply voltage is determined according to the power socket identification;
  (2) Dante PRIMARY/SECONDARY: network audio transmission interface;
  (3) TCP/IP: network interface, connecting PC, online editing and command sending and receiving control;
  (4) VCIN: corresponding to GPIO configuration interface input 1 ~ 4 interfaces, which can be configured as analog or logic control. When it is configured as analog, it can be connected to the wall panel for analog voltage and volume adjustment control. When it is configured as logic, it can be used as a common I/O port;
  (5) GPIO OUT: corresponding to GPIO configuration interface output 1 ~ 4 interface, logic control, connected to external control circuit;
  (6) GPIO IN: corresponding to GPIO configuration interface input port 1-8, logic control, connected to external control circuit;
  (7) RS485: communication interface, connecting external central control equipment/supporting camera tracking;
  (8) RESET: Restore the factory setting button. Method: Press and hold RESET when the power is off, and then power on to start the processor. After 15 seconds, the STA indicator on the panel flashes for 5 times and the reset is successful;
  (9) INPUT: analog audio MIC \ LINE input interface, balanced Phoenix port;
  (10) OUTPUT: analog audio output interface, balanced Phoenix port;

"255.255.25.255.0" -> Add- "Determine-" Determine:
（4） Plug in the power for the device test: select the list of devices in the local device in the menu of the system, select the corresponding IP address of the device in the pop-up box and click "Connect". If the "connect" button becomes "disconnected", the device has been connected successfully.
（5） If step 4 works properly, you can operate all the other functions.
2. Output without sound?
Answer:
(1) Check whether the input / output interface is correctly connected.
（2） Check that the channel corresponding to the mixer is open.
（3） Check whether the input source has sound, and you can use the input end signal generator for testing.
（4） Check the input file transmission corresponding to the mute parameters of the corresponding channel, and the corresponding level value.
（5） Check that the frequency parameters of the frequency divider are set correctly
3. Bad output sound quality, sometimes a rustling sound?
Answer:
(1) the output sound quality and the input level and the output level have a great relationship, usually the input level is less than-10dB, the transmission level
Xiaoyu-10dB, at this time to adjust other parameters, will have a better effect.
（2） Check the other parameter configuration, such as EQ parameters, whether the
frequency divider is reasonable.
（3） The signal generator makes some noise and check if it is turned off.
（4） The noise gate can filter the white noise when unmanned, and open the noise
door to detect the sound quality.
（5） Mac input generates echoes, and enabling feedback elimination can improve sound quality.
4.Matters need attention
Warning: To prevent electrical short circuit, do not place the equipment in rainy or wet places.
If water and other liquids enter the machine, the power should be cut off immediately, and professional maintenance personnel to avoid accidents.
There is no place in the user can repair the machine, do not open the cover, please find professional maintenance personnel to open and repair.
The exclamation point mark in the triangle is to pay attention to safety when the equipment is operated and repaired.
The shining arrow symbol inside the triangle indicates that there is a dangerous voltage inside the device, and the danger of electric shock will occur if touched.

(4) Remote output channel: refers to the channel number of Dante output, which cannot be modified.

For example, as shown in fig. 8, the 16-channel signals received by Dante are sent out through the 16-channel output channels of Dante.

(2)Near End Input Channel Transmit Settings
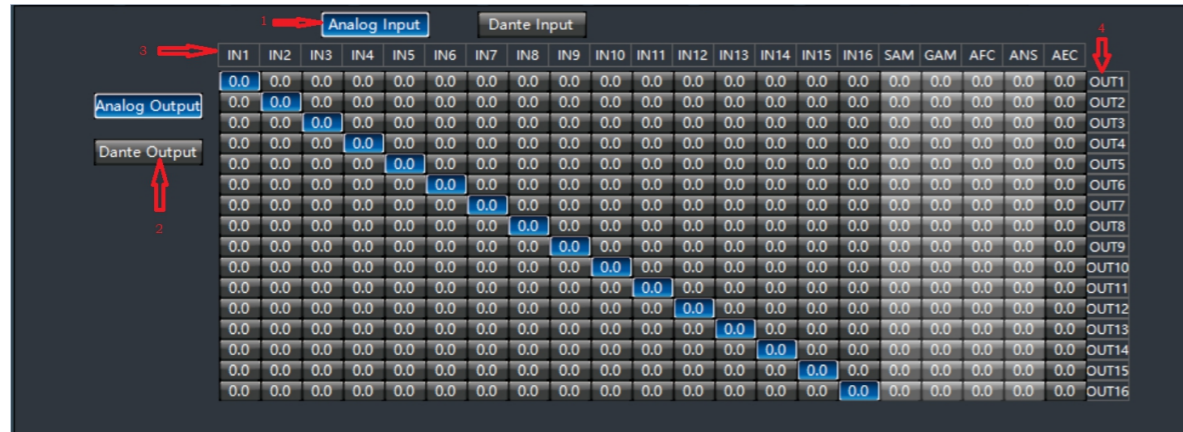

Figure 9

(1) Analog input: when the key is pressed, the blue display indicates that the signal route is set to come from the local analog input.。

(2) Dante output: Press the key to display blue, indicating that the signal route is set to output through Dante.

(3) Local input channel: refers to the channel number of local analog input, which cannot be modified.

(4) Remote Output Channel: refers to the channel number of Dante output. It cannot be modified.

3. Frequently asked questions

1. What configurations are required for the first system?

A: For the first time you use the system, follow the following steps:

（1） Read the instructions carefully and pay special attention to safety matters.

（2） According to the use instructions of the backplane, connect the PC terminal and the device 'audio input' transmission equipment. First, the PC terminal and the equipment can be connected through the LAN network; secondly, connect the signal input equipment (microphone, line input, etc.). The signal input interface is identified with IN or INPUT; finally, the connected signal transmission equipment (Power amplifier and other equipment), the signal output interface is identified starting with OUT or OUTPUT.

（3） The factory default IP address of the device is "192.168.10.10"; if there is no address of the 192.168.10 segment in the PC, please add at least one address of the segment in the PC so that the device is connected normally. The adding process is as follows (the following is the process of adding IP for the XP system):

Online Neighbors Right, Key- "Properties-> Local Connections-" Properties-> Select the Internet protocol (TCP / IP), click Properties-> Advanced-> Click Add-> Enter the IP address such as "192.168.10.101", subnet mask

二、 Software operating instructions

Software installation: The software supports the operating system of win7, win10 or above (win8 operating system is not supported). Before installing the software, please ensure that the computer has installed the DotNet Framework version 3.5 or above. Secondly, at least one of the IP addresses of the PC and the IP address of the device (the default IP address of the device is "192.168.10.10") are in the same network segment, otherwise, the device can only be queried and cannot be connected normally; If the IP address of the same network segment as the device is not set on the PC side, please refer to the precautions for using the device for the first time in the following FAQ to set it correctly. Install the PC software and select the corresponding version. The startup interface is shown in Figure 3:

Figure 3

(1) Menu bar and toolbar: the menu bar includes various function menus of the software, and the toolbar displays common function menus;

(2) Copy/Paste/Mute: for parameter copy between channels or between modules with the same function, if the selection box on the interface is red, it means that the module can perform copy/paste operation; mute means that the system is muted, and all output channels are muted when the button is pressed.

(3) Channel parameter control area: display the parameters of each functional module of each channel. The red selection box indicates that the module can be copied/pasted. Some hidden modules can be dragged left and right in the interface directly.

(4) Input/output channel control area: display the level and gain of each channel. Select any channel, and the corresponding specific parameters will be displayed in module 3; some hidden channels can be switched by using; when the channel selection box is red, the channel can be copied/pasted. When the channel selection box is blue, the parameters of the current channel are displayed in module (3).

(5) Status bar: display the current login user name, IP, and DSP occupancy rate of the connected device.
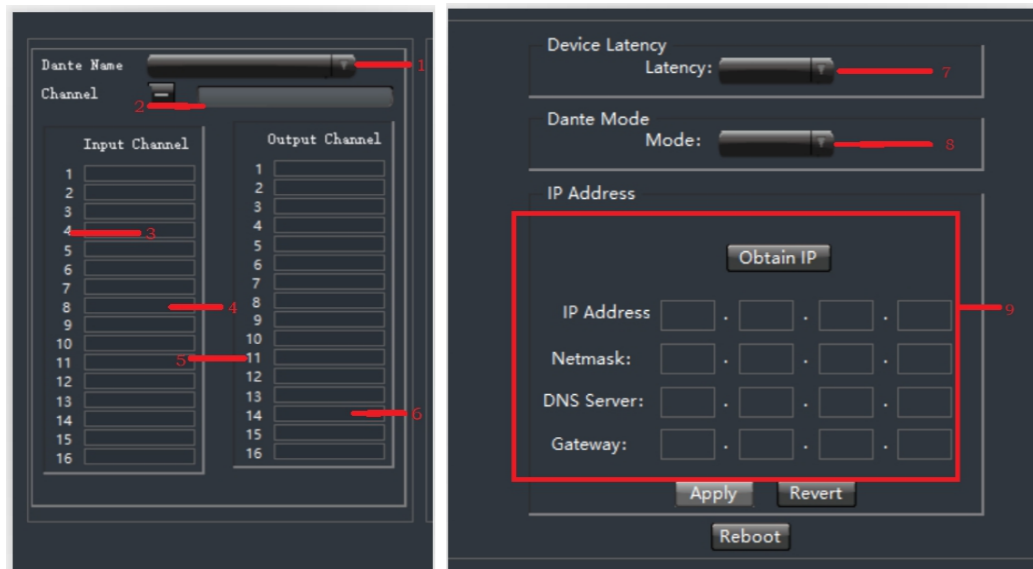
2.1 Menu bar and toolbar

2.1.1 Paper

(1) Create: Create a new edit file with factory configuration parameters.
(2) Open: Open the saved scene.
(3) Save as: Save the current configuration locally in the form of a file (.dat).
(4) Chinese/English: switch the interface display language.
(5) Exit: Close the software.

2.1.2 Local settings

1) Dante control
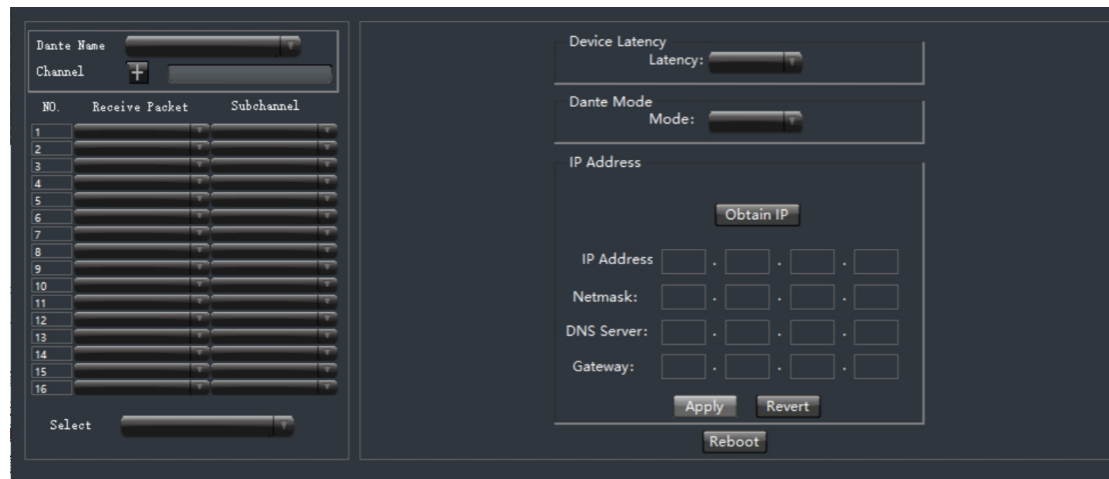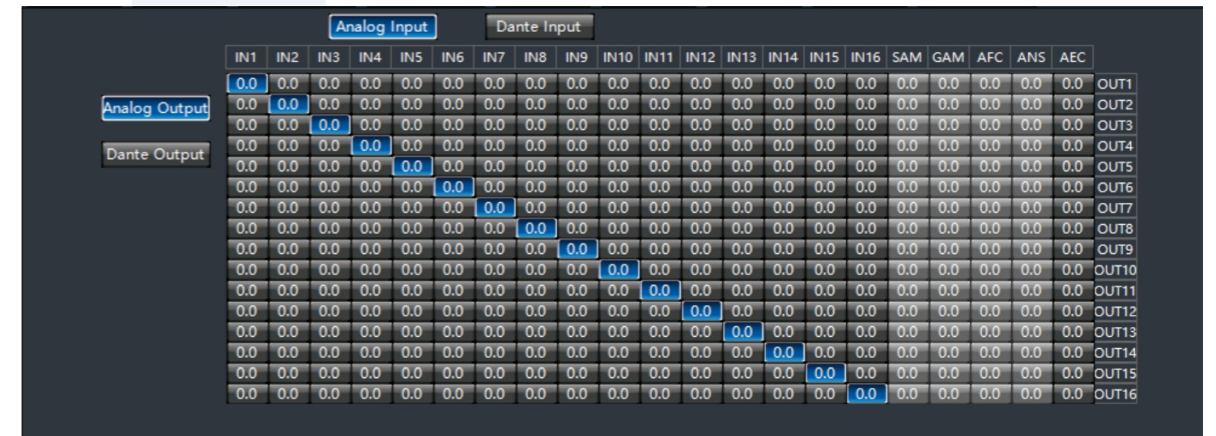

A. Dante settin

右

Figure 4

than this set value, the sound channel will not be closed immediately, and the closing time will be delayed according to this set value. During this time, the sound channel will remain on as long as any signal is above the Threshold limit.

2.7 Mix Matrix

The mixing matrix directly displays the connection relationship between input and output channels in the form of matrix array.
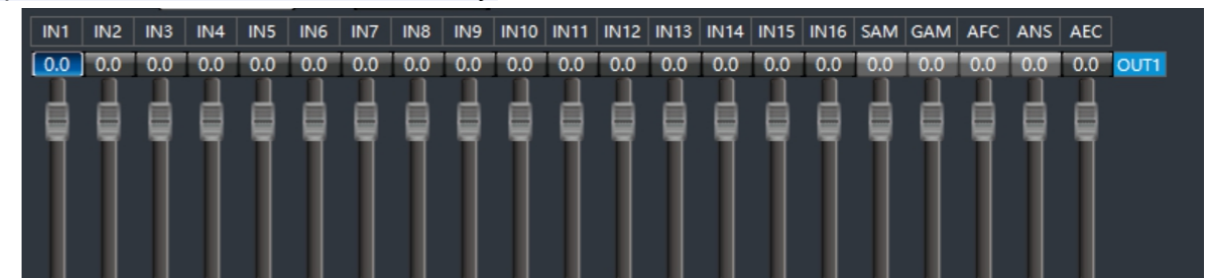
If you want to output the sound of input 1 (IN1) to output 1 (OUT1), just put the first row and the first column of the matrix The node button is lit. Click the OUT1 button to pop up the gain control of each input channel in the output channel 1, as shown in the figure below:

2.7.1 Dante Send settings

(1) Remote Input Channel Transmit Settings

(1) Dante input: Press the button to display blue, indicating that the set signal route comes from Dante input.

(2) Dante output: Press the key to display blue, indicating that the signal route is set to output through Dante.

(3) Remote input channel: refers to the channel number input by Dante, which cannot be modified.

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

Flat: restore the gain of all frequency bands to 0 dB. Narrowband: a type of bandwidth that is lower than normal bandwidth.

Normal: Commonly used normal bandwidth.

Broadband: The highest bandwidth.

* PEQ equalizer refers to the introduction of 2.2.3 five-segment equalizer

(2) Frequency divider The frequency divide is realized by a high-pass filt, a low-pass filter, and a band-pass filter formed by that combination of the high-pass and low-pass filter Please divide the frequency according to the actual situation when using. The frequency divider distinguishes sound signals of different frequency bands.

High-pass through: high frequency section bypass switch.

Low-pass through: low frequency section bypass switch.

High Pass Gain: The gain/attenuation value of the processed high frequency signal output.

Low-pass gain: the gain/attenuation value of the processed low-frequency signal output.

High-pass frequency: frequency division point of high-pass filtering.

Low-pass frequency: frequency division point of low-pass filtering.

(3)Output gain control Output gain control parameter setting is mainly used to adjust the output gain. Modify this value to adjust the output gain processed by the previous series of functions.

Input level: displays the input signal before it is processed by the speaker management module.

Output level: display the output signal processed by the speaker management module.

(4) Delayer The time interval from the input of the signal to the output of the processor, which is generally used to produce reverberation or echo effects, and can also be used for the processing of larger auxiliary speakers.

2.6.3 Limiter

The limiter is used to limit the amplitude of the signal greater than the threshold. When the input signal is greater than the threshold, the output signal is equal to the threshold; when the input signal is less than the threshold, the output signal is equal to the input signal.

Pass-through: The input signal is bypassed without compression.

Threshold: the initial level of amplitude limiting. When the signal is higher than the limit value, the amplitude limiting processing module will be started to limit the excessive signal.

Recovery time: When the input signal is lower

(1) Dante name: Click the drop-down list box corresponding to the name of the receiver Dante to select the receiver Dante device. Note: This name cannot be the same as the Dante name of another device.

(2) Dante name modification column: modify the name of the currently selected Dante device. Click the channel name extension button, as shown in Figure 4 (left), which is the information of the input and output channels of the current Dante device.

(3) Dante input channel number: cannot be modified.

(4) Dante input channel name: can be modified.

(5) Dante output channel number: cannot be modified.

(6) Dante output channel name: can be modified.

(7) Device delay: the delay setting of the Dante device of the receiver. Click the corresponding drop-down box arrow to select the delay parameter, including the selection of 5 delay parameters, namely 0.25 ms, 0.5 ms, 1 ms, 2 ms and 5 ms.

(8) Dante mode: mode selection of the receiver Dante device. Click the corresponding drop-down box arrow to select the type of Dante mode, including the selection of two modes, namely Swiched and Redundant.

(9) IP address: Set and obtain the IP address of the receiver Dante device. There are two ways to set the IP address of the Dante device, one is to get the IP address automatically and the other is to enter it manually. Note: After selecting any IP setting, you must click the [Restart] button before the Dante device's IP can be saved and take effect.

B. Dante receive settings

It is mainly to set each Dante input channel of the Dante device selected in the Dante name and receive signals from the output channel of the specified Dante device.

(1) Dante input channel: the Dante input channel number in Figure 4 (3), which cannot be modified.
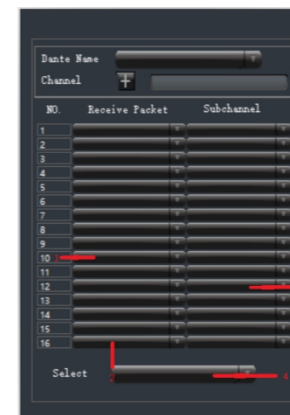
（2）Receive network packets: Click the drop-down box to display all searchable online Dante devices in the current network. By selecting this Dante name, you can establish a connection between send and receive.

(3) Sub-channel: Click the drop-down box to display all the output channels of the specified Dante device, and finally determine the connection of the specific channel 。

(4)Network card selection: select the network card of the Dante device in the network.

Note: See Section 2.8.1 for Dante transmission settings

Figure 5

2) **Version selection**

View the functions of this series of products, and switch to the corresponding software interface.

3) Channel selection

Sorting, grouping and hiding input and output channel
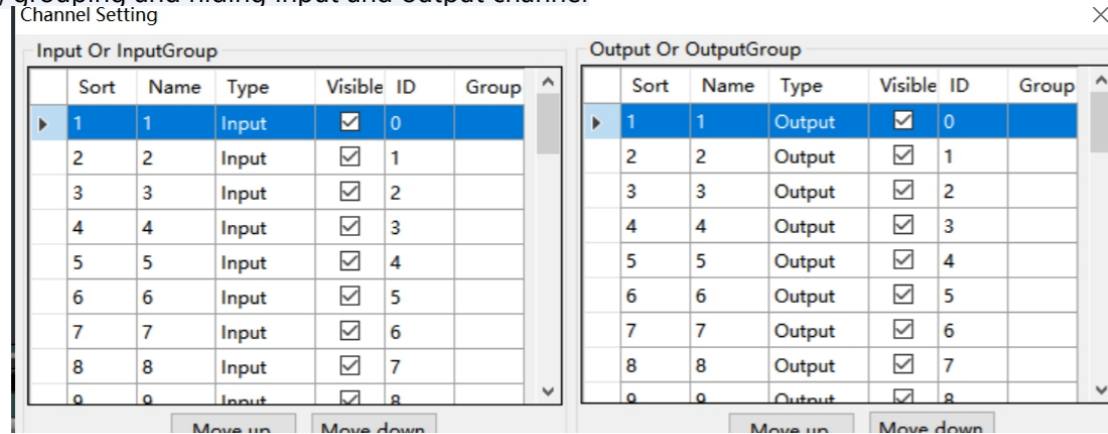

Sorting: Fixed 1 ~ N channels; used to view the position of the corresponding channel.

Name: Select the channel to be sorted, press the Up/Down key to adjust thecorresponding position, and modify the name of the corresponding channel.

Category: Displays channel properties and cannot be modified.

Show: Select to show, otherwise hide the channel.

Grouping: displays the channel information in the grouping.

4) List of devices

Click the "Search" button to query the online devices in the current LAN. The search results are shown in the figure above. "Status" is "!" It indicates that the IP on the same network segment as the device is not set on the PC side, and the device cannot be

2.6.1 **Derived from**

Select from which input signals the signals of the output channel are taken, and if more than one is selected, the signals are superimposed and output.

2.6.2 **Speaker management**

(1) GEQ equalizer Equalizer compensates and modifies the frequency characteristic to achieve a relatively flat frequency response characteristic.
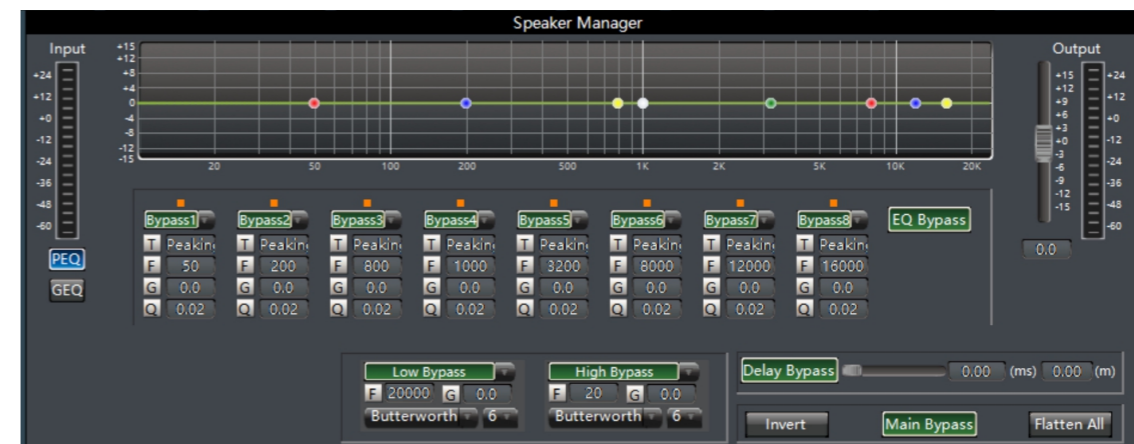
All pass-through: all band signals are bypassed, and the signals directly enter the next processing module; press to indicate that the pass-through is valid, that is, the equalizer is not enabled, so all band signals are pass-through to the next processor; up indicates that the equalizer is enabled, and the signals are output after being processed by the equalizer. The gain of each frequency point can be adjusted independently, so as to achieve the purpose of strengthening and weakening certain frequency points and achieve different effects.

Straight: restore all frequency points to the state of 0 dB.

Set the signal to be processed by the echo canceller, and the processed signal can be input in the "source" of the output part. Line output.

Near-end input: local MIC input, which is the signal that needs echo processing.

Far-end input: reference signal.

ANS level: there are 4 levels that can be controlled, the noise suppression amount of level 1 is 9dB, each level of levels 2, 3 and 4 decreases by 3dB, and the maximum suppression amount is 18dB.

AEC: including 3 echo attenuation levels, the larger the value, the higher the echo attenuation level.

2.6 Audio output module
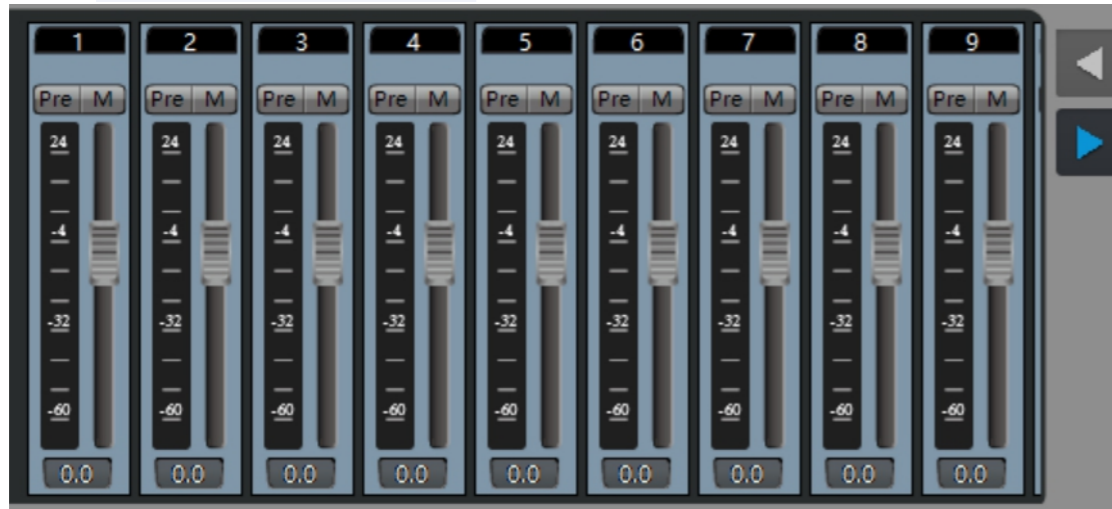
The interface displays 8 channels at most, which can be switched by pressing the key, or by directly clicking the interface to drag left and right; click the channel to switch the function module display box above; refer to 2.1.2.4 to view the channel information. Different types of output channels are represented by different colors of the channels. For example, the 5-8 channels shown in the figure above represent the analog output channels of the device, and the 1-4 channels represent the Dante output channels. The output channel supports the grouping function. Multiple channels can be set to a group. When the gain of the group is adjusted, the gain of the subordinate channels of the group will change at the same time. After the grouping is set, the grouping identifier will appear on the gain fader. The system provides two types of groups: one is the Group group, which directly adjusts the gain value; the other is the DCA group, which adjusts the gain percentage. The channel name is displayed in the upper edit box and can be modified. Pre/M: When the Pre is on, the original level of the signal that has not been processed by the fader is displayed. Otherwise, the signal level of the signal that has been processed by the fader is displayed. M sets the mute of this channel.

Fader: controls the gain addition and subtraction of this channel.

connected normally. Please add an IP on the same network segment as the device on the PC side (refer to FAQ 1), and then try to connect again. If "Connect" is displayed in the "Connect/Disconnect" column, it means that the device is not online. Click "Connect" to connect the currently selected device. When "Connect" changes to "Disconnect", it means that the device is online successfully. If "Disconnect" is displayed in the "Connect/Disconnect" column, it means that the device is online. Click "Connect" to disconnect from the currently connected device. When "Disconnect" changes to "Connect", it means that the device is offline successfully. User information is required to "connect" the device.

In the list on the right, you can add device IP addresses for different LANs (DMZ/VPN). Click Add to add the device name and IP address, and confirm。
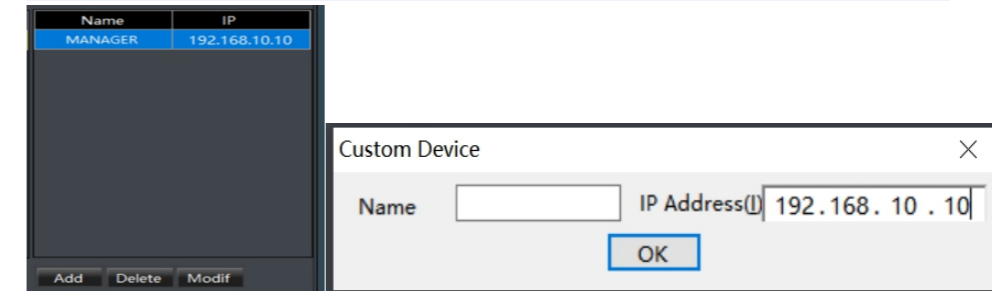
5) **Connect**

Indicates the current device that needs to be connected.

6) **Disconnect**

Disconnect from the currently connected device.

7) **Central control command**

A. Description of simple generation of central control command

Open the software and select "Central Control Command" in the drop-down menu of "Local Settings" in the menu bar. The pop-up dialog box is the operation of the central control command generator on the software interface. The corresponding command will be generated synchronously on the central control command generator.

For example 1：Enter the mute command for channel 2

Click input channel 2 mute in the software, and the command of input channel 2 mute will be displayed in the central control command generator.

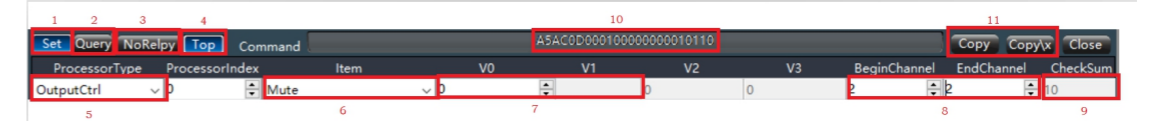B. Operation Instructions for Central Control Command Generator

Figure 6

(1) Setting: when the setting button is under the button, the currently generated central control command is the control command.
(2) Query: The query button is under the point status, and the currently generated central control command is the query command.
(3) The device cannot reply to the command.
(4) Top: When the top button is in the down state, the central control generator interface is always in the current display window.
(5) Processor type: select the module to be controlled, and the module corresponds to the input and output control module on the PC interface; for example: To control the muting of input channel 1, select "Input Source" in the processor type. This is because the mute function is in the input source module on the PC interface, so it is necessary to select the input source to control the mute.
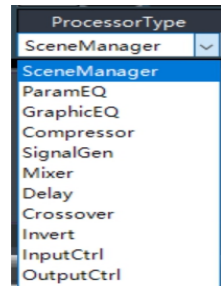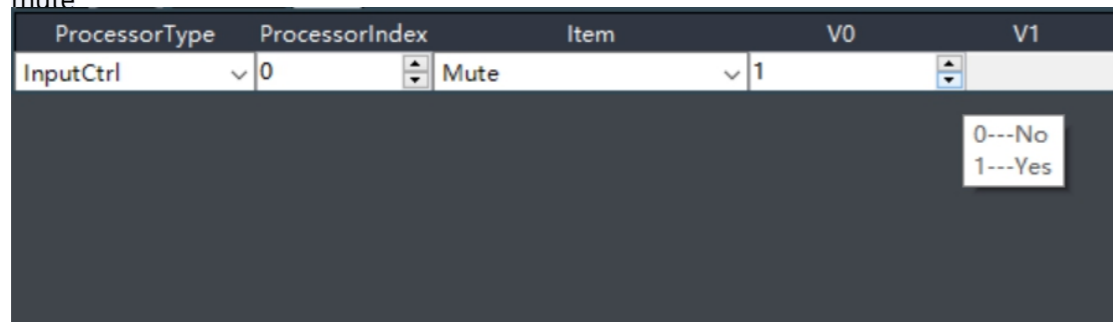

(6) Item: Select the control item in the processor type. For example, control the mute of input channel 1. After selecting the processor type, select "Mute Switch" in Item.
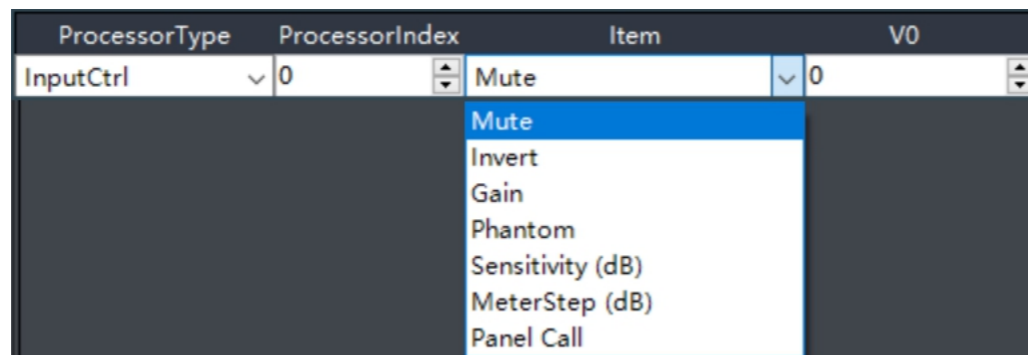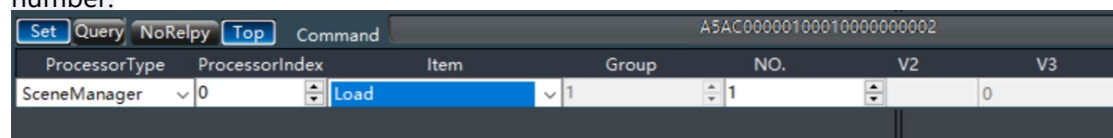

(7) Select the specific parameter of the control item in the processor type.
For example: control the mute of input channel 1, 0 means cancel mute and 1 means mute.

Note: The specific control parameters will change according to the control type and control item selected; Selecting the scene to load will become the selection of the scene number.

Select the mixing control, and it will become the selection of input and output channel numbers.

Mode selection: Conference 1, Conference 2, Music 1 and Music 2 are available for selection. The detection sensitivity of the four modes is different, and the notch gain and bandwidth value of the notch filter are different.

Number of filters: 12 and 16 for selection. The default is 12 filters.

Depth limit: Maximum depth limit of filter notch, adjustable from 0 dB to -20dB. Clear filter: data clearing of a single filter or data clearing of all filters.

Frequency: Displays the frequency value of the feedback howler point.

Gain: Displays the gain value of the filter notch.

Bandwidth: Displays the bandwidth value of the filter notch.

Type: Each filter has three types: fixed, dynamic and manual. Fixed and dynamic are automatic detection display, and manual is user's manual parameter setting. Fixed points are not modifiable after they are set and cannot be overwritten until they are deliberately cleared; dynamic points are not modifiable, but when the filter is fully used and feedback is still occurring, new howling points will overwrite the original points in turn from the first dynamic point. When the manual type is selected, the user can modify the values of the filter frequency, gain, and bandwidth.

2.5 Echo cancellation

priority of channel 2 is set to 3, when both channels receive signals of the same level The gain of Channel 1 is 6 dB higher than the gain of Channel 2. Obviously, priority The setting of the level step value affects the weighting of the priority. If the majorities of all channels The priority is equal. Please set the priority of all channels to 5.

Enable Last Mic: Press the Enable Last Mic button to ensure that the last microphone remains on, even if no speech is detected. This guarantees that at least one microphone will always remain on to prevent dead air.

Mute and Gain: The master control section includes the main gain and mute settings. These only affect the main mix output, not the channel direct output.

Pass-through: Pass-through buttons of gain-sharing automatic mixing and gain-sharing automatic mixing are mutually exclusive, that is, only one algorithm can participate between them.

Hold Time: After the microphone stops speaking, the Hold slider adjusts the length of time the channel remains on. Use long enough so that brief pauses between words and sentences do not cause the channel to shut down. If excessive jitter (frequent opening and closing) occurs, a long hold usually helps. However, too long a duration may prevent the next speaker from starting to select when the NOM count is reached. Threshold: Sets the level of the channel at which all channels are turned off. A higher setting (e.g. -20dB) may help to ensure that there is some room tone when all microphones are off, if not using Enable Last Mic. The mute channel will be fully attenuated regardless of this setting.

Noise Sensitivity: The sensitivity slider controls that the channel must be above the adaptive noise threshold on it. If the access door is too prone to quiet noise, increase this setting. In our experience, noisy rooms (e.g. A lot of fans) require a lower setting than quiet rooms. This is because in a quiet room, even low-level sounds are much louder than noise.

Priority Step Value: The priority step value slider affects the amount of attenuation for all channels as more microphones are turned on. This parameter represents the attenuation when both microphones are thresholded, and the additional attenuation per doubling of each microphone turned on.

Number of open microphones: set the number of open microphones Last Mic Number:

Displays the number of the last mic turned on

Local/Dante: Select the source of the mix input.

2.4 Feedback elimination

The AFC feedback canceller automatically detects and suppresses acoustic feedback in an audio system, and can well distinguish feedback from audio. When feedback is detected1, a notch filter is added to attenuate the frequency of the feedback.

At the same time, it should be noted that in the above figures, some control formats are grayed out, indicating that the corresponding parameters are invalid. For example, processor number, scene group, V2, V3 in scene loading; processor number, V3 in mixing control;

(8) Start channel/end channel: select the channel to be controlled

For example, control the muting of input channel1

For example, control input 1 to 5 channels of mute.

(9) Check code: the check code in the central control command will be automatically generated according to the specific control parameters.

(10) Central control command: the central control command automatically generated according to the selected control parameters

(11) Copy: shortcut operation button for copying

For example, 1: enable feedback elimination of output channel 1, select "feedback suppressor" in processor type, select 0 in V0, and select 1 in start channel/end channel, the generated command is to enable feedback elimination button of output channel 1

For example, 2: control the gain of output channels 2 to 5 to be -5, select "Output Valve" in Processor Type, select "Channel Gain" in Item, input "-5" in V0, the start channel is 2, the end channel is 5, and the generated command is to control the gain of output channels 2 to 5 to be -5

2.1.3 Device settings

1) User management

![User Manager dialog]
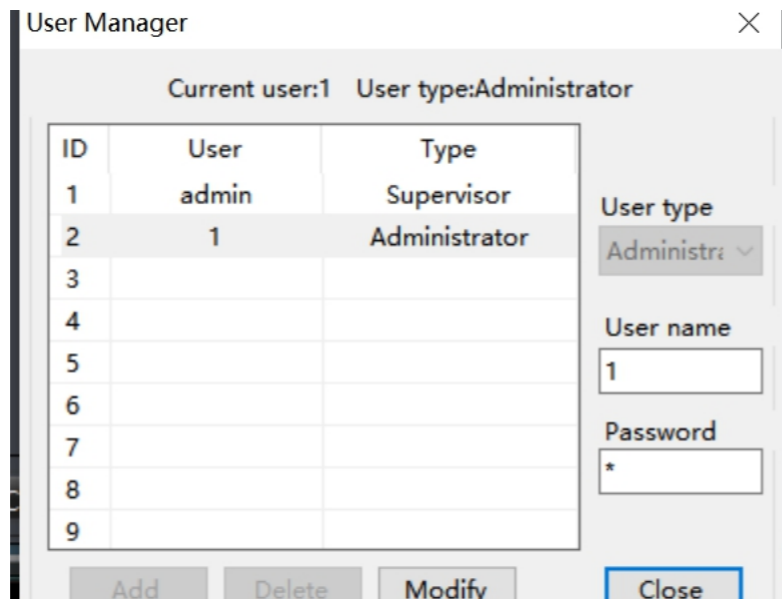
The list of initial users of the device is:

Type	User name	Password
Administrator	admin	123456
User	1	1

The system administrator can add, delete and modify the information of ordinary users, and can also modify the information of administrators; ordinary users can only modify personal information. Modify user: First, select the user to be modified in the left list. The user name and password edit box displays the information of the currently selected user. Enter new information and click "Modify". Delete user: select the line to be deleted in the left list and click Delete to delete the user. Add a user: select an empty line in the list on the left, enter the information of a new user in the user name and password edit box on the right (it should be empty), and click Add to add a new user.

2) RS485 Set

It is used to view and modify the serial port 485 information of the currently connected device. After setting, click the "Save" button to modify the serial port 485 information of the current device. If you want to restore to the default value after modification, click the "Reset All" button directly. Check the reply result to indicate that there is a reply command when the command is sent through the serial port.

3) Network settings

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algorithm. It is only mixed and output as a common microphone and the microphone after automatic mixing.

Level meter: Each channel has one level meter, which is the automatic gain level value in advance. The -60dBu level meter displays the level of the input signal, which is the level value before the fader and before the automatic gain.

Auto: Each channel has an "Auto" key. Press to add this channel to the automatic mix. If a background music channel needs to be placed at a fixed level, or if a "Chairman" microphone needs to be left on all the time, the Auto key needs to select Up. When a channel's Auto key is selected "Bounce" The gain will not be automatically adjusted, and the signal level of this channel will no longer affect the gain of other channels (no longer affect the automatic mix gain calculation).

Mute: Channel mute is a pre-auto gain. That is, turning on mute eliminates the effect of this channel on the gain of the other channels. It mutes that channel and mutes the direct output of that channel in the mix.

Fader: The channel fader is an automatic gain. Controls the mix level and direct output level for this channel, but does not affect the automatic mixer algorithm. You can also control the channel level precisely by clicking in the text box and entering a dB value. Both the channel mute and the fader are of the automatic gain type, that is, no matter what you do, it has no effect on the automatic mixing. That's what I mean This means that even if a channel is muted, if a high level signal is present on that channel, the level of the remaining channels will be reduced. To mute a signal and prevent it from affecting the automatic mix, turn on Mute and cancel "Automatic".

![Automatic mixer control panel]

Priority PR: The channel with higher priority level can surpass the channel with lower priority level. Affect that automatic mixing algorithm. The control uses 0 (lowest priority) and 10 (lowest priority High priority) defines the priority. The default value is 5 (standard first Level). You can adjust the priority through the slider control, or click the edit box. Enter a data throttling priority between 0 and 10. If 2 channels are receiving Of the signals have the same level, the one with the higher priority will have a higher gain. For every 1 priority "unit" difference between channels, the gain will differ by 2dB (assuming excellent The pre-step value is set at 2.0). For example, channel 1 has a priority setting of 6, The

The automatic gain operation is designed so that the microphone is faster than turning the microphone on. So, even if there is a 100-second response, the beginning of the vocabulary will not be cut. For a slow time of a few seconds, the automatic mixer responds like a hold time, with the last active channel held for a few seconds.

(5) Local/Dante: Select the source of the mix input.

2.3.2 Threshold automatic mixing

The gain-sharing automatic mixer has fast, smooth sound operation and requires little adjustment and setup time. However, for some users, a gating algorithm that limits the total number of open microphones (NOM) is preferable. The Threshold Auto Mixer module is built around an adaptive threshold algorithm that is easy to set up and does not require a fixed threshold. The Threshold Auto Mixer analyzes all microphone inputs and attenuates or turns off any microphones that do not pass voice audio. Is being heard normally through the microphone of the voice audio. The threshold automatic mixer is implemented by setting a dynamic threshold just above the background noise floor. Microphones below this threshold will be thresholded. If the qualified voice signal exceeds the threshold, the access gate opens and the signal passes. If the background noise floor changes, the threshold is updated in real time. The threshold automatic mixer uses an adaptive noise threshold for each channel. The channel's signal must exceed a threshold in order to reach a value that can Number of programs. Therefore, in the presence of fixed noise, the channel does not appear, for example, equipment fan or HVAC. In addition, additional module functionality prevents multiple microphone thresholds when a single person is speaking. As more channels come in, the overall level is reduced to prevent feedback. This is called NOM attenuation and is also programmable. The total NOM may also be limited. When this limit is reached, a multi-level priority scheme determines which microphones can be turned on.


Indicator: When the channel is selected and turned on by Auto Mix, the indicator is lit.

Normally open: When the normally open button is selected, this channel does not participate in the automatic mixing algorithm, nor does it affect the automatic mixing
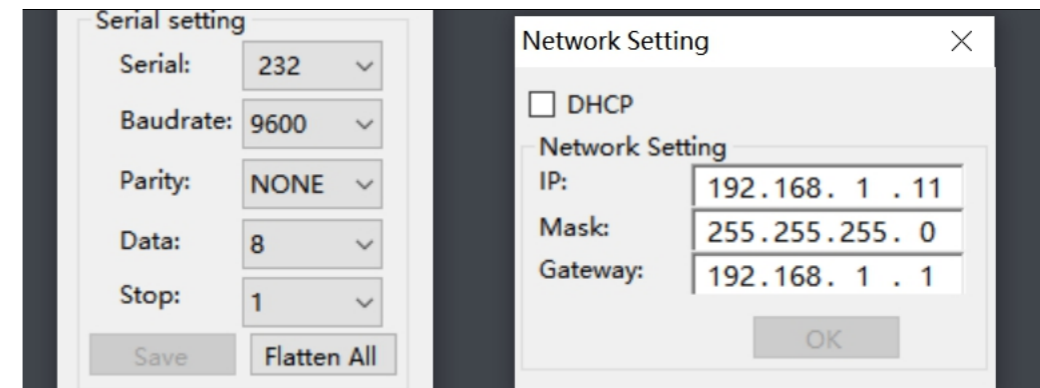
It is used to view and modify the network address and other information of the device. Enter the IP address, subnet mask and gateway of the device in the corresponding position, and click OK to modify the network information of the current device.

4) Scene management
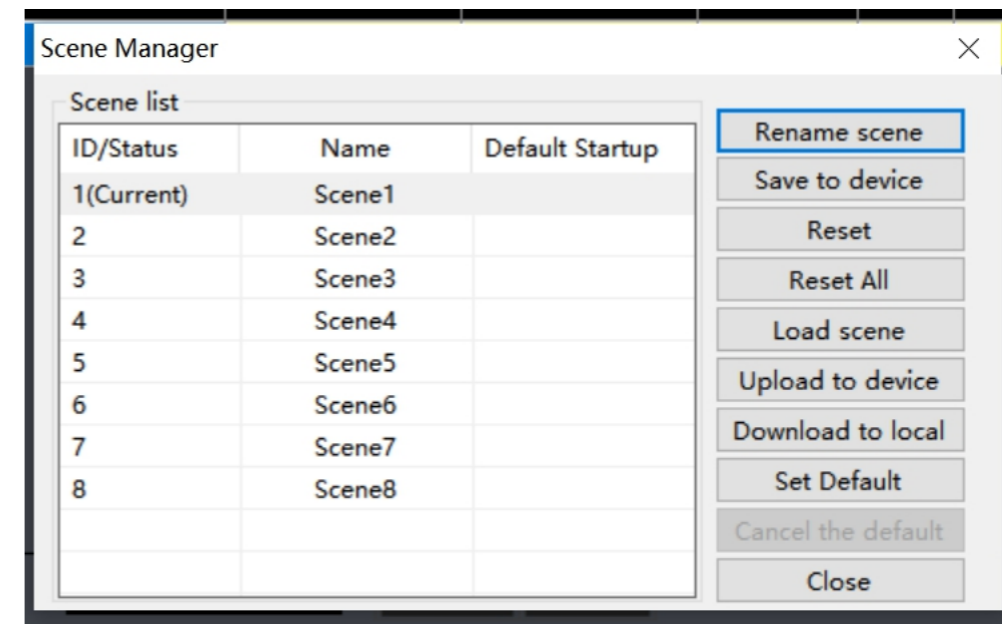
Modify Scene Name: Modify the name of the selected scene.
Save to Device: saves the current scene to the selected device scene number.
Reset: Restore the selected scene configuration to the default configuration.
Reset All: Restores all scenario configurations to the default configuration.
Load Scene: Enable the currently selected scene, usually used for scene replacement.
Upload to device: Upload the scene on the PC, and overwrite the scene on the selected device.
Download to local: save the currently selected device scene to the PC.
Set the default startup: check the selected scene as the scene to be enabled at each startup.
Cancel the default startup: cancel the selected startup scenario.

In the main interface, there will be an intuitive display of the current scene and some common functions. The scene displayed in the drop-down box indicates the scene currently running, as shown in the following figure:
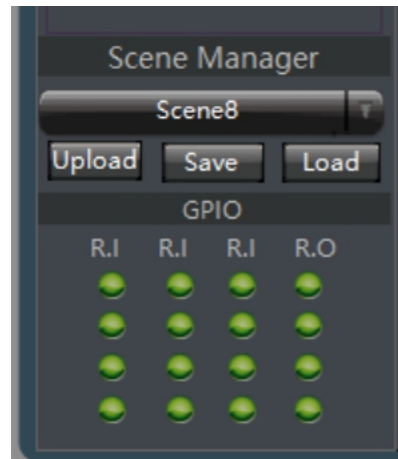
Save: save the scene configuration selected in the drop-down box locally.

Upload: The scene configuration file saved locally will overwrite the scene number configuration file selected in the current drop-down box on the device. At this time, the scene will not run automatically. If you want to run, you need to "load" the scene.

Load: Set the scene selected in the current drop-down box as the current running scene. The GPIO interface is only a display interface, and the 16 GPIO display lights display the high and low levels of the current GPIO pins. When the level of the GPIO pin is high, the indicator light turns red; when the level of the GPIO pin is low, the indicator light turns green. Refer to GPIO settings in 2.1.3.6 for specific settings.

5) Voice tracking

A. Voice tracking settings are divided into camera tracking and custom command sending. Camera tracking is used to control the rotation of the camera when the microphone speaks, and custom command sending is used to send the corresponding command to the corresponding port when the microphone speaks. Tracking threshold means that the detected voice signal must be greater than or equal to the tracking threshold to enable the tracking parameter, otherwise no tracking will be performed. Default MIC refers to turning the camera to the position of the default MIC setting or sending the associated command defined by the default MIC when all microphones are not input. Where a # indicates a virtual number and can only be used to set a default microphone.

B. Camera setting is a camera debugging interface. Generally, the camera position is debugged before tracking. Finally, the parameters of this part will be saved on the camera. Firstly, set the serial port. The serial port number is 232, which corresponds to the port of the back panel connected to the PTZ. Secondly, select the camera address and protocol type. For the camera address, please refer to the actual address of the camera. The protocol is related to the camera model; Finally, the preset point number is the identification defined by the user for the camera, and then the parameters such as up, down, left, right, and focal length, aperture and the like are adjusted to define the position and setting of the camera; Note: a camera address can contain multiple preset points, but a preset point corresponds to only one camera address. Finally, click "Save" to save the parameters to the camera, "Clear" is to delete the information of the current preset point, and "Call" is used View the camera position saved at the current preset point.

C. The microphone number generally corresponds to the input channel of the device, that is, the channel number to which the microphone is connected. The Mike number with the

also control the channel level precisely by clicking in the text box and entering a dB value. Both the channel mute and the fader are of the automatic gain type, that is, no matter what you do, it has no effect on the automatic mixing. This means that even if a channel is muted, if a high level signal is present on that channel, the level of the remaining channels will be reduced. To mute a signal and prevent it from affecting the automatic mix, turn on Mute and turn off Auto.

Priority PR: allows channels with a higher priority to override channels with a lower priority, thereby affecting the automatic mixing algorithm. This control defines the priority as a numerical value between 0 (lowest priority) and 10 (highest priority), with a default value of 5 (standard priority). You can adjust the priority through the slider control, or click the edit box to enter the data adjustment priority between 0 and 10. If both channels are receiving signals of the same level, the one with the higher priority will have the higher gain. For every priority "unit" difference between channels, there is a 2dB difference in gain (assuming Slope is set at 2.0). For example, if the priority of channel 1 is set to 6 and the priority of channel 2 is set to 3, the gain of channel 1 is 6 dB higher than that of channel 2 when both channels receive the same level of signal. Obviously, the setting of the Slope affects the weight of the priority. When the slope is set to 3.0, there is a 3dB difference in gain for every priority "unit" difference between channels. If all channels have equal priority, set the priority of all channels to 5. Caution: Extreme care must be taken when the difference in priority between channels is extreme, such as 1 and 10. Too high a priority can pick up a very loud signal from the speaker, background noise, etc., and can "mask" those channels that are low in priority, even when they are not in use. Higher slope values can further exacerbate this problem.

(2) Gain: Total gain adjustment for automatic mixer output

(3) Slope: The slope control affects the attenuation of the lower input. Higher values attenuate softer channels to lower values. The slope control function is similar to the ratio control on the expander. It is recommended that the control be placed at or near 2.0. Setting it to 1.0 is equivalent to turning off auto-off for all channels. Setting it to 3.0 results in a more aggressive automatic gain adjustment, which may sound unnatural. More settings also result in more total attenuation because more channels are open (effective NOM attenuation). A value of 2.0 results in mathematically ideal gain sharing, which is why it is preferred.

(4) Response Time: The response time slider adjusts the speed of the mixer's automatic gain. Fast time ensures that the beginning of the word is not clipped. Slower times result in smoother, less obtrusive operations. We found that values between 1 second are best.

There are two general types of automatic mixers built on different underlying technologies: threshold and gain-sharing automatic mixers.

2.3.1 Gain sharing automatic mixing

In a gain-sharing automatic mixer, the channels are not open or closed, but are in an arbitrary state between them. Relatively speaking, the higher the volume of the channel, the higher its gain. If several channels are at the same volume, the gain is also equal. If a channel has almost no signal through it, it has almost no gain.

Figure 7

(1)Channel control

Level meter: 2 level meters per channel. The -60dBu level meter displays the level of the input signal, which is the level value before the fader and before the automatic gain. The -48dB level meter displays the amount of automatic gain level after the channel has participated in automatic mixing. If the channel is not in automatic mode, the meter will display 0dB.

Auto: Each channel has an "Auto" key. Press to add this channel to the automatic mix. If a background music channel needs to be placed at a fixed level, or if a "Chairman" microphone needs to be left on all the time, the Auto key needs to select Up. When the automatic key of a channel is selected as "bounce", its gain will not be automatically adjusted, and the signal level of this channel will no longer affect the gain of other channels (no longer affect the automatic mixing gain calculation).

Mute: Channel mute is a pre-auto gain. That is, turning on mute eliminates the effect of this channel on the gain of the other channels. It mutes that channel and mutes the direct output of that channel in the mix.

Fader: The channel fader is an automatic gain. Controls the mix level and direct output level for this channel, but does not affect the automatic mixer algorithm. You can

symbol is a virtual number and can only be used to set the default Mike. The smaller the priority number is, the higher the priority level is. When the priority is the same, it will be processed according to the trigger priority order. If two microphones speak at the same time, the camera will automatically rotate to the preset position corresponding to the microphone with a smaller priority number (i.e., a higher priority level) or send a command corresponding to the microphone with a smaller priority number (i.e., a higher priority level); However, if two mics have the same priority, whose signal is checked first. To enable the MIC setting, when there are only multiple microphones, all the microphone parameters can be set in advance. However, when it is practical, only a part of them can be enabled according to the actual situation. The preset point, serial number, camera address and protocol are generally related to the camera and must correspond to the actual connection of the camera. Custom command means that when the microphone of the matrix detects an input signal (usually when someone is talking), it automatically sends the corresponding command to the defined serial port. Secondly, it can also preset the command, but do not check "Enable Custom Command", the device will not automatically send, but you can still click the "Send" button to send the command in the input box to the designated serial port at any time. Note: There are several parameters such as preset point, serial port number, camera address and protocol in the camera setting and microphone setting, which should be used according to the actual situation. Click "Save" to save the parameter information to the equipment. At this time, the microphone of the channel has been associated with the corresponding camera address. Then use the Enable Microphone Settings option to determine if the microphone settings are in effect when tracking is enabled。

6) GPIO

A. GPIO

Settings The lower part of the GPIO module socket on the rear panel of the audio matrix device is GPIO output channels 1 to 4 (the initial state is output low level), the reference voltage is 3.3 V, and the maximum output current is 40 mA at high level and -30 mA at low level.

The top half of the GPIO module socket is the GPIO input channels 1 to 12, which are internally pulled up and support 3.3 V to 5V level input。
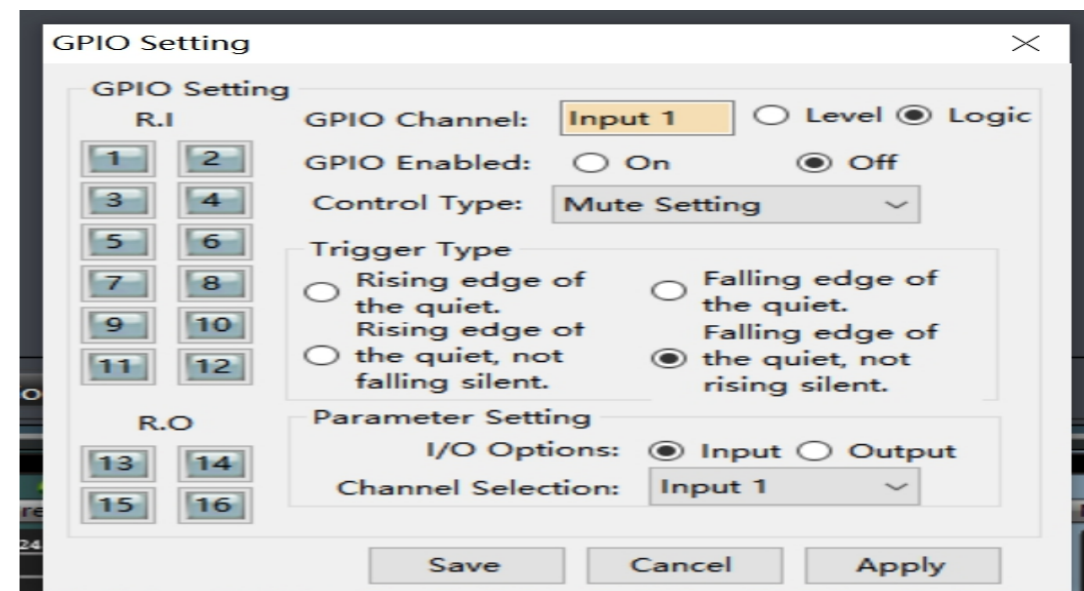
Select the channel number of the GPIO I/O on the left to set the parameters of the channel on the right. When the channel number button on the left is displayed in orange, it means that the GPIO status is enabled. If it is displayed in gray, the channel is not enabled. As shown in the figure above, the status of output channel 1 is open, and the rest are closed. The enabling status indicates whether the setting is effective. The user can first set the level type and parameters of multiple GPIOs, and click Save or Apply. However, only the PIN parameters of the GPIO are saved on the device. Only when the enabling status of the corresponding channel is set to "Open", can the setting be effective. The system does not support setting up multiple GPIO channels to commit at once. After setting a GPIO channel, click the "Apply" button to save the settings of this GPIO channel. At this time, you can set the options of the next GPIO channel. Click "Save" to save the settings of the selected GPIO channels on the current page and exit this window.

B. GPIO Port Definitions and Wiring Example

GPIOs are used in two ways: One is the output level RO (RO 1 ~ 4), that is, when a certain parameter in the matrix changes (such as a certain channel is muted), the output level of a certain output pin of the GPIO changes, thus driving the external circuit;

Audio matrix internal variation----➔GPIO Pin Level Change----➔Drive an external circuit

The other is input RI (RI 1 ~ 12), that is, when the external circuit changes, the level of an input pin of GPIO changes, thus triggering the change of a parameter of the matrix.

External Circuit State Change----➔GPIO Pin Level Change----➔Audio matrix internal variation

Output connection RO 1 ~ 4

RO1 ~ 4 are common 3.3 V level output, the output high voltage of pins RO 1 ~ 4 is 3.3 V, the maximum output current is 40 mA at high level, and the maximum output current is -30 mA at low level; Example 1: Direct Level Output Set the following in RO13 of the PC interface:
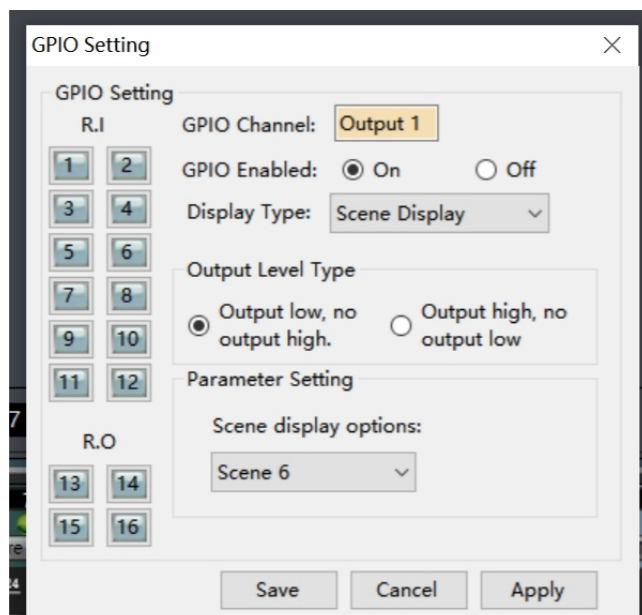
RO13 outputs a low level (less than 0.7 V) when the matrix is loaded with Scenario 6 and a high level (greater than 2.5 V) when loaded with Scenario other than Scenario 6.

intermittent. Automatic gain is to set the threshold, output the input signal below the threshold according to the ratio of 1:1, and directly increase the level above the threshold according to the ratio. Set the target level, and the sound signal can be output stably. Automatic gain control is to automatically control the amplitude of gain by changing the input and output compression ratio. When a weak signal is input, the signal is amplified to ensure the strength of the output sound signal; when the strength of the input signal reaches a certain degree, the signal is compressed to reduce the sound output amplitude.
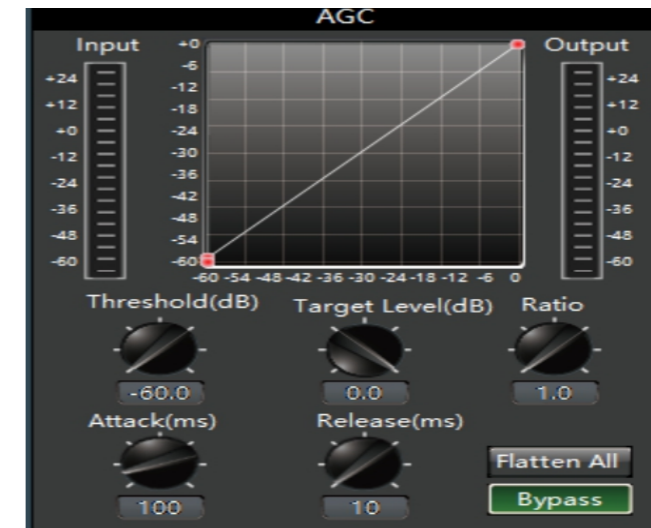
Input: Input the level of the automatic gain controller.

Output: Output the level of the automatic gain controller.

Threshold: the starting level of automatic gain. When the signal is lower than this limit value, the automatic gain processing module will be started to gain the signal that is too small.

Pass-through: The input signal is bypassed and not processed.

2.3 Automatic mixer

In a conference room, there are 10 microphones. If all 10 microphones are turned on and have the same level at this time, only one person is speaking, because the other 9 microphones will pick up noise, reverberation, etc. In the room, which will affect the sound quality. Secondly, due to the existence of these microphones, the effective sound component in the maximum gain that can be achieved before acoustic feedback is relatively reduced, and the volume is insufficient. The automatic mix adjusts that gain of each input channel in real time to adapt to the overall level, maintain the overall system gain by increasing the gain of high-level signals and reducing the gain of low-level signal.

Reset all: restore all parameters to the factory settings.

2.2.4 Compressor

The compressor compresses the signal greater than the threshold value at a predetermined ratio and outputs the signal. When the input level is greater than the predetermined threshold, the output level is compressed according to the set ratio, and the output signal = threshold + (input signal-threshold)/ratio; when the input level is less than the predetermined threshold, the signal is directly output, and the output signal = input signal; when the ratio is adjusted to "+ ∞", the compressor becomes a pressure limiter.

Pass-through: The input signal is bypassed and not processed. The compressor is not activated when pressed, otherwise the compressor is activated.

Threshold: the initial level of compression. When the signal is higher than this limit value, the compression processing module will be started, and the signal will be greater than this value. When the signal is less than the limit value, the compression processing module is not started, and the input signal is directly output.

Ratio: The compression ratio of the signal above the threshold.

Release time: The time between when the input level is less than the threshold and when the compressor stops working completely.

Startup time: the time from when the input level reaches the threshold to when the compressor starts.

Output: The gain for adjusting the output level and the level value actually compressed by the compressor.

Reset all: restore all parameters to the factory settings.

2.2.5 Automatic gain

First of all, let's explain the role of automatic gain. For example, when the user speaks in front of the microphone, the distance between the mouth and the microphone will fluctuate, causing the output volume to fluctuate, and even feel that the speech is

Input Connection RI 1-12

Example 1:

When the level of the pin corresponding to the RI 8 is "falling edge", the matrix automatically loads the scene 4.
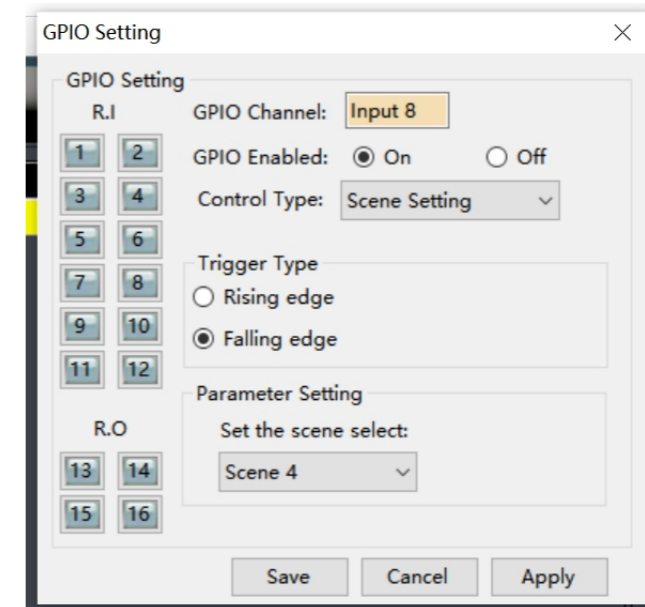
When the switch in the above figure changes from "open state" to "closed state", the level of RI 8 changes from "high level" to "low level", that is, a falling edge is generated, and the matrix automatically loads Scenario 4. When the switch in the above figure changes from "closed state" to "open state", the level of RI 8 changes from "low level" to "high level", that is, a rising edge is generated, and the state of the matrix remains unchanged.

Example 2:

Select the mix settings in RI 12 on the PC:
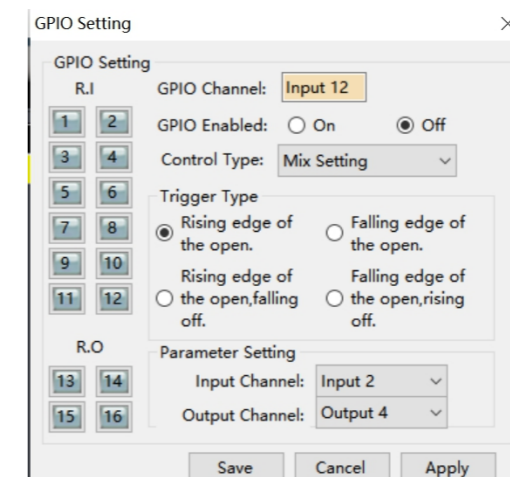
When the external trigger signal is changed from low to high, the RI 12 generates a rising edge, and the changed rising edge sets the mixing function of the contact corresponding to the mixer to on;

C. Basic properties of the GPIO input channel RI

(1) GPIO Channel: Displays the input channel number that is currently being set.
(2) GPIO enable status: Set the GPIO channel to be enabled.
(3) Control types include scene setting, mix setting, volume setting, channel mute setting, system mute setting and serial command setting. Control types have two basic properties:
a. Trigger mode: the trigger type is determined by the control type, and there are at most four trigger modes (rising edge trigger; falling edge trigger; rising edge selection, falling edge cancellation; falling edge selection, rising edge cancellation); rising edge: the GPIO input channel pin changes from low level to high level; Falling edge: The GPIO input channel pin transitions from high to low.
b. Parameter setting: The parameter setting is determined by the control type. Different control types have different parameter settings.

Example 1: Mix settings
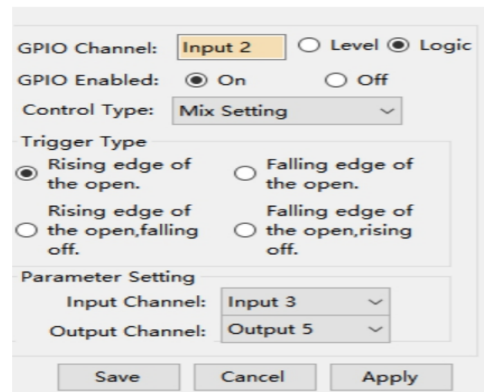
The GPIO channel is input 2 (RI 2), and the selection control type is the mix setting. As shown in the figure, when the level of GPIO input channel 2 changes from low to high, the mixing contact of input 3 and output 5 is opened, that is, the signal of input channel 3 is mixed into the output, Output on channel 5.
If trigger mode 4 (falling edge on, rising edge off) is selected as the trigger type, when the level of GPIO input channel 2 changes from high to low, the mixing contacts of input 3 and output 5 of the main mixer are opened; When the level of the pin of GPIO input channel 2 changes from low to high, the mixing contacts of input 3 and output 5 of the main mixer are closed.

Example 2: Serial port command setting
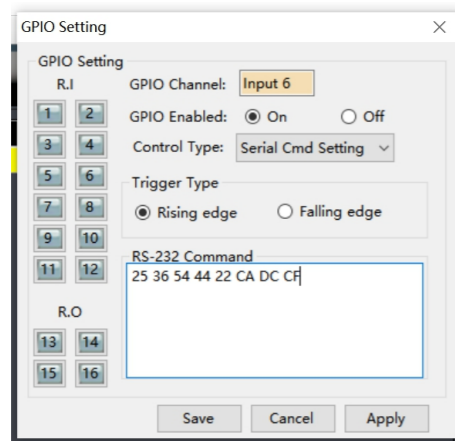
Parameter setting: input 6 (RI 6) hexadecimal instruction (0 ~ 9, A ~ F), two bits are taken as a valid instruction, if there is only one bit, 0 is required to be added, such as 0 3, 0 A, etc. The interface automatically appends a space after every two characters for easy reference. Sent refers to Causes the filter to append spaces to consecutive hexadecimal characters.

Recovery time: the time required for the input signal to return from the extended state to the original non-extended state.

Reset all: restore all parameters to the factory settings.

2.2.3 Equalizer

Equalizer compensates and modifies the frequency characteristic to achieve a relatively flat frequency response characteristic. Different models have different types of equalizers, and the specific type is subject to the actual model of the equipment.

All pass-through: all signals of all frequency bands are bypassed, and the signals directly enter the next processing module; press to indicate that the pass-through is valid, that is, the equalizer is not enabled, and all signals of all frequency bands are pass-through to the next processor; up indicates that the equalizer is enabled, and the signals are output after being processed by the equalizer.

Segment straight-through: after EQ adjustment, the action of bypass cancellation can be carried out for some set frequency bands, which only works on this segment.

Center frequency: The frequency to be equalized.

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

Bandwidth: the bandwidth of the frequency point, that is, the influence range of the section around the center frequency. The larger the value, the greater the bandwidth and the greater the influence range.

Type: The equalizer has five built-in filter types: Peak, Hshelf, Lshelf, HighPass, and LowPass;

Panel call: allow the signal of the panel to be accessed to the channel. Press to access, and pop up to disallow access.

Mute: Pressing indicates that the channel is enabled to mute, which is equivalent to shielding the input signal. Bouncing indicates that the channel signal is not muted.

Test signal: including sine, pink and white noise. When pressing, the parameters of the signal generator can be adjusted, and the signal of the signal generator is connected to the channel, and other input signals are no longer output;

Phantom power supply: The microphone input provides phantom power supply and is used for condenser microphone power supply. Do not turn on the line input or non -condenser microphone to prevent burning;

2.2.2 Expander

The expander increases the dynamic range of the input according to the user's needs.

When the input signal is less than the "threshold", the expander will reduce the input signal and output according to the set "ratio", output level = threshold- (threshold-input level)/ratio; when the input signal is greater than the "threshold", output according to 1:1, output level = input level; When the ratio is adjusted to the maximum (∞), the expander becomes a noise gate.

Pass-through: the input signal is bypassed, and the signal directly enters the next processing module. Does not activate the extender when pressed, otherwise enables the extender.

Ratio: dB of dynamic change of expander input signal/dB of dynamic change of expander output signal.

Startup time: the time required for the input signal less than the "threshold" of the expander to enter the expansion state and output according to the set expansion ratio.

As shown in the figure above, when the level of GPIO input channel 6 changes from low to high, the system executes this hexadecimal control command. Note: The input characters must be hexadecimal characters (0 ~ 9, A ~ F), otherwise the verification fails and the transmission fails.

D. GOIO the basic attributes of the output channe:
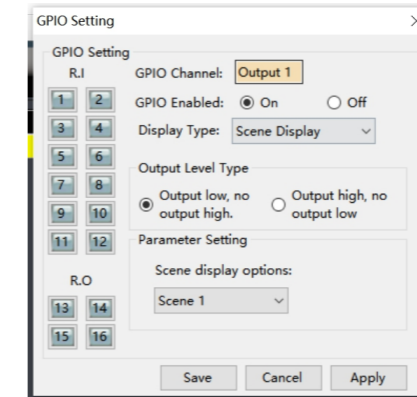
GPIO Channel: Displays the GPIO output channel number that is currently being set.

GPIO Enabled Status: Sets the GPIO channel setting to Enabled.

Display type: scene display, level display, channel mute display and system mute display. Display types have two basic properties:

a. Output level type: It is determined by the display type. There are only 2 modes, which are configured according to the actual situation of GPIO external input. The types of output level types are: Output type 1: output low level, no output high level: means that when the audio matrix meets the output requirements, the GPIO outputs low level, otherwise it outputs high level. Output type 2: output high level, no output low level: refers to when the audio matrix meets the output requirements, GPIO Output high level, otherwise output low level.

b. Parameter setting: The parameter setting is determined by the display type. Different display types have different parameter settings.

Example 1: Scene display
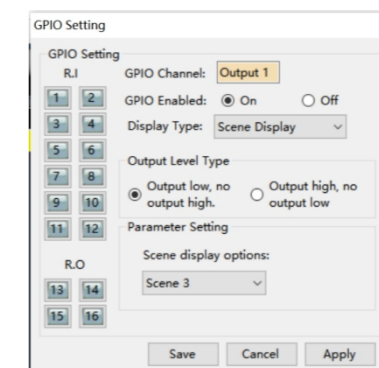
As shown in the figure, when the audio matrix loads scene 3, the pin of GPIO output channel 1 outputs low level.

Example 2: **Level display**
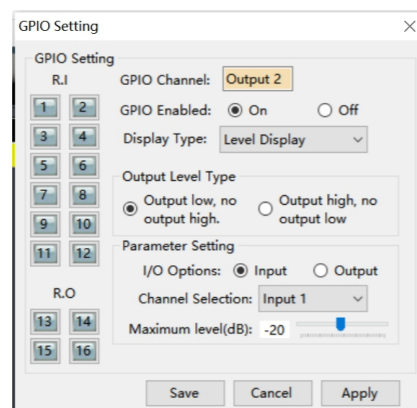
As shown in the figure, when the level value of audio matrix input channel 1 reaches -20 dB, the pin of GPIO output channel 2 outputs low level.

7) Equipment upgrade

Equipment upgrade is divided into automatic detection upgrade and manual upgrade.

Automatic detection and upgrade: When the PC is connected to the device, it will detect the DSP version of the device. If the version is lower, it will pop up a prompt Yes No Upgrade, upgrade point "Yes", not upgrade point "No".

Manual upgrade: download the upgrade package from the official website, connect the device, select upgrade in the device settings menu bar, enter the directory where the upgrade package is located in the address bar, and click "Upgrade" to complete the upgrade of the device.

Note: The device will restart automatically after the upgrade is complete, but it will need to be reconnected manually. Please do not power off during the upgrade. Power off will cause the device to crash before the upgrade is complete.

2.1.4 Help

1) Help documentation

Displays the documentation for this family of products.

2) About

Display company and current software version information

2.2 Audio input module

The interface displays 8 channels at most, which can be switched by pressing the key, or by directly clicking the interface to drag left and right; click the channel to switch the function module display box above. Refer to 2.1.2.3 to view channel information.

Different types of input channels are represented by different colors of the channels. For example, the 10-12 channels shown in the figure above represent the analog input channels of the device, the 13-14 channels represent the USB playback channels, and the 1-3 channels represent the Dante input channels.

The input channel supports the grouping function. Multiple channels can be set to a group. When the gain of the group is adjusted, the gain of the subordinate channels of the group changes at the same time. After the grouping is set, the grouping mark will appear on the gain fader. The system provides two types of groups: one is the Group group, which directly adjusts the gain value; the other is the DCA group, which adjusts the gain percentage. The channel name is displayed in the upper edit box and can be modified. The lamp indicates whether the channel has external control panel input.

There are three States: off, flashing and long on, which are related to whether the call is allowed in the input source.

Pre/M: When the Pre is on, the original level of the signal that has not been processed by the fader is displayed. Otherwise, the signal level of the signal that has been processed by the fader is displayed. M sets the mute of this channel.

Fader: controls the gain addition and subtraction of this channel.

2.2.1 Input source

The sensitivity of the microphone input and the line input can be selected, and high sensitivity indicates that the microphone has high acoustic-electric conversion efficiency and is sensitive to weak sound signals;