



Panda Series Digital Audio Processor

Note:

- This manual uses the full-featured audio processor matrix as an example and can be used as a reference for other types of processors.
- This manual is only for user operation instructions, not for maintenance service purposes.
- This manual is copyrighted by the manufacturer of our company. Without permission, any entity or individual may not use part or all of the contents of this manual as business

Product Introduction

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I、 product overview

1. Appearance

1.1 Panda 88N



1.2 Panda D88N



1.3 Panda 1616N



1.4 Panda D1616N



2. Function Introduction

This series processor adopts the advanced DSP processing technology, and supports up to 16 analog input, 16 analog output, 16 network input and 16 network output audio signal processing.

- Full matrix mixing features, 24bit/48KHz sampling frequency, high performance A/D D/A converter and 32-bit floating point DSP processor.
- DSP audio processing, built-in automatic mixing station, and feedback cancellation, echo cancellation, noise cancellation module
- Input for each channel: front amplifier, signal generator, expander, compressor, and 5 parameter equalization.
- Output for each channel: 31 graphic equalization, delay, frequency divider, limiter.
- Full function matrix mixing function.
- Supporting scenario preset function.
- Automatic memory protection after power failure.
- USB background music playback and recording function.
- Convenient and quick web control: built-in web controller can be quickly operated on Windows, Android, iOS and other platforms.
- Supporting DANTE network transmission, so that the audio transmission is more stable and fast. (optional)

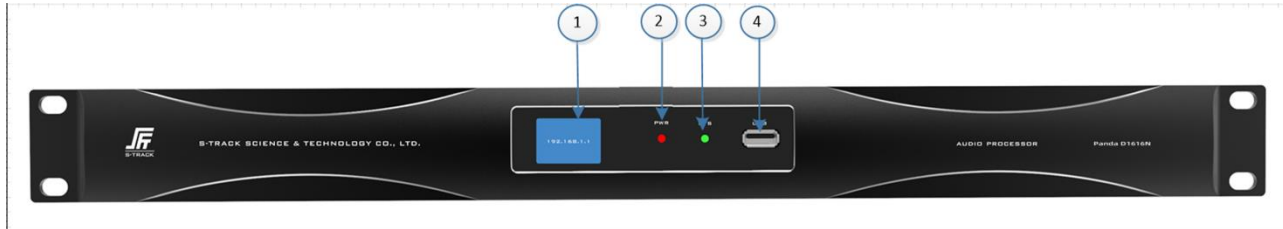
3. Specification parameter

sampling	48k@24bit
Prestage magnification	51dB(Each file is 3dB, a total of 17 files)
phantom power	DC48V
Frequency Range	20Hz ~ 20K Hz, ± 0.3 dB
THD+N	$\leq 0.005\%$ @1k, 4dBu
Digital model dynamic range (A +C)	114dB
Modulus dynamic range (A +C)	120dB
Input impedance (balanced)	20k Ω
Output impedance (balanced)	100 Ω
EIN (A weight)	≤ -125 dBu
Isolation of adjacent channels	100dB @1k Hz, 4dBu
common mode rejection	70dB @80 Hz
maximum input level	18dBu
Maximum Output Level	18dBu
background noise	-90dBu
Delay System	≤ 9 ms
working power supply	AC110V-220V,50Hz/60Hz;
Working temperature	0-40 $^{\circ}$ C
Size(L x P x H)	482*258*45(mm);
Product Model	Panda 44 (4 channels analog input, 4 channels analog output) Panda 88 (8 channels analog input, 8 channels analog output) Panda D88 (8 channels analog input and 8 channels analog output) + 8 \times 8 DANTE Panda 1616 (16 channels analog input, 16 channels analog output)

	Panda D1616 (16 channels analog input, 16 channels analog output) + 16× 16 DANTE
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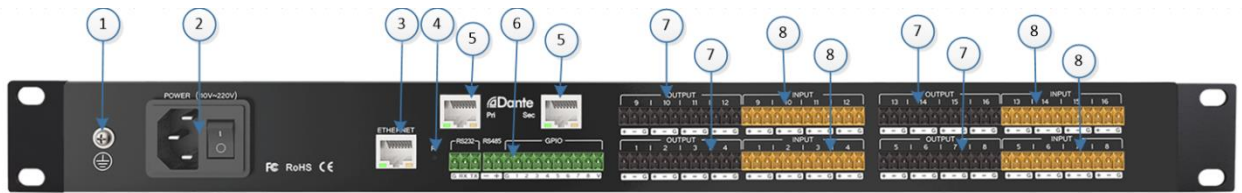
4. Hardware ports on the panel and backplane

The Panda D1616N panel is as follows:



- 1) OLED display displays device name and IP address
- 2) If the power indicator is on, the power supply is normal. Otherwise, the power supply is abnormal
- 3) System indicator. If the indicator blinks, the device runs normally. Otherwise, the device fails
- 4) USB interface: support recording and playing function

The backplane is as follows:



- 1) Ground screw, through which the internal circuit of the equipment is grounded
- 2) POWER interface: connects to the 110V-220V AC POWER supply, and switches on and off the POWER supply of the device
- 3) ETHERNET network control interface: by connecting this network port, the client computer can debug and monitor the equipment
- 4) RESET hole, long press the RESET button to restore factory Settings and restart the processor
- 5) Dante primary + secondary interface: Network voice transmission can be carried out through this interface, and only one can be inserted when connecting with the main interface internally
- 6) RS232+ RS485+GPIO control port: connects to the control terminal or central control device to send and receive control commands
- 7) OUTPUT signal OUTPUT interface, can be connected to power amplifier, active speakers and other equipment
- 8) INPUT signal INPUT interface, can be connected to microphone, DVD and other equipment

II. Use and operation procedure

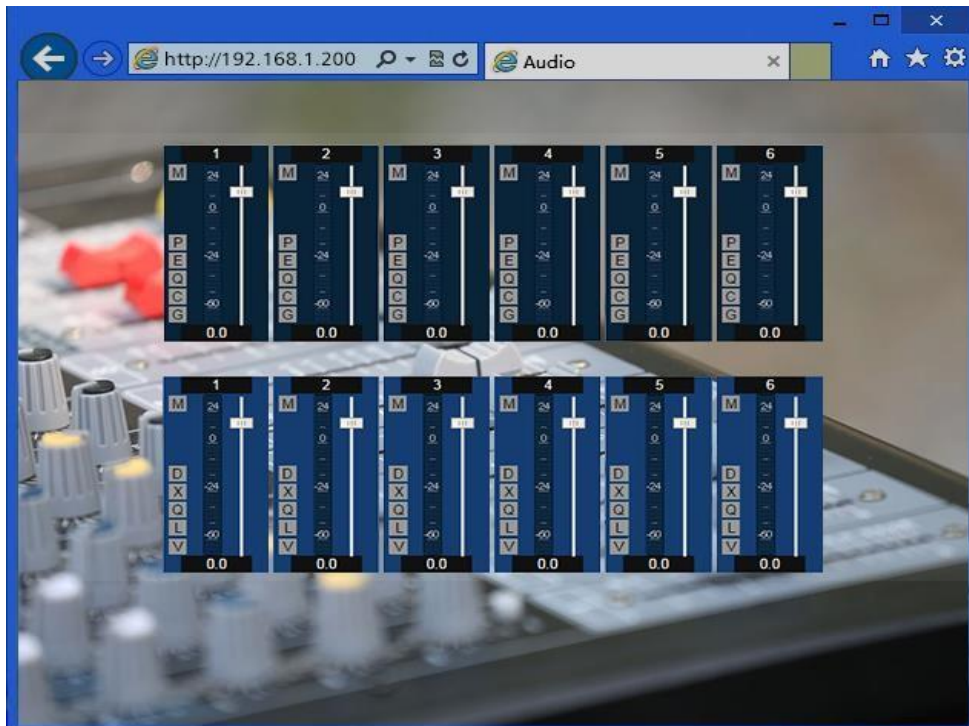
1. Web control and software download

The default IP address is 192.168.1.200. Subnet mask: 255.255.255.0. Add an IP address in this network segment to the PC to ensure proper connection to the device.

After the device is started, use the web browser to access the address "http://192.168.1.200/", as shown in the picture below:



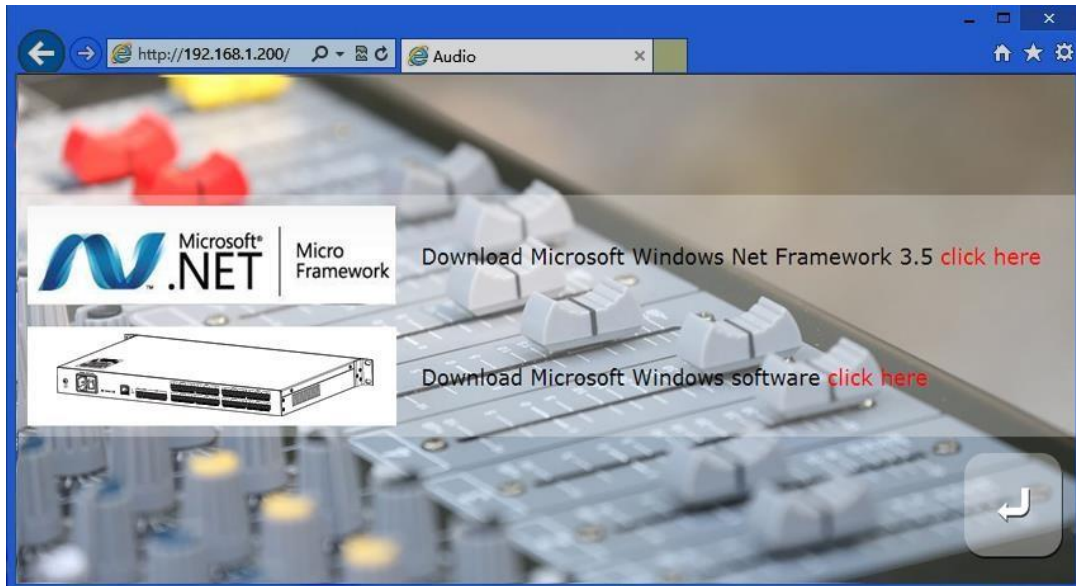
Control: Controls channel parameters and the enable and disable of individual processors.



Scene: Quickly calls and saves the device Scene.



Download: The download link provides the download of .net framework and PC software. The PC software supports XP, Win7 and Win8 operating systems.



Before installing software on the PC, ensure that the Microsoft.net Framework 3.5 or later has been installed on the PC.

When installing the software, some systems (such as WIN8) will pop up "User Account Control Information". Please click "OK" to improve the permissions of the software.


2. Software Interface Introduction


After the software installation is complete, open and run the software. The interface is as follows:




1. Menu bar and toolbar: The menu bar includes various functional menus
- 2, processor parameters control area: drag or scroll the mouse to show the hidden part, support copy/paste function.
3. Process control area: audio data flow chart. Click the icon to set the parameters of each process in detail.
- 4, input/output channel quick control area: display the level and gain of each channel, as well as the fast enable/close button of each processor, support copy/paste function.
5. Buttons in the main interface and Dante interface can correspond to functional test and Dante test respectively. Click the Dante interface button to enter the Dante test interface.
6. Button function area:




 Label: Device search button: Click to search for connected devices and display device IP addresses.

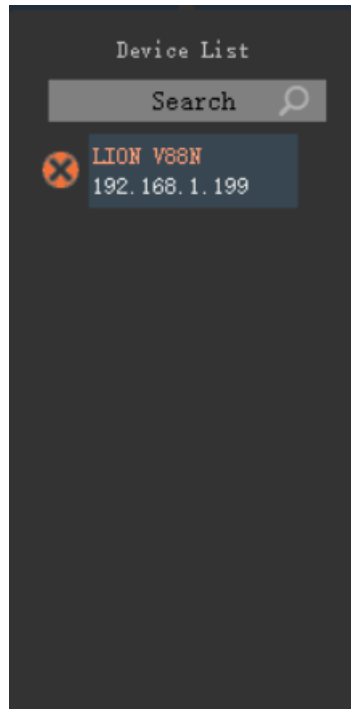
 Label: Device Connection button: The device IP address is known. Enter the IP address, user name, and password in the dialog box that is displayed.

 Label: Scenario list button: You can select and view saved scenarios from the list.

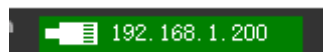
 Label: Save scene button: Saves (overwrites) parameter changes to the selected scene.

 Label: Screen lock button: locks the screen. You must use the administrator password to unlock the screen.

7. After searching the device, click the corresponding device and enter the user name and password to log in:



Enter the user name and password (factory user name:admin/ password :123456), click login, the status bar prompts as follows:



After the scene is downloaded, you can control the device.

3. System flow

Signal processing flow chart

standard configuration	Input: test signal/mute/expander /5 section equalizer/compressor/automatic gain
advanced configuration	(AFC) feedback canceller/(AEC) echo canceller/(ANS) noise canceller/dodge

4. The software features

Switching between flowchart and processor control module:

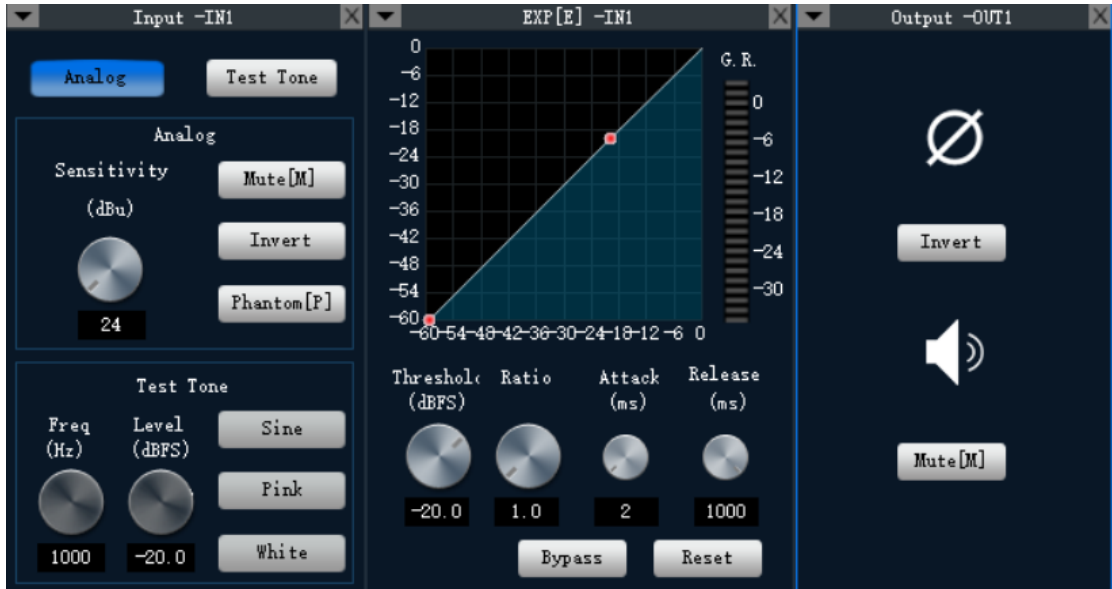
Window 2 is the processor detailed parameters display area, window 3 is the processing flow chart, and also is the fast channel to open and close the processor.

Double-click the processor in window 3 to open/close the corresponding control module in window 2, for example, double-click "Input/Expander/Output" :



As shown in the figure above, the setting interfaces of "input", "Extender" and "output" are arranged in window 2 according to the order in the flowchart. Meanwhile, the processors that have been opened in window 3 are marked with red ticks in the upper right corner. If the selected processor is the output, the corresponding module in window 3 will also be marked with a red box.

If the module for detailed parameter setting has been opened, you can double-click the module in the flowchart to close the corresponding interface for detailed parameter setting.



In the upper part of the detailed setting box, the current control channel number is displayed. In the figure above, the input channel is IN1, and the output channel is OUT1.



In the figure above, the input part shows the parameter control of channel IN4 and the output part shows the parameter control of channel OUT1.



When the channel name is modified, the channel name of the detailed parameter control module will change accordingly. As shown in the figure above, after IN1 is changed to input channel 1, the above display will also change accordingly.

Quick control area:

Window 4 is a shortcut control mode for input and output channels. Processors in each channel can be quickly passed through and enabled. If different channels are selected, channel information displayed in window 2 will be automatically switched.

If the number of channels is more than the area that can be displayed, you can drag or scroll the middle wheel of the mouse to show the hidden part;

Input:

1) The upper edit box displays the channel names that can be modified. After modification, the identification area of the detailed parameter control interface in window 2 will change accordingly.

2) M, P, E, Q, C and G indicate the corresponding shortcut operation mode of the input channel:

M If this parameter is selected, the device is muted	Q If this parameter is selected, equalizer is enabled or disabled
P If this parameter is selected, Turn the	C If this parameter is selected, the compressor is



phantom power on and off	enabled or disabled
E If this parameter is selected, the extender is enabled or disabled	G If this parameter is selected, automatic gain is enabled or disabled

The leftmost button enables and disables all input channels.

3) Level meter displays the input level of the current output channel.

4) The fader adjusts the digital gain of the current output channel.

5) The level meter displays the input level of the current input channel. You can drag left and right or scroll the middle button of the mouse to display the hidden channel; Click channel to switch the channel parameters of the function module above.

Output:

1) The upper edit box displays the channel name, which can be modified; After modification, the identification area of the detailed parameter control interface in window 2 will change accordingly.

2) M, D, X, Q, L, V indicate the corresponding output channel shortcut operation mode:

M If this parameter is selected, the device is muted	Q If this parameter is selected, equalizer is enabled or disabled
D If this parameter is selected, the delay device is enabled or disabled	L If this parameter is selected, the limiter is enabled or disabled
X If this parameter is selected, the divider is enabled and disabled	V If this parameter is selected, output inverting is enabled or disabled

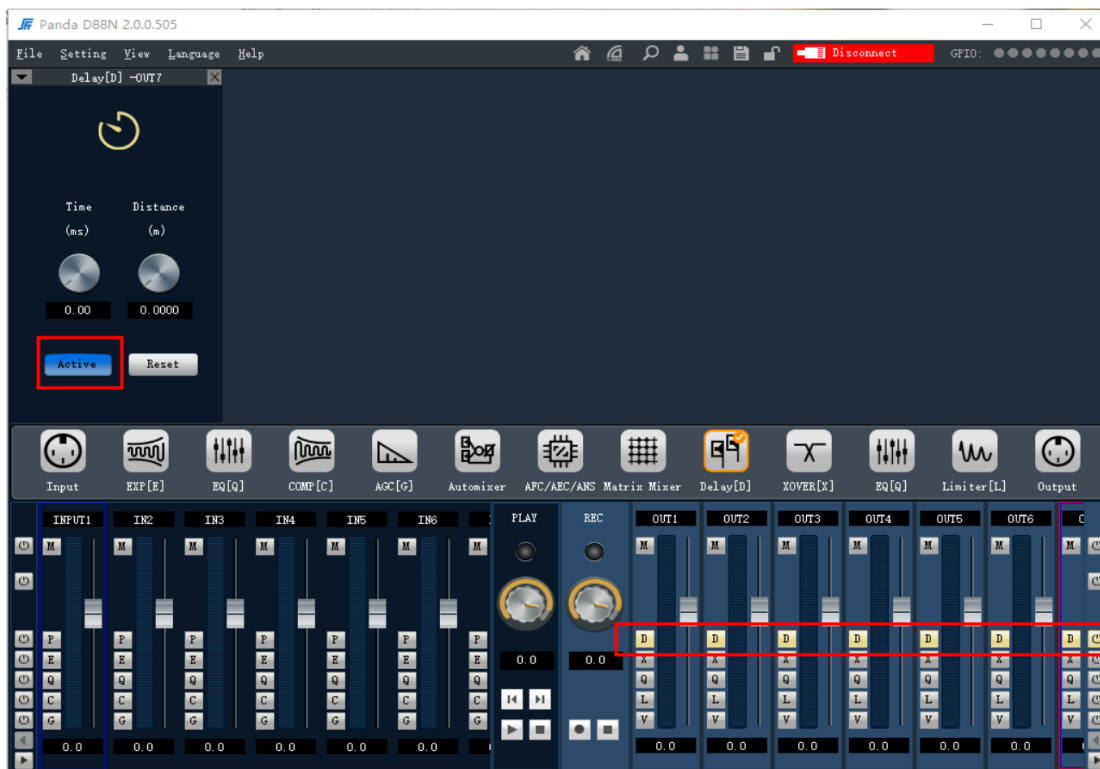
The right button enables and disables the functions of all output channels.

3) Level meter displays the output level of the current output channel.

4) The fader adjusts the digital gain of the current output channel.

5) The level meter displays the output level of the current output channel. You can drag left and right or scroll the middle button of the mouse to display the hidden channel; Click channel to switch the channel parameters of the function module above.

Example: Click the All Enable quick button on the delay, as shown below, to enable all the delay for all output channels.



5. Menu bar and status bar

5.1 File

1. Create: Create a scenario. The parameters are factory configured and only available offline.
2. Open: Open the local saved scene.
3. Save as: Saves the current configuration as a file to the local computer.
4. Exit: Close the software.
- 5, language switch: support simplified, traditional, English 3 languages.

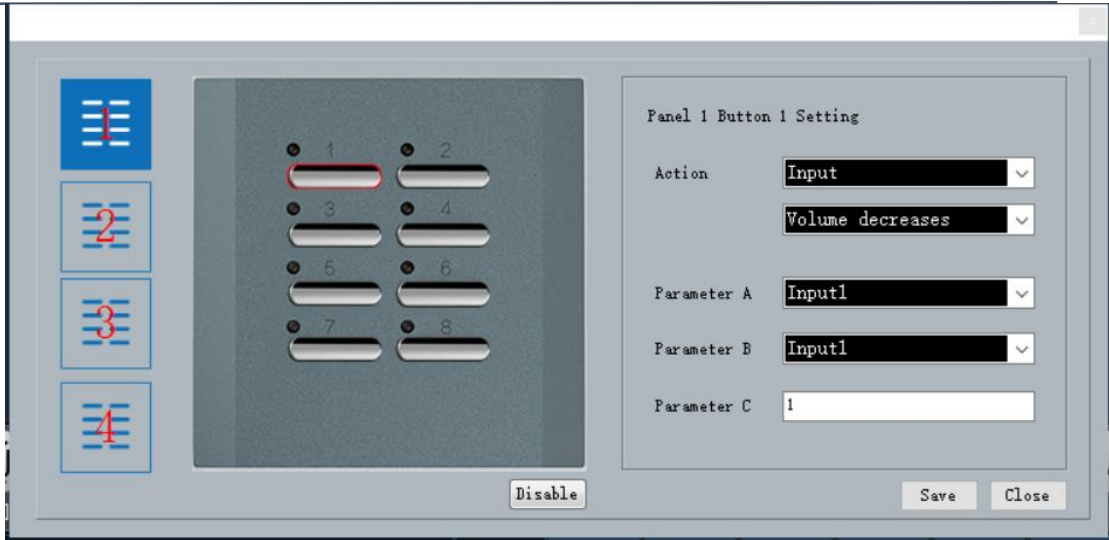
5.2 Central Control Commands

The in-control command generator converts frequently used operations into a 16-character command code that can be easily invoked by external devices. Each command contains no more than three different sets of parameters.

Control command types: Scene, input, output, mixing, parameter equalization, graphic equalization, expander, compressor, automatic gain, delay, frequency divider, limiter.

5.3 Control Panel Configuration

When the processor is successfully connected to the console we provide, this is where you need to set up the buttons on the control panel.



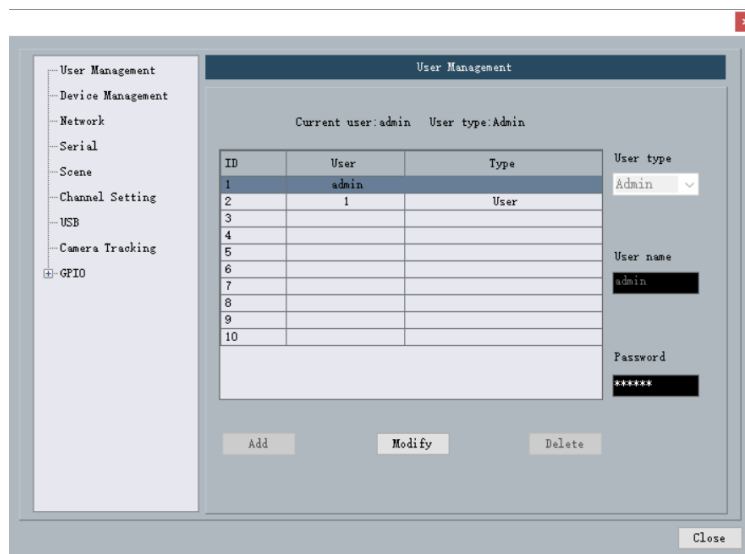
At present, a maximum of four groups of panels can be connected in series. Panels 1 to 4 are automatically numbered according to the series sequence of panels. Select the panel to be set, select the corresponding button on the middle panel, and set the function of this button in the function setting bar on the right.

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 then enter 1 to 4 channel volume all increase 1 db.

5.4 Device Settings

Device Settings include user Settings, network Settings, serial port Settings, scene Settings, camera tracking, GPIO.

1) User Settings



1. The initial user name and password of the device are admin and 123456. The administrator can add, delete, and modify all user information. Ordinary users can only modify

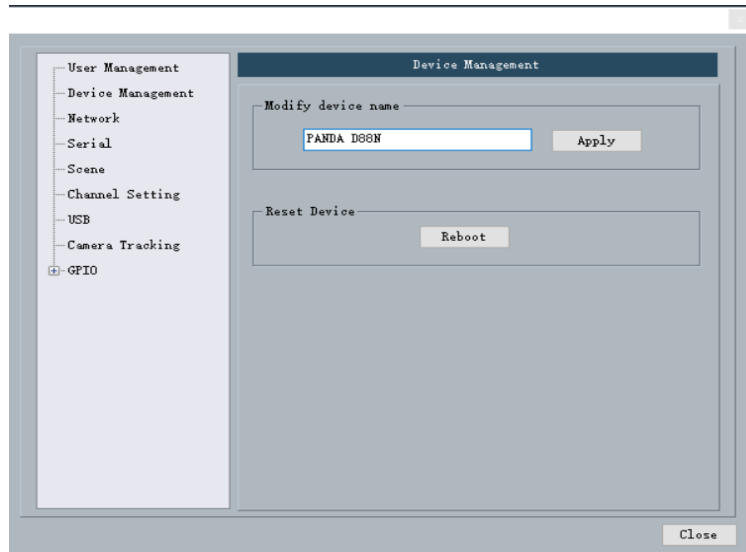
personal information.

2. Modify the user: First select the user to be modified from the user list. The user name and password edit box displays the information of the current selected user.

3. Delete the user: Select the row to be deleted in the user list and click the "Delete" button to delete the user.

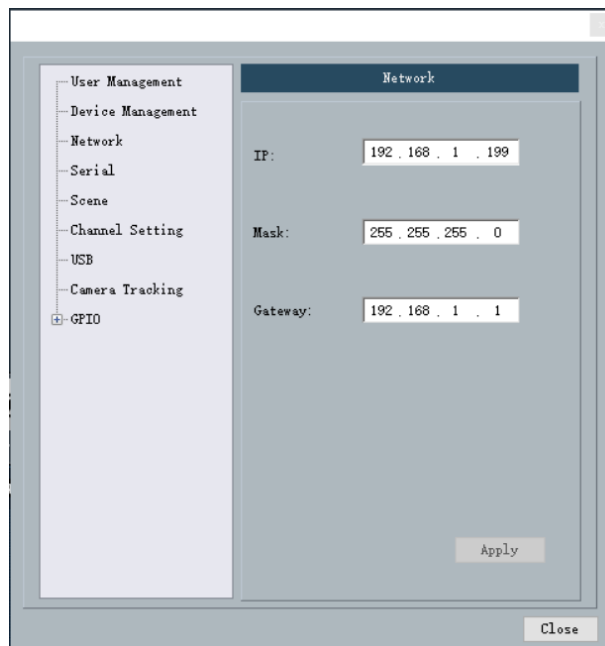
4. Add a user: Select the empty line in the list on the left, and enter the information of the new user in the user name and password edit box (which should be empty) on the right, and click the "Add" button to add a user.

2) Device management



You can view and modify the device name. Modify the device name on the display screen. Click the "Apply" button to complete the device name modification. Click the restart button to restart the device.

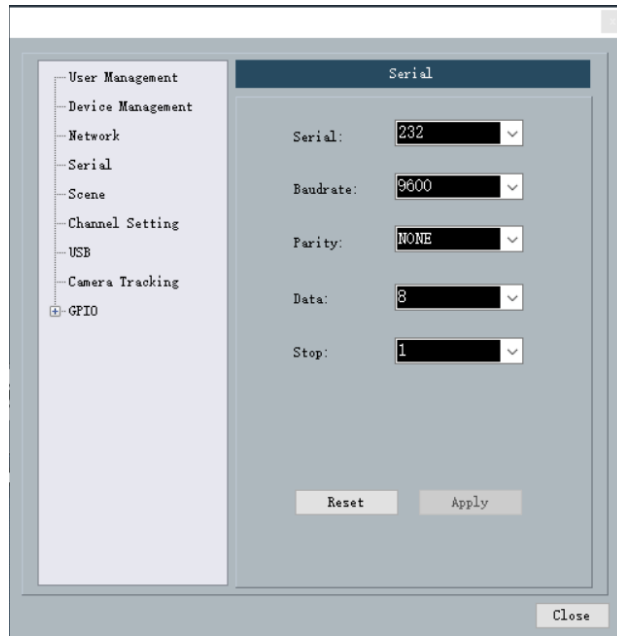
3) Network Settings



Viewing and Modifying the network address of the device Enter the IP address, subnet mask,

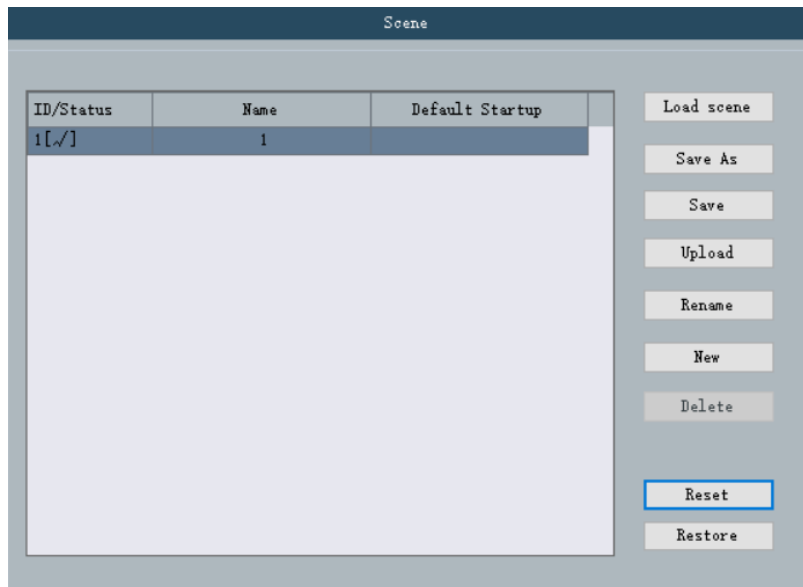
gateway, and click Apply to complete the modification. The device IP address is changed on the display.

4) Serial port Settings



View and modify the serial port information of the current device. After the setting is complete, click Apply to modify the serial port information of the current device. If you want to restore to the default value, click the "Reset All" button directly. The items cannot be empty when setting.

5) Scene setting



1. Modify the name: Modify the name of the selected scenario.
2. Upload scenario: Upload the scenario on the PC and overwrite the selected scenario.
3. Save the scenario: Save the current running parameters to the selected scenario.
4. Save as: Save the current running parameters to the PC as a scenario.
5. Load scenario: Enable the currently selected scenario, usually used for scenario replacement.

6. Restore factory Settings: Restore all scenario configurations to the default Settings.

The device supports offline saving and online saving.

Offline saving is to save the set scenario on the PC, facilitating subsequent calls and replication of the scenario between different devices.

In an online saving scenario, the scenario is directly saved to the device and can be directly invoked after the device is enabled next time.

Example 1: Offline save scenario

1.1 Open the PC software, do not connect to any device, and modify parameters; For example, modify the mixer as the following figure:



1.2 Click "File" -> "Save as" on the menu bar to save the file as Test.

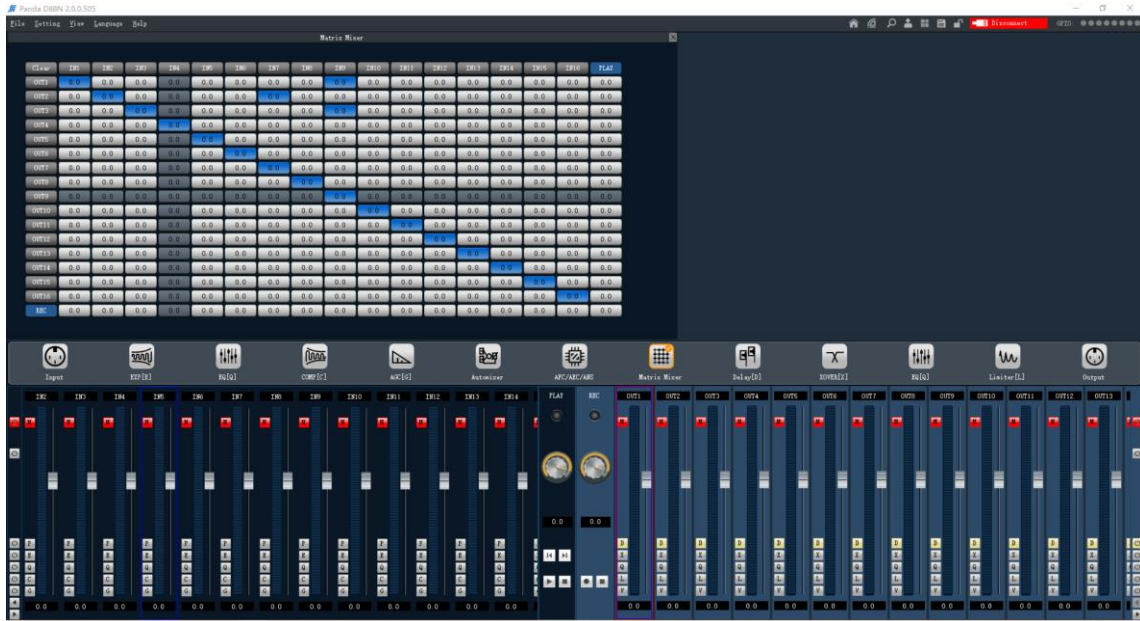
1.3 The next time you use this scenario offline, just open it without any device connected (file -> Open on the menu bar).

Description: Because the open and save as operations in the file are performed offline. It does not immediately take effect on any device, about offline protection See example 2 for how the saved scenario can be used on a device.

Example 2: How do I apply the offline saving scenario to the device

2.1 Example 1 After the scenario is saved offline. Search and connect the corresponding device on the right side of the software interface:

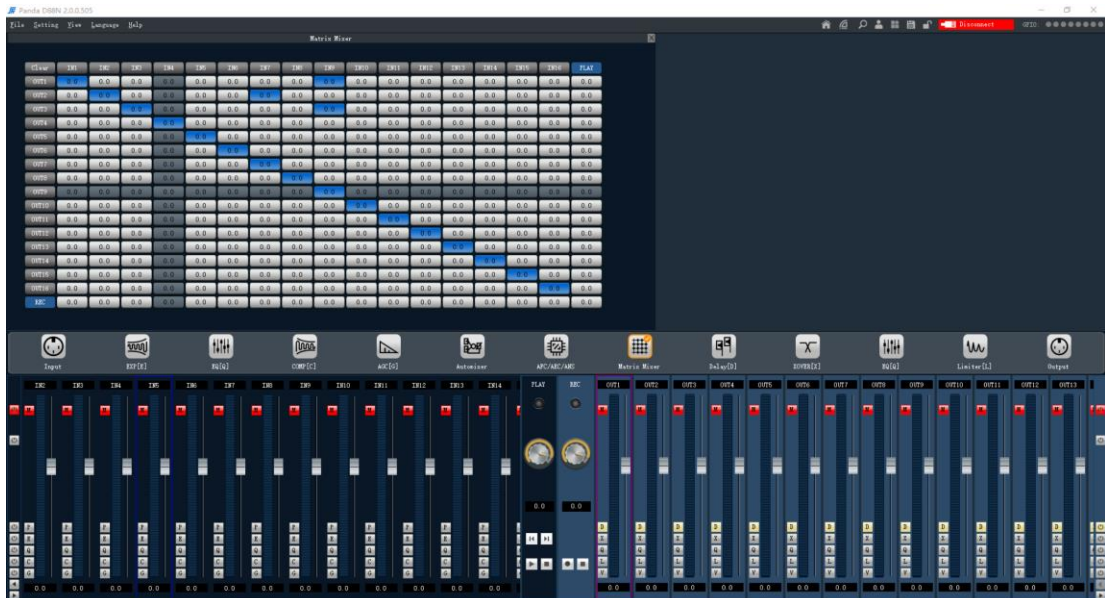
2.2 After the device is connected, choose Settings > Device Settings > Scenario Settings on the menu bar, select the scenario to be set, for example, select scenario 1, click "Open" on the right, select the test file saved in Example 1, and the parameters saved in Example 1 are automatically loaded. The result is as follows:



Example 3: Online save scenario

3.1 If you only need to perform this operation on one device, you do not need to save the operation offline first. You can directly save the operation online.

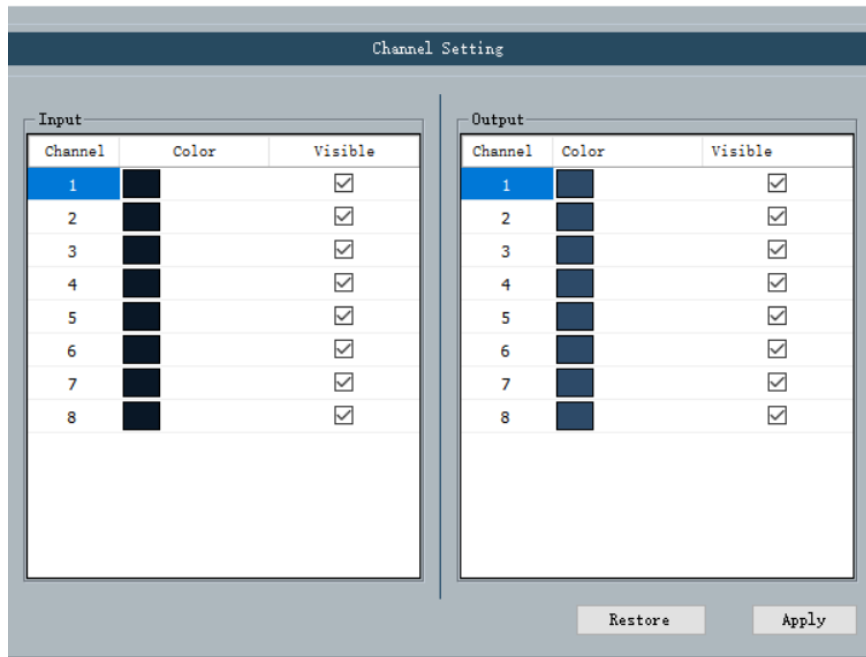
3.2 After the device is connected, modify the scenario parameters to enable all mute functions as follows:



3.3 On the menu bar Settings -> Device Settings -> Scene Settings -> Click "Save Scene"

3.4 After the Settings are successfully saved, the mute button of scenario 1 is always enabled, and scenario 1 is successfully saved, no matter whether the device is restarted or the scenario is changed.

6) Channel configuration



Can be used to configure the background color of each channel.

7) USB playback configuration

USB recording module can enable the function of automatic playback and automatic recording, so as to realize the automatic playback or recording when the USB device is inserted.

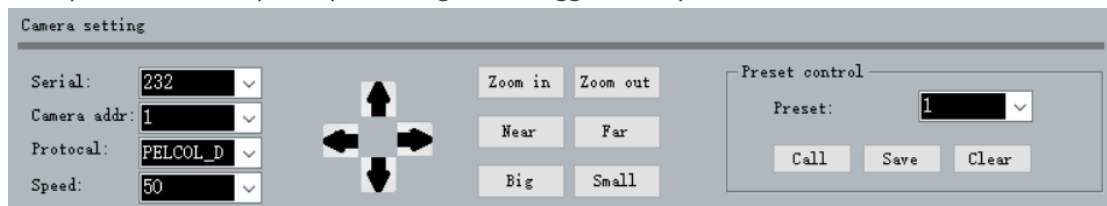


8) Camera tracking

Save camera tracking parameters: Different camera tracking parameters can be saved for each scene. First, click "Apply" after setting on the camera tracking interface. Then click "Save" on the "Scene Control" interface, and the camera tracking parameters are automatically saved to the corresponding scene.



1. Camera tracking type: there are camera tracking and custom commands. Camera tracking is used for channel input signal control camera rotation; The custom command sending is used to control the channel input signal to send the corresponding custom command to the corresponding port.
2. Tracing threshold: Indicates that the detected input signal must be greater than or equal to the tracing threshold. The system automatically enables tracing parameters.
3. Default MIC: when no MIC is entered, turn the camera to the position set by default MIC or send the associated command defined by default MIC. The number with a # is a virtual number and can only be used to set the default MAC.
- 4, reaction time: the maximum intermittent time of the effective signal. If the microphone is used to speak, the reaction time is set as 3 seconds, and the signal is still regarded as valid within 3S pause during speech; if the interval exceeds 3S, the signal is regarded as invalid.
5. Switching time: the minimum speaking time required for the camera to switch to a valid position. If the microphone is used to speak for a longer time than the "switch time", the channel signal is regarded as valid, and the camera will automatically move to the set position. Usually the "switch time" is greater than the "reaction time".
6. Round time: The interval for sending camera switching commands or custom commands. For example, 0 indicates special processing and is triggered only once.



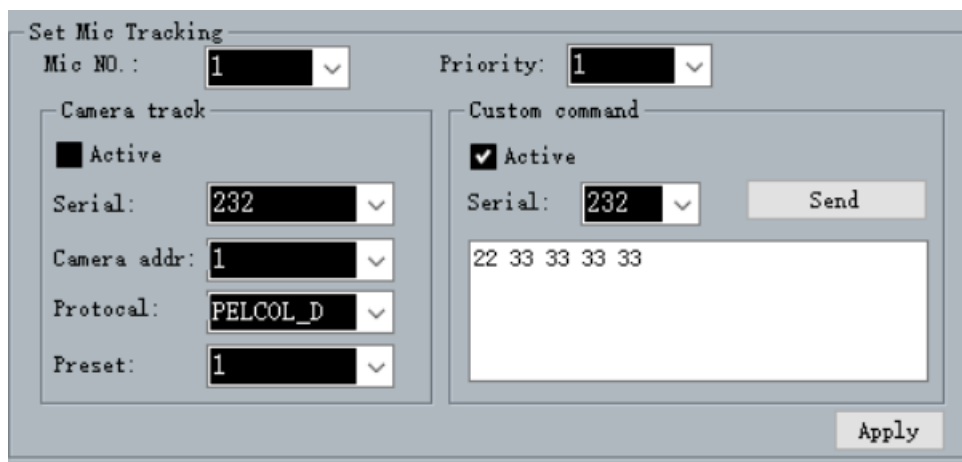
7. The microphone number corresponds to the input channel of the device, that is, the channel number to which the microphone is connected. The MAC number with a # is a virtual MAC number and can only be used to set the default MAC.
8. The smaller the priority is, the higher the priority is. When the priority is the same, the processing is in accordance with the trigger priority order; If two mics speak at the same time, the camera automatically turns to the preset position corresponding to the mic with a low priority (that is, a high priority) or sends the command corresponding to the mic with a low priority (that is, a high priority). However, if the priority of the two mics is the same, the signal detected first prevails.

9. Enable the MIC setting: All the MIC parameters can be set in advance, but only part of them can be enabled according to the actual situation.

10. The preset point, serial port number, camera address, and protocol are related to the camera and must correspond to the actual connection of the camera.

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 the parameters to the device. At this time, the mic of this channel has been associated with the corresponding camera address. The Enable Microphone Settings option is then used to determine whether the microphone Settings are valid when tracing is enabled.



13. Camera Setting is a camera debugging interface. Generally, the camera position is adjusted before tracking, and the parameters of this part will be saved on the camera at the end.

14. First, set the serial port. There are two serial ports (232 and 485), which correspond to the rear backplane port connected to the cradle head.

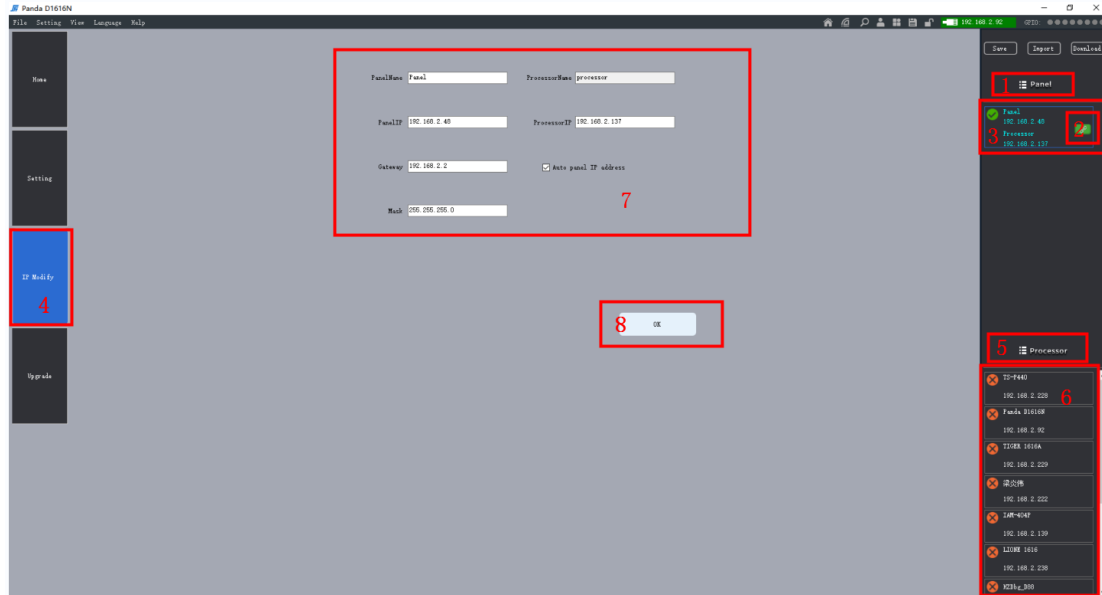
15. The second is the camera address and protocol type. For the camera address, see the actual camera address.



16. Finally, the preset point number is the identification defined by the user for the camera, and then adjust the upper, lower, left, right, and focal length, aperture and other parameters will define the position and setting of the camera;

17. Finally, click "Save" to save the parameters to the camera. "Clear" is to delete the information of the current prefab point, and "call" is used to view the camera position saved by the current prefab point.

5.5 The panel configuration (plus)

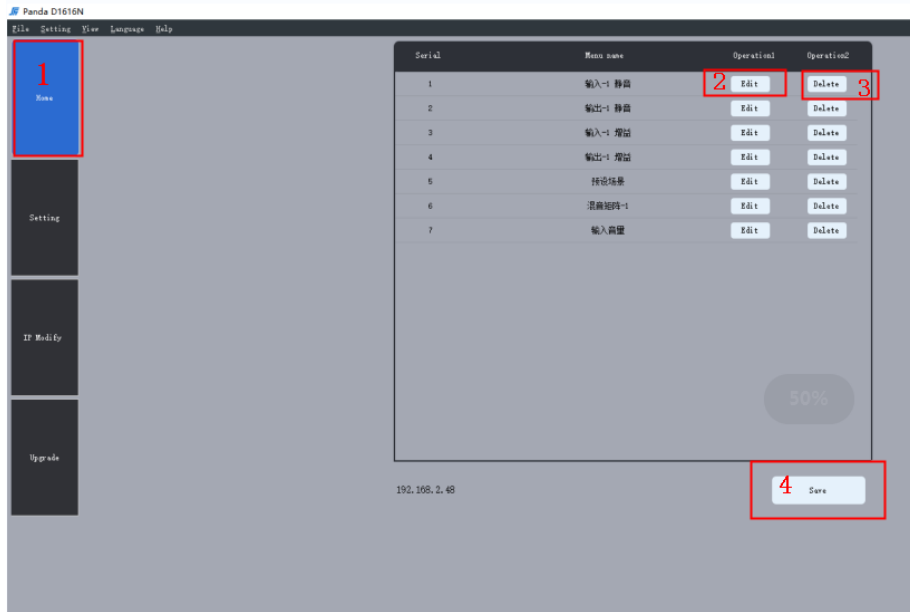
5.5.1 IP Change Information



1. Panel Devices: Search for online panel devices
2.  : connection status  : Disconnected state
3. Basic panel information: Displays the name and IP address of the panel and the controlled PROCESSOR
4. IP change: Double-click the position in Figure 3 to obtain the basic information of the panel
5. Processor devices: Search online processor devices
6. Processor List: Displays the ONLINE PROCESSOR IP address
7. Panel IP information: you can modify panel IP, gateway, subnet mask, processor IP (select from Figure 6) and whether to automatically obtain panel IP (the default is automatically obtain panel IP).
8. Confirm button: Save the modified parameters and disconnect

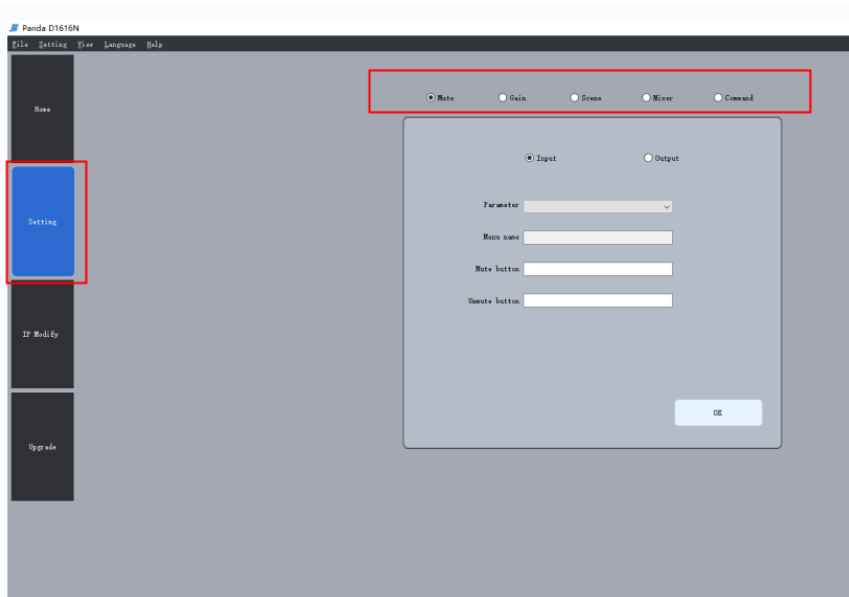
Note: If the panel IP is not automatically obtained, it must ensure that the modified panel IP address does not conflict with others, otherwise the connection cannot be searched. If the conflict occurs, the external network will be disconnected. Ensure that the conflicting panel is searched in the LAN, set the PANEL IP to 0.0.0.0, and click OK to restore the factory Settings of the panel.

5.5.2 Home Page Information



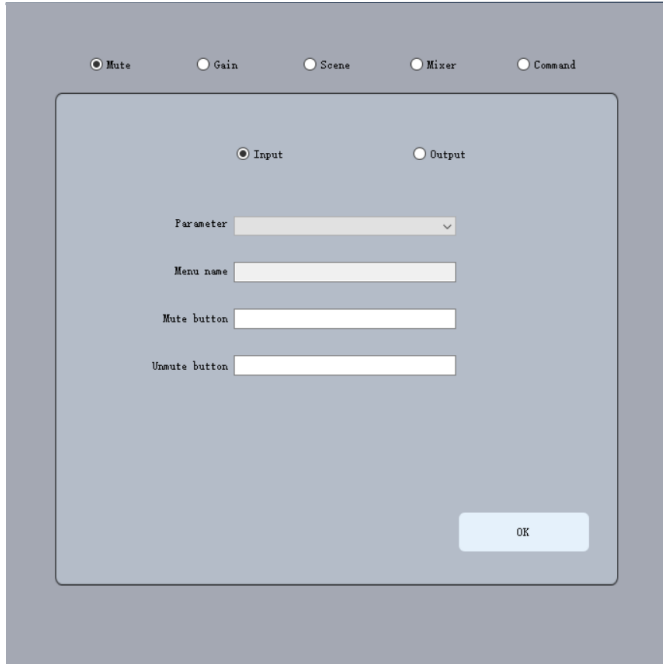
1. Home page: Double-click basic panel information to view the menu information on the panel
2. Edit button: Modifies menu information
3. Delete button: can delete the menu
4. Save button: Save menu information and disconnect, save 99 items at most

5.5.3 Configuring Information



Setting: Mute, gain, scene, mixing matrix, and central command configuration can be added

5.5.3.1 Mute



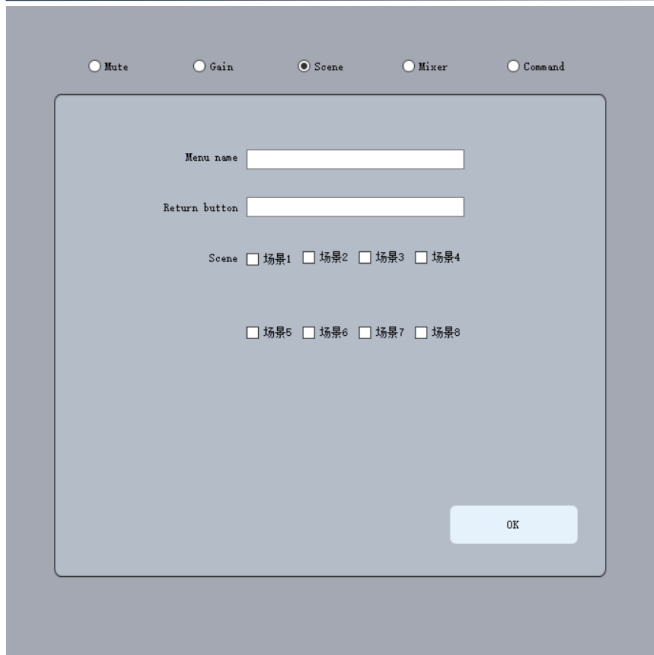
The user can select input or output parameters to display the corresponding menu name. In addition, the user can customize the mute and unmute labels with different characters to control the processor mute status.

5.5.3.2 Gain



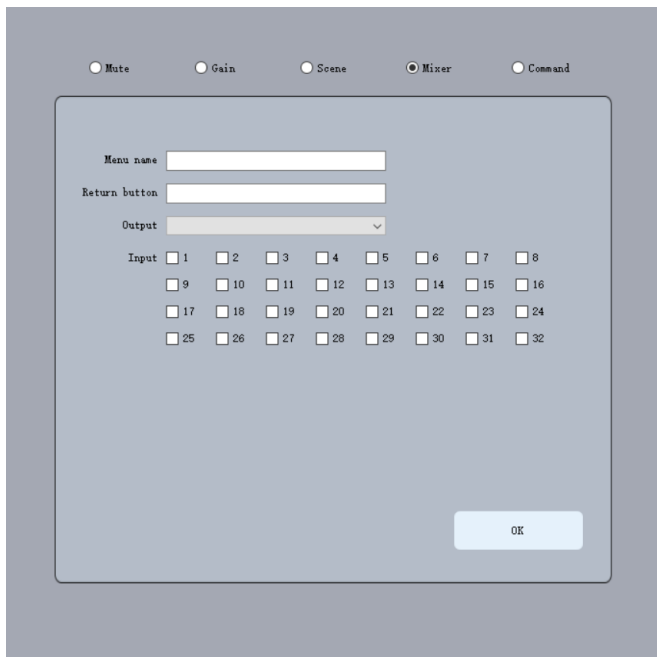
The user can select input or output parameters to display the corresponding menu name, and set the maximum, minimum, and step size of the processor gain (the maximum value is 12, the minimum value is -72, and the step size is greater than or equal to 0.1) to control the processor gain.

5.5.3.3 Scene



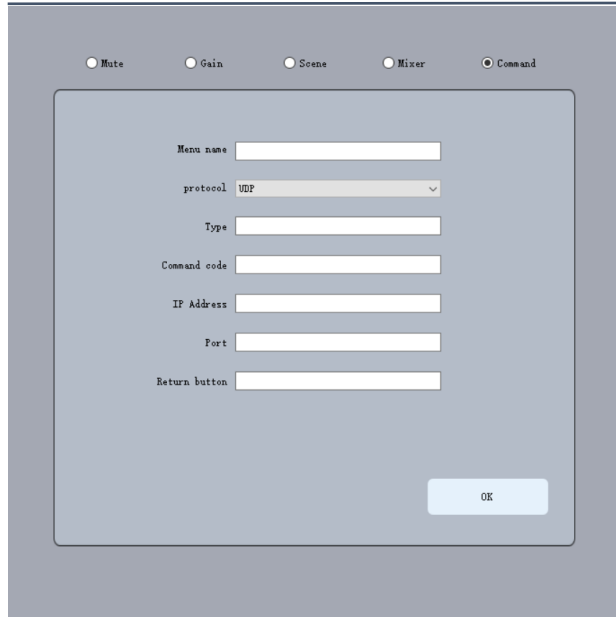
You can customize the menu name and return button by using different characters. You can also select scenarios that can be loaded by the processor to control the processor switching scene.

5.5.3.4 Mixing Matrix



The user can customize the menu name and return button through different characters, and can also select processor output parameters and check input parameters to control processor input and output channels.

5.5.3.5 Central control Command



The screenshot shows a software interface for configuring a command. At the top, there are five radio buttons: Mute, Gain, Scene, Mixer, and Command. The 'Command' radio button is selected. Below the radio buttons is a large rectangular area containing several input fields: 'Menu name' (text input), 'protocol' (dropdown menu with 'UDP' selected), 'Type' (text input), 'Command code' (text input), 'IP Address' (text input), 'Port' (text input), and 'Return button' (text input). An 'OK' button is located at the bottom right of the configuration area.

You can customize the menu name, command type, return button, central control command code, IP address, and port number by using different characters to control the device with the corresponding IP address and port.

5.5.3 Upgrading the Panel

Panel upgrade steps:

Select the design to upgrade -> Upgrade -> Select upgrade package -> Panel shows upgrading and then shows loading, the upgrade is successful.

5.5.4 Toolbar



:Save the added panel configuration information to a local PC



:Import the panel configuration information to the software



:Download the panel configuration information to the pane

6. Processor module

6.1 Import Configuration

The input signal can be analog signal or test signal generated inside the device. For the network version with Dante, it can also be network digital signal.

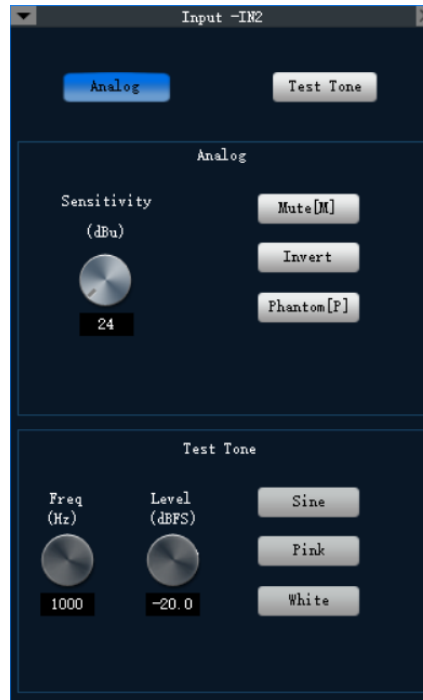
Analog signal can be adjusted by adjusting the sensitivity of the input can be selected; From -51 to 0, every 3dB one gear;

Mute: The channel is mute when selected.

Reverse phase: 180 degrees of signal phase processing.

Phantom power supply: for capacitive microphone power supply, line input or non-capacitive microphone do not open, in case of burning;

Test signal: including sine, pink and white noise, the test signal system will automatically shield the analog input signal;



6.2 Expander

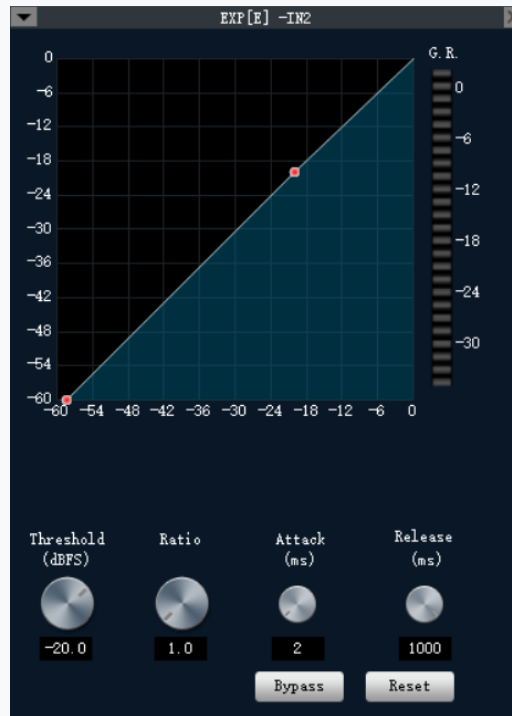
The extender increases the dynamic range of input according to user needs. When the input signal is less than the "threshold", the expander compresses the input signal according to the set "ratio", $\text{output level} = \text{threshold} - (\text{threshold} - \text{input level}) / \text{ratio}$; when the input signal is greater than the threshold, output 1:1, the output level = the input level.

Pass-through/Enable: Whether the extender is valid.

Ratio: the number of db dynamic changes of the expander input signal/the number of dB dynamic changes of the expander output signal.

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

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



6.3 Compressor

The compressor is used to reduce the dynamic range of the signal above a user-defined threshold. The signal level below the threshold remains unchanged.

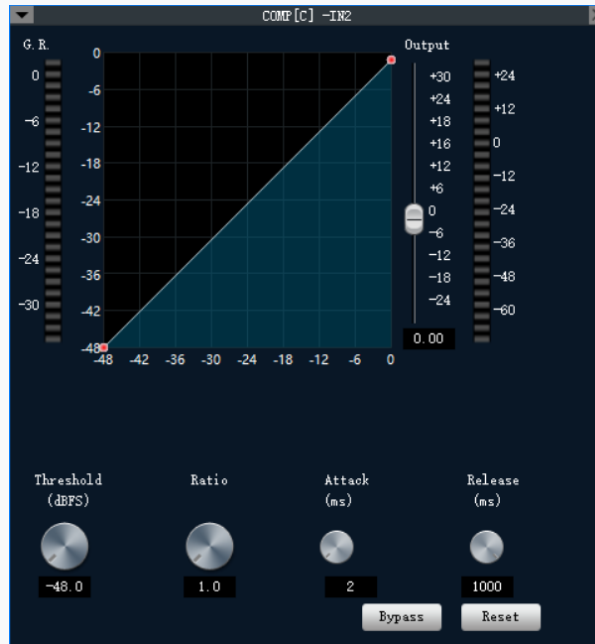
Threshold: The signal level is higher than the threshold and the gain is reduced. This point is the inflection point in the input/output curve. For peak stop, the threshold to be set to stop is just below the peak level.

Ratio: The compression ratio of input and output.

Start-up time: Start with the gain of the compressor to reduce the processing speed. The shorter the start-up time, the greater the instantaneous change of the signal, and the short-term gain attenuation makes hearing unsuitable.

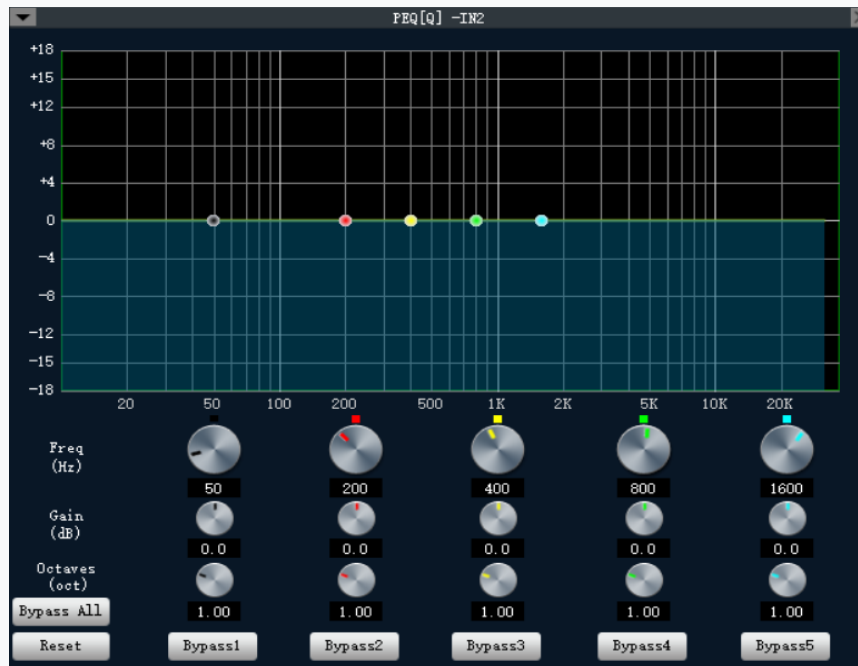
Recovery time: The release time determines the gain change from moment to moment of the compressor. The quick release time increases the subjective level, while the slow release time is more useful to keep it under control.

Output fader: The fader can control the output gain of the module. If the compressor reduces the signal level significantly, the output gain boost may need to maintain the perceived volume.



6.4 Equalizer

The type of equalizer varies according to the device model.



Parameter equalization

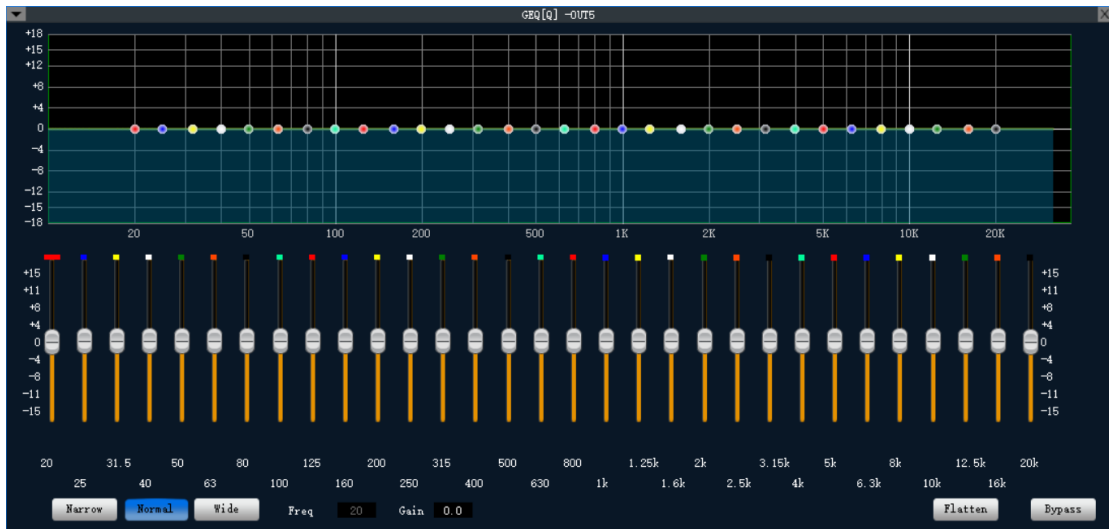
Pass-through/Enable: Whether the equalizer is effective.

Band Through/Enable: Whether the band equalizer is effective.

Center frequency: The center frequency that needs to be equalized.

Gain: The gain/attenuation value of the frequency center point.

Bandwidth: the range of influence of the segment around the center frequency. The larger the value, the larger the bandwidth and the larger the range of influence.



The gain of the 31-band frequency points can be adjusted separately to achieve the purpose of strengthening or weakening certain frequency points and achieving different effects.

Pass-through/Enable: Enable and disable the equalizer.

Gain: The gain/attenuation of the frequency center point.

Flat: Restore the gain of all frequency bands to 0dB state.

Narrowband: A kind of bandwidth, the bandwidth is lower than the ordinary bandwidth.

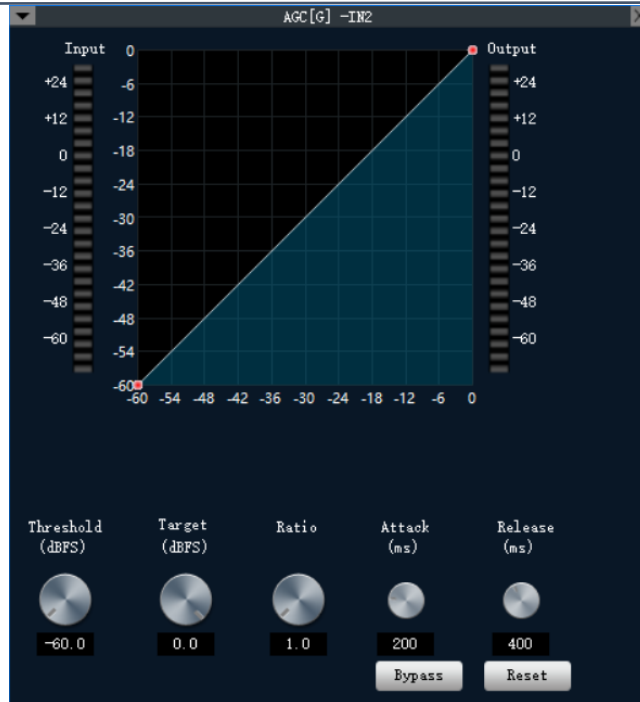
Normal: Commonly used ordinary bandwidth.

Broadband: The highest bandwidth.

6.5 Automatic gain

The purpose of automatic gain control is to bring the signal of the uncertain level to the target level while maintaining the dynamic range of the volume.

Typical usage scenarios: For example, the distance between the user's mouth and the microphone may vary from far to near when the user speaks to the microphone. As a result, the output volume may vary from high to low, and the user may even feel that the speaker is speaking intermittently. Automatic gain is to set the threshold value, the input signal below the threshold value in accordance with the ratio of 1:1 output, for the level above the threshold value in accordance with the ratio of direct promotion, set the target level, sound signal can be stable output.



Threshold: When the signal level is below the threshold, the input/output ratio is 1:1. When the signal level is above the threshold, the input/output = ratio. Set this threshold at a level slightly higher than the noise ratio of your input signal.

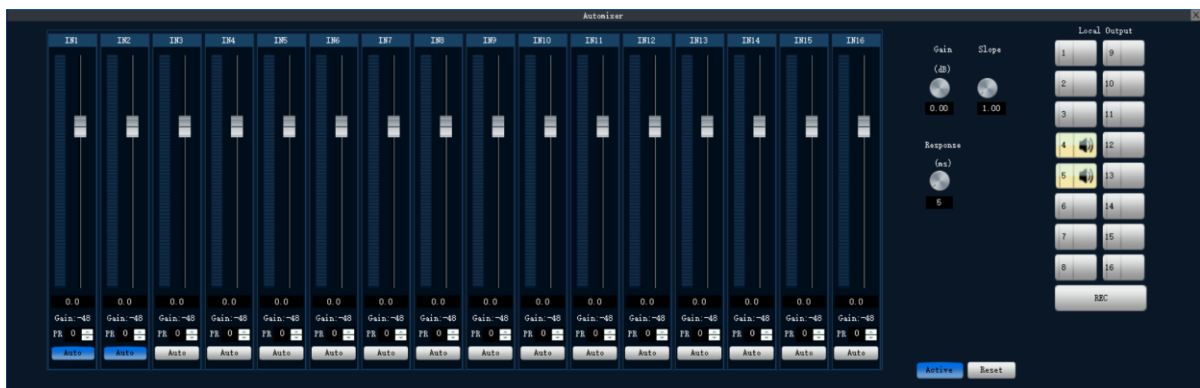
Target level: Desired output signal level.

Automatic gain control is to automatically control the gain amplitude by changing the input and output compression ratio. When the weak signal is input, the signal is amplified to ensure the strength of the output acoustic signal; When the input signal intensity reaches a certain degree, the signal is compressed to reduce the acoustic output amplitude.

6.6 Automix

Automatic mixer is mainly used for automatic operation to control how a traditional mixer with a large amount of speech input outputs the desired results. Consider a typical meeting room scenario, there are ten participants, each with one microphone. If ten microphones are turned on at the same time, only one person speaks, then the output effect must be not ideal, because the other nine microphones pick up the room sound insulation, reverb, etc., which will reduce the output effect of the whole system.

This line of products currently offers automatic mixer using "adaptive gain sharing" technology.



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

Channel control Each channel has an "auto" button, press to add this channel to the automatic mixing.

The channel mute and fader are both automatic gain type. In order to mute a signal and prevent the signal from entering the automatic mixing, please turn on "Mute" and cancel "Auto". **The channel fader** controls the mixing level and direct output level of the channel.

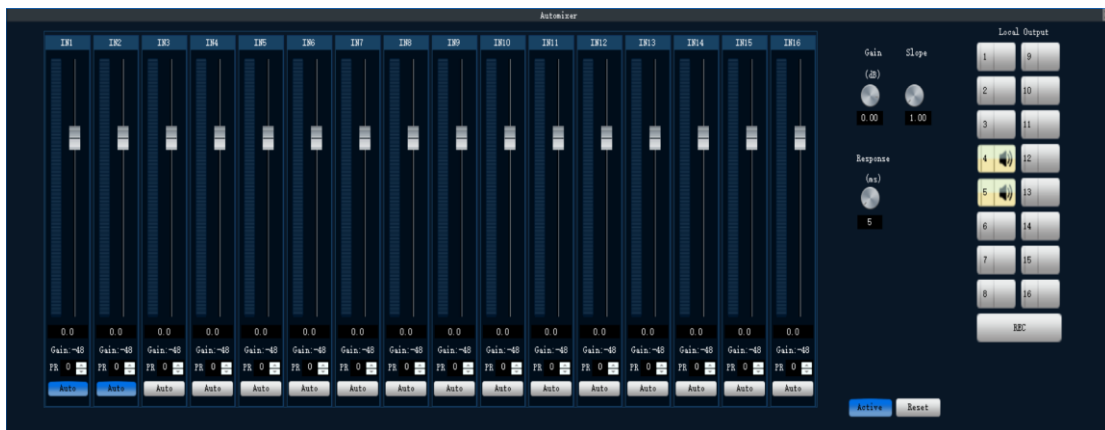
Priority control PR: Allows channels with higher priority to surpass channels with lower priority, thereby affecting the automatic mixing algorithm.

The control defines the priority with a value between 0 (lowest priority) and 10 (highest priority), and the default value is 5 (standard priority).

If the priority of all channels is equal, set the priority of all channels to 5.

Example: Use input channel 1 and channel 2 in automatic mixing, and output the mixed signal on channel 4 and channel 5.

1. First select the automatic buttons of input channels 1 and 2 of the automixer to "auto", mark that the signal of this channel is sent to the automixer for processing, and at the same time enable the main switch of the automixer, there is "through" Becomes "enabled";
2. Select channels 4 and 5 in the "AM/Automixer" column of the mixer, which means that the signals processed by the automixer will be output in output channels 4 and 5.



Note: Since output channels 4 and 5 contain the output signal of the automixer, the input signal input channels 1 and 2 of the automixer cannot be mixed to output channels 4 and 5, as shown in the yellow part.

6.7 Feedback/echo/noise cancellation



Feedback: Select the signal that needs to be processed by the feedback canceller, and select the output channel of the processed signal in the mixer.

Echo: Set the signal to be processed by the echo canceller, and select the output channel of the processed signal in the mixer.

Echo near-end input: local MIC output, that is, the signal that needs echo processing.

Echo far-end input: reference signal.

Noise: Select the signal that needs noise elimination processing, and select the corresponding channel output in the mixer after processing the signal.

Mixing: Mix the signal of the selected input channel to the corresponding output channel.

AM: signal processed by the automatic mixer

AFC: Signal processed by feedback canceller

AEC: Signal after echo cancellation processing

ANS: Signal after noise cancellation processing

Example 1: AFC feedback eliminator and mixer associated operations:

The signals of channels 1 and 2 are fed back and output in channel 6. The configuration is as follows:



1. Select input channels 1 and 2 in the feedback canceller, which means that the signals of input channels 1 and 2 are sent to the feedback canceller for processing.
2. Select the point corresponding to OUT6 in the "AFC/Feedback Cancellation" column of the mixer, which means that the result processed by the feedback canceller is sent to output channel 6 for output.

Example 2: Associated operation of AEC echo canceller and mixer:

The local signal is input channel 1, and the remote signal is input channel 5. That is, the signal about channel 5 in channel 1 is removed and output in channel 6. The configuration is as follows:



1. Select input channel 1 in the local/near end of the echo canceller, and select input channel 5 in the remote/far end.
2. Select the point corresponding to OUT6 in the "AEC/Echo Cancellation" column of the mixer, which means that the echo canceled signal will be sent to output channel 6 for output.

Example 3: Associated operation of noise canceller and mixer:

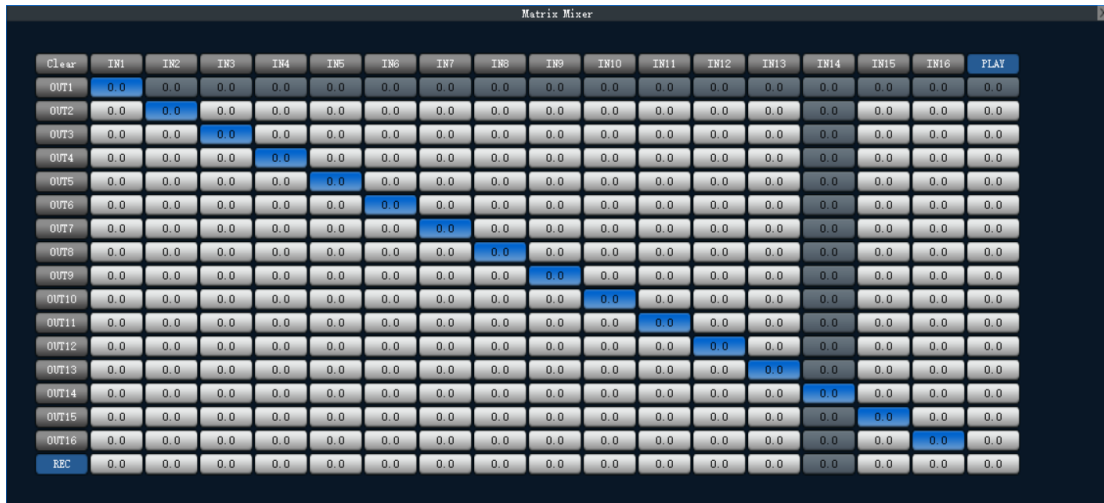
Perform noise cancellation processing on the signals of channels 3 and 5 and output them in channels 1 and 2. The configuration is as follows:



1. Select input channels 3 and 5 in the noise canceller, which means that the signals of input channels 3 and 5 are sent to the noise canceller for processing.
2. Select the points corresponding to OUT1 and OUT2 in the "ANS/Noise Cancellation" column of the mixer, which means that the results processed by the noise canceller will be sent to output channel 1 and output channel 2 for output.

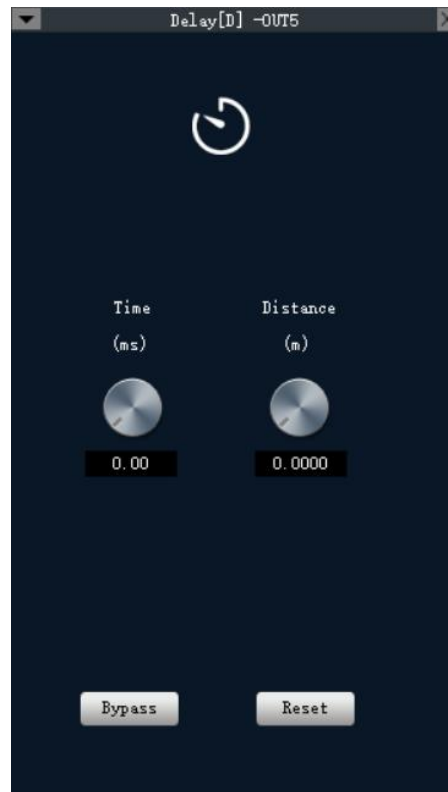
6.8 Matrix mixing

Input 16 channels, output 16 channels, you can choose according to the actual situation, as shown in the figure, the audio source enters from the input 8 channels, and outputs the sound through the output 9 channels, 8 phoenix heads IN1-IN8, 8 phoenix heads OUT1-OUT8 at the bottom. There is an option of recording function. Choose which input can record the sound of this channel. Similarly, there is a playback function option on the right side. Choose which output channel to play the sound of this channel.



6.9 Delayer

The time interval between the signal input to the processor and the output of the processor is generally used to produce effects such as reverberation or echo, and can also be used to process larger auxiliary speakers in the use case.



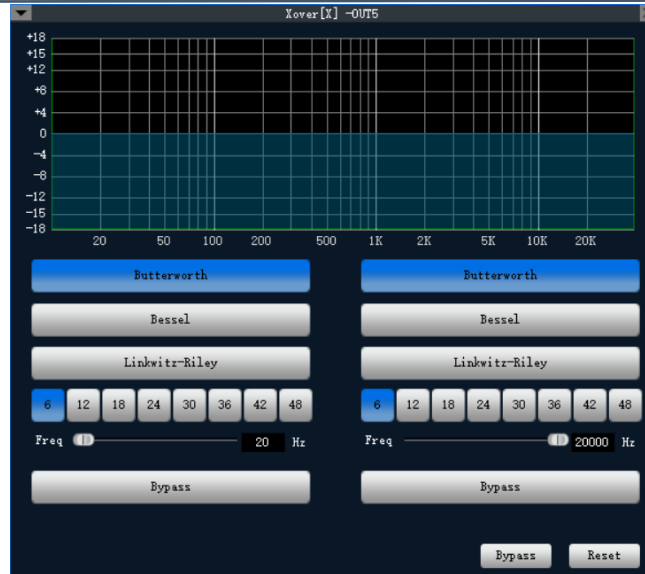
6.10 Frequency divider

High-frequency pass-through/enable: enable and disable the high-pass filter.

Low-frequency pass-through/enable: enable and disable the low-pass filter.

High-pass frequency: the cut-off frequency of high-pass filtering.

Low-pass frequency: the cut-off frequency of low-pass filtering.



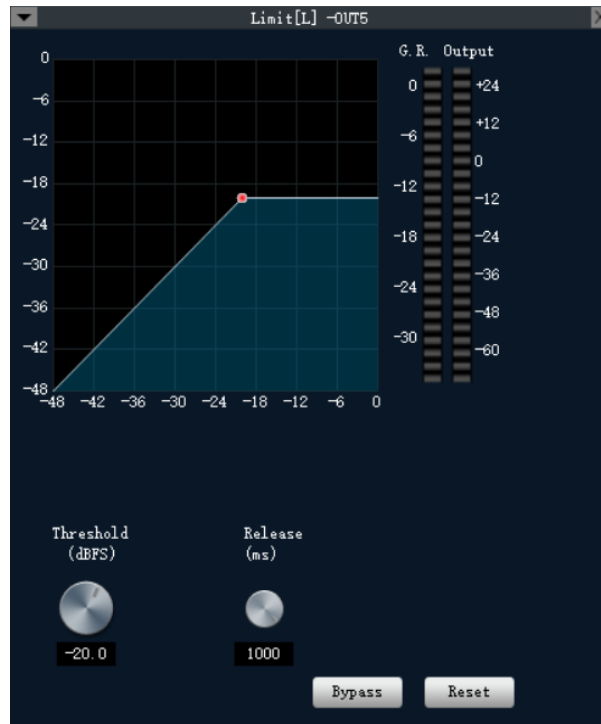
6.11 Limiter

Through/enable: enable or disable the limiter.

Threshold: the starting level of the limiter. When the signal is higher than the limit value, the limiter processing module is started.

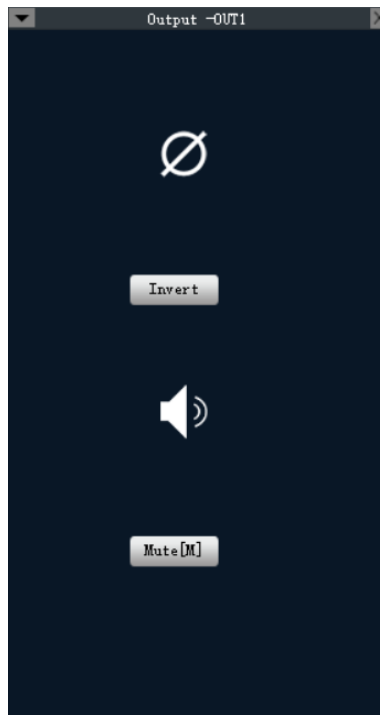
Recovery time: When the input signal is lower than this setting value, the sound channel will not be closed immediately, and the closing time will be delayed according to this setting value. During this time, as long as there is a signal higher than the "threshold" limit value, the sound channel can continue to be turned on.

Compression: The difference between the signal processed by the limiter and the input signal.



6.12 Output Configuration

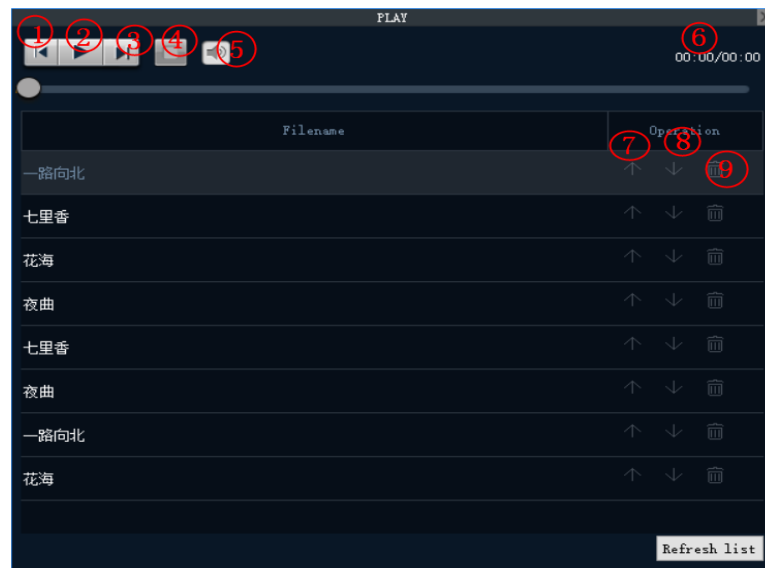
The mute and inversion of the output can be set.



6.13 USB recording and playback function

USB playback function: The processor automatically reads and selects to play MP3 and WAV format audio files in the U disk through the USB interface.

USB playback interface opening method: The playback window of the quick operation interface clearly displays the playlist, the interface is as follows:



1. Previous song button.
2. Play and pause buttons.
3. Next song button.
4. Stop button.

- 5. Mute and volume control buttons.
- 6. Display the total time and elapsed time of the song.
- 7. Move the button up.
- 8. Move the button down.
- 9. Delete button.

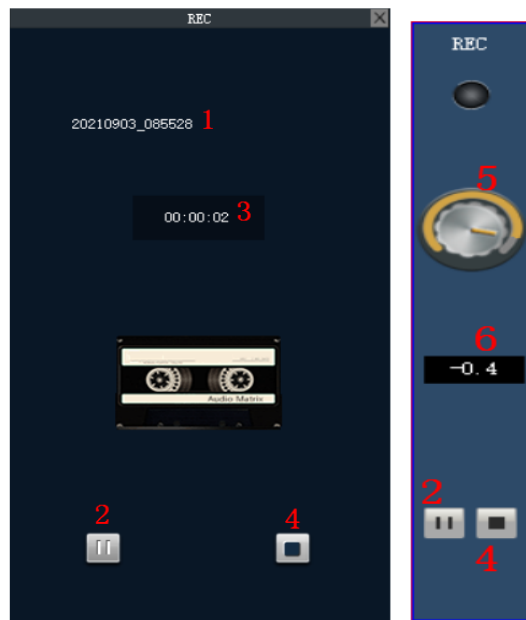
Instructions for USB playback function:

Example: Play a song on the USB flash drive, and send the sound to output channel 1.



1. Select the switch corresponding to "Output 1" on the "play" column of the matrix mixing interface
2. Double-click the song name or play button to start playing the song.

USB recording function: save the audio signal of the channel to storage media such as U disk through the USB interface. Opening method: Click the recording window of the quick operation interface to open the recording interface, as shown in the figure below:

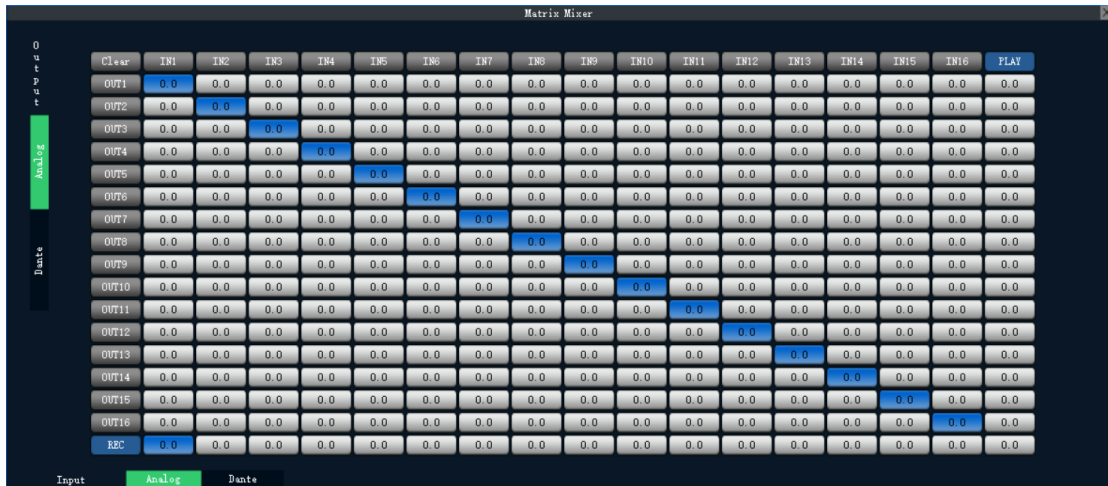


1. File name
2. Recording start and pause button
3. Recording time
4. Recording stop button.
5. The indicator light has three states: gray indicates that the device is not connected to the USB flash drive, red indicates that the device is connected to the USB flash drive, and flashing indicates that it is recording
6. Recording volume control button.

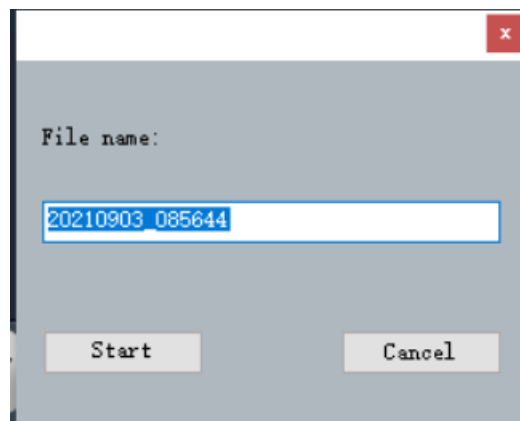
Instructions for USB recording function:

Example: Record the sound of input channel 1 to a USB flash drive.

1. Select the point corresponding to input 1 on the REC output line of the matrix mixing interface.



2. Click the record button, enter the recording file name in the pop-up dialog box, and then click to start recording.



Ps: Please pay attention to the following precautions

1. When the U disk is fully inserted into the device, do not rush to delete or change the position up and down, wait for a period of time before operating
2. When there is a bad area in the USB flash drive to record sound, if you unplug the USB flash drive, it may happen that the recording is still flashing green light, just restart the machine.
3. The U disk recording function can only display 200 records, and can only be displayed in the list in the root directory
4. U disk recording function U disk only supports FAT format U disk
5. U disk recording function only supports wav, MP3

7. Dante module (optional)

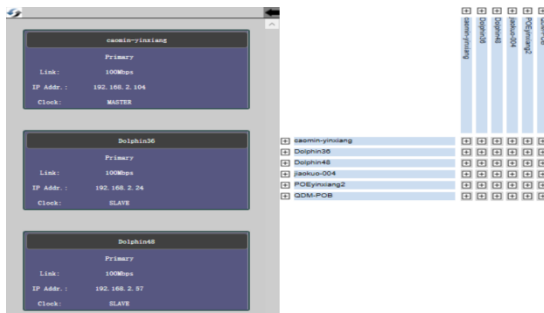
7.1 Dante Interface entry

On the right side of the main interface, there is a Dante interface as shown in the figure below, click to enter the Dante interface



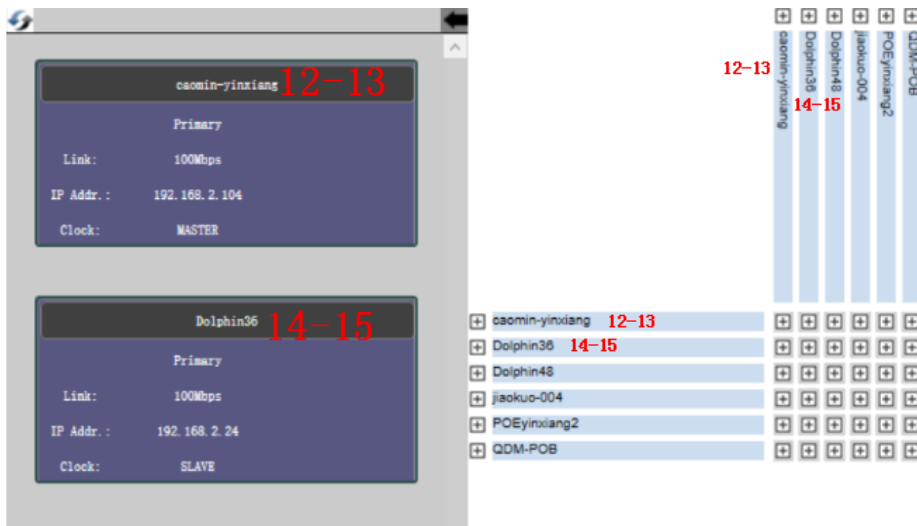
7.2 Dante Device list area and details area

The left area is the dante device details area, which displays the detailed information of each dante device on the right; the right area is used for dante device input and output pairing and displays the searched online dante device name.



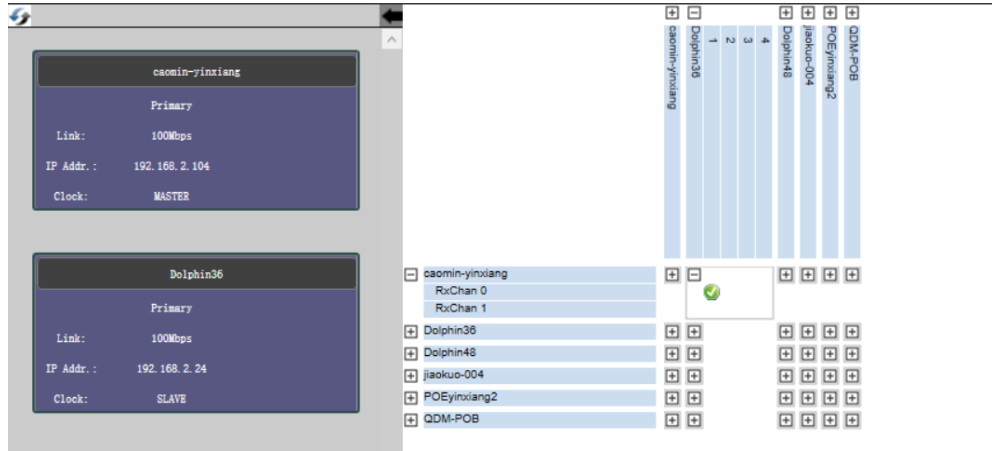
7.3 Dante Multipurpose use

7.3.1 Device pairing operation



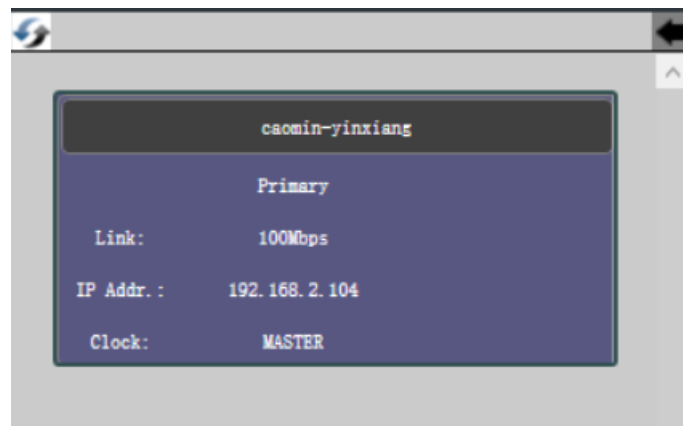
1. As shown in the right area of the above figure, the number and name of dante devices displayed vertically are the same as the number and name of dante devices displayed horizontally. Horizontal device display as sound input, vertical display as sound output
2. For example, if you want to output the input sound source of TX11 channel with dante name 12-13 from the 2-channel RX2 of device with dante name 14-15, click the plus signs corresponding to them in the vertical and horizontal directions to expand, and then just click the mouse at the corresponding position Do the following pairing, a green check mark indicates that

the pairing is successful, and the sound channel is successfully connected.



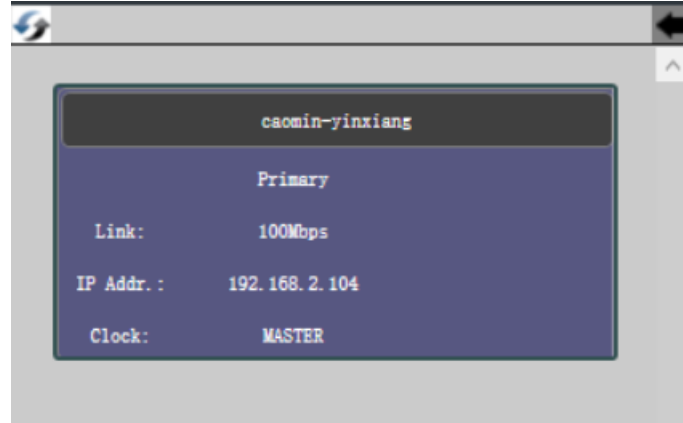
7.3.2 Device list refresh and operation

There is a refresh button in the upper left corner of the details area on the left. This button is mainly used to refresh the device list information on the right. Sometimes the device display is not complete, and you can click refresh at this time, or you can click refresh if the modified device details are not updated in time.



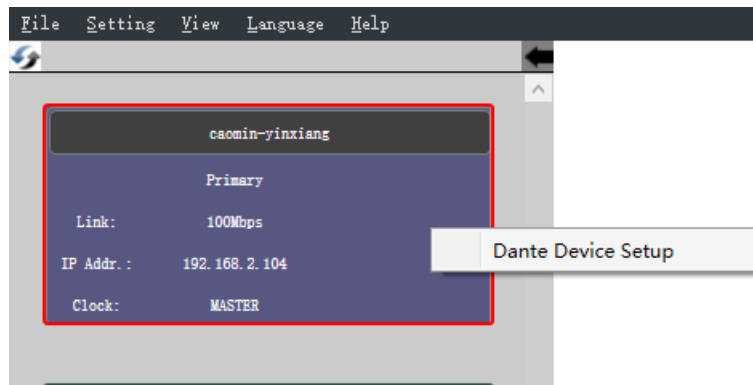
7.3.3 Display or hide operation of device detailed area

There is a zoom button in the upper right corner of the detail interface as follows to expand or indent the detail interface. Click once to expand and then click again to indent and not display.



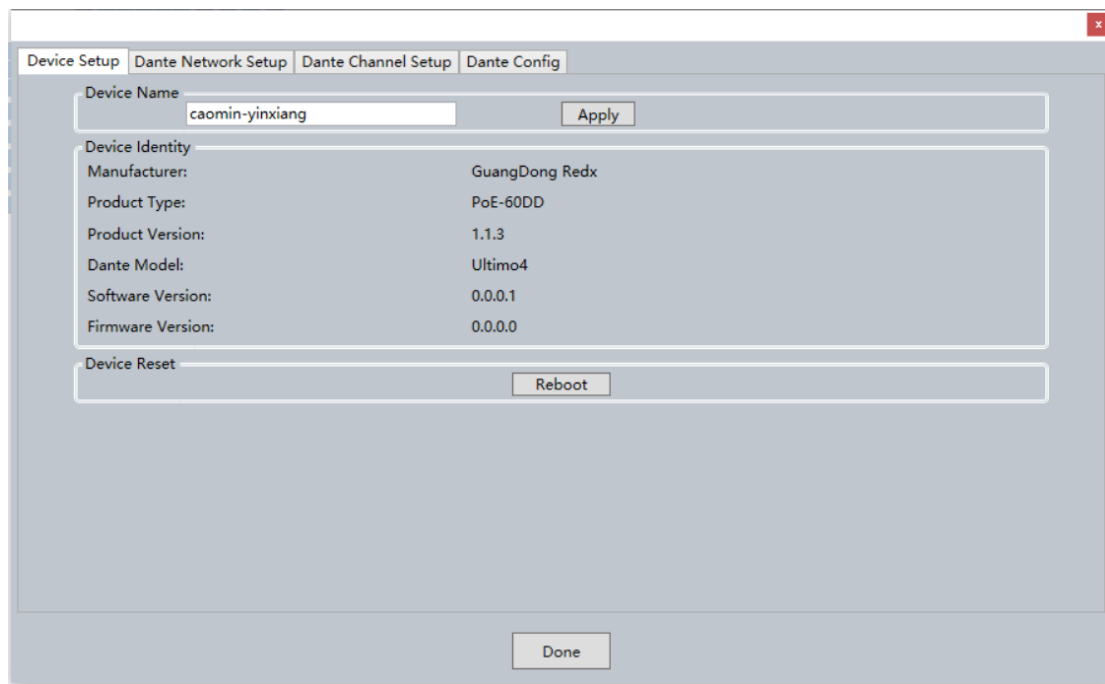
7.4 Dante Modifying device Information

1、 Right-click a dante device that needs to modify information to pop up a dante device setting, click the button to enter.

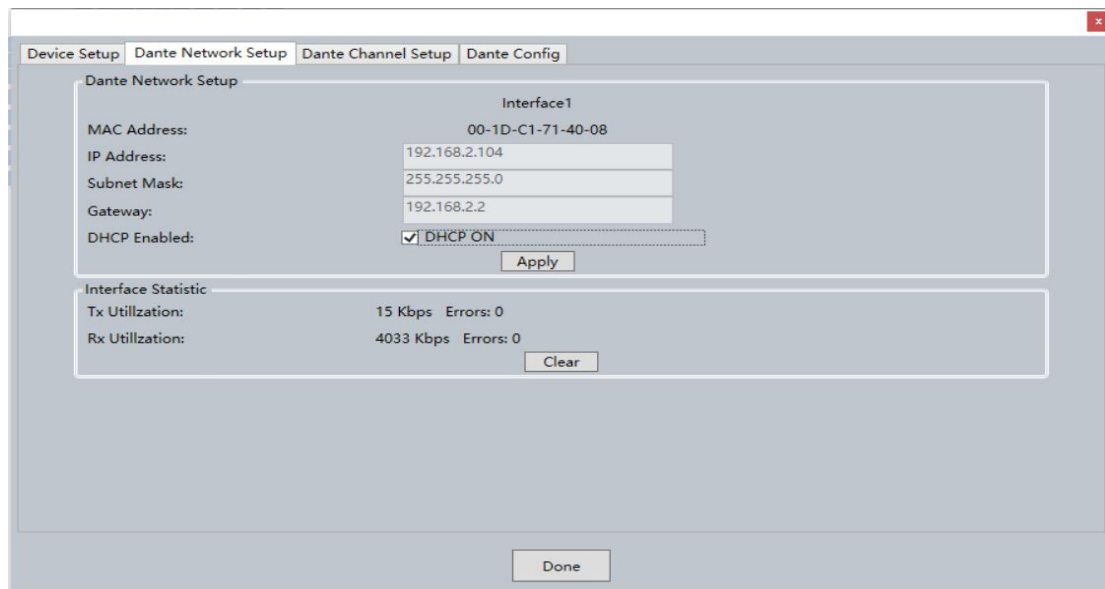


The setting interface can have device setting, Dante network setting, Dante channel setting, Dante setting options.

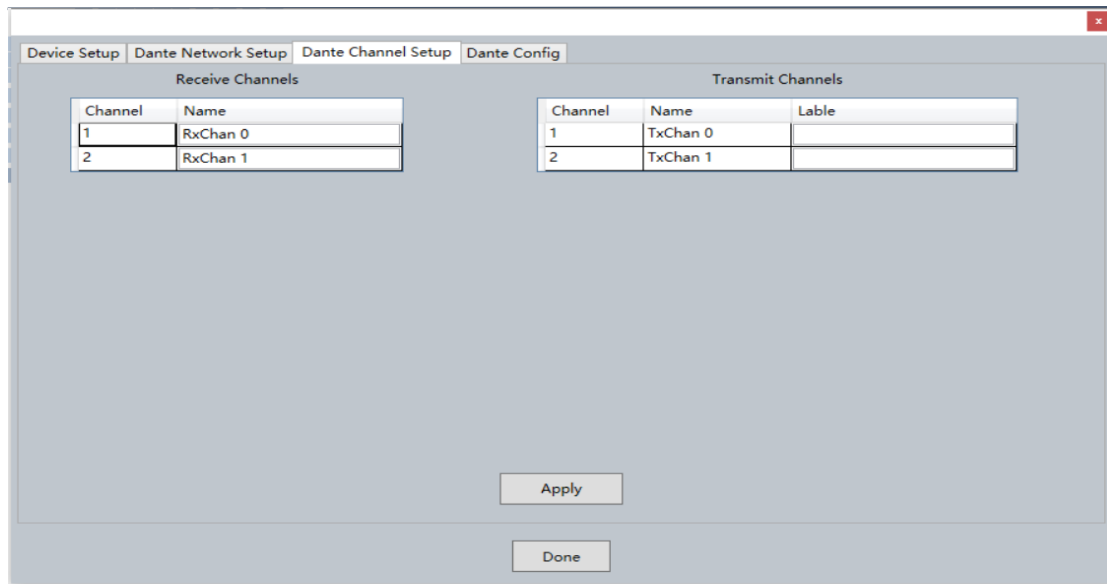
2、 Device settings, display the product information of the device, including the following hardware and software version information, etc. The device name can be modified. After the modification, the name of the device displayed in the device list is this name. Click the restart button to restart the dante module.



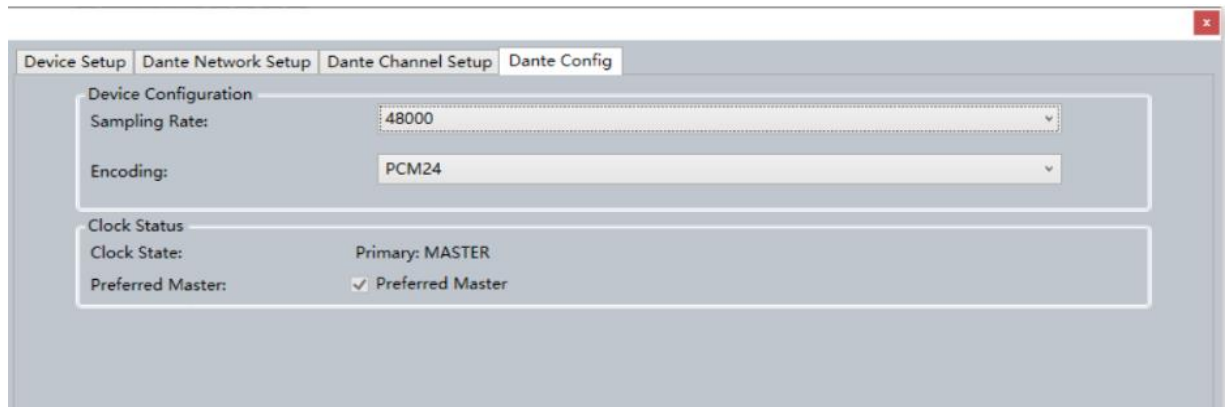
3、Dante network settings, you can set the IP information of the dante device, you can set static and dynamic IP, you must restart after modifying the IP information to take effect.



4、Dante channel settings, you can modify the name display of each input channel and output channel in the device list on the right. For example, if you want input channel 1 to display RX11 output channel 1 to display TX1, you can edit it manually as follows.



5、Dante settings, mainly set the sampling rate and encoding



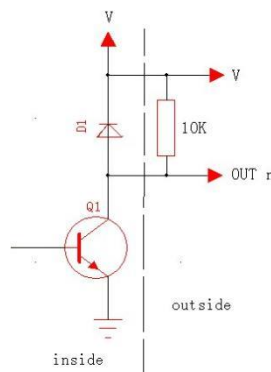
Note: To search for the device, you need the latest version of the dante module, the following information.



PS: The Dante module should be the latest version to better identify the hardware information

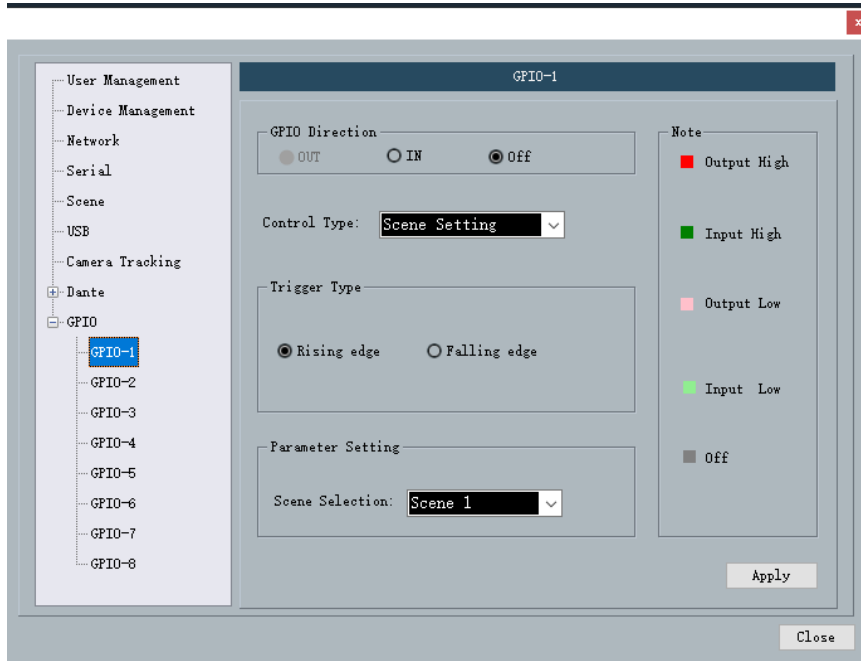
Enclose: GPIO Explain

Output connection method 1: First connect a 10K/0.25W resistor between a GPIO pin and "V" on the device (as shown in the figure), this pin will output low level 0 or high level according to the matrix state change 1. This level can be used to trigger another GPIO or other devices.

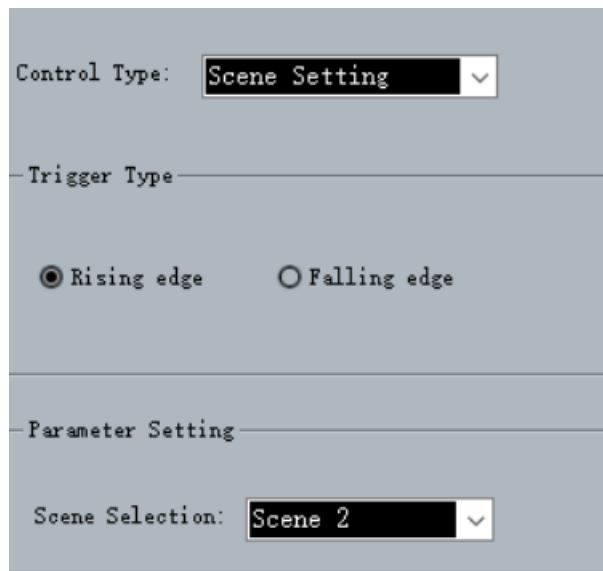


After the device GPIO is connected according to the above method, the following settings

need to be performed on the PC: Connect the device to the PC -> Settings menu -> Device settings -> Corresponding GPIO (gpio-2 in this example) -> Set the direction to " OUT":

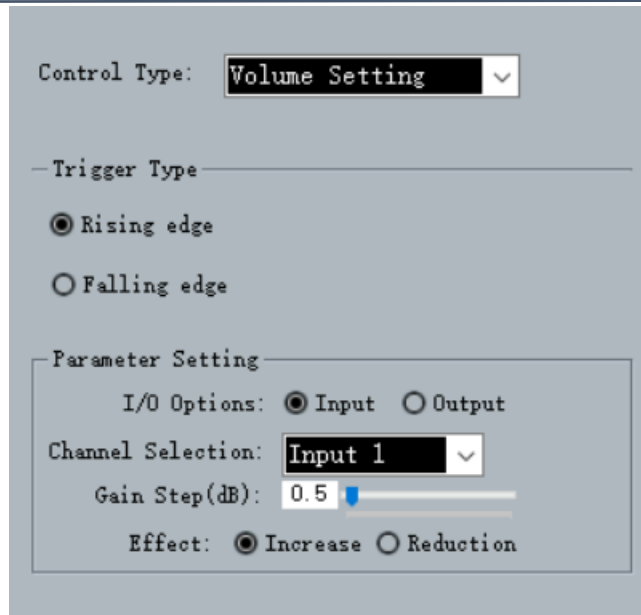


1、 If you select the scene display, click "Apply" below to make the setting take effect. Then load scene 2 on the scene management interface, and the corresponding pin (scene 2) will output low level 0. Until the user loads other scenes, the corresponding pin (scene 2) will output high level 1. Users can trigger operations on other devices based on the status of the corresponding pin (scene 2).



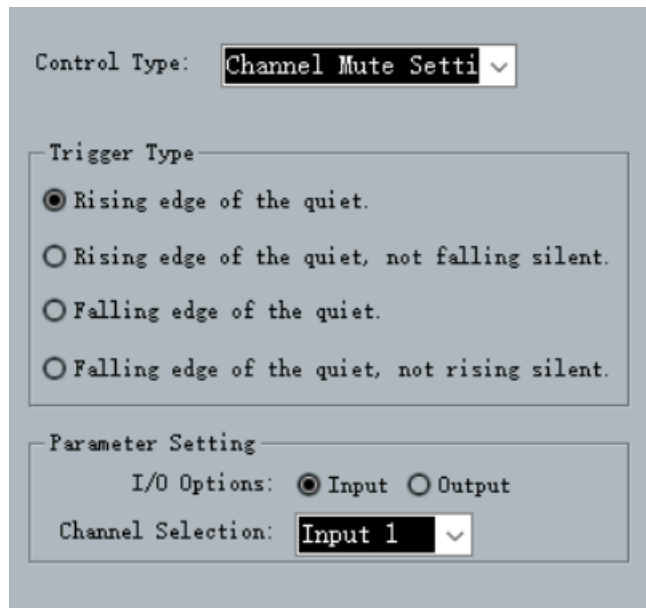
2. If the level display is selected, set as shown in the figure, and click "Apply" below to make the setting effective.

When the level value of audio matrix input channel 1 reaches -28dB, the corresponding pin (2 in this example) outputs 0; until the level of audio matrix input channel 1 is less than -28dB, 1 will be restored.



3. If you select the channel mute display, set as shown in the figure, and click "Apply" below to make the setting effective.

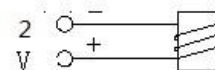
When matrix input channel 3 is muted, the corresponding pin (2 in this example) outputs 1; when matrix input channel 3 is not muted, it outputs 0.



4. If you select the system mute display, set as shown in the figure, and click "Apply" below to make the setting take effect.

When the output channels used by the audio matrix are all muted, the corresponding pin (2 in this example) outputs 0; when any channel is not muted, it outputs 1. Output connection method two (for control):

Drive relay: Relay can be used to control alarm devices, etc., built-in freewheeling diode.



Control Type:

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.