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# Illustration

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

**Note:** this manual is written to provide all the relevant information for the series of models. Due to the different signal configurations, the actual product configuration may differ from the instructions.

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# Important Safety Precautions

(Instructions for Fire, Electric Shock or Personal Injury)

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

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

**Warning-** Improper grounding can cause electric shock.

If you have any question on proper grounding of product, ask a qualified electrician or service personnel to check. Please do not try to change the power plug of product. If it is not fit for the socket, ask a qualified electrician to install an appropriate power socket.

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

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# I. Device Architecture

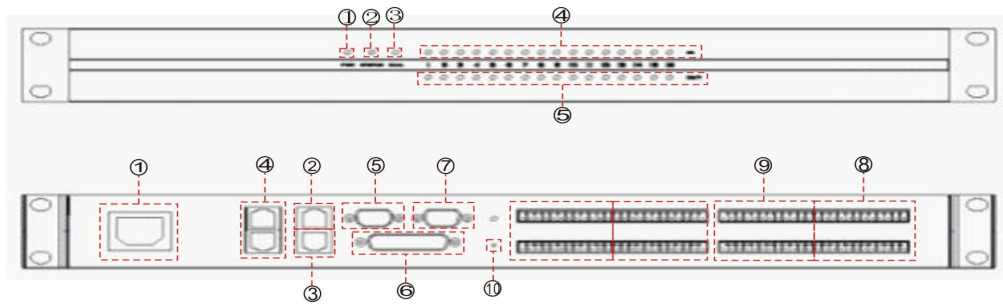


Figure 1

## The front panel of device is shown in Figure 1:

- Power indicator: after the power supply is switched on, light indicates power status.
- Status indicator: the system will run normally if the indicator is flickering and the indicator will be ON for a long time during upgrading.
- Telephone indicator: the indicator will be ON when enabling the telephone module. Otherwise, the indicator is OFF. TC series only.
- Input signal indicator: Illuminates when there is an input signal present. The number of indicators is equal to total number of input channels of on the device.
- Output signal indicator: Illuminates if there is an output signal present, the number of indicators is equal to total number of output channels on the device.

## The rear panel of device is shown in Figure 1:

- AC220V: power plug, supporting AC 100V~240V power supply, 50~60Hz
- M-LAN: network interface, connect PC, on-line editing and command receiving and sending control;
- RC-LINK: external control panel interface, to connect RC panel via the network cable;
- Expand Interface: Need to purchase the expansion module, divided as below based on the Equipment Model No.
  - LINE/SET: Interface of Expansion Board with Tel Module
  - SECONDARY/PRIMARY: Interface of Expansion Board with Cobranet;
  - LINK RX/LINK TX: Interface of Expansion board with Cascade.
  - DANTE SECONDARY/Dante PRIMARY: Interface of Expansion board with DANTE
- RS232: communication interface, to connect the external central control equipment / support camera tracking;
- GPIO: order transfer. For the specific connection mode, see GPIO setting in 2.1.3.6;
- RS485: Support Camera Tracking, DB(9) Female, which Pin3 is RS485A(RS485+), pin4 is RS485B (RS485-), pin5 is ground one.
- INPUT: Analog audio MIC \ LINE input interface;
- OUTPUT: Analog audio output interface;
- RESET: System stem reset button;

## II. Software Instructions

Installation of software: the software supports XP, win7, and vista operating systems. Before installing the software, please make sure the computer net framework3.5 installed. Then, in the IP address of PC, there is at least an address fallen into the same network segment as the device IP address (the default IP address ex factory is 192.168.10.10). Otherwise, the device can be queried only and cannot be normally connected. If the PC is not provided with IP address fallen into the same network segment as the device, please refer to the correct setting in the notes for using the device for the first time in FAQ hereinafter.

After the PC software is properly installed, the starting interface is as shown in Figure 2:

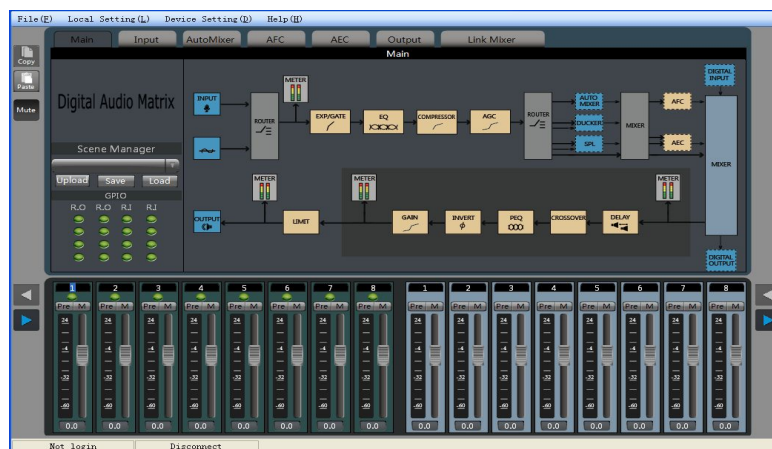


Figure 2

- Menu bar and tool bar: the menu bar contains various function menus of the software, and the tool bar displays function menus in common use.
- Copy / paste: parameter copy between channels or parameter copy between same functional module. The interface choice box is red, indicating that the module can conduct copy / paste operations.
- Channel parameter control area: indicating parameters of various functional modules of each channel. The choice box is red, indicating that the module can conduct copy / paste operations.
- Input / output channel control area: to display the electrical level and gain of each channel, select any channel, and the corresponding specific parameters will be displayed in Module 3; part of the hidden channel can be switched with ;When the channel choice box is red, the channel can conduct copy / paste operations. When the channel choice box is blue, the parameters of the current channel are displayed in Module (3) .
- Status bar: to display the current DSP occupancy factor, login status and connection status of the connecting machine.

### 2.1 Menu Bar and Toolbar

#### 2.1.1 File

- New: Create a new editing file. The parameters are configured in the factory.
- Open: Load a saved scene.

- Save as: Save the current configuration to the local disk..
- Chinese/English: To switch the Language interface
- Exit: Close the software.

## 2.1.2 Local Settings

### 1) Device List:

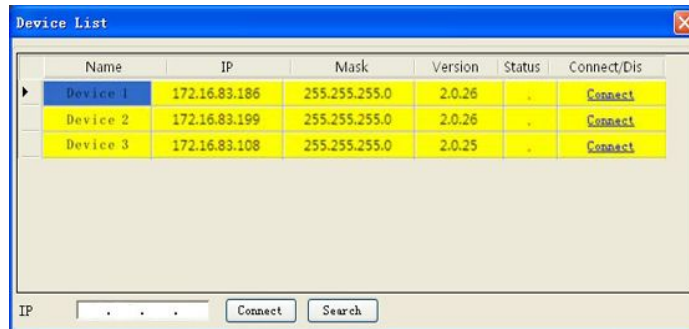


Figure 4

- Click “Search” to check the devices in the current local area network. The search result is shown above. Input the IP address of the device for connection.
- The status “!” means there is no IP in the PC side falling into the same network segment as the device IP address. In this case, add an IP in the PC side falling into the same network segment as the device IP address and try to connect again (Refer to FAQ 1).
- If the “Connect” is displayed in “Connect/Disconnect”, the device is not online. Click the “Connect” to connect the currently selected device. When the “Connect” is changed to “Disconnect”, the device is online successfully.
- If the “Disconnect” is displayed in “Connect/Disconnect”, the device is online. Click the “Connect” to disconnect the currently connected device. When the “Disconnect” is changed to “Connect”, the device is offline successfully.
- It is necessary to input the user’s information when “Connecting” and “Disconnecting” device.

### 2) Version select:



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

### 3) Channel setting:

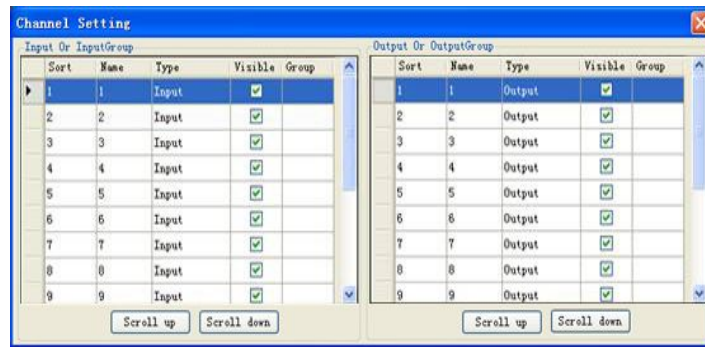




Figure 5

Conduct sorting, grouping and hiding operations to the input and output channel.

- Sorting: fix 1 ~ N channel; to view the position of the corresponding channel.
- Name: select the channels to be sorted, adjust the corresponding position by pressing the up key and the down key, and modify the name of corresponding channel.
- Category: display channel attributes, and cannot be modified.
- Display: selected display, otherwise hide the channel.
- Grouping: display the channel information in groups.

4) **Connect:** Connect the latest connected device, with a shortcut icon .

5) **Disconnect:** Disconnect from the currently connected device, with a shortcut icon .

## 2.1.3 Device Settings

### 1) User Manager



Figure 6

**Table 1 - Initial User List of Device**

Type	User Name	Password
Administrator	admin	123456
General user	1	1
General user	2	2

The system administrator has the right to add, delete and modify the information of general users,



as well as his own information; general users can only operate their personal information. Specific procedures are as follows:

- **Modify User Information:** firstly, select a user to be modified in the right list and then the user's old information will appear in the User Name and Password edit box at the left side. Then, insert new information in the edit box and click the "MODIFY" button to update the user information. The updated information will be displayed in the right list.
- **Delete User:** select the line you want to delete at the right list and then click the "DELETE" button to delete the user. Meanwhile, the user's information will be cleared from the right list.
- **Add User:** select a blank line at the right list and insert the information of a new user in the left the User Name and Password edit box (should be blank). Click the "Add" button to add the new user. The user's information can be seen in the right list.

## 2) Scene Manager

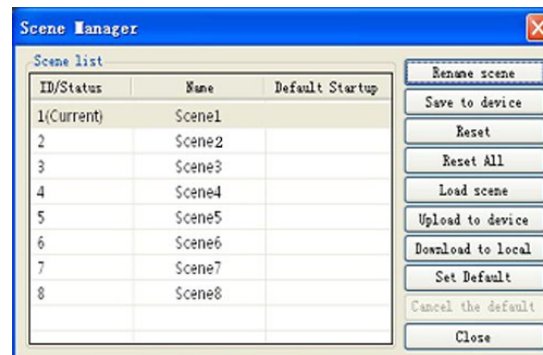


Figure 7

- There are eight scenes setting options. Except "Factory Configuration" (the 0th scene) can be renamed.
- **Save Scene:** save the current scene to the scene number in the selected device.
- **Reset:** Revert the selected scene to default.
- **Reset All:** Revert all the scenes to default.
- **Load Scene:** enable the currently selected scene; usually used to change a scene.
- **Upload to Device:** upload the scene in PC to the device and overwrite the selected scene on the device.
- **Download to Local:** save the currently selected device scene to PC.
- **Activate Setup default:** Check the selected preset as the starting up one.
- **Cancel Setup default:** Cancel the checked starting up preset.
- On the main interface, there is an intuitive display of current scene and the common functions, like below pic:



- The drop-down box shows the scene as the current running scene.
- Save: Save the selected scene to local
- Upload: The configuration file of the scene which saved to the local and overlay the current scene number configuration file in the drop-down box will not running automatically. If need run this scene, you need “load” this scene.
- Load: Set the selected scene to operate as current one.
- GPIO only as the display interface, 16 pieces GPIO indicators show the level of current GPIO pins. The indicators turn red when GPIO pins at high level; The indicators turn green when GPIO pins at low level. Refer to the 2.1.1.6 for the detailed GPIO setup.

### 3) Network Settings

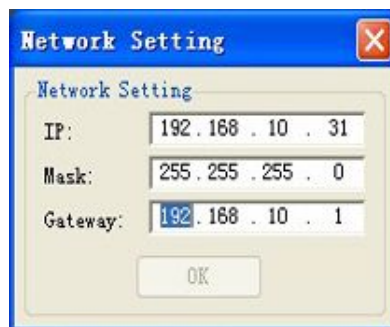


Figure 8

Used to view and modify the configuration of the network address and other information, to input device's IP address, subnet mask, gateway at the corresponding position, and click “OK” button to change the current device's network information.

#### 4) Serial Settings



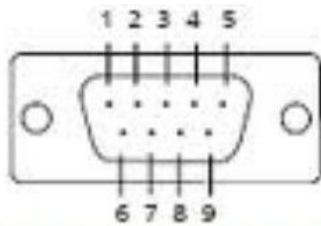
Figure 9

Used to view and modify the serial information of current connected equipment. After revision made, click “Save”. Click “Reset All” to revert to default set. Tick “Return Result” to get reply command when sending command via the Serial.

Illustration 1 To control the camera via RS-232 Serial

Common 232 serial interface illustration as below:

When using RS 232 to control the camera, only need connect Pin 2, Pin 3, Pin 5.

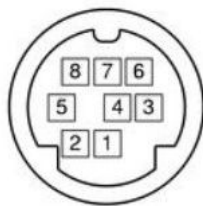


2	RXD	Receive data
3	TXD	Transmitter data
5	GND	Ground wire

Sony camera D70 port schematic:

Connecting RS232

Pin 2/3/5 to Pin 3/5/4 of D70 correspondingly when setting up serial connection of the camera.



1	DTR	Data Terminal Ready
2	DSR	Data Set Ready
3	TXD	Transmitter Data
4	GND	Ground wire
5	RXD	Receive Data
6	GND	Ground wire
7	IR OUT	IR Commander Signal
8	MD Caution	Motion Detector Sensing Signal

## 5) Set Voice tracking

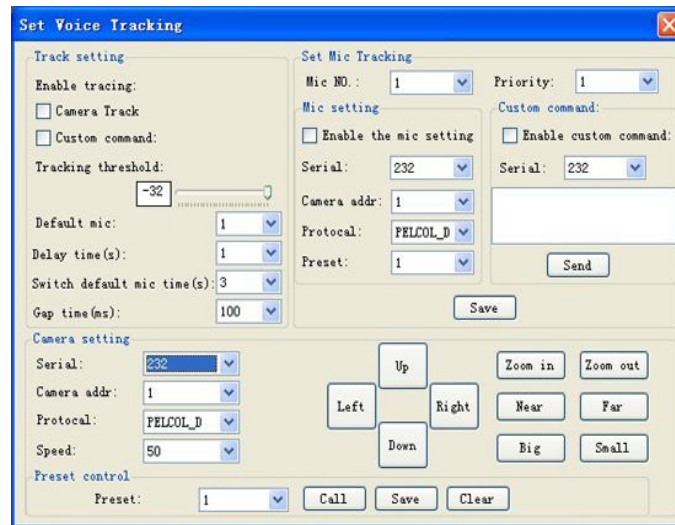


Figure 10

The tracking adjustment, video camera parameters and MIC parameters shall be set for voice tracking.

A. The voice tracking setting can be divided into camera tracking and custom command sending. The video camera tracking is used to control the camera rotation during speaking with MIC; and the custom command sending is used to send corresponding command to the corresponding port during speaking with MIC.

The tracking parameters can be activated only when the detected voice signal is more than or equal to the tracking threshold value. Otherwise, tracking will not be conducted.

The default MIC is when all MICs has no input, turn the video camera to the position of default MIC setting or send the associate command defined by default MIC. The one with # is the virtual number, which can only be used in setting default MIC.

B. The video camera setting is on a video camera debugging interface. Generally, the video camera position shall be set before tracking, and the parameters of the part will be saved in the video camera finally.

Firstly, set the serial port. There are two serial port numbers, 232 and 485 respectively, which are corresponding to the back plate connected to the clouds terrace;

Secondly, select the video camera address and protocol type. Please refer to the actual address of the video camera for the address of video camera, and the protocol is related with the camera model;

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Finally, the preset point number is the mark defined by the user for the video camera. Then adjust the upper, lower, left, right, focal length, light ring and other parameters, to define the position and settings of the video camera;

Note: a video camera can contain multiple preset points, but a preset point can only correspond to a video camera address.

Finally, click "save" to save the parameters on the video camera. "Clear" is to delete the information of the current preset point, and "call" is used to view the video camera position saved in the current preset point.

C. The number of MIC generally corresponds with the input channel, i.e. the number of channel connected to the MIC. The one with # indicates that the MIC number is the virtual number, which can only be used in setting default MIC.

The smaller the priority number is, the higher the priority level is. When the priority levels are the same, it shall be handled in accordance with the triggering priority; for example, if speech is made via two MICs, the video camera will automatically turns to the corresponding preset position of the MIC with smaller priority number (i.e. higher priority level) or send the corresponding command to the MIC with smaller priority number (i.e. higher priority level). The one of which the signal is first checked shall prevail.

To enable the MIC setting is when there are multiple MICs, all MIC parameters can be preset. During the actual use, only a few are enabled in accordance with the actual situation.

The preset point, serial port number, video camera address and protocol are generally related with the video camera, and must be corresponding to the actual connection of the video camera.

The custom command is to send the corresponding command to the defined serial port when the matrix MIC checks the input signal (usually when someone is speaking). Secondly, the command can be preset, but the "enable the custom command" shall not selected. Then the equipment will not automatically send the command, but one can still press the "send" button, to send the command in the input frame to the specified serial port at any time.

Note: both the video camera settings and the MIC settings have the preset point, serial port number, video camera address, protocol and other parameters, which shall be in accordance with the actual occasion in practical use.

For example, a video camera shall be connected with the audio processor at Port 232, and shall be disconnected and then connected with another audio processor at Port 485 without changing the position after debugging. At this moment, the parameters in the video camera shall be remained and not required to be reset. It is only required to adjust the MIC settings. However, Port 485 shall be chosen at this moment.

Click "save" to save the parameter information on the device. At this moment, the channel MIC

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has been associated with the corresponding video camera address. Determine whether the MIC setting is effective when enabling tracking through "enable MIC setting" option.

**Example:**

Switch in the video camera with address 2 at RS232 interface, and switch in a MIC at the input channel 1 and 8 respectively (it is required that the preset point 1 be associated with the MIC of channel 1, the preset point 2 be associated with the MIC of channel 8, and the video camera turn to the MIC of the corresponding input channel). The setting process is as follows:

Connect PC with the device, and open the serial port setting in the device setting. Select 232 for the serial port number, and select 9600 for the baud rate. The check bit, data bit and stop bit shall not be changed, click "save".

A. Associate the preset point 1 and channel 1: (1). video camera settings: select 232 for the serial port number; select 2 for the video camera address; set the preset point 1; select the protocol in accordance with the actual device; adjust the upper, lower, left, right, focal length, light ring and other parameters, to align the video camera with the MIC of input channel 1, and click save button to save the save the preset point; (2) preset point control setting: select 1 for MIC number; select 2 for video camera address; select the protocol in accordance with the actual device; select 232 for the serial port number; set the preset point 1. Click enable the MIC setting; Click OK..

B. Associate the preset point 2 and channel 8: (1). video camera settings: select 232 for the serial port number; select 2 for the video camera address; set the preset point 2; select the protocol in accordance with the actual device; adjust the upper, lower, left, right, focal length, light ring and other parameters, to align the video camera with the MIC of input channel 8, and click save button to save the save the preset point; (2) preset point control setting: select 1 for MIC number; select 2 for video camera address; select the protocol in accordance with the actual device; select 232 for the serial port number; set the preset point 2. Click enable the MIC setting; Click OK..

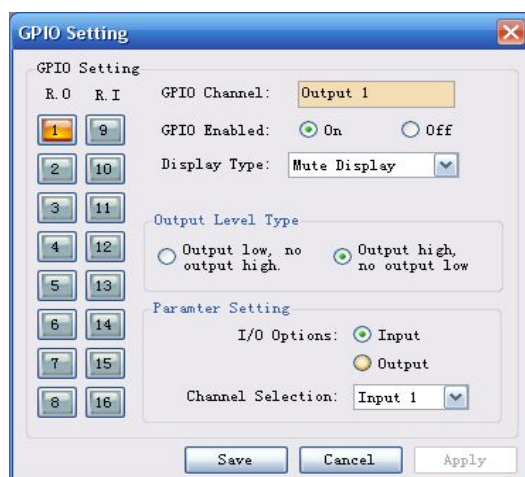
After two MICs and video camera are associated, select enable tracking and set the tracking threshold value, to realize the voice tracking control.

## **6) GPIO**

### **A. GPIO Setting**

The rear panel of the audio matrix device has GPIO muddle with DB25 socket. The output channels of the upper part of the DB25 socket are channels 1~8 (whose original state is high level output), among which channels 5~8 are OC (open-collector) output with reference (driving) voltage of +12 V and maximum output current of 60 mA, and channels 1~4 are common level output with reference voltage of 3.3 V. The maximum output current is 0.4 mA when it outputs high level and -30 mA when it outputs low level.

The input channels 1~8 of the GPIO are located in the lower part of the DB25 socket of the GPIO module. The inner part of the module is equipped with put-up resistor, so the module supports 3.3 V-12 V inputs.

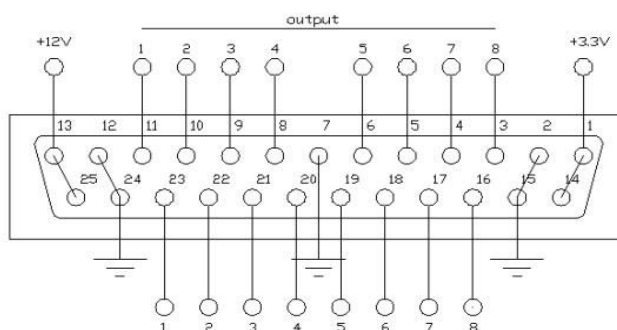


Choose one GPIO input/output channel number on the left and set the parameters of such selected channel on the right. The orange button showing certain channel number indicates that such GPIO channel is on, and the gray buttons indicate that the corresponding GPIO channels are off. Taking the above chart as example, the output channel 1 is on, and the rest channels are off.

GPIO Enabled indicates whether the settings are effective. Users can set the GPIO electrical level and parameters, and click “Save” or “Apply” to save such settings; but such operation is only to save the PIN parameters to the device, and only when the On/Off State is set at “ON”, such settings can become effective.

It is impossible to set several GPIO channels and submit the settings at one time. After setting one GPIO channel, click “Apply” button to save the settings before setting the next GPIO channel; and click “Save” to save the settings of the GPIO channel on the current page and exit from the current page.

## B. Definition and Wiring Demonstration of the GPIO Terminals



Two usages of GPIO:

The first usage is to output electrical level RO (RO 1~4 and RO 5~8), which means when the any parameter of the inside of the matrix changes (for example, certain channel is muted), output level of certain GPIO output pin will change subsequently and drive the external circuit;

Notes: RO 1~4 can only be connected to 12 V (can only be used with PIN-13 and PIN-25), and their outputs are OC outputs, their electrical levels are switchable, their driving current is high,

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and they are usually used to drive relays, buzzer or other devices with high power consumption; and outputs of RO 1~4 are ordinary electrical level outputs. The maximum output current is 0.4 mA when it outputs the high level and -30 mA when outputs at low level.

Inside of the audio matrix changes → electrical level of certain GPIO pin changes → driving external circuit.

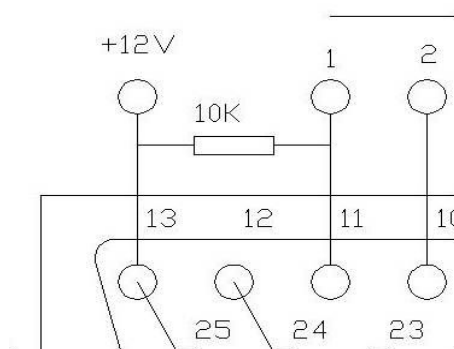
The second usage is input RI (RI 1~8), which means when the external circuit changes, the level of certain GPIO input pin will change subsequently and trigger certain parameter of the matrix to change.

State of external circuit changes → level of certain GPIO pin changes → certain parameter of the inside of the matrix changes

### Wiring Method of Output RO 1~4

Notes: RO 1~4 can only be connected to 12 V (can only be used with PIN-13 and PIN-25), and their outputs are OC outputs, their levels are switchable, their driving current is high, and they are usually used to drive relays, buzzer or other devices with high power consumption.

The 12 V reference OC output can be switched to 12 V output to be used as 12 V triggering signal for the linkage fire control.



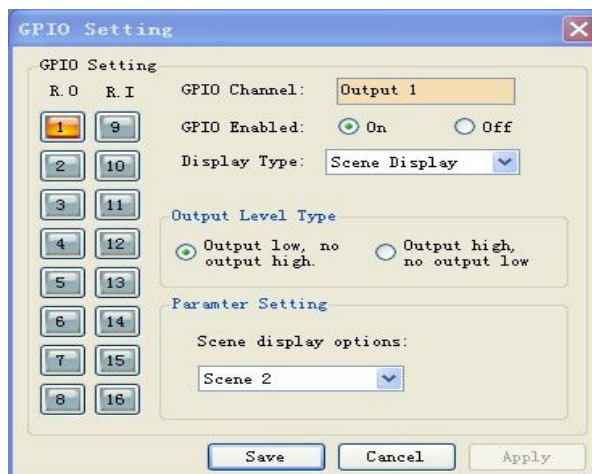
Notes: a 10 k resistance should be connected between PIN-13 and any of the RO 1~4 to switch the OC output to 12 V. As is shown in the chart, PIN-13 outputs constant 12 V voltage; PIN-11 corresponds to RO 8 that outputs 0 or 1 according to the changes of the matrix. Such level can be used to trigger another GPIO or other devices.

The following settings should be done on the PC after the GPIO is connected in accordance with the above methods:

After the device is connected to the PC → enter the GPIO Control interface → click RO 1:

- (1) If the Scene Display is selected, the scene loading is selected, the scene parameter is “Scene 2”, the output electrical level is “output low , no output high ”, and the GPIO Enabled State is “ON”.

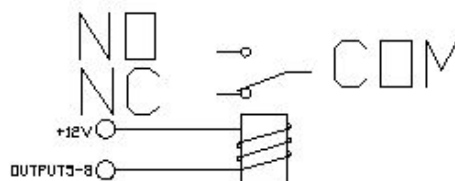




The settings will become effective after the “Apply” button at the bottom is clicked.

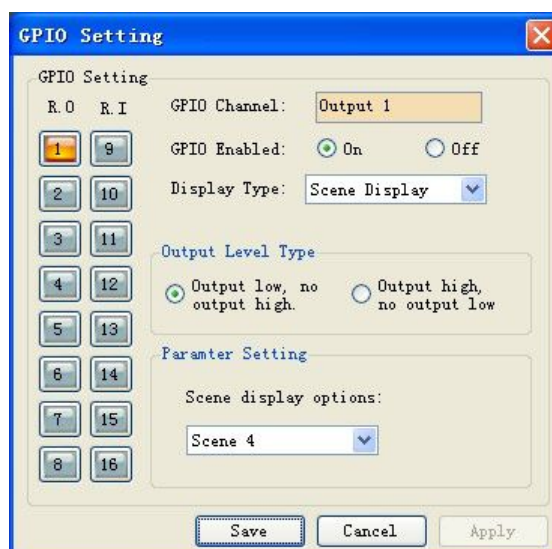
If Scene 2 is loaded on the scene management interface, PIN-11 (i.e. RO 1) will output 0, and remain the same before other scenes are loaded, at which time PIN-11 (i.e. RO 1) will output 1;

### Example 2: OC Output Drives a Relay (RO 1~4)



The relay can be used to control alarm devices or other device  
 PIN-25 outputs 12 V voltage and PIN 8-11 (i.e. RO 1 ~ 4) control the relay according to changes of the matrix state.

The scene type is set at Scene Display for RO 1 on the PC interface as follows:



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When Scene 4 of the matrix is loaded, PIN-11 (i.e. RO 1) outputs low level, there is current running through the relay, and the relay is switched; and when the matrix is switched to other scenes (such as Scene 3), PIN-11 (i.e. RO 1) outputs no level, there is no current running through the relay, and the relay is not switched.

The actions are opposite if “output high, no output low” is selected.

If RO 1 has other bidding parameters, such as level display, channel mute display, system mute display, etc., the working conditions of the relay will be switched according to the changes of the matrix parameters.

## 1.2 Wiring Method of Output RO 5~8

Notes: outputs of RO 5~8 are ordinary 5 V outputs. Working modes of RO 1~4 and those of RO 5~8 are consistent, but the output high voltage of RO 5~8 is 5 V. The maximum output current is 0.4 mA when it outputs the high level and -30 mA when outputs at low level.

### Example 1: Direct Electrical Output

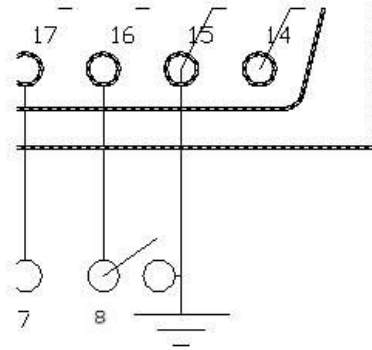
Settings of RO 8 on the PC interface are as follows:



When Scene 6 of the matrix is loaded, PIN 3(RO8) outputs low level (< 0.7 V); and when scenes other than Scene 6 are loaded, PIN 3 outputs high level (> 4 V).

## 1.3 Wiring Method of Input RI 1~8

### Example 1:



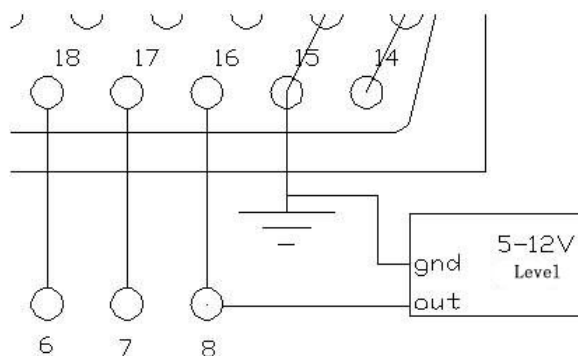
In the above chart, connecting switch of PIN-16 (RI 8) (inputs low level) is closed;  
 The settings are as follows when Scene Setting of RI 8 is selected on the PC interface: the matrix will load Scene 4 automatically if the level of the pin corresponding to RI 8 is “Falling Edge”.



If the state of the switch in the above chart is changed from “open” to “closed”, the level of PIN-16 will be changed from “high level” to “low level”, and then a falling edge will be formed so that the matrix will load Scene 4 automatically.

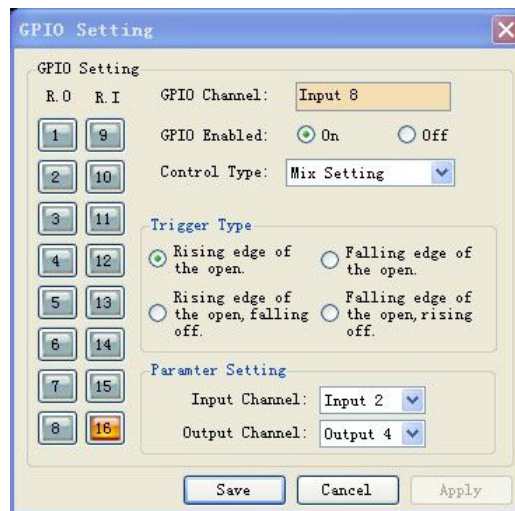
If the state of the switch in the above chart is changed from “closed” to “open”, the level of PIN-16 will be changed from “low level” to “high level”, and then a rising edge will be formed so that the matrix will remain the same.

**Example 2:**



As is shown in the chart, PIN-16 (i.e. RI 8) and PIN-15(grounding) are connected to a 3.3-12 V output system,

And then select Mixer Setting for RI 8 on the PC:



When the external triggering signals are rising from low values, PIN-16 (i.e. RI 8) generates a rising edge, which will cause the sound mixing function of the contact corresponding to the sound mixer to be turned on.

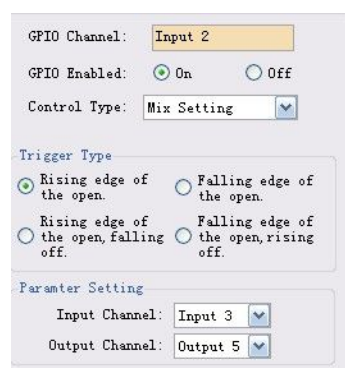
### C. Basic Attribute of GPIO Input Channel RI

- GPIO Channel: display the number of the input channel being set currently.
- GPIO Enabled: set the parameters of the channel at On state.
- Display Type includes Scene Setting, Mixer Setting, Volume Setting, Channel Mute Setting, Mute System and Serial Command Setting.

Control type has 2 basic attributes:

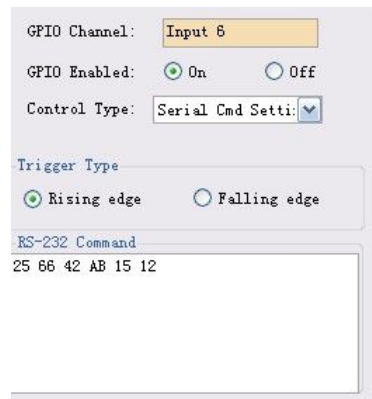
- Trigger Mode: categories of trigger types depend on control types, and there are at most 4 triggering modes (Rising Edge Trigger; Falling Edge Trigger; Rising Edge Selection and Falling Edge Trigger Cancellation; and Falling Edge Selection And Rising Edge Cancellation); and Rising Edge refers to the fact that electrical level of the GPIO input channel pins is changed from low to high; and Falling Edge refers to the fact that the level of the GPIO input channel pins is changed from high to low.
- Parameter Setting: parameter setting depends on control types, and different control types allow different parameter settings.

#### a) Mix Setting



When the GPIO Channel is input 2(RI10), the mixer setting should be selected as the Control Type. As is shown in the chart, when the level of GPIO input channel 2 is changed from low to high, the sound mixing contacts corresponding to input channel 2 and output channel 5 will be opened, and the signals of input channel 3 will be mixed and transmitted to output channel 5 and then the signals will be output. If the trigger type is trigger mode 4 (Falling edge of the open, rising off), the contacts corresponding to the input channel 3 and output channel 5 of the key sound mixer will be closed when electrical level of the pin of GPIO input channel 2 is changed from low to high.

### b) Serial Command Setting

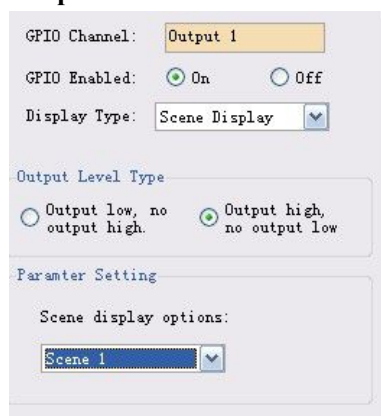


Parameter setting: input hexadecimal orders (0~9 and A~F). Two characters constitute one effective order, and if there is only one character, a 0 should be added before such bit, such as 03, 0A, etc. Bland space will be added after each two characters for the convenience of reading automatically by the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

As is shown in the above chart, the system will perform the hexadecimal order when the level of GPIO input channel 6 is changed from low to high.

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

### D. Basic Attributes of GPIO Output Channels:



- a) GPIO Channel: display the number of the output channel being set currently.
- b) GPIO Enabled: set the parameters of the GPIO channel at ON state.
- c) Display Type: scene display, level display, channel mute display and system mute display. Display type has two basic attributes:

---

Output Level Type: depends on display type and has only two modes. Categories of output level types depending on actual external inputs of the GPIO are as follows:

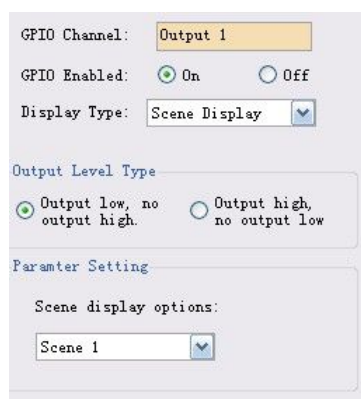
Output level type 1: output low, no output high: refers to the fact that GPIO outputs low level when the audio matrix meets the relevant outputting requirements, otherwise the GPIO outputs high level.

Output electrical level type 2: output high, no output low: refers to the fact that GPIO outputs high level when the audio matrix meets the relevant outputting requirements, otherwise the GPIO outputs low level.

#### 1) Parameter Setting:

Parameter settings depend on the display types. Different display types allow different parameter settings.

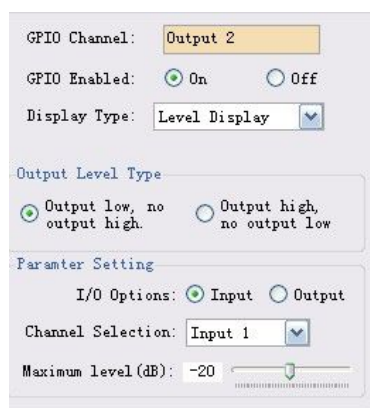
##### a) Scene Display



The screenshot shows the configuration interface for GPIO Channel 1. The 'GPIO Channel' is set to 'Output 1'. 'GPIO Enabled' is set to 'On'. 'Display Type' is set to 'Scene Display'. Under 'Output Level Type', 'Output low, no output high' is selected. Under 'Parameter Setting', 'Scene display options' is set to 'Scene 1'.

As is shown in the chart, pin of GPIO output channel 1 outputs low level when the audio matrix loads the default scene.

##### b) Level Display



The screenshot shows the configuration interface for GPIO Channel 2. The 'GPIO Channel' is set to 'Output 2'. 'GPIO Enabled' is set to 'On'. 'Display Type' is set to 'Level Display'. Under 'Output Level Type', 'Output low, no output high' is selected. Under 'Parameter Setting', 'I/O Options' is set to 'Input', 'Channel Selection' is set to 'Input 1', and 'Maximum level (dB)' is set to -20.

As is shown in the chart, pin of GPIO output channel 2 outputs low level when the level of audio matrix input channel 1 reaches -20dB.


#### 7) Device Update

To download the upgrade package from the official website, input the directory of the upgrade package in the address bar, and click "upgrade" to complete device upgrade. The device will reboot after upgrade, but manual connection is required.

## 2.2 Audio input module



Figure 23

The interface can display 8 channels at most, which can be switched by pressing  key; click the channel to switch the above functional module display box. See 2.1.2.3 for the channel information.

The input channel supports grouping function, and multiple channels can set to a group. When the gain of the group is adjusted, the gain of the subordinate channel is also changed. The grouping identification will be on the gain fader after grouping. The system provides two groups: one is GROUP group, to directly adjust the gain value; the other is DCA group, to adjust the gain percentage.

- 1) The above edit box displays the channel name, which can be modified.
- 2) The lamp indicates whether the channel has external control panel input, with 3 states: on, off and flash, which depends on whether call is allowed in the input source.



Figure 24

Lamp state	Whether call is allowed in the channel.	Whether there is panel MIC signal input in the channel.
On	Yes	Yes
Off	Yes / No	No
Flash	No	Yes

- 3) PRE/POST: the electrical level displayed is before or after fader.
- 4) Level display and input gain adjustment fader
- 5) Input gain

## 2.2.1 Input source



Figure 25

The sensitivity of MIC input and line input can be selected. High sensitivity indicates high acoustic-electric conversion efficiency of the MIC, and sensitive reflection of weak voice signal; Allow call: allow the access of panel signal to the channel. Down indicates access, and up indicates access is not allowed.

- Telephone input: allow the access of the phone module signal to the channel. Down indicates access, and up indicates access is not allowed.
- Mute: down indicates the channel enables mute, i.e. the input signal is shielded, and up indicates the channel signal is not mute.
- Test signals: including sine, pink and white noise. The parameters of the signal generator can be adjusted when pressed, the signal of the signal generator access the channel, and other input signals are no longer output;
- Phantom power: MIC input is provided with phantom power, for condenser microphone. It shall not be turned on in case of line input or non-condenser microphone, so as to prevent overburning;



---

## 2.2.2 Exp/Gate

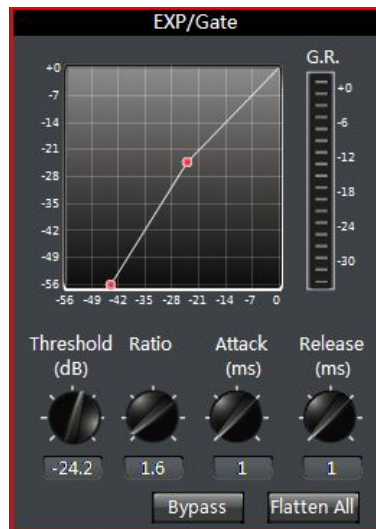


Figure 26

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

- Bypass: the signal input is bypassed and the signal will go directly to the next processing module. If it is pressed the expander will not be enabled; otherwise, the expander will be enabled.
- Ratio: the dB of dynamically changed signal input of the expander/the dB of dynamically changed signal output of the expander.
- Attack time: less than the time needed of the signal input of “threshold” of the expander from the entering into the expanding status to output by the setting of expanding ratio.
- Release time: the time needed for the signal input returning to the original non-expanding status from the expanding status.
  - All reset: all parameters are reset to the factory settings.

## 2.2.3 EQ

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



Figure 27 5 band paragraph EQ

- The equalizer is to compensate and correct the frequency characteristics to make it reach a true and straight frequency response characteristic.
- Bypass All: bypass all bands, the signal directly to the next processing module. Press down shows that EQ is disabled, when popped up shows the EQ is enabled.
- Band Bypass: Range through-pass: after equalizer adjustment, you can cancel the bypass of certain set frequency ranges. As long as you click to select the corresponding frequency range button, you can restore the original 0dB status, inactivating the bypass of this band without affecting others.
- Center frequency: the frequency that needs equalization processing shall be between 20Hz and 20000Hz. When we change the value, the icon of equalizer will also react synchronously.
- Gain: the gain/attenuation at the center of frequency. When the value is 0, the center frequency and Q value shall be invalid.
- Q value: It means the bandwidth of frequency point. The more the value, the larger the bandwidth will be.

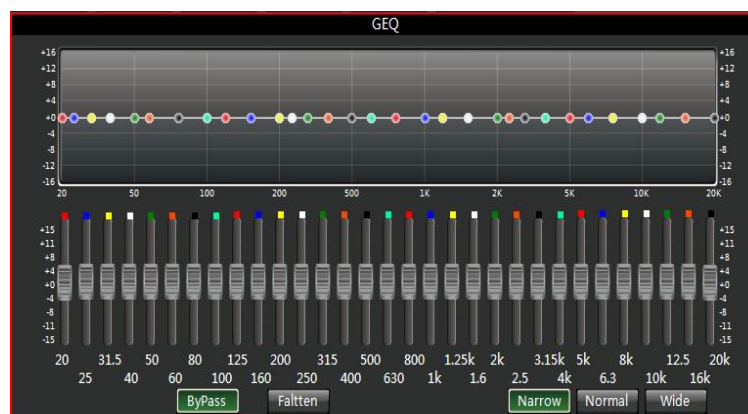


Figure 28 31 band graphics EQ

- Bypass: the signal input is bypassed and not be processed.
- Gain: the gain/attenuation at the center of frequency. When the value is 0, the center frequency and Q value shall be invalid.

- Flatten: all band gain recovery to 0dB.
- Narrow Band: bandwidth (Q), value is smaller than normal.
- Normal: bandwidth (Q), value is common bandwidth.
- Wide Band: bandwidth (Q), value is larger than normal.

## 2.2.4 Compress

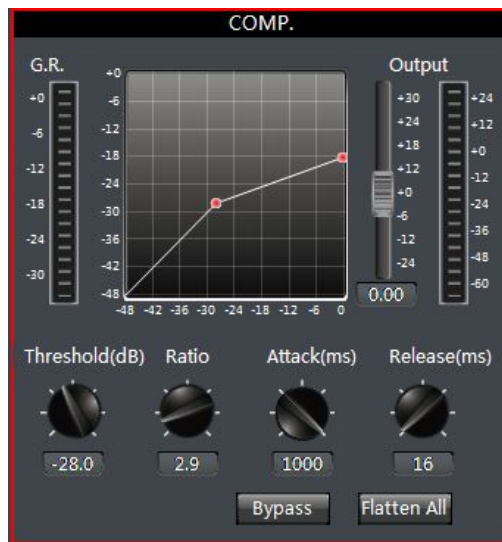


Figure 29

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

- Bypass: the input signal is bypassed and will not be processed. If it is pressed, the compressor will be disabled. Otherwise, the compressor will be enabled.
- Threshold: is the initial level of compression. When the signal is more than this limit value, the compression processing module will be enabled to compress the signal; when the signal is less than this limit value, the compression processing module will be disabled and the signal input will be fed directly to the output.
- Ratio: the compression ratio of signal over threshold.
- Release time: the time from the level input is less than preset value to that the compressor fully stops operating.
- Attack time: the time from the level input reaches the threshold to that the compressor starts.
- Output: the actually compressed level value.

## 2.2.5 AGC

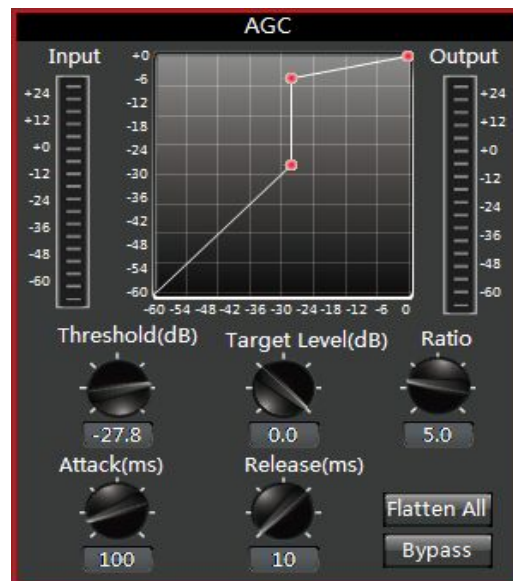


Figure 30

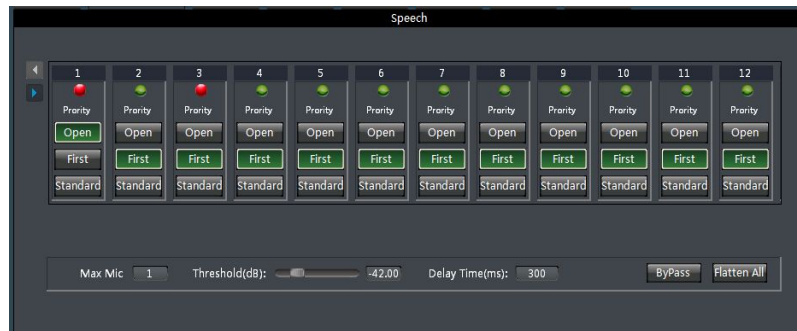
First, the function of AGC is described. For example, when the user speaks facing towards the microphone, the distance between the mouth and the microphone will fluctuate, causing fluctuating volume output. Though setting the threshold, AGC outputs the signal input by 1:1 if the level less than threshold while the level over the threshold will be directly raised by ratio. The target level is properly set so that the sound signal may be output stably.

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

- Input: the level of input automatic gain controller.
- Output: the level of output automatic gain controller.
- Threshold: it is the initial level of automatic gain. When the signal is less than this limit value, the automatic gain processing module will be enabled to gain the excessively small signal.
- Bypass: the signal input is bypassed and not be processed.

---

## 2.3 Speech



Speech: By this way, one or several mic outputs with higher voice can be chosen to reduce all kinds of noise, enhance S/N and reduce the comb filtering effect.

Bypass: If activate bypass, then all the inputs will not be controlled and output directly.

Priority: Divided into 3 levels as: Open, First, Standard. The opened channels are not limited by the maximum mics and threshold and output directly. But the First and Standard channels will. The level of First is higher than standard. Normally, Priority is chosen as "First".

Maximum Mics: Set up the maximum numbers of mic which output simultaneously (5 channels at most). Usually it is set as "1".

Threshold: Only when the electric level of inputs is higher than the Threshold and the maximum mics is not fully chosen will the channel have the output level. Normally, it is set around -20dB.

Delay time: Only when the level of one channel is lower than the threshold and reach the voice speed delay will the channels with the level higher than threshold have output.

Notes: Speech is optional; some models may not include this function.

## 2.4 Auto Mixer

In the meeting room, 10 microphones, if 10 microphones are open and have the same level, and only one person in the speech cause the remaining 9 microphones will pick up the room noise, reverberation sound, affect the audio quality. Secondly, because of these standby microphones, the effective acoustic components of the maximum gain before the sound feedback would relatively decline and cause volume inadequacy.

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

In the gain distribution type automatic mixer, a channel is not exactly open or closed, but located any state arbitrarily. Relatively speaking, if the volume channel is higher, the gain is higher too . If several channels volume are the same, then gains are equal. If a channel is almost no signal through, it almost no gain.

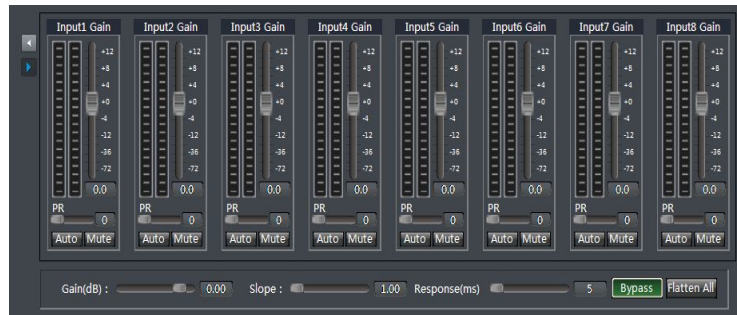


Figure 32

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

Channel control: each channel has an automatic "AUTO" button, turn on the channel into the automatic mixing. If you need a background music channel at a fixed level, or need to be a "chairman" Mic always remains in the open state, then you need to push the "AUTO" off button on the automatically key. When a channel to select "AUTO" off the automatically key, the gain will be automatically regulated, the channel signal level will not affect the other channel gain (such as no longer affects automatic mixer gain calculation).

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

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

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

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

If all channels of equal priority, please set all channel priority to 5.

Note: when the channel priority differences for extreme cases, such as 1 and 10, must be more

circumspect. High priority from the speaker up to very large signal, background noise, will "masking" out the low priority channel, even when it is not in use, higher slope value will further exacerbate the problem.

## 2.5 Ducker

Main function of ducker module: if the signal from one channel is selected as the control signal, the module is used to decrease the effect of the signal from its adjacent channel. Its main application includes conference rooms.

For example, if the audio input from the rostrum selected as the control signal, the audio output from others will be decreased when the main speaker speaks out and thus it seems there is only one person speaking.

Also for example, background music will be played during normal business in a shopping mall. When broadcasting a notice or tip, the music will be automatically closed at the time of human voice insertion and will be automatically restored after sound has been disappeared. Here the ducker is valid.

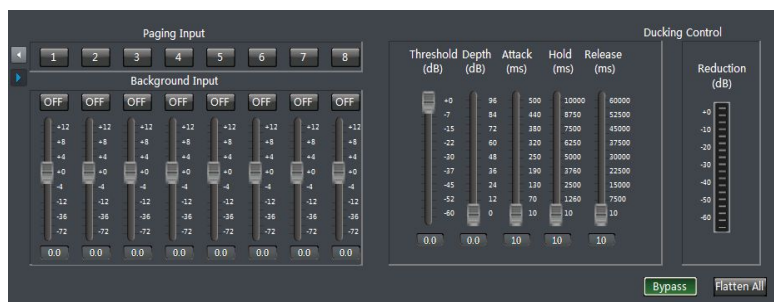


Figure 33

1. As shown in the input channel on the "on" / "off" button (the number of channels and devices are the same number of physical input channels), choose the way that needs to be dodge input channel "open" (the music signal channel), the channel will be automatically in the main mixer to open in DUCK signal in the other inputs can not be mixing process.

2. As shown in "paging input" in the menu, select it as a way to dodge the signal input channels (the MIC signal channel).

- Bypass : bypass the input signal and do not duck it.
- Threshold: the initial level for ducking, when the signal is above this limit, the ducker processing module will start to duck the excessively large signal.
- Depth: once the bypassing signal exceeds the threshold specified, the gain can be reduced by adjusting the range of the threshold.
- Attack time: the time to reduce the gain if the bypassing signal exceeds the threshold specified.
- Hold time: the time to hold the setting status when the gain is reduced.
- Release time: if the input signal is lower than the specified value, the audio channel will not be immediately shut down and a delay will be given based on the specified value. During the delay, the audio channel will be activated again if only the signal is greater than "Threshold".

- Level attenuation (Reduction): level after being processed by the module for a user's view.

## 2.6 SPL (Sound Pressure Level)

Automatic Noise Canceller module according to the ambient noise level automatically adjusts input signal level, input signal level increases as the ambient noise increased.

Such as a sports stadium, the appreciation in the audience concentrate on the game, the venue environment quieter, the sound output does not need at this time a great announcer, but when the audience cheers or warm atmosphere when the announcer's voice output will large, so as not to drown the voice of the audience. ANC role is to specify the output will increase as the ambient noise increases, when used as a monitor, monitor the surrounding noise, the other MIC as a working microphone, for voice input.



Figure 34

1. The "on" / "off" button (the number of channels and devices are the same number of physical input channels), choose to work the way that the signal channel input channel "open" (the broadcast channel), the channels will be automatically in the main mixer in the SPL signal to open, in the other inputs can not be mixing process.

2. As shown in "sense input" in the menu, select the microphone that monitors all the way as the input channel.

- Gain display: top window shows the gain through the module (assuming there is no bypass).
- Bypass: press the button to bypass the module and the input will be sent to the output without change.
- Maximum Gain: the maximum allowable signal gain in dB, it defines the upper limit of output volume when the ambient sound is very loud. It can be adjusted by the fader, or click on the file to enter a dialog box and directly define a value. This value cannot be less than the minimum gain.
- Minimum Gain: it defines the most insignificant sound output when the ambient is very quiet. The fader can be adjusted, or click on the file to enter a dialog box and directly define a value. Step for fine-tuning 0.01 dB. This value cannot be more than the maximum gain.
- Gain Ratio: control the gain changes relative to the change of peripheral level. If the value is set to around 1.0:1, it means the level increases / decreases by 1dB, SPL gain will increases / decreases by 1dB. A higher value, such as 2.0:1, means as compared with the increase of peripheral level, the gain increases even more and is often used in noisy environments. A lower value, such as 0.5:1, means the increase of peripheral level by 1dB, the gain only increases / decreases by 1dB and thus the effect is less obvious than before.
- Speed: control the change rate of module, it shows in seconds. longer time means when the peripheral level changes, the gain gradually increases or decreases; and vice versa.



- 
- Gap threshold: level control when the audio (program) level is so low that it can be regarded as “intermittent”. when the audio (program) level is lower than the level and the duration is at least the intermittence time, the intermittent detection LED will light up and SPL will respond to the peripheral level. When the audio (program) level is higher than the level, SPL will not be adjusted according to the peripheral level. In the case, the level must be set so that the LED can also light up when the audio (program) signal is so weak that the microphone is unable to pick up enough program signal and the signal picked up is almost the ambient noise. For the place where signal is too weak, the gap threshold can be increased to eliminate those signals, for example, slight sound from music channel. If a audio (program) signal is frequently intermittent (for example, the background music with visible intermittence), the threshold should be set lower or slightly more than the background noise of the audio signal. Only in this way, the music and paging can be detected.
  - Gap Time: control the time with which an audio signal can be regarded as “intermittent” (less than the intermittence threshold), it shows in milliseconds. This setting can be used to compensate the reverberation time of the relatively “active” room (reverberation time is too long), or in other words, to eliminate reverberation “tail” in paging broadcast or audio signals. In general, the value is set to 100-200ms; for excessively “active” rooms, it is required to set it at 1S or above.
  - Gap Interval: if there is no intermittence in a program, the module will generate intermittence by temporarily muting the audio signal.
  - Gap Detection: intermittence detection LED. If intermittence is detected, the LED will light up and the module will response to the pickup input.
  - Forced Gap : immediately forced intermittence key. Press the button to temporarily mute the audio signal so that a piece of intermittence and pickup can be generated.
  - Reset All: clear these values. This feature can be used to monitor the noise level around the room.
  - Calibration: force threshold value to the current level meter reading.
  - Threshold: pickup threshold control. When the pickup input level is at the threshold, the module gain will not change. For the calibration of the threshold, set it at the average of the ambient level in the room. The level meter provided can show the RMS (root mean square) value of the input level currently picked up the for reference. A fader or input data can be used to adjust the threshold and the calibration key can force the threshold to be set at the current level meter reading. Theoretically, not show signal, it should be calibrated to the average of the ambient level.
  - Gain Display: the window top shows the gain through the module (assuming there is no bypass).
  - Minimum Value : the minimum ambient level after resetting that for a user to view.
  - Maximum Value: the maximum ambient level after resetting that for a user to view.
  - Peripheral Level : the initial background noise, including the echo of room audio.

---

## 2.7 Telephone control

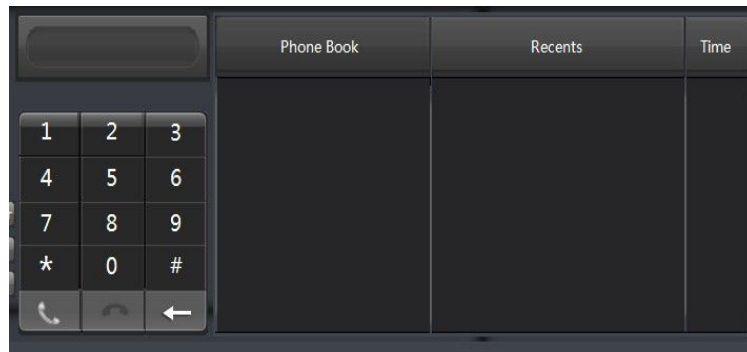


Figure 35

The module can only be used for device with telephone, and the device only provides a telephone interface. Therefore, it is required to select "telephone input" in the input source.

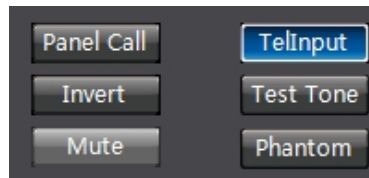


Figure 36

The remote telephone signal will enter the selected input channel, and processing of the rest is the same with the analog signal.

Meanwhile, it is also required to set the signal output to the remote end: select the channel required to be output to the remote telephone, and select telephone output in the output setting of the channel:

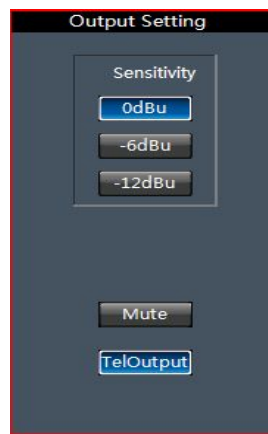


Figure 37

The signal of the output channel will be output to the remote telephone.

## 2.8 Feedback Canceller

AFC Feedback Canceller can auto-detect and suppress sound's feedback. It can distinguish voice and feedback clearly. When the feedback is detected, the module will add a notch filter and reduce the feedback frequency.

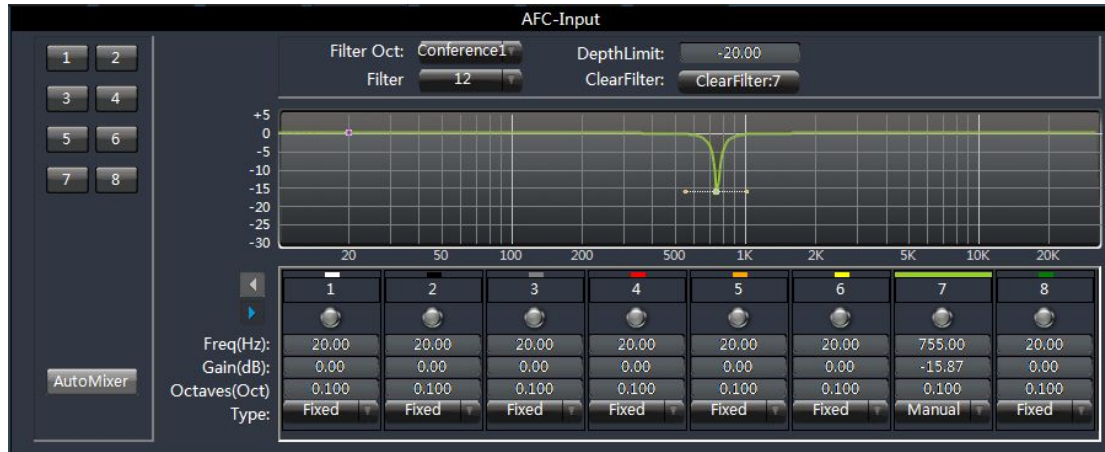


Figure 38

- Filter Oct: there are four kind of mode in the list, they are “Conference 1”, “Conference 2”, “Music 1” and “Music 2”. The sensitivity of the modes is different as well as the gain value and the bandwidth value.
- Filter: can select 12 or 16, default one is 12.
- Depth limit: range of notching depth is from 0dB to 20dB.
- Clear Filter : clear data on filters.
- Frequency: show feedback frequency.
- Gain: show filter notching gain value.
- Octaves: show filter notching bandwidth value.
- Type: Static, Dynamic and Manual. Static Type and Dynamic Type support auto-detecting, Manual Type means user need to set the parameter manually. Once the frequency point was set to Static, it cannot be revised or covered until the user clean the points manually. Dynamic frequency points cannot be revised and they will cover previous point once all points are used. When select Manual Type, user can revise frequency point, gain value and bandwidth value.

---

## 2.9 AEC



Figure 39

Set the echo to be processed through the feedback canceller, and the signal processed can be output in "from" of the output part.

Proximal end input: the signal input from local MIC and requiring echo processing.

Remote input: reference signal.

## 2.10 EX-Plus Audio Mixing

- The working mode of EX-Plus is to transmit audio signal by means of custom DIGI-EXP bus and the bus supports to transmit a maximum of 128 channels' signals simultaneously. The signals on the bus can be recognized through their "Device Number" and "Channel Number". The range of device' s number is 1 to 8 and each device has a revisable device (default setting number is 1). The range of channel' s number is 1 to 16 and each device can simultaneously send 16 channels' signals to the DIGI-EXP bus, and the device also can simultaneously receive 16 channels' signals from the DIGI-EXP bus.

- It supports 4 EX-Plus units to cascade together by using shielded crosswire and the length of the crosswire must less than 1 meter. EX-Plus will output the signal to the DIGI-EXP bus and other units will receive the signal from the bus to appointed output channels by setting "Device Number" and "Channel Number".

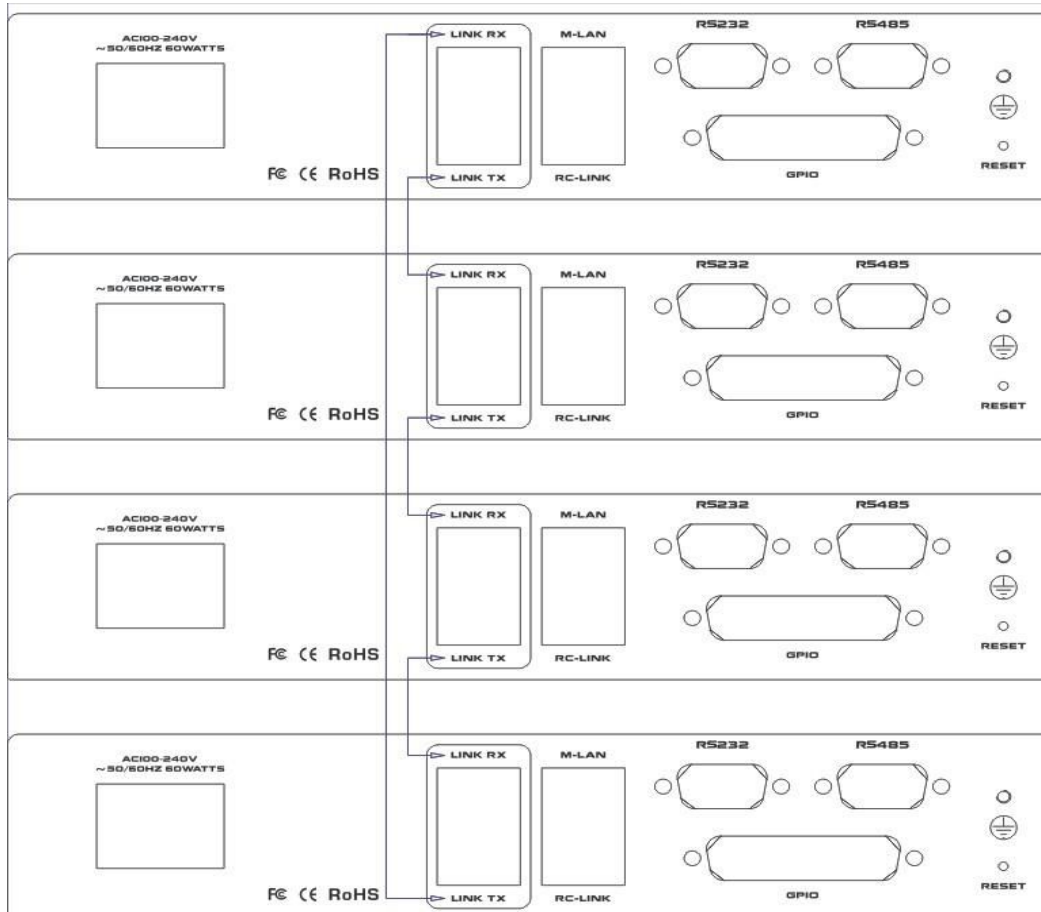


Figure 40

- There are two kinds of EX-Plus, one is principal, the other is subordinate.
- Time synchronizer will work when EX-Plus starts to transmit signals. Time synchronizer of subordinate EX-Plus will follow principal one and only can set one EX-Plus principal when several devices cascaded. If there are two principal EX-Plus or all of EX-Plus are subordinate type, the quality of transmission will be lowered.

### 2.10.1 EX-Plus Sending End setting

Status			Link Output1				Link Output2				Link Output3			
Receive	Device:	Channel:	Local Input				Local Input				Local Input			
<input checked="" type="checkbox"/>	1: 7	1	1	2	3	4	1	2	3	4	1	2	3	4
	2: 7	2	5	6	7	8	5	6	7	8	5	6	7	8
	3: 7	3	9	10	11	12	9	10	11	12	9	10	11	12
	4: 7	4	13	14	15	16	13	14	15	16	13	14	15	16
	5: 7	5	AFC		AEC		AFC		AEC		AFC		AEC	
	6: 7	6	AutoMixer		ANS		AutoMixer		ANS		AutoMixer		ANS	
	7: 7	7	Link Input				Link Input				Link Input			
	8: 7	8	1	2	3	4	1	2	3	4	1	2	3	4
	9: 7	9	5	6	7	8	5	6	7	8	5	6	7	8
	10: 7	10	9	10	11	12	9	10	11	12	9	10	11	12
	11: 7	11	13	14	15	16	13	14	15	16	13	14	15	16
Device Index:	12: 7	12	Link Input				Link Input				Link Input			
7	13: 7	13	1	2	3	4	1	2	3	4	1	2	3	4
Device Type:	14: 7	14	5	6	7	8	5	6	7	8	5	6	7	8
Master	15: 7	15	9	10	11	12	9	10	11	12	9	10	11	12
	16: 7	16	13	14	15	16	13	14	15	16	13	14	15	16

- There are 16 “Link Output” channels, which were marked from “Link Output1” to “Link Output16” . All local signals can be mixed to each “Link Output” for sending.
- Shown as image above
- Device Number is 2 and Device Type is Principal.
- Signal from channel “Link Input3” from previous EX-Plus will join into channel “Link Output1” of the receiver and then be sent to the bus.
- And signal from Local Input Channel 1 and 2 will be mixed to “Link Output2” then be sent to the bus.

## 2.10.2 EX-Plus Receiving End Setting



- There are 16 “Link Input” channels in list, which were marked from 1 to 16. Each “Link Input” channel only can select one “Link Output” channel to receive and all “Link Input” channels can select any one of “Link Output” channel to receive.
- Shown as image above
- Device Number is 3 and Device Type is Subordinate.
- “Link Input1” will receive signal of “Link Output1” which is from EX-Plus number 2.
- “Link Input4” will receive signal of “Link Output4” which is from EX-Plus number 1.

---

## 2.10.3 EX-Plus Receive Signals and Output to Local



- How to mix link output to local output?
- Select an output channel and choose source from "Link Input".
- Shown as image above
- "Link Input1" and "Link Input2" will be mixed to local output.

## 2.11 Cobranet Mixer

### 2.11.1 Cobrane Receiver Setting

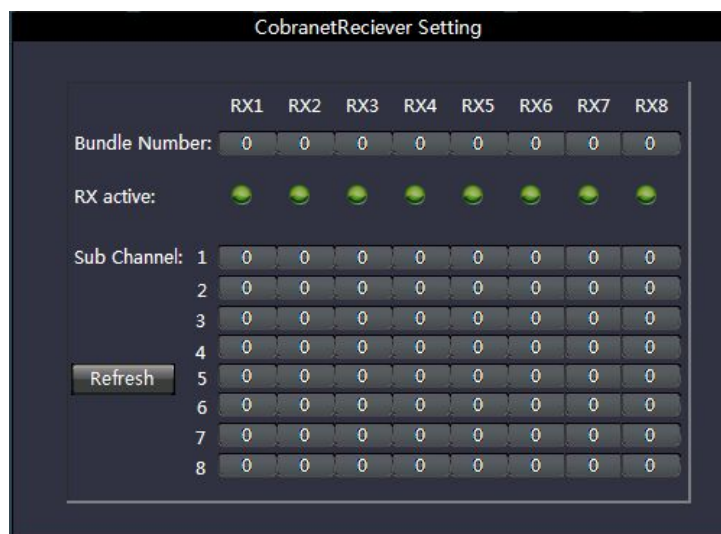


Figure 42

- Bundle No.: receive the Bundle number from the sending end. For the value range and setting method, see the sending setting.
- Priority level: the receiving priority compared with other bundle numbers. The larger the value is, the higher the priority level is. If the levels are the same, the principle of first-come, first-served shall be followed. It is only effective when the network processing capability is insufficient. The value range is between 0 and 255.
- Activation state: the green lamp is on with sending end, and the gray lamp is on without sending end.
- Sub-channel: the corresponding channel under the bundle number. Each bundle number is allowed to carry 8-way audio data at most at the same time. The value range is 0 and 33-64. 0 indicates not use, and 33-64 correspond to the analog output 1-32 respectively, which can be modified according to the specific circumstances.

## 2.11.2 Cobranet Output



Figure 43

The COBRANET output has 8 ways, COBRANET output 1 to COBRANET output 8. The corresponding setting can be conducted for each COBRANET output . The COBRANET output 1 is taken as an example in the above figure:

- Local input: 16 signal input locally and signal with feedback / echo / automatic audio mixing processing;
- COBRANET input: COBRANET input signal received locally.
- After the local input and extended input are set, the system will automatically select the channel signal mixing to the corresponding COBRANET output.

As shown in the above figure: the signal output of COBRANET output 1 is the audio mixing of signals from channel 2 and channel 6, signal through automatic mixing and signal of local COBRANET input 3 and local COBRANET input 6



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## 2.11.3 Cobranet Transmitter Setting

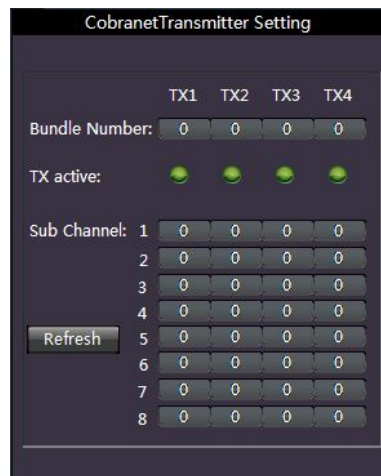
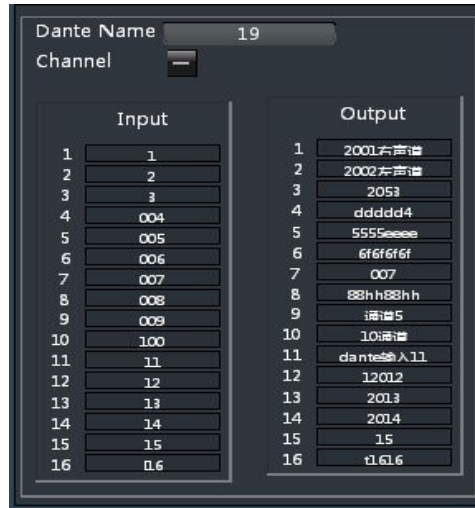


Figure 44

- Bundle No.: each device is allowed to be set with 4 sending Bundle numbers at most. 0 is the invalid number, 1-255 is the multicast number segment, 256-65279 is the unicast number segment, and 65280-65535 is the custom number segment. Input the Bundle number in the edit box, press enter, and wait for device return. Refresh the edit box, until there is data, and then setting is successful (the refreshing speed is fast usually). Note: only when the Bundle number of the sending end of a device is identical with that of the receiving end of another device, a sending -> receiving connection can be determined.
- Sub-channel: the corresponding channel under the bundle number. Each bundle number is allowed to carry 8-way audio data at most at the same time. The value range is 0 and 33-32. 0 indicates not use, and 1-32 correspond to the analog output signal 1-32 respectively, which can be modified according to the specific circumstances.

## 2.12 Dante Mixing

### 2.12.1 Dante Name Setting



Pic ① Dante Name, Input channel name, output channel name setting

Dante Name Setting: mainly set the name of Dante equipment, each input and output channel.

Dante Name: Name of the equipment in Dante networking, can be revised. Note: This name can't be the same of other Dante equipment. Another equipment can be confirmed connection of Send-Receive by choosing the name.

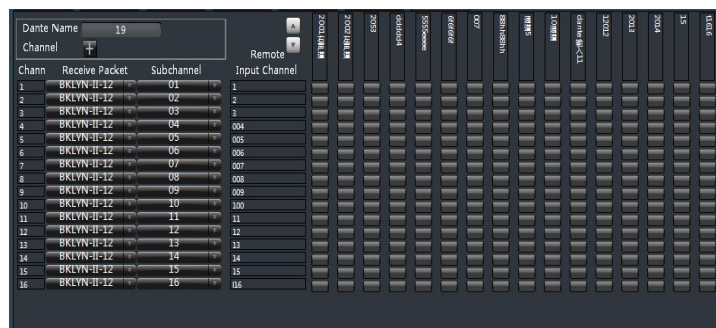
Dante input channel number: Non-revisable.

Dante input channel name: can be revised revisable, but name of the inputs can't be the same under one Dante device.

Dante Output channel Number: Non-revisable

Dante Output channel name: revisable.

### 2.12.2 Dante Receive Setting



Pic ② Dante Receive Setting

Dante Receive Setting: mainly set the Dante outputs channel name of the equipment; receive the signal of the appointed output channel from the designated Dante equipment.

Channel: i.e. Dante input channel number in pic ①, non-revisable.

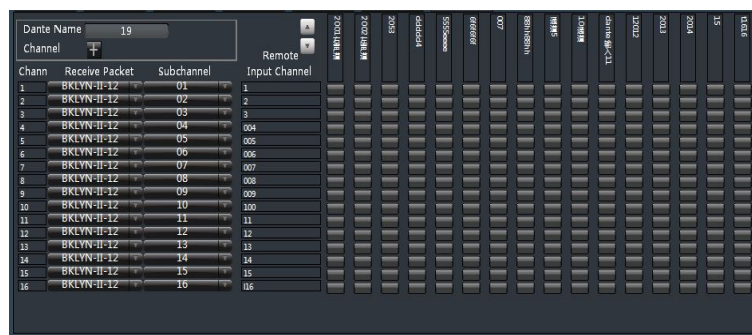
Remote input channels: i.e. Dante inputs name in Pic ①--- channels that receive the signal via Dante.

Receive Data Packet: Click to reveal current online Dante equipment that can be searched. By choosing this Dante name, one can confirm connection of Send-Receive.

Sub-channel: Click to reveal all the input channels of the designated Dante equipment, choose a certain channel to final confirm Send-Receive connection.

## 2.12.3 Dante Send Setting

### (1) Remote Input Channel Send Setting



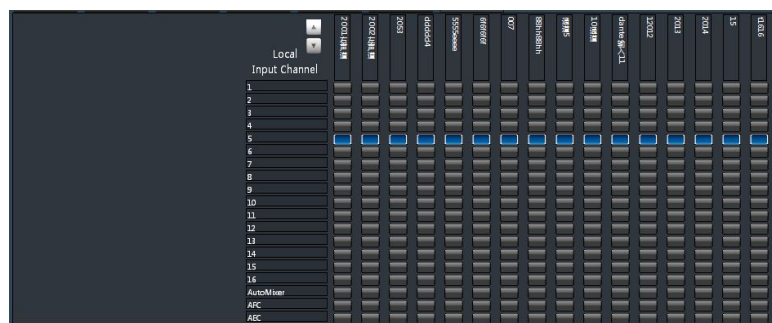
Pic ③ Dante remote send setting

Remote inputs channel: i.e. Dante inputs name in Pic ①---channels that receive the signal via Dante.

Remote outputs channel: i.e. Dante outputs name in Pic ①---channels that receive the signal via Dante.

Remote inputs channel send setting: Resend the received Dante signal via Dante. See the pic: mix the received data packet one by one to the Dante outputs channel, and then send out.

### (2) Local Input Channel Send Setting



Pic ④ Dante local send setting module

Local Input Channel: The results of local analog inputs processed with certain algorithms, non-revisable.

Remote Output Channel: i.e. Dante outputs name in Pic ①---channels that receive the signal

via Dante.

Local input channel send setting: The results of local analog inputs processed with certain algorithms, send out via Dante. As the pic shows, set signal of local analog input No.3 and No.12, send out via the relevant Dante channel.

## 2.13 Audio output module

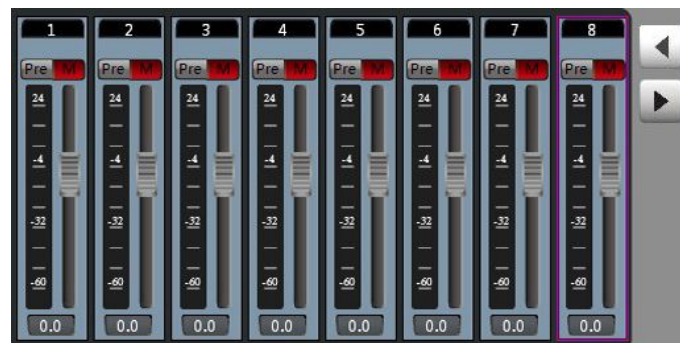



Figure 45

The interface can display 8 channels at most, which can be switched by pressing  key; click the channel to switch the above functional module display box. See 2.1.2.3 for the channel information.

The input channel supports grouping function, and multiple channels can set to a group. When the gain of the group is adjusted, the gain of the subordinate channel is also changed. The grouping identification will be on the gain fader after grouping. The system provides two groups: one is GROUP group, to directly adjust the gain value; the other is DCA group, to adjust the gain percentage.

- The above edit box displays the channel name, which can be modified.
- PRE/POST: the electrical level displayed is before or after fader.
- Level display and output gain adjustment fader.
- Output gain

### 2.13.1 From



Figure 46

Select the input signal from which the output channel signal are taken. If more than one signals are selected, then the signal are superimposed for output.

## 2.13.2 Speaker Manager

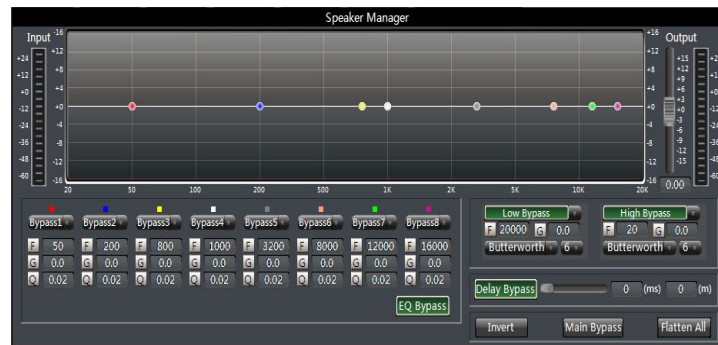


Figure 47

### (1) EQ

There are 8 bands for output parameter equalizer and each band can individually adjust center frequency, gain and Q value (bandwidth) to reinforce or weaken the signal in some bands and accordingly to achieve different effects. Each point on the equalizer can be dragged without limit. The parameters for the selected band will change accordingly.

- Flatten All : restore all bands to the status at 0 dB.
- Band Bypass: after adjusting EQ, a user can cancel the bypass which has been set for some bands. A user can restore a band to the status at 0 dB by selecting the corresponding button to that band. Bypass can only affect the band and cannot affect others.
- Center Frequency: the frequency to be balanced. When some numbers need to be changed, the graph in the graphic equalizer will be accordingly synchronized.
- Gain: the gain/attenuation in a center frequency. When this value is 0, both the center frequency and Q value are invalid.
- Q Value: frequency band block. The greater the value is, the greater the bandwidth will be.

### (2) XOVER (Crossover)

Xover can distinguish the sound signals of different frequencies.

- High-Pass Flat: bypass switch to prevent signal from being processed by a high pass filter; the selection of this item indicates the channel does not start the filter.
- Low-Pass Flat: bypass switch to prevent signal from being processed by a low pass filter; the selection of this item indicates the channel does not start the filter.
- High-Pass Gain: the gain/attenuation output by a high-frequency signal after processed.
- Low-Pass Gain: the gain/attenuation output by a low-frequency signal after processed.
- High-Pass Frequency: frequency settings for high pass filter.
- Low-Pass Frequency: frequency settings for low pass filter.

---

### (3) Output Gain

If “MAIN BYPASS” is selected, the limiter will be enabled, otherwise, it will be disabled. The output gain control parameter settings are mainly adjusting the output gain. The output gain after a series of functional processing above mentioned can be adjusted by changing the setting value.

- Input Level: shows the input signal before it is processed by the speaker manager module.
- Output Level: show the output signal after it is processed by the speaker manager module.

### (4) Delay

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

## 2.13.3 Limiter

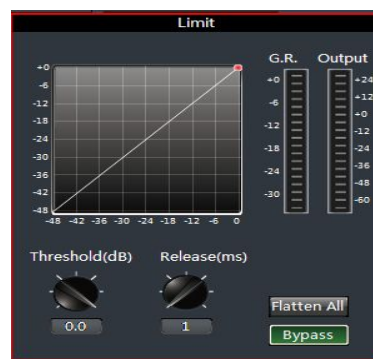


Figure 48

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

- Bypass: The signal input is bypassed and not be processed.
- Threshold: the initial level for limiter; when the signal is above this limit, the limiter processing module will start to limit excessively large signal.
- Release Time: if the input signal is lower than the threshold, it will not immediately turn off the sound channel but rather delay the closing time according to the specified value. As long as some signal is larger than “Threshold” during the delay, the sound channel will continue to open.
- Output Sensitivity: is used to adjust the sensitivity of output level.
- Audio Effect Level: is used to show the processing effect of signal after the limiter.
- Output Level: used to show the output signal after processed by the limiter.

---

## 2.13.4 Output setting

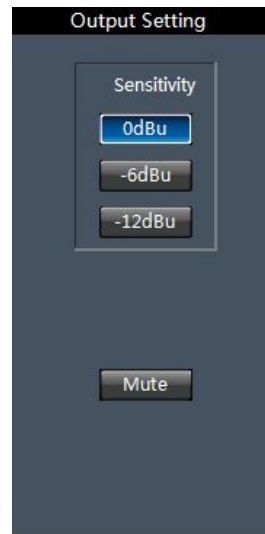


Figure 49

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

---

## 2.14 Center Control Command Generator Operation

### 2.14.1 Easy Generated Center Control Command

Open Smart2.0 Software; choose “Center Control Command” in the drop-down box under “Local Setting” menu. The Dialog box pops out--- It is the Center Control Command Generator.

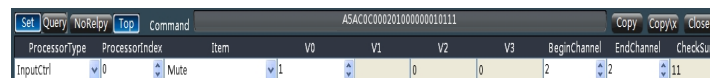
Operating on the software interface, it will simultaneously generate the corresponding command in the Center Control Command Generator.


Example 1: Input channel 2 mute command




Click “M” of input channel 2 on the software interface, then the Center Control Command Generator will reveal the command code.

### 2.14.2 Center Control Command Generator Operating Instruction



Set: The button under the status of clicked  , the current generated center control command is the control command.

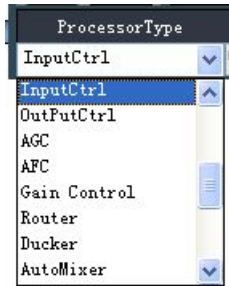
Query: The button under the status of clicked  , the current generate center control command is the search command

No reply: The button under the status of clicked  ; each command that sent out via Center Control will have its corresponding reply command; through the reply command, one can check whether it was set successfully. Otherwise, there will be no reply command.

Top: The button under the status of clicked  ; then the Center Control Command interface will always be current display window.

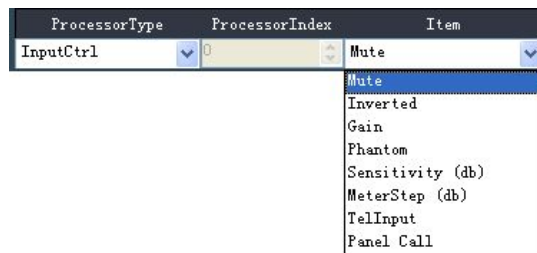
Processor Type: Choose the module need to be controlled. The module corresponds to the input and output module on Smart2.0 PC Interface. Eg: To control Mute of Input channel 1, then choose the “InputCtrl” under “Processor Type”. Because the Mute function on Smart 2.0 PC interface is included in Input source Module, to control Mute, “Input Ctrl” needs to be chosen.





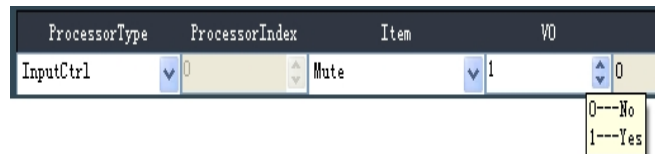
Item: To choose the control items of the processor type.

Example: To control Mute of Input 1, after chose the processor type, choose “Mute” under “Item”.



Choose the detailed parameter in the control item of Processor Type.

Example: To control Mute of Input1, 0 represents cancel mute, 1 means mute.



Note: Detailed control parameter will be differ based on the change of the control item

Choose “Load”, it will be the selection of scene number.



Choose “Mixer”, then it will be the selection of input and output channel number.



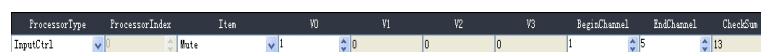
Note: in the above pics, some of the control parts are in gray color. It means the corresponding parameter is invalid. Like the “ProcessorIndex”, “Group”, “V2”, “V3” in “Load” and “ProcessorIndex” “V3” u Mixer control.

Begin Channel/End Channel: Choose the channel need to be controlled.

Example: To control Mute of Input 1



Example: To control Mute of Input 1 to Input 5



Checksum: Checksum in Center Control Command, it will be automatically generated by the specific control parameter.

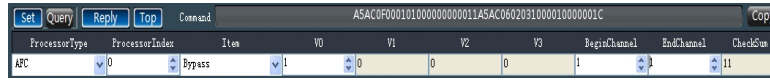
Center Control Command: It will automatically generate the center Control Command by

---

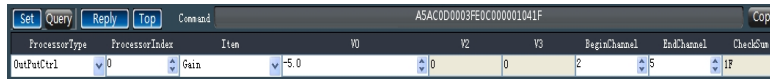
the specific control parameter.

Copy: Quick operation button of copy.

Example 1: Enable AFC of Input1, choose “AFC” under “Processor Type”; choose “0” under “V0”; choose “1” under both “Begin Channel” and “End Channel” then the command thus generated will enable the “AFC “ button of input 1.



Example 2: To control gain as -5 of input 2 to input 5: choose “Output Ctrl” under “Processor Type”; choose “Gain” under “Item”; input “-5” in “V0”; set “Begin Channel” as 2, “End Channel” as 5; then the command thus generated will be Channel gain of input 2 to input 5 as -5.



Note: Please refer to the Center Control Command Protocol as to check what a certain value represents in the command.

---

## III.FAQ

**★ Question: *What configurations shall be made when the system is used for the first time?***

- **Answer:** When this system is used for the first time, the following steps shall be followed:

- ① Read the instructions carefully, especially the safety precautions.
- ② Connect PC port, device, audio input and output device according to the instruction in the rear panel. Firstly, PC and devices can be connected via LAN (for other connection mode, pay attention to the location of the interface needed). Secondly, connect signal input devices (MIC and LINE input devices); Finally connect output devices (power amplifier and other devices).
- ③ The defaulted IP address in the factory is “192.168.10.10”. If there is no address of “192.168.10.10” network segment in the PC, please add at least one address of this network segment in the PC so that the device can be normally connected. The adding process is as follows (the following shows the process adding IP in XP system): Right click network computer ->Attribute->Local Connection-> Attribute ->Select Internet protocol (TCP/IP) in “Series of item used of this connection”, click attribute ->advanced->Click “Add” in the IP column->Input IP address such as “192.168.10.101”, sub-network mask “255.255.255.0”->Add->OK->OK;
- ④ Plug in the power, and then test the connection in the device. For details refer to: PC -> Menu Bar -> Local Settings ->Device list. Press the “CONNECT”, successfully connected devices when the “CONNECT” button change to “DISCONNECT”.
- ⑤ If Step 4 is normal, enter the device configuration stages.

**★ Question: *There is no voice from the output?***

- **Answer:**

- ① Check whether the input and output interfaces are connected correctly.
- ② Check whether there is any voice from the input source and make use of line input mode for testing.
- ③ Check the Mute parameters of channels corresponding to input and output and the corresponding levels.
- ④ Check mute parameters and level value of the channel that the input and output correspond to.

**★ Question: *The output audio quality is poor and the output sometimes rustles?***

- **Answer:**

- ① The output audio quality has close relationship with input and output levels. Usually, the input/output levels are less than -10dB. Adjusting other parameters can gain better result. Check other parameter settings, such as EQ and crossover.
- ② The signal generator may generate some noise and check whether it is turned off.
- ③ The noise gate can filter white noise in the absence of human voice. Enable the noise gate and then check the audio quality.
- ④ MIC input will produce echo. The audio quality can be improved by enabling the feedback suppressor.

In short, any error can be reported to us by "Help -> Contact Us". This may help us to diagnose the overall performance of the product and to make further improvement in the future versions.