

# Operation Manual

PX-3000 AUDIO MATRIX

RM-3088 REMOTE MICROPHONE STATION

LM-3088A REMOTE WALL PANEL



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# Contens

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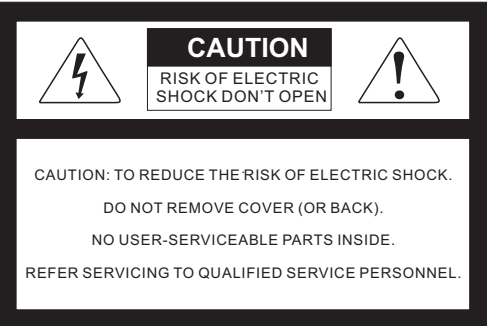


# Welcome

Thanks you for choosing our products, we will always provide innovative, advanced, reliable products like before.

We are sincerely trust these products will provide years of satisfactory service, but if anything is not to your complete satisfaction, we will endeavor to make things right.

Welcome to us again, and thank you for becoming part of our worldwide extended family!

# Warning

 <p><b>CAUTION</b> RISK OF ELECTRIC SHOCK DON'T OPEN</p> <p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>	 <p>This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.</p>  <p>This symbol is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying the appliance.</p> <p>Caution: To prevent electric shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.</p>
<p><b>WARNING</b></p> <p>To prevent fire or shock hazard, do not expose the unit to rain or moisture.</p>	<p>Attentions: Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant on une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.</p>
<p>* Do not install this equipment in a confined space such as a book case or similar unit. * The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such vases, shall be placed on the apparatus. * Worded: "WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING-WATER AND MOISTURE: Unit should not be used near water(e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so than objects do not fall and liquids are not spilled into the enclosure through openings."</p>	
<p><b>Service Instructions</b> * Worded: "Caution: These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so." * Location: Instruction Manual.</p>	
<p><b>NOTE</b> : This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</p>	

## Installation Environment

Installation this system is not difficult and complex. But you still need to spend some time to read this manual and ensure the connection and installation is exact.

Never place this product in an environment which could alter its performance or reduce its service life.

Such environments usually include high levels of heat, dust, moisture, and vibration.

## Important Safety Instructions



1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer' s instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

### - **Avoid excessive heat, humidity, dust and vibration**

Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity-such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation, or to vibration that could cause mechanical damage.

### - **Avoid physical shocks**

Strong physical shocks to the unit may cause damage. Handle the unit with care.

### - **Do not open the case or attempt repairs or modifications yourself**

This product contains no user-serviceable parts. Refer all maintenance to qualified our service personnel. Opening the case and/or tampering with internal circuitry voids the warranty.

### - **Always power off before making connections**

Always turn the AC mains OFF before connecting or disconnecting cables. This is important to prevent damage to the unit itself as well as other connected equipment.

### - **Handle cables carefully**

Always plug and unplug cables (including the AC mains power cord) by gripping the connector, not the cord.

### - **Clear with a soft dry cloth**

Never use solvents such as benzine or paint thinner to clean the unit. Wipe clean with a soft, dry cloth.

## SYSTEM OVERVIEW

The PX-3000 series audio matrix (20 bus voice alarm system) is a new public address system and commercial audio system with highly competitive. The audio and control signal are based on the bus-type to transfer, therefore this whole system with excellent feature including: compact device, high integration, powerful functions, flexible and convenient control, completed logic control port. For the contractor and the audio designer, It' s biggest selling-points is Simple and Intuitive. Make the design and the use of PA-system become more and more easy.

PX-3000 system can be applied on public address system which required multi channels audio streaming simultaneously. The PX-3000 is suitable for the system whether the application is big or small. This system can be used on the high building, hotel, bus station, entertainment venues, hospital, convention center, restaurant, school, etc.

The mail controller(8x8 audio matrix including the functions as: pre-amp, equalizer, zones selector, remote microphone station interface, remote wall panel interface, monitor speaker, 3 wire and 4 wire volume controller override, fire alarm or emergency message, logic output and input, etc. Through it' s link function, max 32 pcs audio matrix controller can be linked and up to 256 zones can be supported. Max 8 pcs Microphone station can be connected to the master audio matrix, also 0-8 pcs remote wall panel can be connected into each zone.

### System equipment as below:

1. 8X8 audio matrix (PX-3000, max 32pcs can be linked and extend up to 256 zones)
2. Microphone station (RM-3088, max support 8 pcs, can be set as business or emergency paging microphone station)
3. Remote wall control panel (LM-3088A, each zones can connect 0-8 pcs)

### 6 steps priority control (high priority will override lower priority, same priority can be arranged)

1. Emergency paging microphone station (when RM1-8 are set to be emergency microphone)
2. Automatic fire alarm (Pre-recorded fire message in SD2 or external fire audio input)
3. Business microphone station (when RM1-8 are set to be business microphone)
4. Timer audio (Timing source from built-in SD1 or external timer audio source)
5. Remote panel (LM-3088A, each branch area can connect 0-8 of panel)
6. BGM source (AUX1-8 and built-in SD1 source of master audio matrix)

### System capacity:

The master audio matrix provide 20bus audio inputs : AUX1-8 · SD1 · RM1-8 · SD2 built-in fire alarm, external timing, external fire alarm. All the slaver matrix share the 20bus from master audio matrix. Max 32pcs audio matrix can be linked and extend up to 256 zones. Each zone can connect 0-8 pcs remote wall panel which communication distance is 1000 meters, power by the matrix or external power supply.

### Technical Support (Settings and operations)

The system comes with fully functional, simple operation, good interactive interface and remote control software. All functions can be set and controlled by PC software. It supports different permissions levels for operators and provides password.

## Front Panel of Audio Matrix



### 1. Monitor Speaker

-Built-in monitor speaker can select and monitor each input or output channel with volume control and mute switch by touchscreen.

### 2. Touchscreen

-7" color touchscreen which with a full operating system and real-time status monitoring. The resolution is 800x600, the backlight brightness and screen saver time can be set on the setting many.

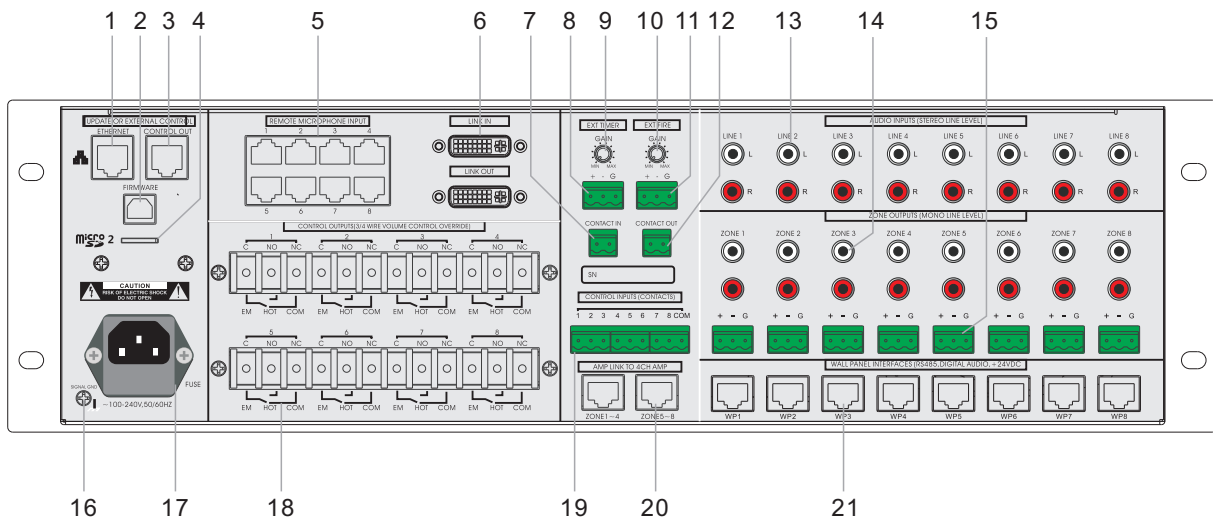
### 3. Micro SD1 (TF1) card slot

-Max 32G, MP3 support any sampling rate Layer3 audio decoding. Micro SD1: for BGM or Built-in timer; Support FAT16 and FAT32 file system.

### 4. Power Switch and indicator

-When the matrix power on, the LED on. When the matrix power off, the LED off.

## Rear Panel of Audio Matrix



### 1. Ethernet Control Connector

-Through this port, you can connect this unit to PC, ethernet, internet or other control system. And setup the matrix for system application, monitoring, remote control and so on.

Note: for the detail control command, please contact your supplier.

### 2. Firmware Upgrade Port

-Through this port, you can update the flash firmware to newest function and debug the program.

### 3. Control output port

-This port use to connect the power sequencer, amplifier detector or other equipment which can be controlled.

### 4. Micro SD2 (TF2) card slot

-Max 32G, MP3 support any sampling rate Layer3 audio decoding. Micro SD2: for internal fire Pre-recorded message. Support FAT16 and FAT32 file system.

### 5. Remote Microphone Station Input Port

-Up to 8 pcs remote microphone station can be connected to this matrix. All the 8 remote microphone can be set as emergency paging microphone or business broadcast microphone.

The priority is EM>RM, when the system has two or more EM or RM, the priority will be sequence by the port number: Port1>2>3>4>5>6>7>8.

### 6. Link In and Link Out Port

-Using those two port to link in and link out the master and slaver matrix, Max 32 pcs audio matrix controller can be linked and up to 256 zones can be supported.

### 7. External Timer Contact Input Port

-Using this port to connect the external timer contact out and open above external timer audio signal.

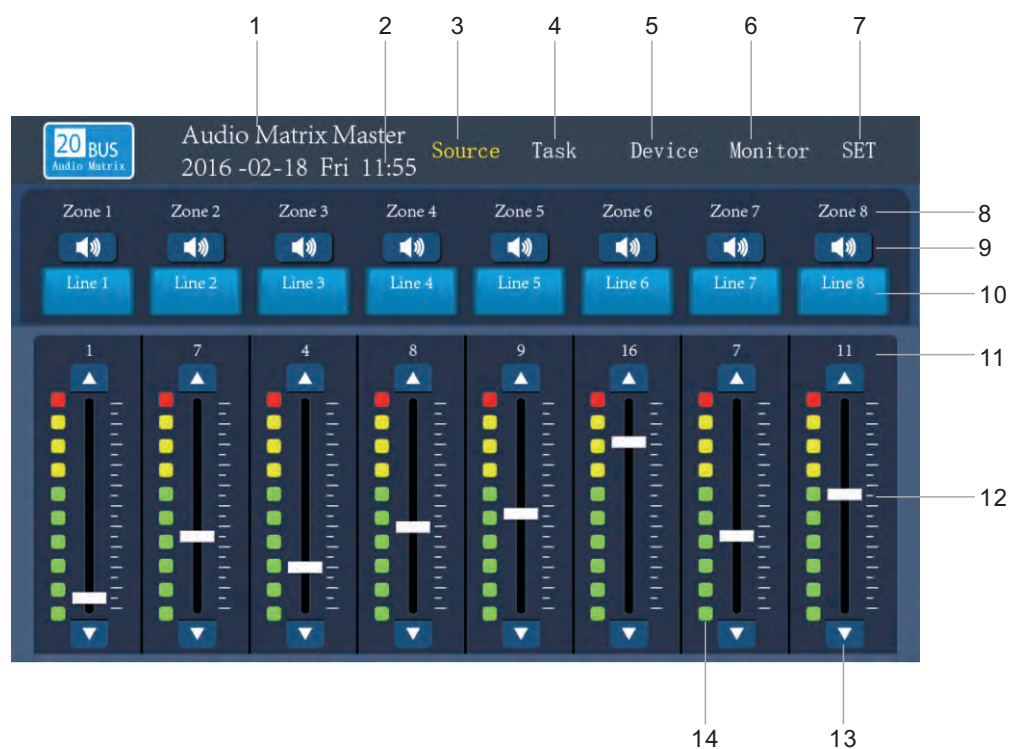
### 8. External Timer Audio Signal Input Port

-Using this port to connect the external timer audio signal.



9. External Time Input Gain Control Knob.
  - To adjust the input gain of external timer. Adjust the input gain to proper level to avoid distortion.
10. External Fire Alarm Input Gain Control Knob
  - To adjust the input gain of external fire alarm audio. Adjust the input gain to proper level to avoid distortion.
11. External Fire Alarm Audio Signal Input Port
  - Using this port to connect the external fire alarm audio signal.
12. Emergency Paging Contact Output Port
  - When the system is doing a fire alarm or emergency paging this port will output a contact closure to activate other third-party equipment like sound-light alertor, CCTV, etc.
13. 8CH Audio Input Port (BGM Priority)
  - RCA stereo input ports for AUX1-8 BGM audio source such as CD, MP3, tuner, iPad, PC etc.
14. 8CH Audio Output Port For Each Zone (Mono, Unbalanced, +-)
  - Using those RCA port to connect these audio output to the amplifier, record devices, effect processor, or other destination as required by the installation of each zone.
15. 8CH Audio Output Port For Each Zone (Mono, Balanced, +-G)
  - Using those phoenix port to connect these audio output to the amplifier, record devices, effect processor, or other destination as required by the installation of each zone.
16. Signal Gnd Connector
  - When lots of equipments are connected to this matrix and there is noise in system, please connect this screw terminal to other units' s GNG, it may reduce or avoid the noise. (Note: this is not the safety ground )
17. AC Power Input Port
  - Universal wide voltage switching power supply: 100~240VAC, 50/60Hz: Max output 156W.
18. Volume Controller Override Control Port
  - Support 3 wire and 4 wire (require external PSU) volume controller override.  
For detailed connections please see page54.
19. Fire Alarm Trigger Input Port
  - 8 channels of dry contact closure signal from fire control system can be connected to these port. When the contact closure inputs coming, the microSD2 pre-recorded message or external fire alarm audio will automatic be page to related zones(by software setting). And the related zones will display "Fire" on the touchscreen to show now is doing a fire alarm.
20. Amp Link Audio Output Port
  - Using this port to connect the 4CH amplifier which also has a amp link port. 4 channels audio signal can be transmitted by only one twisted pair network cable.
21. Remote Wall Panel Input Port
  - 0-8 pcs remote wall panel can be connected into each zone. Use the wall panel to select audio source, adjust volume, local mic/line audio input for each zone.

## Audio screen description



The main touchscreen on the matrix display the matrix name, date & time, zone name, audio source and volume information. On this screen, you can control the select the audio source, set the volume and mute for each zone.

### 1. Audio Matrix Name

-The Name can be set by 20 bus assistant PC setup software, please see the PC software part.

### 2. Date and Time

-Date and time can be set by 20 bus assistant PC setup software, please see the PC software part.

### 3. Audio Source Menu Button

-Click this button can switch to the "Audio Source" main screen.

### 4. Task Menu Button

-Click this button can switch to the "Task" main screen.

### 5. Device Menu Button

-Click this button can switch to the "Device" main screen.

### 6. Monitor Button

-Click this button can switch to the "Monitor" main screen.

### 7. Set Menu Button

-Click this button can switch to the "Set" main screen.

#### 8. Zone Name

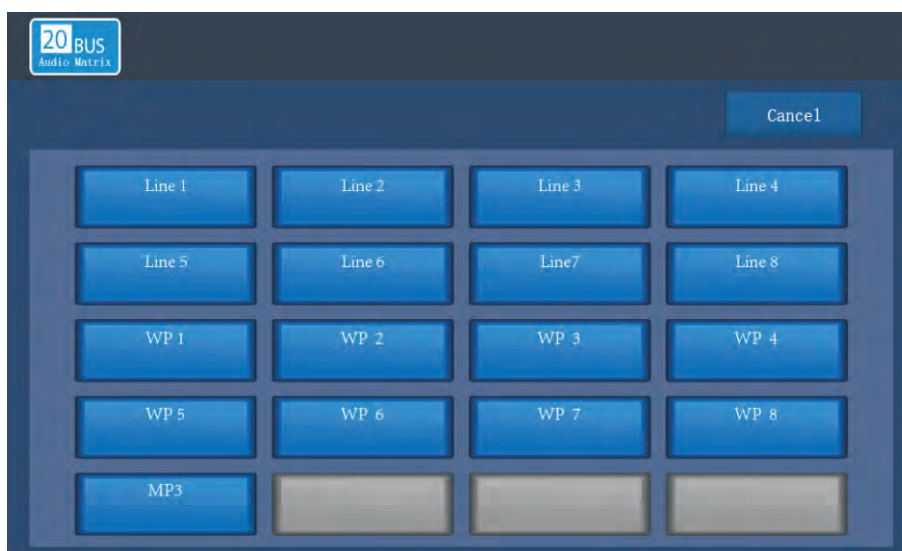
-The zone name can be set by 20 bus assistant PC setup software, please see the PC software part.

#### 9. Mute Button

-Click this button will mute the BGM audio source, click again will cancel the mute function.

#### 10. Audio Source Selection Button

-The button will display current audio source name. Click this button can switch to audio source screen, and then select the audio source for current zone. The audio source include Aux1-8 on master matrix, Wall Panel input for each zone, built-in Micro SD1 BGM. Below is the audio source screen.



#### 11. Volume Value

-Display the current volume value.

#### 12. Volume Fader

-Click this volume fader to change the volume for current zone.

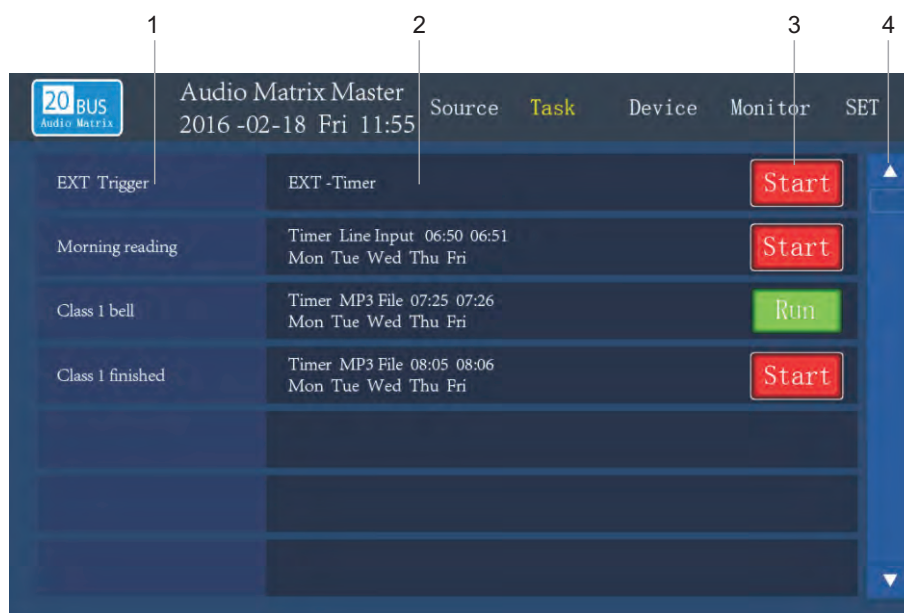
#### 13. Volume Up/Down Button

-Click these two Up/Down button to add or reduce the volume for current zone.

#### 14. Output Volume Indicator

-These LED indicator will show the current output level dynamically.

## Task Screen Description



**Task screen display all the task which preset by PC setup software.**

### 1. Task Name

-Display the task name. (Note: EXT-Timer has the highest priority in all task. When some task has time conflict, the front task will has higher priority.)

### 2. Detailed Task Information

-Display the detailed task information. The Task information includes: Timer type, source, play mode, play count, play start time and finish time, week. The audio source for task is Line input 1-8 of the matrix and the built-in Micro SD1 (when SD1 is set to be timer source.) All the task should be set by the PC setup software.

( For example: the morning reading task shows that is a internal-timer, the audio source is the line input of the matrix, the start time is 06:50, the finish time is 06 : 51, run from monday to friday.

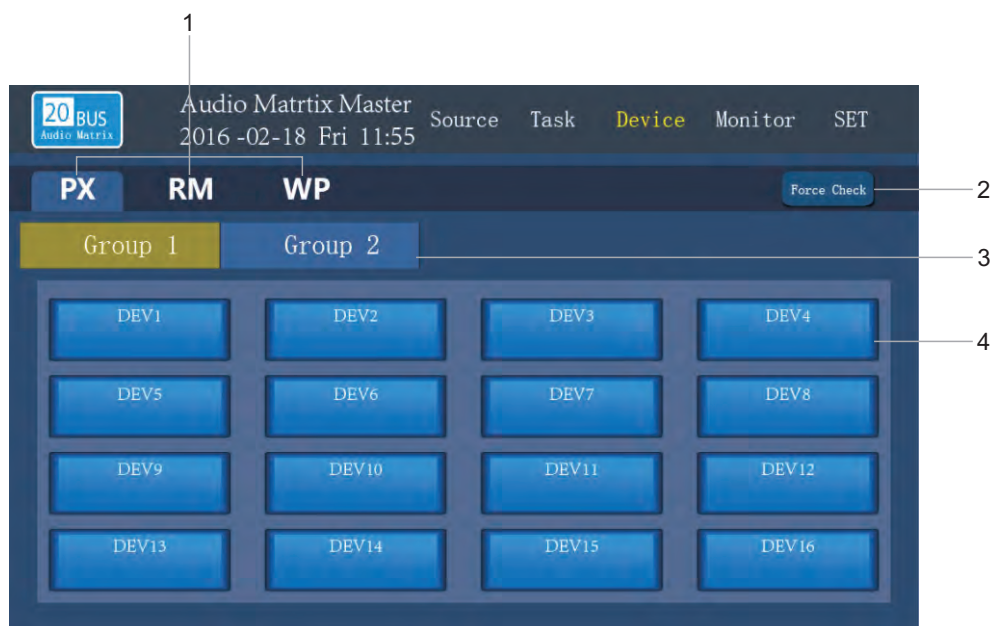
### 3. Task Status Button

-Display the current task status and you can click this button to change the task status.

### 4. Page Up/Down Button

-Click this button can check all the task.

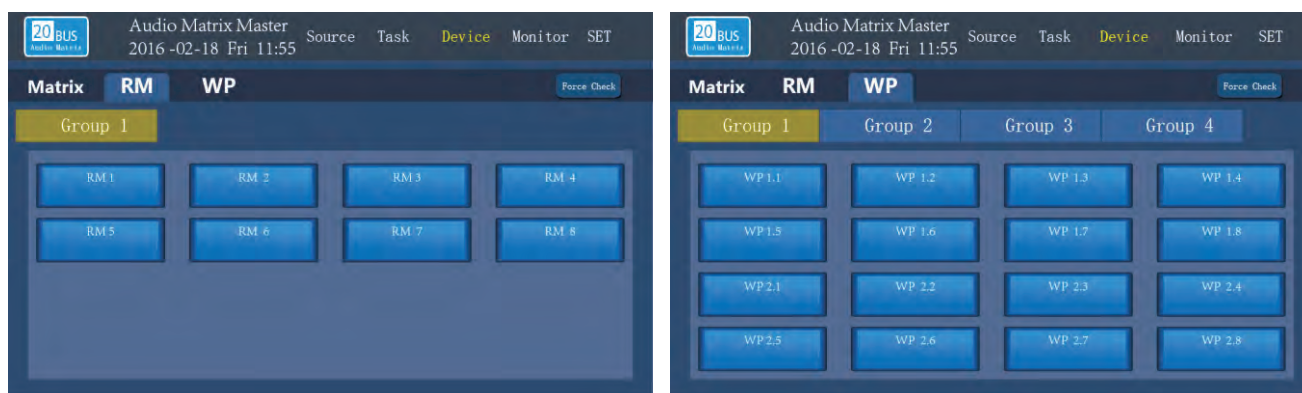
## Device Screen Description



Device screen display all the devices information in the PA system.

### 1. Different Device Selection Button

-Click those button will switch to audio matrix, remote microphone station or wall panel screen.



### 2. Force Check Button

-Click this button can force check all the on line system devices.

### 3. Page button

-Click this button can switch to another page screen.

### 4. Device Information Screen

-Display all the device information in a group.

## Monitoring Screen Description



On this monitor screen, you can choose to monitor all the system audio signal. Audio signal includes: the 20bus audio signal(which from master matrix: AUX1-8, SD1, RM1-8, SD2 built-in fire alarm, external timing, external fire alarm), 8 channels zone output audio signal and the wall panel audio input from each zone.

### 1. Page button

-Click to choose the audio source screen which you want to monitor.

### 2. Audio Source Information Screen

-Display all the audio source information in a system.

### 3. Stop Button

-Click this button to stop monitoring.

### 4. Monitor Volume Value

-Display the current monitor volume value.

### 5. Volume Fader and Volume Up/Down button

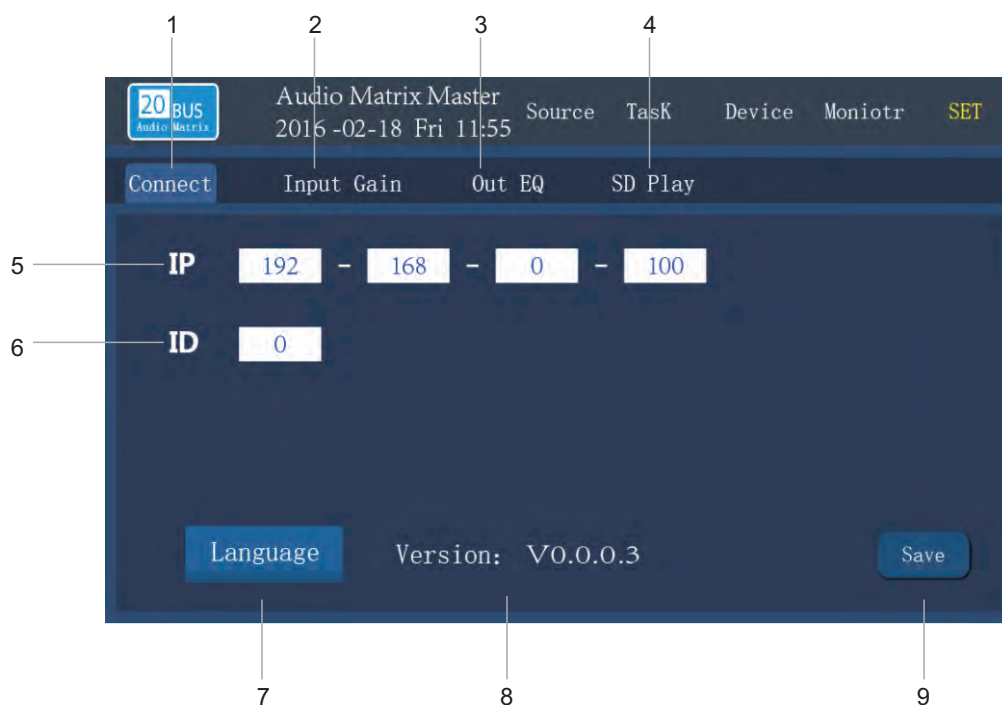
-Push the fader or click Up/Down button to add or reduce volume for current monitor channel .

### 6. Mute Button For Monitor Speaker

-Click this button will mute the monitor speaker, click again will cancel the mute function.



## Setting Screen Description



**On setting screen, you can change IP address, set ID, change the language, check the firmware version, set all the input gain, output EQ, play micro SD1 music etc.**

### 1. Connect Button

-Click to set IP address, ID, choose the language and see the firmware version. When finished the setting, please click the save button to save the changes.

### 2. Input Gain Button

-Click this button to set input gain for all input audio signal (See the picture below).



### 3. Output EQ Button

-Click this button to set 8 channels output EQ of the matrix (includes volume, treble and bass).



### 4. SD Play Button

-Click this button to switch to the SD card audio playing operation (see next page to know the detailed).

### 5. IP Address Bar

-IP address of matrix can be seen and changed here. To connect your setting PC, you need to set to correct IP address.

### 6. IDBar

-ID address of matrix can be seen and changed here. Note: ID0 is the master matrix and the ID1~ID31 is the slaver matrix 1~31. All the matrix should be has a different ID. When the matrix is set to ID 1~31(it means that it's a slaver matrix), all the input of it can no be use.

### 7. Language Button

-Click to change the different language for the touchscreen.

### 8. Firmware Version

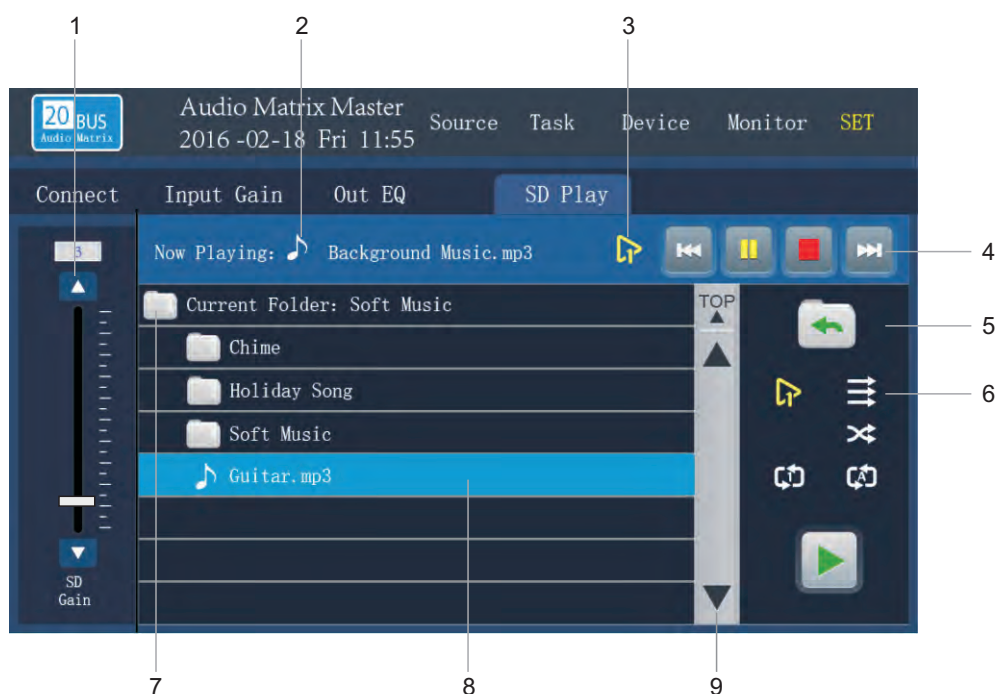
-It show the current firmware version of the touchscreen.

### 9. Save Button

-When finished the setting, please click the save button to save the changes.



## SD Card Playing Screen Description



**On this SD playing screen, you can operate all the music playing function (on the Micro SD1 on the front of the matrix).**

### 1. Micro SD1 Input Gain Button

-Push the fader or click Up/Down button to add or reduce volume for SD1 playing volume.

### 2. The Player Status

-It shows the player status. The song name can be read here.

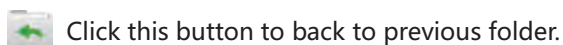
### 3. Playing Mode Status

-It shows the current play mode your choose. When the mode set to be "Play One" or "Repeat One" , the "Next" button can not be click and click the "PREV" will play again the song.

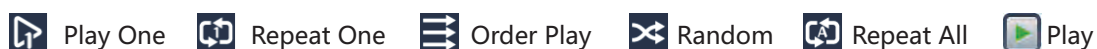
### 4. Player Operation Button



### 5. Back Button



### 6. Play Mode Select Button



-Note: When only one song in a folder, just the "Play One" and "Repeat One" can be selected. when there are many songs in a folder, click the "Play" button to order play all the songs.

### 7. Current Folder Name

-It shows the current folder name.

### 8. Folder Information

-It shows all the folder and files in current Folder.

### 9. Page Up/Down Button



Page Up



Page Down



Back to top

## Front Panel of Remote Microphone Station



The microphone station has a convenient touchscreen interactive interface. It can be set as business microphone station or emergency paging microphone station.

1. Gooseneck microphone input port

-Insert condenser microphone and supply 24VDC phantom power.

2. Touchscreen

-7-inch color touchscreen with all operating and real-time status monitoring. The touchscreen has real-time audio signal output indicator. The brightness and saver time of touchscreen are adjustable.

3. Talk/Paing LED Indicator

-When doing a normal paging or emergency paging, the LED turn red; when paging finished, the LED turn green to show the power status.

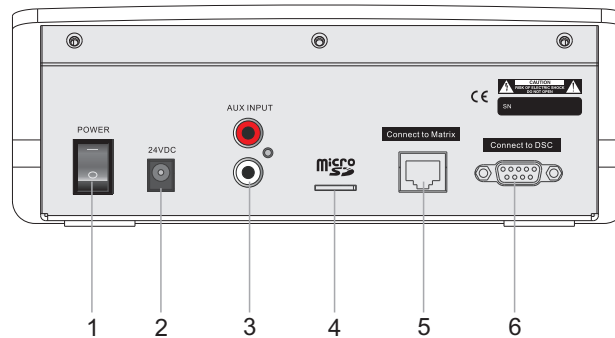
4. "TALK" TALK button

-Press this button to talk and press again to cancel (Push on / Push off mode).

Pressing this button to talk and release this button to cancel (PTT mode: Push-to-talk)

Each corresponding zone will display red or yellow paging status indicating that the zone is receiving an announcement.

## Rear Panel of Remote Microphone Station



The remote microphone has an aux input and a build-in Micro SD card. So it not only a paging microphone station, but also it can play external audio input or build-in SD card audio files to any zone you want. Selecting audio source and then press talk button to play audio. When finishing playing, press talk button again to cancel. (Note: When playing external aux input or micro SD card, you can switch the source to gooseneck microphone again).

### 1. Power Switch

-When the microphone power on, the LED around talk button on. When power off, the power LED off.

### 2. External Power Input Port

-External DC24V power input port (Note: the RJ-45 port will supply the 24VDC power from the matrix. If the long distance cabling cause the voltage down, you need to use this Ext. power supply).

### 3. External Aux Input Port

-Connect external audio source here, like PC, Mobile, CD or iPad etc.

### 4. Micro SD(TF) Card Slot

-Plug your micro SD(TF) card here, the audio format support mp3, wav etc. The card max support 32G and FAT16 & FAT32 file system.

### 5. Connect To The Master Matrix

-Up to 8 pcs remote microphone station can be connected to the master audio matrix. All remote microphones can be set as emergency paging microphone or business broadcast microphone. The priority is EM>RM, when the system has two or more EM or RM, the priority will be sequence by the port number: Port1>2>3>4>5>6>7>8. The cable should be cat 5 or better twisted pair. (The RJ45 should be 568B type). Communications protocol: RS-485; Communication distance: max 1000 meters; Power: 24VDC; Audio: mono.

### 6. Reserved COM Port

-Reseved com port for future use.

## Main Screen of Remote Microphone Station Description



The main touchscreen of remote microphone station display the name, EM/RM priority, audio source, control, set up and paging zone selector etc. When a paging is needed, select your audio source first and then select the zone which you want, press talk button to start a paging (Push on, push off mode or Push to talk mode can be preset ).

### 1. Microphone Name

-The name can be set by the PC setup software, please see the PC setup software part.

### 2. Microphone Priority Type

-It show the priority type of the microphone station, the priority type can be set by the PC setup software.

### 3. Home Button

-Switching to the home screen by clicking this button.

### 4. Audio Source Selection Button

-You can choose the gooseneck microphone, external aux input or build-in micro SD as you paging source. You also can switch the source when doing a paging.

### 5. Micro SD Card VOD Button

-Click VOD button to switch to the SD VOD screen.

### 6. Control Button

-Click this button to switch to the control screen. On the control screen, you can see and adjust the volume of every zone, and select the audio source for every zone. It is convenient remote control interface for the operator.

## 7. Set Button

-Click this button to switch to the control screen.

## 8. Page Button

-Click this button to check or choose the zone which your want to page.

Note: If the page button is gray, it shows that there is no zone on the page.

## 9. Zone Selection Indicator

-This indicator will light when there are some zone on the page have been selected.

## 10. Audio Source Volume Indicator

-It will show the current volume level of the audio source dynamically.

## 11. Audio Source Selection Indicator

-This indicator will light when the gooseneck or line in has been selected as the audio source.

## 12. Cancel Button

-Click this button to cancel all selected zones.

## 13. Group Zone Button

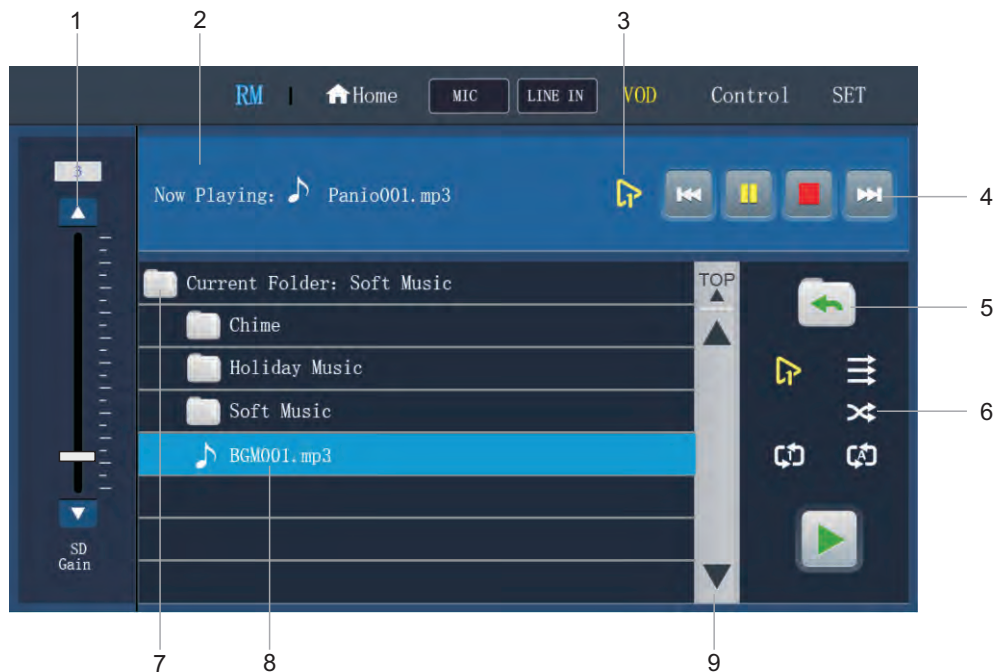
-Usually there button will be set to group zone often use. It is fixed position and you do not need to search by page.

## 14. Zone Button

-Select all the zone which you want, and then press the physical talk button to page. Press the talk button again to cancel the page.

Note: There are  $8 \times 16 = 128 + 4 = 132$  zone buttons can be set by PC setup software. Please see the PC software part for details.

## Micro SD Card VOD Screen of Remote Microphone Station Description



The VOD screen on the microphone station use to play the audio files in the micro SD card. Select the zone first, press talk button to page status, select and play the audio file to related zone.

### 1. Micro SD Gain Button

-Push the fader or click Up/Down button to add or reduce volume for Micro SD playing volume.

### 2. The Player Status

-It shows the player status. The song name can be read here.

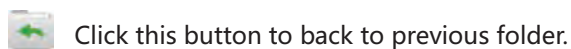
### 3. Playing Mode Status

-It shows the current play mode your choose. When the mode set to be "Play One" or "Repeat One" , the "Next" button can not be click and click the "PREV" will play again the song.

### 4. Player Operation Button



### 5. Back Button



### 6. Play Mode Select Button



-Note: When only one song in a folder, just the "Play One" and "Repeat One" can be selected. when there are many songs in a folder, click the "Play" button to order play all the songs.

### 7. Current Folder Name

-It shows the current folder name.

### 8. Folder Information

-It shows all the folder and files in current Folder.

### 9. Page Up/Down Button



## Control Screen of Remote Microphone Station Description



**On the control screen, you can see and adjust the volume of every zone, and select the audio source for every zone. It is convenient remote control interface for the operator. It is like operating PA system on the the matrix.**

#### 1. Volume Control And Audio Source Selector For Each Zone

-On this screen, you can control the volume and select the audio source for each zone. The operation will change with the matrix synchronously.

#### 2. Matrix List

-On the list, you can choose the matrix what you like and set the volume and audio source for each zone.



## Set Screen of Remote Microphone Station Description



**On the set screen, you can set on chime, off chime, PTT, backlight, screen saver time and language. And the audio source (gooseneck microphone, line input, Micro SD) gain, monitor speaker volume, output gain, output treble, output bass, output volume can be set here.**

### 1. Mute Button

-Click this button will mute all the output audio, click again will regain the volume. (Note: don't mute the output when paging).

### 2. On Chime Enabled Button

-This button is used for microphone paging start with a chime.

### 3. Off Chime Enabled Button

-This button is used for microphone paging finish with a chime.

### 4. PTT Enabled Button

-This button is used to set the PTT function.

Note: when PTT is set on (push to talk mode), you need to pressing the physical talk button always when microphone paging. when PTT is set off (push on, push off mode), you press the physical talk button once and then paging with microphone, press the talk button again and stop the paging.

### 5. Backlight Setting Button

-Click this button to set the screen backlight value.

### 6. Screen Saver Time Setting Button

-Click this button to set the screen backlight time value.

#### 7. Language Switcher Button

-Click this button to change the menu language.

#### 8. Gooseneck Microphone Gain Control Button

-Push the fader or click Up/Down button to add or reduce volume for gooseneck microphone.

#### 9. External Line Input Gain Control Button

-Push the fader or click Up/Down button to add or reduce volume for line input.

#### 10. Micro SD Audio Gain Control Button

-Push the fader or click Up/Down button to add or reduce volume for micro SD card.

Note: the operation will change with the volume on VOD screen synchronously.

#### 11. Monitor Speaker Gain Control Button

-Push the fader or click Up/Down button to add or reduce volume for monitor speaker.

#### 12. Output Treble Control Button

-Push the fader or click Up/Down button to add or reduce the treble of master output audio.

#### 13. Output Bass Control Button

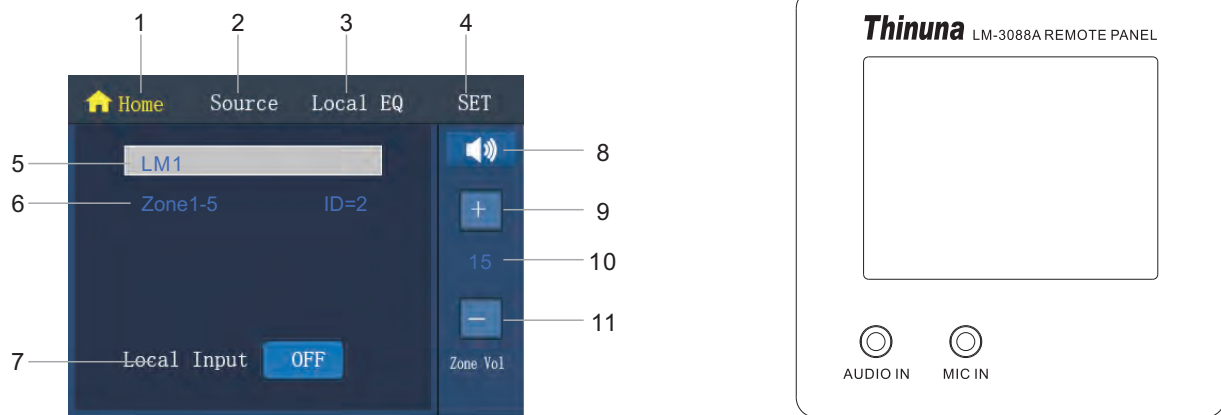
-Push the fader or click Up/Down button to add or reduce the bass of master output audio.

#### 14. Output Volume Control Button

-Push the fader or click Up/Down button to add or reduce the volume of master output audio.

Note: all the volume should be set according to project status. Do not set the microphone volume to the minimum position to avoid no sound when doing a emergency paging.

## Main Screen of Wall Panel Description



**This screen displays the wall panel name, related zone name, current source name, current volume value, mute status etc.**

### 1. Home Button

-Switching to the home screen by clicking this button.

### 2. Audio Source Selection Button

-Switching to the audio source selection screen by clicking this button.

### 3. Local EQ Setting Button

-Switching to the local EQ setting screen by clicking this button.

### 4. Set Button

-Switching to the setting screen by clicking this button.

### 5. Current Audio Source Name

-It shows the current audio source name of related zone.

### 6. Current Zone Name And Panel ID

-It shows the current zone name of the panel which is connected to the output of the matrix. Also shows the ID adress.

### 7. Local Audio Input On/Off Button

-Click this button to enable or disenable the local mic or line input.

### 8. Mute Button

-Click this button will mute the volume for the related zone. Click again will regain the volume.

### 9. Volume Up Button

-Click this button to up the volume for the related zone.

### 10. Volume Value

-It shows the current master volume value of the related zone. Note: the value will change with matrix audio screen synchronously.

### 11. Volume Down Button

-Click this button to down the volume for the related zone.

## Audio Source Selection Screen of Wall Panel Description



**On this screen, you can choose the audio source for current zone.**

#### 1. Line Input Of Matrix Selection Button

-Click this button, all the 8 CH audio inputs of matrix will show on the screen. The audio source button which is selected will change to yellow.

#### 2. Wall Panel Local Input Selection Button

-Click this button, all the local audio sources from wall panels will show on the screen. The audio source button which is selected will change to yellow.

#### 3. Micro SD1 Mp3 Source Of Matrix Selection Button

-Click this button, the micro SD1 mp3 source will be selected to current.

Note: Micro SD1(TF1) card should be defined by PC setup software, this button would be gray and useless when it is set to timer task.

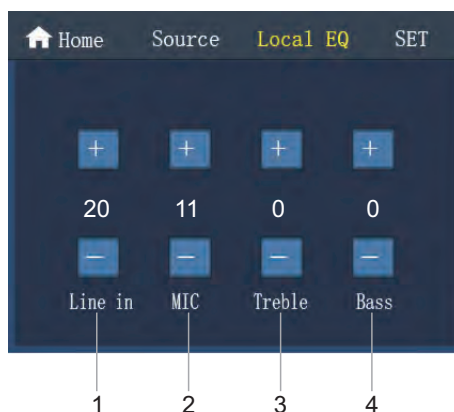
#### 4. Off Button For Cancel All Selected Source

-Click this button will cancel all the selected audio source. You need to choose the audio source again when you cancel audio source.

#### 5. Detailed Audio Source Screen

-This screen shows the detailed audio input information when you click the matrix input or wall panel.

## Local EQ of Wall Panel Description



The gain, treble, bass of local audio input can be controlled on this screen.

### 1. Gain Control Button Of Local Line Input

-Click the Up/Down button to add or reduce volume for local line input.

### 2. Gain Control Button Of Local Mic Input

-Click the Up/Down button to add or reduce volume for local mic input.

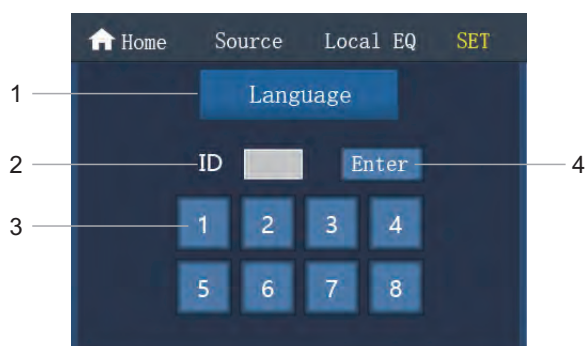
### 3. Treble Control Button Of Local Input

-Click the Up/Down button to add or reduce treble for local input.

### 4. Bass Control Button Of Local Input

-Click the Up/Down button to add or reduce bass for local input.

## Setting Screen of Wall Panel Description



On the set screen you can set the menu language and ID for current wall panel.

### 1. Language Switch Button

-Click this button to change the menu language.

## 2. ID Address Input Field

-It shows the current ID address.

## 3. ID Address Number keyboard

-Total 8 pcs wall panel can be connected to each output of matrix. The ID address should be one and only number. Repetitive ID address will cause the failure in a PA system.

## 4. Enter Button

-When finished the ID address number selection, click this enter button to finish setting.

Note: When first installation of the wall panel, you can enter number 51137 to download the data from matrix (Zone name, matrix input name, wall panel name etc.).

# 20 bus Assistant PC setup Software Part

## Software setup for windows

### 1.1 PC Hardware Requirement

Operating PC should be meet the requirement as below:

Operating System: Windows XP/Windows 2000/Windows 7/Windows 8/Windows 10

Processor: 2.4GHz

Ram: 2G

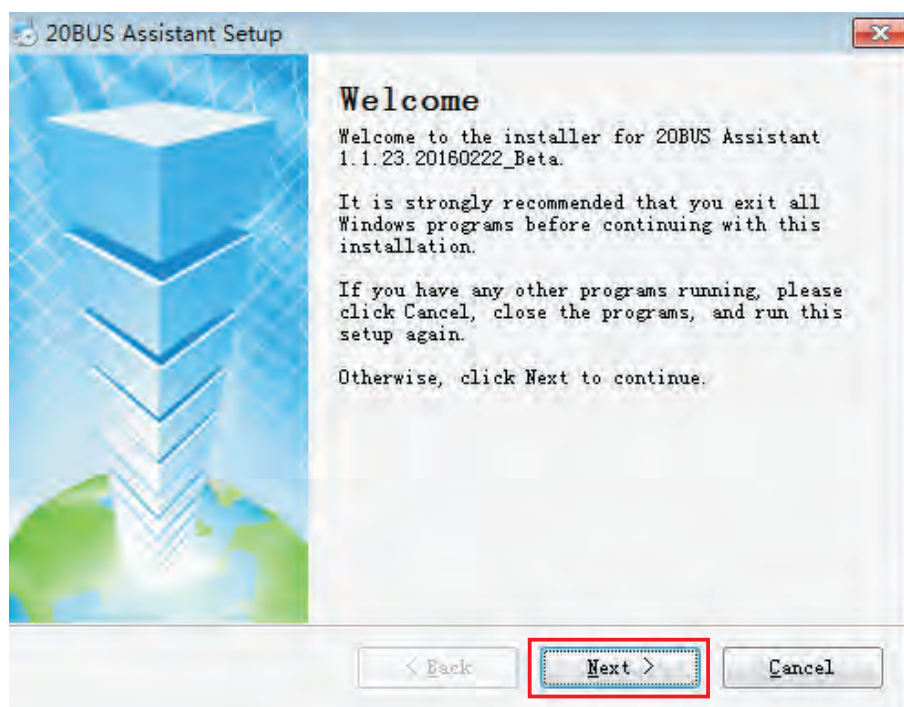
Hard Drive: 60G

Network Card: 10M/100M

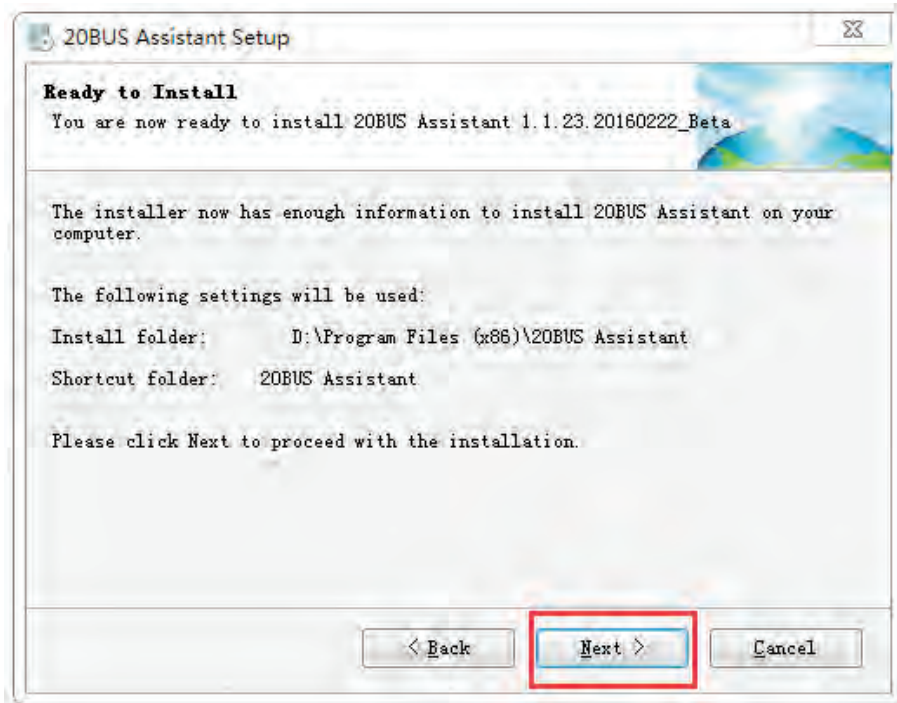
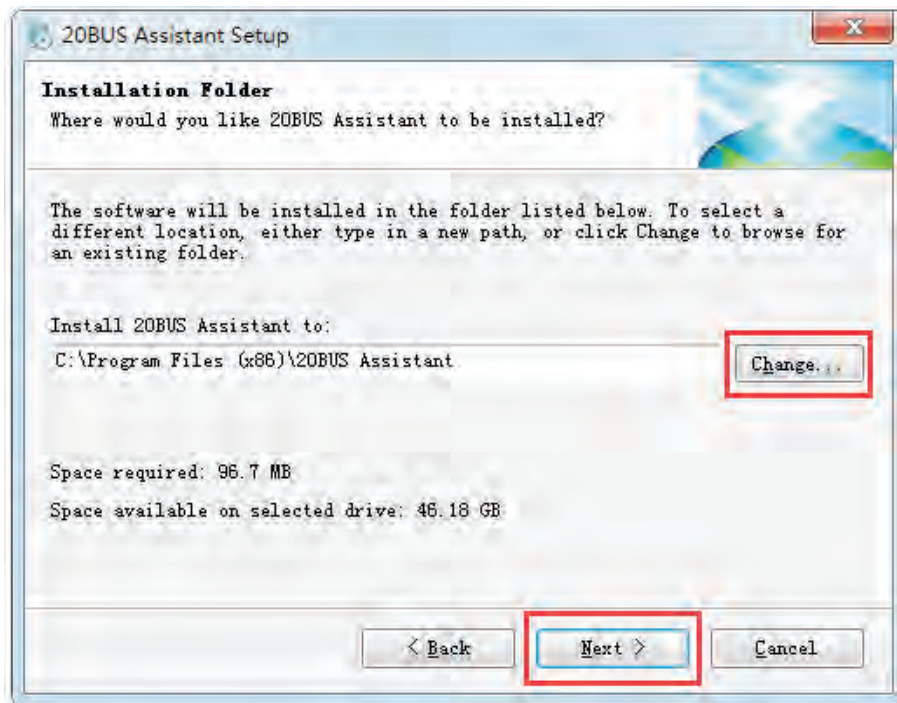
Resolution: 1024×768

### 1.2 Software Setup

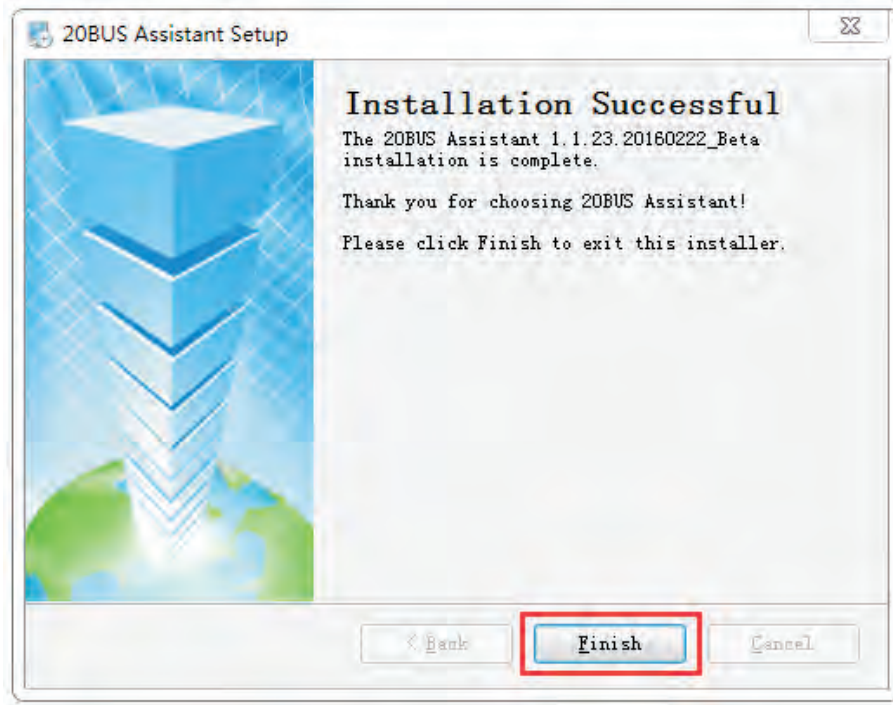
1. Click the "20BUS Assistant setup.exe" , click "Next" .



2. Change your installation folder and then click "next" to continue installation .







When finished installation, a software desktop icon will appear on the desktop.

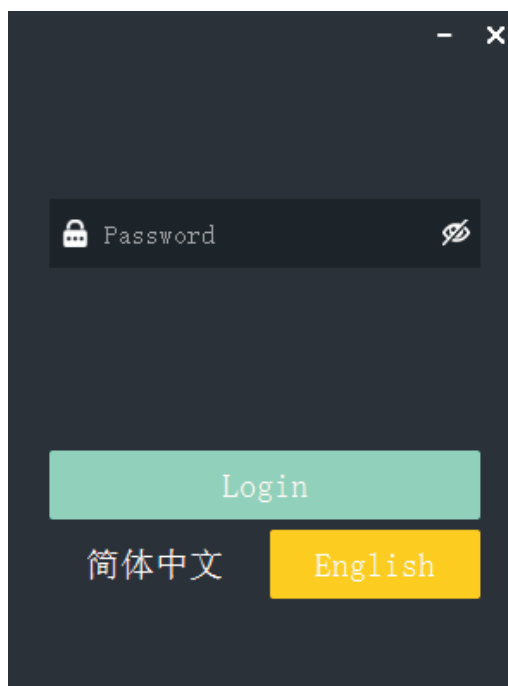


Click the icon to open the software. On this login windows, please choose the language and then enter the password to open the software.

*Note: there are two password to login.*

*One is the administrator password: **admin**. The administrator has all software permissions.*

*Another is operator password: **123456**. The operator only has task configuration and setting operation.*



The following is software main screen.



## 1. Software Menu Description

ReConfig: initialize all configuration data.

Save: save current software data.

Open Backup: open a \*.pxt configuration file.

Backup: save current configuration data to a \*.pxt file.

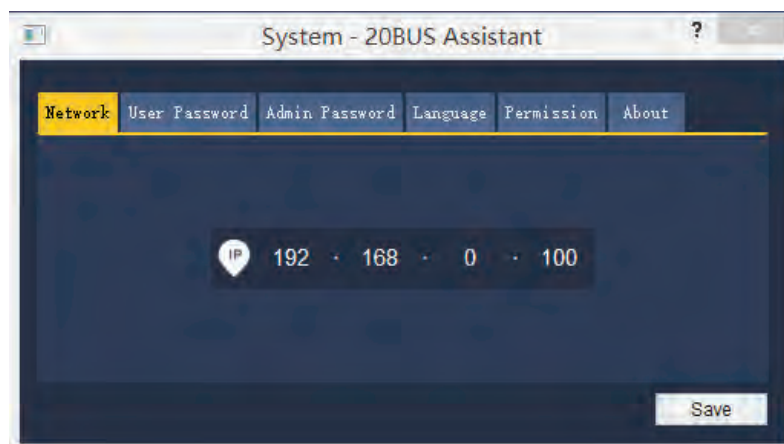
Mp3 Search: search the mp3 files in the micro SD1(TF1) when the card is set to timer task audio source.

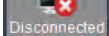
*Note: you need to plug the card into your control PC and read the audio files or folder information.*

Download: write current configuration data into the master matrix. (The master matrix should be connected to the control PC).

Upload: read configuration from the master matrix. (The master matrix should be connected to the control PC).

System: click the system button will appear the windows as below. You can set the IP address of master matrix, change the administrator and operator password, choose menu language, change the login permission and check the software version.



Connect: click this icon  to connect the master matrix.

## 2. Configuration Part Description.

The matrix, remote microphone station, wall panel, zone, fire alarm and plan task can be set here. Usually professional engineer will set the configuration here.

### 2.1 Matrix Config Screen



The matrix config menu screen use to set the general configuration of the PA system. It includes the matrix quantity, remote microphone station name and quantity, matrix input name, priority of remote microphone station, EXT-Timer name, EXT-Fire name, Micro SD1(TF1) name and its function define.

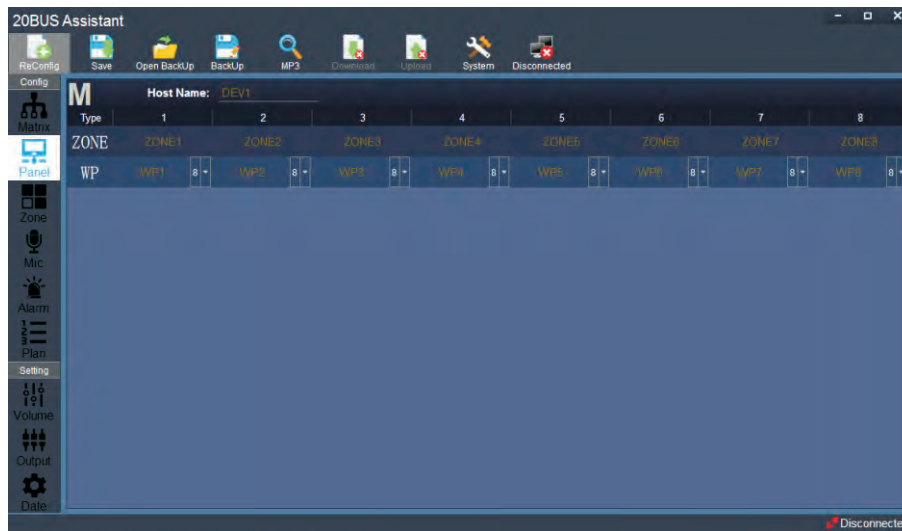
There are three parts on the matrix config screen: count windows, name windows and TF1 define windows.

- The count windows: set the RM(remote mic station) and matrix quantity here. Note: max 32pcs matrix can be linked and extend up to 256 zones; max 8pcs remote microphone can be set as business or emergency paging microphone.

- Name windows: double click the name of line input and RM, and then enter the name here. Also RM priority can be set here.

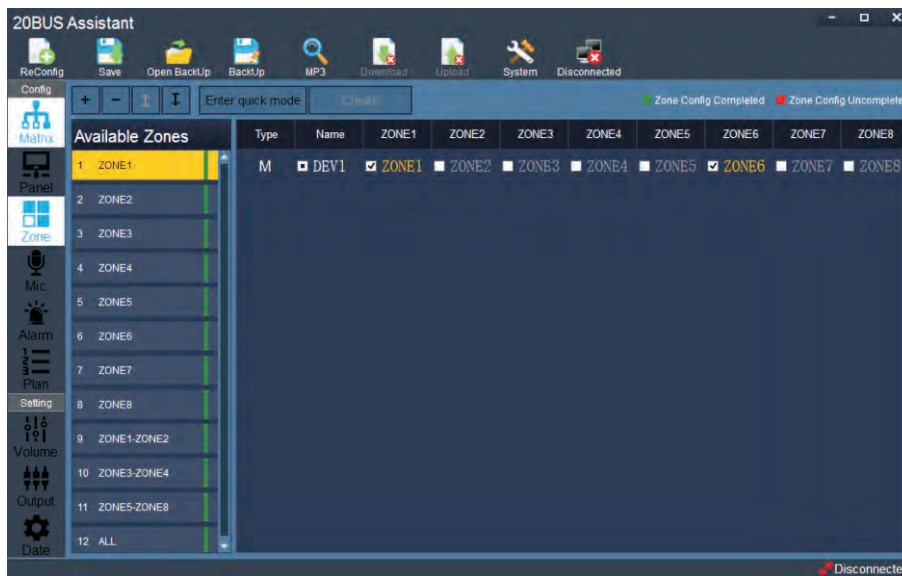
- Micro SD1(TF1) define windows: the TF1 card function on the front panel of master matrix can be set as background music or timer task. This choice will affect the plan config screen, please see the plan config part for detailed.

## 2.2 Wall Panel Config Screen



Wall panel config screen can set the matrix name, every output name, wall panel name. Each zone can connect 0-8 pcs remote wall panels. Double click the name to modify.

## 2.3 Zone Config Screen







Available Zone config screen use to set the zone information. One zone is consist of one or several output of the master and slaver matrix. The smallest zone is one output of matrix.

Set all zones information here, and assign the zone to microphone station and alarm next.

There are three part of the zone config menu: operation button windows, zone list windows, matrix output windows.

Operation Button Windows Description:

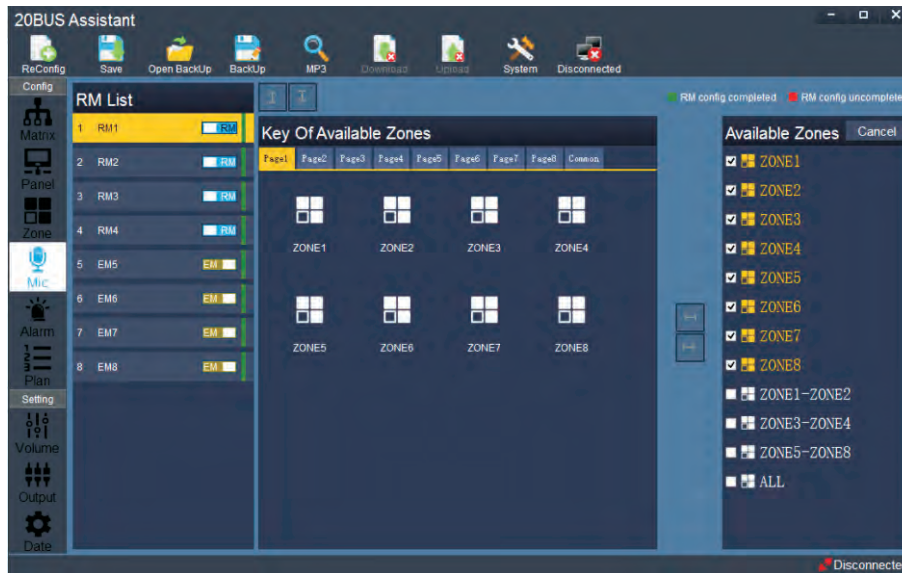
-  : Add zone, click this button to create a new zone. And then select output of the matrix for the new zone.
-  : Delete zone, click this button to delete a zone which is chosen at present.
-  : Move Up, click this button to move a zone which is chosen at present up in the list.
-  : Move Down, click this button to move a zone which is chosen at present down in the list.

Enter quick mode: click this button to enter a quick create zone mode.

Create: click the create button in the quick mode, all the smallest selected zone of the matrix output will be set to zone list windows on the left side with the same name.

- Create a new zone: click the add zone button to create a new zone. And then select output of the matrix for the new zone.

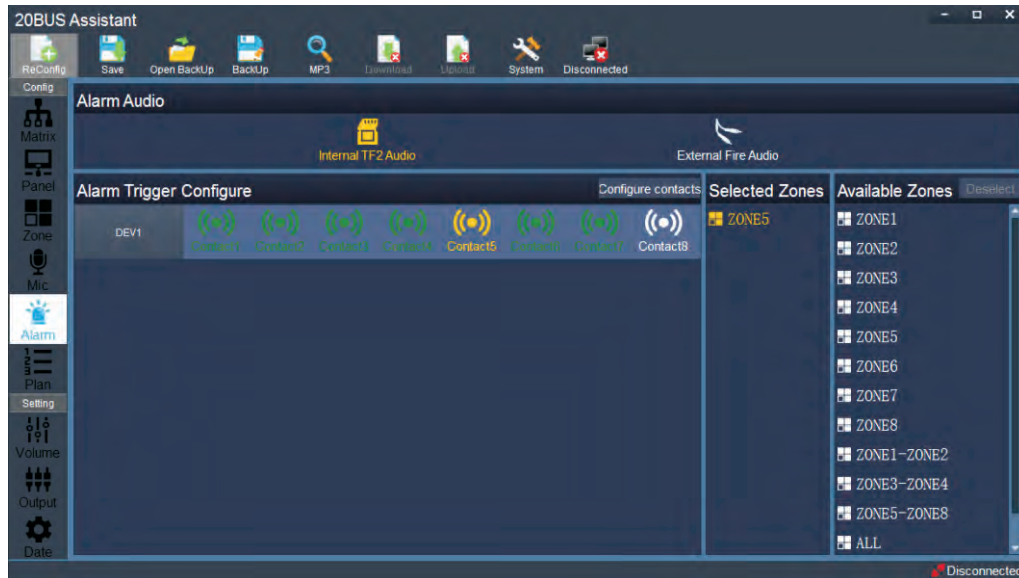
## 2.4 Remote Microphone Station Config Screen



Assign the zones to the 132pcs programmable keys on the remote microphone station here. There are four parts on the mic config screen: RM list windows, RM keys assign windows, available zones list windows, function key button windows. Every RM has 9 pages programmable keys. There are 16pcs programmable keys in each page 1-8. Page9 is for 4pcs fixed quick selected keys.

- Buttons assign operation: double click the zone in the available zones list windows will add the zone to RM keys windows. Similarly double click the assigned keys in the RM key window will delete the keys. Also you can click the cancel button to cancel all the zones which have been assigned.

## 2.5 Alarm Config Screen

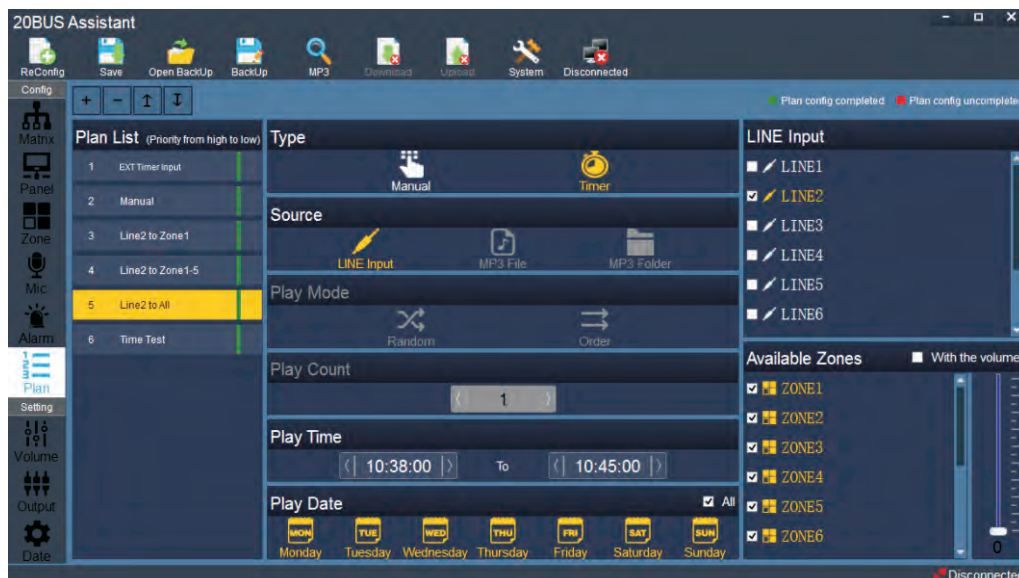


Alarm configuration screen use to set the Fire Alarm Trigger Input Ports of the master and slaver matrix. 8 channels of dry contact closure signal from fire control system can be connected to these port. When the contact closure inputs coming, the microSD2 pre-recorded message or external fire alarm audio will automatic be page to related zones(by software setting). And the related zones will display "Fire" on the touchscreen to show now is doing a fire alarm. The fire alarm or emergency audio source can be selected between internal micro SD2(TF2) or external fire audio input.

Every matrix has 8 channels of dry contact closure input, each input should be configured to any zone or any combined zone to page audio. White color meas no zone in the contact input. Green color means one or more zones in the contact input. Yellow means current selected contact input.

Set or modify the contact inputs: Choose any contact input and then click "configure contacts" button to set or modify the related zones. Double click the zone in the available zones list windows will add the zone to selected zone windows. Similarly double click assigned zones in the selected zone windows will delete the zone. Also you can click the deselect button to delete all the zones which have been assigned. When finished all the contact input configuration click the "save and quit".

## 2.6 Plan Task Config Screen



Plan config screen use to set the plan task, the screen includes function buttons, plan list, type, source, play mode, play count, play time, play date, line input of matrix, available zones windows.

Operation functions buttons description:



: Click this button to add a new plan task.



: Click this button to delete a plan task which is chosen at present in the list.



: Move Up, click this button to move a plan task which is chosen at present up in the list.



: Move Down, click this button to move a plan task which is chosen at present down in the list.

Plan list windows: it shows all the plan task. The priority is from high to low according to the list sequence.

Note: The external timer contact input has the highest priority in all plan task. When the contact input on the rear panel of the master matrix has a contact closure input, the audio from external timer will be sent to the selected zones.

Type: select the manual or timer type at first.

On the manual type, the line input can be manual switch to selected zone by click the start button on the matrix task touchscreen.

On the manual type, the mp3 file in the Micro SD1(TF1) card can be manual play to selected zone by click the start button on the matrix task touchscreen. The play times can be set here.

On the manual type, the mp3 folder in the Micro SD1(TF1) card can be manual play to selected zone by click the start button on the matrix task touchscreen. The play times, play mode (random or sequence) can be set here.

Source: line input of master matrix, audio file in micro SD1(TF1), audio folder in micro SD1(TF1) can be selected as plan task.

Note: use the "Mp3 Search" button to search the mp3 files in the micro SD1(TF1) when the card is set to timer task audio source. *Note: you need to plug the card into your control PC and read the audio files or folder information.* If the micro SD1(TF1) card is set to background music function, mp3 file and mp3 folder is useless here.

Play mode: random or sequence play mode can be chosen when the source is mp3 folder.

Play count: the play count can be set here when the source is mp3 file.

Play time: set the play started time and finished time here.

Weekly cycle: set the time task with weekly cycle mode.

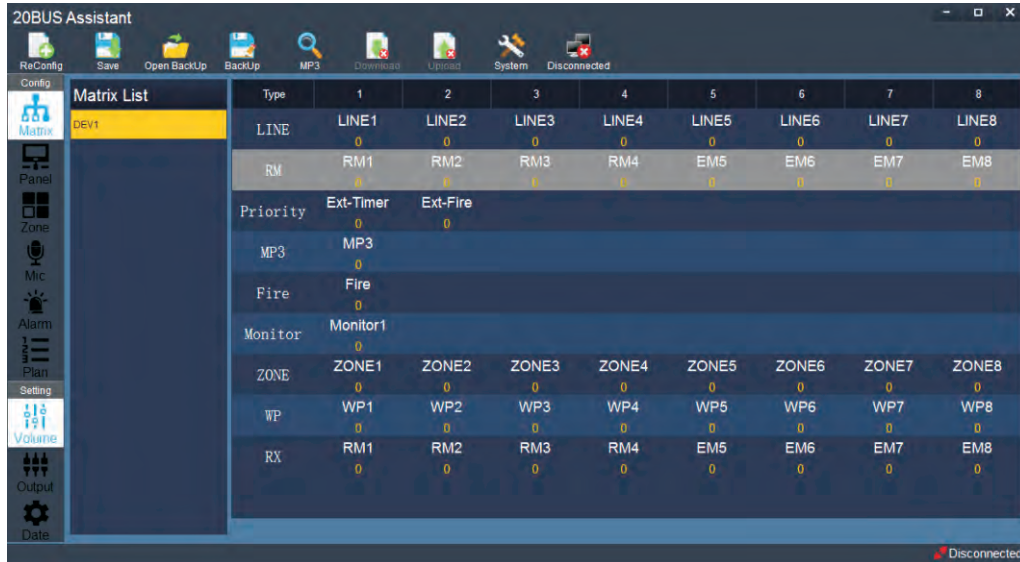
Line input list: this windows will show the 8CH line inputs of master matrix.

Available zone list: select the zones which you want to play the audio.

### 3 Setting Section Description

On setting section screen, you can remote control all the input/output signals through the network port on the real panel of the master matrix and set the time of the matrix.

#### 3.1 Volume Setting windows

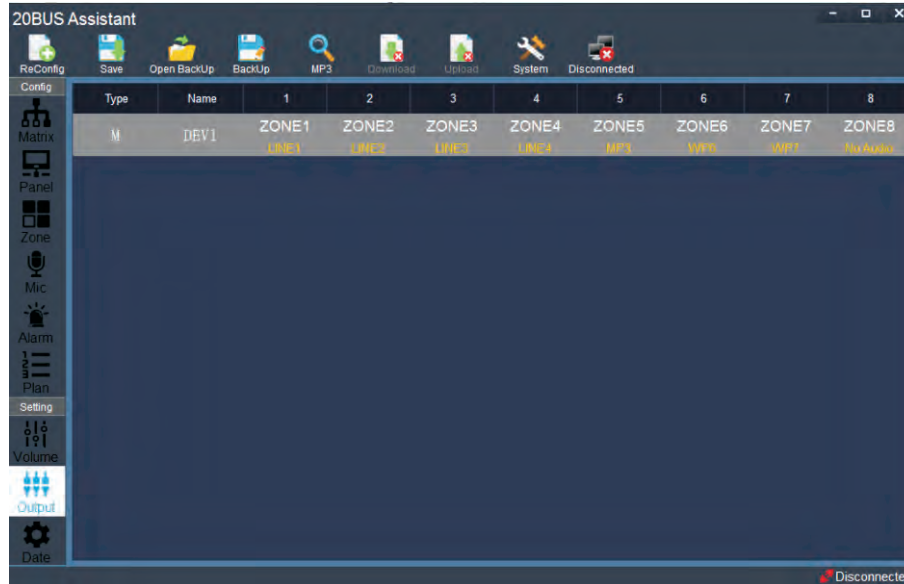


Volume setting includes matrix list and signal & port information. Double click the port which you want to adjust volume and will appear the new volume control windows as below. Then volume gain is from 0-20dB, the treble and bass EQ is from -5dB+5dB.





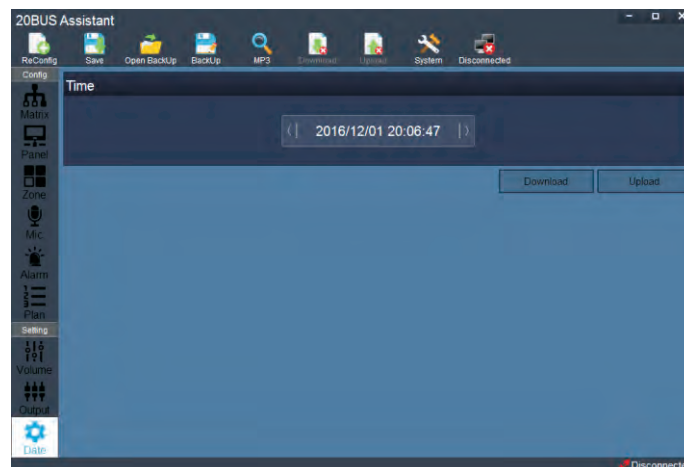
### 3.2 Output Setting Windows



On output setting windows, you can remote choose the audio source for each output zone of the master and slaver matrix. Double click the matrix which you want to select audio source, it will appear a new windows as below. The audio source includes 8CH line inputs of master matrix, mp3 from micro SD1(TF1 ) card(the card need to be set as background music source) and one of the wall panel local audio source. Also you can select the “no source” , it means that no audio source will be play to the zone.



### 3.3 Date Setting Windows



On the date setting windows, you can modify the system time and then download time or upload time from master matrix.

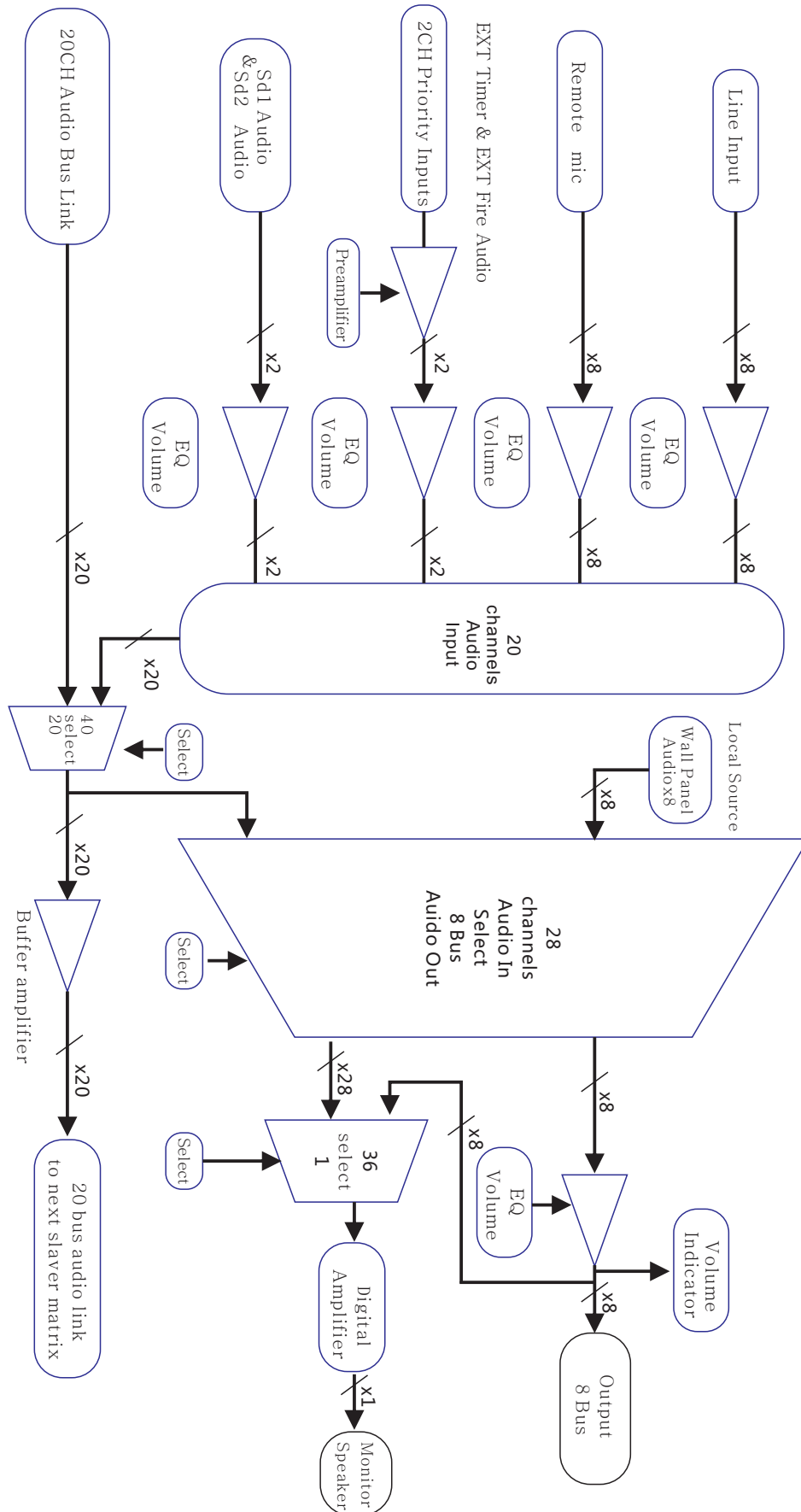
## Specification

Model No.	Audio Matrix
Input	Aux 1-8: -10dB, Unblanced, Stereo.
Output	Output 1-8: 0dB, Blanced and unblanced, Mono.
Call station interface	0dB, Balanced, RS-485, 24VDC
Micro SD1	Max 32G, MP3 support amy sampling rate Layer3 audio decoding.
Micro SD2	Front panel SD1: BGM or Built-in timer; Rear panel SD2: Internal fire Pre-recorded message.
Touchscreen	Size:7-inch,Resolution: 800x600; Color: 64K, 16 bit RGB Support the functions as: Text, GUI, Picture, Flash player and Touch control.
EQ control	Treble: $\pm 12$ dB at 10kHz; Bass: $\pm 12$ dB at 100Hz
Frequency response	20Hz~20kHz, $\pm 3$ dB
S/N	>90dB
THD	<0.01%
Priority control	EM>Fire>RM>Timer>LM>BGM
Serial communication	Communications protocol: RS-485; Communication distance: Max 1000 meters.
Power Source	Universal wide voltage switching power supply: 100~240VAC, 50/60Hz: Max output 156W
Power Consumption	Stand-alone: about 20W; After connecting all microphone and panel: about 148W
Weight	8kg
Dimensions	482(W) x 132(H) x 290(D)mm

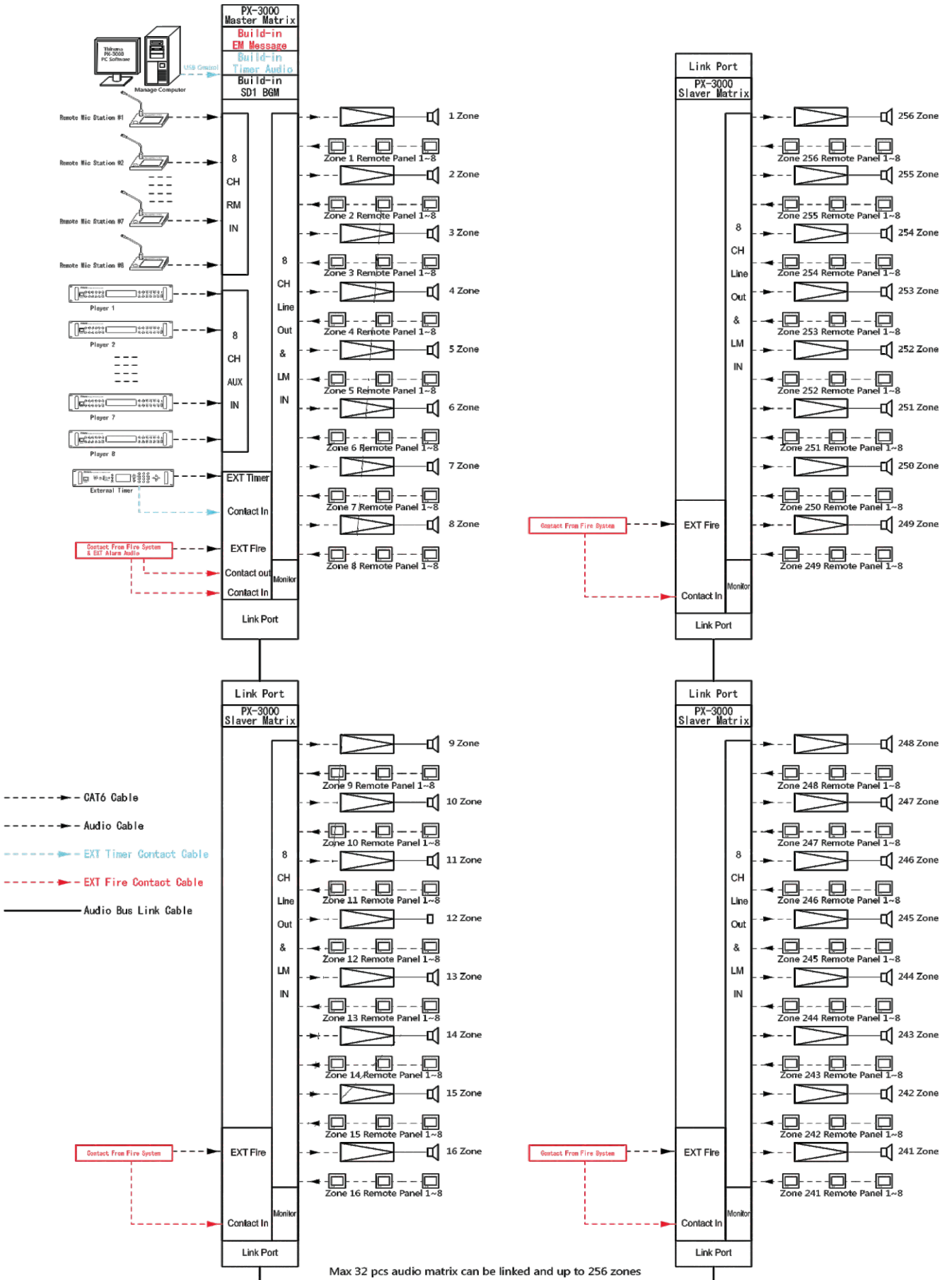
Model No.	Microphone Station
Mic input	-50dB, Balance
Line input	-10dB, Unbalance, Stereo
Audio output	0dB, Balanced
Frequency response	Aux: 20Hz~20kHz; Mic: 50Hz~15kHz
Touchscreen	Size:7-inch,Resolution: 800x600; Color: 64K, 16 bit RGB Support the functions as: Text, GUI, Picture, Flash player and Touch control.
EQ control	Treble: $\pm 12$ dB at 10kHz; Bass: $\pm 12$ dB at 100Hz
Phantom power	DC24V
Serial communication	Communications protocol: RS-485; Communication distance: Max 1000 meters.
THD	<0.01% at 100Hz~10kHz
S/N	>90dB
Power Source	Provide from audio matrix or external power supply (DC24V, 1A)
Power Consumption	<10W
Weight	1.7kg
Dimensions	300(W) x 70(H) x 150(D) mm; Gooseneck length: 390mm

Model No.	Wall Panel
Mic input	-50dB, Balance
Line input	-20dB, Unbalance
Audio output	0dB, Balanced
Frequency response	Aux: 20Hz~20kHz; Mic: 50Hz~15kHz
Touchscreen	Size:7-inch,Resolution: 800x600; Color: 64K, 16 bit RGB Support the functions as: Text, GUI, Picture, Flash player and Touch control.
EQ control	Treble: $\pm 12$ dB at 10kHz; Bass: $\pm 12$ dB at 100Hz
Serial communication	Communications protocol: RS-485; Communication distance: Max 1000 meters.
THD	<0.01% at 100Hz~10kHz
S/N	>90dB
Power Source	DC24V, Provide from Audio matrix
Power Consumption	<2W
Weight	0.2kg
Dimensions	86(W) x 86(H) x 35(D) mm;
Install bottom box	Stander single 86 electrician bottom box (surface-mounted or flush-mounted)

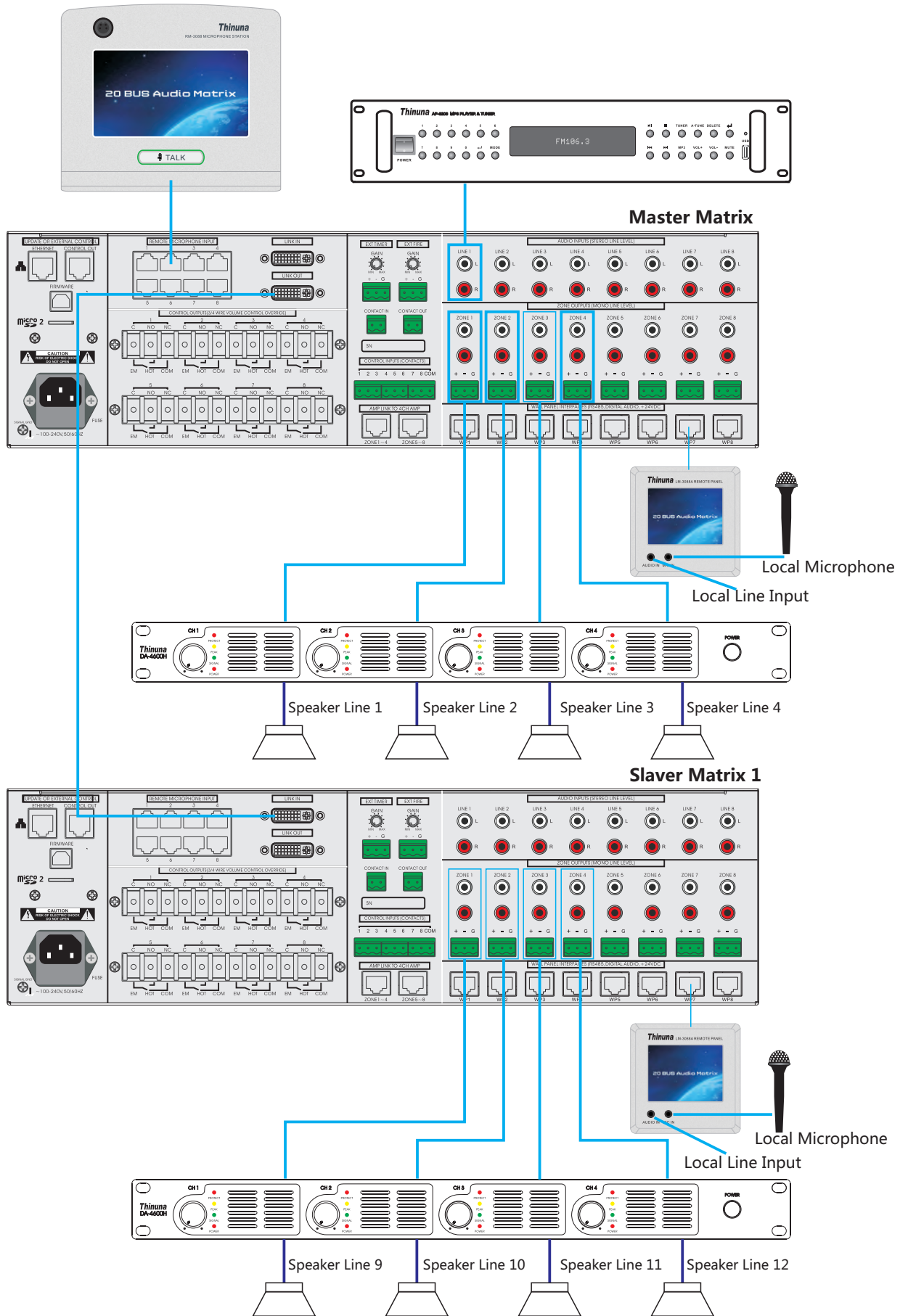
# Block diagram



# Application



# Connections



## Quick Start Guide

1. Please take a few time to read this manual carefully to familiarize yourself with important information regarding installation, product features, and operation.
2. Do not connect the unit to the AC mains until all settings are completed. AC mains should be switched on later in this procedure. Before connecting you AC main power to your matrix, ensure that the matrix power switch is in the OFF position.
3. Connect 8CH audio output to corresponding amplifier.
4. Connect audio source to 8CH line inputs of the master matrix. For example, autoplay music player, CD player, Mp3 player, tuner etc.
5. Connect remote microphone station to the remote microphone input port of master matrix.
6. Connect the wall panel to the corresponding input port of the master or slaver matrix zone output.
7. Connect your PC which has been installed the "20BUS Assistant" control software. And configure your setting according to the system requirement.
8. Power the matrix and download the configuration file to the master matrix. Operate your matrix on the touchscreen, at first select the audio source for each zone output. And then set the input gain for audio source and the output volume, treble, bass. Ensure that all the volume should be adjusted from low the high. You can monitor the audio signal through the monitor speaker.
9. Test wall panel: when power on the matrix, the matrix will output power supply to the wall panel. At first, you need to set the ID address for all wall panel. **Note: When first installation of the wall panel, you can enter number 51137 to download the panel setting data from matrix (Zone name, matrix input name, wall panel name etc.).** When the data update finished, select the audio source and set proper volume for current zone. If you need to use the local microphone or line input, connect your local source and set the volume, treble, bass.
10. Test timer Setting: Build-in Micro SD1(TF1) or external timer audio input should be set by the 20 bus assistant PC software. All the plan task should be configured on the plan screen of the PC software and should be operated on the matrix touchscreen. There is one timer contact input port on the rear panel of master matrix which can be connected to the contact output of external timer. Testing the control input and adjust the input gain to a proper level.
11. Test Remote microphone station setting: **At first installation, please click the "RM/EM priority button" 5 times continuously to download the microphone data from master matrix.** When the data update finished, select your audio source first and then select the zone which you want, press talk button to start a paging (Push on, push off mode or Push to talk mode can be preset ), the corresponding zone will show "Rm" or "EM" . You can choose the gooseneck microphone, external aux input or build-in micro SD as you paging source. You also can switch the source when doing a paging. And then you can set the proper volume for each zone on the control screen. The operation will change with the matrix synchronously. When finished paging, press the "Talk" button again to cancel the paging.

12. Test fire alarm contact input: 8 channels of dry contact closure signal from fire control system should be connected to these port. When the contact closure inputs coming, the microSD2 pre-recorded message or external fire alarm audio will automatic be page to related zones(by software setting). And the related zones will display "Fire" on the touchscreen to show now is doing a fire alarm. The fire alarm or emergency audio source can be selected between internal micro SD2(TF2) or external fire audio input

Note: the build-in fire message can be replaced through the micro SD2(TF2) card. When a fire alarm is activating, the control output port will output a contact closure to activate a third party device.

13. Test the emergency microphone station paging: When a emergency paging is needed, select your audio source first and then select the zone which you want, press talk button to start a paging (Push on, push off mode or Push to talk mode can be preset ). the corresponding zone will show "EM" . And then you can set the proper volume for each zone on the control screen. The operation will change with the matrix synchronously. When finished paging, press the "Talk" button again to cancel the paging.

Note: the emergency paging has the highest priority in the PA system. When a emergency paging is activating, the control output port will output a contact closure to activate a third party device.

## Connection for Phoenix connector

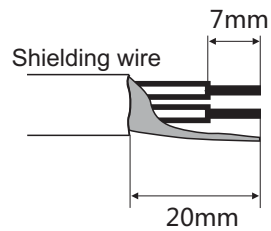
### Attention:

1. Must need to use shielding wire.

2. Please pay attention to the naked wire part of wire and avoid soldering tin.

When banding the wire, if the tin solder damage, it will probably increase contact resistance and cause heating. Please use the proper audio cable and speaker cable.

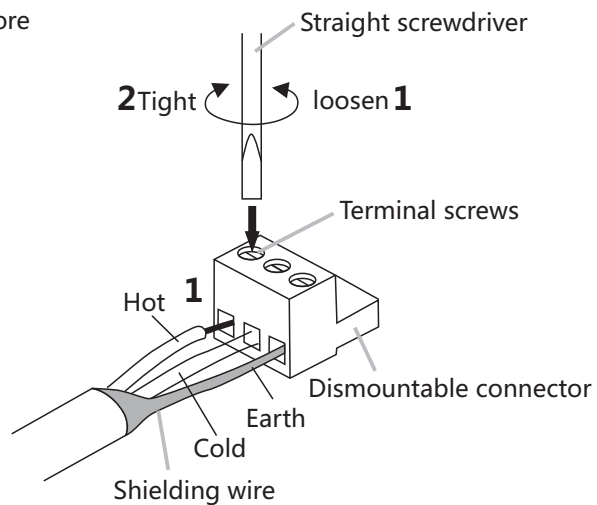
### 1. Naked wire part



### 2. Phoenix connector wiring steps

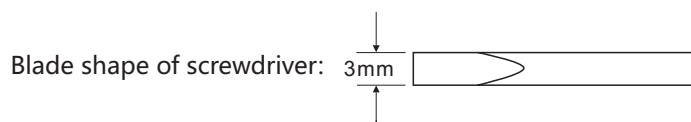
Step 1: Loosen the screw of the terminal before insert the wire.

Step 2: Tight the screw of terminal.



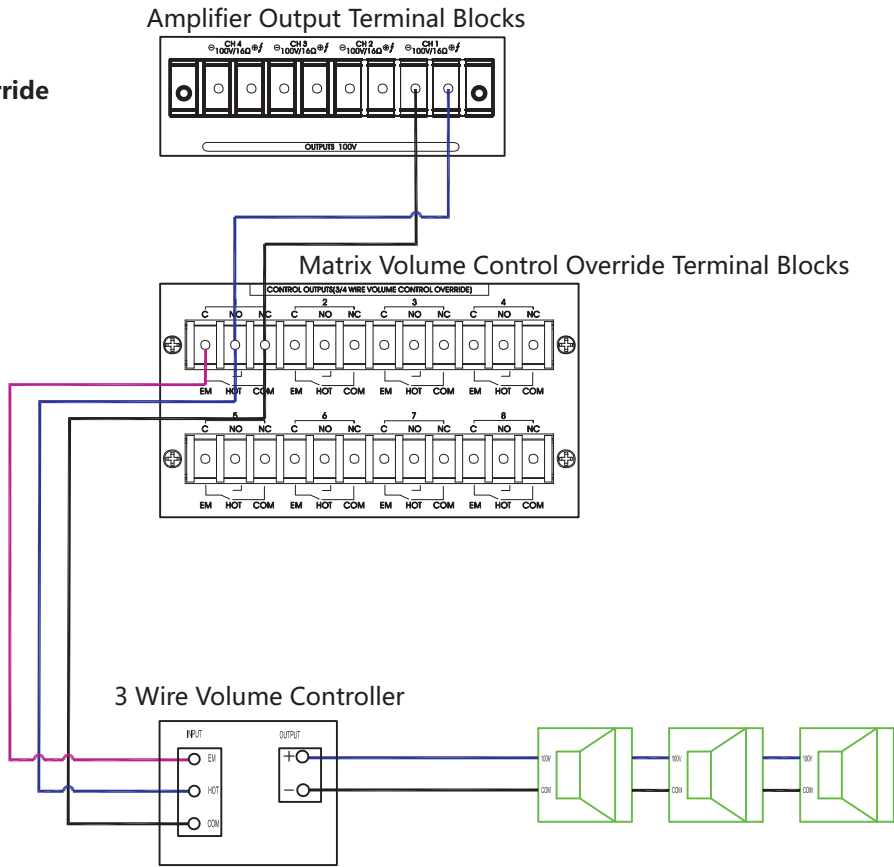
### Remark

Suggest for the Straight screwdriver: Blade width for 3mm

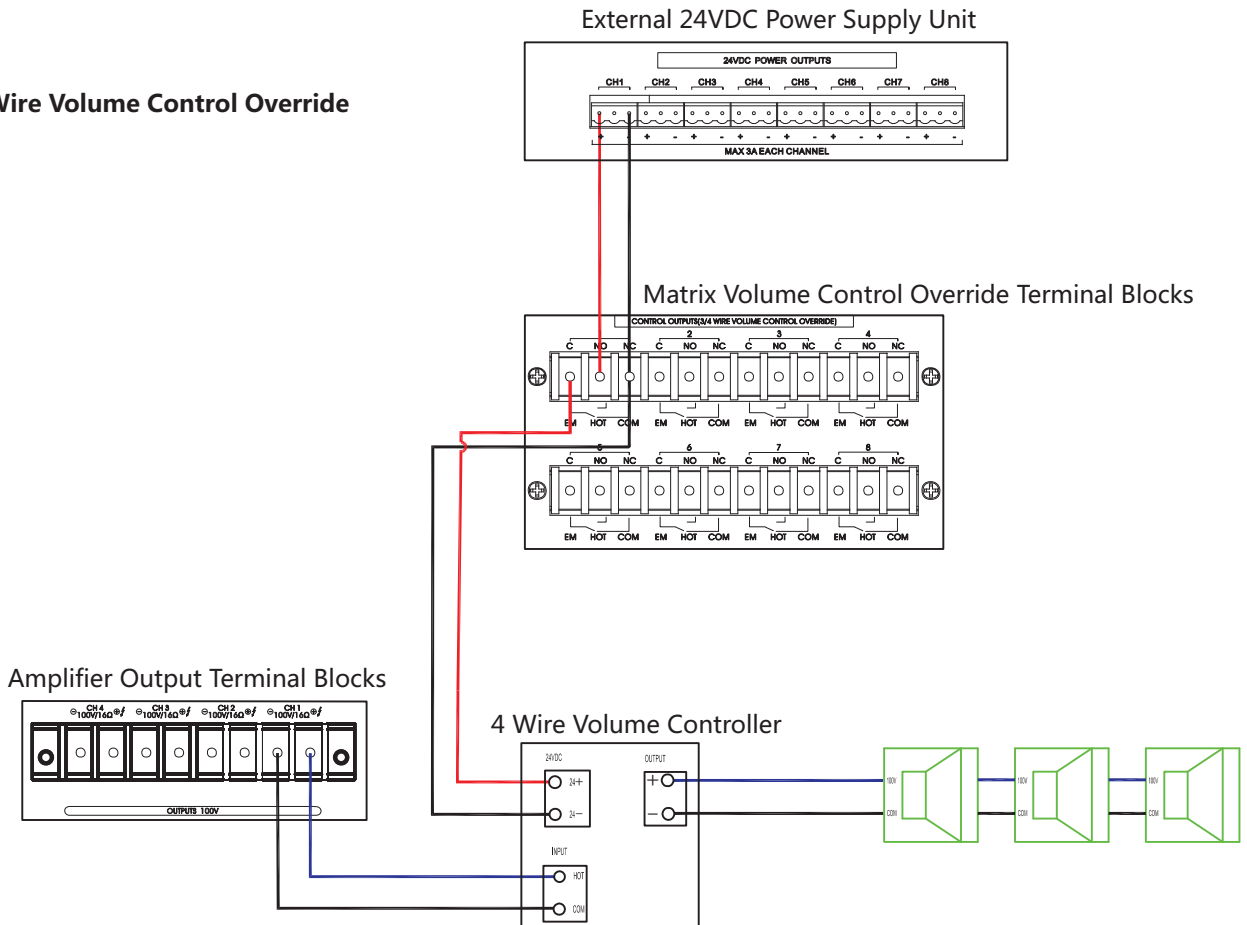




**3 Wire Volume Control Override**



**4 Wire Volume Control Override**



# Service

## Procedures

Ensure the problem is not related to operator error, or external system devices, Once it is certain that the problem is related to the product contact your warranty provider as described in the warranty section of this manual.

## Schematic

A Schematic is available by contacting your warranty provider.

## Parts List

A Parts List is available by contacting your warranty provider.

## Variations

Variations of this product exist to reflect the variations in AC power requirements throughout the world. Product supplied through local sources are compatible with local AC power requirements.

## Options

No optional items are available for this product.

## Warranty

Warranty terms and conditions vary by country and may not be the same for all products. Terms and conditions of warranty for a given product may be determined first by locating the appropriate country which the product was purchased in, then by locating the product type.

To obtain specific warranty information and available service locations contact us directly or the authorized distributor for your specific country or region.



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Specifications are subject to change without notice.