

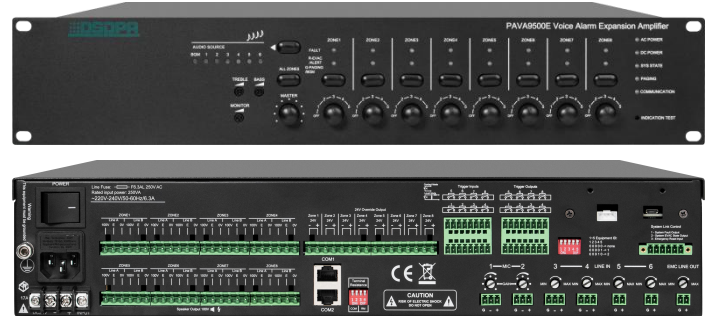
PAVA9500 8-Zone Amplifier Host with Main/Backup Switching

PAVA9500E 8-Zone Expansion Amplifier with Main/Backup Switching



PAVA9500

8-Zone Amplifier Host with Main/Backup Switching



PAVA9500E

8-Zone Expansion Amplifier with Main/Backup Switching

Description

EN54-16 fire emergency broadcasting system provides manual operation and timing programming, and gives priority to the former over the latter; supports real-time monitoring of equipment operating status and recording of operating logs. It meets the relevant standard of "EN54-16 Voice Alarm Control and Indicating Equipment". The broadcasting system can be used for fire emergency broadcasting, daily service broadcasting and background broadcasting; this system is positioned as a small emergency broadcasting system, mainly used in small shopping malls, small office buildings and exhibition halls, etc.

PAVA9500 is an 8-zone amplifier host with main/backup switching function in the EN54-16 system, and is designed to be 2U high, with backup amplifier, timed audio sources, 2 microphone inputs, 4 analog inputs, 1 line output and a fire emergency broadcast panel; supports the total power of up to 500W; holds 8 zone outputs, with the total power of 500W for all zones.

PAVA9500E is an 8-zone expansion amplifier with main/backup switching function in the EN54-16 system, and is designed to be 2U high, with backup amplifier, 2 microphone inputs, 4 analog inputs and 1 line output; supports the total power of up to 500W; holds 8 zone outputs, with the total power of 500W for all zones.

Features

Host Features

- Designed with a standard 2U chassis, made of high-end oxidized blackened aluminum alloy with a frosted panel, revealing a premium look and high-class quality.
- With one-button alarm and two editable alarm voices, with EMC MIC for on-site guidance in case of

emergency.

- With EVAC voice message and Chimes management, allowing for a maximum of 10 customized emergency voice program sources.
- With 2 built-in 500W digital power amplifiers for automatic switching and backup as well as BGM broadcasting.
- With AB line speaker output for 8 zones, with independent switch and volume control for each zone, with master volume and treble/bass adjustment, with an output of 500W for each zone and a total power of no more than 500W for 8 zones.
- With 8-zone on/off function, including on/off buttons for independent zones and all zones (press and hold the button to open all zones of the system).
- Support 6 external inputs, including 2 balanced microphone inputs, 4 balanced line inputs for fire audio input and background music broadcasting; and 1 line output for external expansion or recording backup.
- With built-in audio source playback (mp3, wav).
- Featuring dual bus RJ45 network ports and CAN bus transmission, the host and expansion amplifier are cascaded hand-in-hand or looped. If the host is connected to a single expansion amplifier, it can support a maximum transmission distance of 600 meters; if connected to expansion amplifiers in a centralized manner, it can support up to 19 PAVA9500E expansion amplifiers, with a total of 160 zones, or up to 30 PAVA9425E expansion amplifiers, with a total of 128 zones.
- Support automatic playback and timing functions to enable timed fixed-point and fixed-area track playback and unattended operation.
- With 4 RJ45 network ports for paging microphones, it supports remote microphone paging and zone/group broadcasting, and can be connected to up to 8 units.
- With 8 trigger inputs (with dry contact and level optional), 8 dry contact trigger outputs, and 8 24V override outputs.
- Support remote computer detection and control, audio priority settings, operating records review, and impedance detection parameters settings.
- Support speaker line detection (grounded, open circuit, short circuit) and system detection (expansion amplifier or microphone dropout).
- Support AC power supply and DC24V power supply, which can be identified and switched automatically, with AC power supply as the main power supply normally.
- With AC and DC power connection detection and warning functions.
- With DIP settings for overall system monitoring / trigger mode configuration / host IP address selection / host IP address reset.
- Support system fault detection, emergency output and emergency reset input.
- With multi-function display for device working status: working/fault/normal.
- With an external SD card slot for expanding 64G storage space to store external audios, recordings, logs, built-in EVAC voices, etc.
- With monitoring function, built-in recording function, and built-in timed programming function for timed programming of dry contacts to control the on/off of the power sequence controller.
- Support simultaneous output of dual audio, support remote paging for any single or multiple zones while broadcasting background music, without interrupting background music broadcasting of other zones. In this mode, the emergency broadcast remains the highest priority and will be broadcast to all zones forcibly, followed by the paging broadcast, and the background music channel will act as a backup to the emergency broadcast channel.
- The host local handheld microphone supports single track recording and loop playback.
- Audio source priority level: Host EMC MIC > Fireman MIC > Host or Fireman MIC EVAC or ALERT Broadcasting > Fire Alarm Dry Contact Trigger > Remote Paging Microphone > Timed Point Broadcasting > Recording and Broadcasting Function of Handheld MIC on Host Panel > Local BGM Player

= 1-6 External Inputs.

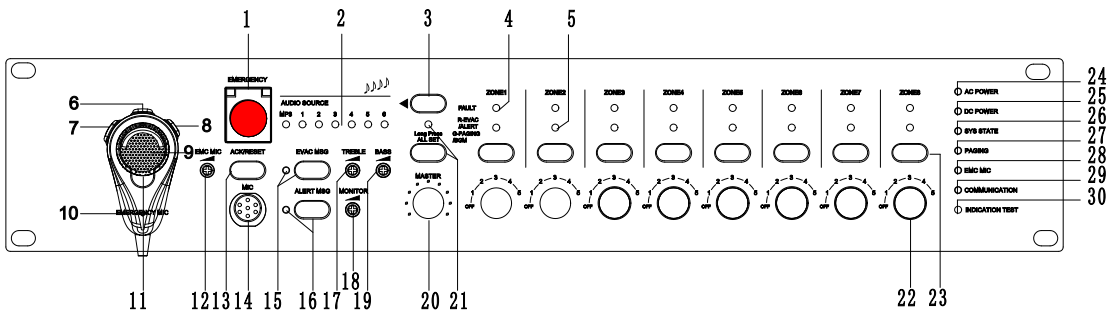
Expansion Host Features

- Designed with a standard 2U chassis, made of high-end oxidized blackened aluminum alloy with a frosted panel, revealing a premium look and high-class quality.
- Work with the amplifier host PAVA9500, and can be combined with the expansion amplifier PAVA9425E for emergency broadcasting and background music broadcasting.
- With a built-in local customized alarm or voice signal player, and 4MB storage space (in MP3 format, the storage length of the program source is determined by the sampling rate and storage space) to store up to 10 different program sources, which can be changed via the MICRO USB interface. Trigger settings for input dry contacts can be completed via a PC sub control software.
- With 2 built-in 500W digital power amplifiers for automatic switching and backup as well as BGM broadcasting.
- With AB line speaker output for 8 zones, with independent switch and volume control for each zone, with master volume and treble/bass adjustment, with an output of 500W for each zone and a total power of no more than 500W for 8 zones.
- With 8-zone on/off function, including on/off buttons for independent zones and all zones.
- Support 6 external inputs, including 2 balanced microphone inputs, 4 balanced line inputs for fire audio input and background music broadcasting; and 1 line output for external expansion or recording backup.
- Featuring dual RJ45 network ports and CAN bus transmission, the host and expansion amplifier are cascaded hand-in-hand or looped. If the host is connected to a single expansion amplifier, it can support a maximum transmission distance of 600 meters; if connected to expansion amplifiers in a centralized manner, it can support up to 19 PAVA9500E expansion amplifiers, with a total of 160 zones, or up to 30 PAVA9425E expansion amplifiers, with a total of 128 zones.
- Work with the host to realize automatic playback and timing functions, enabling timed fixed-point and fixed-area track playback and unattended operation.
- Work with the host to realize remote microphone paging and zone/group broadcasting.
- With 8 trigger inputs (with dry contact and level optional), 8 dry contact trigger outputs, and 8 24V override outputs.
- Support remote computer detection and control, audio priority settings, operating records review, and impedance detection parameters settings.
- Support speaker line detection (grounded, open circuit, short circuit).
- Support AC power supply and DC24V power supply, which can be identified and switched automatically, with AC power supply as the main power supply normally.
- With AC and DC power connection detection and warning functions.
- With 5-digit DIP address settings.
- Support system fault detection, emergency output and emergency reset input.
- With multi-function display for device working status: working/fault/normal.
- With monitoring function, it can work with the host for dry contact programming output.
- Support simultaneous output of dual audio, support remote paging for any single or multiple zones while broadcasting background music, without interrupting background music broadcasting of other zones. In this mode, the emergency broadcast remains the highest priority and will be broadcast to all zones forcibly, followed by the paging broadcast, and the background music channel will act as a backup to the emergency broadcast channel.
- Priority level: Bus Emergency Audio (output from the host data audio bus to each expansion amplifier, play Host EMC MIC EVAC or ALERT depending on the host priority) > Fire Alarm Dry Contact Trigger > Bus BGM Audio (output from the host data audio bus to each expansion amplifier) = 1-6 External Inputs.

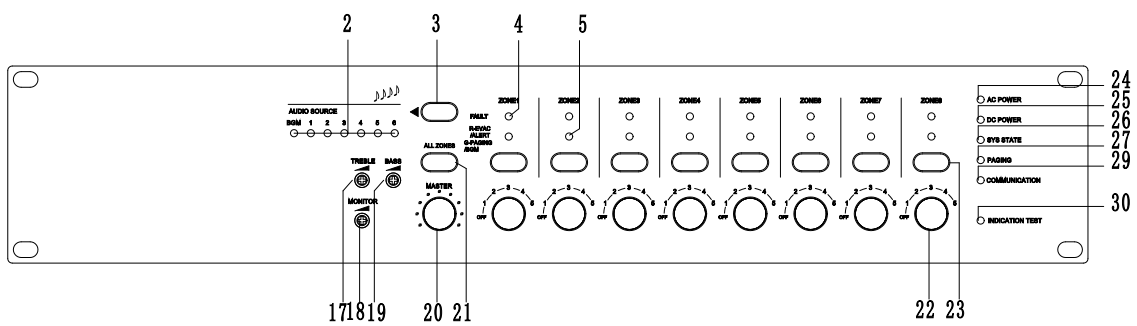
Specifications

Model		PAVA9500	PAVA9500E
Rated Output Power		≥500W (100V)	
Input Sensitivity	EMC MIC	20mV 600Ω	---
	MIC	5±0.5mV 10kΩ	
	LINE	1000±100mV 10kΩ	
Harmonic Distortion	EMC MIC	<1% 1kHz	---
	MIC	1%1khz	
	LINE	<1% 1kHz	
Frequency Response	EMC MIC	80Hz-15kHz (±3dB)	---
	MIC	1%1khz	
	LINE	50Hz-18kHz (±3dB)	
S/N Ratio	EMC MIC	>75dB (A-Weighted)	---
	MIC	1%1khz	
	LINE	>80dB (A-Weighted)	
EMC Line	Output Voltage	1000mV	1000mV
Auxiliary Output	Frequency Range	80Hz-15kHz (±3dB)	80Hz-15kHz (±3dB)
	Harmonic Distortion	<1% 1kHz	<1% 1kHz
System Connection Control Contact Output/Input	System Fault Relay Output		Short circuit, no voltage
	Emergency Mode Relay Output		Short circuit, no voltage
	Fire Reset Input		Short circuit, t≥0.5S, no voltage
	8-Channel Dry Contact Output		Short circuit, no voltage
	8-Channel Dry Contact	Short Circuit Mode	Short circuit input, no voltage
	Level Mode	3.3V~24V	
Voice Message	Data Format	WAV	---
	Storage Type	SD card	---
	Retention Time	>10 years	---
Working Power	AC	AC220V-240V/50-60Hz	
	DC	DC 24V/17A	
Package Dimensions (L*W*H)		625×635×165mm	
Machine Dimensions (L*W*H)		428*430*88mm	
Gross Weight		14kg	13.3kg
Net Weight		12.05kg	11.75kg

Front Panel



PAVA9500 (8-Zone Amplifier Host with Main/Backup Switching Function)



PAVA9500E (8-Zone Expansion Amplifier with Main/Backup Switching Function)

1—Emergency Voice Switch

- ◆ Flashing Red - The current system is working in emergency mode.
- ◆ Off - The current system is working in normal mode.
- ◆ When the LED is off, press the switch to enable the emergency mode, and then the LED indicator light flashes red. At this time, all zones of the whole system are forcibly opened and not allowed to be operated by the local zone button and PC control software to execute corresponding zone status commands.
- ◆ When the LED is flashing, press the switch to disable the emergency mode, and at the same time, the emergency voice broadcast will be stopped and the zone status will be restored.

2/3—Line Audio Source Indication / Selection Button

- ◆ Mainly used for displaying the audio output of the current zone.
 - ◆ The MP3 playback of the host corresponds to the audio of the SD card on the rear panel, while the MP3 of the expansion amplifier corresponds to the background music audio of the host.
 - ◆ Channel 1-6 correspond to the 6 external line input audios mentioned in the item 13, 14 and 15 on the rear panel.
- Note: The line audio source selection button is used to switch audio sources among MP3/BGM and 6 external lines, with the LED indication status synchronized, which can be displayed on the control interface of the software PAVA9000 where the audio output of the current zone can be changed.

4—ZONE FAULT / Zone Working Status Indicator

- ◆ Off - The zone is normal.
- ◆ Green - The zone is open-circuited.
- ◆ Flashing Green - The zone is lightly loaded.
- ◆ Yellow - The zone is short-circuited.

- ◆ Flashing Yellow - The zone is overloaded.
- ◆ Red - One of the zone lines is connected to the ground, that is, the amplifier is grounded.

5—R-EVAC/ALERT&G-PAGING/BGM / Zone Service Type Status Indicator

- ◆ This indicator light is both for zone on/off indication and zone service type status indication, off for zone off, on in any color for zone on.
- ◆ Normally Red - EVAC/ALERT voice message broadcasting, fire dry contact triggering, EMIC or fireman MIC paging.
- ◆ Normally Green - BGM background music playing.
- ◆ Green Strobe - PAGING normal remote paging broadcasting.

6—Green REC Button

Press this button twice consecutively (press and hold it for the third time) to start recording, and then the handheld microphone recording indicator lights up to enable the voice recording function. If the recording function is enabled again, the old recordings will be overwritten automatically, and only the latest recordings will be saved and broadcast.

7—Black PTT Paging Button

Press and hold the PPT paging button for emergency voice broadcast, which forcibly turns on all the system zones and DC24V output on the rear panel, and switches the audio source to EMC MIC. Release the button to turn off the emergency voice broadcast and restore the original zone status. If triggered by EVAC/ALERT, it will continue to broadcast the alarm voice.

8—Green PLAY Button

Press the button to play the recorded audio repeatedly.

9—Microphone Pickup Window

10—Recording Indicator

When you press and hold the REC button, this indicator light lights up normally red; when you release the REC button, this indicator light goes out.

11—Handheld Emergency Paging Microphone Holder

When the microphone is not in use, put the hook on the back of the microphone into this holder.

12—Emergency Microphone Output Sensitivity Control

13—Multi-function Reset Button

- ◆ Respond to the system status.
 - a. If the device is working normally or if the button is pressed once after an abnormality is diagnosed in the system and pressed again when the “SYS STATE” indicator light is normally on, the device will have no other response.
 - b. If an abnormality is diagnosed in the device, the “SYS STATE” indicator light will flash intermittently. After pressing this button, the “SYS STATE” indicator light will be normally on and no longer flash, indicating the device fault status, and the buzzer will stop unless a new abnormality is diagnosed in the system.
 - c. When the system is executing a timing point, press this button to disable the current timing point.

14—Circular Connector

Note: It is mainly used to connect and fix the emergency microphone.

15—EVAC Voice Message Button and Status Indicator

- ◆ When the EMERGENCY indicator light is flashing, press this button and then the indicator light will light up. If the ALERT MSG indicator light is on, press this button and then the ALERT broadcast will be stopped, the ALERT MSG indicator light will go out, and the EVAC alarm voice will be broadcast.
- ◆ When the EMERGENCY indicator light goes out, press this button and it does not work.
- ◆ Green - The current “EVAC MSG” voice message is being broadcast.
- ◆ Off - The current “EVAC MSG” voice message is not broadcast.
- ◆ Yellow - The current “EVAC MSG” voice message is lost or the SD card is faulty.

16—ALERT Voice Message Button and Status Indicator

- ◆ When the EMERGENCY indicator light is flashing, press this button and then the indicator light will light up. If the EVAC MSG indicator light is on, press this button and then the EVAC broadcast will be stopped, the EVAC MSG indicator light will go out, and the ALERT alarm voice will be broadcast.
- ◆ When the EMERGENCY indicator light is off, press this button and it does not work.

- ◆ Green - The current "ALERT MSG" voice message is being broadcast.
- ◆ Off - The current "ALERT MSG" voice message is not broadcast.
- ◆ Yellow - The current "ALERT MSG" voice message is lost or the SD card is faulty.

17/19—Audio Treble/Bass Control

18—Monitor Volume Control

20—Master Zone Output Volume Control

21—ALL ON/OFF and Status Indicator

- ◆ Green - Forcibly turn on all zones in the system (please note that it refers to the entire system, not limited to the local device).
- ◆ Off - Restore the state of zones in the system before the forced-open operation.
 - a. When all zone output indicator lights of the machine are currently off, press this button to turn on the output of all zones of the machine.
 - b. When all zone output indicator lights of the machine are currently on, press this button to turn off the output of all zones of the machine.
 - c. When the Long Press ALL SET indicator light of the machine is currently off, long press this button for 1 second to turn on the output of all zones of the whole system.
 - d. When the Long Press ALL SET indicator light of the machine is currently on, short press or long press this button for 1 second to restore the original output state of all zones.

Note: All are two-color lights except for the LINE CONTROL and Long Press ALL SET indicators.

22—Zone Output Volume Control

Note: There are 6 gears in total.

23—Zone ON/OFF Button

- a. When the output indicator light of the current zone is off, press this button to turn on the output of the zone.
- b. When the output indicator light of the current zone is on, press this button to turn off the output of the zone.

24—System Host / Expansion Amplifier AC Power Indicator

- ◆ Green - Indicates that the current system host / expansion amplifier AC power supply is normal.
- ◆ Yellow - Indicates that the current system host / expansion amplifier AC power supply is faulty.
- ◆ Yellow 1-Second Strobe - The AC power fuse is faulty.

25—System Host / Expansion Amplifier DC24V Backup Power Indicator

- ◆ Green - Indicates that the backup power supply of the current system host / expansion amplifier is powering the equipment.
- ◆ Off - Indicates that the backup power supply of the current system host / expansion amplifier is normal or not configured.
- ◆ Yellow - Indicates that the backup power supply of the current system host / expansion amplifier is faulty.
- ◆ Yellow 1-Second Strobe - The DC power fuse is faulty.

Note: The host backup power supply is configured in the system control software interface.

26—System Status Indicator

- ◆ Yellow 1-Second Strobe - The system equipment is faulty.
- ◆ Normally Yellow: If ACK is received for a system fault, this indicator light will light up normally yellow.
- ◆ Off - Each module is working normally or the master detection switch is not turned on.

Note: When the host detects the number of online devices is less than the number of devices set in the PC, the SYS STATE indicator turns yellow and strobes every 1 second, and when no ACK is received, it is flashing, and when the fault is not eliminated, the ACK can shield buzzer and turns the SYS STATE indicator normally yellow.

27—Remote Pager Connection Status Indicator

- ◆ Green - Indicates that a pager is currently working.
- ◆ Off - Indicates that the system pager is connected normally.
- ◆ Yellow - Indicates that the pager is not logically or physically connected to the system host.

Note: Please configure according to the actual number, address and type.

28—Emergency Microphone Status Indicator

- ◆ Green - Indicates that the microphone is working.
- ◆ Off - Indicates that the current microphone is normal and not working.
- ◆ Yellow - Indicates that the microphone is faulty.

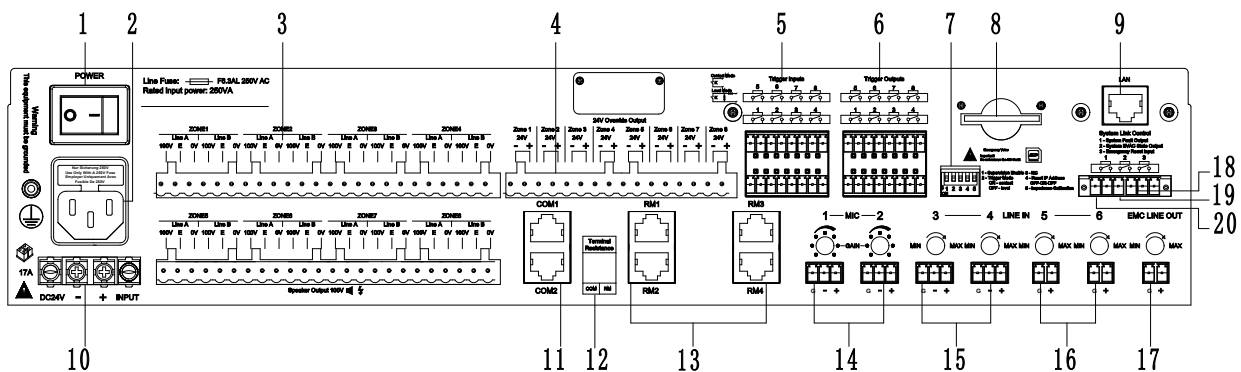
29—System Host / Expansion Amplifier Connection Status Indicator

- ◆ Green - Indicates that the current device is connected normally.
 - Host: Indicates that the current host is logically or physically connected to the PC sub control software, and logically or physically connected to the expansion amplifier or paging microphone.
 - Expansion Amplifier: Indicates that the current device is logically or physically connected to the host.
- ◆ Off - Indicates that the current host is connected normally, while the current expansion amplifier is connected abnormally.
 - Host: Indicates that the current host is not logically or physically connected to the PC sub control software, but logically or physically connected to the expansion amplifier or paging microphone.
 - Expansion Amplifier: It is not logically or physically connected to the system host.
- ◆ Yellow - Indicates that the current host is not logically or physically connected to the expansion amplifier or paging microphone.

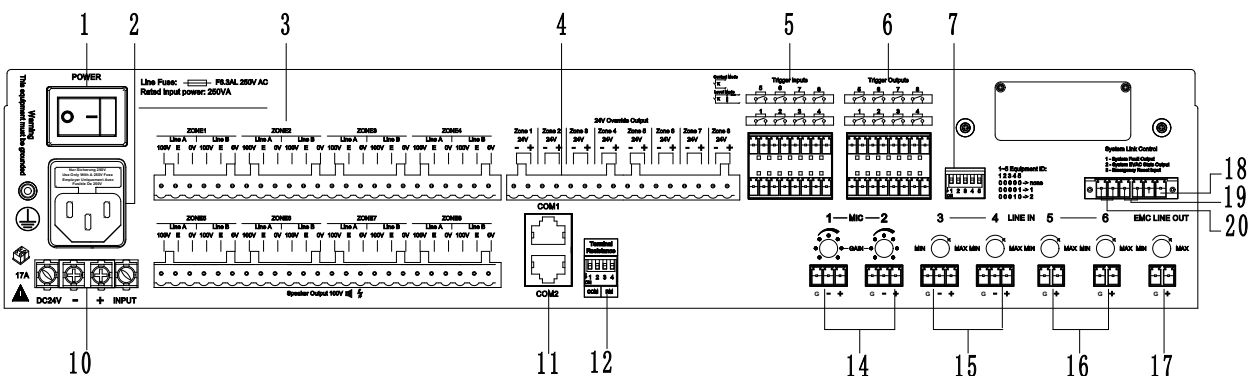
30—System Equipment LED Test (Mainly test the LEDs on the panel of the host and expansion amplifier as well as remote pager)

Note: If the system is configured with an expansion amplifier and remote pager, press this button to enter the LED test mode synchronously, and the LEDs on the panel will light up sequentially from red to green to yellow.

Rear Panel



PAVA9500 (8-Zone Amplifier Host with Main/Backup Switching Function)



PAVA9500E (8-Zone Expansion Amplifier with Main/Backup Switching Function)

1— Power Switch

2—AC220V-240V Power Input Interface

3—8 Channels of Speaker A&B Loop Output Interfaces

- ◆ If the detection function is enabled, the line open-circuit, short-circuit or ground fault will be alarmed accordingly based on the device enabling settings on the PC control software.
- ◆ If the detection function is disabled, no loop detection will be performed and all zones are in normal state.
- ◆ It can be connected to external constant voltage speakers.
- ◆ Output voltage: 0~100V.

4—8 Channels of DC24V Output Interfaces

- ◆ In EMC mode (host EVAC/ALERT, host EMC MIC, fireman microphone ECAV/ALERT, fireman microphone EMC MIC, fireman FUNCTION 1-6, fire dry contact trigger), the DC24V output is forcibly enabled. The timing point can allow you to select whether to enable DC24V output or not.
- ◆ It can be connected to external four-wire sound control.
- ◆ The rated output current is 0.2A per channel.

Note: The total power of 8-channel outputs shall not exceed 38W.

5—8 Channels of Programmable Dry Contact Output Interfaces

- ◆ The timed output of any dry contact can be programmed and configured.
- ◆ The triggered output of any dry contact can be configured for a fire alarm input signal.

6—8 Channels of Programmable Input Contact Interfaces

- ◆ It can be configured in two ways: dry contact input and level input. When configured as a dry contact input, no polarity should be distinguished; when configured as a level input, the left one of two terminal blocks is the positive end, and the right one is the negative end when facing the rear panel, with the input voltage of 3.3-24V.

7—System Host / Expansion Amplifier Module Configuration Switch (Down for “Enabled”, Up for “Disabled”)

- ◆ System host:

“1” - indicates the master detection switch of the system, “enabled” for monitoring the working status of each module of the system, otherwise “disabled”.

“2” - indicates trigger mode configuration switch, “enabled” for short-circuit triggering, “disabled” for level triggering.

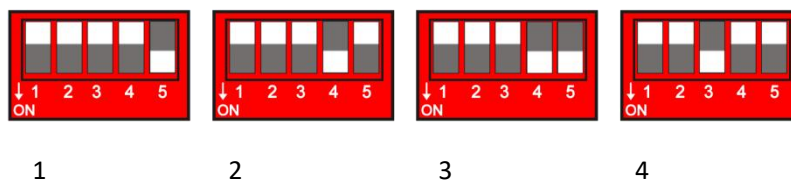
“3” for none.

“4” - indicates default value resetting of the host IP. IP address: 192.168.199.250; port number: 10086.

“5” - indicates impedance detection modeling. Dial the switch down and immediately dial it up to trigger a modeling action.

- ◆ Expansion amplifier:

“1~5” indicates the IDs for device connection. The following devices are connected with the IDs as shown below (that is, the binary value of the device ID1~5, dialed down for “1”, dialed up for “0”). Note: The silk screen printing “1” on the DIP switch is the highest binary bit, and “5” is the lowest binary bit. For the correspondence between the device address order and the binary value, please refer to the “Attached Table: Comparison Table of Zone Address and Dialing Code Settings”.



8—SD Card

- ◆ Used for recording real-time device detection.
- ◆ Used for storing recording files.
- ◆ The SD card cannot be inserted or removed during power-on, and the host can be started normally only if the SD card is inserted.

9—Ethernet Connection Port

- ◆ Mainly used for connecting the software PAVA9000.
- ◆ Used for remote upgrade of system firmware.

Notes:

- 1) Device default IP address: 192.168.199.250; communication port number: 10086.
- 2) If the IP modified by the software PAVA9000 is forgotten, the default IP address can be restored by dialing down the 4th digit mentioned in the item "7" and then dialing up it again.
- 3) The host PAVA9500 can be directly connected to the PC via this port and automatically identify TIE/EIA-568B and TIE/EIA-568A standards. In order to unify the interface, it is recommended to use the TIE/EIA-568B standard connection method.

10—Backup DC24V Power Input Interface

- ◆ It is an external battery interface and the capacity of the battery is configured according to the actual usage requirements.

11—CAN Bus Data Dual-Channel Audio Bus Interfaces

- ◆ With dual RJ45 interfaces, the host can be connected to up to 19 8-zone expansion amplifiers or 30 4-zone expansion amplifiers hand in hand.

12—System Host / Expansion Amplifier Bus Communication Termination Resistor Configuration Switch (Down for "Connected", Up for "Disconnected")

- ◆ System host:

"1" "2" (these two dip switches are in parallel) - indicates the communication bus termination resistor with the expansion amplifier, dialed down for connecting the communication bus termination resistor, so as to ensure that the host side and the last expansion amplifier of the communication bus of the host and expansion amplifier are connected to the termination resistor in the whole system.

"3" "4" (these two dip switches are in parallel) - indicates the communication bus termination resistor with the remote paging microphone, dialed down for connecting the communication bus termination resistor, so as to ensure that the host side and the last remote paging microphone of the communication bus of the host and remote paging microphone are connected to the termination resistor in the whole system.

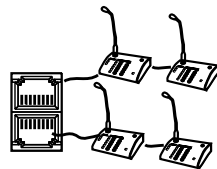
- ◆ Expansion amplifier:

"1" "2" (these two dip switches are in parallel) - indicates the communication bus termination resistor with the host, dialed down for connecting the communication bus termination resistor, so as to ensure that the host side and the last expansion amplifier of the communication bus of the host and expansion amplifier are connected to the termination resistor in the whole system.

Note: The host is terminated with this resistor by default, which can be determined according to the actual communication situation.

13—Powered Data Audio Bus Interfaces

- ◆ With four RJ45 ports, the system can be connected to up to 8 devices (remote paging microphones or fireman microphones) hand in hand.
- ◆ Connected with a network cable in a star connection mode.



Star Connection Mode

14—MIC1-2 Two Microphone Balanced Input Interfaces

- ◆ With $\pm 2.5\text{mV}$ input sensitivity and independent volume control.

15—LINE1-2 Two Line Balanced Input Interfaces

- ◆ With $\pm 500\text{mV}$ input sensitivity and independent volume control.

16—LINE3-4 Two Line Single-Ended Input Interfaces

- ◆ With 1000mV input sensitivity and independent volume control.

17—LINE OUT Single-Ended Output Interface

- ◆ With 1000mV input sensitivity and independent volume control.

18—System Fault Output Interface

- ◆ When the system is faulty, the output interface is disconnected, otherwise it is closed.

19—System Voice Alarm State Output Interface

- ◆ When the system is working in the fire alarm state, the output interface is closed, otherwise it is disconnected.

20—Fire Alarm Reset Input Interface

- ◆ When the current device is working in fire alarm mode, the interface can be used to reset and switch to normal mode.
- ◆ When the current device is working in normal mode, no operation is required.

Note: When installing the equipment into the rack and routing the cables, the signal input and power output of the expansion amplifier can not be bundled together. If bundled, it may cause the amplifier to self-oscillate, potentially leading to amplifier damage.