Honeywell

INTEVIO PA/VA System

User Manual

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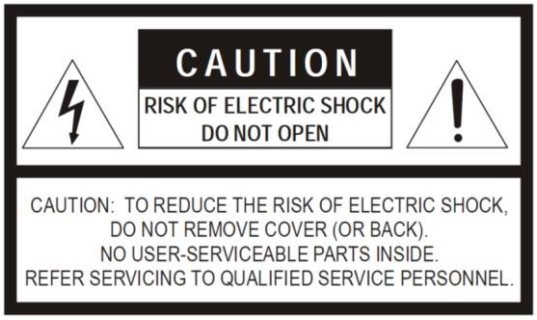
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Safety Guidelines



	**Danger** This sign reminds users of “dangerous voltage” on the product.
	**Caution** This sign reminds users of important instructions attached to the product.
Safety guideline	In order to prevent electric shock, this equipment plug shall not be used as conductor to extend power supply line. Do not block the equipment’s ventilation opening or put other equipment on it.
Safety guideline	Protect this equipment against rainwater or moisture so as to avoid fire or electric shock.

Safety Precautions

Please carefully read and observe the following precautions before installing, operating or using this product.

Electricity Utilization Safety

- Local electrical safety regulations must be observed for product installation and operation.
- The Company shall not be liable for fire or electric shock accidents caused by incorrect installation and mistake.

Transportation Safety

- The product shall be protected against impact, violent vibration or liquid erosion during transportation, storage and installation.

Environmental Requirements

- Do not install the product within the environment of extreme temperature or dust and mechanical vibration.
- This equipment shall be well ventilated and protected against dust, moisture, direct sunshine and violent during the use. It shall be kept away from radiating objects or heat sources and well ventilated. The optimum working environment temperature is 5-28ºC and relative humidity <95%. If the equipment is in operation for a long time and ambient temperature is too high, it is recommended that effective measures should be taken to reduce temperature.

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- Requirements on grid power supply voltage by the equipment: AC 220V (-15% ~ +10%) 50 ~ 60 Hz. In case of too high, too low voltage or that fluctuating greatly, it is recommended that AC regulated power supply should be installed.
- As the product is not waterproof, do not expose it to rainwater or liquid environment so as to avoid damaging it.
- Put the equipment on solid level plane or install it on a rack.
- Do not put other articles on the equipment top.

Safe Use Precautions

- The equipment shall be installed under the direction of professionals.
- Please carefully check power supply lines for damage prior to use. The lines must be connected to the equipment in strict accordance with identifications.
- Power supply plugs and sockets shall match each other. Otherwise, suitable sockets must be provided. Human damage to the sockets shall be prohibited.
- Power supply for the equipment shall be provided with sufficient capacity and independent and reliable grounding lines.
- Please ensure the equipment power supply grounding lines interconnected and connected with the ground. Otherwise, it will cause it abnormal, even damaged.
- There are HV lines within it. When turn on the power, do not open the equipment cover without permission so as to prevent electric shock.
- Prior to the first energization to start equipment, please check its external wiring for correctness so as to avoid damage.
- During the energization, please do not touch wiring terminals identified with “lightning” at random so as to avoid electric shock.
- Please do not change equipment connection circuits at random during energization so as to avoid damage.
- In case of failure to the equipment, please ask professional repair personnel to repair it. Otherwise, the Company shall neither dispose of any problems nor undertake relevant responsibilities.

Label and User’s Manual

- Please pay attention to information on the product label such as type and power supply.
- Please carefully read the user’s manual and operate according to the instructions. The user’s manual is for reference for operation of products of different types. Specific operations of products of different types are not listed herein. In case of any problem, please contact the Company.
- Please maintain this Manual for future reference.

Network Security

Placement

- Please put the device in a safe place, lock the cabinet and keep the keys well.
- The access control system of the central control room should be under strict management.
- Any person except authorized maintainer is forbidden to disassemble or change parts of device.

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- It is forbidden to communicate INTEVIO system with third party system unless updating the configuration.

Password Precaution

- Please change the password during the system deployment.
- Users need to change the password regularly.
- The password with six numbers is preferred.

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Preface

Thank you for purchasing the INTEVIO public address and voice alarm system. Please carefully read this manual prior to product use so as to ensure correct use of the system.

Brief Introduction

This manual describes the equipment appearance, installation and wiring, contained in the following sections:

Chapter 1: System Overview

This section introduces the INTEVIO system's structure, product features, appearance and technical specification.

Chapter 2: System Installation

This section describes the preparatory work and installation procedures.

Chapter 3: System Configuration

This section introduces the configuration instructions of INTEVIO system.

Chapter 4: System Commissioning

This section introduces the commissioning instructions.

Chapter 5: Operation Instructions

This section describes the operations instructions for usage.

Chapter 6: Maintenance

This section introduces some troubleshooting methods and the maintenance related information of INTEVIO system.

Intended Reader

This manual is mainly for the people who need to install, operate and maintain the INTEVIO system.

Relevant Documents

The following documents can be used as a reference when reading this manual:

- RK-MCU Master Control Unit Product Instructions
- RK-ZONE8 Zone Expander Product Instructions
- RK-ZONE24 Zone Expander Product Instructions
- RK-AMP500 500W Class-D Power Amplifier Product Instructions
- RK-MIC Remote Call Station Product Instructions

Instructions

- All contents including figures in this manual are to be used only for reference.
- The product may be subject to change from time to time without notice.
- Users of this product are recommended to carefully read all warnings and precautions in this manual.
- Carefully read this manual before using the product and keep it as a reference for future use.
- This manual has been reviewed with its accuracy is ensured. In case of any doubt or dispute of the product description, the final interpretation given by Life Safety A/V (Guangzhou) Co., Ltd. shall prevail.
- Life Safety A/V (Guangzhou) Co., Ltd is not liable for any consequences caused by user mistakes when using the product or user misunderstandings of the manual content.

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Abbreviations

Acronyms are used to refer some expressions for easy to read. The abbreviations are as follow:

Abbreviation	Definition	Description
AMP	Power Amplifier	Amplify the audio signal and output the high power audio signal to drive loudspeakers.
HCU	Master Control Unit	The management of the system, which can drive 8 zones, The system capacity can be increased to extend more devices.
MAINS	Main power supply	Primary power source
BACKUP	Backup power supply	Secondary power source
DCT	Dry contact	A kind of the interface which can be linked to relays or switches.

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1 System Overview

INTEVIO PA/VA System provides a series of public audio solutions. It is highly integrated with device simplification, easy expansion, simple installation, convenient operation, etc.

This chapter mainly introduces the system features, composition, structure, applications and briefly describes each device's feature, component and technical specification.

System Introduction

System Features

- Centralized system, easy to expand.
- Supports 2 audio channels, apply to public address and voice alarm system.
- Simple installation, commissioning and convenient operation.
- Digital volume control to every audio input and output.
- Class-D technology, to reduce the energy consumption of system.
- Built-in mass memory, which is used to store audio files, configuration data, log files, etc.
- Supports temporary recording and automatic recording.
- Supports external power amplifier to increase the system power output.
- Flexible amplifier redundancy.
- Built-in loudspeakers to monitor audio source.
- Built-in 500W Class-D power amplifier in RK-MCU.
- Full system supervision, including main/backup power supply, CPU, microphone, power amplifier loop, network, speaker lines and dry contact inputs, etc.
- Fault status indicating by lights and LCD.
- Be able to call all zones via PTT microphone of RK-MCU while the CPU of RK-MCU is failure.
- Timing data can be configured via software and downloaded to master control unit.
- The system supports maximum 128 zones.
- Maximum 6 remote call stations can be connected for live broadcast and other operations.
- Zone expander has independent audio input interface, which can be used under standalone mode or while CPU failure occurs in RK-MCU.

System Composition

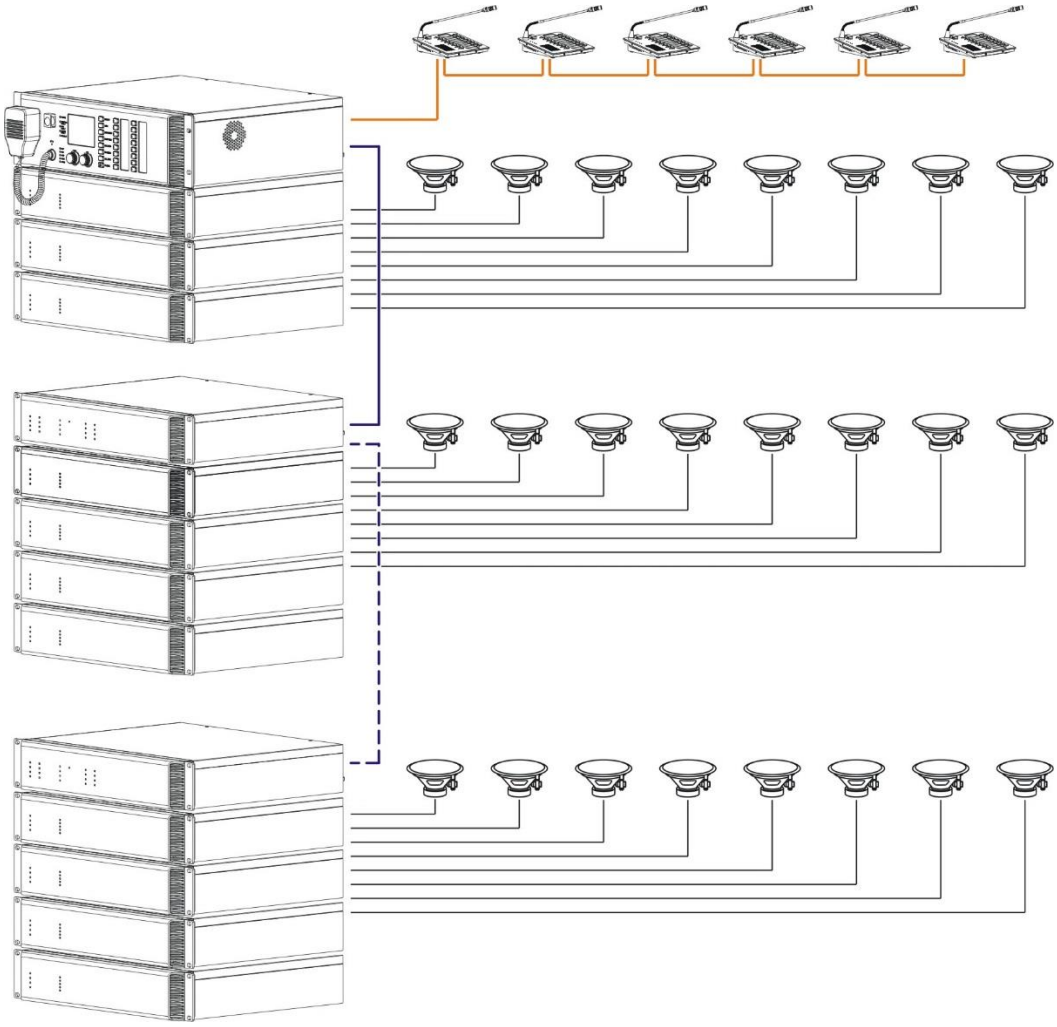
- RK-MCU Master Control Unit
- RK-ZONE8 Zone Expander
- RK-ZONE24 Zone Expander
- RK-AMP500 500W Class-D Power Amplifier
- RK-MIC Remote Call Station
- X-K4 4-Key Expansion Module
- X-K8 8-Key Expansion Module
- INTEVIO-Config System Configuration Software

System Structure

System only allows to equip one RK-MCU, which is connected to zone expanders and call stations through control and audio bus to manage all the devices in system. Maximum 15 RK-ZONE8 or 5

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RK-ZONE24 can be connected and maximum 128 zones can be extended. Call stations and RK-MIC are connected to master control unit (RK-MCU) as the chain structure as below:



Note:

RK-ZONE8 and RK-ZONE24 can't be used in the same system since they have different audio channels and speaker lines.

Applications

System can apply to:

- Educational institutions, e.g. school, etc.
- Factories
- Office buildings
- Lobbies
- Apartment hotels
- Churches

RK-MCU Master Control Unit

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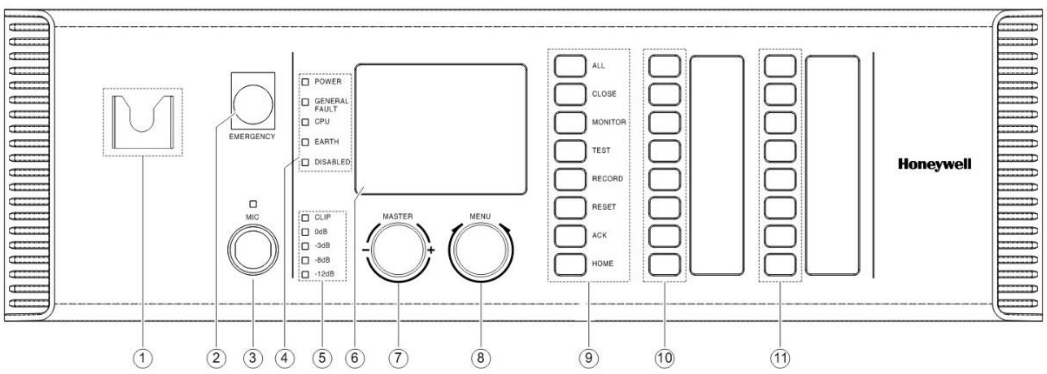
Master Control Unit is the central management device of the system, which is used to manage and monitor all devices in the system, and perform various operations. Master control unit has audio storage, broadcast, zone control, monitor, timing control, fault diagnosis, etc. functions. The built-in 500W Class-D power amplifier drives maximum 8 loudspeaker lines to meet the requirements of small applications. It can also be connect to zone expanders to increase system capacity to meet the requirements of large applications.

Product Features

- Manage all devices in the system, used for public address and emergency broadcast.
- View system status and set the parameters via LCD screen.
- Supports both single channel mode and dual channel mode.
- Maximum 8 loudspeaker lines can be connected, the maximum power rate of each speaker line is 500W.
- Built-in 500W Class-D power amplifier, also supports external power amplifiers.
- Flexible power amplifier redundancy. One spare amplifier can back up all amplifiers in the system.
- Built-in 1GB Flash memory and 8GB SD card, which are used to store audio files, recording files, configuration data and log files, etc.
- Two auxiliary inputs and one MIC/LINE input.
- Optional PTT microphone for live broadcast.
- Digital volume control, easy to set input and output volume.
- 255 broadcast priorities.
- Built-in loudspeaker to monitor the audio signal of two channels.
- Automatic recording and temporary recording.
- Full system supervision, including main power supply, backup power supply, CPU, PTT microphone, power amplifier, speaker lines, dry contact inputs, network communication, etc.
- 10 dry contact inputs with supervision and 8 dry contact outputs.
- Supports 3-wire and 4-wire volume controller.
- Supports the integration with third party system, such as fire alarm system via the dry contact or RS-485 interface.
- Zone expanders to increase the system capacity.
- Remote call station can be connected for live broadcast and broadcast control.
- Built-in standard configuration to allow the direct usage of system after installation.

Product Appearance

Front Panel

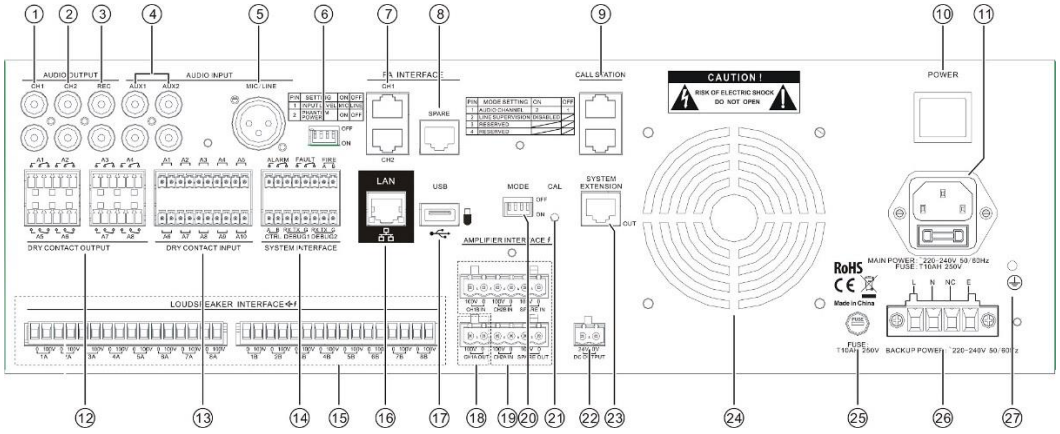


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No.	Buttons/Indicators	Description
1	Microphone bracket	The microphone bracket is used for PTT microphone.
2	Emergency button	A protective cover is above the emergency button to avoid wrong operation. If switching to manual emergency mode, raise the protection cover, then press the button. The indicator light turns red.
3	Microphone socket and indicator light	Used to connect microphone to HCU. The indicator light is off when in standby mode. When microphone is being used, the light turns green. When microphone experiences a fault, the light turns yellow.
4	Device status indicator lights	To indicate the status of device power, general fault, CPU fault, ground fault, forbidden etc. • POWER indicates the power supply status. This light is green when the device is powered on. • GENERAL FAULT indicates the whole system's fault status. When the system detects any fault, the indicator turns yellow. When a new fault occurs and without confirmation, the light turns yellow and flickers. • CPU indicates the CPU fault status of HCU, the indicator turns yellow when the CPU is failure. • EARTH indicates the earth fault status of HCU speaker lines, it turns yellow when an earth fault is found, and the fault point can be checked in the menu. • DISABLED indicates the disabled status. It turns yellow when a loudspeaker line is automatically disabled due to a short circuit, and details can be checked in menu.
5	VU meter	To indicate the signal level of internal power amplifier.
6	LCD display screen	To display the system work status and set the parameters.
7	Wheel knob of master volume	To adjust the output volume of audio channel 1(BGM) in public address.
8	Wheel knob of menu	To operate the menu, including left rotation, right rotation and click operation.
9	Function buttons	There are some function buttons: • ALL is used to select all zones in system, the indicator turns green and flickers when all zones are selected. • CLOSE is used to forcibly close the selected zones. • MONITOR is used to switch to monitor channel (CH1, CH2 or close). • TEST is used to enable the self-test function. • RECORD is used for temporary record. • RESET is used to reset all the fault status. • ACK is used to confirm the new fault status. • HOME is used to return to standby mode by one-click.
10	Zone buttons & status indicators	8 zones/groups buttons with status indicator lights, which can be configured.
11	Audio source button & status indicator light	8 audio source selection buttons with status indicator lights, which can be configured.

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Rear Panel



No.	Parts/Ports	Description
1	Audio output of CH1	To output the signal of channel 1, can be connected to the external power amplifier or third party devices.
2	Audio output of CH2	To output the signal of channel 2, can be connected to the external power amplifier or third party devices.
3	REC output	To output the audio signal from microphone, can be connected to the external recording device.
4	AUX1/AUX2	To be connected with the external audio source, such as CD/DVD player, tuner, etc.
5	MIC/LINE input	It is a balanced input, and can be connected with the external microphone or other audio devices. The input sensitivity can be set via the DIP switch beside.
6	MIC/LINE DIP switch	To set the sensitivity and the phantom power output of MIC/LINE input.
7	Power amplifier interface	To connect to the external power amplifiers of two audio channels, HCU will transmit the audio signal and self-test signal to power amplifier and receive the fault status from power amplifier.
8	Spare power amplifier interface	To connect to a spare power amplifier, HCU will transmit the audio signal and self-test signal to power amplifier and receive the fault status from power amplifier.
9	Call station interface	To connect to the remote call station, transmit audio signal, control data, power supply from HCU to remote call stations.
10	Power switch	To turn on or turn off the AC power.
11	Main power & fuse	To connect to the AC power supply. A fuse must be installed in the socket for over current protection.
12	Dry contact outputs	8 dry contact output interfaces, which can be used to control external devices.
13	Dry contact inputs	10 dry contact input interfaces, which can be connected to the third party devices for the business or voice alarm purpose.

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No.	Parts/Ports	Description
14	System interface	Interfaces will be connected to third party systems: • ALARM - A dry contact output to transmit the voice alarm status to third party system. • FAULT – A dry contact output to transmit the general fault status to third party system. • FIRE – Used to connect to the fire alarm system via the RS-485 bus. • CTRL- This port is reserved to connect to the third party system. • DEBUG 1/DEBUG 2 are used to upgrade the firmware.
15	Loudspeaker interface	Speaker line interface of 8 zones, each zone has two speaker lines (A&B) in parallel connection.
16	Ethernet interface	10M/100M Ethernet interface.
17	USB interface	To insert the USB storage.
18	CH1A OUT	The 100V output of internal power amplifier corresponding to the CH1A.
19	70V/100V interface of external power amplifier	Including the CH1B IN, CH2A IN, CH2B IN and the IN/OUT of spare amplifier.
20	MODE	It is the DIP switch to set the work mode of current device and system.
21	Calibration key	To calibrate the impedance of speaker line.
22	DC power output	24V DC power output.
23	System extension interface	To connect to zone expanders.
24	Fan	Cooling fan controlled by temperature.
25	Fuse of backup power supply	Overcurrent protection for backup power supply.
26	Backup power input	To connect to AC backup power supply.
27	Grounding screw	To connect to grounding wire.

Technical Specification

Parameters	Values
Main power supply	AC 220-240V，50/60Hz
Backup power supply	AC 220-240V，50/60Hz
Fuse	T10AH 250V
Power consumption	<760W
PTT Microphone	
Sensitivity	-59±3dBV
Frequency response	100Hz -14KHz, ±3dB

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Parameters	Values
SNR	>50dB, A-weighted
Auxiliary input	
Number	2
Input sensitivity	1V(0dBV)
Input impedance	10 KΩ
Frequency response	85Hz-18KHz, ±3dB
SNR	>80dB, A-weighed
MIC/LINE Input	
Input sensitivity	5mV/1V, set by DIP switch
Input impedance	20 KΩ
Frequency response	80Hz-18KHz, ±3dB
SNR	>80dB, A-weighted
Phantom power output	24V DC, set by DIP switch
Audio Output	
Output channels	CH1, CH2 and record
Output signal	1V (0dBV)
THD	<0.1%
Internal Power Amplifier	
Max. power output	500W
Output signal	100V(CH1A)
Frequency response	80Hz-18KHz, ±3dB
THD	<0.1%
Power Amplifier Interface	
Number	3 (CH1, CH2 and spare amplifier)
Output signal	1.4V
THD	<0.1%
Control signal	Self-testing, amplifier fault and power saving control signal
Loudspeaker Interface	
Zone Number	8 (each has A and B output)
Max. load power	500W
Contact Input / Output	
Contact input	10 contact input interfaces with supervision
Contact output	8 contact output interfaces (NO、NC and COM), “Fault” output and “Alarm” output.
Maximum voltage of the outputs	AC 250V/DC 30V
Maximum current of the outputs	2.5A
Others	
DC Power output	24V/1A

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Parameters	Values
Monitoring loudspeaker	2W/8Ω
Ethernet interface	10M/100M
Memory capacity	1GB Flash Memory, 8GB SD card
Working Conditions	
Relative Humidity	< 95%, without condensing
Operating temperature	-10°C~+50°C(14°F to +122°F)
Storage temperature	-40°C~+70°C(-40°F to +158°F)
Specification	
Dimension (W*H*D)	482 mm×133.5 mm ×420 mm
Packing dimension (W*H*D)	580 mm×279 mm ×552 mm
Net weight	14.3Kg
Gross weight	17.4Kg

RK-ZONE8 Zone Expander

RK-ZONE8 is the zone extension device to expand the quantity of loudspeaker lines and interfaces. RK-ZONE8 can provide 16 loudspeaker line interfaces (corresponding to 8 zones), 8 dry contact inputs and 8 dry contacts. External power amplifiers must be connected to drive the loudspeakers.

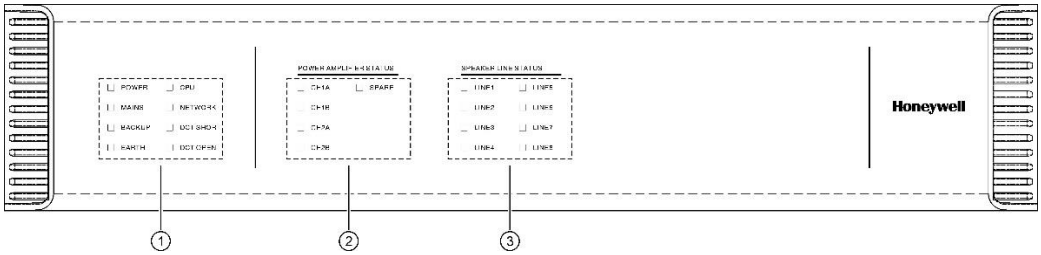
Product Features

- Supports both single and dual audio channels.
- Expanding 16 loudspeaker lines (corresponding to 8 zones), each zone has two speaker lines.
- 8 dry contact inputs with supervision.
- 8 dry contact outputs.
- 4 external power amplifiers and 1 spare power amplifier can be connected.
- Flexible amplifier redundancy function.
- Full supervision, including main power supply, backup power supply, CPU fault, power amplifier, speaker lines, dry contact inputs and network fault, etc.
- The signal volume to amplifiers can be set via RK-MCU.
- Supports 3-wire and 4-wire volume controller.
- Supports standalone mode and networking mode.
- 1 line input interface, which can be connected to external device while the device is in standalone mode or the CPU of RK-MCU is failure.
- DC power output interface, which can supply power for external modules, such as volume controller.
- Maximum 15 RK-ZONE8 can be used in system.

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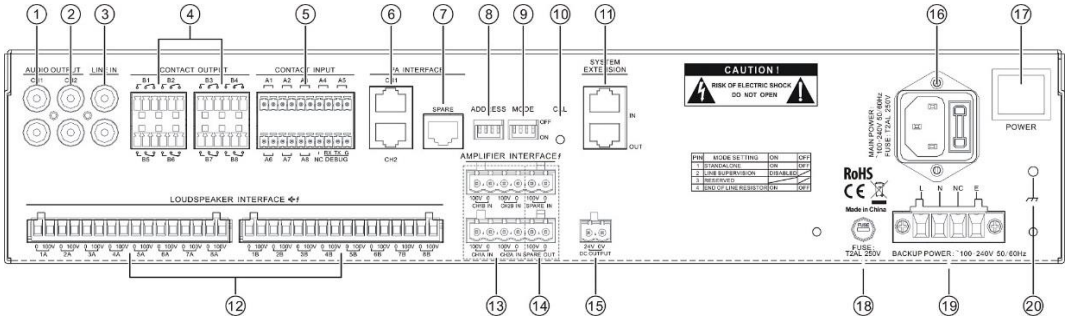
Product Appearance

Front Panel



No.	Button/Indicator Light	Description
1	Device status indicators	To indicate the status of power supply, main power fault, backup power fault, earth fault, CPU fault, network fault, open circuit and short circuit of dry contact inputs.
2	Indicators of power amplifier status	To indicate loop fault of the connected power amplifiers.
3	Indicators of speaker lines	To indicate the work status and fault status of 8 zones.

Rear Panel



No.	Parts/Ports	Description
1	Audio output of CH1	To output the signal of channel 1, can be connected to external power amplifier or third party devices.
2	Audio output of CH2	To output the signal of channel 2, can be connected to external power amplifier or third party devices.
3	Line in	Audio input interface, which is used to connect to external audio devices, such as CD/DVD player, tuner, etc.
4	Contact outputs	8 dry contact output interfaces which can be used to control the external devices.
5	Contact inputs	8 dry contact input interfaces which can be connected to third party devices and used for business or voice alarm purpose. Debug interface is used to upgrade the firmware.
6	Power amplifier interface	To connect to the external power amplifiers of two audio channels, transmit the audio signal, self-test signal to power amplifier, and receive the fault status from power amplifier.
7	Spare amplifier interface	To connect to a spare amplifiers, transmit the audio signal, self-test signal to power amplifier, and receive the fault status from power amplifier.

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No.	Parts/Ports	Description
8	Address DIP switch	To set the device address for communication, the range is from 1~15.
9	Mode switch	To set the work mode.
10	Calibration key	To calibrate the impedance of connected loudspeaker lines.
11	System extension interface	To connect the RK-MCU or the former zone expander.
12	Loudspeaker interface	Speaker line interfaces of 8 zones, each zone has two speaker lines (A&B) in parallel connection.
13	External amplifier interface	Including the CH1A IN, CH1B IN, CH2A IN and CH2B IN.
14	Spare amplifier interface	The 70V/100V audio interface of spare amplifiers.
15	DC output	DC24V power output.
16	Main power & fuse	To connect to the AC power supply. A fuse must be installed in the socket for over current protection.
17	Power switch	To turn on or turn off the AC power.
18	Fuse of backup power supply	Overcurrent protection for backup power supply.
19	Backup power input	To connect to the AC backup power supply.
20	Grounding screw	To connect to the grounding wire.

Technical Specifications

Parameters	Values
Main power supply	AC 100-240V, 50/60Hz
Backup power supply	AC 100-240V, 50/60Hz
Fuse	T2AL 250V
Power consumption	35W
Line Input	
Input signal	1V(0dBV)
Input impedance	10 KΩ
Frequency response	80Hz-18KHz, ±3dB
SNR	>80dB, A-weighted
Audio Output	
Output channels	CH1, CH2
Output signal	1V(0dBV)
THD	<0.1%
Power Amplifier Interface	
Number	3 (CH1, CH2 and spare amplifier)
Output signal	1.4V
THD	<0.1%
Control signal	Self-testing, amplifier fault and energy-saving signal

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Parameters	Values
Loudspeaker Interface	
Zone number	8 (with A and B output)
Max. load power	500W
Contact Input / Output	
Dry contact input	8 dry contact inputs with supervision
Contact output	8 dry contact output (NO、NC and COM)
Maximum voltage of the outputs	AC 250V/DC 30V
Maximum current of the outputs	2.5A
Others	
DC Power output	24V/1A
Working Conditions	
Relative humidity	< 95%, without condensing
Working temperature	-10°C~+55°C(14°F to +131°F)
Storage temperature	-40°C~+70°C(-40°F to +158°F)
Specification	
Dimension (W*H*D)	482 mm×88 mm ×407 mm
Packing dimension (W*H*D)	580mm×235mm ×552mm
Net weight	7.5Kg
Gross weight	10.3Kg

RK-ZONE24 Zone Expander

RK-ZONE24 is the zone extension device to expand the quantity of loudspeaker lines and interfaces. RK-ZONE24 can provide 24 loudspeaker line interfaces and 24 dry contact inputs. External power amplifiers must be connected to drive the loudspeakers.

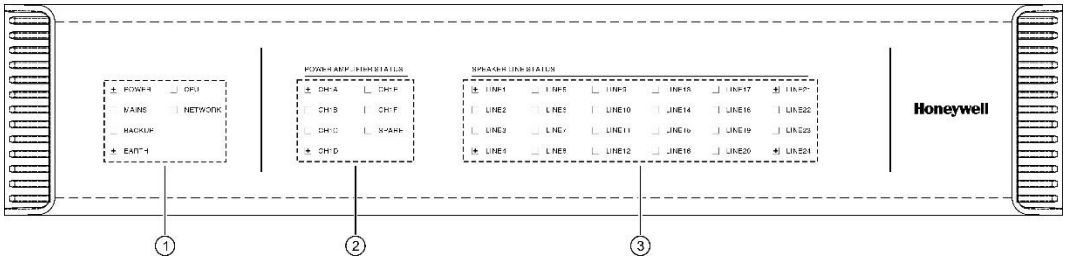
Product Features

- Support single audio channel.
- Expanding 24 loudspeaker lines.
- 24 dry contact inputs without supervision.
- 6 external power amplifiers and 1 spare power amplifier can be connected.
- Flexible amplifier redundancy function.
- Full supervision, including main power supply, backup power supply, CPU fault, power amplifier, speaker lines, and network fault, etc.
- The signal volume to amplifiers can be set via RK-MCU.
- Supports standalone mode and networking mode.
- 1 line input interface, which can be connected to external device while the device is in standalone mode or the CPU of RK-MCU is failure.
- Maximum 5 RK-ZONE24 can be used in system.

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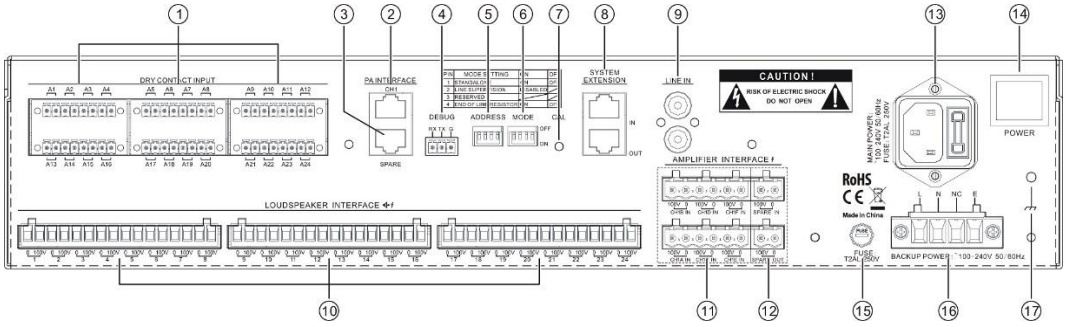
Product Appearance

Front Panel



No.	Buttons/Indicators	Description
1	Device status indicator lights	To indicate the status of power supply, main power fault, backup power fault, earth fault, CPU fault and network fault.
2	Indicator of power amplifier status	To indicate the loop fault of the connected power amplifiers.
3	Indicator of speaker line status	To indicate the work status and fault status of 24 zones.

Rear Panel



No.	Parts/Ports	Description
1	Dry contact inputs	24 dry contact input interfaces which can be connected to third party devices.
2	Power amplifier interface	To connect the external power amplifiers of two audio channels, transmit the audio signal, self-test signal to power amplifier, and receive the fault status from power amplifier.
3	Spare amplifier interface	To connect a spare amplifiers, transmit the audio signal, self-test signal to power amplifier, and receive the fault status from power amplifier.
4	Debug interface	To upgrade the firmware.
5	Address DIP switch	To set the device address for communication, the range is from 1~15.
6	Mode switch	To set the work mode.
7	Calibration key	To calibrate the impedance of connected loudspeaker lines.
8	System extension interface	To connect to RK-MCU or former zone expander.
9	Line in	Audio input interface, which is used to connect to the external audio devices, such as CD/DVD player, tuner, etc.
10	Loudspeaker interface	There are 24 loudspeaker line interfaces.

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No.	Parts/Ports	Description
11	External amplifier interface	Including CH1A IN, CH1B IN, CH1C IN, CH1D IN, CH1E IN and CH1F IN.
12	Spare amplifier interface	The 70V/100V audio interface of spare amplifiers.
13	Main power & fuse	To connect to the AC power supply. A fuse must be installed in the socket for over current protection.
14	Power switch	To turn on or turn off the AC power.
15	Fuse of backup power supply	Overcurrent protection for backup power supply.
16	Backup power input	To connect to AC backup power supply.
17	Grounding screw	To connect to grounding wire.

Technical Specifications

Parameters	Values
Main power supply	AC 100-240V，50/60Hz
Backup power supply	AC 100-240V，50/60Hz
Fuse	T2AL 250V
Power consumption	40W
Line Input	
Input signal	1V(0dBV)
Input impedance	10 KΩ
Frequency response	80Hz-18KHz, ±3dB
SNR	>80dB, A-weighted
Power Amplifier Interface	
Number	2 (CH1 and spare amplifier)
Output signal	1.4V
THD	<0.1%
Control signal	Self-testing, amplifier fault and energy-saving signal
Loudspeaker line	
Output channel No.	24
Max. load power	500W
Contact Interface	
Contact input	24 contact input interfaces without supervision
Working Conditions	
Relative humidity	< 95%, without condensing
Working temperature	-10°C~+55°C(14°F to +131°F)
Storage temperature	-40°C~+70°C(-40°F to +158°F)
Specification	
Dimension (W*H*D)	482 mm×88 mm ×407 mm

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Parameters	Values
Packing dimension (W*H*D)	580mm×235mm ×552mm
Net weight	7.8Kg
Gross weight	10.5Kg

RK-AMP500 500W Class-D Power Amplifier

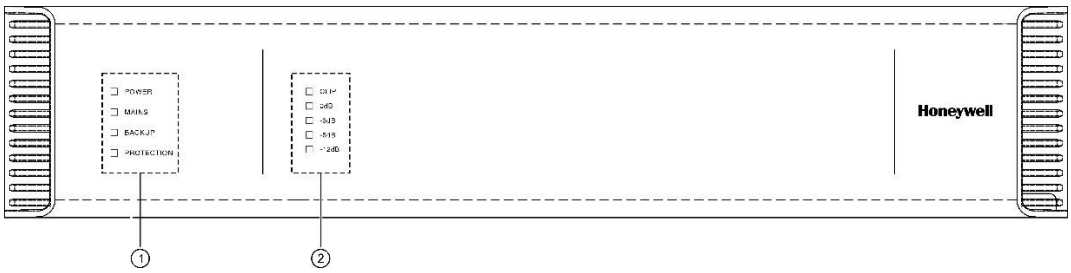
RK-AMP500 is used to amplify the audio signal to drive loudspeakers. It is referred to as “DA” within the manual.

Product Features

- Class-D technology with high efficiency.
- Maximum 500W power output.
- 70V and 100V audio output.
- Supports balanced or unbalanced audio input.
- Forced fan cooling
- Automatic limit output voltage

Product Appearance

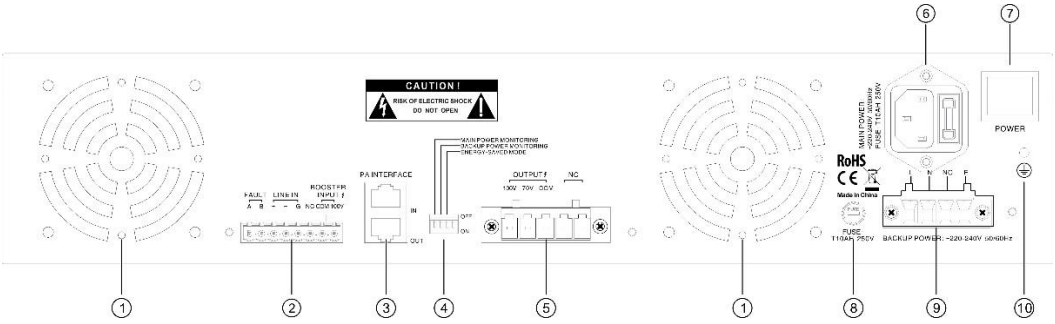
Front Panel



No.	Button/Indicator Light	Description
1	Device status indicator lights	To indicate the status of power supply, main power fault, backup power fault and protection. • POWER indicates the power supply status, the light is green when the DA is powered on. • MAINS indicates the main power supply fault status. If main power supply is failure, the light turns yellow. • BACKUP indicates the backup power supply fault status. If backup power supply is failure, the light turns yellow. • PROTECTION indicates the DA protection status. If the output is switched off due to overload, short-circuit or over temperature, the light turns yellow.
2	VU meter	To indicate the DA input signal level. The top red indicator shows the input signal is too high.

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Rear Panel



No.	Buttons/Indicators	Description
1	Cooling fan	
2	Audio input & fault interface	FAULT indicates when DA experiences a fault, it is disabled and output the dry contact fault signal. LINE IN indicates the balance input interface, capable to input external audio source. BOOSTER INPUT indicates the 100V audio input, capable to connect to other DA output.
3	PA interface	To connect to the RK-MCU or zone expanders to receive audio and control signal.
4	Work mode setting switch	To set the DA function, such as main power fault detection, backup power fault detection and power saving function.
5	DA output interface	To output the amplified 70V/100V audio signal.
6	Main power & fuse	To connect to the AC power supply. A fuse must be installed in the socket for over current protection.
7	Power switch	To turn on or turn off AC power.
8	Fuse of backup power supply	Overcurrent protection for backup power supply.
9	Backup power input	To connect to AC backup power supply.
10	Grounding screw	To connect to grounding wire.

Technical Specifications

Parameters	Values
Main power supply	AC 220V-240V 50/60Hz
Backup power supply	AC 220V-240V 50/60Hz
Power consumption	<720W
Fuse	T10AH 250V
DA output	70V / 100V
Max. output power	500W
Frequency response	80Hz~18KHz (+1dB ~ - 3dB)
Input impedance	20KΩ
PA input (RJ-45)	1.4V
Line in	1.4V
Booster input	100V

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Parameters	Values
Link output	1.4V
SNR	>90dB, A-weighed
THD	<0.1% (at 1/3 rated power, 1kHz)
Indicator lights	Power supply, main power fault, backup power fault, protection and VU meter.
Cooling method	Forced air cooling
Relative humidity	< 95%, without condensing
Operating temperature	-10°C~+55°C(14°F to +131°F)
Storage temperature	-40°C~+70°C(-40°F to +158°F)
Dimension (W*H*D)	482 mm×88 mm ×407 mm
Packing dimension (W*H*D)	580 mm×235 mm ×552mm
Net weight	10.6Kg
Gross weight	13.2Kg

RK-MIC Remote Call Station

RK-MIC is used to perform the various broadcasts and live broadcasts in zones. This unit has programmable buttons, users can easily conduct the operations, such as paging, BGM broadcast, business broadcast, voice alarm, volume control, recording, monitoring, etc. If necessary, extension key modules can be connected to RK-MIC to provide more buttons.

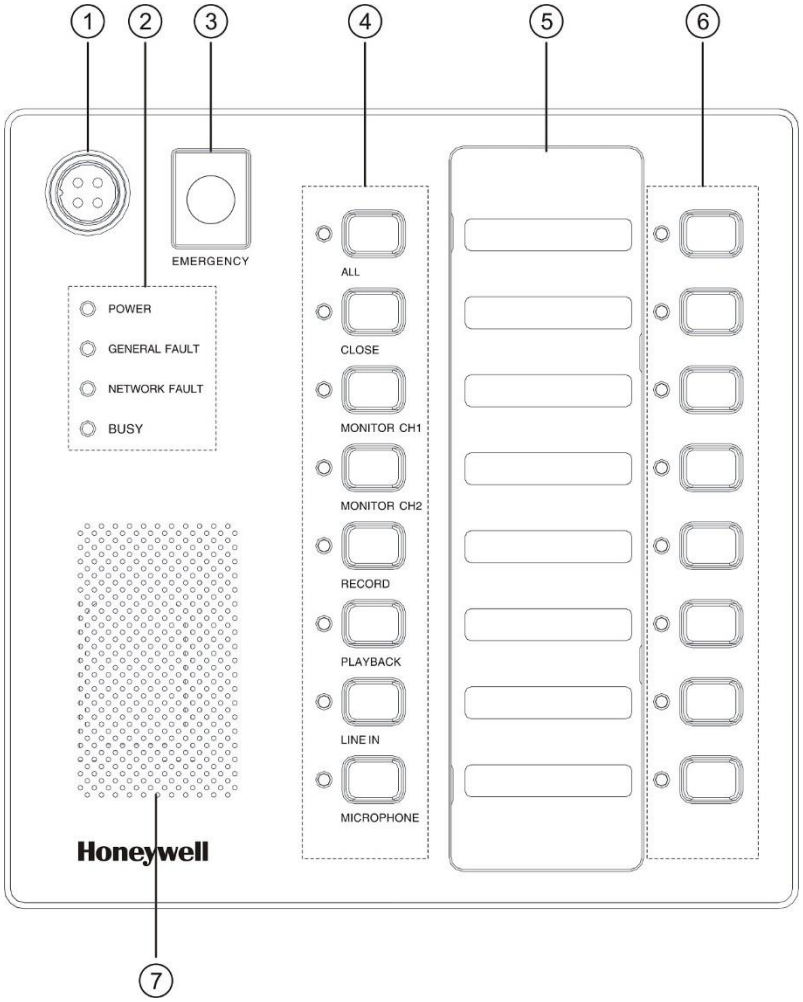
Product Features

- Supports both gooseneck and PTT microphone for live broadcast.
- Built-in loudspeaker to monitor CH1/CH2 audio in the system.
- Temporary recording function, easy to operate.
- A line input interface, which can be connected to external BGM audio source.
- The volume of microphone, line input and loudspeaker can be set via the volume regulators at rear panel.
- 8 programmable buttons, which can be configured.
- Supports extension key modules.
- Supervision on microphone and communication automatically.
- The maximum distance between RK-MCU and RK-MIC is 600 meters via the twisted-pair cable.
- Call station can be powered by RK-MCU.
- Maximum 6 remote call stations can be connected to the system.

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Product Appearance

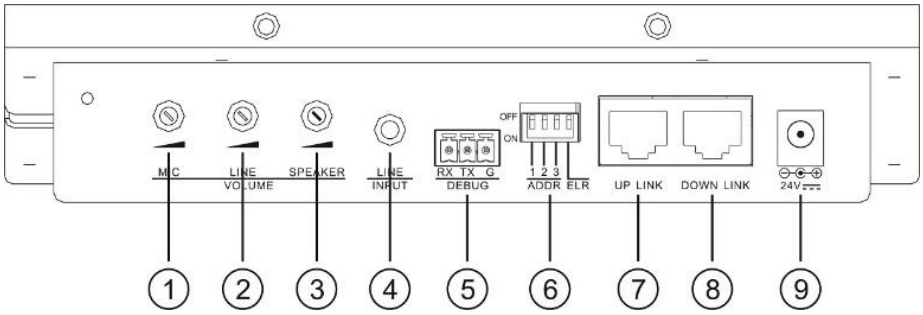
Front Panel



No.	Buttons/Indicators	Description
1	Microphone socket	To install the gooseneck or PTT microphone.
2	Device status indicator lights	To indicate the status of power supply, general fault of system, network fault and busy status of audio bus, etc.
3	Manually emergency button	A protective cover is above the manual emergency button to prevent pressing by mistake. The indicator light is off when in standby mode. When microphone is working, the light turns green. When microphone fault is found, the light turns orange.
4	Function buttons	There are some function buttons, such as ALL, CLOSE, MONITOR CH1, MONITOR CH2, RECORD, PLAYBACK, LINE IN and MICROPHONE, etc.
5	Label	Characters can be written or printed on the label to describe the name or function of corresponding programmable keys.
6	Programmable buttons & indicators	8 programmable buttons and corresponding indicators.
7	Loudspeaker	To monitor or listen the system's audio.

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Rear Panel



No.	Parts/Ports	Description
1	MIC volume	To adjust the volume of microphone.
2	Line volume	To adjust the volume of line input.
3	Loudspeaker volume	To adjust the volume of loudspeaker.
4	Line input	This port can be connected to the external audio devices, such as CD/DVD player, tuner, etc.
5	Debug interface	To upgrade the firmware.
6	Address	The DIP switch is used to set the address of remote call station for communication, which ranges from 1 to 6. This device has built-in 120Ω resistor for CAN bus, the 4th switch is to set the end resistor. Only the end device on the bus can be set to connect to the end resistor.
7	Up link	To connect to the RK-MCU or former remote call station.
8	Down link	To connect to the next remote call station.
9	Power adapter interface	It is used to supply the power by connecting to external power adapter in case the device can't be powered by RK-MCU.

Technical Specifications

Parameters	Values
Power supply	24V DC
Power consumption	10 W
Microphone	
Sensitivity	-50dB±3dB
SNR	>60dB, A-weighted
Optimal pickup distance	10～20cm
SNR	>77dB, A weighting
THD	<0.5%
Optimal pickup distance	10～20cm
Line Input	
Input signal	1V(0dBV)
Input impedance	10 KΩ
Frequency response	80Hz-18KHz, ±3dB
SNR	>85dB, A-weighted
THD	<0.1%

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Parameters	Values
Others	
Built-in loudspeaker	2W/8Ω
Working Conditions	
Relative humidity	< 95%, without condensing
Operating temperature	-10°C~+55°C(14°F to +131°F)
Storage temperature	-40°C~+70°C(-40°F to +158°F)
Specification	
Dimension (W*H*D)	200 × 46.5 × 200 mm
Packing dimension (W*H*D)	403 × 133 × 268mm
Net weight	1.4Kg
Gross weight	2.5Kg

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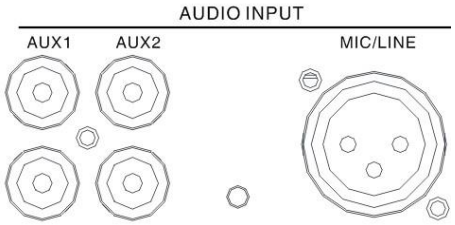
2 System Installation

Installers are required to know well with the functional components of the system. We recommend the information of all devices should be read before installation.

Interface Introduction

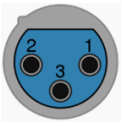
RK-MCU Master Control Unit

Audio Input

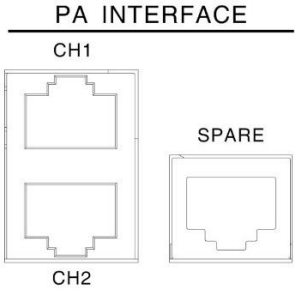


There are 3 audio inputs at the rear panel of RK-MCU, which can be connected to the external audio devices. AUX 1 and AUX 2 can be connected to the external audio source by RCA interface. The signal level of both inputs should be less than 1V, shielded cable with RCA terminal is recommended. MIC/LINE input use XLR interface, through which the differential signal can be input. The Input type can be set as microphone or line via DIP switch beside the interface. MIC/LINE interface can output 24V DC phantom power and can be set on or off by DIP switch also.

XLR Terminal Definition:

PIN	Signal	Legend
1	Ground	
2	Positive	
3	Negative	

Power Amplifier Interface

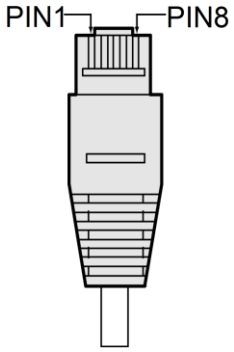


Power amplifier interfaces are used to connect to the external master control unit with power amplifiers. It transfers audio signal and control signal, such as self-testing, power-saving from controller to power amplifier, and transfers fault signal, such as power fault and protection from power amplifier to controller. RK-MCU has 3 RJ-45 ports for power amplifier interface to be used to connect to the amplifiers which correspond to audio channel 1, audio channel 2 and spare amplifier. It is recommended to use attached cables to connect.

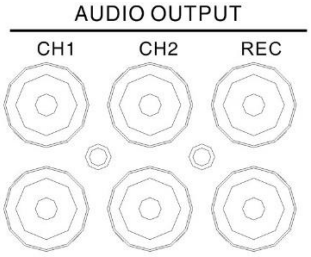
The definition of power amplifier interface:

PIN	Signal	Legend
1	Self-testing control signal	
2	Power-saving control signal	

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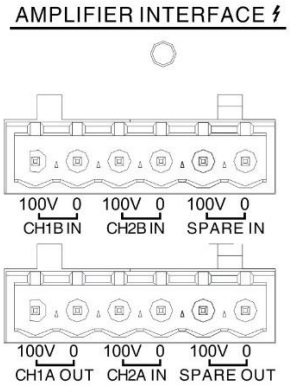
PIN	Signal	Legend
3	VCC(24V DC), from device output to power amplifier	
4	Differential audio signal positive	
5	Differential audio signal negative	
6	Ground	
7	Power amplifier fault signal • When power amplifier works normally, the output voltage is 24V DC. • When power amplifier is failure, under the protection or self-testing condition, the output voltage is 0V.	
8	Reserved	

Audio Output



The device has three additional audio outputs, corresponding to audio channel 1, audio channel 2 and record output, which can be connected to the third party system or external power amplifier via RCA terminal. When users operate live broadcast via the PTT microphone, REC interface will output the audio signal of microphone. It is available only when PTT microphone is working.

Amplifier Interface



Amplifier interface is used to input or output the 100V audio signal from power amplifier:

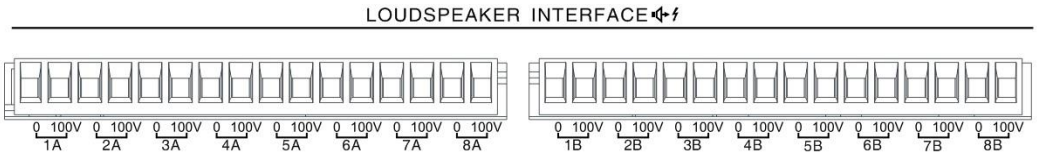
- CH1A outputs the 100V audio signal of the internal amplifier, which corresponds to audio channel 1 and loudspeaker line from CH1 to CH4.
- CH1B can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH5 to CH8.
- CH2A can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 2 and loudspeaker line from CH1 to CH4.
- CH2B can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 2 and loudspeaker line from CH5 to CH8.
- SPARE IN can be connected with the backup power amplifier or SPARE OUT interfaces from HCU or other zone expanders.

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- SPARE OUT can be connected with the SPARE IN interfaces of other zone expanders.

The terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

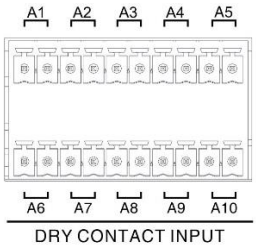
Loudspeaker Interface



HCU has 2 groups (A and B) of loudspeaker line interfaces, each group can separately connect to 8 loudspeaker lines. 1A and 1B output the same signal and can't be controlled separately and so on.

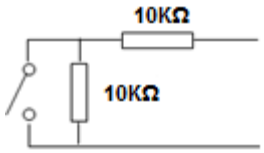
Matching terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Dry Contact Input



There are 10 dry contact inputs can be supervised as needed. The interfaces can be directly connected with the dry contact output of third party device. Please don't connect other power source to these ports.

When the supervision function is disabled, the dry contact output of the third party device can be directly connected to dry contact inputs. When supervision function is enabled, 2 pcs of 10K ohm resistors should be installed on the dry contact outputs of the third party device, which shown as below.



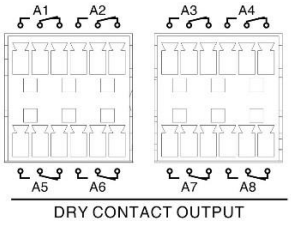
The terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

The voltage of dry contact input is 24V DC normally, and only switch or relay can be connected to. Please check the signal type of the interfaces of the third device before installation, and pay attention do not connect to external power source. If the output of third party device has voltage signal, please use relay to convert the signal to dry contact.

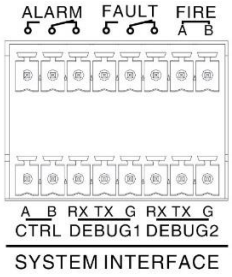
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Dry Contact Output



There are 8 dry contact outputs, which are from B1 to B8, each port has NO, NC and COM. The external modules or third party device can be connected, such as 3-wire volume. Users can connect with external module or the third party system, such as three-wire system volume controller. The maximum voltage and current for each dry contact output is 250V and 5A.

System Interface

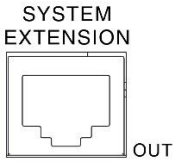


System interface is used to connect to external device or the third party system. Detailed functions are as below:

- ALARM - This is a dry contact output to be used to transmit the emergency status of the system to third party device. The port has NO, NC and COM terminal. While the system is playing emergency voice, the interface will be activated and send the emergency status to the third party system.
- FAULT – This is a dry contact output to be used to transmit the general fault status of the system to third party device. The port has NO, NC and COM terminal. While the system finds any fault, the interface will be activated and send fault signal to third party system.
- FIRE – This port is used to connect to fire alarm system via RS-485 bus and transmit the fire alarm signal and work status through MODBUS protocol.
- CTRL – This is a reserved RS-485 interface.
- DEBUG1 – This port is a reserved RS-232 interface.
- DEBUG2 – This port is a reserved RS-232 interface.

The terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

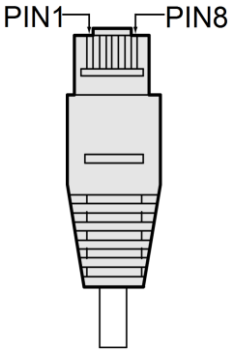
System Extension



Zone expanders shall be connected with master control unit via system extension interface. The twisted pair CAT-5 is recommended. A twisted-pair (2m) cable is attached in the zone expander package.

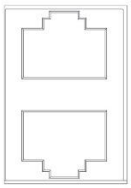
Definition of system extension interface:

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PIN	Type	Legend
1	CH1 audio positive	
2	CH1 audio negative	
3	N/A	
4	CH2 audio positive	
5	CH2 audio negative	
6	Ground	
7	CAN bus positive	
8	CAN bus negative	

Call Station Interface

CALL STATION



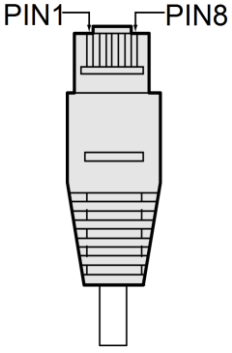
There are 2 call station interfaces (RJ-45) at the rear panel of HCU, which are used to connect with remote call station. It includes 24V DC power, audio signal and CAN bus. Maximum 6 call stations and 2 branches can be connected.

The twisted pair CAT-5 is recommended. A twisted pair (2m) cable is attached in the call station package.

Note:

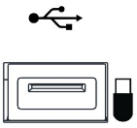
Maximum 6 call stations can be connected with master control unit and the distance between the call station and HCU should be less than 600m.

Definition of call station interface:

PIN	Type	Legend
1	Mic/line audio positive to HCU	
2	Mic/line audio negative to HCU	
3	24V DC power	
4	Monitor audio positive from HCU	
5	Monitor audio negative from HCU	
6	Ground	
7	CAN bus positive	
8	CAN bus negative	

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USB Interface



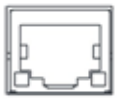
There is an USB interface to be used to insert the USB storage. The HCU can play the audio files stored in the root path of USB storage.

Note:

This interface is USB master, to avoid the damage, it is only used to insert the USB storage.

Only the audio files with the format *.WAV (44.1 KHz/16Bit) in the root can be recognized by HCU.

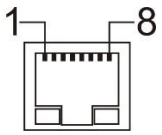
LAN



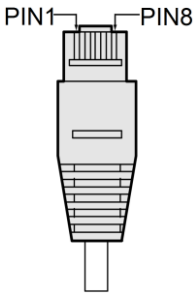
The LAN interface is used to connect to PC or Ethernet switch for system configuration. User can set the function and parameters via Ethernet by configuration software.

Be sure to use the cross cable to connect HCU LAN interface with PC according to T568A and T568B standard. If HCU needs to be connected to Ethernet switch, both cross and straight connection are available since switch has Auto-MDIX function. But for 100m transmission distance, cross cable is recommended. A twisted pair (2m) is attached in the package for connection.

Definition of Ethernet interface:

PIN	Type	Legend
1	TX+	
2	TX-	
3	RX+	
4	No pin	
5	No pin	
6	RX-	
7	No pin	
8	No pin	

568A/568B cable order definition:

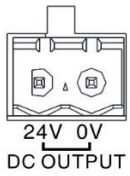
PIN	T568A Color	T568B Color	Legend
1	Green-white	Orange-white	
2	Green	Orange	
3	Orange-white	Green-white	
4	Blue	Blue	
5	Blue-white	Blue-white	
6	Orange	Green	
7	Brown-white	Brown-white	
8	Brown	Brown	

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Note:

Only connect the Ethernet port of a computer or Ethernet switch to the LAN port. Any connection with other RJ-45 ports will damage the computer or Ethernet switch.

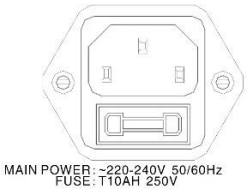
DC Power Output



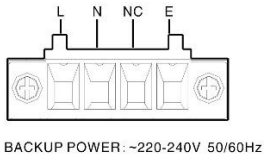
HCU has a 24V DC power output which can be used for external. The output current should be less than 1A. A resettable fuse is built in the interface to avoid any damage caused from short circuit. The interface has DC power output no matter it is powered by main power supply or backup power supply.

The terminal is attached in the package, the cable with a cross-section of 0.5 mm^2 to 1.5mm^2 is recommended.

Power Input



Main power interface with a resettable fuse is used to connect to AC 220V main power source. T10AH/250V fuse is recommended.



Backup power interface is used to connect to AC 220V backup power source. The fuse besides the interface is used for protection.

The connector is attached in the package, the 3-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

Please pay attention to the wiring connection when connect the main power and backup power cable to the same network.

RK-ZONE8 Zone Expander

Audio Input



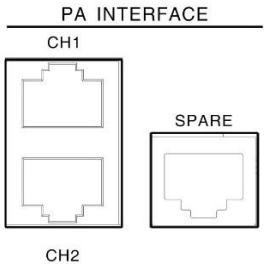
Zone expander has a line input to connect to the external audio devices. It can be used only when the CPU of HCU is failure or zone expander is in standalone mode. The level of audio input should be less than 1V.

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Note:

The audio signal of line input can be only played on the speaker lines connected with the same device, it is not available to broadcast to the whole system.

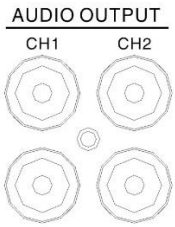
Power Amplifier Interface



Power amplifier interfaces are used to connect to the external master control unit with power amplifiers. It transfers the audio signal and control signal, such as self-testing, power-saving from controller to power amplifier, and transfers the fault signal, such as power fault or protection from power amplifier to controller. RK-ZONE8 has 3 RJ-45 ports for power amplifier interface to be used to connect to amplifiers which correspond to audio channel 1, audio channel 2 and spare amplifier. It is recommended to use attached cable to connect.

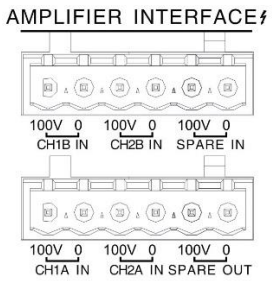
Please refer to the definition of “Power Amplifier Interface” of RK-MCU.

Audio Output



The device has two additional audio outputs, corresponding to audio channel 1 and audio channel 2, which can be connected with third party system or external power amplifiers via RCA terminal.

Amplifier Interface



Amplifier interface is used to input or output 100V audio signal from power amplifier:

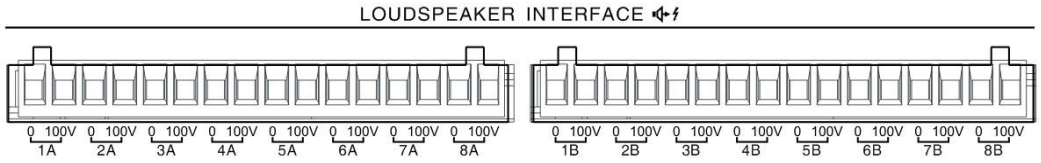
- CH1A can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH1 to CH4.
- CH1B can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH5 to CH8.
- CH2A can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 2 and loudspeaker line from CH1 to CH4.
- CH2B can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 2 and loudspeaker line from CH5 to CH8.

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- SPARE IN can be connected with backup power amplifier or SPARE OUT interfaces from HCU or other zone expanders.
- SPARE OUT can be connected with SPARE IN interfaces of other zone expanders.

The terminals are attached in the package, the cable with a cross-section of 0.5 mm^2 to 1.5 mm^2 is recommended.

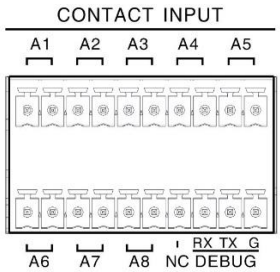
Loudspeaker Interface



RK-ZONE8 has 2 groups (A and B) of loudspeaker line interfaces, each group can separately connect to 8 loudspeaker lines. 1A and 1B output the same signal and can't be controlled separately and so on.

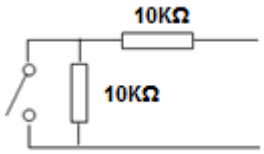
Matching terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Dry Contact Input Interface



There are 8 dry contact inputs which can be supervised as needed. The interfaces can be directly connected with dry contact output of third party device. Please don't connect other power source to these ports.

When the supervision function is disabled, dry contact output of the third party device can be directly connected to dry contact inputs. When supervision function is enabled, 2 pcs of 10K ohm resistors should be installed on the dry contact outputs of the third party device, which is shown as below.



Debug interface is a RS-232 port, which can be used to upgrade the firmware.

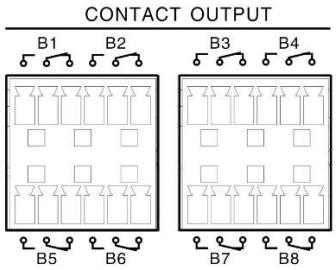
The terminals are attached in the package, the cable with a cross-section of 0.5 mm^2 to 1.5 mm^2 is recommended.

Note:

The voltage of dry contact input is 24V DC normally. Only the switch or relay can be connected. Please make sure the signal type of the interfaces of third device before installation, and note that not to connect to external power source. If the output of third party device has voltage signal, please use relay to convert the signal to dry contact.

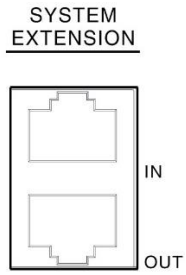
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Dry Contact Output Interface



There are 8 dry contact outputs from B1~to B8, each port has NO, NC and COM. The external modules or third party device can be connected, such as 3-wire volume, etc. Users can connect with external module or the third party system, such as three-wire system volume controller. The maximum voltage and current for each dry contact output is 250V and 5A.

System Extension



System extension interface is used to transmit the audio and control signal among system control units, such as RK-MCU and zone expanders. Input interface can be connected with the extension output interface of other devices, and output interface can be connected with other extension input interface of external devices. Please refer to the definition of “System Extension” of RK-MCU.

The twisted-pair CAT-5 cable is recommended. A twisted pair (2m) cable is attached in the zone expander package.

Note:

Do not connect the extension input interfaces together, neither the extension output interfaces.

Do not try to connect input and output interfaces of the same device together.

DC Power Output

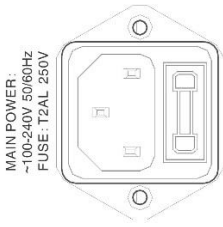


RK-ZONE8 has a 24V DC power output which can be used for external devices. The output current should be less than 1A. A resettable fuse is built in the interface to avoid any damage caused from short circuit. The interface has DC power output no matter the device is powered by main power supply or backup power supply.

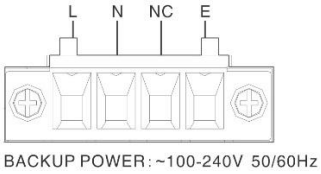
The terminal is attached in the package, the cable with a cross-section of 0.5 mm^2 to 1.5mm^2 is recommended.

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Power Input



Main power interface with a resettable fuse is used to connect to AC 220V main power source. T10AH/250V fuse is recommended.



Backup power interface is used to connect to AC 220V backup power source. The fuse besides the interface is used for protection.

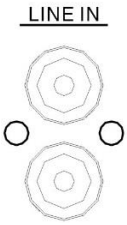
The connector is attached in the package, 3-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

Please pay attention to the wiring connection when connect the main power and backup power cable to the same network.

RK-ZONE24 Zone Expander

Audio Input

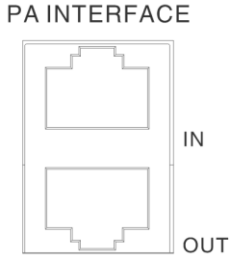


Zone expander has a line input to connect to external audio devices. It is only can be used when the CPU of HCU is failure or zone expander is in standalone mode. The level of audio input should be less than 1V.

Note:

The audio signal of line input can be only played on the speaker lines connected with the same device, it is not available to broadcast to the whole system.

Power Amplifier Interface

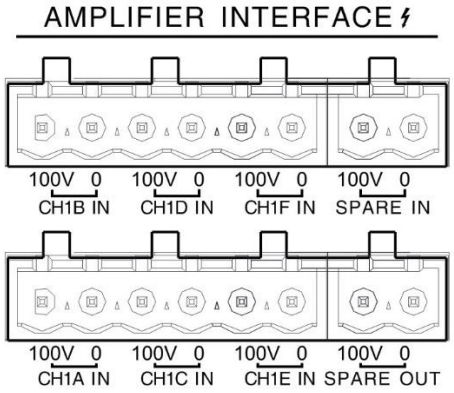


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Power amplifier interfaces are used to connect to external master control unit with power amplifiers. It transfers audio signal and control signal, such as self-testing, power-saving from controller to power amplifier, and transfers fault signal, such as power fault or protection from power amplifier to controller. RK-ZONE24 has 2 RJ-45 ports for power amplifier interface to be used to connect with the amplifiers which correspond to audio channel 1 and spare amplifier. It is recommended to use attached cable to connect.

Please refer to the definition of “Power Amplifier Interface” of RK-MCU.

Amplifier Interface

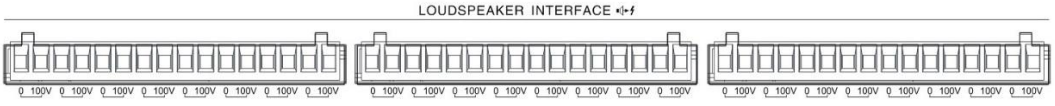


Power amplifier interface is used to input or output 100V signal.

- CH1A can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH1 to CH4.
- CH1B can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH5 to CH8.
- CH1C can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH9 to CH12.
- CH1D can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH13 to CH16.
- CH1E can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH17 to CH20.
- CH1F can be connected with the 100V audio signal from external power amplifier, which corresponds to audio channel 1 and loudspeaker line from CH21 to CH24.
- SPARE IN can be used to connect with external backup power amplifier or spare out interface of other zone expanders.
- SPARE OUT can be connected with SPARE IN interfaces of other zone expanders.

Matching terminals are attached in the package, the cable with a cross-section of 0.5 mm^2 to 1.5 mm^2 is recommended.

Loudspeaker Interface

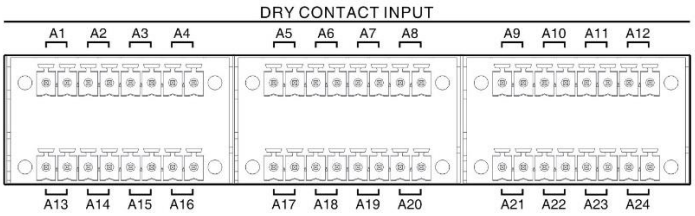


RK-ZONE24 has 16 loudspeaker line interfaces.

Matching terminals are attached in the package, the cable with a cross-section of 0.5 mm^2 to 1.5 mm^2 is recommended.

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Dry Contact Input Interface



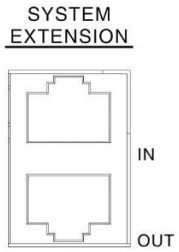
There are 24 dry contact inputs without supervision. The interfaces can be connected to third party device to activate public address or voice alarm.

The terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

The voltage of dry contact input is 24V DC normally. Only the switch or relay can be connected. Please make sure the signal type of the interfaces of third device before installation, and note that not to connect to external power source. If the output of third party device has voltage signal, please use relay to convert the signal to dry contact.

System Extension



System extension interface is used to transmit the audio and control signal among system control units, such as RK-MCU and zone expanders. Input interface can be connected with the extension output interface of other devices, output interface can be connected with other extension input interface of external devices. Please refer to the definition of “System Extension” of RK-MCU.

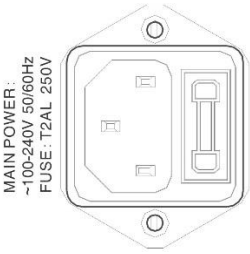
The twisted-pair CAT-5 cable is recommended. A twisted pair (2m) cable is attached in the zone expander package.

Note:

Do not connect the extension input interfaces together, neither the extension output interfaces.

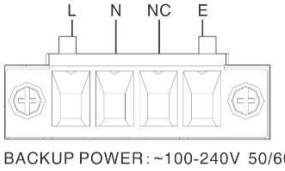
Do not try to connect input and output interfaces of the same device together.

Power Input



Main power interface with a resettable fuse is used to connect to AC 220V main power source. T10AH/250V fuse is recommended.

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Backup power interface is used to connect to AC 220V backup power source. The fuse besides the interface is used for protection.

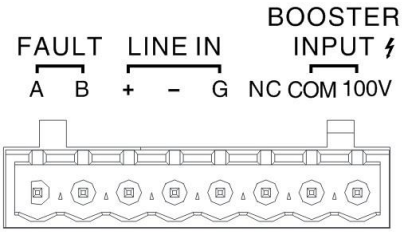
The connector is attached in the package, 3-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

Please pay attention to the wiring connection when connect the main power and backup power cable to the same network.

RK-AMP500 500W Class-D Power Amplifier

Audio Input



LINE IN is a balanced audio interface, which used to connect to external audio source. The interface is inclusive of positive (+), negative (-) and ground signal.

BOOSTER INPUT is a high voltage input used to connect to the 70V/100V output of other power amplifier.

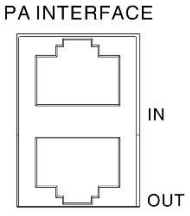
The audio signal from LINE IN 1, BOOSTER INPUT 2 and controllers, such as RK-MCU or zone expanders is mixed and amplified.

The terminals are attached in the package, 2-pin shield audio with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended for LINE IN 1 and 2-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended for BOOSTER INPUT 2.

Fault Output

If any fault occurs, the amplifier will be protected. During the self-testing, ports A and B will be short. This interface can be connected with third party device to transfer fault signal of power amplifier.

Power Amplifier Control Interface

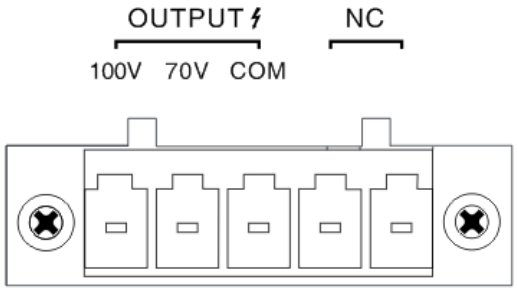


Power amplifier control interface is used to connect with controllers, such as RK-MCU or zone expanders to transfer audio signal, control signal, such as self-test, power-saving signal to power amplifier, and transfers fault signal, such as power fault, power protection from amplifier to controllers. There are two ports, IN and OUT. PA IN can be connected to the PA OUT of other controllers or power amplifiers. PA OUT can be connected to the PA IN of other power amplifiers. Attached cable is recommended.

Please refer to the definition of “Power Amplifier Interface” of RK-MCU.

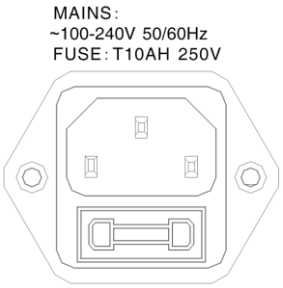
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Power Amplifier Output

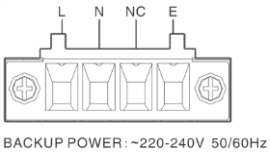


There are two outputs, 70V or 100V, which are used to output the high voltage audio signal from power amplifier. The terminal is attached in the package, 2-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Power Input



Main power interface with a resettable fuse is used to connect to AC 220V main power source. T10AH/250V fuse is recommended.



Backup power interface is used to connect to AC 220V backup power source. The fuse besides the interface is used for protection.

The connector is attached in the package, 3-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

Please pay attention to the wiring connection when connect the main power and backup power cable to the same network.

RK-MIC Remote Call Station

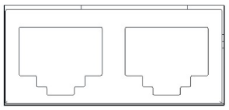
Line Input



Line input interface of RK-MIC uses 3.5mmTRS interface, which can be directly connected with audio device by cables. Attached audio cable can switch the interface when use the audio device with RCA interface.

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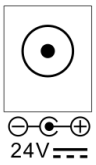
Call Station Interface



There are two RJ-45 ports, named UP LINK and DOWN LINK, UP LINK is used to connect to master control unit or the DOWN LINK of call station. DOWN LINK is used to connect to the UP LINK of call station. 24V DC power, audio and CAN control bus are included in the interfaces.

The twisted pair CAT-5 is recommended. A twisted-pair cable (2m) is attached in the call station package.

Power Input



Remote call station can be powered by master control unit via twisted-pair cable or the external power adaptor. For the long distance and big quantity of devices, a power adapter can be connected directly even it is powered by master control unit. The call station will switches to external power input automatically.

Preparation for Installation

Before installing the system, appropriate preparation is required to ensure a smooth installation process.

- Preparing tools
- Preparing auxiliary materials
- Preparing cables and auxiliary devices
- Packing list inspection

Preparing Tools

Prepare the following tools before installing the system equipment:

- Electrostatic proof wrist band
- Electrostatic proof gloves
- Wire stripping pliers
- Wire cutting pliers
- RJ-45 crimp tool
- Slotted screwdriver (M2)
- Phillips screwdriver (P1)

Preparing Auxiliary Materials

Prepare the following auxiliary materials before installing the system devices:

- Insulating tape
- Wire buckles
- Cable labels

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- Plastic ties

Preparing Cables and Auxiliary Equipment

Prepare the following cables before installing the system devices:

- Power cable

  Power cable used for main power supply is attached in the package. The connector of backup power interface is attached in the package instead of power cable. Installer should connect it via the 3-pin cable, which with a cross-section from 0.5mm^2 to 1.5mm^2 is recommended.

- Power amplifier control interface cable

  A twisted-pair cable (2m) is attached in power amplifier package.

- Power amplifier cable

  This cable is used to connect the controller to the power amplifier as well as the controller to the loudspeakers. The controller here means RK-MCU or zone expanders.

  Audio cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

- Audio cable

  When connect to external audio source, such as CD/DVD player, etc. It is recommended to use shield cable.

- CAT-5 Ethernet cable

  Twisted-pair cables are required to be no longer than 100m and with a diameter of 0.51mm (wire gauge of 24AWG). The shielded twisted-pair cables are recommended.

- Dry contact input/output cables and external devices (optional)

  The dry contact inputs or outputs are used to connect the system with third party device or external devices. The cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Packing List Inspection

Please check the external packages for intactness before unpacking them for content inspection. Use the “Packing list” to check the package contents. Contact the carrier or supplier promptly in case of any package content problems.

System Installation

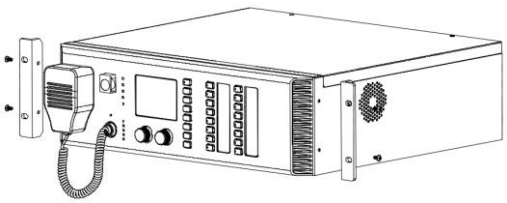
The devices support cabinet installation, and remote call station supports both desktop and cabinet installation.

Installing the Devices in the Appliance Cabinet

Each device is attached with the cabinet brackets, which can be installed in 19’ cabinet directly. Here, we take RK-MCU as an example for illustration, and this installation also works with other devices.

Installation steps:

1. Install the cabinet brackets to both sides of the front panel for each device, which is shown as below. Then use attached screw to fasten.



2. Install the devices into cabinet. In order to ensure a good cooling condition, it is recommended to use 1U panel placed between the power amplifiers and neighboring devices. The height of each device is as following:

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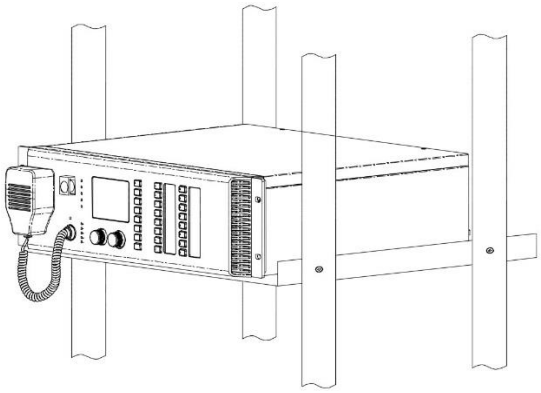
No.	Model	Name	Height
1	RK-MCU	Master Control Unit	3U
2	RK-ZONE8	Zone Expander	2U
3	RK-ZONE24	Zone Expander	2U
4	RK-AMP500	500W Class-D Power Amplifier	2U
5	X-NPMS-R	Rack Bracket of Call Station	5U

3. Install the bottom plate according to arrangement. Use screw to fasten the connection between the plate and cabinet. Make sure do not twist or squeeze the plate.

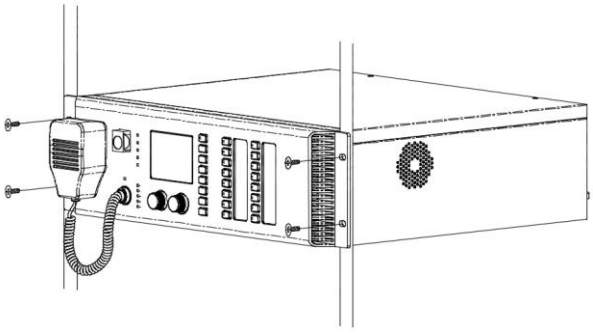
Note:

To ensure the devices taking stress uniformly, it's recommended to use L or U-shape plate to support devices in cabinet. Do not pile the devices with only fixing the brackets of front panel.

4. After installing all the plates, softly push devices into cabinet till both sides of rack touch the inside frame of cabinet.



5. Use screws to fasten the both brackets to the cabinet.



6. Install the 1U panel to the free space.

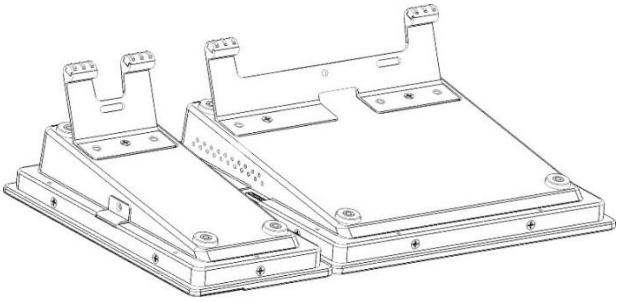
Installing the Remote Call Station on Desktop

Installing the Key Module

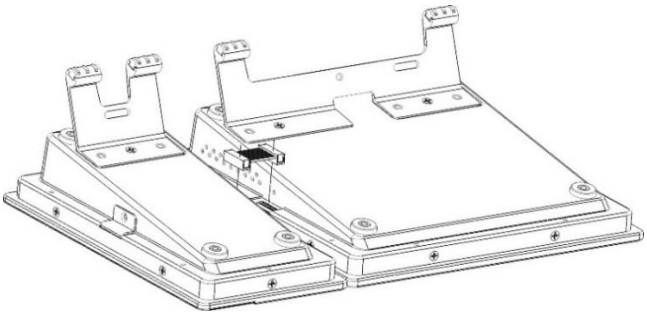
If there are key modules, please follow below procedures to connect key modules to remote call station:

1. Turn over the remote call station and key module on the desk, which are shown as below:

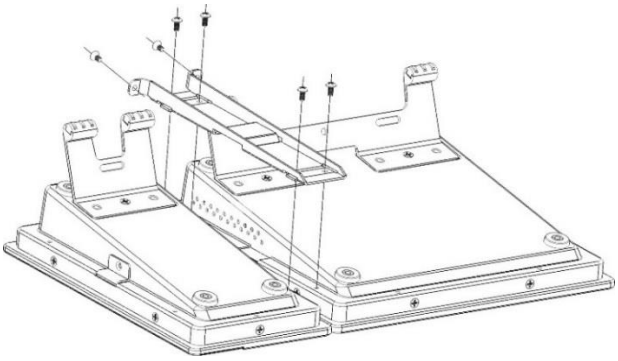
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2. Connect them by attached cables.



3. Install the bracket between them and fasten it. Finally place them up.

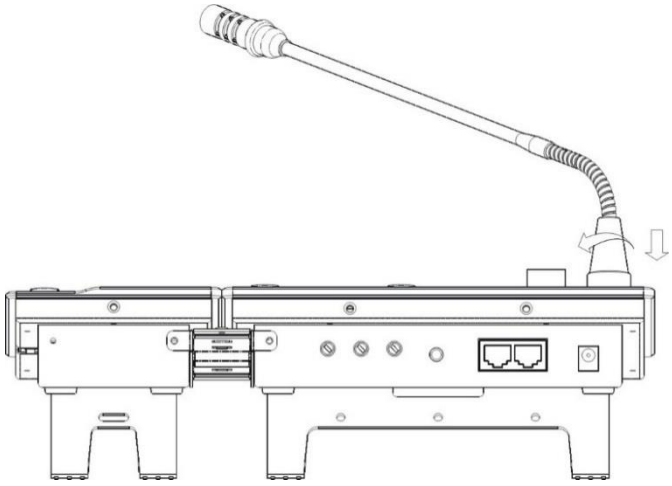


4. Follow the above steps to install other modules, then place it on the desktop.

Installing the Goose-neck Microphone

Insert the microphone plug to the top-right socket on the RK-MIC and clockwise rotate to fasten the bottom screw.

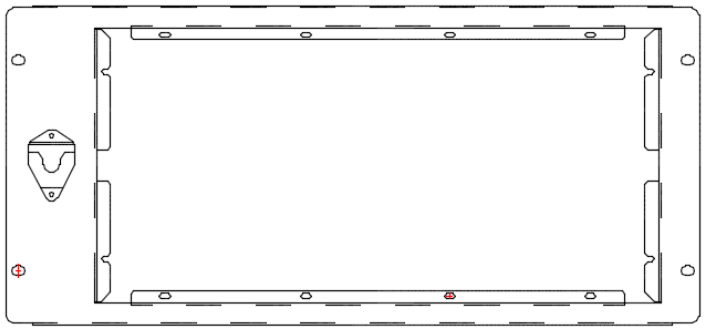
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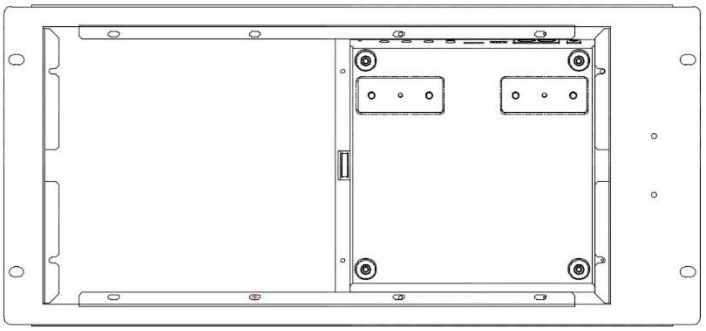
Installing the Remote Call Station in Cabinet

Follow above procedures to connect the remote call station and key modules, then install the call station to the fixed bracket as following steps:

1. Place the remote call station in the frame of below bracket.



2. Turn over the bracket and call station, then use attached screw to fix the remote call station to the bracket.

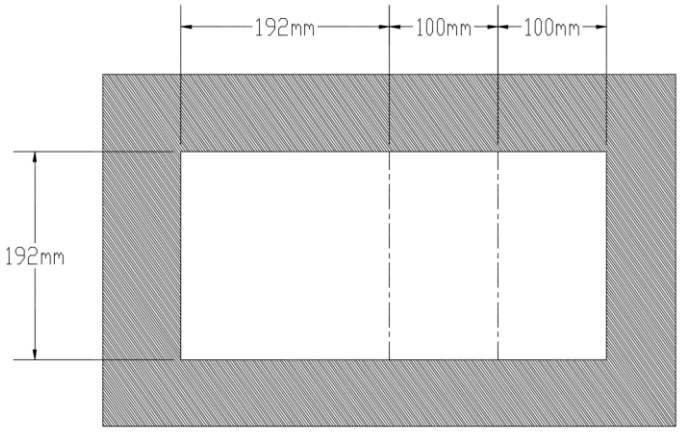


3. Place them in the cabinet and fasten it.
4. Install the PTT microphone to the socket of RK-MIC and hang the microphone in the left of rack.

Embedded Installation of Remote Call Station

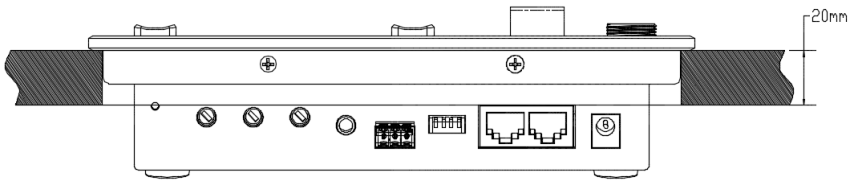
If users need to install RK-MIC in an embedded way, please follow below dimension to make a place for the remote call station.

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The place with the dimension of 192mm x 192mm is suitable to install the remote call station only. For key modules, please expand 100mm of length for each module.

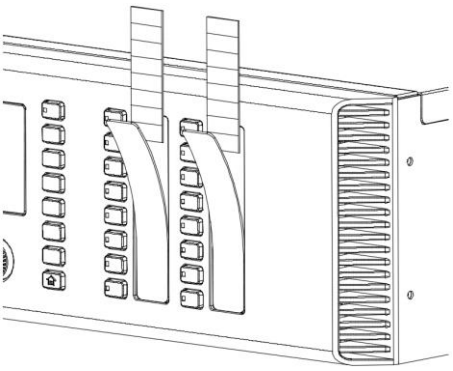
To ensure the wiring, the diameter of cable should be less than 20mm. Please reserve enough space for connection.



Installing Device Labels

Installing RK-MCU Labels

There are 8 zone buttons and 8 audio source buttons on the front panel of RK-MCU. The buttons can be identified by the labels on the right. Standard labels are attached, users can write the button name on the labels, then install the labels as shown below.



The steps are as below:

1. Use screwdriver to pry one side of slot.
2. Take out the plastic cover.
3. Put the label in the slot.
4. Reinstall the cover.

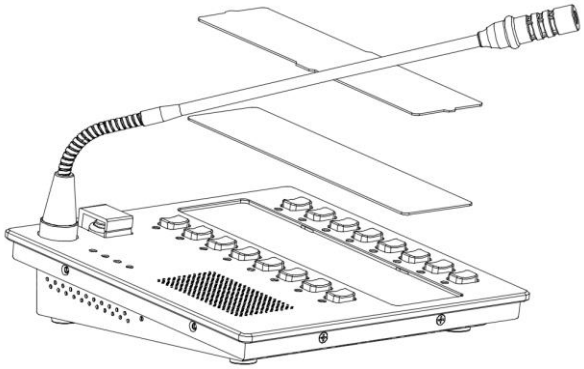
Installing RK-MIC Labels

There are 8 configurable buttons on the panel of RK-MIC, users can write the button name on the label and then install it to RK-MIC.

The steps are as follow:

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1. Use screwdriver to pry one side of slot.
2. Take out the protective cover.
3. Put the label in the slot.
4. Reinstall the cover.



Connecting the System

After installing all the devices, please connect the devices as following instructions.

Connecting Power Supply

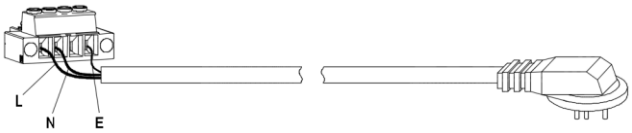
All the devices except RK-MIC have special main power supply interfaces and backup power supply interfaces. Main power cable is attached in the package. For the backup power cable, users need to make it according the actual length.

Connecting the Main Power Supply

Please use the attached power cable to connect the main power slot to AC 220V power supply.

Connecting the Backup Power Supply

The terminal of backup power supply is attached in the package. Please pay attention to the polarity when connecting.



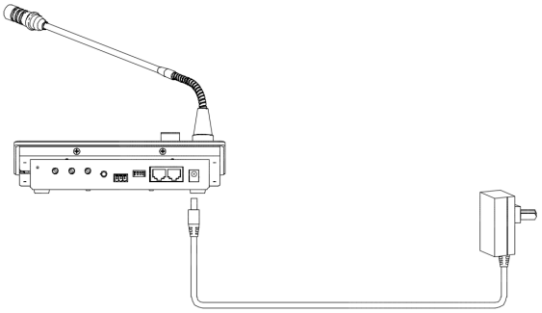
Note:

When connecting the power cables to the backup power socket, please pay special attention to make sure the polarity of cables should comply with the port of device. The wires are identified as L (Live wire), N (Null wire), and E (Earth wire).

Connecting the RK-MIC Power Supply

Remote call station can be powered by master control unit through the twisted-pair cable. If RK-MIC can't be powered due to long distance or much devices, an AC power adaptor can be connected to the 24V DC port of remote call station.

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Note:

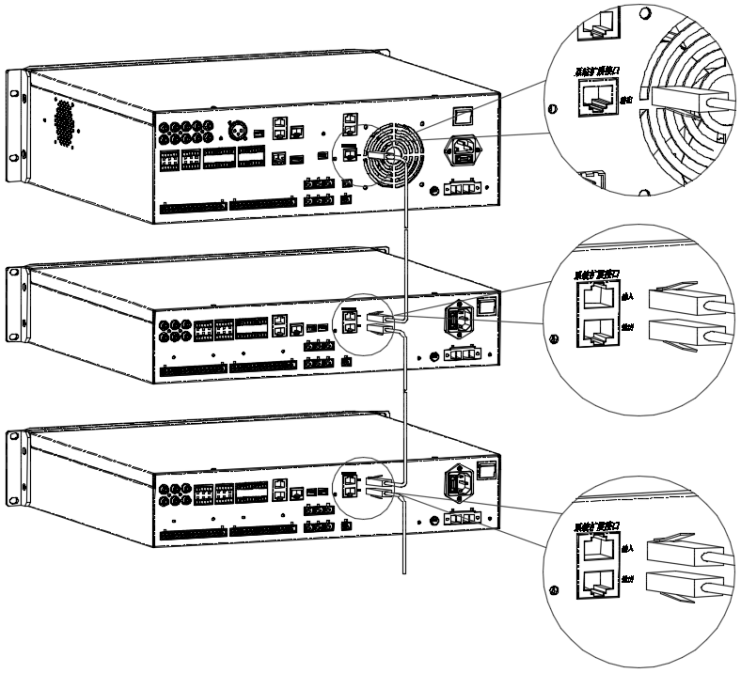
If the distance between RK-MCU and RK-MIC is over 400 meters and there are more than one RK-MIC, please connect AC power adaptors to remote call stations.

Connecting Zone Expanders

Zone expanders can be connected with master control unit by using the twisted-pair cable, which is attached in the package.

The connection steps are shown as below:

1. Connect the OUTPUT port of system extension interface of RK-MCU to the INPUT port of system extension interface of a zone expander.
2. Connect the OUTPUT port of system extension interface of the zone expander to the INPUT port of system extension interface of the next zone expander.
3. Follow the above steps to connect all the zone expanders.



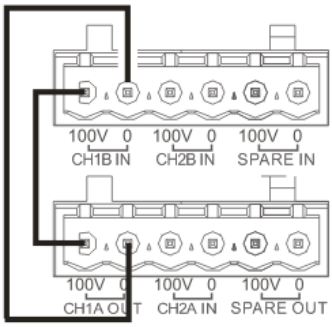
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Connecting RK-MCU

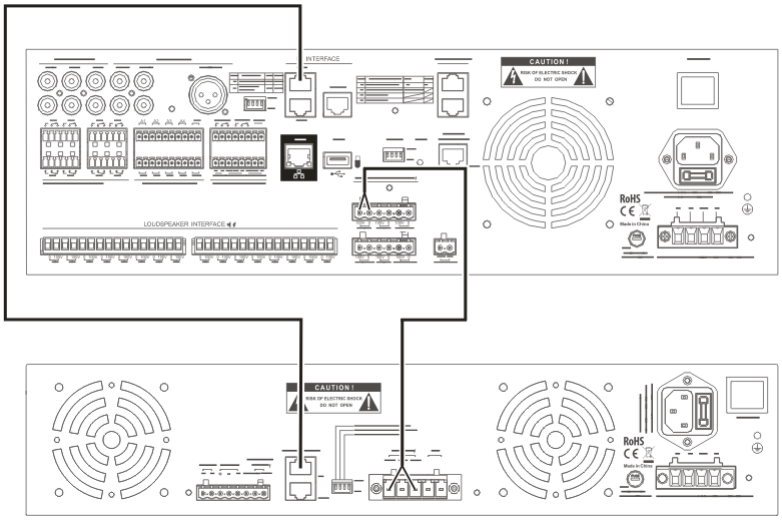
Connecting Main Power Amplifier

Below is the amplifier interface of master control unit to connect to the 100V output of power amplifier. Master control unit has a 500W internal power amplifier, the high voltage signal can be outputted through the CH1A OUT port. Maximum 3 external power amplifiers can be connected to master control unit.

1. Under the single channel mode, if there are less than 4 zones, no connection of power amplifier is needed.
2. Under the single channel mode, if there are more than 4 zones and the total power rate is less than 500W, the device can be connected as following:
   - Connecting the “100V” and “0” of “CH1A OUT” to the corresponding ports of “CH1B IN”.

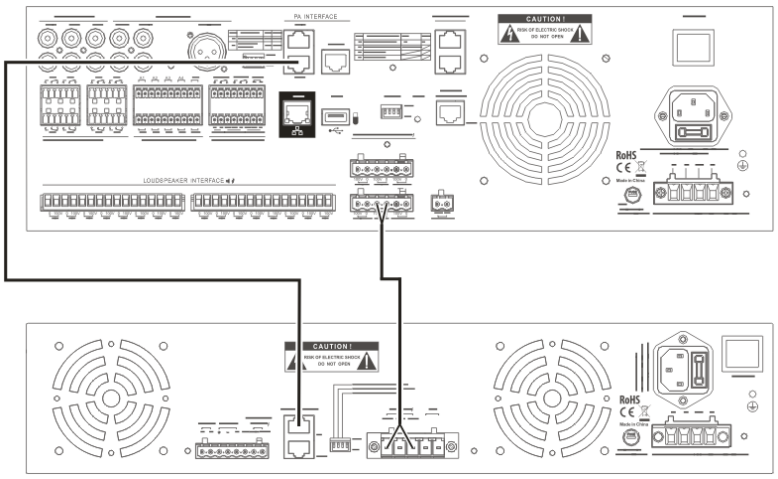


3. Under the single channel mode, if there are more than 4 zones and the total power rate is more than 500W, the external power amplifier need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-MCU to PA interface “IN” of power amplifier.
   - Connect the “100V” and “COM” output of power amplifier to CH1B IN of RK-MCU, port “COM” shall matches “0V” input.

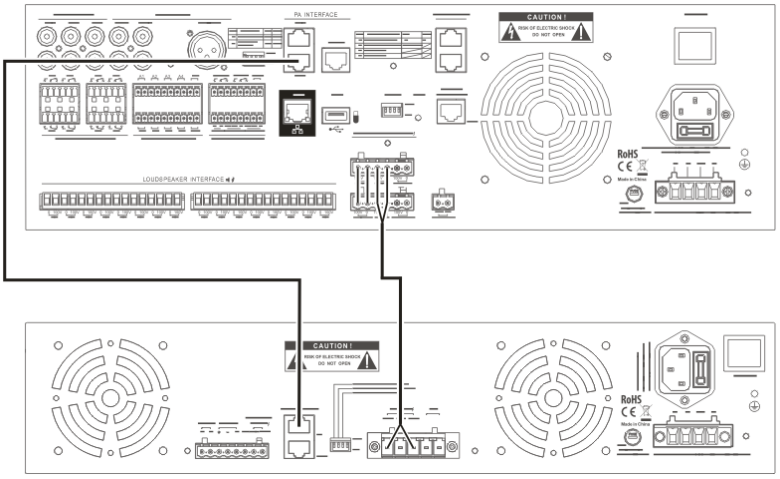


4. Under the dual channel mode, if there are less than 4 zones, one external power amplifier for CH2 need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH2” of RK-MCU to the PA interface “IN” of power amplifier.
   - Connect the “100V” and “COM” output of power amplifier to “CH2A IN” of RK-MCU, port “COM” shall matches “0V” input.

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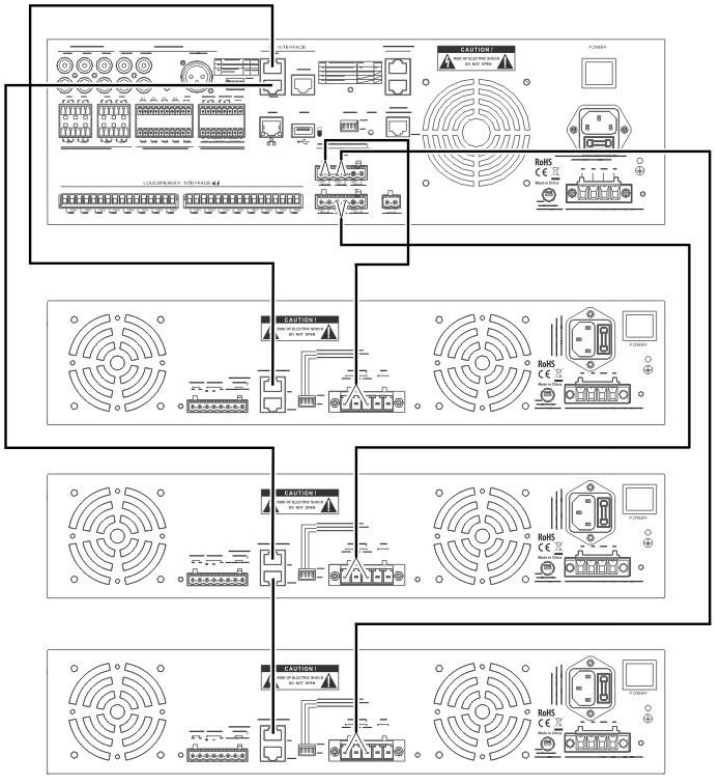
5. Under the dual channel mode, if there are more than 4 zones and the total power rate is less than 500W, the external power amplifiers need to be connected as the following steps:
   - Connect the “100V” and “0V” of “CH1A OUT” to the corresponding ports of “CH1B”.
   - Use the twisted-pair cable to connect PA interface “CH2” of RK-MCU to PA interface “IN” of power amplifier.
   - Connect the “100V” and “COM” output of power amplifier to “CH2A IN” of RK-MCU, port “COM” shall matches “0V” input.
   - Connect the “100V” and “0V” of “CH2A” to the corresponding ports of “CH2B”.



6. Under the dual channel mode, if there are more than 4 zones and the total power rate is more than 500W, 3 external power amplifiers need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-MCU to the PA interface “IN” of the first power amplifier.
   - Connect the output port “100V” and “COM” of the first power amplifier to RK-MCU input port “CH1B”.
   - Use twisted-pair cable to connect PA interface “CH2” of RK-MCU to the PA interface “IN” of the second power amplifier.
   - Connect the output port “100V” and “COM” of the second power amplifier to RK-MCU input port “CH2A”.
   - Use twisted-pair cable to connect PA interface “OUT” of the second power amplifier to PA interface “IN” of the third power amplifier.

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- Connect the output port “100V” and “COM” of the third power amplifier to RK-MCU input port “CH2B”.



Connecting Speaker Line

Please refer to the related manual of loudspeakers before connection. Following are the steps to connect speaker line to RK-MCU.

1. Strip about 10mm insulated surface of cable and insert it into the loudspeaker terminal, then fasten the screw.
2. Insert the terminal with installed audio cable into loudspeaker interface of RK-MCU.
3. Install the protective cover to avoid electric shock.

Note:

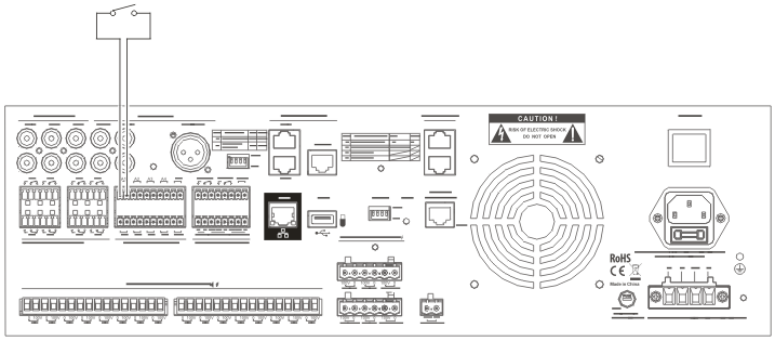
Please pay attention to match the polarity when connecting loudspeaker cable to terminal.

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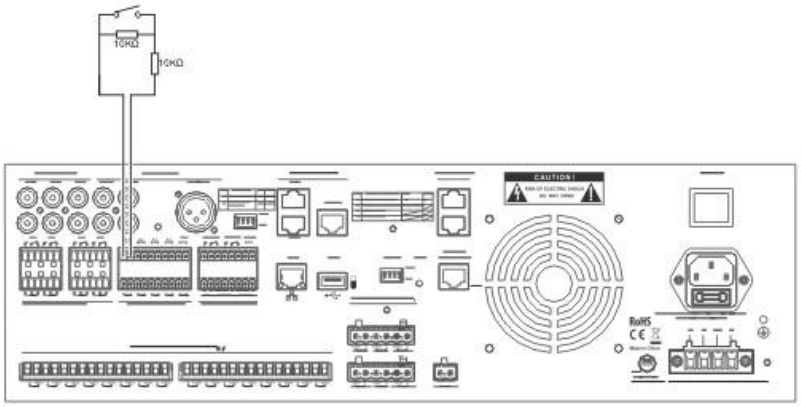
Connecting Dry Contact Input

There are two ways to connect external devices or the third party device to RK-MCU by using the dry contact inputs:

1. If the line of dry contact inputs isn't required to be supervised, connect the relay or the switch output of external devices or the third party device to the dry contact inputs of RK-MCU. When dry contact inputs are activated, the corresponding function can be started. The interfaces are powered by RK-MCU, please don't connect any external power sources.



2. When the line of dry contact inputs are required to be supervised, it is required to install 10KΩ resistors to each switch output of external devices or the third party device, which is shown as below:



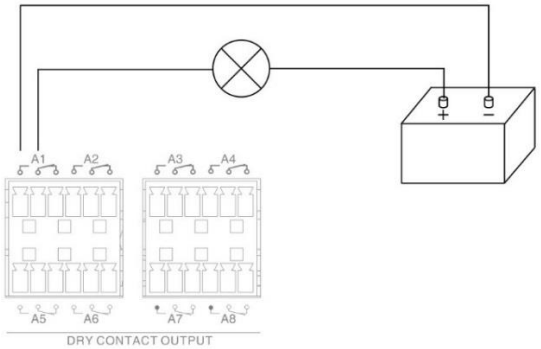
Connecting Dry Contact Output

Each dry contact output has NO, NC and COM pins, which can be used to control third party devices or transmit the device status.

Following are the dry contact output connection:

1. Control external device

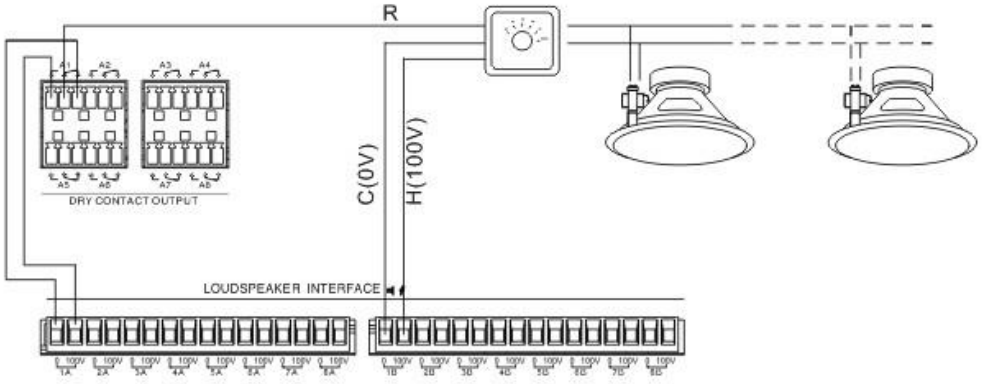
   When the dry contact output is used as switch to control external device or transmit device status, connect NO, NC and COM terminal to the external device as shown as below:



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2. Connecting 3-wire volume controller

   Loudspeaker interface A and B are in parallel connection. When connecting 3-wire volume controller, connect the loudspeaker interface from A group to the dry contact output NO and NC pins, the COM output acts as switching wire(R) to connect to 3-wire volume controller. The corresponding 100V and 0V from B group connecting to 3-wire volume controller act as hot point (H) and cool point(C). The connection is shown as below:



Connecting Audio Devices

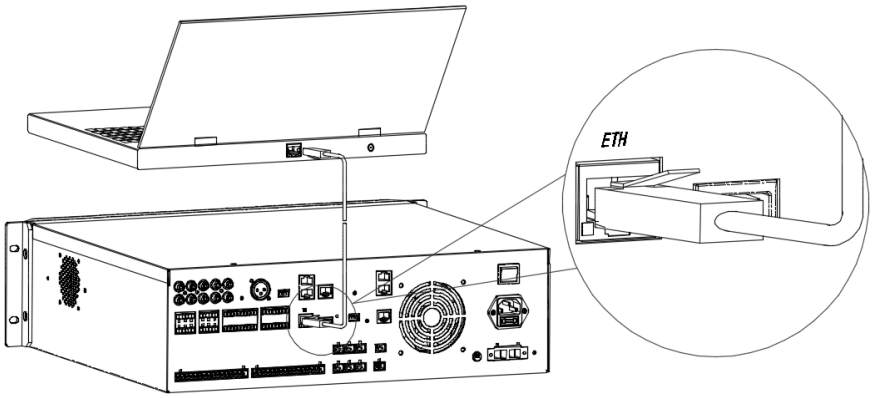
There are 2 auxiliary inputs and 1 MIC/LINE input which can be connected to external audio source devices. When connecting audio device, it is required to select the matched interface according to audio signal type. Unbalanced signal can be inputted from AUX1/AUX2 (RCA interface), and both of balanced and unbalanced signal can be inputted through MIC/LINE (XLR interface). Shielded cable is required and the plugs in both sides need to match device interface.

Note:

The gain and phantom power of MIC/LINE port can be set by DIP switch. Please set the DIP switch according to the audio source. The port set to be LINE input has no phantom power output by default. When the phantom power is enabled, the interface will output 24V DC and power to external audio source. Be careful to use this function and pay attention to avoid the damage to audio device.

Connecting Ethernet

When using PC to configure the system, master control unit need to be connected with PC with or without the Ethernet switch.



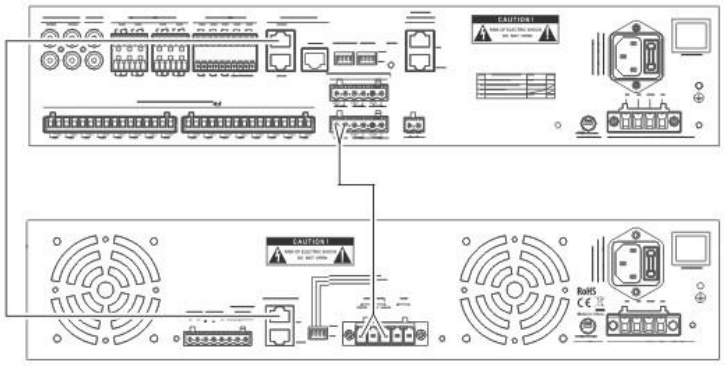
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Connecting RK-ZONE8

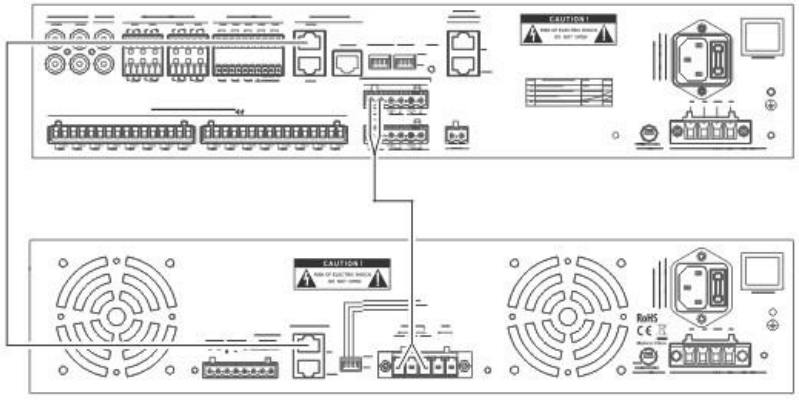
Connecting Main Power Amplifiers

The relevant amplifier interface of RK-ZONE8 has detailed description in “Interface Introduction” part. Maximum 4 power amplifiers can be connected with RK-ZONE8. Please select proper connection method according to actual application.

1. Under the single channel mode, if there are less than 4 zones, one external amplifier need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-ZONE8 to PA interface “IN” of power amplifier.
   - Connect the “100V” and “COM” output of power amplifier to CH1A IN of RK-ZONE8, “COM” shall matches “0V” input.

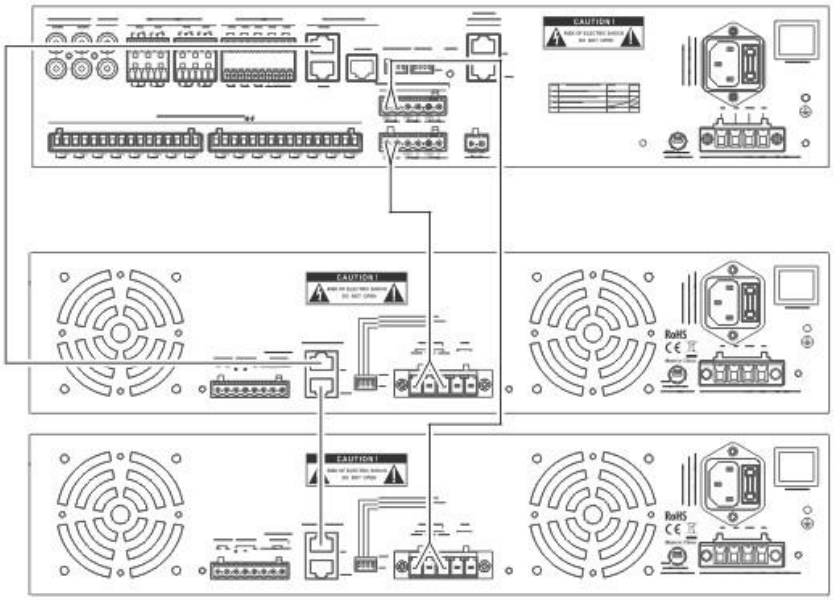


2. Under the single channel mode, if there are more than 4 zones and the total power rate is less than 500W, the external power amplifiers need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-ZONE8 to PA interface “IN” of power amplifier.
   - Connect the amplifier output port “100V” and “COM” to RK-MCU input port “CH1A”, port “COM” shall matches “0V” input.
   - Connect the “100V” and “0V” of CH1A to the corresponding ports of CH1B.

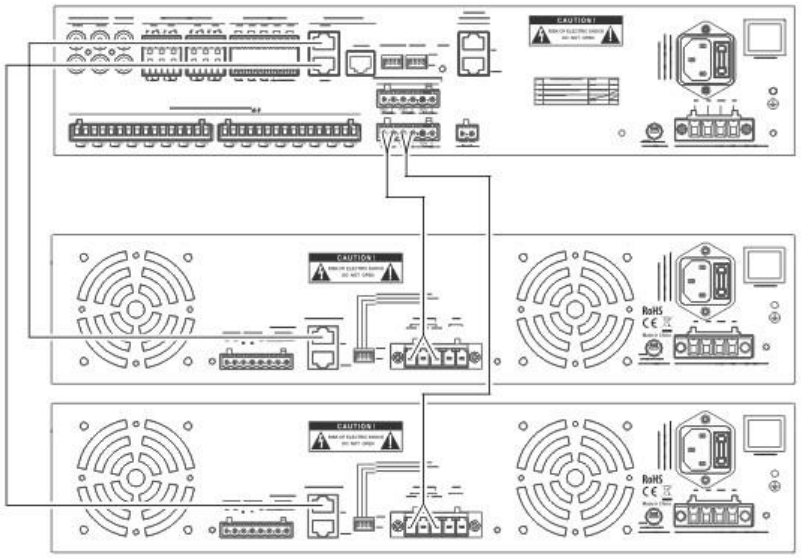


3. Under the single channel mode, if there are more than 4 zones and the total power rate is more than 500W, the external power amplifier need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-ZONE8 to PA interface “IN” of the first power amplifier.
   - Use twisted-pair cable to connect PA interface “OUT” of the first power amplifier to PA interface “IN” of the second power amplifier.
   - Connect output port “100V” and “COM” of the first power amplifier to RK-ZONE8 input port “CH1A”.
   - Connect output port “100V” and “COM” of the second power amplifier to RK-ZONE8 input port “CH1B”, “COM” shall matches “0V” input.

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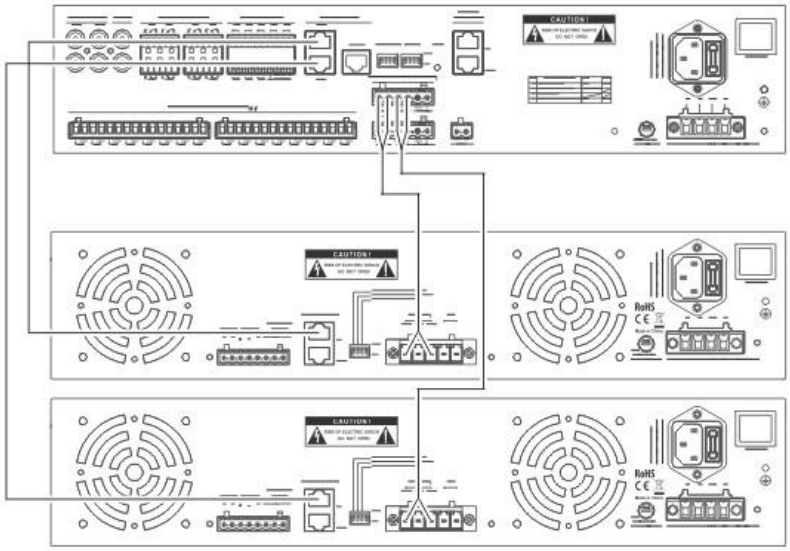
4. Under the dual channel mode, if there are less than 4 zones and the total power rate is less than 500W, the external power amplifiers need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-ZONE8 to PA interface “IN” of the first power amplifier.
   - Connect output port “100V” and “COM” of the first power amplifier to RK-ZONE8 input port “CH1A”.
   - Use twisted-pair cable to connect PA interface “CH2” of RK-ZONE8 to PA interface “IN” of the second power amplifier.
   - Connect output port “100V” and “COM” of the second power amplifier to RK-ZONE8 input port “CH2A”, “COM” shall matches “0V” input.



5. Under the dual channel mode, if there are more than 4 zones and the total power rate is less than 500W, 2 external power amplifiers need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-ZONE8 to PA interface “IN” of the first power amplifier.
   - Connect the “100V” and “COM” output of the first power amplifier output port to “CH1A IN” of RK-ZONE8, “COM” shall matches “0V” input.
   - Connecting the “100V” and “0V” of “CH1A” to the corresponding ports of “CH1B”.

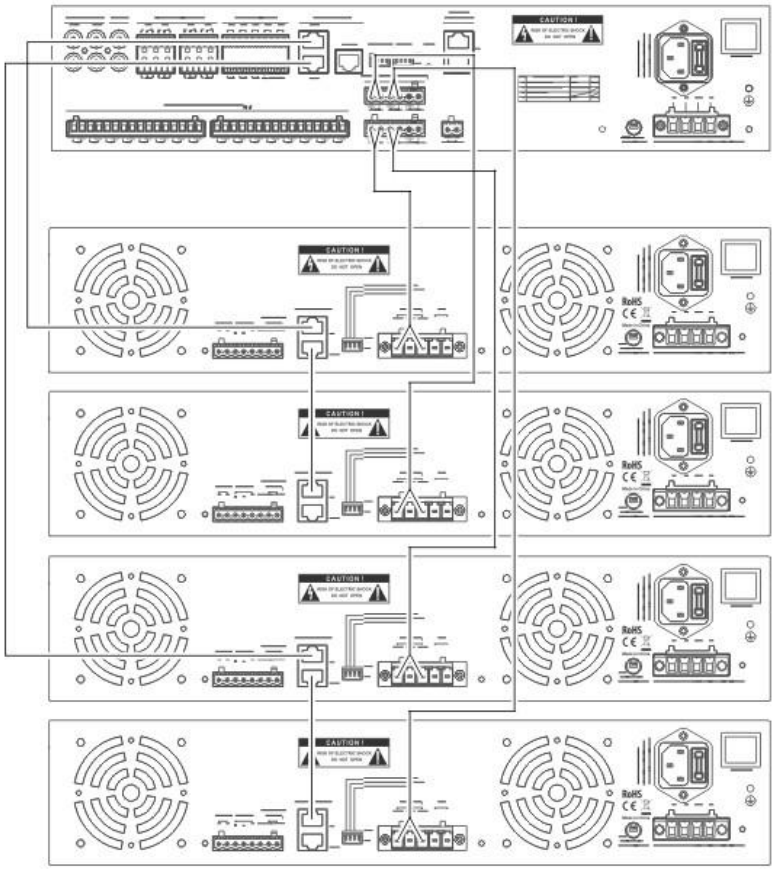
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- Use twisted-pair cable to connect PA interface “CH2” of RK-ZONE8 to PA interface “IN” of the first power amplifier.
- Connect the “100V” and “COM” output of the first power amplifier output port to “CH2A IN” of RK-ZONE8, “COM” shall matches “0V” input.
- Connect the “100V” and “0V” of “CH2A” to the corresponding ports of “CH2B”.



6. Under the dual channel mode, if there are more than 4 zones and the total power rate is more than 500W, 4 external power amplifiers need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH1” of RK-ZONE8 to PA interface “IN” of the first power amplifier.
   - Connect the “100V” and “COM” output of the first power amplifier output port to “CH1A IN” of RK-ZONE8, “COM” shall matches “0V” input.
   - Use twisted-pair cable to connect PA interface “OUT” of the first power amplifier to PA interface “IN” of the second power amplifier.
   - Connect the “100V” and “COM” output of the second power amplifier output port to “CH1B IN” of RK-ZONE8.
   - Use twisted-pair cable to connect PA interface “CH2” of RK-ZONE8 to PA interface “IN” of the third power amplifier.
   - Connect the “100V” and “COM” output of the third power amplifier output port to “CH2A IN” of RK-ZONE8.
   - Use twisted-pair cable to connect PA interface “OUT” of the third power amplifier to PA interface “IN” of the forth power amplifier.
   - Connect the “100V” and “COM” output of the forth power amplifier output port to “CH2B IN” of RK-ZONE8.

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Connecting Loudspeaker line

Please refer to related manual of loudspeakers before connection. Following are the steps to connect speaker line to RK-ZONE8.

1. Strip about 10mm insulated surface of cable and insert it into the loudspeaker terminal, then fasten the screw.
2. Insert the terminal with installed audio cable into loudspeaker interface of RK-MCU.
3. Install the protective cover to avoid electric shock.

Note:

Please pay attention to match the polarity when connecting loudspeaker cable to terminal.

Connecting Dry Contact Input

The way of RK-ZONE8 connection to dry contact input is the same with RK-MCU, please refer to “Connecting Dry Contact Input” in “Connecting RK-MCU” part.

Connecting Dry Contact Output

The way of RK-ZONE8 connection to dry contact output is the same with RK-MCU, please refer to “Connecting Dry Contact Output” in “Connecting RK-MCU” part.

Connecting Audio Device

RK-ZONE8 has 1 audio input interface to connect to external audio source, which can be played via connected loudspeaker line only under special condition. RCA interface is used to connect to external audio source. The valid value of input signal should be less than 1V and shield audio cable with RCA terminal is recommended. Use the wire with RCA terminal to connect to output of audio device and input of device circuit.

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Connecting RK-ZONE24

Connecting Main Power Amplifier

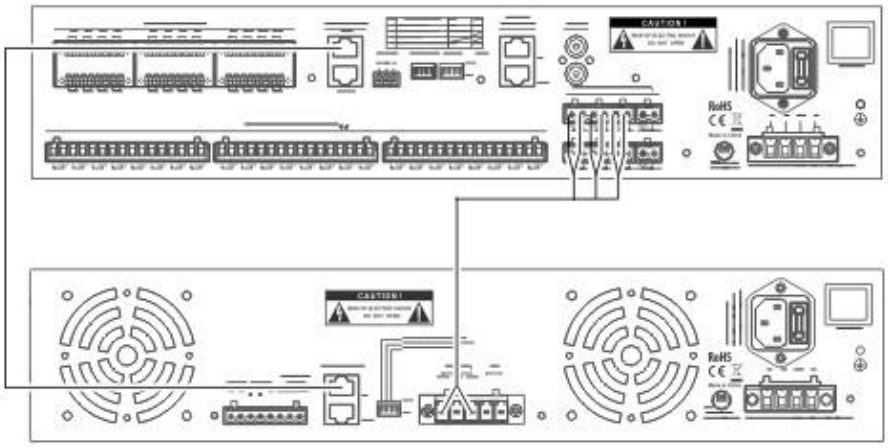
The relevant amplifier interface of RK-ZONE24 has detailed description in “Interface Introduction” part. It can connect to maximum 6 main power amplifiers and each amplifier input matches 4 loudspeaker lines. It is flexible to place multiple inputs in parallel connection and connect to one power amplifier, which can drive more lines by one power amplifier. Below is the sample for the connection of one power amplifier, two power amplifiers and six power amplifiers.

1. Connecting One Power Amplifier

   If device is connected with only 1 power amplifier and more than 20 loudspeaker lines. Please follow below steps for connection:

   - Use twisted pair to connect RK-ZONE24 amplifier interface “CH1” to the amplifier control interface “cascade input”.
   - Connect output port “100V” and “COM” of power amplifier to RK-ZONE24 input port “CH1A”, port “COM” shall matches “0V” input.
   - Connect input port “100V” and “0” of CH1A to the corresponding input port of CH1B, CH1C, CH1D, CH1E and CH1F for parallel connection.

   If the connected zones are less than 20, some unnecessary ports don’t need to be connected.



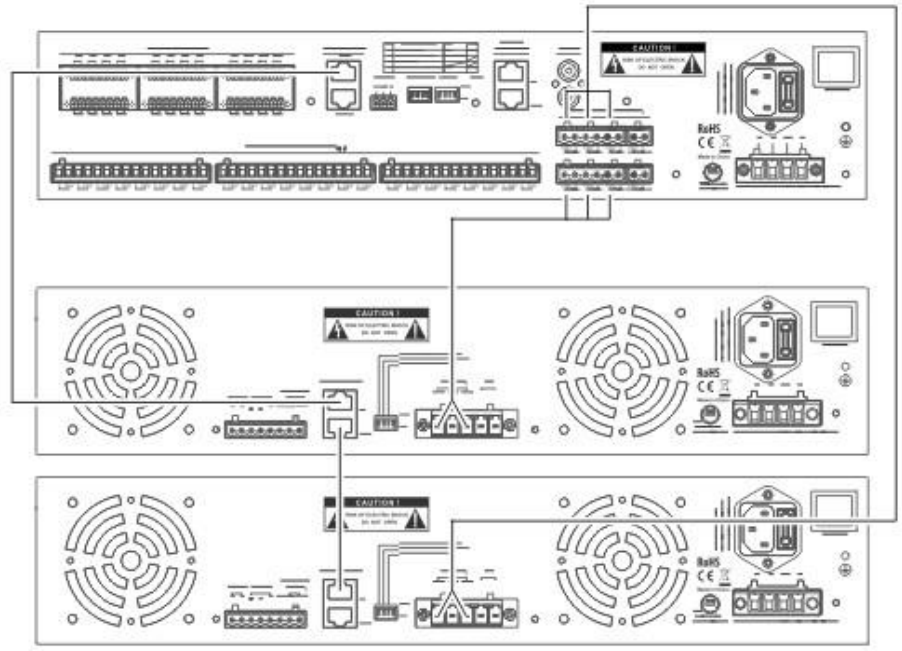
2. Connecting Two Power Amplifier

   If device connect 2 power amplifiers and more than 20 loudspeaker lines. Please follow below steps for connection:

   - Use twisted pair to connect RK-ZONE24 amplifier interface “CH1” to the amplifier control interface “cascade input” of the 1st power amplifier.
   - Use twisted pair to connect amplifier control interface “cascade output” of the 1st power amplifier to amplifier control interface “cascade input” of the 2nd power amplifier.
   - Connect output port “100V” and “COM” of the 1st power amplifier to RK-ZONE24 input port “CH1A”, port “COM” shall matches “0V” input.
   - Connect output port “100V” and “COM” of the 2nd power amplifier to RK-ZONE24 input port “CH1B”, port “COM” shall matches “0V” input.
   - Connect input port “100V” and “0” of CH1A to the corresponding input port of CH1C and CH1E for parallel connection.
   - Connect input port “100V” and “0” of CH1B to the corresponding input port of CH1D and CH1F for parallel connection.

   It is only need to connect the power amplifier to the input port of connected loudspeaker line.

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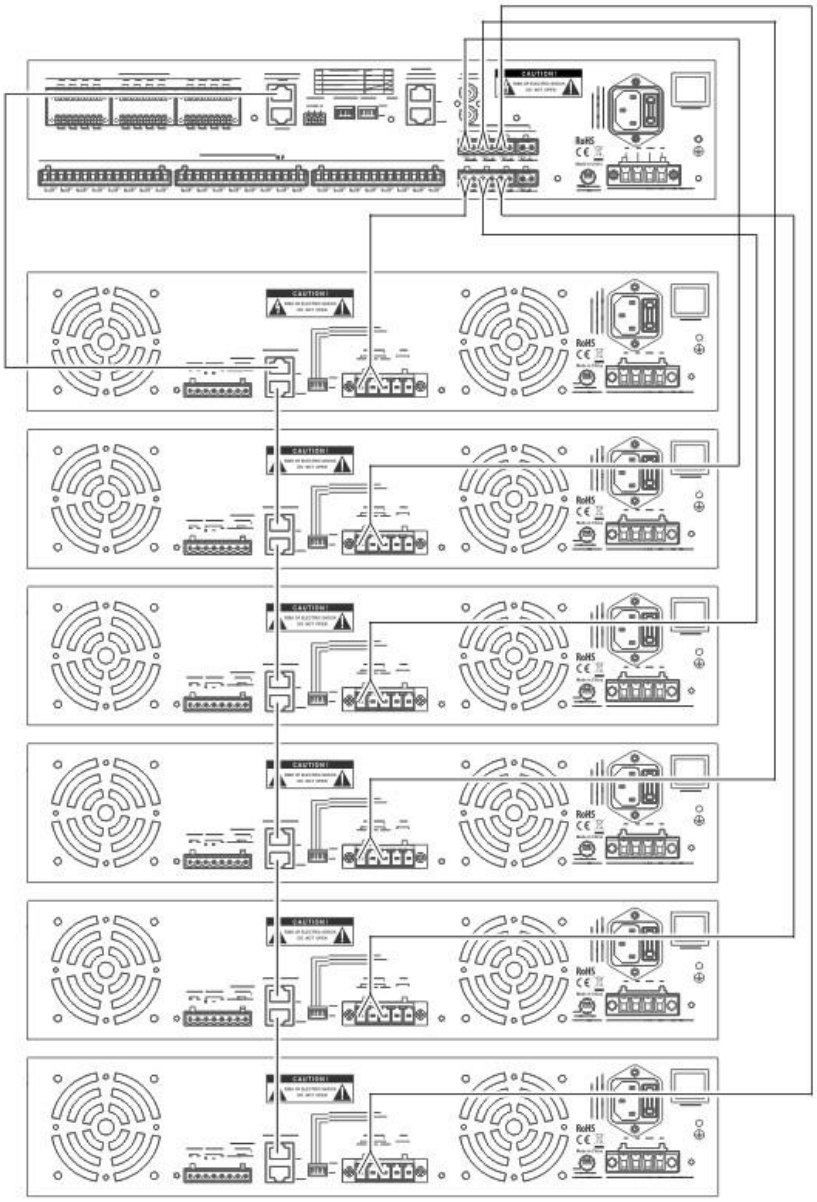


3. Connecting Six Power Amplifier

   If device need to connect 6 power amplifiers, please follow below steps for connection:

   - Use twisted pair to connect RK-ZONE24 amplifier interface “CH1” to the amplifier control interface “cascade input” of the 1st power amplifier.
   - Use twisted pair to connect amplifier control interface “cascade output” of the 1st power amplifier to amplifier control interface “cascade input” of the 2nd power amplifier.
   - Use twisted pair to connect amplifier control interface “cascade output” of the 2nd power amplifier to amplifier control interface “cascade input” of the 3rd power amplifier.
   - Use twisted pair to connect amplifier control interface “cascade output” of the 3rd power amplifier to amplifier control interface “cascade input” of the 4th power amplifier.
   - Use twisted pair to connect amplifier control interface “cascade output” of the 4th power amplifier to amplifier control interface “cascade input” of the 5th power amplifier.
   - Use twisted pair to connect amplifier control interface “cascade output” of the 5th power amplifier to amplifier control interface “cascade input” of the 6th power amplifier.
   - Connect output port “100V” and “COM” of the 1st power amplifier to RK-ZONE24 input port “CH1A”, port “COM” shall matches “0V” input.
   - Connect output port “100V” and “COM” of the 2nd power amplifier to RK-ZONE24 input port “CH1B”, port “COM” shall matches “0V” input.
   - Connect output port “100V” and “COM” of the 3rd power amplifier to RK-ZONE24 input port “CH1C”, port “COM” shall matches “0V” input.
   - Connect output port “100V” and “COM” of the 4th power amplifier to RK-ZONE24 input port “CH1D”, port “COM” shall matches “0V” input.
   - Connect output port “100V” and “COM” of the 5th power amplifier to RK-ZONE24 input port “CH1E”, port “COM” shall matches “0V” input.
   - Connect output port “100V” and “COM” of the 6th power amplifier to RK-ZONE24 input port “CH1F”, port “COM” shall matches “0V” input.

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Connecting Loudspeaker line

Please refer to related manual for loudspeaker connection. Following are the steps for connecting loudspeaker line to RK-ZONE24.

1. Strip about 10mm insulated surface of cable and insert it into the loudspeaker terminal, then fasten the screw.
2. Insert the terminal with installed audio cable into loudspeaker interface.
3. Install the interface protective cover to prevent electric shock.

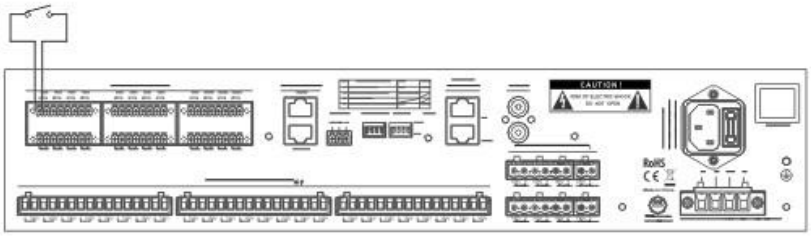
Note:

Pay special attention to match the polarity when connecting loudspeaker cable to terminal.

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Connecting Dry Contact Input

RK-ZONE24 has 24 dry contact input interfaces without line supervision function. Dry contact input of RK-MCU can be directly connected to signal output of external device or the third party system. When the dry contact is off, preset function can be enabled. Please don't connect the dry contact input interface to the external electric equipment.



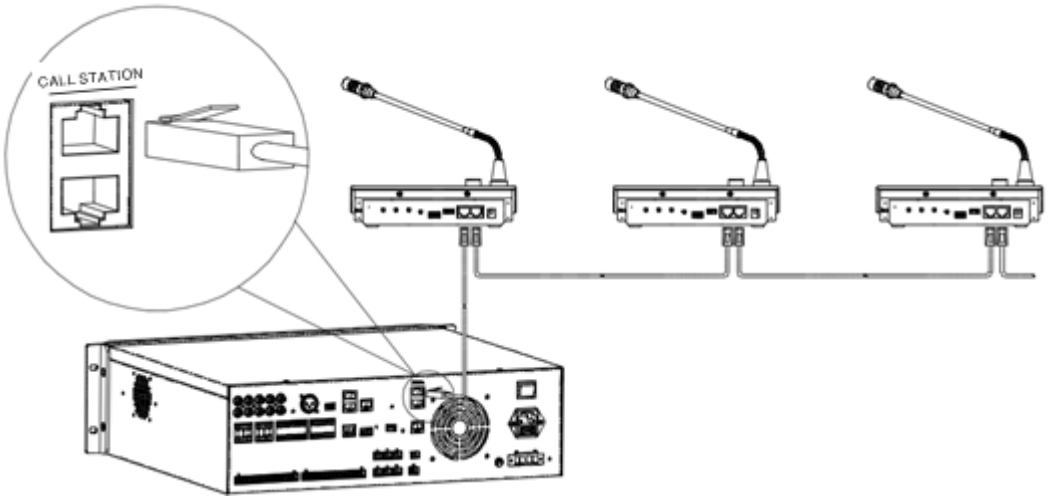
Connecting Audio Device

RK-ZONE24 has 1 audio input interface to connect external audio source, which can be played via connected loudspeaker line only under special condition. RCA interface is used to connect to external audio source. The valid value of input signal should be less than 1V. It is recommended to use the shield audio cable with RCA terminal. Please use the wire with RCA terminal to connect to output of audio device and line input.

Connecting RK-MIC

Connecting RK-MCU

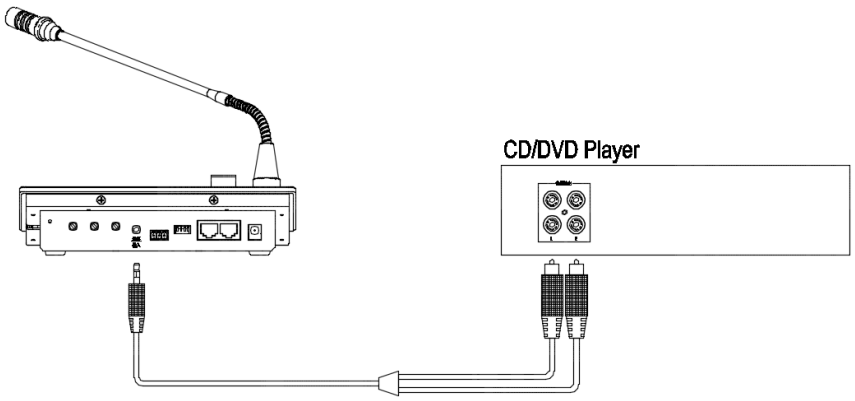
Please refer to the chapter "Call Station Interface" for specific information of RK-MIC interface. Use the twisted pair to connect call station interface of RK-MCU to input interface of RK-MIC. There are 2 call station interfaces on RK-MCU, RK-MIC can connect to either of them. When there are many RK-MICs need to be connected, users need to connect the input interface of RK-MIC to the output interface of RK-MIC as below.



Connecting External Audio Source

RK-MIC has 1 audio input interface to connect to external audio source, which is used for BGM broadcast. Since the interface has TRS port with a cross-section of 3.5mm, it is required to use attached cable to connect to audio device. While connecting, use 2 RCA plugs to insert to output port of left and right channel of audio device, and insert the terminal with a cross-section of 3.5mm into line in port.

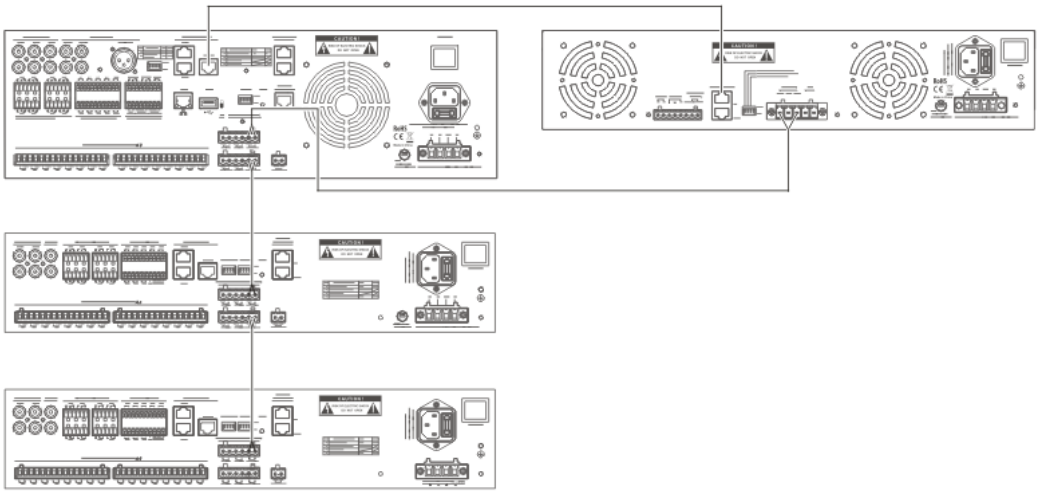
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Connecting Spare Power Amplifier

If redundancy function of power amplifier is required, the installer should be clear which devices will share a spare power amplifier, and which device will be connected to the PA interface of spare amplifier.

First, please connect the PA interface of spare power amplifier with the spare interface of a controller (which may be RK-MCU, RK-ZONE8 or RK-ZONE24), connect the 100V output of spare power amplifier to *SPARE IN* of the controller, then connect *SPARE OUT* of the controller to *SPARE IN* of another controller one by one. The connection is shown as below:



To ensure the function works well, the configuration must follow the actual connection of spare power amplifier.

Connecting Third Party System

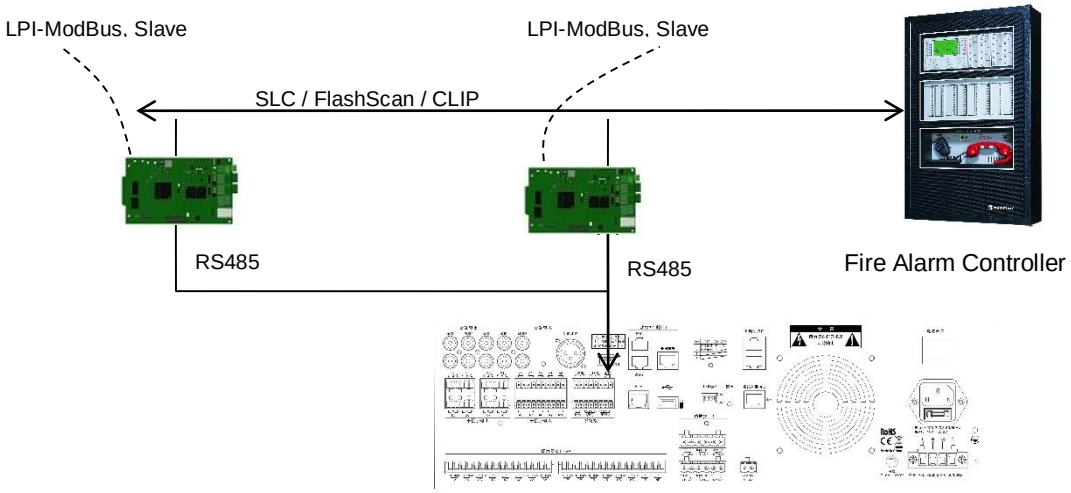
Fire Alarm System

INTEVIO system can be linked with fire alarm system by LPI-MODBUS module. Following are the supported fire controllers:

- N-6000
- NFS-3030
- NFS2-3030
- NFS-640
- NFS2-640

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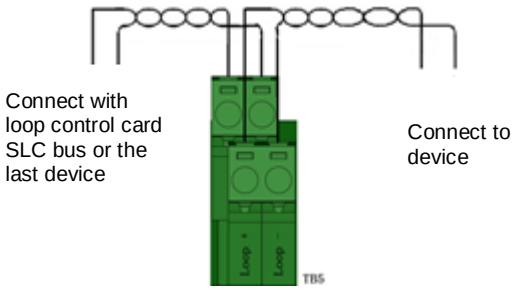
When RK-MCU is connected with fire alarm system by LPI-ModBus module, RK-MCU is the Master device and can be connected to maximum 3 LPI-ModBus modules, which act as the Slave devices. The RS-485 interface of LPI-ModBus can directly connect to fire alarm interface of RK-MCU. To assure the communication performance, it is required not use star connection for the RS-485 bus when connect to LPI-ModBus modules. The connection is as follow:



Below is the steps for connection:

1. Connecting SLC Loop Wire

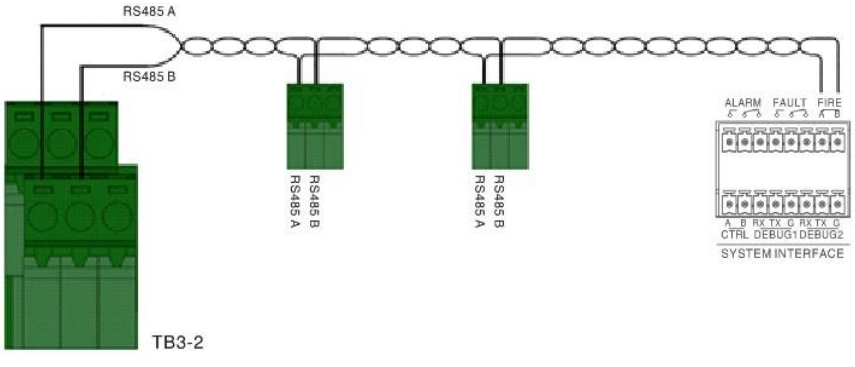
   Connect the SLC bus of fire alarm controller loop to TB5 port of LPI-ModBus module, which is shown as below:



2. Connecting RS-485 Bus

   Connect the fire alarm interface of RK-MCU to TB3-2 port of LPI-ModBus module, please pay attention that:

   - RS485 bus does not support T-shape connection. Only hand in hand way to keep working.
   - The maximum distance between LPI-ModBus module and RK-MCU is 1000m (16AWG).
   - The range of wire diameter is from 12AWG to18AWG, the shielded twisted pair cables are recommended.



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3. Connecting Power Supply

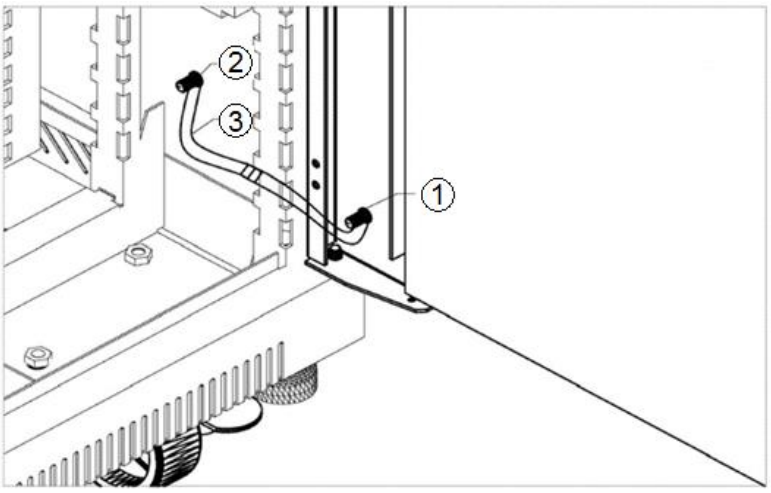
Connecting the power interface of LPI-ModBus module to power supply, pay attention to match the polarity when connecting the power supply.

Grounding

Normally, there are grounding terminals at the bottom of cabinet or the door of cabinet.

1. Connecting Cabinet Grounding Wire

Generally, cabinet has special ground terminal. The figure ① and ② are grounding screws, which need to be connected.



2. Connecting Device Grounding Wire

All device have a special grounding screw, which is shown as figure⏚. After installing device in cabinet, it is requested to use a cable with a cross-section of 1.5mm^2 to connect the cabinet grounding to device grounding.

Note:

To prevent grounding loop, it is forbidden to connect output grounding to input grounding.

Basic Settings

After installation, some basic setting on work mode is required.

Address Setting

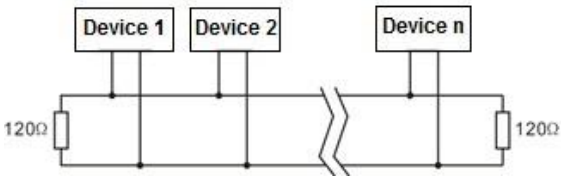
Before the system debugging, we need to set the address of zone expander and remote call station. It should be started from 1 and continuously set. The setting range of 1 to 15 is for RK-ZONE8, 1 to 5 is for RK-ZONE24 and 1 to 6 is for RK-MIC.

There is an address DIP switch at the back panel of device, which can be used to set address according to binary system. Please refer to the chapter “Relation Table of Address & DIP” for DIP switch setting.

End-of-Line Resistor

Devices can communicate with each other by CAN bus. End-of-line resistor need to be installed to keep communications among devices normally. Both sides of CAN bus should be installed with 120Ω resistor, which is shown as below:

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120Ω resistor is built in the interface of each device, users can connect or disconnect the resistor to the bus by DIP switch easily.

System Extension Bus

The inside of system extension interface of RK-MCU is connected with 120Ω resistor. After master control unit is connected with zone expanders, users need to turn on the 4th pin of dip switch "work mode" to connect the end-of-line resistor at the zone expander of the end.

Remote Call Station Bus

RK-MCU has 2 interfaces without 120Ω resistor to connect remote call stations. After master control unit is connected to remote call stations, users need to turn on 'ELR' to connect to the end-of-line resistor on RK-MIC of the end. If master control unit is at the end of the bus, it is required to insert a plug with 120Ω resistor in another interfaces.

Work Mode Setting

Following is the work mode setting for RK-MCU, RK-ZONE8, RK-ZONE24 and RK-AMP500.

RK-MCU Master Control Unit

1. Mic/Line Setting

   The input range and phantom power output of input interface can be set through the DIP switch on the right side of Mic/line.

Switch No.	Function	Description
1	Gain setting	• ON——Microphone input • OFF——Line input
2	Phantom power	• ON——Enabled • OFF——Disabled

2. Audio Channel Setting

   System can support maximum 2 audio channels. RK-MCU and RK-ZONE8 can support both single and dual audio channel. RK-ZONE24 can only support single audio channel. Before use, user should set the audio channel by "work mode" switch.

Switch No.	Function	Description
1	Audio channel	• ON——Dual channel Mode • OFF——Single Channel Mode

3. Line Supervision Disabled

   Line supervision of RK-MCU can be forcibly disable by setting "work mode" switch.

Switch No.	Function	Description
2	Line supervision	• ON——Disabled • OFF——Work as configured

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RK-ZONE8/24 Zone Expander

1. Standalone & Networking Mode Setting

   Zone expander can work in standalone and networking mode, which can be set by “work mode” switch. When device works in standalone mode, it only broadcasts line input audio in audio channel 1. Loudspeaker line can be enabled and disabled by setting dry contact input. When device is under networking mode, RK-MCU performs broadcast control and status supervision on zone expanders.

Switch No.	Function	Description
1	Work mode	• ON——Standalone Mode • OFF——Networking Mode

2. Line Supervision Disabled

   Line supervision of zone expander can be forcibly disabled by setting “work mode” switch.

Switch No.	Function	Description
2	Line supervision	• ON——Disabled • OFF——Work as configured

HAM-500 500W Class-D Power Amplifier

1. Main Power Supervision

   Main power fault supervision can be enabled by setting power amplifier’s DIP switch.

Switch No.	Function	Description
1	Main power supervision	• ON——Enabled • OFF——Disabled

2. Backup Power Supervision

   Backup power fault supervision can be enabled by setting power amplifier’s DIP switch.

Switch No.	Function	Description
1	Backup power supervision	• ON——Enabled • OFF——Disabled

3. Power-saving Mode

   Power amplifier’s DIP switch can enable or disable the power-saving function. When it is enabled, device will automatically turn off some lines to save power, and power amplifier will enter a normal working condition through the power-saving signal. When it is disabled, device will be in a normal working condition.

Switch No.	Function	Description
1	Power-saving mode	• ON——Enabled • OFF——Disabled

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System Hardware Checking

To avoid the damage from incorrect connection, please carefully check below issues:

1. Check the power connection of all devices, especially those with AC backup power. Note that the polarity should be matched.
2. Check the connection of system extension circuit, and the end device should be connected to end resistor.
3. Check the wiring connection from RK-MCU and zone expander to power amplifier.
4. Check the wiring connection between backup power amplifier and related devices.
5. Check the wiring connection from RK-MIC to RK-MCU and the connection between RK-MICs. Note that the end device should be connected to end resistor.
6. To avoid short circuit, no burr on the wire terminal.
7. Check all the settings of device address and work mode.
8. Check the connection of loudspeaker lines.

The power supply cannot be turned on unless all the checking have been finished. For the power supply information, please refer to “Power on & off”.

System Basic Information

Please pay attention to following information before configuring the system.

Below are the default setting of RK-MCU:

No.	Description	Parameter
1	System ID	10000
	IP address	192.168.2.200
2	Subnet mask	255.255.255.0
3	Gateway address	192.168.2.1
4	Device password	8888
5	Time zone	+8

For more parameters, such as device’s IP address, subnet mask, gateway, firmware version, etc., users can view them through the menu “View System Information”.

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3 System Configurations

Users can configure the system via the configuration software if the default configuration cannot meet the requirements. The configuration software can be obtained from our website. This chapter mainly introduces the operations about system configuration and broadcast function configuration.

Operating Environment

System configuration software sends data to devices via the Ethernet communication, below requests must be met for the installed computer:

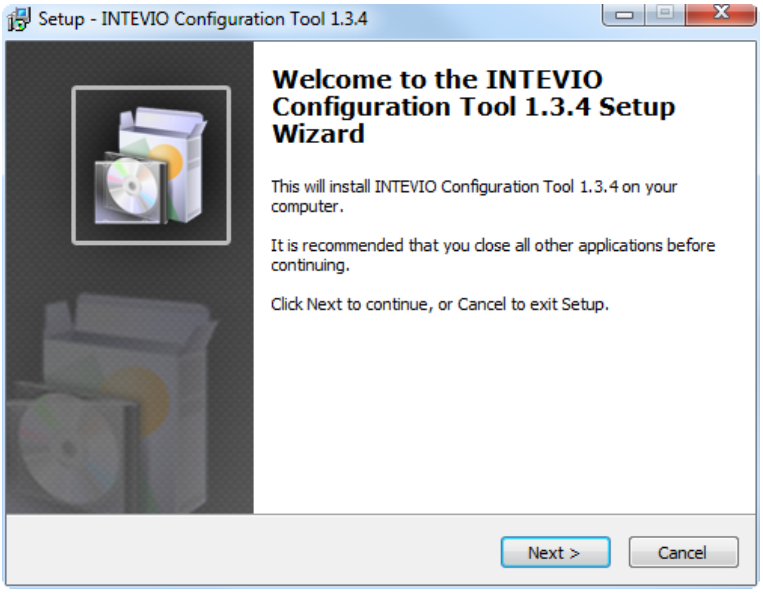
- Windows XP, Windows 7 or Windows 10 operating system
- 1GHz or higher speed CPU
- At least 512MB RAM
- At least 1GB free space of hard disk
- 10M/100M Ethernet port
- 1024X768 or higher resolution
- Allowed to access to network by firewall

Installation and Uninstallation

Installation

Please follow the below instructions to install the software:

1. Double-click the installation program “INTEVIO Configuration Tool Setup.exe”, and the below window is displayed:

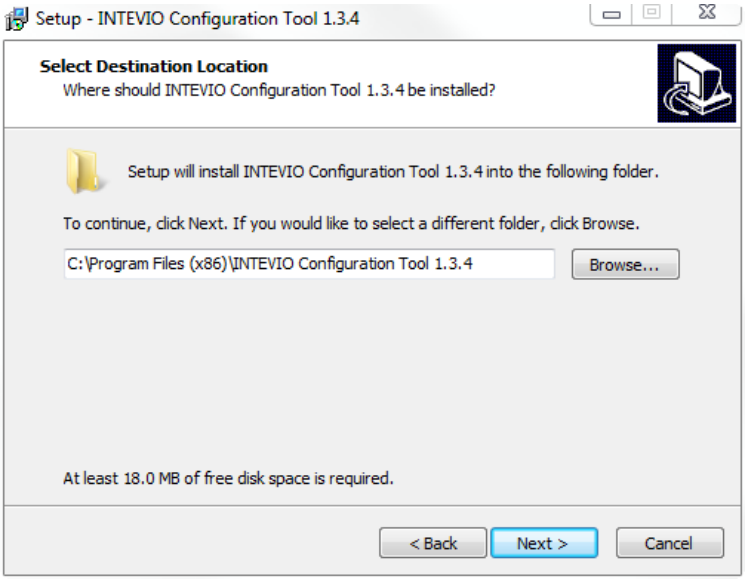


2. Click **Next**, the License Agreement page is displayed. Please carefully read the agreement.
3. Select **I accept the agreement** on the page.
4. Click **Next**, the information page is displayed.

   Read the important information on this page before proceeding to the next step.
5. Click **Next**, The page is shown as below.

   The default installation directory is C:\Program Files(x86)\INTEVIO Configuration Tool. If users want to change the directory, click **Browse** to choose a different location.

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6. Click **Next**, the Additional Tasks page is displayed.
7. To create a desktop shortcut for running the software, select **Create a desktop icon**.
8. Click **Next**, the Ready to Install page is displayed.
9. Click **Install**, the Installing page is displayed.

   The software is then installed on the computer. The installation progress is displayed.
10. Click **Next**, the information page is displayed.

    Read the information carefully on this page before proceeding the installation.
11. Click **Next**, the Completion page is displayed. If users need to start the software immediately, select the option **Launch INTEVIO Configuration Tool**. Otherwise, click **Finish** to complete the software installation.

Uninstallation

Please follow below steps to uninstall the software.

1. Click **Start** at the lower left of the computer desktop, and select *Program → INTEVIO Configuration Tool → Uninstall INTEVIO Configuration Tool.* A prompt dialog appears with the message “Are you sure to remove the INTEVIO Configuration Tool and its all components?”
2. Click **Yes** to uninstall the software and all of its components.
3. After the uninstallation is completed, here comes the prompt dialog “Some content cannot be deleted, you can manually remove them”. Click **OK** to finish the uninstallation.

Note:

If users want to delete the remaining files manually, find the *INTEVIO Configuration Tool* folder from the installation directory and delete it.

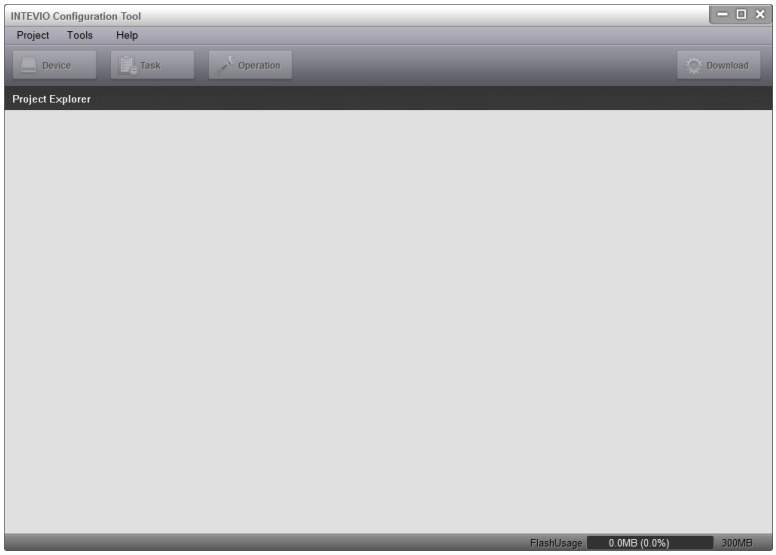
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Configuration Operation

General Introduction

Running & Exiting Software

Double click the icon on the desktop or click **Start** at the lower left of the computer desktop, and select *ALL Programs→INTEVIO Configuration Tool* to run the software, which is shown as below:



To exit the software, select the menu commands *Project→Exit or click the "X" icon* on the upper right of the window.

Main Window Introduction

The configuration software is shown with the title bar, menu bar, project explorer view, navigation buttons and main page.

Menu Bar

- Project

  Users can do below operations through the Project menu:

  - New

    To create new project files.
  - Open

    To open existing files.
  - Save As

    Save the current project, which can be renamed.
  - Recent Projects

    Display the recent projects.
  - Project Information

    Set the information of a project, such as the project name, company name, contact and phone number, etc.
  - Close

    Close the current project without exiting the software.
  - Exit

    Exit the software.

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- Tools
  - Browse Recorded Files

    View the recorded files from RK-MCU.
  - Upload Project file from RK-MCU to PC

    Read the system configuration files and audio files from RK-MCU.
  - Upgrade RK-MCU Firmware

    Upgrade the firmware of master control unit through Ethernet.
  - Upgrade Peripheral Firmware

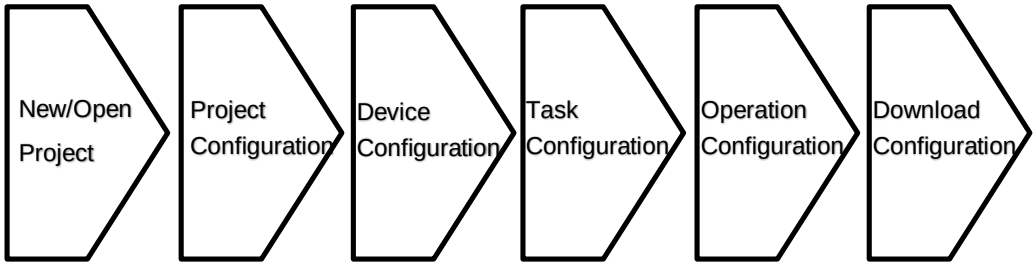
    Upgrade the firmware of zone expanders or remote call stations.
  - Select Language

    Selecting the displayed language.
- About

  Display the software version and copyright information.

Configuration Guide

Please follow below steps to configure the INTEVIO system:



1. New/Open

   Before configuration, it is required to create a new project file or open an existing project file.
2. Project Configuration

   Setting the project properties and devices.
3. Device Configuration

   Set the basic parameters of each device.
4. Task Configuration

   Set the broadcast tasks, including audio files, play lists and task parameters.
5. Operation Configuration

   Set the function about broadcast operation, such as button, dry contact input and timing broadcast.
6. Download Configuration

   Download the configuration file and audio file, etc. to master control unit.

For the new user, please follow above steps to configure. For the well-known user However, operations can be flexibly proceeded according to need.

Note:

Due to the dependencies among the settings, to avoid wrong operation, the software will save all the setting automatically while configuring the system.

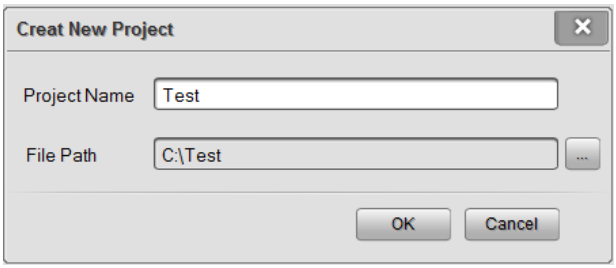
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Project

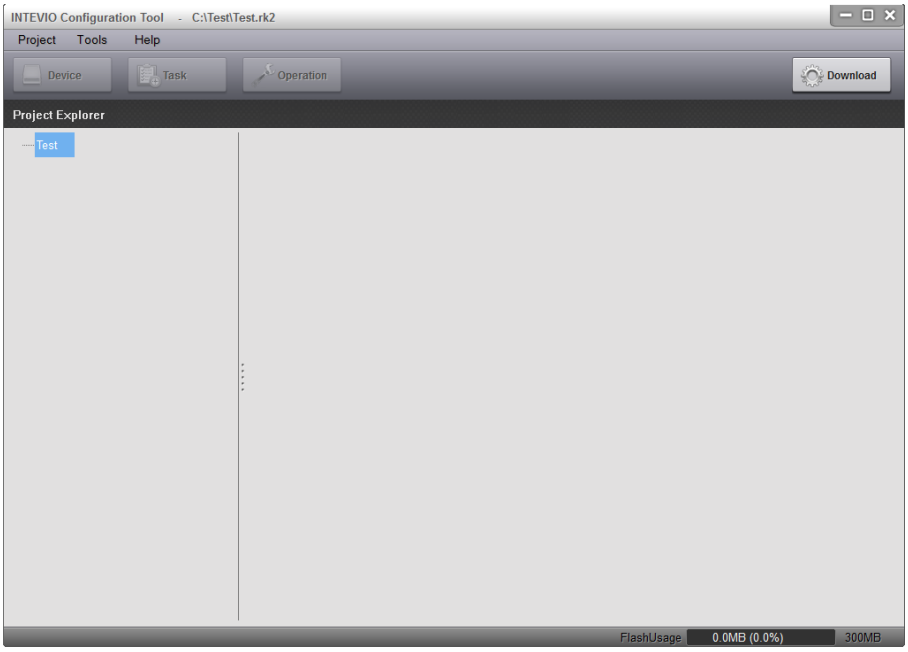
New

Following are the steps to create a new file:

1. Select the menu *Project* → *New*. The new project window is displayed as below.



2. Set the project name and file path. The directory can be changed and the default path is “My Documents”. Click the ... icon beside the path field to select a different directory.
3. Click the “OK” button to create the project. The window will be shown as below:



Click the “Cancel”, the new project window will be closed.

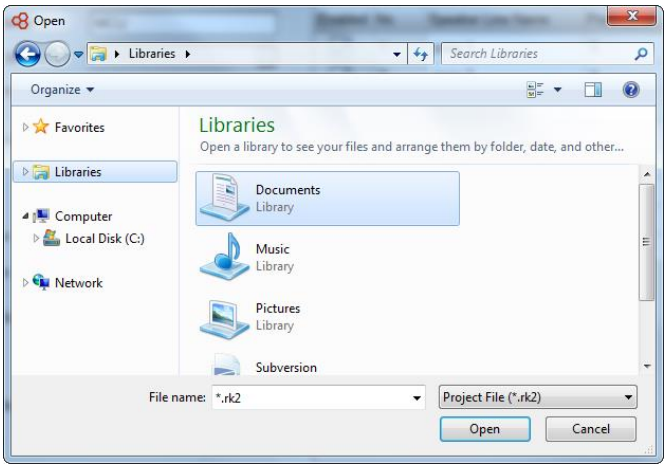
4. Right click the project name in ‘Project Explorer’, and select ‘Add’ in the menu to display ‘Add Device’ window. Select ‘RK-MCU’ in device type, then click ‘OK’ button to add a MCU in the project.

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Open

Following are the steps to open a project:

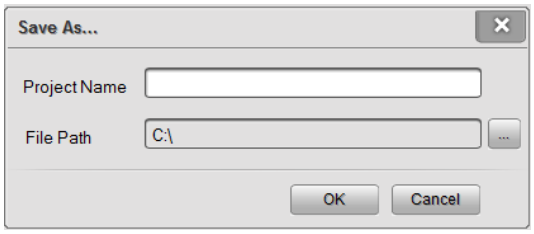
1. Select the menu *Project → Open*. The window is displayed as below:



2. Select the project file according to location path.
3. Click “Open” button to open the project file. The “Cancel” button is to close the window.

Save As

Select the menu *Project → Save as*. The window is displayed as below:



1. Enter the project name and select the storage directory for the project file.
2. Click the “OK” button. Then the project is saved as another file, but the current is still the original file.

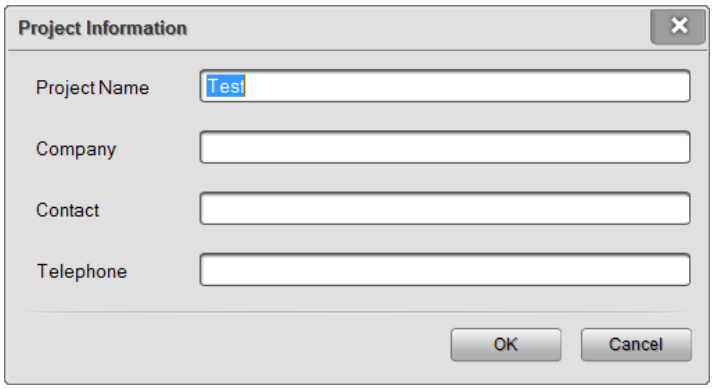
Recent Projects

Select the menu *Project → Recent Projects*. Click the file that need to be viewed from the project list.

Project Information

Please follow below steps to configure project properties:

1. Select the menu *Project → Project Information*. The basic information, such as project name, company, contact and telephone is displayed as below:



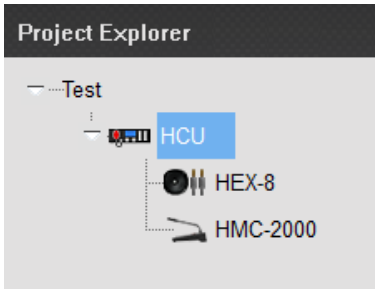
2. Enter the project name, company, contact and telephone.

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3. Click *OK* button to save.

System Setting

After creating a new file or opening a project, a tree structure with all devices of the project will be displayed in the left side of window. Select the root, and right click to add a HCU to the project.

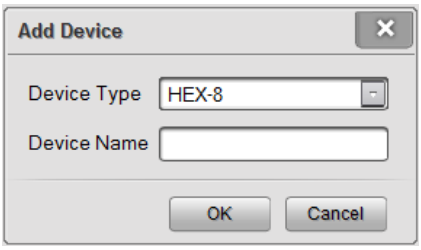


Select HCU and right click to display following menu:



- Add

  Add menu is used to add new devices for system, click it and below window will be displayed:

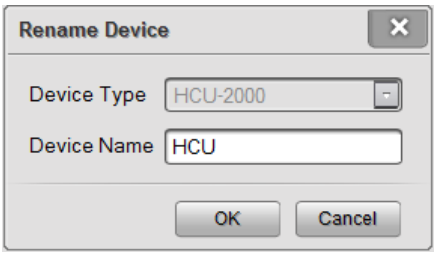
  Click the dropdown box beside *Device Type* to view the device list. Select a device type and enter the device name, then click *OK* to save it.

- Copy/Paste

  Users can add the same type of device with similar parameter by copy. First select a device and click the menu Copy → *Paste*.

- Rename

  If users need to reedit the device name. Select a device and right click to select *Rename*. Enter a new name in the pop window and click *OK* to save.

- Delete

  If users want to delete device from project, first select the device and right click to select *Delete*.

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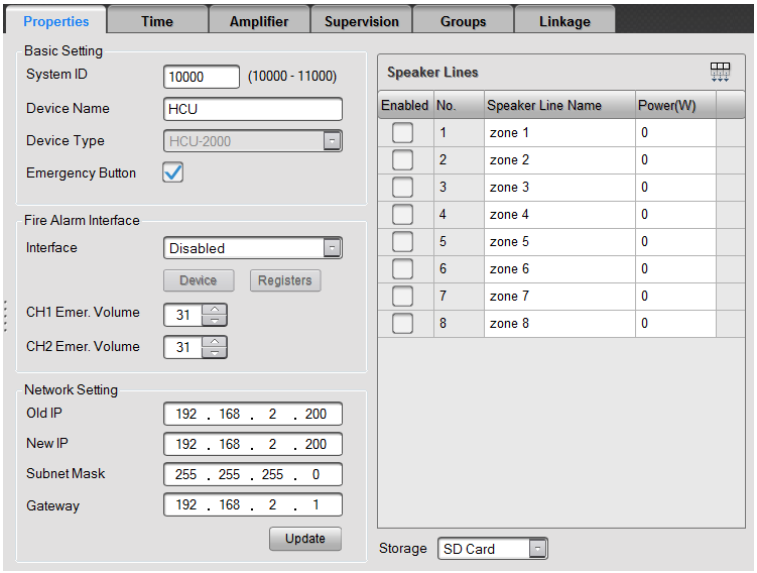
Device

RK-MCU

Select RK-MCU, and click *Device* button to view the related options, such as Properties, Time, Amplifier, Supervision, Groups and Linkage.

1. Properties

   Set the RK-MCU working parameter as followed:



- Basic Setting

Basic setting includes System ID, Device Name and Emergency Button.

System ID is the device identification in the system, which in the range of 10000~11000.

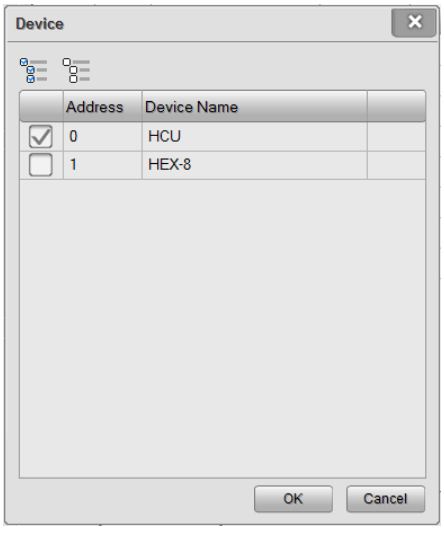
The option *Emergency Button* is to enable or disable emergency button on the front panel of HCU. The checkbox shown as  means enabled.

- Fire Alarm Interface

This item is used to set the interface type and interface parameter related to fire alarm system, which includes Dry Contact, LPI-ModBus or Disabled. The default setting is disabled.

If select LPI-ModBus, HCU will be the master device and can communicate with fire alarm system by LPI-ModBus module. Please refer to LPI-ModBus Converter User Manual for details.

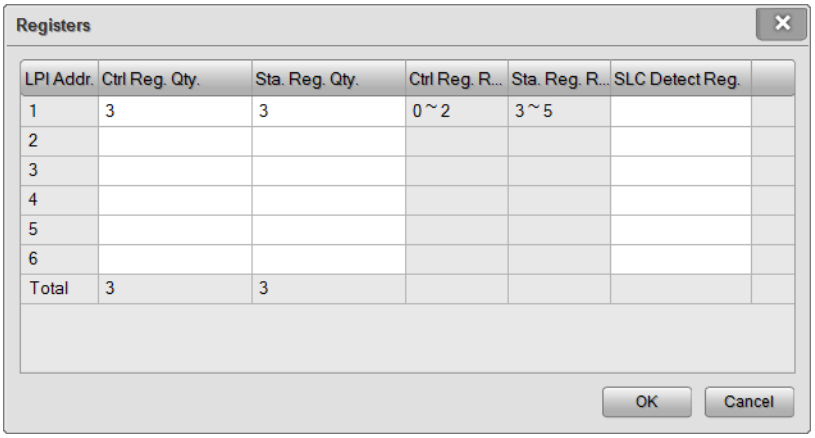
After selecting the fire alarm interface, click *Device* to select the device to be activated in emergency as below:



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Select the device need to be linked. Click *OK* to switch to fire alarm setting interface and all selected zones will be displayed in this window.

When the interface is LPI-ModBus, users need to set the quantity of control registers and status registers, click *Registers* to show the following window:



There are 16 status registers and 16 control registers, the quantity of which need to be set for each LPI-ModBus module. The total quantity of status and control registers shall be less than 16.

- Network Setting

Network Setting is used to set RK-MCU network parameter. To change the device IP address, users need to connect the computer with master control unit. The network segment of computer should be the same with master control unit. Click *Upgrade* button to change the IP address. The IP address of RK-MCU is 192.168.2.200 by default. Users can also query IP address from the menu of HCU, please refer to the chapter “Device Information” for details.

Note:

Downloading Configuration file won’t change any network parameter, the network configuration can be changed only by upgrade. While setting the network, please keep device and computer connected well and note that the network configuration should be right.

- Speaker Lines

Speaker Lines is used to enable speaker lines, set name and load power. Click the checkbox as below,  means enabled and  means disabled. Users can change the name and power of speaker lines. The load power is only used to note.

Selecting a speaker line and clicking the  button can set all the power to be the same with the current one.

- Trigger Mode of Dry Contact Inputs

This table is used to set the trigger mode of each dry contact input as short activation or open activation.

If “Short Activation” is selected, when the switch of third party device is opened, the dry contact input will be deactivated, and when the switch is closed, the dry contact will be activated.

If “Open Activation” is selected, when the switch of third party device is closed, the dry contact input will be deactivated, and when the switch is opened, the dry contact will be activated.

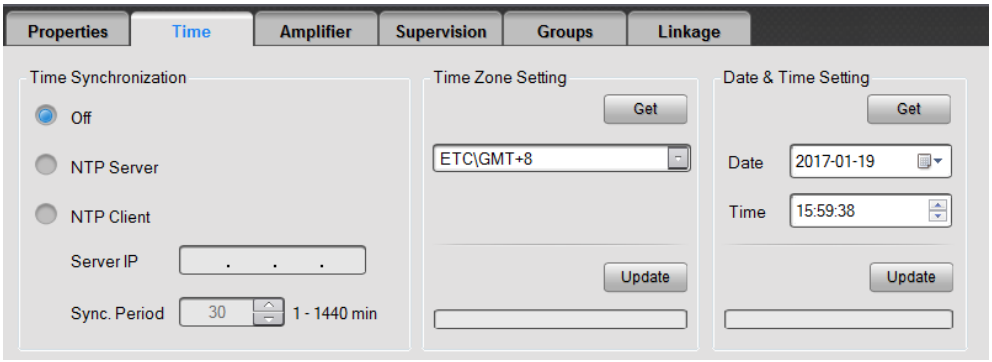
- Storage

Storage shows the storage type used by RK-MCU, it can be SD card or Flash, which can be changed.

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2. Time

Time is used to set the parameters related to clock, which is shown as below:



- Time Synchronization

Time Synchronization is to set the parameters of time synchronization for HCU through NTP protocol, which is normally disabled by default.

If NTP Server is enabled, HCU will work as a NTP server, other devices will synchronize the time with it.

If NTP Client is enabled, HCU will automatically synchronize the time with a NTP server, the Server IP and Sync. Period should be set.

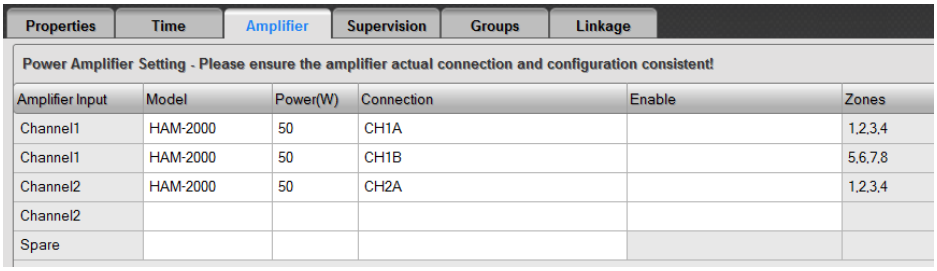
- Time Zone Setting

Time Zone Setting is used to set the time zone of master control unit. Choose the time zone of local, and click “Update” button to change the time zone of HCU. If the time zone is different with the local time zone, the time and date will be wrong while time synchronization.

- Date & Time Setting

Date & Time is used to view and manually update the device’s date and time. Click “Get” button to read the device’s time and clicking “Update” button can synchronize device’s date and time with the computer.

3. Amplifier



Amplifier Input	Model	Power(W)	Connection	Enable	Zones
Channel1	HAM-2000	50	CH1A		1,2,3,4
Channel1	HAM-2000	50	CH1B		5,6,7,8
Channel2	HAM-2000	50	CH2A		1,2,3,4
Channel2					
Spare					

Set the model of power amplifier corresponding to each audio channel, then set the ports of MCU which are connected with the output of power amplifier. The setting must be same with the actual connection.

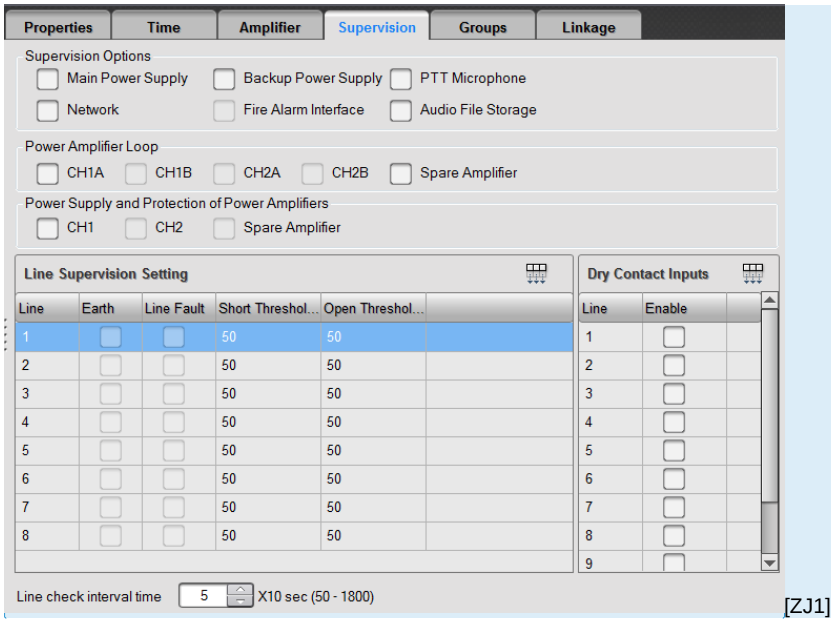
When users need amplifier redundancy function, if the audio signal of spare power amplifier is from MCU, please set the model of power amplifier in Spare row, then set the spare ports of the devices which are connected to the output of the spare power amplifier.

In *Enable* column, select the spare amplifier corresponding to the main amplifiers to enable the redundancy function.

4. Supervision

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Supervision is used to enable or disable the supervision functions, the window is shown as below:



[ZJ1]

- Supervision Options

Through the software, users can set enable or disable Main Power Supply, Backup Power Supply, PTT Microphone, Network, Fire Alarm Interface and Audio Files Storage. Click the checkbox,  means enabled.

If the checkbox of '*Battery Save*' is enabled, when the main power supply (AC power) of any control units in the system is fault, the system will disable all non-emergency functions. This option is only available when the supervision of main power supply is enabled.

- Power Amplifier Loop

The options of power amplifier loop is used to enable or disable the supervision of the loops between controllers and power amplifiers. The options includes CH1A, CH1B, CH2A, CH2B and spare amplifier.

- Power Supply and Protection of Power Amplifiers

The power supply and protection status of power amplifiers may be supervised if the corresponding options are enabled. The power supply failure of the power amplifier on the same audio channel can't identified separately, MCU only show the power supply failure of the audio channel, and users may check the indicators from the front panels of power amplifiers.

- Line Supervision Setting

Users can respectively enable and disable the supervision function of speaker lines and earth fault, and set the threshold of short circuit and open circuit. When the impedance compared with the calibrated value is lower than the short threshold, a fault of short circuit will be found in the speaker line. When the impedance compared with the calibrated value is higher than open threshold, a fault of open circuit will be found in the speaker line.

Select a line, and click the  icon to set the rest of parameters the same as the selected one.

- Line Check Interval Time

RK-MCU is designed with timing supervision function, which can be used to set the supervision interval. The value ranges from 10~1800s.

- Dry Contact Input

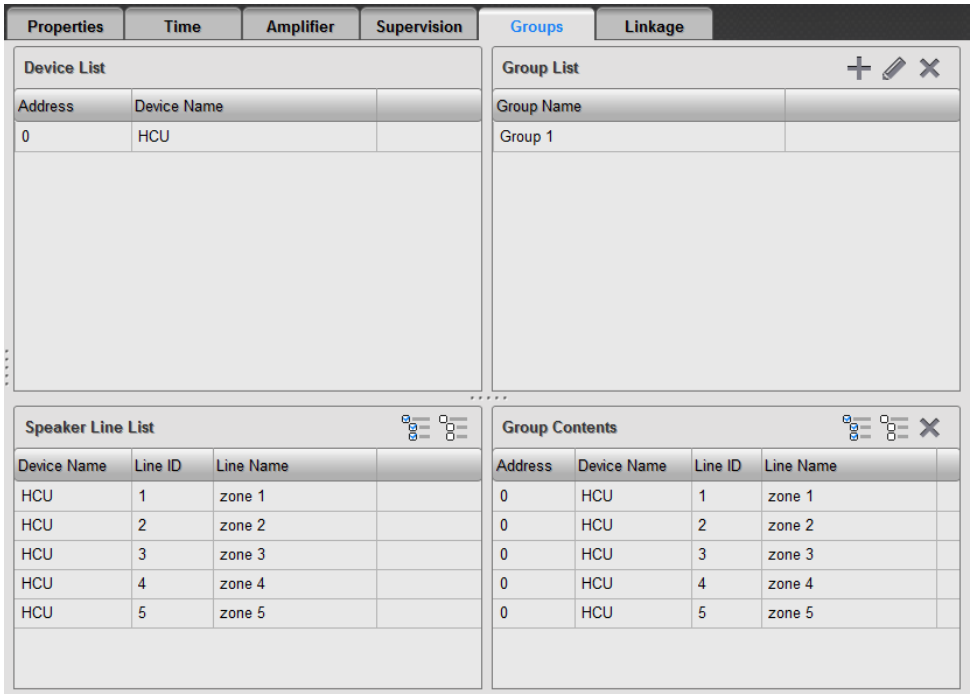
If the dry contact inputs are connected with the third party devices, the transmission line can be supervised. This function can be configurable. If the supervision is enabled, two resistors of

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10KΩ should be connected to each dry contact output of third party device. Please refer to Connecting Dry Contact Input for related information.

5. Groups

Each group includes some speaker lines and users can configure groups through the software. The interface is shown as below:

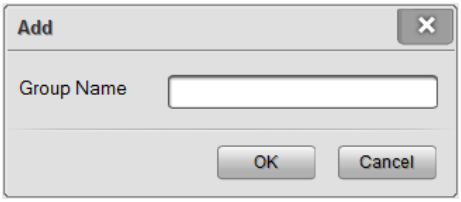


- Device List & Speaker Line List

Device List displays all controllers that are connected with loudspeaker lines. Select one device and the speaker line list will display the connected lines.

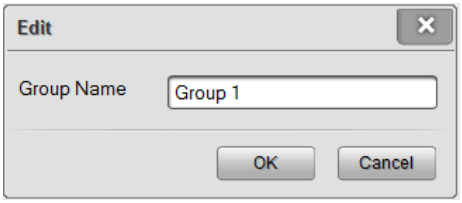
- Group List

Users need to create group first. Click the icon  in group list and show the below window:



Enter the group name and click OK to create a new group.

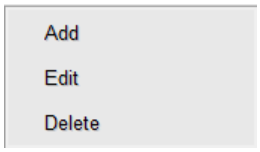
Select a group in group list and click  icon or double click to show below window. Users can enter the group name as followed:



In the group list, selecting a group and clicking  icon can delete the group.

Right clicking in group list can add, rename and delete group.

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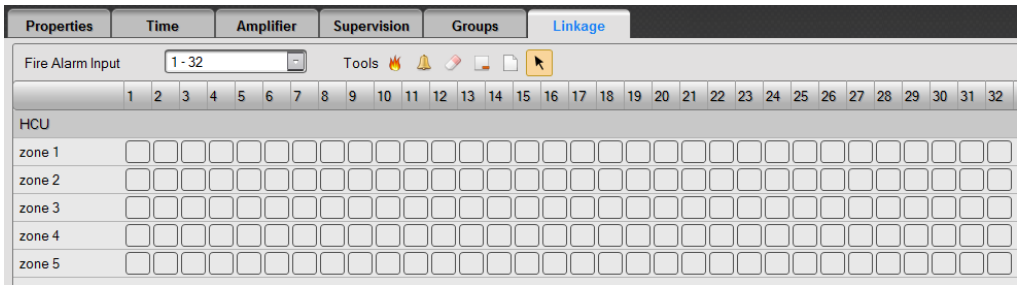
- Group Contents

Select a group, the *Group Contents* will display all speaker lines of this group. Choose a device and select speaker lines to add to the group. Users can also put speaker lines into group content by dragging. If users drag a device from the device list to group contents, then all the zones of the device will be added into group.

Users can click  icon or right click to select *Delete* to delete one or more groups in group list.

6. Linkage

Linkage is used to set fire alarm linkage function, users can separately set each zone as below:



Each column is matched with fire alarm input. The input signal can be the dry contact input or the fire signal sent by fire alarm system via the LPI-ModBus module. Each page can display maximum 32 input signals, users can select other pages by clicking the dropdown list. Each row is matched with one speaker line, users can view more content by dragging the scroll bar.

Separately set each way's broadcast zones. Below are some gadgets:

 Evacuation: it is used to set linked evacuation lines which are related by fire alarm inputs.

 Alert: it is used to set linked alert lines which are related by fire alarm inputs.

 Clear: it is used to clear cell's setting.

 Clear current flags: it is used to clear all flags of a device.

 Clear all flags: It is used to clear all cell's setting.

 Select: It is used to select a cell.

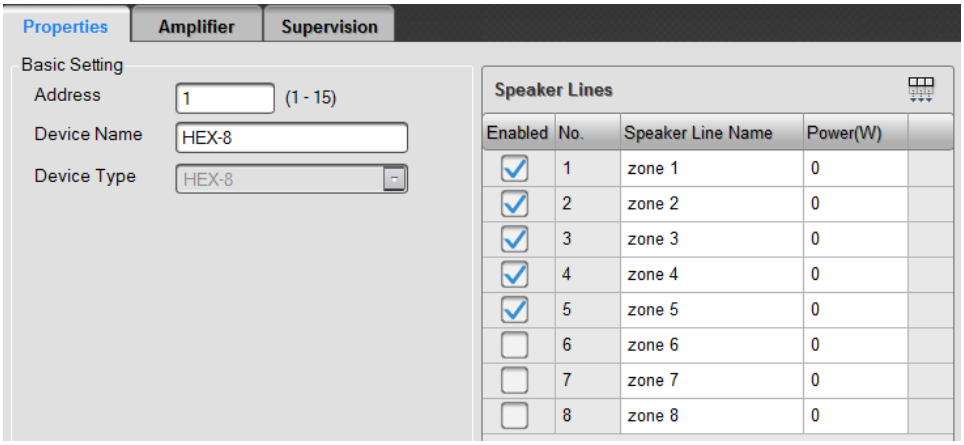
Select the icon  or  and click a cell to set, select clear tools to clear the settings.

RK-ZONE8

1. Properties

Set the related working parameter as below:

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- Basic Setting

Basic setting includes address and device name. Address should be the same with the address set by DIP switch at the rear panel of the device, which ranges from 1~15. Please refer to the chapter "Address Setting" for related device setting. Device name can be renamed by users and note that don't create the same name in one project.

- Speaker Lines

Speaker Lines is used to enable speaker lines. Click the checkbox as below,  means enabled and  means disabled. Users can change the name and power of speaker lines. The load power is only used to note.

Selecting a speaker line and clicking the  button can set all the power to be the same with the current one.

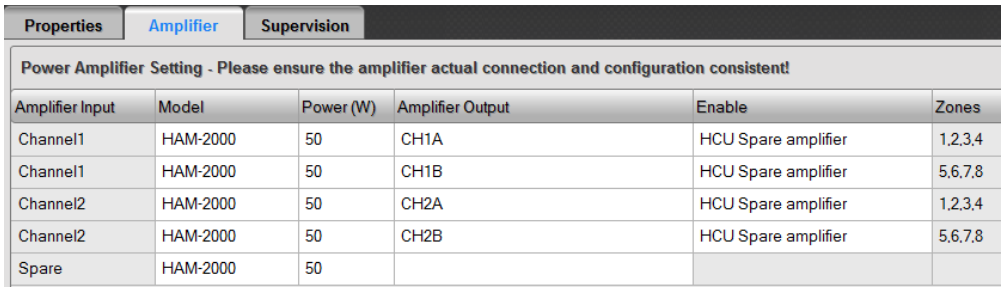
- Trigger Mode of Dry Contact Inputs

This table is used to set the trigger mode of each dry contact input as *Normally Open* or *Normally Closed*.

If "*Normally Open*" is selected, when the switch of third party device is opened, the dry contact input will be deactivated, and when the switch is closed, the dry contact will be activated.

If "*Normally Closed*" is selected, when the switch of third party device is closed, the dry contact input will be deactivated, and when the switch is opened, the dry contact will be activated.

2. Amplifier



Set the model of power amplifier corresponding to each audio channel, then set the ports of RK-ZONE8 which are connected with the output of power amplifier. The setting must be same with the actual connection.

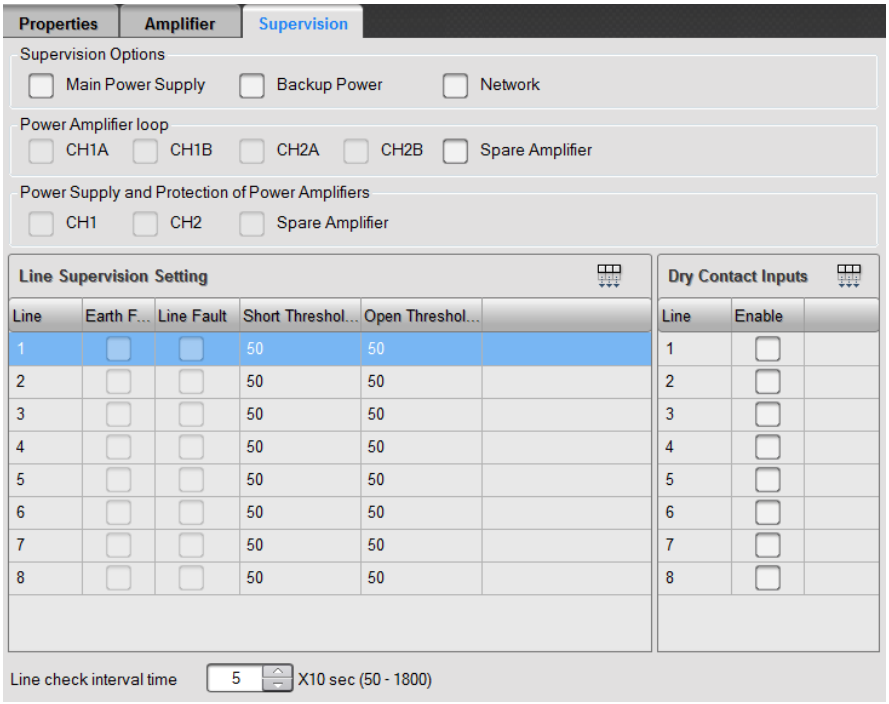
When users need amplifier redundancy function, if the audio signal of spare power amplifier is from this device, please set the model of power amplifier in Spare row, then set the spare ports of the devices which are connected to the output of the spare power amplifier.

In *Backup Amplifier* column, select the spare amplifier corresponding to the main amplifiers to enable the redundancy function.

3. Supervision

Supervision is used to set related parameter of supervision function, which is shown as below:

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- Supervision Options

Through the software, users can set enable or disable main power supply, backup power supply and network, power amplifier loop, power supply and protection of power amplifier. Click the checkbox,  means enabled.

- Power Amplifier Loop

The options of power amplifier loop is used to enable or disable the supervision of the loops between controllers and power amplifiers. The options includes CH1A, CH1B, CH2A, CH2B and spare amplifier.

- Power Supply and Protection of Power Amplifiers

The power supply and protection status of power amplifiers may be supervised if the corresponding options are enabled. The power supply failure of the power amplifier on the same audio channel can't be identified separately, MCU only show the power supply failure of the audio channel, and users may check the indicators from the front panels of power amplifiers.

- Line Supervision Setting

Users can respectively enable and disable the supervision function of speaker lines and earth fault, and set the threshold of short circuit and open circuit. When the impedance compared with the calibrated value is lower than the short threshold, a fault of short circuit will be found in the speaker line. When the impedance compared with the calibrated value is higher than open threshold, a fault of open circuit will be found in the speaker line.

Select a line, and click the  icon to set the rest of parameters the same as the selected one.

- Line Check Interval Time

RK-ZONE8 is designed with the timing supervision function, which can be used to set the supervision interval. The value ranges from 10~1800s.

- Dry Contact Inputs

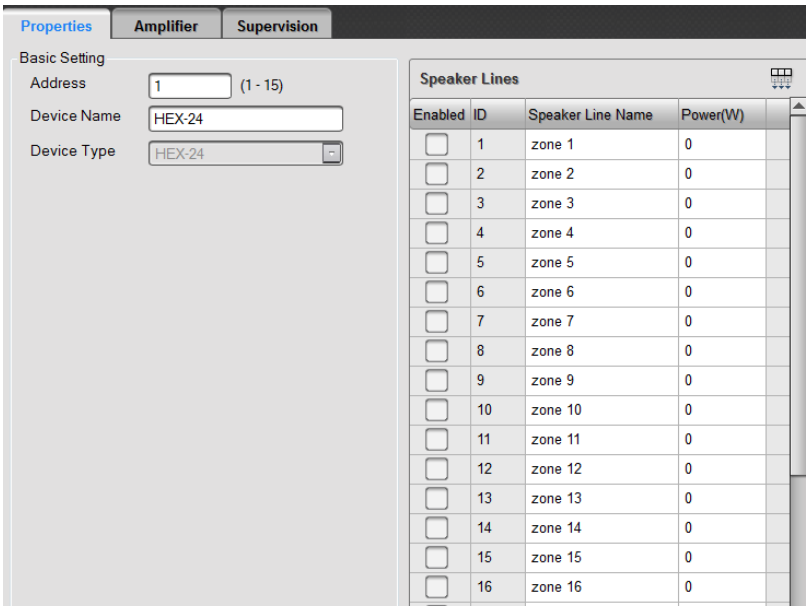
If the dry contact inputs are connected with the third-party devices, the transmission line can be supervised. This function can be configurable. If the supervision is enabled, two resistors of 10KΩ should be connected to each dry contact output of third party device. Please refer to Connecting Dry Contact Input for related information.

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RK-ZONE24

1. Properties

Set the related working parameter as below:



- Basic Setting

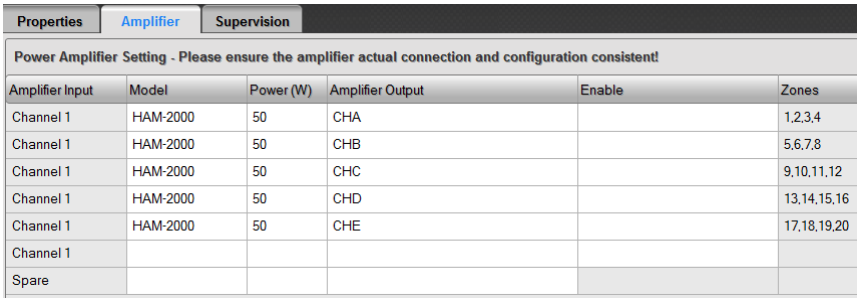
Basic setting includes address and device name. Address should be the same with the address set by DIP switch at the rear panel of the device, which ranges from 1~5. Please refer to the chapter “Address Setting” for related device setting. Device name can be renamed by users and note that don’t create the same name in one project.

- Speaker Lines

“Speaker Lines” is used to enable speaker lines. Click the checkbox as below,  means enabled and  means disabled. Users can change the name and power of speaker lines. The load power is only used to note.

Selecting a speaker line and clicking the  button can set all the power to be the same with the current one.

2. Amplifier



Set the model of power amplifier corresponding to audio channel 1, then set the ports of RK-ZONE24 which are connected with the output of power amplifier. The setting must be same with the actual connection.

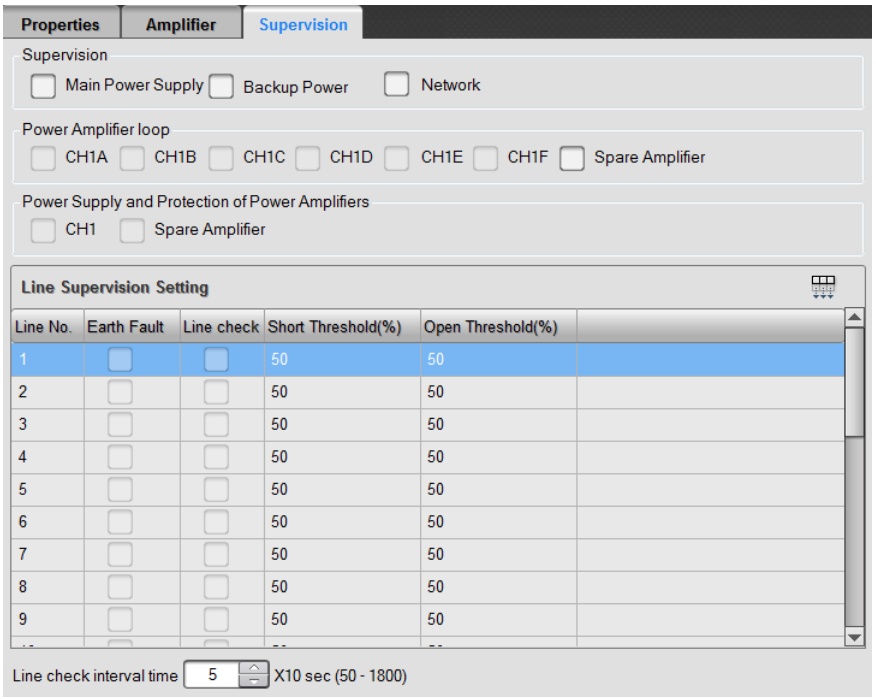
When users need amplifier redundancy function, if the audio signal of spare power amplifier is from this device, please set the model of power amplifier in Spare row, then set the spare ports of the devices which use the same spare power amplifier.

In *Enable* column, select the spare amplifier corresponding to the main amplifiers to enable the redundancy function.

3. Supervision

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Supervision is used to set related parameter of supervision function, which is shown as below:



- Supervision

Through the software, users can set enable or disable the supervision of main power supply, backup power supply, and network. Click the checkbox,  means enabled.

- Power Amplifier Loop

The options of power amplifier loop is used to enable or disable the supervision of the loops between controllers and power amplifiers. The options includes CH1A, CH1B, CH1C, CH1D, CH1E, CH1F and spare amplifier.

- Power Supply and Protection of Power Amplifiers

The power supply and protection status of power amplifiers may be supervised if the corresponding options are enabled. The power supply failure of the power amplifier on the audio channel can't be identified separately, MCU only show the power supply failure of the audio channel, and users may check the indicators from the front panels of power amplifiers.

- Line Supervision Setting

If line impedance is enabled, users can respectively enable and disable the supervision function of speaker lines and earth fault, and set the threshold of short circuit and open circuit. When the impedance compared with the calibrated value is lower than the short threshold, a fault of short circuit will be found in the speaker line. When the impedance compared with the calibrated value is higher than open threshold, a fault of open circuit will be found in the speaker line.

Select a line, and click the  icon to set the rest of parameters the same as the selected one.

- Line Check Interval Time

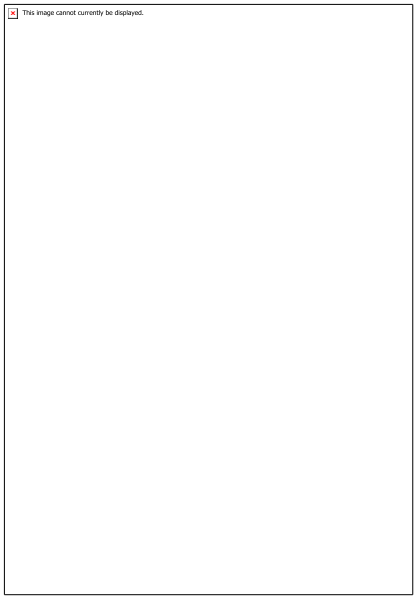
RK-ZONE24 is designed with the timing supervision function, and this item can be used to set the supervision interval. The value ranges from 10~1800s.

RK-MIC

1. Properties

   Set the related working parameter as below:

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- Basic Setting

Basic setting includes Device ID, Device Name, Emergency Button and Tone setting.

Device ID is the actual ID address, which ranges from 1~15. Please refer to the chapter “Address Setting” for related device setting.

The option of emergency button is used to enable or disable the emergency button of RK-MIC.

The checkbox means enabled.

Note:

Only one emergency button can be enabled in a system.

The option of chime is used to enable or disable pre-signal and end-signal for live announcement.

The checkbox means enabled. The bar is used to set the chime volume by dragging.

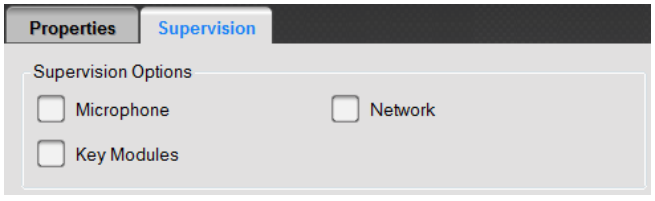
The option of key lock is used to enable or disable the key lock function. The checkbox means enabled, and the programmable keys 6, 7, 8 can be only used for locking or unlocking the remote call station when this function is enabled.

- Extended Key Module Setting

If X-K4 or X-K8 extended key module is used, users need to select the actual used module here. The default is none.

2. Supervision

Supervision is used to set related parameter of supervision function, which is shown as below:



- Supervision Options

Through the software, users can set enable or disable Microphone, Network, and key modules.

Click the checkbox, means enabled.

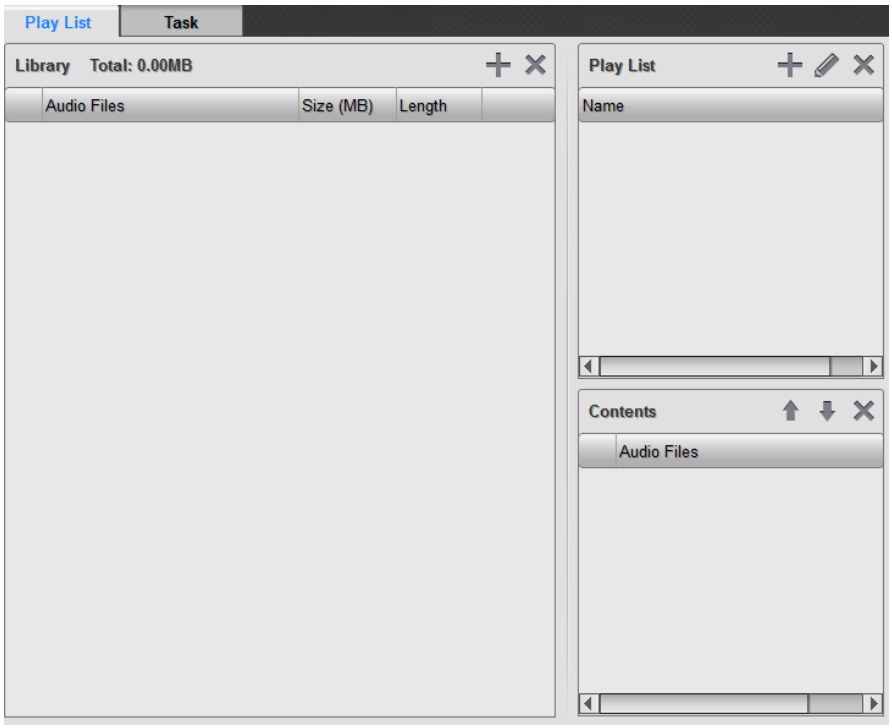
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Task

Task setting includes Play List and Task. Play List is used to set audio files and lists, Task is used to set broadcast functions.

Play List

Audio source can be set by Play List, including Library, Play List and Contents as shown below:



- Library

If users need to broadcast audio, should first set library before configuration. Library displays all the audio files name, size and length. RK-MCU and RK-MIC share the same library, software will download the audio files to devices.

The total storage space of all audio files will be shown at the top of library.

Users can select audio files from computer and add it to library by clicking the icon  at the right top of library. Software supports MP3 and WAV format and will automatically convert the audio file to the format supported by the system.

Selecting an audio file and clicking the icon  can delete it from the list. If the file is already added into the play list, a pop window will be displayed with a message showing it cannot be deleted.

Users can add or delete audio files by right clicking in library.



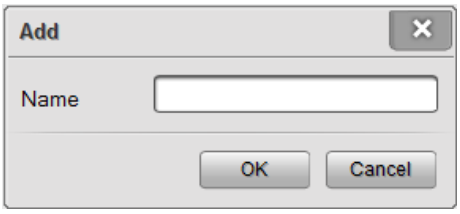
Clicking the icon  beside the file can listen to the audio.

- Play List

Users need to create a play list after the audio file is added to library.

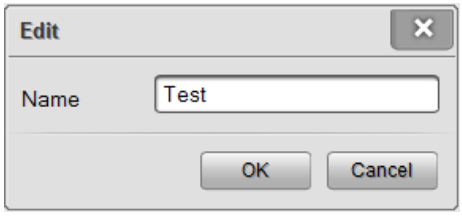
Click the icon  in play list and following pop window will be displayed:

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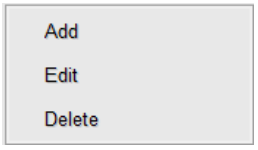
Enter the name of the play list, then click OK to finish creating the new play list.

Selecting a list and clicking the icon or left double clicking the list can display below window to rename the play list.



Selecting a list in the play list window and clicking the icon can delete it.

Users can add, edit and delete the play list by right clicking in the play list.



- Contents

Selecting a play list and the *Content* will show all the audio files. Users can add files into the play list by dragging them into the list window.

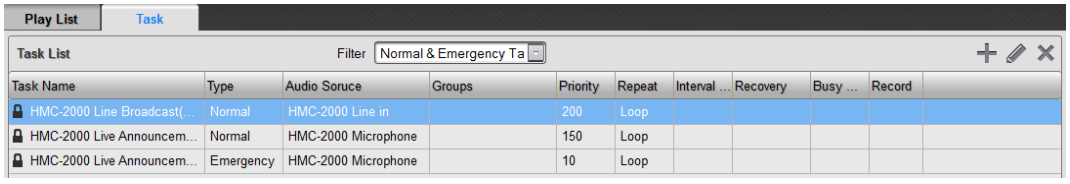
Selecting an audio file in *Content* and clicking the icon and can adjust the order of broadcasting.

Selecting an audio file in *Content* and clicking the icon can delete the audio file from the list.

Task

Task is used to set broadcasting the task. Each task includes Audio Source, Policy (Priority, Loop, Busy Wait, Recovery, Full, etc.), Groups, etc.

Users can view tasks in Task list as below:



- Task List

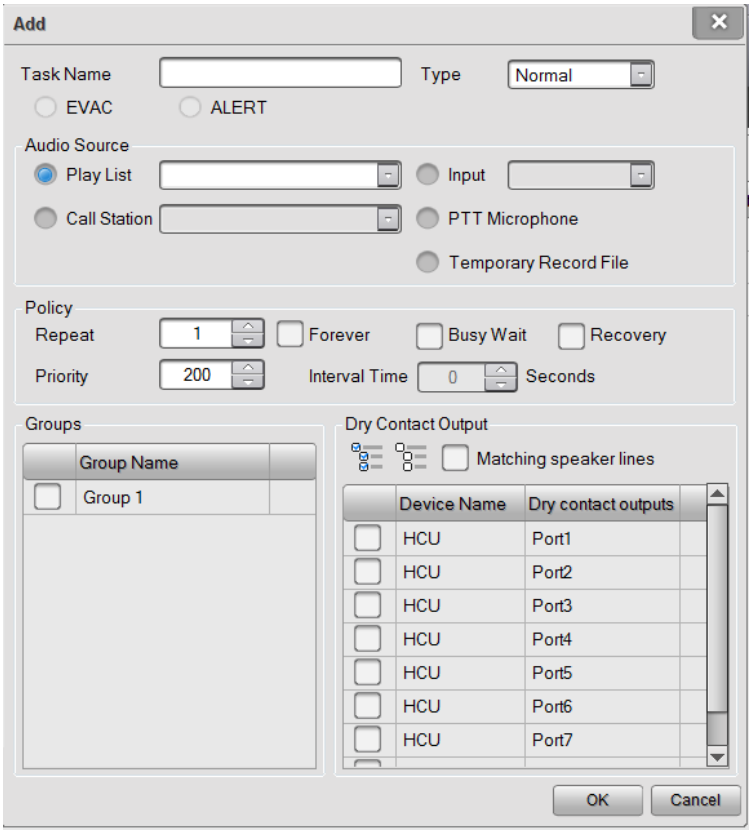
There are many parameters of all tasks displayed in the task list, such as the task name, type, audio source, groups, dry contact, priority, repeat, recovery, busy wait etc.

Tasks shown in the list can be filtered according to the condition on the top, the filter conditions can be Normal & Emergency Tasks, Normal Tasks, Emergency Tasks or Timing Tasks.

- Adding Play Task

Click icon in the upper right corner of the task list, and the window is displayed as below:

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Users need to enter task name, type, policy, groups and dry contact output.

- Task name

This is the description of a task, which will be used to identify the task.

- Type

Broadcast task is divided into normal and emergency task, which are in different priority. The less the value it is, the higher the priority it has.

Normal is used for the public address such as the normal background music, operation broadcast, voice broadcast, etc. The priority range is 56~255.

Emergency is used for the fire emergency broadcast. The priority range is 1~55.

- Audio Source

There are many audio sources, such as play list, input, call station, PTT Mic and temporary record files.

- Play List: the audio files are usually used for voice alarm, background music, etc. Users can also add the prompt tone files into the play list as needed.
- Input: normally means the external audio input interface of RK-MCU, such as AUX1, AUX2 and MIC/LINE input.
- Call Station: the audio source from call station, such as microphone or line in.
- PTT Microphone: the PTT microphone on the front panel of RK-MCU.
- Temporary Record File: the audio file recorded by temporary record operation, which is stored in RK-MCU.

Policy is used to set the parameter related to broadcast of a task:

- Repeat: means the repeat times of a playlist, the range is 1~65534. If the checkbox of *forever* is enabled, it means the playlist will be repeated till the stop operation. This parameter is invalid for the external audio input.

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- Busy Wait: check the checkbox to enable the lower priority task which is in conflict with a higher priority one plays when the running task finished. Otherwise the task will be canceled automatically.
- Recovery: enable or disable the shortcut task which was be broken off by the higher priority task resumes automatically when the insert task finished.
- Priority: the range of the value is different based on different task type. The Normal and Emergency task values must be respectively between 56 ~ 255 and 1 ~ 55. If many play tasks are set to broadcast to the same zones simultaneously, the highest priority will be played. The less the value it is, the higher the priority it has.
- Interval Time: this is the time between two broadcasts of playlist, the range is 0~3600s. This parameter is invalid for the external audio input and it is only used to meet the requirement of fire alarm rolling play in emergency. In interval time, the relay of ALARM is activated.

- Groups

It is used to select the groups of speaker line. Click  to select all, and click  to clear all.

- Dry Contact Output

It is used to set dry contact outputs which can be activated by a task. Click  to select all, and click  to cancel all.

Check the checkbox of matching speaker lines, the dry port output channel will corresponds with the zones. For example, the Port 1 will be enabled when the Zone 1 runs. The function is used for volume controller. The dry contact here means the corresponding dry contact output of zones and it cannot control other dry contact without broadcast task.

Click OK to save the settings.

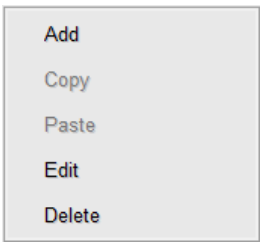
- Editing Play Task

Select one play task in the task list, and click  icon in the upper right corner of the task list or double left click, the Edit window is displayed. The user can edit the parameters like those above as needed.

- Deleting Play Task

Select one play task in the task list, and click  icon in the upper right corner of the task list. The deleting confirmation window will be displayed, then click YES to delete that task.

Users can also add, copy, paste, edit and delete play task by right clicking.



Operation

Operation setting is used to set the play task activated by key, dry contact input and timing. This only suit for RK-MCU and RK-MIC.

RK-MCU

Operation

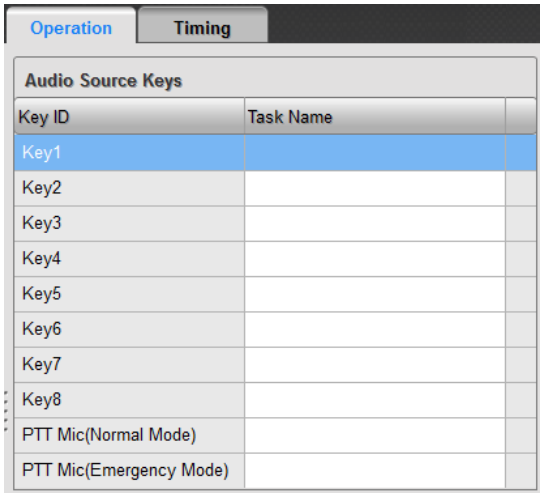
Select RK-MCU and click the Operation Setting button, users can set related broadcast functions in below window.

1. Audio Key Setting

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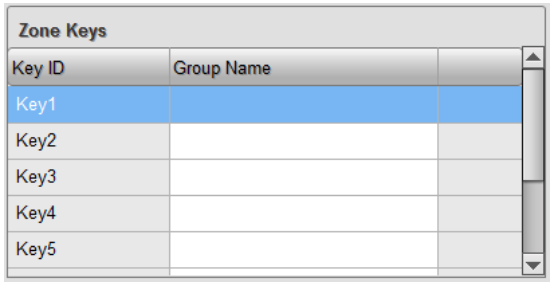
It is used to set the broadcast function on RK-MCU. The Key1 to Key8 are separately corresponding to the 8 audio buttons on panel. The normal Mic. and emergency Mic. are corresponding to the operation under normal broadcast and emergency broadcast.

Clicking the task table which corresponding to key or Mic. can select tasks from the dropdown list.



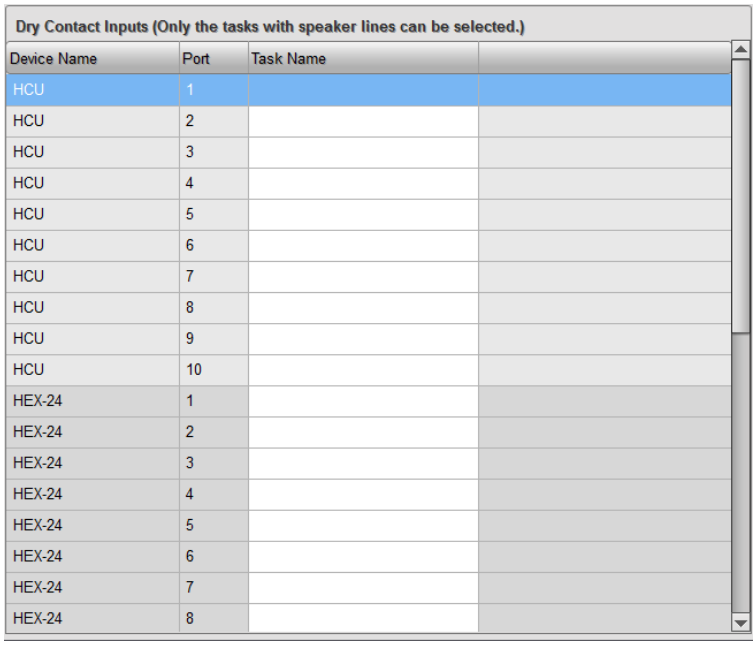
2. Zone Key Setting

It is used to set the 8 groups which corresponding to the group keys of panel. Clicking the group table can select groups from the dropdown list.



3. Dry Contact Inputs Setting

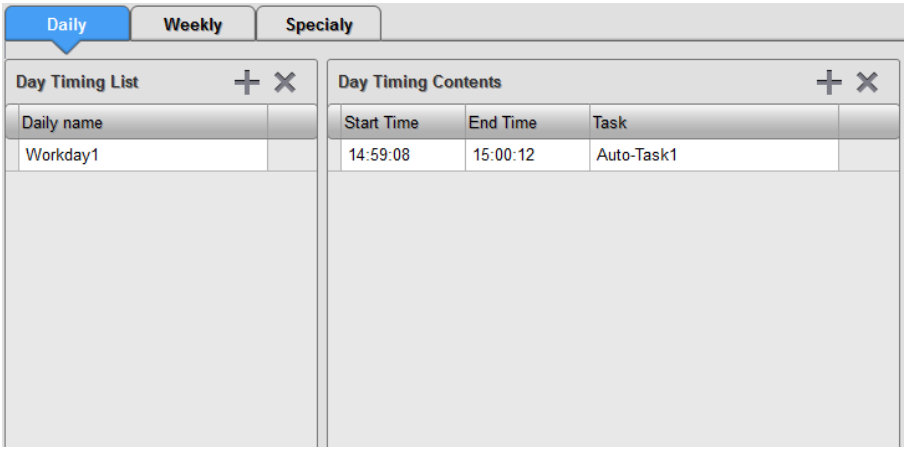
The list of dry contact inputs is used to configure the task which can be activated by the corresponding dry contact inputs. Click the table, and select tasks corresponding to the dry contact inputs from the drop-down list.



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Timing

The timing broadcast function can be set through the configure software, and HCU can work automatically according to the timing setting. The timing setting includes Daily, Weekly and Special. The daily timing is the foundation setting. Before configuring any timing schedule, users should create a daily schedule first. Then use the daily schedule to configure the weekly and special schedules as needed.



- Daily

Daily timing should be set first while the configuration, which is the basic element and can be quoted by weekly timing and special timing. Click icon to create a new day timing at the up-right corner of day timing list, and enter the schedule name. Click icon to delete selected day timing.

Select a day timing and then click the corresponding Start Time, End Time and Task to set the detailed contents of the Timing Contents. If only start time and end time are set, and no task is specified, the item will be invalid, and the start time and end time won't be saved.

Each day timing can be set maximum 65535 timing items.

Note:

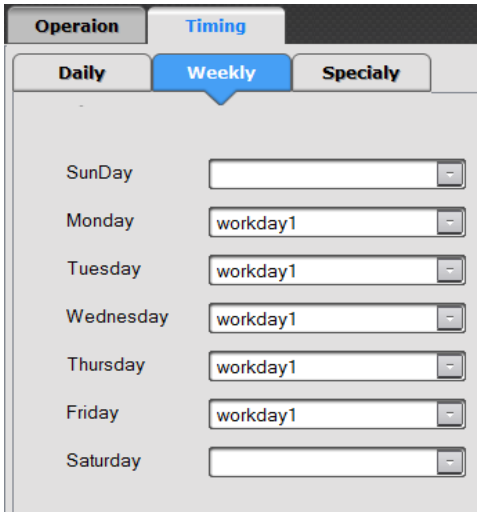
Make sure the daily timing is set within 1 day, and the end time must be at least 5 seconds after the start time.

The tasks which are used for timing function should be configured while the filter is "Timing Task" in task configuration windows. Timing function is only used for normal broadcast.

- Weekly

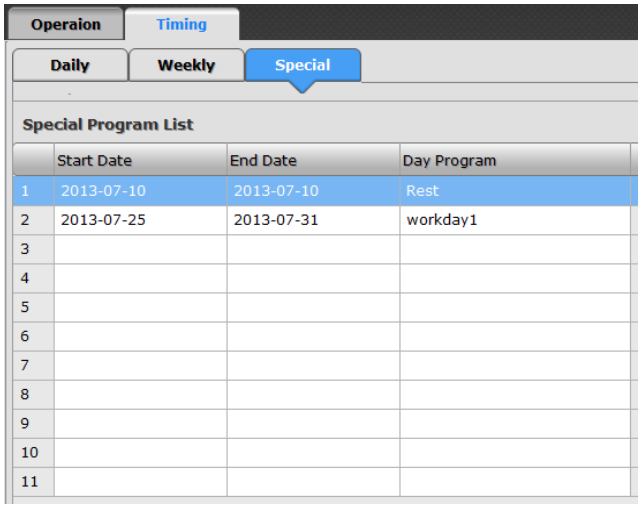
Click Weekly and the setting window will be displayed. Select a day timing for each day within a week. If the content of one day is empty, means that day has no timing schedule.

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- Special

Special timing is the schedule beyond the weekly timing. For example, set a special play task for festival or rest. The priority of special timing is higher than weekly timing. If one day is set in special timing, then other timing settings will be invalid.

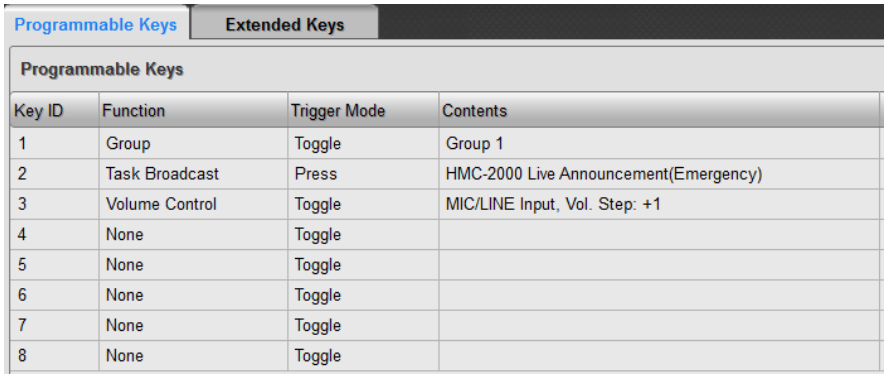


	Start Date	End Date	Day Program
1	2013-07-10	2013-07-10	Rest
2	2013-07-25	2013-07-31	workday1
3			
4			
5			
6			
7			
8			
9			
10			
11			

RK-MIC

Select RK-MIC and click *Operation Setting* button, users can set all related broadcast functions from below window.

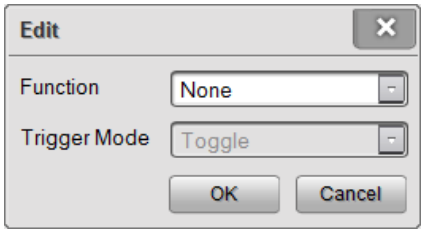
Programmable Keys



Key ID	Function	Trigger Mode	Contents
1	Group	Toggle	Group 1
2	Task Broadcast	Press	HMC-2000 Live Announcement(Emergency)
3	Volume Control	Toggle	MIC/LINE Input, Vol. Step: +1
4	None	Toggle	
5	None	Toggle	
6	None	Toggle	
7	None	Toggle	
8	None	Toggle	

There are 8 programmable keys on the panel of RK-MIC, whose function can be set via the configuration software. Double click an item in the table, select it and click the icon to set its function.

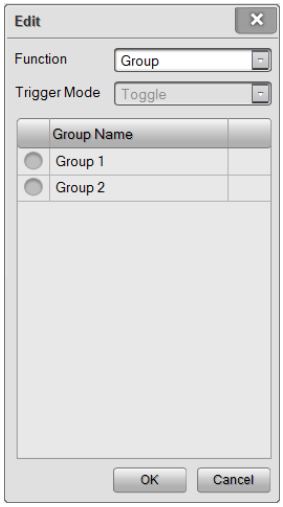
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The function of keys can be selecting a group, volume control or task broadcast. Default function is none. If the function is task broadcast, the trigger mode can be set as *Toggle* or *Press*.

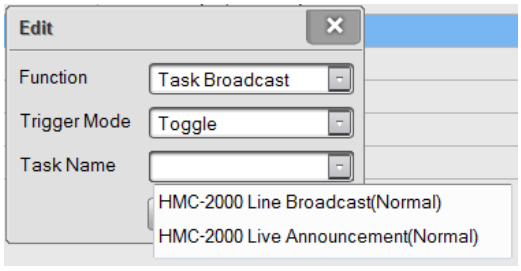
- Group

It is used to select zones and work with task keys to proceed broadcast operation. If the function is *Group*, the corresponding group should be specified from the list, which is shown as below:



- Task Broadcast

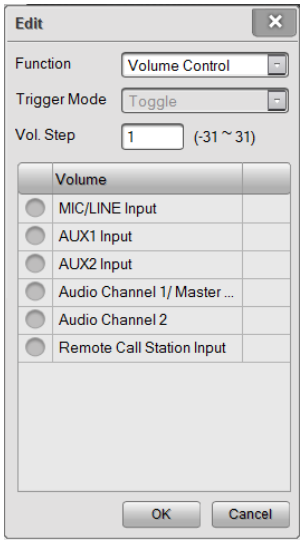
If the function is task broadcast, trigger mode and task must be set. Click the trigger mode to select toggle or press mode. *Toggle* means press the trigger and press again to stop. *Press* means press the trigger and keep pressing during the broadcast till release to stop. Selecting the task name and users can select task from the drop-down list.



- Volume Control

If the function is volume control, uses need to set the volume type and step. The range of volume step is from -31 to +31. If it is negative, the volume will be decreased. If it is positive, the volume will be increased. The volume type includes MIC/LINE input, AUX1 Input, AUX2 Input, Audio Channel1/Master volume, Audio channel2 and remote call station input. Other volumes can be set via the menu of HCU.

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Extended Keys

Extended Keys

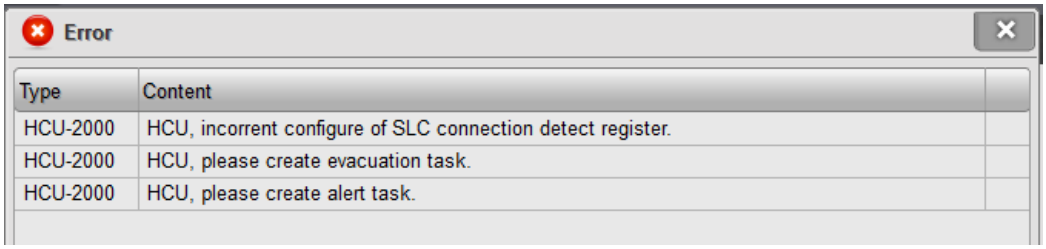
Module ID	Key ID	Function	Trigger Mode	Contents
1	1	None	Toggle	
1	2	None	Toggle	
1	3	None	Toggle	
1	4	None	Toggle	
1	5	None	Toggle	
1	6	None	Toggle	
1	7	None	Toggle	
1	8	None	Toggle	

Extended keys are the key modules which are connected with remote call station. The configuration of extended keys is the same with programmable keys.

Download Configuration File

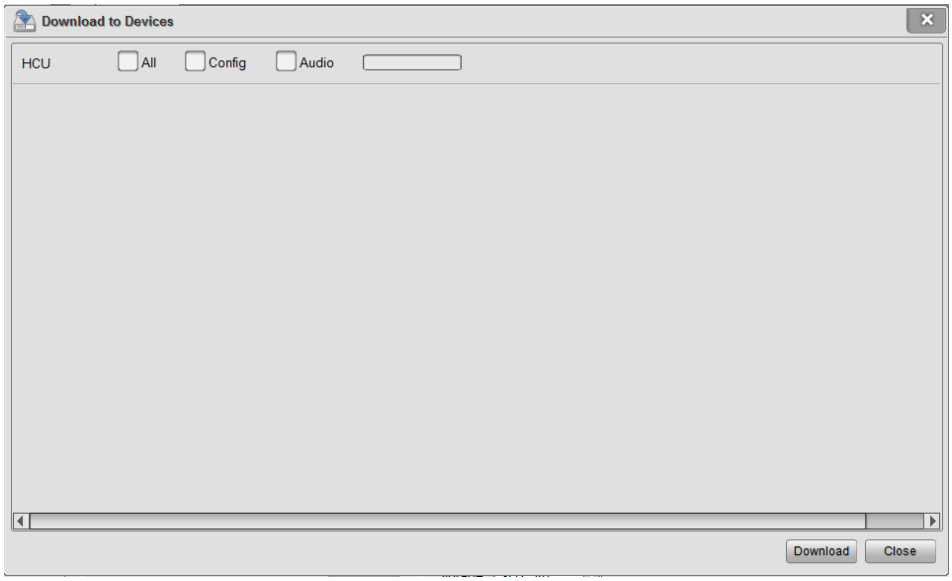
Before downloading configuration data, users need to make sure all the configurations and the computer are connected with master control unit via the Ethernet, and the IP address of the computer and HCU should be in the same segment.

Click ***Download*** button, the software will verify the configuration data automatically. If there are any errors, the message window will show all the errors as below:



Users can correct the configuration according the messages. If there aren't any error, click *Download* button, the download window will be shown as below:

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Users can click the checkbox to select the items (configuration file or audio file) to download as needed. Then click *Download* button to download the data through the Internet. The progress bar and description show the current download status. Click the *Close* button to exit the window.

If it fails to download the data, please check it as below:

- Check the network connection between computer and device.
- Check the IP address setting of computer and device.
- Check the firewall setting.

Note:

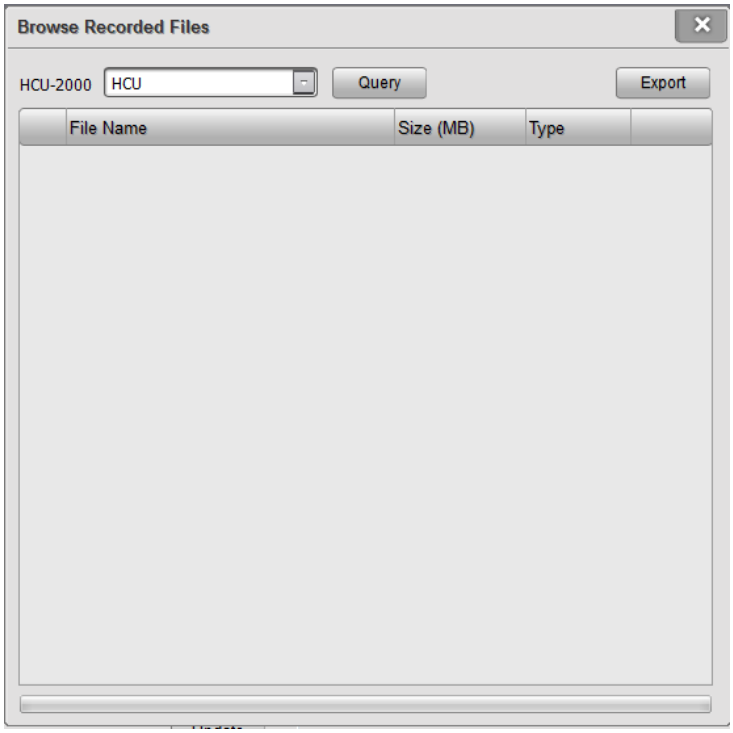
- Please use cross-cable to connect the computer with RK-MCU.
- If Ethernet switch is used, please use parallel cable or cross cable to connect the computer with RK-MCU.

Other Operations

Browse Recorded Files

If users need to query the auto-recorded files in RK-MCU, users can read the file list through configuration software and upload the specified file to PC. Click the menu *Tools* —〉 *Browse recorded files*, below window will be displayed.

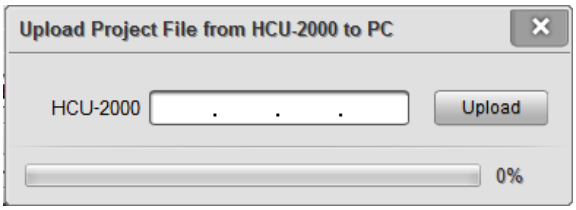
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Select HCU, and click *Query* button, the software will automatically read the recorded file list from RK-MCU. The window shows file's name, storage space and record time. Click the icon beside a file to play it via the sound card of computer. If a file need to be exported, select a file and click *Export* button to save the audio file in the computer.

Upload System Configuration

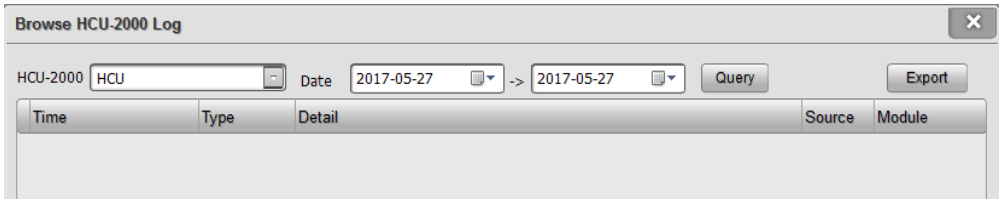
It is available to upload the project file from HCU to computer, so users can check and edit the configuration. Click the menu Tools —〉 Upload project file from RK-MCU to PC, below window will be displayed.



Enter the IP address of RK-MCU and click Upload button, then select a folder in the popped window and click OK to save.

Browse RK-MCU Log

Users can browse the log of RK-MCU including operation record and fault log. Click the menu Tools—〉 Browse RK-MCU Log, below window will be displayed.

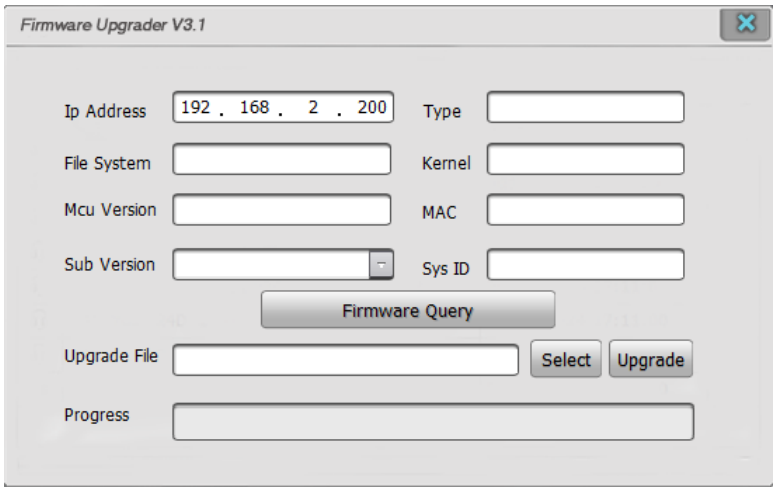


Select a HCU from the drop-down list, and set the start and end date, then click "Query" button. The software will read log data from the device automatically and display logs in the below table. Click "Export" button to export and save the log data.

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Upgrade RK-MCU Firmware

Users can click the menu Tools —〉 Upgrade RK-MCU Firmware to query and upgrade RK-MCU firmware version.



Enter the IP address of RK-MCU and click *Firmware Query* button, the software will read and display all the firmware version, including device type, file system version, kernel version, HCU version, MAC address and system ID, etc.

If users need to upgrade device firmware, click the button *Select* and select the program file in *.bin format, then click *Upgrade* button. The progress bar will show the upgrade status.

Upgrade Peripheral Firmware

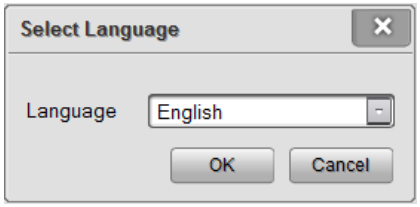
Users can click the menu Tools —〉 Upgrade Peripheral Firmware to query and upgrade the firmware of remote call stations and zone expanders.

Before the operation, a RS-232 port of the computer must be connected with the target device. Select the connected serial port from the drop-down list, then click “Open” button to open the serial port.

Click “Browse” button, and select the program file in *.bin format, then click “Upgrade” button to upgrade the firmware of the connected device.

Change Software Language

The software supports multiple languages, users can click the menu Tools —〉 Select Language to change software language.



Select the language from the dropdown list and click OK to save it.

Add New Language

In order to meet the demands of some countries and regions, users (professional preferred) can add new languages to the software. Following are the illustration of software and HCU, which are related to user interface display.

Configuration Software

There is a file named “language_cfg.xls” in software’s installation directory, which can be opened by Excel and following contents will be shown:

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V1.4.0	English	Simplified Chinese
Main Form		
MAIN_TITLE	INTEVIO Configuration Tool	INTEVIO 配置软件
MAIN_PROJECT_NAME	Project Name	项目名称
MAIN_PROJECT_FOLDER	File Path	文件路径
MAIN_DEVICE_GROUP	{DEV_TYPE_MCU} Name	{DEV_TYPE_MCU}名称
MAIN_BT_DEVICE	Device	设备配置
MAIN_BT_TASK	Task	任务配置
MAIN_BT_OPRATE	Operation	操作配置
MAIN_BT_UPLOAD	Download	下载配置
MAIN_DEV_ATTRIBUTE	Properties	设备属性
MAIN_DEV_TIME	Time	时钟设置
MAIN_DEV_FAULT_DETECT	Supervision	故障诊断
MAIN_MCU_AMPLIFIER	Amplifier	功放配置
MAIN_MENU_NEW	New	新建
MAIN_MENU_OPEN	Open	打开
MAIN_MENU_RECENT	Recent Projects	最近打开项目
MAIN_MENU_SAVEAS	Save As...	另存为...
MAIN_MENU_CLOSE	Close	关闭项目
MAIN_MENU_EXIT	Exit	退出

Users can add new language in New Language column. The new language in MAIN_TITLE row will be displayed in the dropdown list of Setting Language window. Users also can enter the corresponding contents of the English contents. Please take attention to the length of content or it will cause the wrong or incomplete information displayed in the interface. Then save the setting and select the new language from the menu.

RK-MCU

There is a file named “language_mcu.xls” in software’s installation directory, which can be opened by Excel and following contents will be shown:

Objects	Remark	English	New Language
Form-Homepage	**Homepage**		
Menu	Button[6]	MENU	
Manual	Emergency Mode[6]	MANUAL	
Auto	Emergency Mode[6]	AUTO	
Normal	Normal Mode[6]	NORMAL	
Fault	General Fault[6]	FAULT	
None	Monitoring[6]	OFF	
CH1	Monitoring[6]	**CH1**	
CH2	Monitoring[6]	CH2	
Push U disk, can play audio files.	Label[40]	Insert USB disk to play audio files.	

Users can add new language in New Language column and also can enter the corresponding contents of the English contents. Please pay attention to the length of characters, otherwise, the software won’t display all characters. When downloading the configuration, the language file will be transferred to HCU, users can select the new language from the menu. Please refer to the chapter “System Setting” for details.

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4 System Commissioning

This chapter mainly introduces debugging operations.

- Calibration
- Checking system function

Calibration

There is a *Calibration* button at the rear panel of HCU and zone expanders, which are used to calibrate the impedance of all connected loudspeaker lines. Device is based on measuring data and combined with configured parameter to judge whether the loudspeaker line experiences an open circuit or a short circuit fault.

Normally, calibration will be proceeded after installation. Before the calibration, please make sure the loudspeaker lines are connected to devices correctly, then use a sharp tool to press the *Calibration* button. Device will automatically calibrate the impedance.

The impedance of loudspeaker line is changed with different environment. If users find loudspeaker line works normally but device shows a fault, it is necessary to calibrate it again.

Checking System Function

After the installation and configuration, it is required to test and confirm system functions before delivery. Following are the items need to be checked:

1. Under standby mode, check if each device works normally. If fault detection function is enabled, users can simulate a fault to check whether the device can detect the fault.
2. If amplifier redundancy function is available, check whether spare power amplifier can replace main power amplifier to work.
3. Check if all broadcast functions can normally work according to users' requirements.

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5 Operation Instructions

This chapter mainly introduces system operations and function operations.

Indication & Operation Components

RK-MCU Master Control Unit

Indicators

Indicator	Color	Status	Description
POWER	Green	ON	Power on
		Flashing	The device is working in power-saved mode. It is unavailable now.
GENERAL FAULT	Yellow	OFF	The system is normal.
		Flashing	A new fault is found.
		ON	A fault exists in the system, and has been confirmed.
CPU	Yellow	OFF	CPU works normally.
		ON	The CPU of HCU is error or stops working.
EARTH	Yellow	OFF	No earth fault is found.
		ON	An earth fault is found in speaker lines.
DISABLED	Yellow	OFF	No loudspeaker line is disabled.
		ON	Loudspeaker line is automatically disabled due to short circuit.
MIC		OFF	The PTT Microphone is normal and not working now.
	Green	ON	Paging by PTT microphone.
	Yellow	ON	The failure of PTT microphone is found.
Level Meter		OFF	Built-in power amplifier has no signal input.
	Green		Built-in power amplifier is working.
	Red		Clip, audio signal level is higher than the maximum level.
EMERGENCY	Red	OFF	System is working in normal mode.
		Flashing	The system is activated by fire alarm signal, and working in automatic emergency mode.
		ON	The system is working in manual emergency mode.
ALL	Green	OFF	Function is disabled.
		Flashing	Select all speaker lines by pressing *All* button.
Zone Indicator		OFF	The speaker lines are idle.
	Green	Flashing	The corresponding group is already selected.
		ON	Normal mode: the group is broadcasting. Auto. emergency mode: playing alert message in the group.
	Red	ON	Operate live broadcast or broadcast voice messages in the group.
	Yellow	ON	Fault of open circuit or short circuit is found in the group.
Audio Source Indicator	Green	OFF	The task is not started.
		Flashing	Pre-listening, reserved and unavailable.

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Indicator	Color	Status	Description
		ON	The task is being played in normal mode.
	Red	ON	The task is being played in emergency mode.
	Yellow	ON	Error of audio source is found, e.g. storage fault of audio files.

Buttons/Switches

Button/Switch	Action	Description
Power Switch	Press	Connect or disconnect main power supply.
MIC Button	Press	Start live broadcast or temporary record.
Emergency Button	Press	Enter or exit manual emergency mode.
Wheel Knob of Master Volume	Anticlockwise Rotation	Decrease CH1/master volume.
	Clockwise Rotation	Increase CH1/master volume.
	Press	Exit volume setting.
Wheel Knob of Menu	Anticlockwise Rotation	Decrease the current value.
	Clockwise Rotation	Increase the current value.
	Press	Perform actions, enter or exit value setting.
ALL	Press	Select all speaker lines.
Close	Press	Forcibly close the selected speaker lines.
Monitor	Press	Start to monitor and switch monitor channel (CH1, CH2 and OFF).
Record	Press	Enter temporary record.
Reset	Press	Clear all fault status, all indicators will return normal status, and the buzzer will be muted.
ACK	Press	Confirm new fault, the indicator of general fault will be in yellow, and the buzzer will be muted.
Home	Press	Return to homepage.
Zone/Group	Press	Select or deselect groups.
Audio source	Press	Start the corresponding audio task.

RK-ZONE8 Zone Expander

Indicators

Indicator	Color	Status	Description
POWER	Green	ON	Power on
		Flashing	The device is working in power-saved mode. It is unavailable now.
MAINS	Yellow	OFF	Main power supply works normally.

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Indicator	Color	Status	Description
		ON	Failure of main power is found.
BACKUP	Yellow	OFF	Backup power supply works normally.
		ON	Failure of backup power is found.
EARTH	Yellow	OFF	No earth fault is found.
		ON	Earth fault is found in speaker lines.
CPU	Yellow	OFF	CPU works normally.
		ON	The CPU of HCU is error or stops working.
NETWORK	Yellow	OFF	The connection with HCU is normal or the device is in standalone mode.
		ON	The failure of connecting with HCU is found.
DCT SHORT	Yellow	OFF	No short circuit fault is found on dry contact inputs.
		ON	Short circuit fault is found on the wiring of dry contact inputs, for more details, please check the menu of HCU.
DCT OPEN	Yellow	OFF	No open circuit fault is found on dry contact inputs.
		ON	Open circuit fault is found on the wiring of dry contact inputs, for more details, please check the menu of HCU.
POWER AMPLIFIER STATUS	Yellow	OFF	The connection between power amplifier and zone expander is normal.
		ON	Failure is found on the connection between power amplifier and zone expander.
SPEAKER LINE STATUS		OFF	The speaker line is idle.
	Green	ON	Normal mode: the group is broadcasting. Auto. emergency mode: playing alert message in the speaker line.
	Red	ON	Operate live broadcast or playing voice messages in the speaker line.
	Yellow	ON	Fault of open circuit or short circuit is found in the speaker line.

Buttons/Switches

Button/Switch	Action	Description
Power switch	Press	Connect or disconnect main power supply.

RK-ZONE24 Zone Expander

Indicators

Indicator	Color	Status	Description
POWER	Green	ON	Power on
		Flashing	The device is working in power-saved mode. It is unavailable now.
MAINS	Yellow	OFF	Main power supply works normally.
		ON	Failure of main power is found.

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Indicator	Color	Status	Description
BACKUP	Yellow	OFF	Backup power supply works normally.
		ON	Failure of backup power is found.
EARTH	Yellow	OFF	No earth fault is found.
		ON	Earth fault is found in speaker lines.
CPU	Yellow	OFF	CPU works normally.
		ON	The CPU of HCU is error or stops working.
NETWORK	Yellow	OFF	The connection with HCU is normal or the device is in standalone mode.
		ON	The failure of connecting with HCU is found.
POWER AMPLIFIER STATUS	Yellow	OFF	The connection between power amplifier and zone expander is normal.
		ON	Failure is found on the connection between power amplifier and zone expander.
SPEAKER LINE STATUS		OFF	The speaker line is idle.
	Green	ON	Normal mode: the group is broadcasting. Auto. emergency mode: playing alert message in the speaker line.
	Red	ON	Operate live broadcast or playing voice messages in the speaker line.
	Yellow	ON	Fault of open circuit or short circuit is found in the speaker line.

Buttons/Switches

Button/Switch	Action	Description
Power switch	Press	Connect or disconnect main power supply.

RK-AMP500 500W Class-D Power Amplifier

Indicators

Indicator	Color	Status	Description
POWER	Green	ON	Device is powered on.
		Flashing	Device is under power-saving mode.
MAINS	Yellow	OFF	Main power supply works normally.
		ON	Failure of main power is found.
BACKUP	Yellow	OFF	Backup power supply works normally.
		ON	Failure of backup power is found.
PROTECTION	Yellow	OFF	Device works normally.
		ON	The output of power amplifier is turn off due to the protection of over temperature, overload or output short circuit.
Level Meter		OFF	The power amplifier has no signal input.

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Indicator	Color	Status	Description
	Green		The power amplifier is working.
	Red		Clip, audio signal level is higher than the maximum level.

Buttons/Switches

Button/Switch	Action	Description
Power switch	Press	Connect or disconnect main power supply.

RK-MIC Remote Call Station

Indicators

Indicator	Color	Status	Description
POWER	Green	ON	Power on.
		Flashing	The system is in power-saved mode.
GENERAL FAULT	Yellow	OFF	The system is normal.
		Flashing	New fault is found.
		ON	Fault exists in the system, and has been confirmed.
NETWORK FAULT	Yellow	OFF	The connection with HCU is normal or the device is in standalone mode.
		ON	The failure of connecting with HCU is found.
BUSY	Yellow	OFF	The audio channel to HCU is idle.
		Flashing	The audio channel is occupied by the microphone of other remote call station which has lower priority than this device.
		ON	The audio channel is occupied by the microphone of other remote call station which has higher priority than this device.
ALL	Green	OFF	Function is disabled.
		Flashing	Select all speaker lines.
CLOSE	Green	OFF	The key isn't pressed.
		Flashing once	The key is pressed.
MONITOR CH1	Green	OFF	CH1 is not monitored.
		ON	CH1 is being monitored.
MONITOR CH2	Green	OFF	CH2 is not monitored.
		ON	CH2 is being monitored.
RECORD	Green	OFF	No record operation.
		Flashing	The device is proceeding record operation.
PLAYBACK	Green	OFF	No playback operation.
		ON	Playing the temporary record file in the loudspeaker.
LINE IN	Green	OFF	The task isn't activated.

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Indicator	Color	Status	Description
		ON	The task is activated.
MICROPHONE		OFF	The task of microphone paging isn't activated.
	Green	Flashing	Playing pre-signal or end-signal.
		ON	Paging by the microphone.
	Yellow	ON	The failure of microphone is found.
Indicators of Programmable Keys		OFF	• The group is idle. • The task isn't activated. • No operation.
	Green	Flashing	• The group is selected. • Activating the task.
		Flashing once	Change volume.
		ON	• Normal mode: zones are broadcasting. • Emergency mode: zones are warning. • Selected audio source is being played. • Volume has been adjusted to the limit.
	Red	Flashing	Waiting to broadcast selected emergency audio source.
		ON	• Emergency mode: zones are playing evacuation broadcast or paging. • Selected emergency audio source is being played.
	Orange	ON	• Loudspeaker lines in zone or group has fault (open circuit, short circuit or earth fault). • Corresponding audio or voice has fault.

Buttons/Switches

Button/Switch	Action	Description
All	Press	Select all zones.
Close	Press	Forcibly close selected zones.
Monitor CH1	Press	Monitor or stop monitoring CH1.
Monitor CH2	Press	Monitor or stop monitoring CH2.
Record	Press	Start or stop temporary recording.
Playback	Press	Play temporary record file in the built-in loudspeaker.
Line in	Press	Start or stop broadcasting the audio source from line in.
Microphone	Press	Start or stop live broadcast.
Programmable buttons	Press	• Select or deselect zone or group. • Start or stop broadcasting audio source. • Increase or decrease volume.

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Operations

Power On & Off

There is a power switch at the rear panel of each device to connect or disconnect AC power supply. After installation, press power switch to “I” position to turn on the device, and press power switch to “O” position to turn off the device.

Reset

All the fault status of the system can be cleared manually by press *RESET* button at the front panel of RK-MCU. If the fault still exist, device will show notification again.

ACK

When system detects any new fault, the buzzer of RK-MCU will beep, meanwhile the general fault indicator will turn yellow and flashing to remind operators. Operator can press “ACK” button at the front panel of HCU to confirm the fault, then the buzzer will be muted and general fault indicator will always be yellow.

Test

Test function is used to check the light and sound indicators. Following are the steps for test operation:

1. Press the *TEST* button at the front panel of HCU to start test function. Test will not affect other functions. During the test:
   - All indicators will forcibly light, multi-color indicator will flash different colors in turn.
   - The screen displays red, green and blue in turn.
   - Buzzer rings.
2. Repress the *TEST* button to stop the function. All indicators will resume normal working condition. During testing, if there is no operation within 1 minute, test will be stopped automatically.

Monitor

The current broadcasting content may be monitored via the built-in loudspeaker of RK-MCU and RK-MIC.

Please follow the below steps to proceed monitor operation at RK-MCU:

1. Press the *MONITOR* button at the front panel of RK-MCU, audio channel 1 will be monitored, and its signal will be played via the built-in loudspeaker of RK-MCU, and CH1 is displayed under the monitor icon in screen.
2. Repress the *MONITOR* button, CH2 is displayed under the monitor icon in screen, audio channel 1 will be monitored, and its signal will be played via the built-in loudspeaker.
3. Repressing the *MONITOR* button will stop monitor function.

The loudspeaker volume can be adjusted through menu, please refer to related chapter for detailed operation.

Please follow the below steps to proceed monitor operation at RK-MIC:

1. Press the *MONITOR CH1* button on RK-MIC, indicator turns green and audio channel 1 will be monitored via built-in loudspeaker.
2. Repress *MONITOR CH1* button to stop monitor function, the indicator turns off and built-in loudspeaker will be muted.
3. Press the *MONITOR CH2* button on RK-MIC, indicator turns green and audio channel 2 will be monitored via built-in loudspeaker.

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4. Repress *MONITOR CH2* button to stop monitor function, the indicator turns off and built-in loudspeaker will be muted.
5. During monitoring, users can change the monitored audio channel.
6. Because there is only one audio channel from RK-MCU to RK-MIC, new operation will cover the older operation.

Note:

- During monitoring, if the loudspeaker is used for other purpose, device will stop monitoring automatically.
- During monitoring, if the function related to microphone is activated, such as live announcement, temporary record, etc., the device will stop monitoring automatically. After the microphone function is stopped, monitor function will be resumed.

Volume Setting

There is a knob at the front panel of RK-MCU to adjust the master volume corresponding to audio channel 1. Back ground music and external audio source will be played in audio channel 1. Please refer to “Master Volume Adjustment” for operations.

The volume of other input or output of RK-MCU can be also set in the menu. Please refer to “System Setting” for operations.

There are 3 hidden volume knobs at the rear panel of RK-MIC, which are used to change the volume of microphone, line in and built-in loudspeaker. Please use cross screwdriver to change it, rotating in clockwise direction will increase the volume.

Zone/Group Selection

Before broadcast, users need to select target zone first. The speaker lines which have the fault of short circuit are unavailable. Press the *All* button to select all zones of the system, If zones or groups are selected, the corresponding indicator will turn green and flash.

Cancel Zone Selection

Press the buttons corresponding to selected zone or group to cancel the selection. The indicators will resume to normal working condition.

The device will cancel all the selection, if no any operation within 1 minute after zone selection.

Close Zones

Manually select zones and press *Close* button, system will forcibly close selected zones.

Live Announcement

Users may proceed live announcement via the microphone of RK-MCU or RK-MIC. Following are the steps to use the microphone of RK-MCU for paging:

1. In normal mode, press the zone buttons to select target zones.
2. Pick up the PTT microphone and press the side button to start live announcement.
3. Release the button to stop broadcast.

Below are the steps to use the microphone of RK-MIC for paging:

1. In normal mode, press the zone buttons to select target zones.
2. Press the microphone button to start live announcement. The indicator will turn green and flash while playing pre-signal or chime. After that, it lighted in green.
3. Press the microphone button again to stop broadcast, the indicator will go out.

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Broadcast Audio Files

Audio files can be stored in RK-MCU with the format of WAV, 44.1 KHz/16bit. The capacity for audio files is maximum 60 minutes.

The broadcast of configured audio files can be activated by dry contact inputs, timing, and fire alarm signal. If users need broadcast the audio files manually, please following the below operation steps:

1. In normal mode, press the zone buttons to select target zones.
2. Press the button corresponding to the audio files to broadcast.

If failing to proceed the broadcast, please make sure the priority of the task is higher than the current task. In emergency mode, the system will disable all the non-emergency task automatically.

Broadcast External Audio

RK-MCU has MIC/Line, AUX1 and AUX2 audio input interfaces. Below are the steps to broadcast the audio sources:

1. Press zone buttons to select target zones in normal mode.
2. Press the button corresponding to the desired audio source, the indicator turns green and start to broadcast.

If failing to proceed the broadcast, please make sure the priority of the task is higher than the current task. In emergency mode, the system will disable all the non-emergency task automatically.

Auto-record

During live announcement in emergency, HCU can record the voice automatically. Max. 99 recorded files can be stored, the total time is up to 1 hour. If the total recording time exceeds the capacity-1 hour, the device will delete the earliest file. If the current recording time exceeds 1 hour, the system will stop recording automatically.

Auto-record follows live announcement in emergency, and there isn't any additional operation. Users may check the recorded files from the LCD screen of RK-MCU, please refer to "Check Recorded Files" chapter for detail information.

Temporary Record

Temporary record can be proceeded by the PTT microphone of RK-MCU and the microphone of RK-MIC. The recorded file will be stored in RK-MCU and can be broadcasted to zones by manual operation. RK-MCU can keep only 1 temporary record file with up to 30 minutes. When proceeding a new temporary recording, the new file will cover the old one. Temporary broadcast can be only used in normal mode.

Recording

Please follow the below steps to proceed temporary record at RK-MCU:

1. Press "Record" button, screen will display temporary record.
2. Press the side button of PTT microphone to start recording, indicator turns green and screen shows recording time.
3. Release the side button of PTT microphone to stop recording, indicator goes out and screen resumes to previous screen.

Please follow the below steps to proceed temporary record at RK-MIC:

1. Press "Record" button to start temporary record, indicator turns green and flashing.
2. Press "Record" button again to stop recording, indicator goes out.

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Playback

Users can playback recorded files via internal loudspeaker on RK-MCU screen, please refer to “Check Recorded Files” chapter for further information.

Record listening also can be operated by RK-MIC, below are the steps:

1. Press “Playback” button at front panel, indicator turns green and flickers. Recording will be broadcasted through RK-MIC built-in loudspeaker.
2. Repress “Playback” button to stop listening.

Record Broadcast

Steps for broadcasting recording by RK-MIC:

1. Press the zone button.
2. Press “Playback” button to broadcast record, indicator turns green.

Enter/Exit Manual Emergency Mode

There are emergency buttons with plastic cover at the front panel of RK-MCU and RK-MIC. When system receives fire alarm signal from fire alarm control panel, the indicator of emergency buttons turn red and flashing. If users want to proceed emergency broadcast manually, press emergency button which is enabled by configuration to enter manual emergency mode, and the emergency indicator turns red. Press the button again to exit manual emergency mode.

Note:

- All non-emergency function will be disabled automatically when the system works in emergency mode, the volume of CH1/CH2 output will be changed to the default value which is configured.
- The emergency button of RK-MCU and RK-MIC can be enabled or disabled through configuration tool, only one button can be enabled in a system.
- Under manual emergency mode, system will continue emergency broadcast but not response to fire alarm signal.

Emergency Voice Alarm

If users want to proceed emergency voice alarm manually, please follow the steps:

1. Press emergency button to enter manual emergency mode.
2. Press zone buttons to select target zones.
3. Press the button which is configured with emergency task to broadcast emergency voice messages.

Emergency Live Announcement

If users want to proceed emergency live announcement via the PTT microphone of RK-MCU, please follow the steps:

1. Press emergency button to enter manual emergency mode.
2. Press zone buttons to select target zones.
3. Pick up PTT microphone and press the side button to enable live announcement.
4. Release the button to stop.

If users want to proceed emergency paging via the microphone of RK-MIC, please follow the steps:

1. Press emergency button to enter manual emergency mode.
2. Press zone buttons to select target zones.

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3. Press “Microphone” button of RK-MIC to enable live announcement. The indicator turns green and flashing, which shows it is playing pre-signal or chime. While paging, the indicator always lights in green.
4. Press “Microphone” button again to stop paging, the indicator goes out.

Lock & Unlock

If “Key Lock” function of RK-MIC is enabled, the programmable keys 6, 7, 8 will be used to lock or unlock the device. Follow below steps to lock the device:

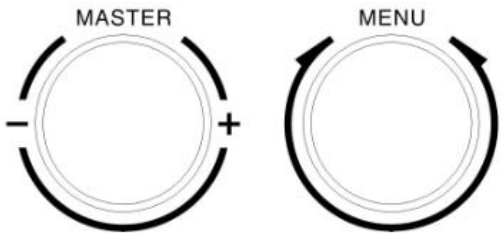
1. Press key 7, its indicator will light in green.
2. Then press key 6 and key 8 simultaneously, their indicators will light in green.
3. Release all keys, the keys of the RK-MIC is locked.

Follow below steps to unlock the device:

1. Press key 7.
2. Press key 6 and key 8 simultaneously, their indicators will be off.
3. Release all keys, the keys of the RK-MIC is unlocked.

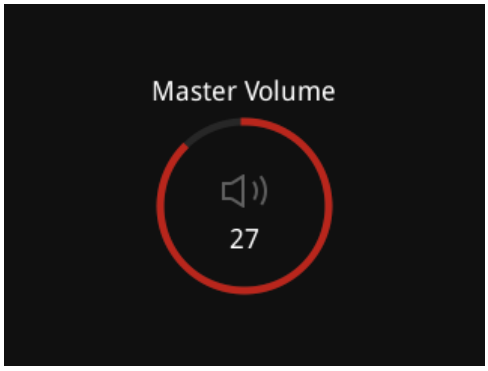
Menu Operation

There are two knobs on RK-MCU front panel: master volume and menu.



Master Volume Adjustment

Master volume knob can be used to adjust audio channel 1 under public address mode. Usually, channel 1 is used to broadcast background music and the knob cannot be used under emergency alarm mode. The volume can be adjusted from 0 to 31. Clockwise rotating can turn up the volume. When the volume comes to the limit, it cannot be changed.



During adjustment, screen shows current volume. When there is no operation executed for 3 seconds, device will automatically resume to previous condition. Manual pressing the knob can also exit the interface.

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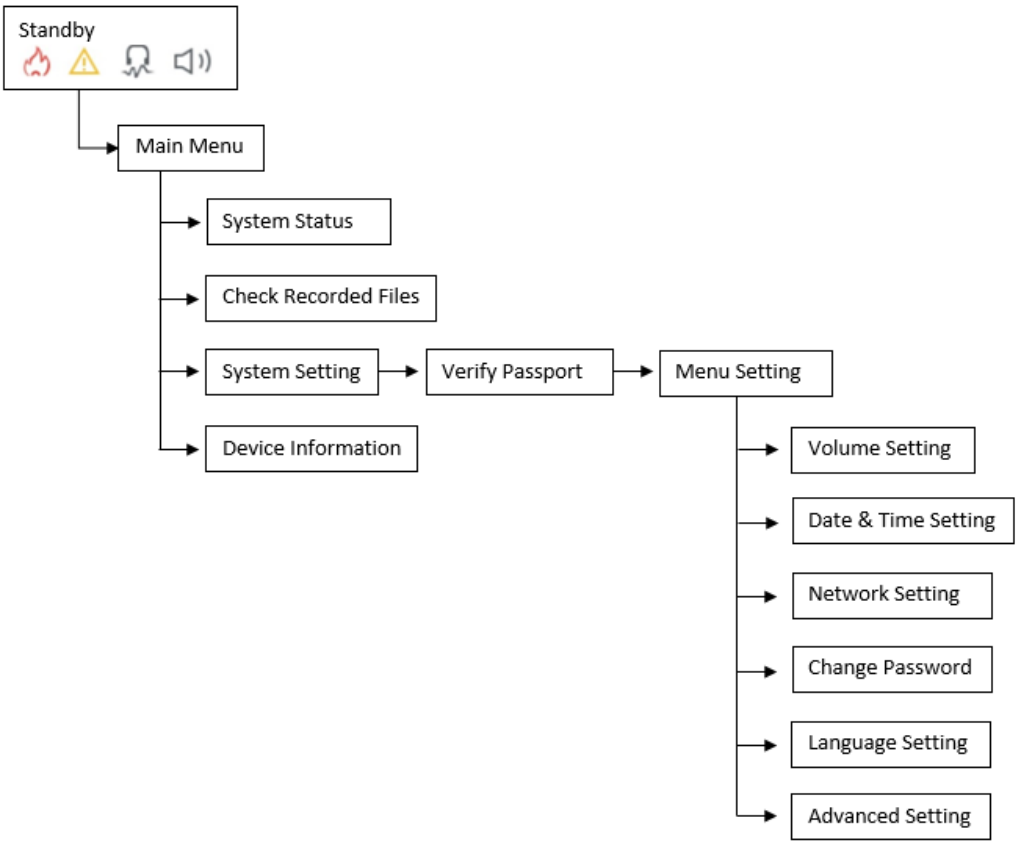
Menu Operation

Menu knob can execute following operations:

- Clockwise rotating:
  - Move the cursor to the right
  - Move down the cursor
  - Increase value
- Counterclockwise rotating:
  - Move the cursor to the left
  - Move up the cursor
  - Decrease value
- Pressing:
  - Enter the sub-menu
  - Exit the menu
  - Operate the function corresponding to the button
  - Enter or exit edit mode
  - Select the item.

There is a *Home* button on the front panel, which can directly lead to homepage without returning step by step.

Menu Structure

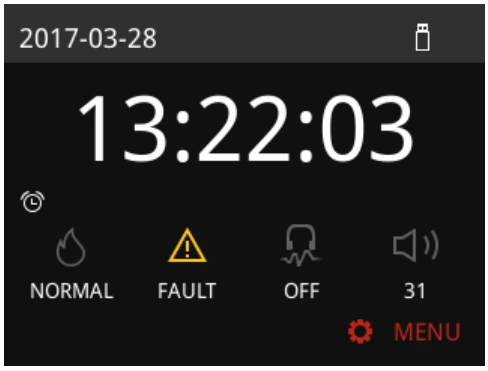


Menu Description

Standby

After startup, the screen shows the homepage, on which users can view the time, work mode, general fault status, monitor status and master volume.

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Below are the descriptions for the icons and buttons.

Emergency Status

- If the system is working in normal mode, the icon will be grey, and the description is “NORMAL”.
- If the system receives any fire alarm signal, and works in auto. Emergency mode, the icon turns red, and the description is “AUTO”.
- If the emergency button is pressed and the system works in manual emergency mode, the icon turns red, and the description will be “MANUAL”.

General Fault Status

- If the system works normally, no fault is found, the icon will be grey.
- If there are some fault, the icon will be yellow.

Monitor Status

The characters shows the current status:

- None means no monitoring.
- “CH1” means audio channel 1 is being monitored.
- “CH2” means audio channel 2 is being monitored.

Master Volume

- The digit shows the current volume of audio channel 1, back ground music usually be played in audio channel 1.

Menu Button

- Device will enter main menu when pressing the menu knob.

USB

- When an USB storage is inserted to the device, this icon will be displayed.

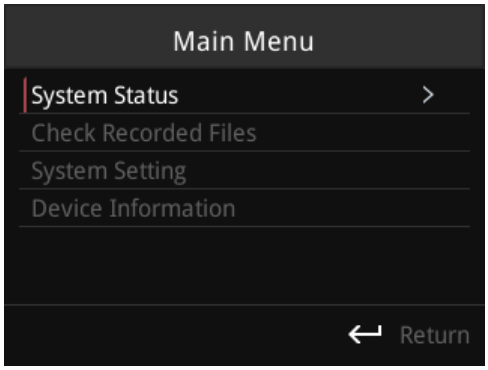
Timing

- When enable the timing function, the screen will show the task’s name and time. If there isn’t timing task, the icon will be hided.

Main Menu

In homepage, press the menu knob, device will display main menu, users can view the submenu: System Status, Check Recorded Files, System Setting and Device Information. Rotate the menu knob to move cursor and press the knob to enter the submenu. Select *Return* to go back the homepage.

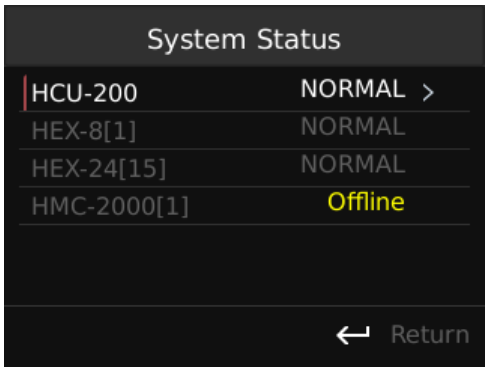
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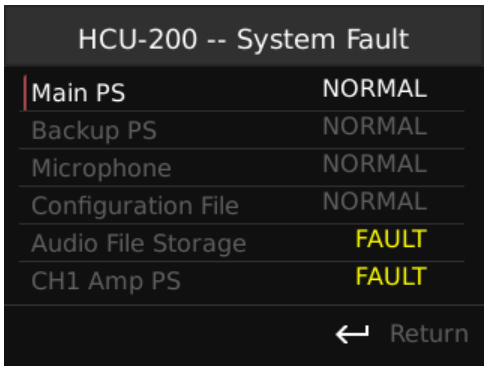
System Status

The system status menu displays the device list of the system, the device address is shown in the brackets right of models. The right column displays the status of each devices, such as Normal, Fault or Offline, so users may know the device status easily

Rotating the menu knob to move the cursor. Select a device and press the knob to view the detail fault. Select *Return* and press knob to return main menu.



If users select RK-MCU, the interface shows as below:



The fault list of RK-MCU is as follow:

No.	Component	Status	Description
1	Main PS	Normal/Fault	Display the main PS fault status.
2	Backup PS	Normal/Fault	Display backup PS fault status.
3	PTT Microphone	Normal/Fault	Display the PTT microphone status.
4	Configuration File	Normal/Fault	Display the configuration file status.
5	Audio File Storage	Normal/Fault	Display the fault status of audio file storage.
6	CH1 Amp PS	Normal/Fault	Display the status of power supply of the power amplifiers which are connected to CH1.

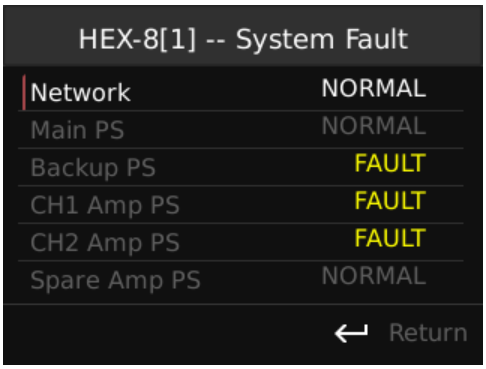
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No.	Component	Status	Description
7	CH2 Amp PS	Normal/Fault	Display the status of power supply of the power amplifiers which are connected to CH2.
8	Spare Amp PS	Normal/Fault	Display the status of power supply of the spare power amplifiers.
9	CH1A Amp Loop	Normal/Fault	Display the loop status of CH1A power amplifier.
10	CH1B Amp Loop	Normal/Fault	Display the loop status of CH1B power amplifier.
11	CH2A Amp Loop	Normal/Fault	Display the loop status of CH1C power amplifier.
12	CH2B Amp Loop	Normal/Fault	Display the loop status of CH1D power amplifier.
13	Spare Amp Loop	Normal/Fault	Display the loop status of spare power amplifier.
14	Speaker Line 1	Normal/ Open /Short	Display the status of speaker line 1.
15	Speaker Line 2	Normal/Open/ Short	Display the status of speaker line 2.
16	Speaker Line 3	Normal/Open/ Short	Display the status of speaker line 3.
17	Speaker Line 4	Normal/Open/ Short	Display the status of speaker line 4.
18	Speaker Line 5	Normal/Open/ Short	Display the status of speaker line 5.
19	Speaker Line 6	Normal/Open/ Short	Display the status of speaker line 6.
20	Speaker Line 7	Normal/Open/ Short	Display the status of speaker line 7.
21	Speaker Line 8	Normal/Open/ Short	Display the status of speaker line 8.
22	Speaker Line 1 Earth	Normal/Fault	Display the earth fault of speaker line 1.
23	Speaker Line 2 Earth	Normal/Fault	Display the earth fault of speaker line 2.
24	Speaker Line 3 Earth	Normal/Fault	Display the earth fault of speaker line 3.
25	Speaker Line 4 Earth	Normal/Fault	Display the earth fault of speaker line 4.
26	Speaker Line 5 Earth	Normal/Fault	Display the earth fault of speaker line 5.
27	Speaker Line 6 Earth	Normal/Fault	Display the earth fault of speaker line 6.
28	Speaker Line 7 Earth	Normal/Fault	Display the earth fault of speaker line 7.
29	Speaker Line 8 Earth	Normal/Fault	Display the earth fault of speaker line 8.
30	Dry Contact Input 1	Normal/Open/ Short	Display the wiring status of dry contact input 1.
31	Dry Contact Input 2	Normal/Open/ Short	Display the wiring status of dry contact input 2.
32	Dry Contact Input 3	Normal/Open/ Short	Display the wiring status of dry contact input 3.

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No.	Component	Status	Description
33	Dry Contact Input 4	Normal/Open/ Short	Display the wiring status of dry contact input 4.
34	Dry Contact Input 5	Normal/Open/ Short	Display the wiring status of dry contact input 5.
35	Dry Contact Input 6	Normal/Open/ Short	Display the wiring status of dry contact input 6.
36	Dry Contact Input 7	Normal/Open/ Short	Display the wiring status of dry contact input 7.
37	Dry Contact Input 8	Normal/Open/ Short	Display the wiring status of dry contact input 8.
38	Fire Alarm Interface (RS-485)	Normal/Fault	When HCU is connected to fire alarm system via the fire alarm interface (RS-485), it displays the interface status.

If users select RK-ZONE8, the interface shows as below:



The fault list of RK-ZONE8 is as follow:

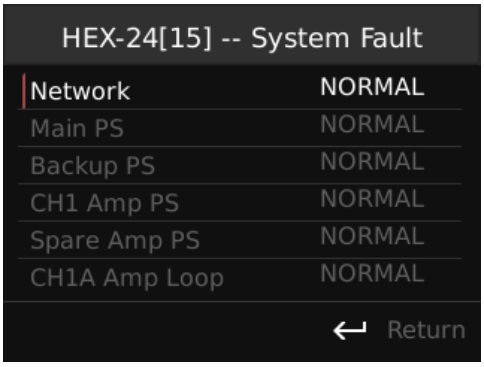
No.	Positions	Status	Description
1	Network	Normal/Fault	Display the communication status between the device and RK-MCU.
2	Main PS	Normal/Fault	Display the status of main power supply.
3	Backup PS	Normal/Fault	Display the status of backup power supply.
4	CH1 Amp PS	Normal/Fault	Display the status of power supply of the power amplifiers which are connected to CH1.
5	CH2 Amp PS	Normal/Fault	Display the status of power supply of the power amplifiers which are connected to CH2.
6	Spare Amp PS	Normal/Fault	Display the status of power supply of the spare power amplifiers.
7	CH1A Amp Loop	Normal/Fault	Display the loop status of CH1A power amplifier.
8	CH1B Amp Loop	Normal/Fault	Display the loop status of CH1B power amplifier.
9	CH2A Amp Loop	Normal/Fault	Display the loop status of CH1C power amplifier.
10	CH2B Amp Loop	Normal/Fault	Display the loop status of CH1D power amplifier.
11	Spare Amp Loop	Normal/Fault	Display the loop status of spare power amplifier.
12	Speaker Line 1	Normal/Open/ Short	Display the status of speaker line 1.
13	Speaker Line 2	Normal/Open/ Short	Display the status of speaker line 2.

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No.	Positions	Status	Description
14	Speaker Line 3	Normal/Open/ Short	Display the status of speaker line 3.
15	Speaker Line 4	Normal/Open/ Short	Display the status of speaker line 4.
16	Speaker Line 5	Normal/Open/ Short	Display the status of speaker line 5.
17	Speaker Line 6	Normal/Open/ Short	Display the status of speaker line 6.
18	Speaker Line 7	Normal/Open/ Short	Display the status of speaker line 7.
19	Speaker Line 8	Normal/Open/ Short	Display the status of speaker line 8.
20	Speaker Line 1 Earth	Normal/Fault	Display the earth fault of speaker line 1.
21	Speaker Line 2 Earth	Normal/Fault	Display the earth fault of speaker line 2.
22	Speaker Line 3 Earth	Normal/Fault	Display the earth fault of speaker line 3.
23	Speaker Line 4 Earth	Normal/Fault	Display the earth fault of speaker line 4.
24	Speaker Line 5 Earth	Normal/Fault	Display the earth fault of speaker line 5.
25	Speaker Line 6 Earth	Normal/Fault	Display the earth fault of speaker line 6.
26	Speaker Line 7 Earth	Normal/Fault	Display the earth fault of speaker line 7.
27	Speaker Line 8 Earth	Normal/Fault	Display the earth fault of speaker line 8.
28	Dry Contact Input 1	Normal/Open/ Short	Display the wiring status of dry contact input 1.
29	Dry Contact Input 2	Normal/Open/ Short	Display the wiring status of dry contact input 2.
30	Dry Contact Input 3	Normal/Open/ Short	Display the wiring status of dry contact input 3.
31	Dry Contact Input 4	Normal/Open/ Short	Display the wiring status of dry contact input 4.
32	Dry Contact Input 5	Normal/Open/ Short	Display the wiring status of dry contact input 5.
33	Dry Contact Input 6	Normal/Open/ Short	Display the wiring status of dry contact input 6.
34	Dry Contact Input 7	Normal/Open/ Short	Display the wiring status of dry contact input 7.
35	Dry Contact Input 8	Normal/Open/ Short	Display the wiring status of dry contact input 8.

If users select RK-ZONE24, the screen will show as below:

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The fault list of RK-ZONE24 is as follow:

No.	Positions	Status	Description
1	Network	Normal/Fault	Display the communication status between the device and RK-MCU.
2	Main PS	Normal/Fault	Display the status of main power supply.
3	Backup PS	Normal/Fault	Display the status of backup power supply.
4	CH1 Amp PS	Normal/Fault	Display the status of power supply of the power amplifiers which are connected to CH1.
6	Spare Amp PS	Normal/Fault	Display the status of power supply of the spare power amplifier.
7	CH1A Amp Loop	Normal/Fault	Display the loop status of CH1A power amplifier.
8	CH1B Amp Loop	Normal/Fault	Display the loop status of CH1B power amplifier.
9	CH1C Amp Loop	Normal/Fault	Display the loop status of CH1C power amplifier.
10	CH1D Amp Loop	Normal/Fault	Display the loop status of CH1D power amplifier.
11	CH1E Amp Loop	Normal/Fault	Display the loop status of CH1E power amplifier.
12	CH1F Amp Loop	Normal/Fault	Display the loop status of CH1F power amplifier.
13	Spare Amp Loop	Normal/Fault	Display the loop status of spare power amplifier.
14	Speaker Line 1	Normal/Open/ Short	Display the status of speaker line 1.
15	Speaker Line 2	Normal/Open/ Short	Display the status of speaker line 2.
16	Speaker Line 3	Normal/Open/ Short	Display the status of speaker line 3.
17	Speaker Line 4	Normal/Open/ Short	Display the status of speaker line 4.
18	Speaker Line 5	Normal/Open/ Short	Display the status of speaker line 5.
19	Speaker Line 6	Normal/Open/ Short	Display the status of speaker line 6.
20	Speaker Line 7	Normal/Open/ Short	Display the status of speaker line 7.
21	Speaker Line 8	Normal/Open/ Short	Display the status of speaker line 8.
22	Speaker Line 9	Normal/Open/ Short	Display the status of speaker line 9.
23	Speaker Line 10	Normal/Open/ Short	Display the status of speaker line 10.

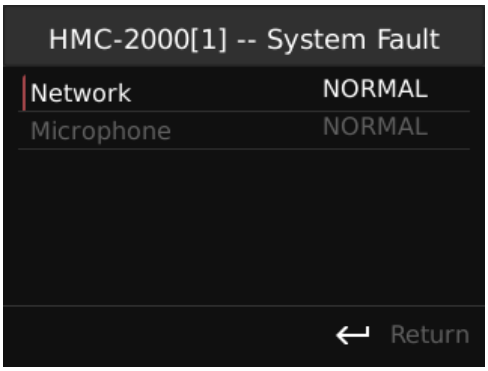
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No.	Positions	Status	Description
24	Speaker Line 11	Normal/Open/ Short	Display the status of speaker line 11.
25	Speaker Line 12	Normal/Open/ Short	Display the status of speaker line 12.
26	Speaker Line 13	Normal/Open/ Short	Display the status of speaker line 13.
27	Speaker Line 14	Normal/Open/ Short	Display the status of speaker line 14.
28	Speaker Line 15	Normal/Open/ Short	Display the status of speaker line 15.
29	Speaker Line 16	Normal/Open/ Short	Display the status of speaker line 16.
30	Speaker Line 17	Normal/Open/ Short	Display the status of speaker line 17.
31	Speaker Line 18	Normal/Open/ Short	Display the status of speaker line 18.
32	Speaker Line 19	Normal/Open/ Short	Display the status of speaker line 19.
33	Speaker Line 20	Normal/Open/ Short	Display the status of speaker line 20.
34	Speaker Line 21	Normal/Open/ Short	Display the status of speaker line 21.
35	Speaker Line 22	Normal/Open/ Short	Display the status of speaker line 22.
36	Speaker Line 23	Normal/Open/ Short	Display the status of speaker line 23.
37	Speaker Line 24	Normal/Open/ Short	Display the status of speaker line 24.
38	Speaker Line 1 Earth	Normal/Fault	Display the earth fault of speaker line1.
39	Speaker Line 2 Earth	Normal/Fault	Display the earth fault of speaker line 2.
40	Speaker Line 3 Earth	Normal/Fault	Display the earth fault of speaker line 3.
41	Speaker Line 4 Earth	Normal/Fault	Display the earth fault of speaker line 4.
42	Speaker Line 5 Earth	Normal/Fault	Display the earth fault of speaker line 5.
43	Speaker Line 6 Earth	Normal/Fault	Display the earth fault of speaker line 6.
44	Speaker Line 7 Earth	Normal/Fault	Display the earth fault of speaker line 7.
45	Speaker Line 8 Earth	Normal/Fault	Display the earth fault of speaker line 8.
46	Speaker Line 9 Earth	Normal/Fault	Display the earth fault of speaker line 9.
47	Speaker Line 10 Earth	Normal/Fault	Display the earth fault of speaker line 10.

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No.	Positions	Status	Description
48	Speaker Line 11 Earth	Normal/Fault	Display the earth fault of speaker line 11.
49	Speaker Line 12 Earth	Normal/Fault	Display the earth fault of speaker line 12.
50	Speaker Line 13 Earth	Normal/Fault	Display the earth fault of speaker line 13.
51	Speaker Line 14 Earth	Normal/Fault	Display the earth fault of speaker line 14.
52	Speaker Line 15 Earth	Normal/Fault	Display the earth fault of speaker line 15.
53	Speaker Line 16 Earth	Normal/Fault	Display the earth fault of speaker line 16.
54	Speaker Line 17 Earth	Normal/Fault	Display the earth fault of speaker line 17.
55	Speaker Line 18 Earth	Normal/Fault	Display the earth fault of speaker line 18.
56	Speaker Line 19 Earth	Normal/Fault	Display the earth fault of speaker line 19.
57	Speaker Line 20 Earth	Normal/Fault	Display the earth fault of speaker line 20.
58	Speaker Line 21 Earth	Normal/Fault	Display the earth fault of speaker line 21.
59	Speaker Line 22 Earth	Normal/Fault	Display the earth fault of speaker line 22.
60	Speaker Line 23 Earth	Normal/Fault	Display the earth fault of speaker line 23.
61	Speaker Line 24 Earth	Normal/Fault	Display the earth fault of speaker line 24.

If users select RK-MIC, the screen will show as below:



The fault list of RK-MIC is as follow:

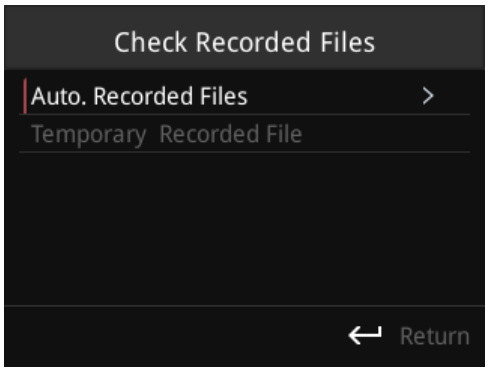
No.	Positions	Status	Description
1	Network	Normal/Fault	Display the communication status between the device and RK-MCU.
2	Microphone	Normal/Fault	Display the microphone status.

Rotating menu knob to view more contents in fault list, pressing the knob to return the last menu.

Check Recorded Files

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In Check Recorded Files menu, users can view and play the auto-recorded and temporary recorded files via the built-in loudspeaker.

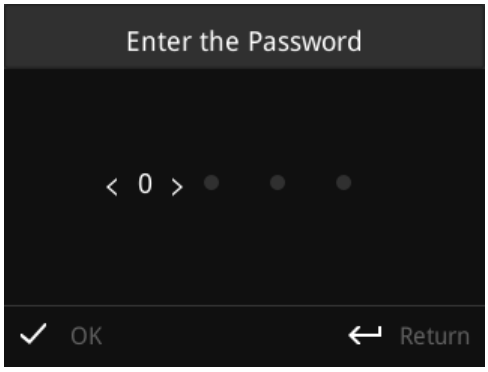


Rotate the menu knob and press it to view the file list. In the file list, rotate knob to select recorded files and press the knob to play it. Device can play the recorded files via the built-in loudspeaker.

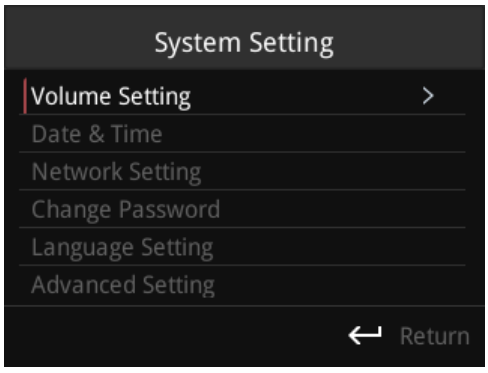
System Setting

Select System Setting in the main menu and press the knob, then it will display the password verification. If the password is 0000, users can directly enter the setting interface without inputting the password. The default password is 8888.

Password Verification



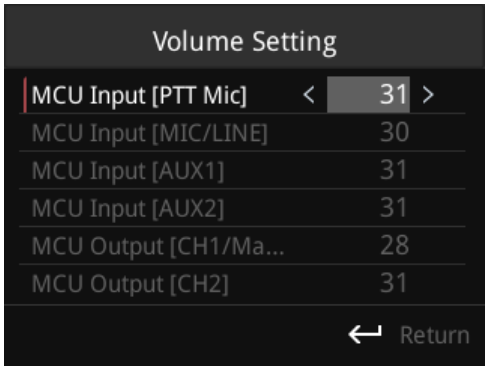
In the password verification, users can input the password by rotating the knob and pressing the knob, then select *OK* and press knob. If the password is right, the screen will display system setting menu, otherwise, it will back to the main menu. Selecting *Return* and press knob, device will go back to main menu.



System Setting includes Volume Setting, Date & Time, Network Setting, Change Password, Language Setting and Advanced Setting. Rotate the knob to select and press it enter into setting interface.

Volume Setting

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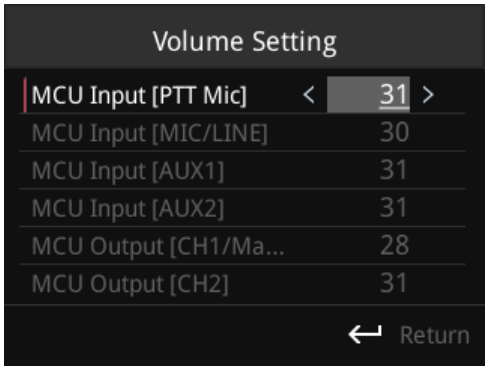
Users can adjust the input and output volume in the volume setting interface.

Below items can be set:

No.	Item	Range	Description
1	MCU Input [PTT Mic]	0~31	Set the volume of PTT Mic input of HCU.
2	MCU Input [MIC/LINE]	0~31	Set the volume of MIC/LINE input of HCU.
3	MCU Input [AUX1]	0~31	Set the volume of AUX1 input of HCU.
4	MCU Input [AUX2]	0~31	Set the volume of AUX2 input of HCU.
5	MCU Output [CH1/Master]	0~31	Set the volume of audio channel 1 of HCU.
7	MCU Output [CH2]	0~31	Set the volume of audio channel 2 of HCU.
8	MCU Output [Monitor]	0~31	Set the volume of monitor output of HCU.
9	MCU Amp [CH1]	0~31	Set the volume of power amplifiers which are connected with CH1 of HCU.
10	MCU Amp [CH2]	0~31	Set the volume of power amplifiers which are connected with CH2 of HCU.
11	MIC Input	0~31	Set the volume of audio signal from remote call stations.
12	Z8-x Amp [CH1]	0~31	Set the volume of power amplifiers which are connected with CH1 of RK-ZONE8 whose address is x.
13	Z8-x Amp [CH2]	0~31	Set the volume of power amplifiers which are connected with CH2 of RK-ZONE8 whose address is x.
14	Z24-x Amp [CH1]	0~31	Set the volume of power amplifiers which are connected with CH1 of RK-ZONE24 whose address is x.

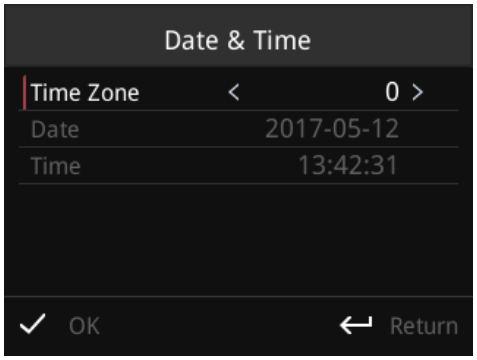
In the volume setting interface, rotating the knob to move cursor and press it to enter the setting interface as below. Rotating knob can adjust the value.

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Select *Return* and press knob to exit volume setting interface and back to last menu.

Date & Time



Users can set time zone, date and time in above interface.

- Time Zone

  Select *Time Zone* and press knob to enter setting interface. The range is from -12 to +12. Rotating the knob can adjust time zone, pressing it can exit setting.

  Note:

  If device's time zone is not same with local, device will display wrong time while synchronizing time via network.

- Date

  Select *Date* and press knob to enter setting interface. Default is year setting, users can rotate knob to adjust and press it proceed to month setting. After all the setting, interface will automatically exit.

- Time

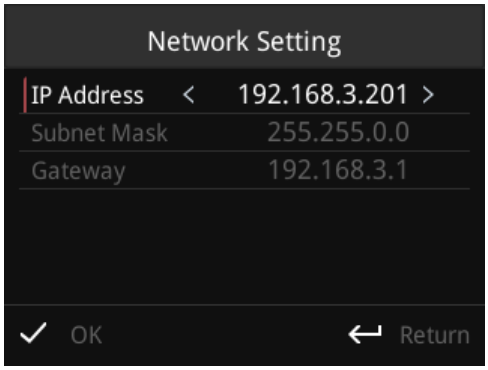
  Select *Time* and press knob to enter setting interface. The setting way is the same as date setting. After all the setting, interface will automatically exit.

After setting the time zone, date and time, rotate knob to select *OK* and press it. If users select *Return*, then device will back to last menu without saving.

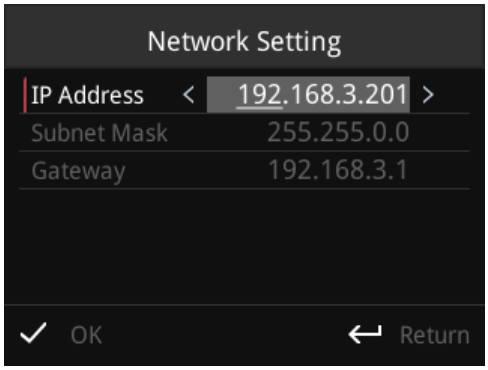
Network Setting

When HCU is connected to other devices via Ethernet, such as a computer, users need to set network parameter.

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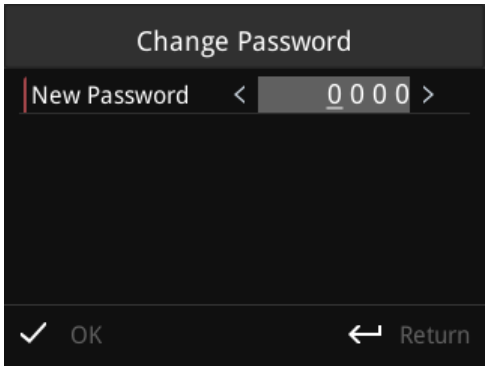


In the Network Setting interface, users can set IP address, subnet mask and gateway. Select the items which need to be set and press knob to set. Rotating knob can adjust, pressing it can set the next. After setting, press knob to exit.



Please follow above steps to set and rotate knob to select *OK*, then press it to save and return to last menu. If users select *Return*, then device will back to last menu without saving.

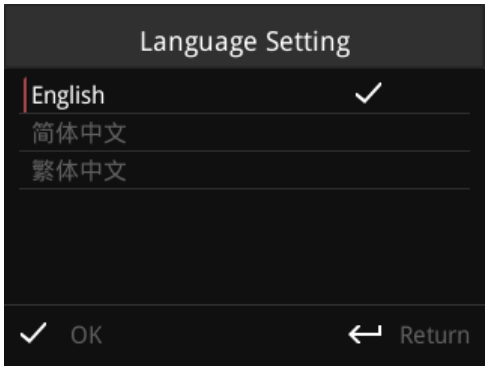
Change Password



Users can set new password in Change Password interface. Press knob to enter setting interface and rotate it to set, press again for next setting. After setting, rotate knob to select *OK* and press it to save. If users select *Return*, then device will back to last menu without saving.

Language Setting

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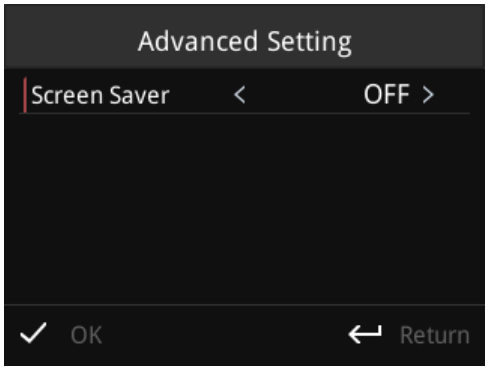
HCU supports multi-language display, users can set language in above menu. If the language list cannot meet requirement, users can also add new language by configuration software. Rotate knob and move cursor to language, press knob and the icon ✓ will be displayed. Select *OK* and press knob to save the settings. If users select *Return*, then device will back to last menu without saving.

Note:

Device will restart after clicking *Save*.

Advanced Setting

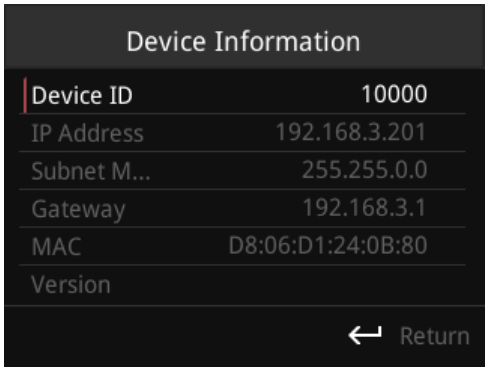
Users can set screen saver function in advanced setting menu.



Rotate knob and move the cursor to 'Screen Save', press the knob to enable or disable the function. Select *OK* and press the knob to save the setting. If users select *Return*, device will back to last menu without saving.

Device Information

Users can view device ID, IP address, subnet mask, gateway, MAC and firmware version, etc. in Device Information screen. All the data cannot be changed. Rotating knob can move cursor, pressing it can back to main menu.



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6 Maintenance

This chapter is mainly about system's daily maintenance, FAQ, solutions, etc.

Regular Maintenance

During using the system, maintainers and operators need to regularly check system's running status and solve the problems in time so as device can keep long term stable working.

1. Regularly test system function.
2. Periodically clean the dust around cooling holes.
3. The battery model of HCU is CR 2032(Panasonic), if the device clock is showed abnormal, please change with a new battery.

Note:

- Please solve the problem found during maintenance in time. If device has fault, contact with the retailer.
- It is recommended to replace the battery using the same model.

Troubleshooting

Checking Problems

Below steps can be followed to check system:

1. Record the detail condition and status:
   - Fault status
   - What operations is being proceeded when fault occurs
   - Other existing abnormal phenomena
   - Export fault log file
2. Please make sure the operation is complied with the manual. If not, please record the actual operation.
3. If fault is not caused by misoperation, please test it again, and make sure the problem may happens again.
4. Please contact the suppliers or after-sales, and provide the configuration file and upon information. We will help you to analysis the problem and solve it.

Troubleshooting

Following are the common fault, causes and actions.

No.	Fault	Causes	Actions
1	Main PS	The main power is disconnected or fuse is burned.	Check the connection of main power supply, and change the fuse if it is burned.
2	Backup PS	The backup power is disconnected or fuse is burned.	Check connection of backup power supply, and change the fuse if it is burned.

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No.	Fault	Causes	Actions
3	Microphone	The microphone may be the PTT microphone of HCU or the microphone of remote call station. The problem may be: - The socket is disconnected or loose. - The microphone is damaged.	Please check the connection of microphone socket. Check microphone's installation and make sure the interface is locked. If the microphone is connected well, please change a new microphone.
4	Configuration File	The device can't find the configuration file or there is any error.	Please download configuration file to the device again.
5	Emergency Voice	Emergency voice file is lost or corrupted.	Reload the configuration file or audio file.
6	CH1 Amp PS	The possible reasons are: - The main power supply of some power amplifier corresponding to CH1 is disconnected. - The backup power supply of some power amplifier corresponding to CH1 is disconnected. - Any fuse of CH1 power amplifiers is burned.	Please check the connection and fuse of power supply of CH1 power amplifiers.
7	CH2 Amp PS	The possible reasons are: - The main power supply of some power amplifier corresponding to CH2 is disconnected. - The backup power supply of some power amplifier corresponding to CH2 is disconnected. - Any fuse of CH2 power amplifiers is burned.	Please check the connection and fuse of power supply of CH2 power amplifiers.
8	Spare Amp PS	The possible reasons are: - The main power supply of spare power amplifier is disconnected. - The backup power supply of spare power amplifier is disconnected. - Any fuse of spare power amplifiers is burned.	Please check the connection and fuse of power supply of spare power amplifiers.
9	CHxx Amp Loop	The possible reasons are: - The connections between power amplifier and controller are error. - The power amplifier can't work normally.	Please check the power amplifier and whose connections with controller.

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No.	Fault	Causes	Actions
10	Spare Amp Loop	The possible reasons are: - The connections between spare power amplifier and controller are error. - The spare power amplifier can't work normally.	Please check the power amplifier and whose connections with controller.
11	Speaker Line xx - Open	A part of loudspeakers on the speaker line are disconnected, or no calibration.	Please check the connection of loudspeakers of the speaker line. If no exceptional is found, please calibrate the device.
12	Speaker Line xx - Short	The speaker line is shorted, overload, or no calibration.	Please check the connection of loudspeakers of the speaker line. If no exceptional is found, please calibrate the device.
13	Speaker Line xx - Earth	The impedance between speaker line and the ground is lower than the threshold.	Please check the speaker line, fix the earth points.
14	Dry Contact Input xx - Open	The wiring of the dry contact input is open or disconnected.	Please check the wiring of dry contact input.
15	Dry Contact Input xx - Short	The wiring of the dry contact input is shorted.	Please check the wiring of dry contact input.
16	Fire Alarm Interface (RS-485)	The possible reasons are: - The connection between HCU and LPI-ModBus module is short, open or reversed. - The connection between LPI-ModBus module and fire alarm control panel is error. - No power supply to LPI-ModBus module. - Mistakes in configuration	Please check the connection from fire alarm control panel to HCU, the power supply of LPI-ModBus and the configuration.
17	Network	The possible reasons are: - No connection or wrong connection from device to HCU. - Device is powered off. - No end-of-line resistor is connected to the communication bus.	Please check the connection of communication bus and make sure the last device is connected with end-of-line resistor. Please check the power status of all the devices on communication bus.

Maintenance

Changing Fuse

Fuse is attached with each device. If the rupture of any fuse is found, it must be changed by professional people.

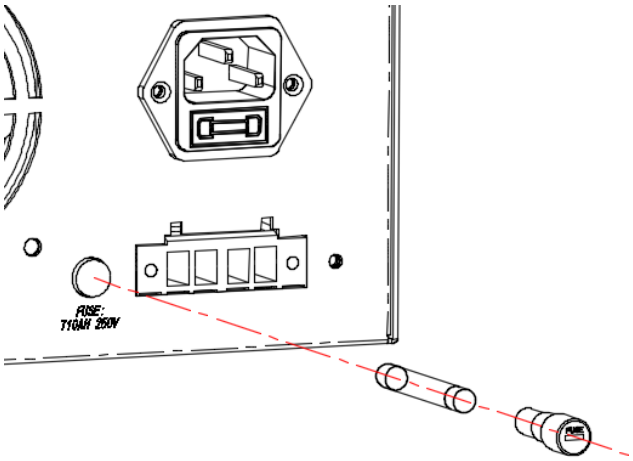
If the fuse of main power supply need be changed, please pull out the fuse cover and change the fuse, then push the cover back.

Following are the steps to change the fuse of backup power supply:

1. Press and anticlockwise rotate the fuse knob on rear panel, the fuse will popup.

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2. Remove the melted wire and replace with the new fuse, then insert the holder.
3. Press and clockwise rotate the fuse knob till the limit.



Upgrading Device Firmware

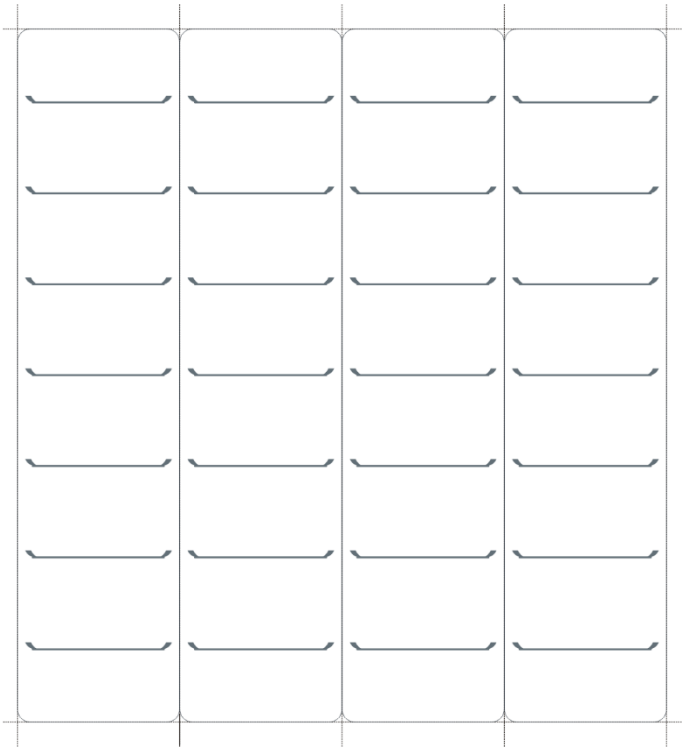
If device firmware need to be upgraded, the operation must be only conducted by professional people. Before upgrading, please make sure the compatibility among the new firmware and other devices to ensure the system working normally.

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Appendix

RK-MCU Label

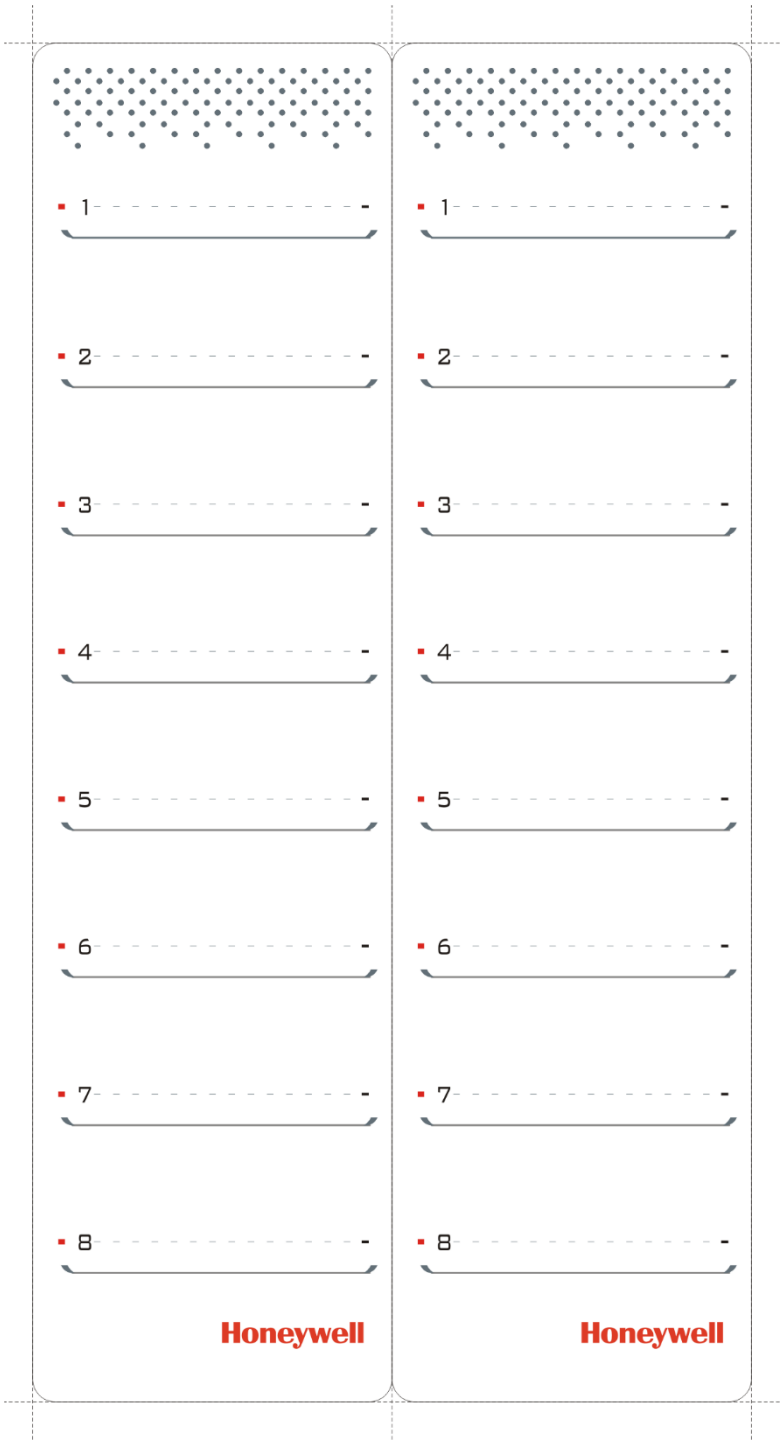
If it is required to make RK-MCU button label, please print below and write the names on the label. Users can refer to the chapter “Installing RK-MCU Labels” for the installation.



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RK-MIC Label

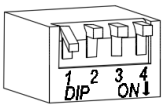
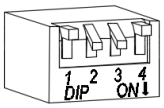
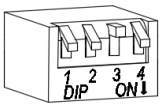
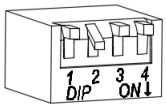
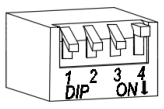
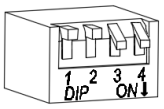
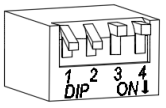
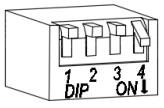
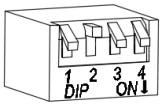
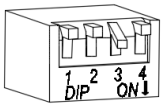
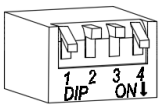
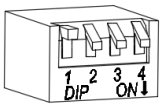
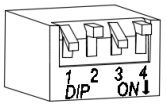
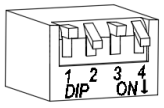
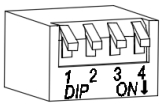
If it is required to make RK-MIC button label, please print below and write the numbers on the label. Users can refer to the chapter “Installing RK-MIC Labels” for the installation.



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DIP Switch Setting

4-pin DIP switch are used to set device address, below figures shows the DIP switch setting corresponding to the address code according to binary.

Address	DIP Switch	Address	DIP Switch	Address	DIP Switch
1		6		11	
2		7		12	
3		8		13	
4		9		14	
5		10		15	

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