Honeywell

INTEVIO PA/VA System

User Manual

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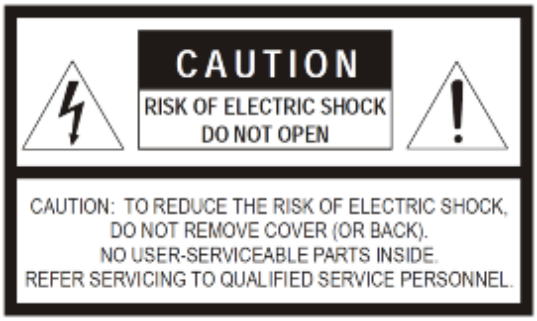
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Safety Guidelines



	**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	To prevent electric shock, this equipment plug shall not be used as a conductor to extend any 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 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 or mistakes.

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 environments of extreme temperature, dust and mechanical vibration.
- This equipment shall be well ventilated and protected against dust, moisture, direct sunshine and vibrations during 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.
- Requirements on grid power supply voltage by the equipment: AC 220V (-15% ~ +10%) 50 ~ 60 Hz. In case of too high or too low voltage, or that which greatly fluctuates, it is recommended that an AC regulated power supply should be installed.

- As the product is not waterproof, do not expose it to rainwater or other wet or damp environments to avoid damaging it.
- Put the equipment on a solid level plane or install it on a rack.
- Do not put other articles on top of the equipment.

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 are interconnected and connected to ground to prevent unstable use or permanent damage.
- There are HV lines within it. When powered up, do not open the equipment cover without permission, to prevent electric shock.
- Prior to the first equipment power up, please check its external wiring for correctness to avoid damage.
- During power up, please do not touch wiring terminals identified with a lightning symbol at random, to avoid electric shock.
- Please do not change equipment connection circuits whilst the unit is powered up, to avoid damage.
- In case of failure to the equipment, please ask professional repair personnel to repair it. Otherwise, the Company shall neither rectify any problems nor undertake its 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 this 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 safe.
- The access control system of the central control room should be under strict management.

- Any person except an authorized & trained maintenance engineer is forbidden to disassemble or change parts of the device.
- It is forbidden to communicate between this INTEVIO system and third-party systems unless updating the software of this device.
- The network port of the device is enabled only in deployment mode.

Password Precaution

- Please change the password during the system deployment.
- Users need to change the password regularly.
- A password with four numbers is preferred.
- The screen will automatically lock for one minute if the input password is entered incorrectly, five times.

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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 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-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 for accuracy. 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.

Abbreviations

Acronyms are used to refer to some components, the abbreviations are as follows:

Abbreviation	Definition	Description
AMP	Power Amplifier	Amplifies the audio signal and outputs the high-power audio signal to drive loudspeakers.
MCU	Master Control Unit	The management of the system, which can drive 8 zones; the system capacity can be increased to extend three number of zones or speaker circuits.
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.
PS	Power Supply	

1 System Overview

This INTEVIO PA/VA System provides a number of public address solutions. It is highly integrated with device simplification, easy expansion, simple installation, convenient operation, etc. The system is designed in accordance with EN 50849:2017 and EN 54-16:2008.

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, usable as a public address and/or voice alarm system.
- Simple installation, commissioning and convenient operation.
- Digital volume control for each audio input and output.
- Class-D technology, which leads to lower energy consumption of the 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(s) to increase the system power output.
- Flexible amplifier backup.
- Built-in loudspeaker 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, communication, speaker lines and contact inputs, etc.
- A short circuit or an interruption in loudspeaker lines can be found within 100s and isolated automatically, which won't affect other loudspeaker lines.
- Fault status indicating by lights and LCD.
- PTT microphone of RK-MIC can broadcast live messages to all zones even during a system CPU failure on RK-MCU.
- Timing data can be configured via software and uploaded to Master Control Unit.
- The system supports a maximum of 128 zones.
- A maximum of 6 remote call stations can be connected for live announcements and other broadcast operations.
- The zone expander has an independent audio input interface, which can be used in standalone mode or while RK-MCU is in CPU failure.

Optional Functions

In compliance with the EN 54-16 standard, the following optional functions with requirements are included in INTEVIO system:

- Audible warning
- Manual silencing of the voice alarm condition buzzer
- Manual reset of the voice alarm condition
- Voice alarm condition output
- Indication of faults related to the transmission path to the CIE
- Indication of faults related to voice alarm zones
- Voice alarm manual control
- Emergency microphone(s)

- Redundant power amplifier

System Components

- RK-MCU — Master Control Unit
- RK-ZONE8 — Zone Expander
- RK-AMP500 — 500W Class-D Power Amplifier
- RK-MIC — Remote Call Station
- HMC-K4 — Expansion Keypad (4 Keys)
- HMC-K8 — Expansion Keypad (8 Keys)
- INTEVIO Configuration Tool — System Configuration Software
- HN-PTT — PTT Microphone
- HN-EOL — End-of-line Module
- HN-AIO2X2 — Audio Control Module
- HN-RTR — RJ-45 to RCA Convertor
- 581726 — Power Supply Unit PSU 24V-1
- 584900 — Upright cabinet with hinged frame 24U
- 584901 — Upright cabinet with hinged frame 40U
- 584902 — Upright cabinet with hinged frame 24U
- 584903 — Upright cabinet with hinged frame 40U
- 584910 — Upright cabinet without hinged frame 26U
- 584911 — Upright cabinet without hinged frame 42U
- 584913 — 19" Upright cabinet 12U
- 584920 — 19" Upright cabinet SZB
- X-NPMS-R — Rack Mounted Panel for Remote Call Station
- X-NPMS-W — Lockable wall mounted box for Remote Call Station

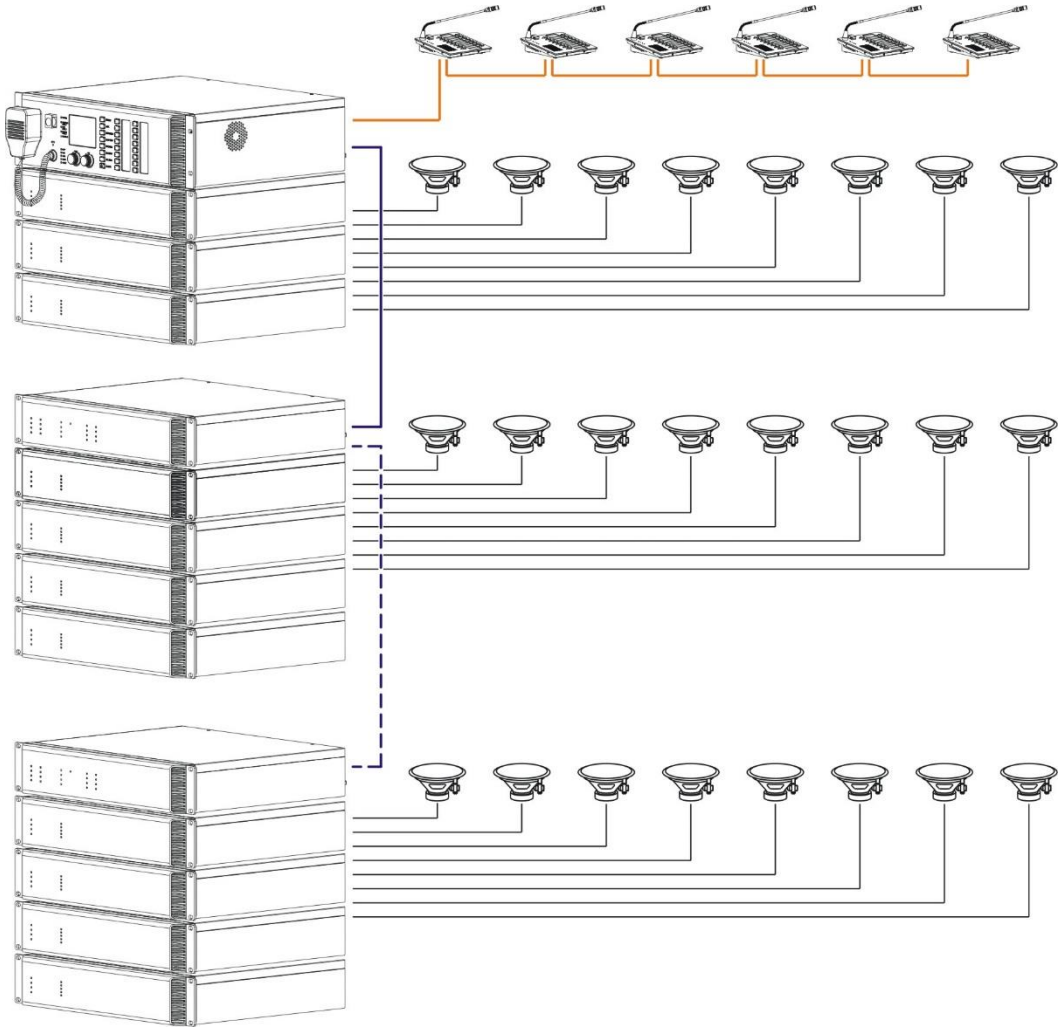
Note: Emergency microphones include RK-MIC (Remote Call Station), HMC-K4 (Extension Keypad, optional) and/or HMC-K8 (Extension Keypad, optional), which may be placed on the desktop, installed in the rack with X-NPMS-R (Rack Mounted Panel for Remote Call Station) or installed on a wall with X-NPMS-W (Lockable wall mounted box for Remote Call Station). If RK-MIC is installed in the rack or on a wall, HN-PTT (PTT Microphone) is required, and HMC-K4/HMC-K8 will be unavailable. Emergency microphones are connected to the Master Control Unit via twisted-pair cable (fire-rated where applicable).

System Specification

Parameters	Values
Main power supply	AC 100-240V, 50/60Hz
Backup power supply	21.5V DC - 28.5V DC
Speaker lines of RK-MCU	8 (each has A and B output)
Speaker lines of RK-ZONE8	8 (each has A and B output)
Max. power output of RK-MCU	500W
Max. power output of RK-AMP500	500W

System Structure

The INTEVIO PA/VA system requires only one RK-MCU to be installed, which is connected to zone expanders and call stations and uses its control and audio bus to manage all the devices in the system. Up to 15 RK-ZONE8 can be connected enabling up to 128 zones. Remote call stations (RK-MIC) are connected to the Master Control Unit (RK-MCU) in a daisy chain configuration as shown below:



Applications

System can apply to:

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

RK-MCU Master Control Unit

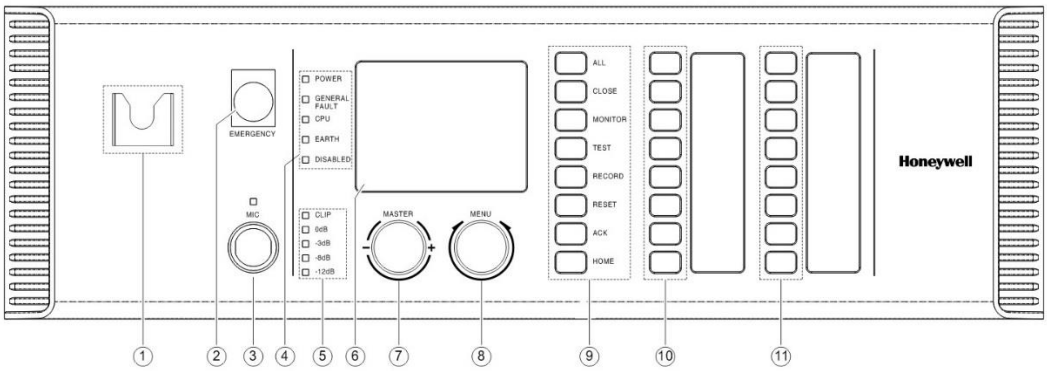
The Master Control Unit is the central management device of the system, which is used to manage and monitor all devices in the system and perform various operations. The Master Control Unit has audio storage, broadcast, zone control, monitor, timing control, fault diagnosis, etc. functions. The built-in 500W Class-D power amplifier drives a maximum of 8 zones (16 loudspeaker lines) to meet the requirements of small applications. It can also be connected to zone expanders to increase the system's capacity to meet the requirements of large applications.

Product Features

- Manages all devices in the system, used for public address and emergency broadcasts.
- View system status and set the parameters via LCD screen.
- Supports both single channel mode and dual channel mode.
- Maximum 8 zones (16 loudspeaker lines) can be connected, the maximum power rate available for the connected zones is 500W.
- Built-in 500W Class-D power amplifier, also supports external power amplifiers.
- Flexible power amplifier backup. 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, contact inputs, network communication, etc.
- 10 contact inputs with supervision and 8 dry contact outputs.
- Supports 3-wire and 4-wire volume controller.
- Supports the integration with third party system via the contact inputs or RS-485 interface.
- Zone expanders to increase the system capacity.
- Remote call station can be connected for live announcements or other broadcast controls.
- Built-in standard configuration to allow the direct usage of system after installation.

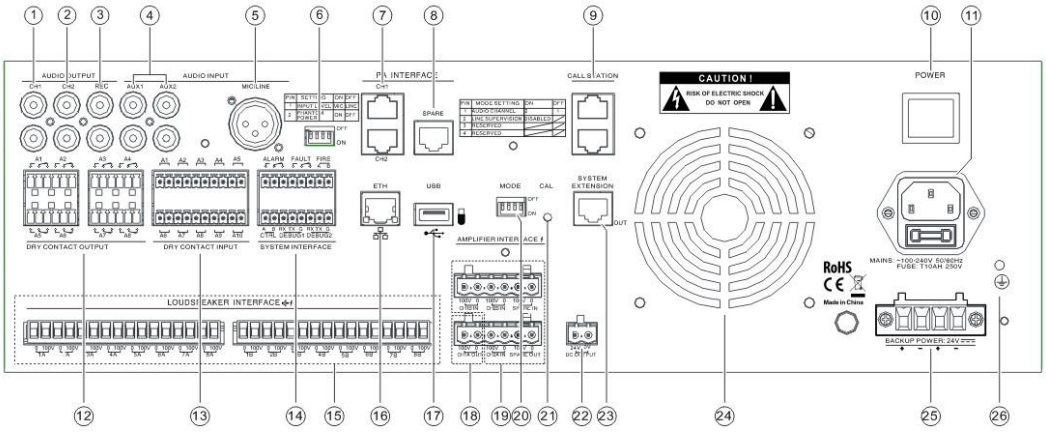
Product Appearance

Front Panel



No.	Buttons/Indicators	Description
1	Microphone bracket	The microphone bracket is used for the PTT microphone.
2	Emergency button	A protective cover is fitted over the emergency button to prevent accidental operation. If switching to manual emergency mode, raise the protective cover, then press the button. The indicator light turns red.
3	Microphone socket and indicator light	Used to connect microphone to MCU. The indicator light is off when in standby mode. When a microphone is being used, the light turns green. If a microphone experiences a fault, the light turns yellow.
4	Device status indicator lights	To indicate the status of device power, general faults, 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 MCU. The indicator turns yellow in case of CPU failure. • EARTH indicates the earth fault status of the MCU 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 and 2 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 also some function buttons: • ALL is used to select all zones in the 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.

Rear Panel



No.	Parts/Ports	Description
1	Audio output of CH1	To enable a signal output to channel 1.This can be connected to an external power amplifier or third-party devices.
2	Audio output of CH2	To enable the signal output to channel 2. This can be connected to an external power amplifier or third-party devices.
3	REC output	To output the audio signal from a microphone. This can be connected to an external recording device.
4	AUX1/AUX2	To be connected with an optional external audio source, such as CD/DVD player, tuner, etc.
5	MIC/LINE input	It is a balanced input and can be connected with an external microphone or other audio devices. The input sensitivity can be set via the DIP switch.
6	MIC/LINE DIP switch	To set the sensitivity and the phantom power output of the MIC/LINE input.
7	Power amplifier interface	To connect to the external power amplifiers of two audio channels, the MCU will transmit the audio signal and self-test signal to the power amplifier(s) and receive the fault status from power amplifier(s).
8	Spare power amplifier interface	To connect to a spare power amplifier, the MCU 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 signals, control data, and enable the power supply from the MCU 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	Contact inputs	10 contact input interfaces, which can be connected to the third-party devices for the business or voice alarm purpose.

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 reserved.
15	Loudspeaker interface	Speaker line interface of 8 zones, each zone has two speaker lines (A&B).
16	Ethernet interface	10M/100M Ethernet interface.
17	USB interface	To insert the USB storage.
18	CH1A OUT	The 100V output of the 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 set speaker line setpoint. When use Impedance & EOL or EOL mode for supervision, press this key.
22	DC power output	24V DC power output.
23	System extension interface	To connect to optional zone expanders.
24	Fan	Temperature controlled cooling fan
25	Backup power input	To connect to 24V DC backup power supply.
26	Grounding screw	To connect to grounding wire.

Technical Specification

Parameters	Values
Main power supply	AC 100-240 V, 50/60 Hz
Backup power supply	21.5 V DC - 28.5 V DC
Fuse	T10AH 250 V
Power consumption	<740 W
PTT Microphone	
Sensitivity	-59±3 dBV
Frequency response	100 Hz -14 KHz, ±3dB
SNR	>50 dB, A-weighted
Auxiliary input	
Number	2
Input sensitivity	1 V(0 dBV)
Input impedance	10 KΩ
Frequency response	85 Hz-18 KHz, ±3dB

Parameters	Values
SNR	>80 dB, A-weighed
MIC/LINE Input	
Input sensitivity	5 mV/1 V, set by DIP switch
Input impedance	20 KΩ
Frequency response	80 Hz-18 kHz, ±3dB
SNR	>80 dB, A-weighted
Phantom power output	24 V DC, set by DIP switch
Audio Output	
Output channels	CH1, CH2 and record
Output signal	1 V (0 dBV)
THD	<0.1%
Internal Power Amplifier	
Max. power output	500 W
Output signal	100 V (CH1A)
Frequency response	80 Hz-18 kHz, ±3dB
THD	<0.1%
Power Amplifier Interface	
Number	3 (CH1, CH2 and spare amplifier)
Output signal	1.4 V
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	400 W for regular transmission of voice message or background music. 400 W (sine continuous tone according to EN54-16, continuous voice messages.)
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 250 V / DC 30 V
Maximum current of the outputs	2.5 A
Others	
DC Power output	24V / 1 A
Monitoring loudspeaker	2 W / 8 Ω
Ethernet interface	10 M / 100 M
Memory capacity	1 GB Flash Memory, 8 GB SD card
Working Conditions	
Relative Humidity	< 95%, without condensing

Parameters	Values
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	14.3 Kg
Gross weight	17.4 Kg

Note:

In general, for both EN54-16 and non EN54-16 systems, the loudspeaker load of a single amplifier must not exceed 400W.

RK-ZONE8 Zone Expander

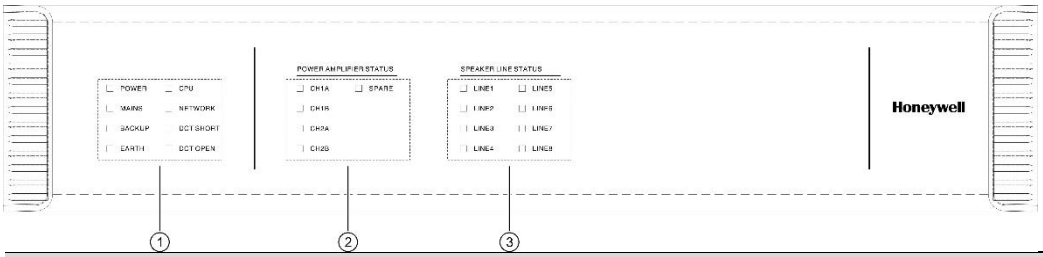
RK-ZONE8 is the zone extension device to expand the quantity of loudspeaker lines and interfaces. RK-ZONE8 can provide 16 loudspeaker line interfaces (corresponding to 8 zones), 8 contact inputs and 8 dry contact outputs. External power amplifiers must be connected to drive the loudspeakers.

Product Features

- Supports both single and dual audio channels.
- Expanding 8 zones (corresponding to 16 loudspeaker lines), each zone has two speaker lines.
- 8 contact inputs with supervision.
- 8 dry contact outputs.
- 4 external power amplifiers and 1 spare power amplifier can be connected.
- Flexible amplifier backup function.
- Full supervision, including main power supply, backup power supply, CPU fault, power amplifier, speaker lines, 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 while CPU failure on RK-MCU.
- DC power output interface, which can supply power for external modules, such as volume controller.
- Maximum 15 RK-ZONE8 can be used in system.

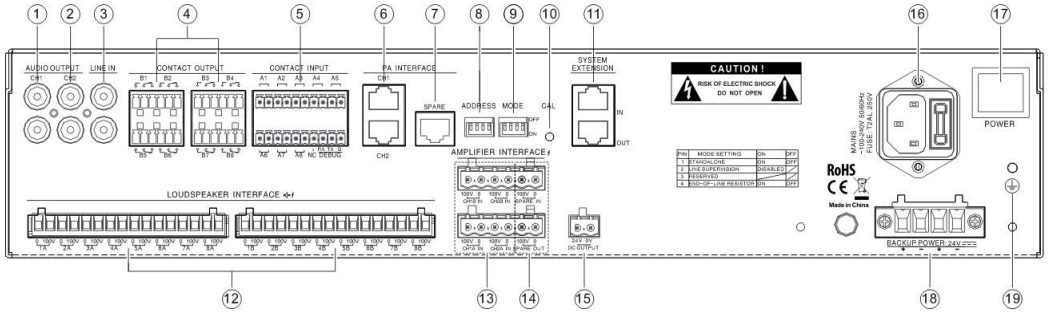
Product Appearance

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 contact inputs.
2	Indicators of power amplifier status	To indicate 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 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.

No.	Parts/Ports	Description
7	Spare amplifier interface	To connect to a spare amplifier, transmit the audio signal, self-test signal to power amplifier, and receive the fault status from power amplifier.
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 set speaker line setpoint. When use Impedance & EOL or EOL mode for supervision, press this key.
11	System extension interface	To connect the RK-MCU or the other zone expander.
12	Loudspeaker interface	Speaker line interfaces of 8 zones, each zone has two speaker lines (A&B).
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	Backup power input	To connect to 24V DC backup power supply.
19	Grounding screw	To connect to the grounding wire.

Technical Specifications

Parameters	Values
Main power supply	AC 100-240V, 50/60Hz
Backup power supply	21.5V DC - 28.5V DC
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	1 V (0 dBV)
THD	<0.1%
Power Amplifier Interface	
Number	3 (CH1, CH2 and spare amplifier)
Output signal	1.4 V

Parameters	Values
THD	<0.1%
Control signal	Self-testing, amplifier fault and energy-saving signal
Loudspeaker Interface	
Zone number	8 (with A and B output)
Max. load power	500 W
Contact Input / Output	
Contact input	8 contact inputs with supervision
Contact output	8 dry contact outputs (NO, NC and COM)
Maximum voltage of the outputs	AC 250 V / DC 30 V
Maximum current of the outputs	2.5 A
Others	
DC Power output	24 V / 1 A
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)	580 mm × 235 mm × 552 mm
Net weight	7.5 Kg
Gross weight	10.3 Kg

RK-AMP500 500W Class-D Power Amplifier

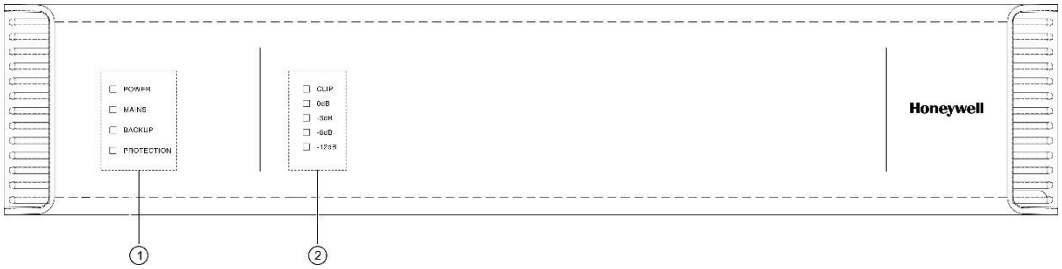
RK-AMP500 is used to amplify the audio signal to drive loudspeakers. It is referred to as “DA” within the manual.

Product Features

- Class-D technology with high efficiency.
- Maximum 400 W power output.
- 70 V and 100 V audio output.
- Supports balanced or unbalanced audio input.
- Forced fan cooling
- Automatic limit output voltage

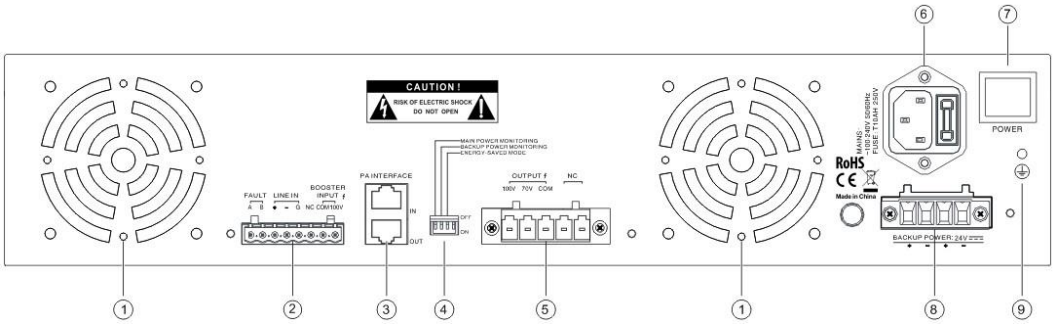
Product Appearance

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 indicate the main power supply fault status. If main power supply fails, the light turns yellow. • BACKUP indicates the backup power supply fault status. If the backup power supply fails, the light turns yellow. • PROTECTION indicates the DA protection status. If the output is switched off due to overload, short-circuit or overheating, 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.

Rear Panel



No.	Buttons/Indicators	Description
1	Cooling fan	
2	Audio input & fault interface	FAULT indicates when the DA experiences a fault, it is disabled and sends a fault output via dry contact. LINE IN indicates the balanced input interface, for the input of an external audio source. BOOSTER INPUT indicates the 100 V 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.

No.	Buttons/Indicators	Description
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	Backup power input	To connect to 24V DC backup power supply.
9	Grounding screw	To connect to grounding wire.

Technical Specifications

Parameters	Values
Main power supply	AC 100V-240V 50/60Hz
Backup power supply	21.5V DC ~ 28.5V DC
Power consumption	<700W
Fuse	T10AH 250V
DA output	70V / 100V
Max. output power	400W for regular transmission of voice messages or background music. 400W (sine continuous tone according to EN54-16, continuous voice messages)
Frequency response	80Hz~18kHz (+1dB ~ - 3dB)
Input impedance	20KΩ
PA input (RJ-45)	1.4V
Line in	1.4V
Booster input	100V
Link output	1.4V
SNR	100dB±5%, A-weighted
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	10.6 Kg
Gross weight	13.2 Kg

Note:

In general, for both EN54-16 and non EN54-16 systems, the loudspeaker load of a single amplifier must not exceed 400W.

RK-MIC Remote Call Station

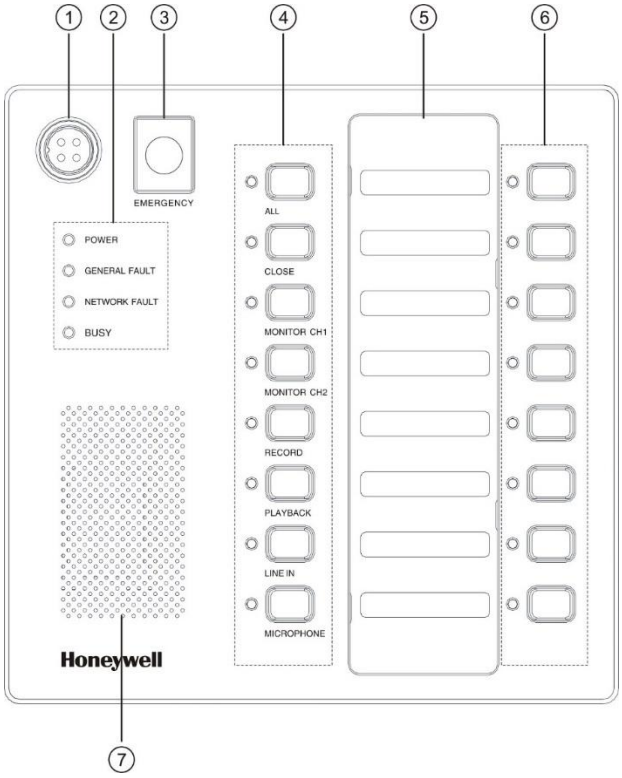
RK-MIC is used to perform the various broadcasts and live broadcasts to any or all selected zones. This unit has programmable buttons, users can easily conduct the operations, such as paging, BGM broadcast, business broadcast, voice alarm, volume control, recording, monitoring, etc. If necessary, extension 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 the 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.

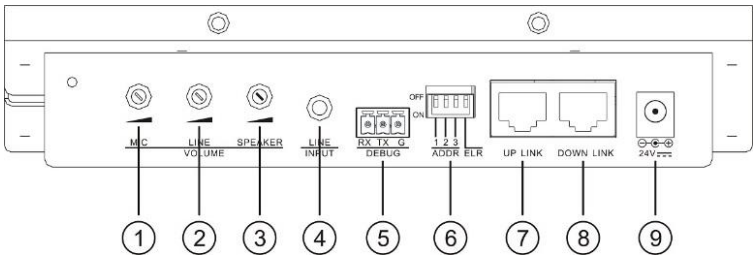
Product Appearance

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	The button is protected by a cover to prevent pressing by mistake. To switch to the manually mode, first lift the cover, and press down the button. The indicator will light in red.
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 chanels audio.

Rear Panel



No.	Parts/Ports	Description
1	MIC volume	To adjust the volume of the microphone.
2	Line volume	To adjust the volume of the line input.
3	Loudspeaker volume	To adjust the volume of the loudspeaker.
4	Line input	This port can be connected to an external audio device, such as a 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 stations for communication, which ranges from 1 to 6. This device has a built-in 120 Ω resistor for the 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 previous 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 an 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
Line Input	
Input signal	1V(0dBV)
Input impedance	10 KΩ
Frequency response	80Hz-18kHz, ±3dB
SNR	>85dB, A-weighted
THD	<0.1%
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

Parameters	Values
Gross weight	2.5Kg

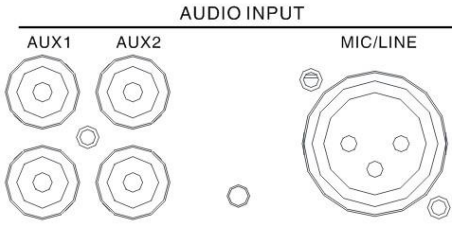
2 System Installation

Installers are required to understand the functional components of the system. Refer to the documentation provided for information on all system devices before installation.

Interface Introduction

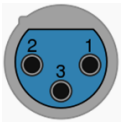
RK-MCU Master Control Unit

Audio Input

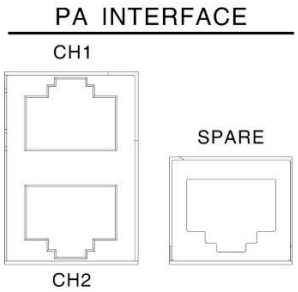


There are 3 audio inputs on the rear panel of the RK-MCU, which can be connected to external audio devices. AUX 1 and AUX 2 can be connected to the external audio source by RCA plugs. The signal level of both inputs should be less than 1 V, shielded cable with RCA terminals is recommended. MIC/LINE input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

XLR Terminal Definition:

PIN	Signal	Legend
1	Ground	
2	Positive	
3	Negative	

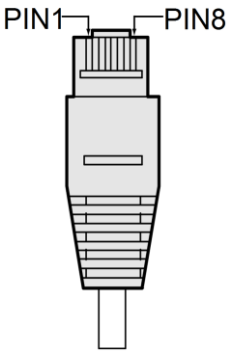
Power Amplifier Interface



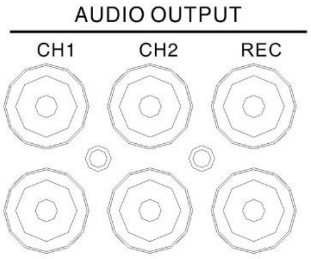
Power amplifier interfaces are used to connect a power amplifier to the external Master Control Unit. Audio, control, and fault signals, such as self-testing, power-saving information, and power fault/protection is transferred between the controller and power amplifier via this interface.

RK-MCU has 3 RJ-45 ports for power amplifier interfacing, to be used to connect to the amplifiers which correspond to audio channel 1, audio channel 2 and a spare amplifier. It is recommended to use premade cables to connect power amplifiers.

Wiring of the power amplifier interface:

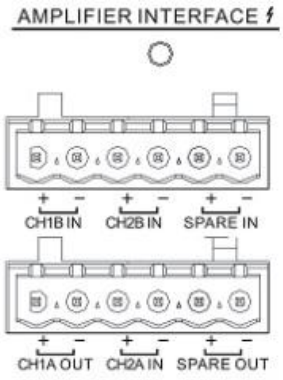
PIN	Signal	Legend
1	Self-testing control signal	
2	Power-saving control signal	
3	VCC (24 V DC), from device output to power amplifier	
4	Differential audio signal positive	
5	Differential audio signal negative	
6	Ground	
7	Power amplifier fault signal • When power amplifier works normally, the output voltage is 24 V DC. • When power amplifier is in fault, under the protection or self-testing condition, the output voltage is 0 V.	
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 a third-party system or an external power amplifier via RCA terminal. When a live announcement is active via the PTT microphone, the REC interface will output the audio signal of microphone. This is only available when the PTT microphone is active.

Amplifier Interface



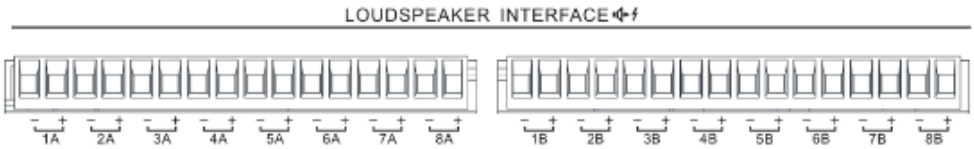
The Amplifier Interface is used to input or output the 100 V audio signal from power amplifier:

- CH1A outputs the 100 V audio signal of the internal amplifier, which corresponds to audio channel 1 and loudspeaker line from line 1 to line 4.
- CH1B can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 1 and enables loudspeaker lines 5 to 8.
- CH2A can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 2 and loudspeaker lines 1 to 4.

- CH2B can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 2 and loudspeaker lines 5 to 8.
- SPARE IN can be connected with a backup power amplifier, SPARE OUT interface from MCU or other zone expanders.
- SPARE OUT can be connected with the SPARE IN interfaces of other zone expanders.

These terminal connections are provided with the product. A cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

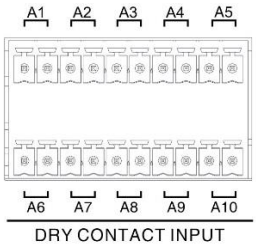
Loudspeaker Interface



The MCU has 2 groups (A and B) of loudspeaker line terminals. Each group can separately connect to 8 loudspeaker lines. The interfaces of 1A and 1B may be connected to two different speaker lines in the same zone, they will broadcast the same audio signal and can't be controlled separately. If an open circuit should occur on one speaker line, others won't be affected. While broadcasting, if a short circuit fault occurs on one speaker line, others will be momentarily affected, then the speaker line with the short circuit will be isolated, and the affected lines will recover.

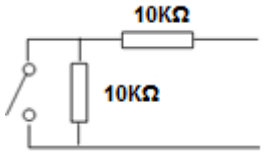
Connection terminals are provided with the product. A cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Contact Input



There are 10 contact inputs which can be supervised as needed. The interfaces can be directly connected with the dry contact output of third-party device(s). Other power sources must not be connected to these ports.

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

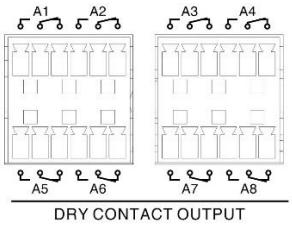


The connection terminals are provided with the product, a cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Note:

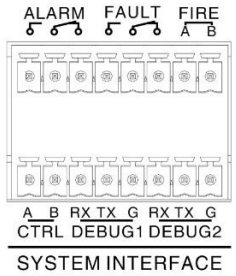
The contact input voltage is 24 V DC and should only be connected to a switch or relay. Check the signal type of the interfaces of the third device before installation. Do not connect to an external power source. If the output of the third-party device has voltage, please use a relay to convert the signal to a dry contact.

Dry Contact Output



There are 8 dry contact outputs, which are from A1 to A8, each port has NO, NC and COM. This provides a connection for external modules or third-party devices, such as a volume controller. The maximum voltage and current for each dry contact output are 250 V and 5 A.

System Interface

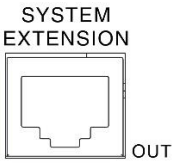


System interface is used to connect to an external device or a third-party system. Detailed functions are as below:

- ALARM - This is a dry contact output to be used to transmit the voice alarm status of the system to a third-party device. The port has NO, NC and COM terminals. While the system is playing emergency voice the interface will be activated, and will be deactivated during the interval time which is set in the task.
- FAULT – This is a dry contact output to be used to transmit the general fault status of the system to a third-party device. The port has NO, NC and COM terminals. While the system is in fault, the interface will be activated and send a fault signal to the third-party system.
- FIRE – This port is used to connect to the 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 connection terminals are provided with the product. A cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

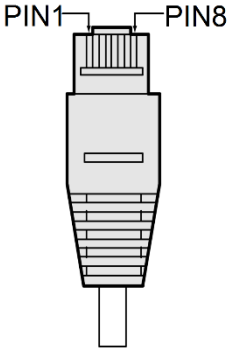
System Extension



Zone expanders shall be connected with the Master Control Unit via the system extension interface. Twisted pair CAT-5 is recommended. A twisted-pair (2m) cable is provided in the zone expander package.

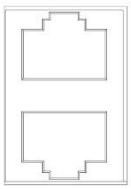
Wiring of the system extension interface:

PIN	Type	Legend
1	CH1 audio positive	
2	CH1 audio negative	

PIN	Type	Legend
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



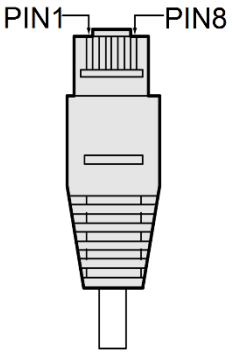
There are 2 call station interfaces (RJ-45) at the rear panel of the MCU, which are used to connect with remote call station(s). They include 24 V DC power, audio signal and CAN bus. Maximum 6 call stations and 2 branches can be connected.

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

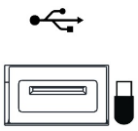
Note:

Up to 6 call stations can be connected with the Master Control Unit and the distance between the call station and MCU should be less than 600m.

Wiring of the call station interface:

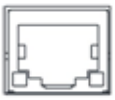
PIN	Type	Legend
1	Mic/Line audio positive to MCU	
2	Mic/Line audio negative to MCU	
3	24 V DC power	
4	Monitor audio positive from MCU	
5	Monitor audio negative from MCU	
6	Ground	
7	CAN bus positive	
8	CAN bus negative	

USB Interface



The USB interface can be used to insert a USB storage device. The port can be used only for audio playback.

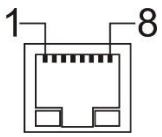
LAN



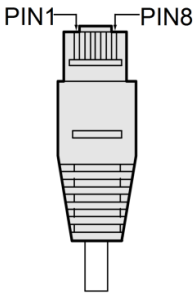
The LAN interface is used to connect to a PC or Ethernet switch for system configuration. User can set the function and parameters via Ethernet via the configuration software.

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

Wiring of the 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	

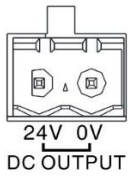
568A/568B cable order definition:

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	

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.

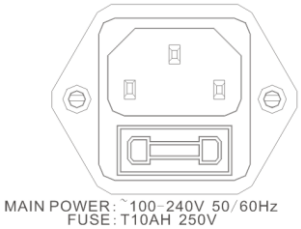
DC Power Output



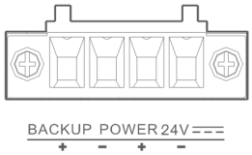
The MCU has a 24 V DC power output which can be used for external power. The output current should be less than 1 A. A resettable fuse is built into the interface to avoid any damage caused from a short circuit. The interface has DC power output whether it's powered by the main power supply or a backup power supply.

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

Power Input



The main power interface with a resettable fuse is used to connect to AC power source. T10 AH / 250 V fuse is recommended.



Backup power interface is used to connect to a 24 V DC power source.

The connector is provided in the package, a 2-pin cable with a cross-section of 4mm^2 is recommended.

RK-ZONE8 Zone Expander

Audio Input

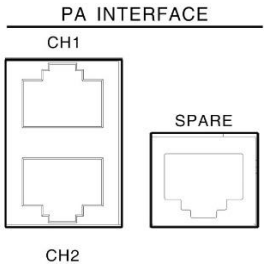


The RK-ZONE8 zone expander has a line input to connect to external audio devices. It should be used only if there is a CPU failure on the MCU or if the zone expander is in standalone mode. The level of audio input should be less than 1 V.

Note:

The audio signal of the 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.

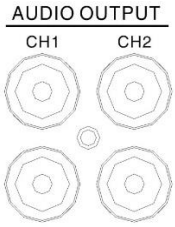
Power Amplifier Interface



The 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. The 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 provided cable to connect.

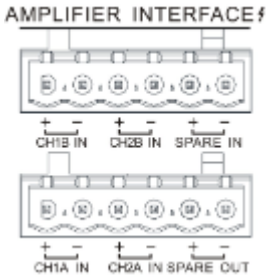
Please refer to the definition of “Power Amplifier Interface” of RK-MCU.

Audio Output



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

Amplifier Interface

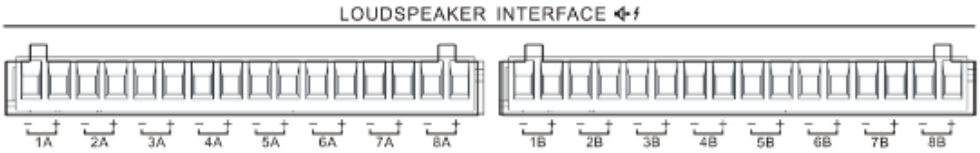


The amplifier interface is used to input or output 100 V audio signals from the power amplifier:

- CH1A can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 1 and loudspeaker lines 1 - 4.
- CH1B can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 1 and loudspeaker lines 5 - 8.
- CH2A can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 2 and loudspeaker lines 1 - 4.
- CH2B can be connected with the 100 V audio signal from an external power amplifier, which corresponds to audio channel 2 and loudspeaker lines 5 - 8.
- SPARE IN can be connected with a backup power amplifier or SPARE OUT interfaces from the MCU 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.

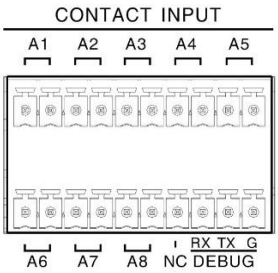
Loudspeaker Interface



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

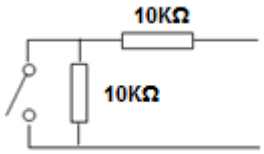
Matching terminals are attached in the package, the cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Contact Input Interface



There are 8 contact inputs which can be supervised as needed. The interfaces can be directly connected with dry contact outputs of third-party devices. Do not connect other power sources to these ports.

When the supervision function is disabled, dry contact outputs of the third-party devices can be directly connected to contact inputs. When supervision function is enabled, two 10k ohm resistors should be installed on the dry contact outputs of the third-party device, as shown below.



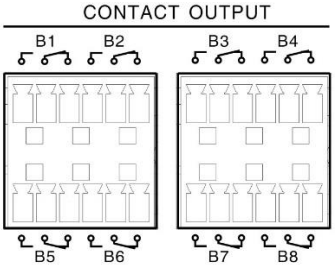
Debug interface is a RS-232 port, which can be used to upgrade the firmware.

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

Note:

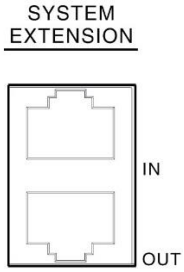
The voltage of contact input is 24 V DC. Only a switch or relay can be connected. Make sure the signal type of the interfaces matches with the third-party device before installation, and not to connect to an external power source. If the output of the third-party device has any voltage, use a relay to convert the signal to dry contact.

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 a third-party device, such as volume controller can be connected. The maximum voltage and current for each dry contact output are 250V and 5A.

System Extension



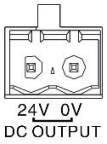
The system extension interface is used to transmit the audio and control signals between system components, such as the RK-MCU and zone expanders. The input interface can be connected to the extension output interface of other devices, and output interface can be connected with other extension input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

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

Note:

Do not connect extension inputs or extension outputs of the same device together or to each other.

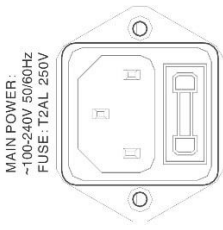
DC Power Output



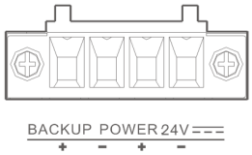
The RK-ZONE8 has a 24 V DC power output which can be used for external devices. The output current should be less than 1 A. A resettable fuse is built into the interface to avoid any damage caused from short circuits. The interface has a DC power output whether the device is powered by the main power supply or the backup power supply.

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

Power Input



The main power interface with a resettable fuse is used to connect to AC power source. A T10 AH/250 V fuse is recommended.

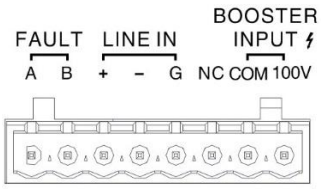


The backup power interface is used to connect to a 24 V DC power source.

The connector is provided in the package, a 2-pin cable with a cross-section of 1mm^2 to 1.5mm^2 is recommended.

RK-AMP500 500W Class-D Power Amplifier

Audio Input



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

The BOOSTER INPUT is a high voltage input used to connect to the 100 V output of other power amplifiers.

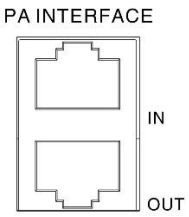
The audio signals from LINE IN 1, BOOSTER INPUT 2 and controllers, such as the RK-MCU or zone expanders is mixed and amplified.

The connection terminals are provided in the package, a 2-pin shielded audio connector with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended for LINE IN 1 and a 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 shorted. This interface can be connected with third party devices to transfer the fault signal of a power amplifier.

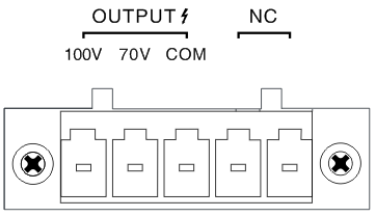
Power Amplifier Control Interface



The power amplifier control interface is used to connect with controllers, such as the RK-MCU or zone expanders to transfer audio and control signals, such as self-test, power-saving signal to the power amplifier, or fault signals, 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.

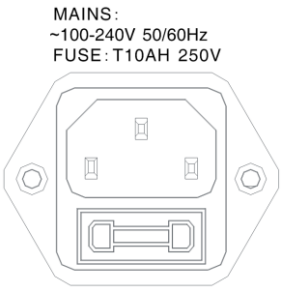
Please refer to the definition of “Power Amplifier Interface” of the RK-MCU.

Power Amplifier Output

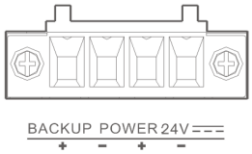


There are two outputs, 70 V or 100 V, which are used to output the high voltage audio signal from the power amplifier. The terminal is attached in the package, 2-pin cable with a cross-section of 0.5mm^2 to 1.5mm^2 is recommended.

Power Input



Main power interface with a resettable fuse is used to connect to an AC power source. T10 AH/250V fuse is recommended.



The backup power interface is used to connect to a 24 V DC power source.

The connector is provided in the package, a 2-pin cable with a cross-section of 3mm^2 to 3.5mm^2 is recommended.

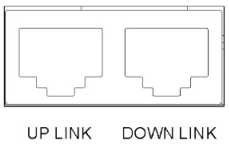
RK-MIC Remote Call Station

Line Input



The line input interface of the RK-MIC uses a 3.5mm TRS interface, which can be directly connected with an audio device via cables. Provided audio cable can match the interface when connecting the RCA interface of an audio device.

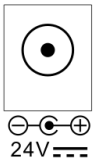
Call Station Interface



There are two RJ-45 ports, named UP LINK and DOWN LINK. The UP LINK interface is used to connect to the Master Control Unit or the DOWN LINK of a call station. The DOWN LINK interface is used to connect to the UP LINK of a call station. The interface includes 24 V DC power, audio and the CAN control bus.

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

Power Input



The remote call station can be powered by the Master Control Unit via twisted-pair cable or by the external power adaptor. For long cable distances or a large quantity of devices, a power adapter can be connected directly even it is also powered by the Master Control Unit. The call station will switch to the 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
- Plastic ties

Preparing Cables and Auxiliary Equipment

Prepare the following cables before installing the system devices:

- Power cable

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

- Power amplifier control interface cable

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

- Power amplifier cable

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

  An 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 shielded 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). Shielded twisted-pair cables are recommended.

- Contact input/output cables and external devices (optional)

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

Specification of Loudspeaker Cables

The following cable cross-sections(mm^2) must be used for loudspeaker loop, depending on the power and cable length.

Power / Length	100W	200W	300W	400W	500W
100m	0.5	0.5	0.5	0.75	0.75
200m	0.5	0.5	0.5	0.75	1
300m	0.5	0.75	0.75	1	1.5
400m	0.5	0.75	0.75	1	1.5
500m	0.5	0.75	0.75	1.5	1.5
600m	0.5	0.75	1	1.5	1.5
700m	0.75	1	1	1.5	2
800m	0.75	1	1.5	2	2
900m	0.75	1.5	1.5	2	2.5
1000m	0.75	1.5	1.5	2	2.5

Cable Type：The loudspeakers can be connected using communications cable I-Y (St) Y n×2×0.8mm, for example. If a different, comparable cable type is used, please bear in mind the output and cable length required.

Conversion: Cable cross-section → Cable diameter

0.5 mm^2 → 0.8 mm

0.75 mm^2 → 1.0 mm

Calculation aid: Loop fault-free → Max. 1dB (=10%) power loss

Loop with faults → Additional 2 dB power loss

Up to 1st speaker max. 150 m cable length; the further speakers are evenly distributed.

Packing List Inspection

Please check the external packages for damage 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

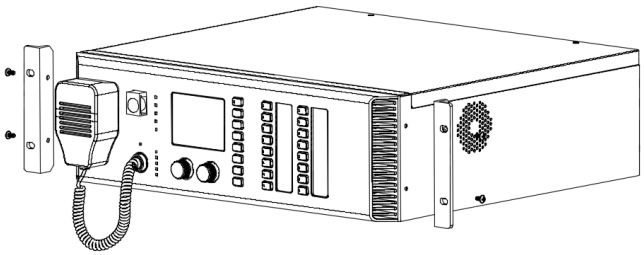
The devices support cabinet installation, and the remote call stations support both desktop and cabinet installation.

Installing the Devices in the Appliance Cabinet

Each device is attached with the cabinet brackets, which can be installed into a 19-inch 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 screws to fasten.



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

No.	Model	Name	Height
1	RK-MCU	Master Control Unit	3U
2	RK-ZONE8	8 Zone Expander	2U
3	RK-AMP500	500W Class-D Power Amplifier	2U
4	X-NPMS-R	Rack Bracket for Call Station	5U

Note: the height of 1 U is 44.5mm.

3. Install the bottom plate according to arrangement. Use screws to fasten the connection between the plate and cabinet. Do not twist or squeeze the plate.

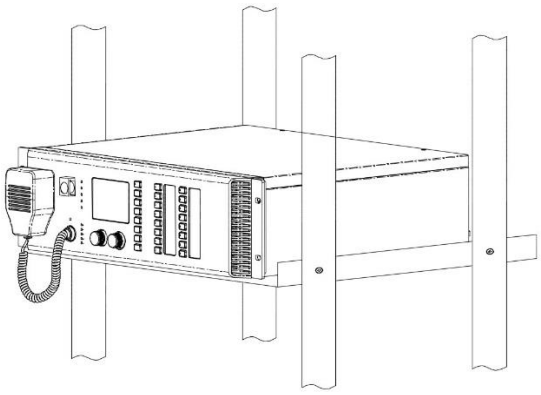
Note:

It is recommended to use an L or U-shaped plate to support the devices in the cabinet and ensure acceptable stress levels on the device brackets.

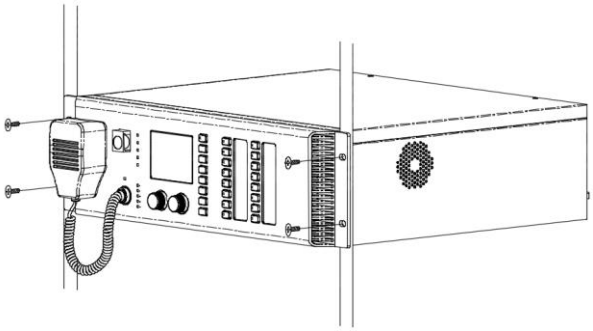
Do not pile the devices with only fixing the brackets of front panel.

In order to comply with the regulations of EN 54-16 certification, please install the machine legs which are provided in the packages.

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



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



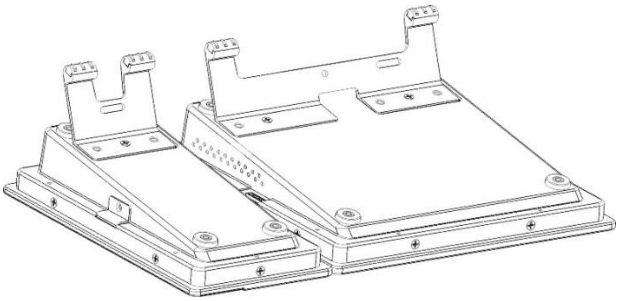
6. Install the 1 U panel to the free space.

Installing the Remote Call Station on Desktop

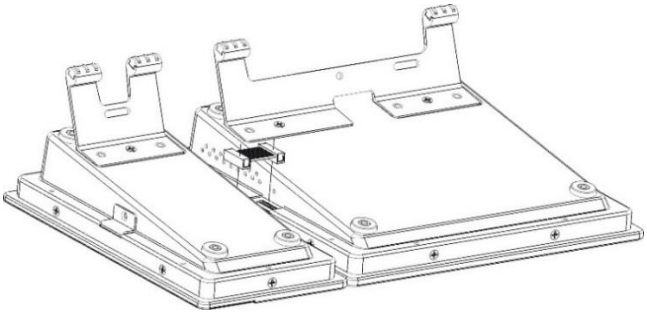
Installing the Key Module

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

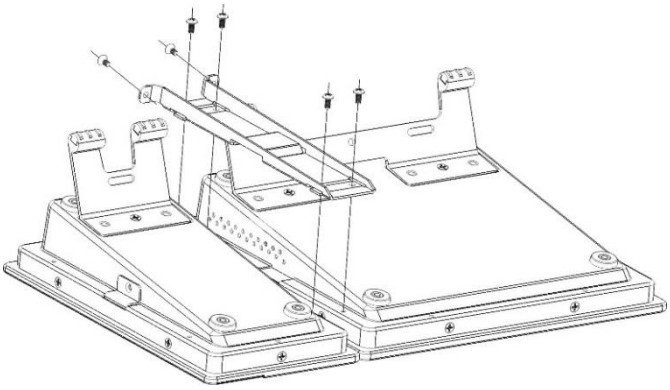
1. Turn the remote call station and key module over on the desktop, as shown below:



2. Connect the remote call station and key module together using the cables provided.



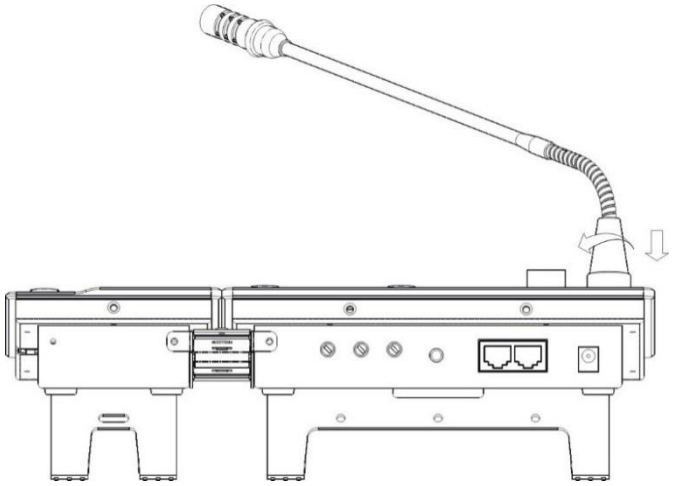
3. Install the bracket between them, as shown below, and fasten using the screws provided. Turn the module over.



4. Repeat these steps to install the remaining modules.

Installing the Goose-neck Microphone

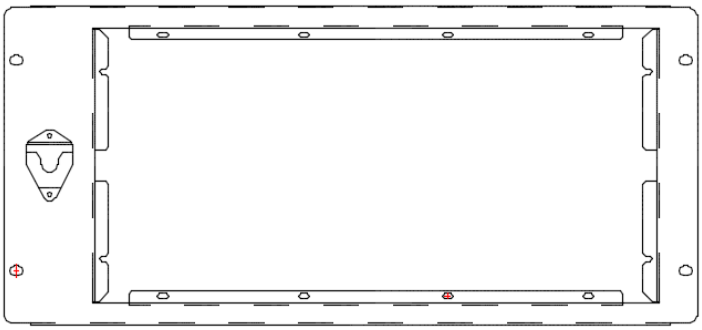
Insert the microphone plug to the top-right socket on the RK-MIC and clockwise rotate to fasten the bottom screw.



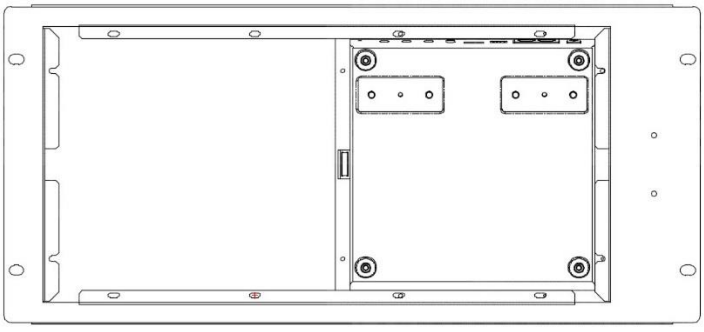
Installing the Remote Call Station in Cabinet

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.



2. With the call station in place, turn the bracket over. Use the screws provided to fasten the call station to the bracket.

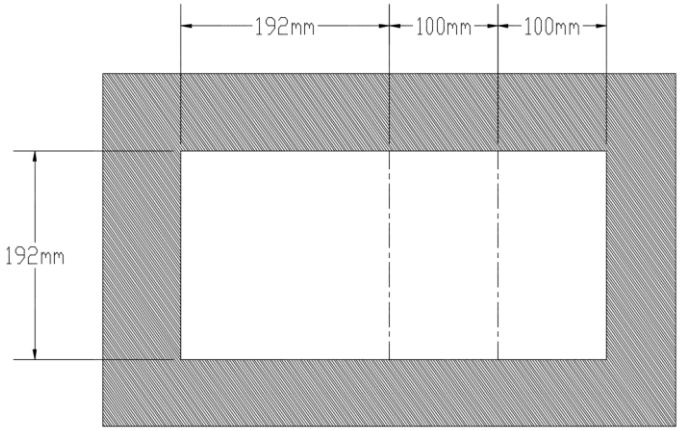


3. Place the bracket/call station assembly in the cabinet and use the hardware provided to fasten it.

4. Install the PTT microphone to the RK-MIC socket and hang the microphone in the space provided on the left side of the rack.

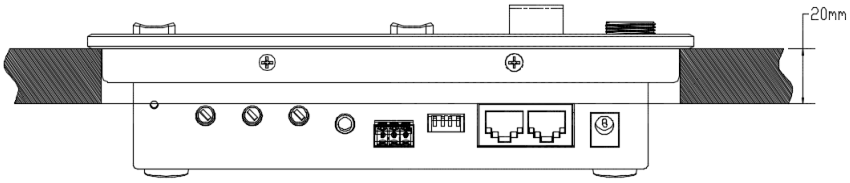
Flush Installation of a Remote Call Station

To flush mount the installation of the RK-MIC, use the dimensions below to create the opening to install the call station.



The 192 mm x 192 mm section of the above stated dimensions is for the flush installation of the remote call station only. For key modules, expand the length by 100 mm for each module.

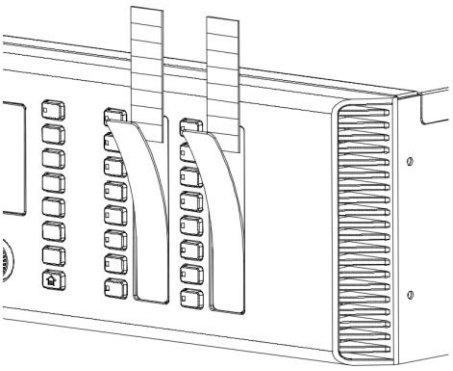
The diameter of cable should be less than 20 mm. Ensure that there is enough space to accommodate the wiring and connections.



Installing Device Labels

Installing RK-MCU Labels

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



To install the labels, follow these steps:

1. Use a flat-blade tool, such as a screwdriver, to lift the plastic cover of the label slot.
2. Remove the protective cover.
3. Place the label in the slot.

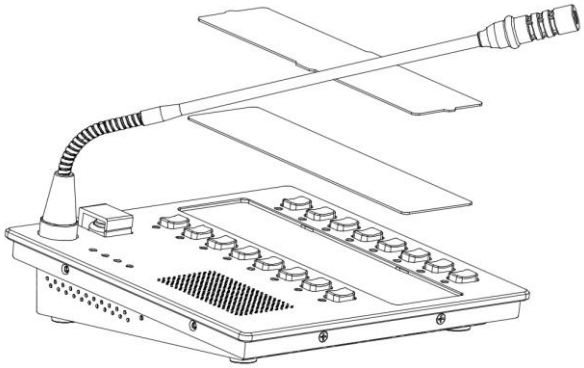
4. Replace the plastic cover.

Installing RK-MIC Labels

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

The steps are as follow:

1. Use a flat-blade tool, such as a screwdriver, to lift the plastic cover of the label slot.
2. Remove the protective cover.
3. Place the label in the slot.
4. Replace the plastic cover.



Connecting the System

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

Connecting Power Supply

All the devices except the RK-MIC have special mains power supply interfaces and backup power supply interfaces. The 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 power supply.

Connecting the Backup Power Supply

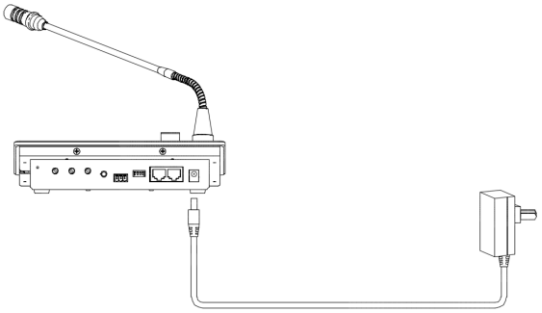
If the system has no backup power supply, please disable the supervision of backup power supply using the configuration software tool.

The backup power supply of devices should be connected to power supply equipment with a 24 V DC output. Before connecting, make sure the output current of the PSU meets the power consumption requirements of the device.

The backup power supply connection is provided in the package. Pay attention to the polarity when wiring.

Connecting the RK-MIC Power Supply

The remote call station can be powered by the Master Control Unit through the twisted-pair cable. If the RK-MIC can’t be powered due to long distance or exceeding the power consumption limitations of devices, an AC power adaptor can be connected to the 24 V DC port of the remote call station.



Note:

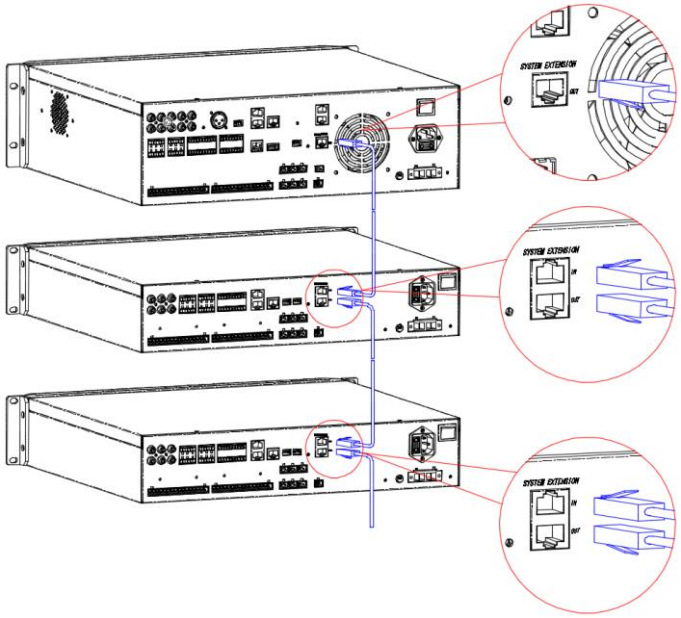
If the distance between the RK-MCU and RK-MIC is over 400 meters, and there are more than one RK-MIC, please connect AC power adaptors to remote call stations.

Connecting Zone Expanders

Zone expanders can be connected to the Master Control Unit by using the twisted-pair cable, which is provided in the package.

The connection steps are shown as below:

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

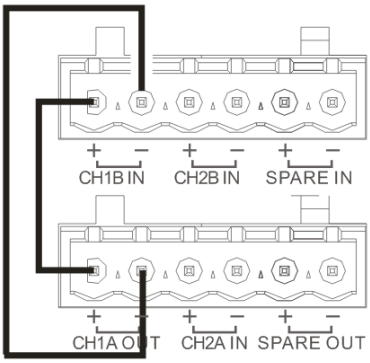


Connecting RK-MCU

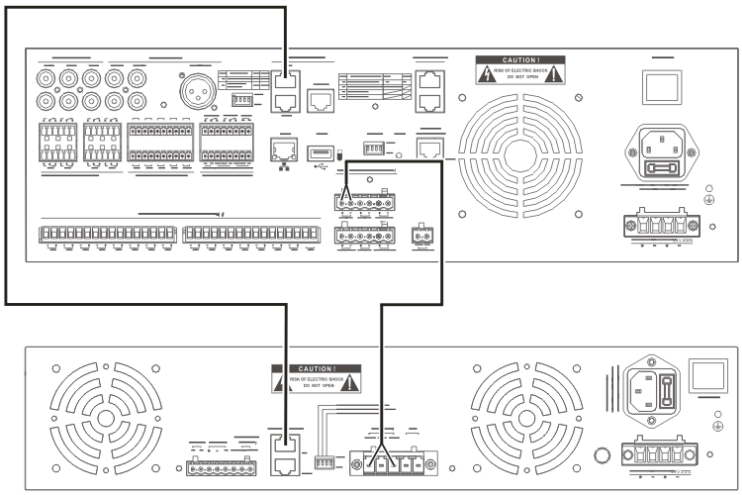
Connecting Main Power Amplifier

The amplifier interface of the Master Control Unit (pictured below) is used to connect the 100V output of the power amplifier. The Master Control Unit has a 500W internal power amplifier. The high voltage signal can be outputted through the CH1A OUT port. A maximum of 3 external power amplifiers can be connected to the Master Control Unit.

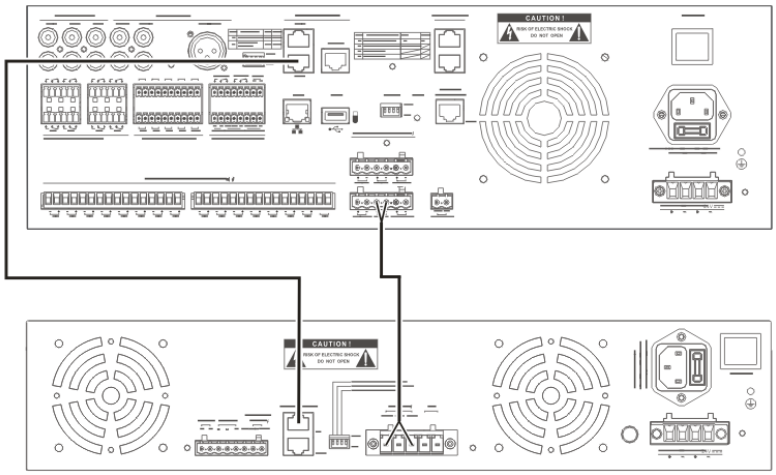
1. Under the single channel mode, if there are less than 4 zones, no connection of power amplifier is needed.
2. In the single channel mode, if there are more than 4 zones and the total power rate is less than 500W, connect the device as follows:
   - Connecting the “+” and “-” of “CH1A OUT” to the corresponding ports of “CH1B IN”.



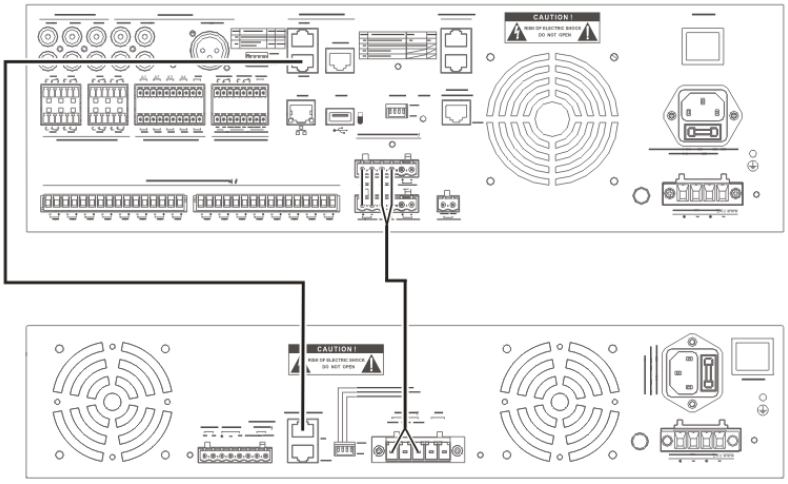
3. Under the single channel mode, if there are more than 4 zones and the total power rate is more than 500W, the external power amplifier needs to be connected as the following steps:
   - Use a twisted-pair cable to connect PA interface “CH1” of RK-MCU to the PA interface “IN” of power amplifier.
 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



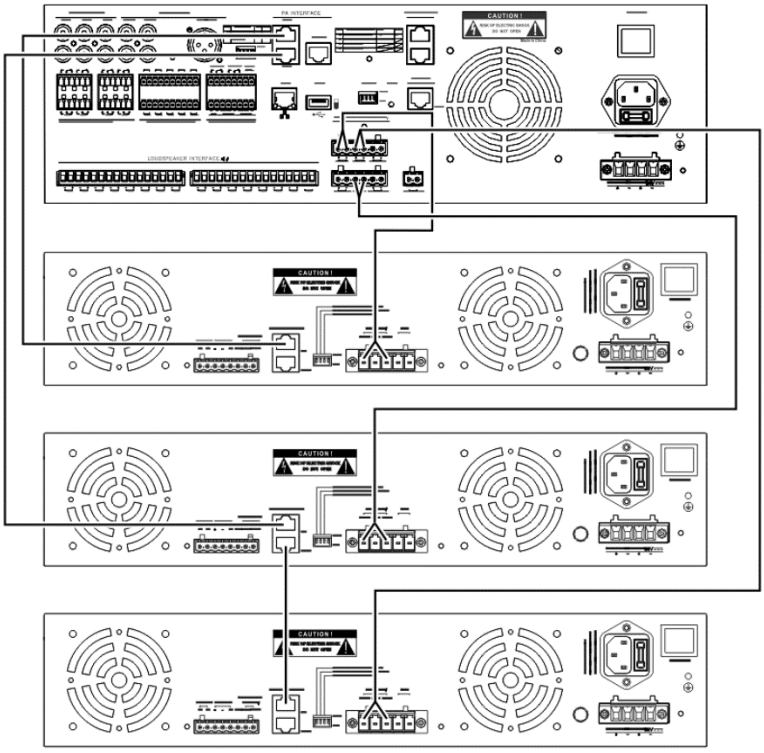
4. Under the dual channel mode, if there are less than 4 zones, one external power amplifier for CH2 need to be connected as the following steps:
   - Use twisted-pair cable to connect PA interface “CH2” of RK-MCU to the PA interface “IN” of power amplifier.
   - Connect the “100V” and “COM” output of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



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 “+” and “-” of “CH1A OUT” to the corresponding ports of “CH1B IN”.
   - 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, “COM” output connects to “CH2A IN-” input.
   - Connect the “+” and “-” of “CH2A IN” to the corresponding ports of “CH2B IN”.



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

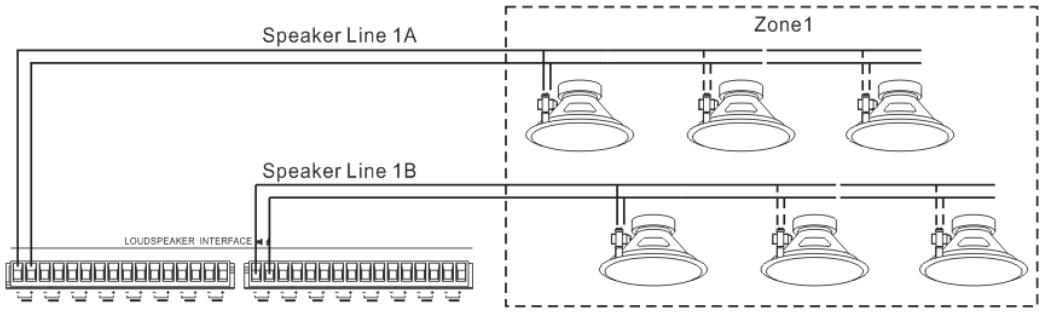


Connecting Speaker Line

Refer to the related manual of loudspeakers before connection. Follow the steps below to connect the speaker line to the RK-MCU.

1. Strip approximately 10mm of insulation from the cable and insert it into the loudspeaker terminal. Fasten the screw.
2. Insert the terminal with the installed audio cable into the loudspeaker interface of the RK-MCU.
3. Install the protective cover to avoid electric shock.

Sometime, the loudspeakers of zones need be connected to the system in two branches, the speaker lines may be connected as the below figure.

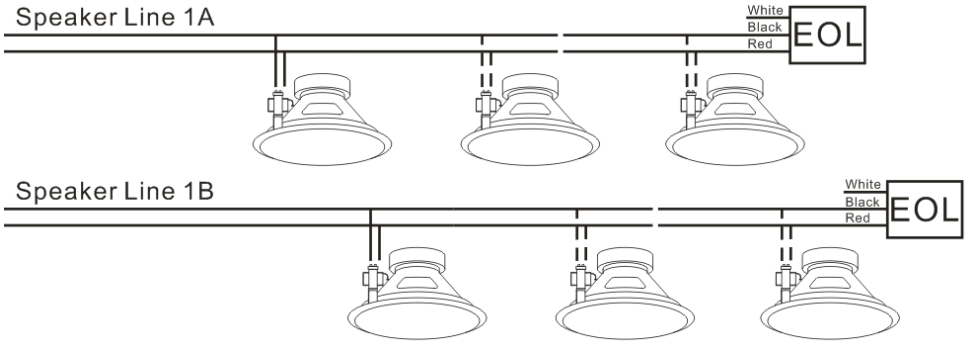


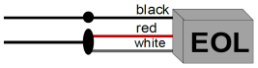
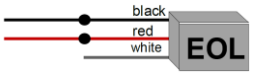
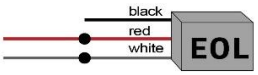
Note:

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

Connecting EOL Module

If the speaker lines need to be supervised, please connect end-of-line module (EOL) to the end of speaker lines.



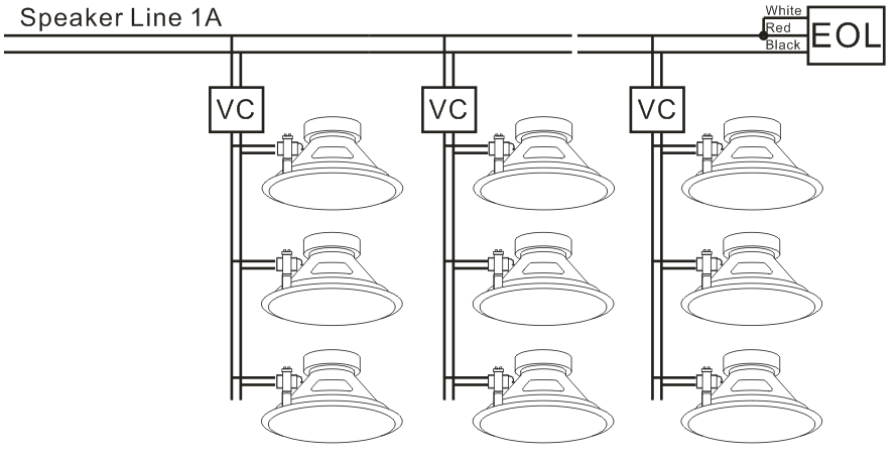
	From 250 W (inclusive) upwards
	40W to 250W
	Up to 40W(inclusive)

Note:

It is recommended to do line supervision tests during commissioning for all installed speaker lines by disconnecting the last speaker/EOL.

Please contact technical support for additional information.

If volume controller is used in speaker lines to control the output volume of some branches, please connected the EOL module as below:



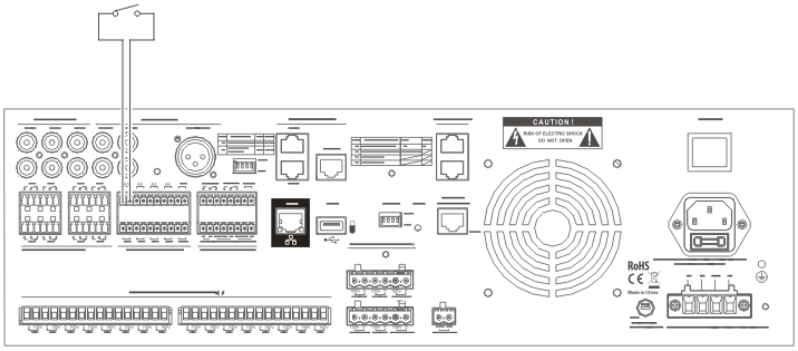
Note:

Spur lines with volume controllers are not monitored.

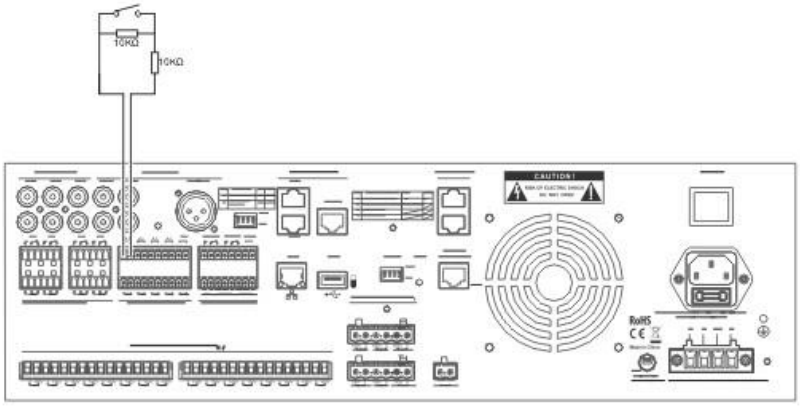
Connecting Contact Input

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

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



2. If the line of the contact inputs needs to be supervised, it is necessary to install 10kΩ resistors to each switch output of the external devices or the third-party device as shown below:



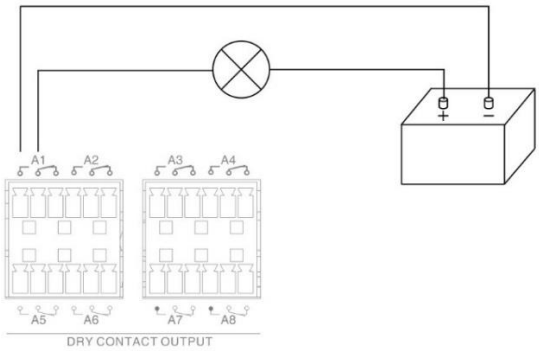
Connecting Dry Contact Output

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

Follow the steps below to connect dry contact outputs:

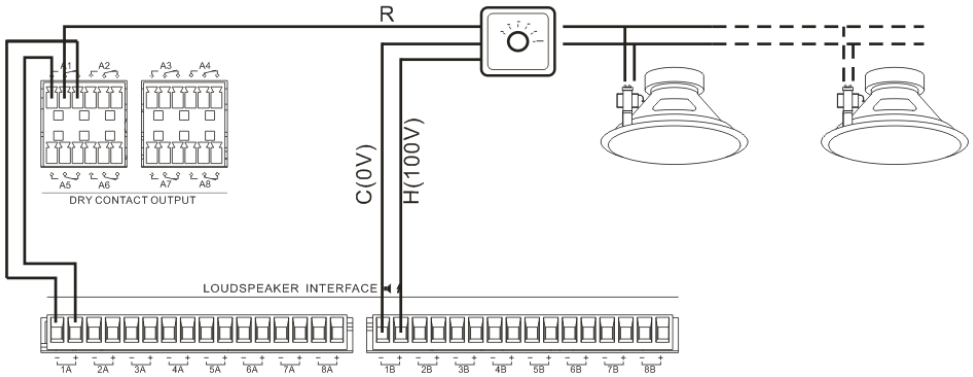
1. Control external device

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



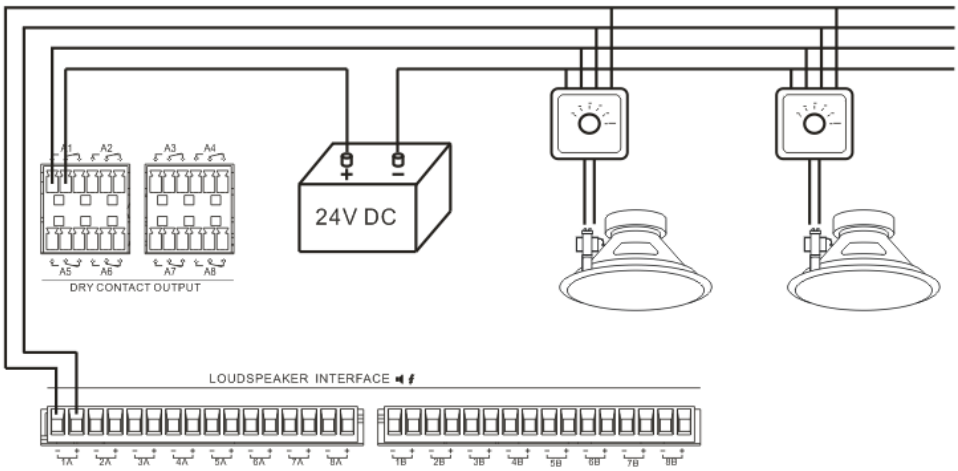
2. Connecting 3-wire volume controller

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



3. Connecting 4-wire volume controller

When connecting a 4-wire volume controller, please refer to the user's manual of the volume controller. The diagram below shows the connection:



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 devices, it is necessary to select the matching interface according to the audio signal type. Unbalanced signal can be input from AUX1/AUX2 (RCA interface). Both

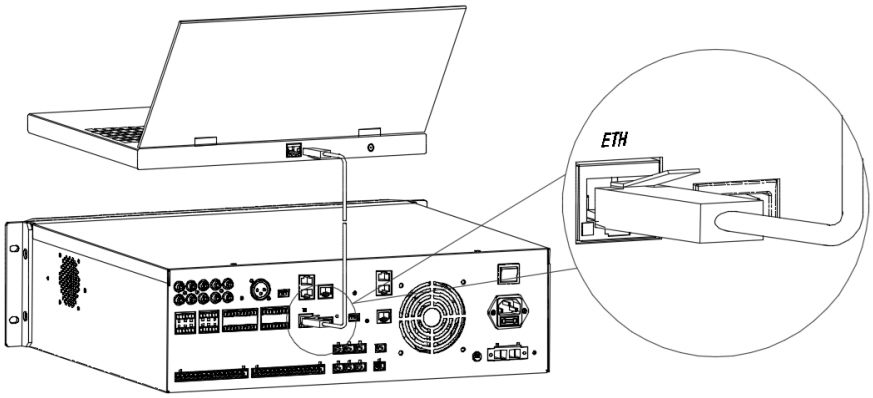
balanced and unbalanced signals can be input through the MIC/LINE (XLR interface). A shielded cable is required and the plugs in both sides need to match the device interface.

Note:

The gain and phantom power of the MIC/LINE port can be set using the DIP switch. Please set the DIP switch according to the audio source. The port set to be the LINE input has no phantom power output by default. When the phantom power is enabled, the interface will output 24V DC and power to the external audio source. When using this function, ensure that the audio device is not damaged.

Connecting Computers

When using a PC to configure the system, the Master Control Unit needs to be connected to a PC with or without Ethernet switch.

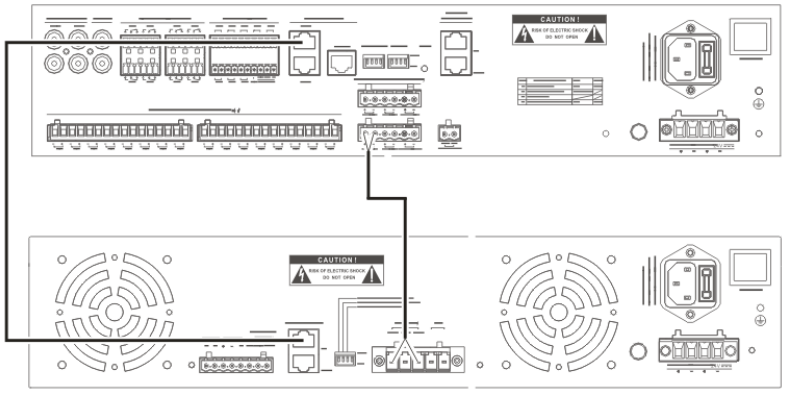


Connecting RK-ZONE8

Connecting Main Power Amplifiers

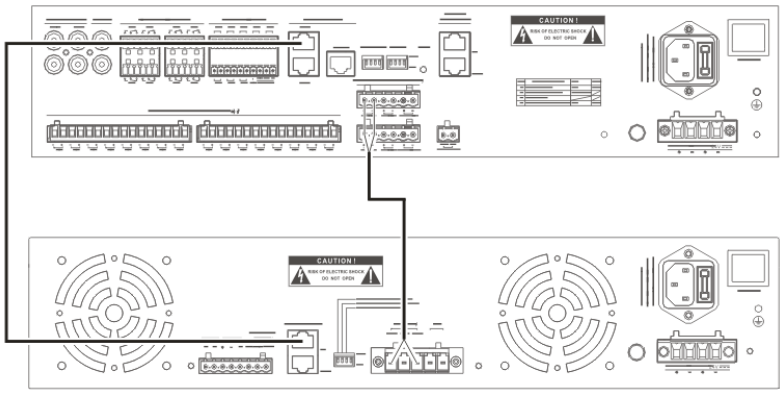
The relevant amplifier interface of the RK-ZONE8 has a detailed description in the “Interface Introduction” section. A maximum of 4 power amplifiers can be connected to the RK-ZONE8. Select the proper connection method according to the expected application.

1. In single channel mode, if there are fewer than 4 zones, an external amplifier needs to be connected as follows:
   - Use a twisted-pair cable to connect the PA interface “CH1” of the RK-ZONE8 to the PA interface “IN” of the power amplifier.
   - Connect the “100V” and “COM” output of the power amplifier to “CH1A IN” of the RK-ZONE8; “COM” output connects to the “CH1A IN-” input.

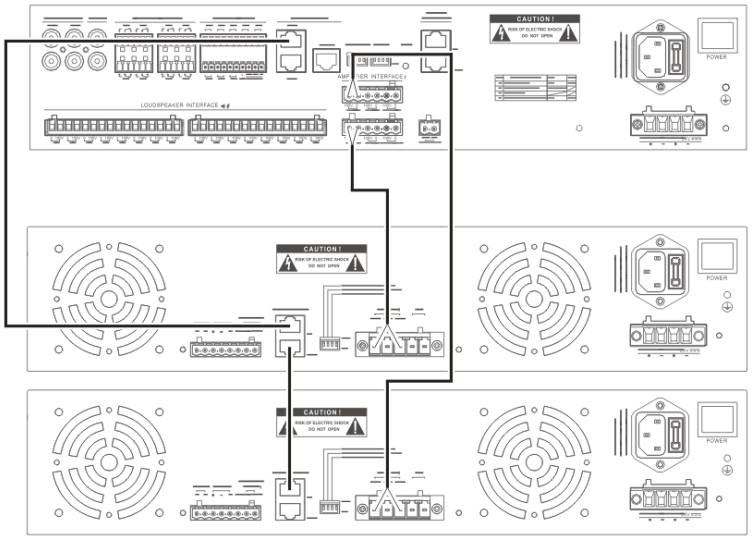


2. In single channel mode, if there are more than 4 zones and the total power rate is less than 500W, the external power amplifiers need to be connected as follows:

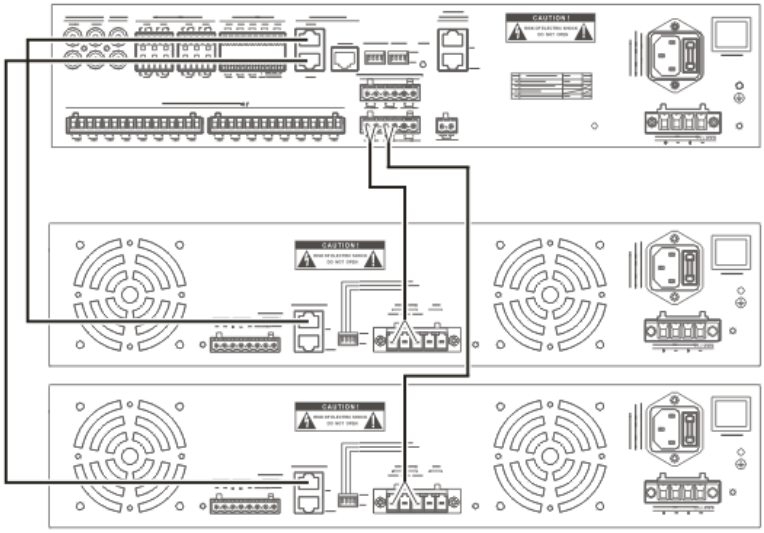
- Use a twisted-pair cable to connect the PA interface “CH1” of the RK-ZONE8 to the PA interface “IN” of the power amplifier.
- Connect the amplifier output port “100V” and “COM” to RK-MCU input port “CH1A IN”; port “COM” output connects to the “CH1A IN-” input.
- Connect the “+” and “-” of “CH1A IN” to the corresponding ports of “CH1B IN”.



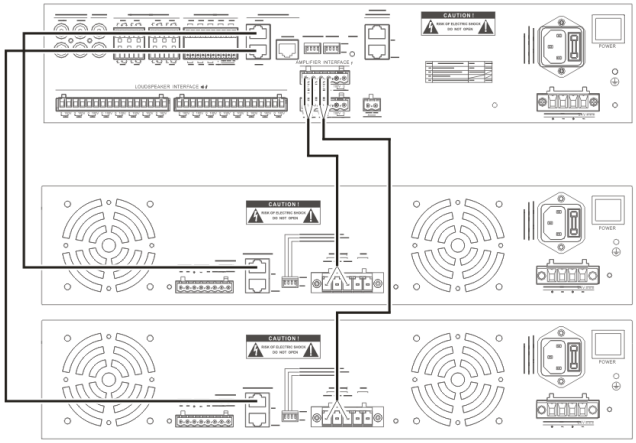
3. In single channel mode, if there are more than 4 zones and the total power rate is more than 500W, the external power amplifier needs to be connected as follows:
   - Use a twisted-pair cable to connect the PA interface “CH1” of the RK-ZONE8 to the PA interface “IN” of the first power amplifier.
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



4. In dual channel mode, if there are fewer than 4 zones and the total power rate is less than 500W, connect the external power amplifiers as follows:
   - Use a twisted-pair cable to connect the PA interface “CH1” of RK-ZONE8 to the PA interface “IN” of the first power amplifier.
   - Connect the output port “100V” and “COM” of the first power amplifier to the RK-ZONE8 input port “CH1A IN”.
   - Use a twisted-pair cable to connect the PA interface “CH2” of the RK-ZONE8 to the PA interface “IN” of the second power amplifier.
   - Connect the output port “100V” and “COM” of the second power amplifier to the RK-ZONE8 input port “CH2A IN”; “COM” output connects to the “CH2A IN-” input.

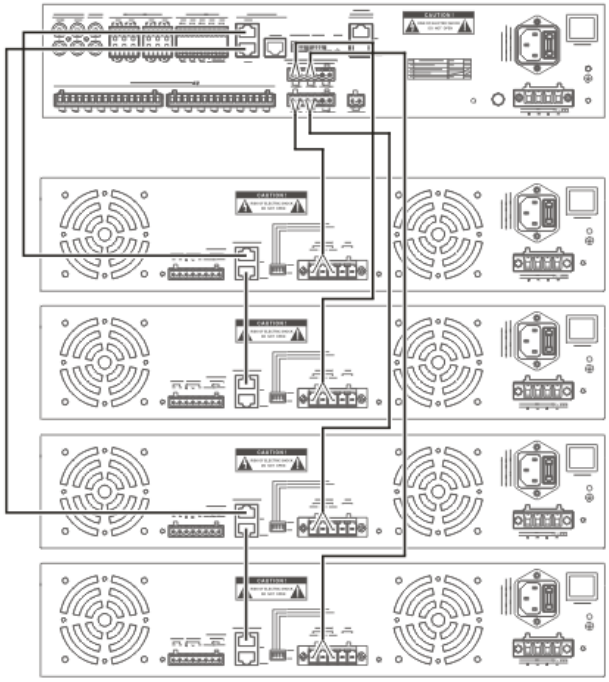


5. In dual channel mode, if there are more than 4 zones and the total power rate is less than 500W, 2 external power amplifiers need to be connected as follows:
   - Use a twisted-pair cable to connect the PA interface “CH1” of the RK-ZONE8 to the PA interface “IN” of the first power amplifier.
   - Connect the “100V” and “COM” output of the first power amplifier output port to “CH1A IN” of the RK-ZONE8; “COM” output connects to the “CH1A IN -” input.
   - Connect the “+” and “-” of “CH1A IN” to the corresponding ports of “CH1B IN”.
   - Use a twisted-pair cable to connect the PA interface “CH2” of the RK-ZONE8 to the 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 the RK-ZONE8; “COM” output connects to the “CH2A IN -” input.
   - Connect the “+” and “-” of “CH2A IN” to the corresponding ports of “CH2B IN”.



6. In 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 follows:
   - Use a twisted-pair cable to connect the PA interface “CH1” of the RK-ZONE8 to the 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 the RK-ZONE8; “COM” output connects to the “CH1A IN -” input.
   - Use a twisted-pair cable to connect the PA interface “OUT” of the first power amplifier to the 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 the RK-ZONE8.

- Use a twisted-pair cable to connect the PA interface “CH2” of the RK-ZONE8 to the 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 the RK-ZONE8.
- Use a twisted-pair cable to connect the PA interface “OUT” of the third power amplifier to the 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 the RK-ZONE8.

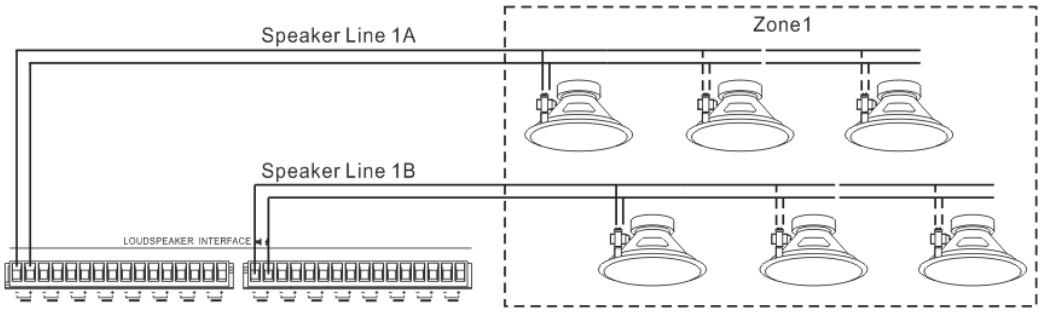


Connecting Loudspeaker Line

Please refer to the related manual for the loudspeakers before connection. Follow the steps below to connect the speaker line to the RK-ZONE8:

1. Strip about 10mm (0.4 in.) of the insulated surface of the cable and insert it into the loudspeaker terminal, then fasten the screw.
2. Insert the terminal with the installed audio cable into the loudspeaker interface of the RK-MCU.
3. Install the protective cover to avoid electric shock.

Sometimes, the loudspeakers of the zones need to be connected to the system in two branches. The speaker lines may be connected as shown in the figure below.



Note:

Be sure to match the polarity when connecting the loudspeaker cable to the terminal.

Connecting EOL Module

The method for connecting the EOL module is the same as the RK-MCU; please refer to “Connecting EOL Module” in the “Connecting RK-MCU” section.

Connecting Contact Input

The method for connecting the RK-ZONE8 to the contact input is the same as the RK-MCU; please refer to “Connecting Contact Input” in the “Connecting RK-MCU” section.

Connecting Dry Contact Output

The method for connecting the RK-ZONE8 to the dry contact output is the same as the RK-MCU; please refer to “Connecting Dry Contact Output” in the “Connecting RK-MCU” section.

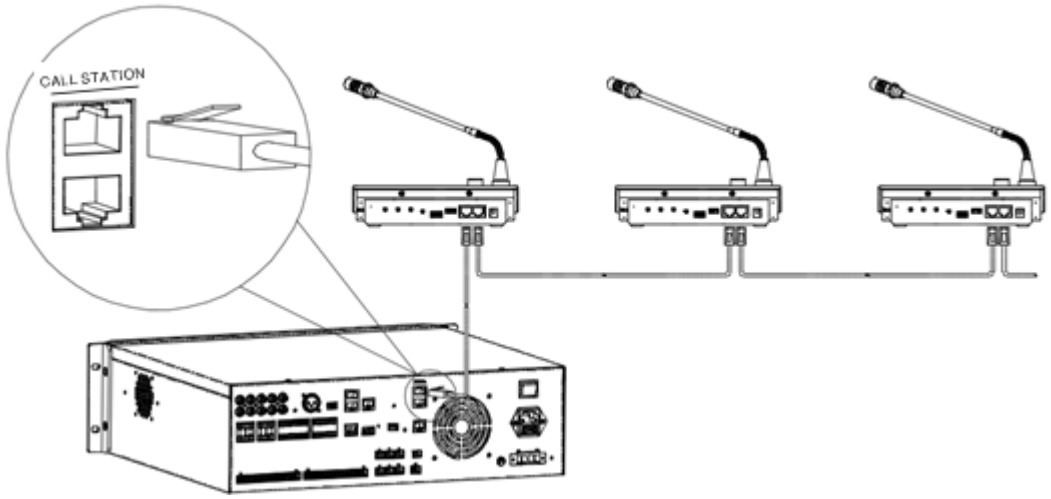
Connecting Audio Device

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

Connecting the RK-MIC

Connecting with RK-MCU

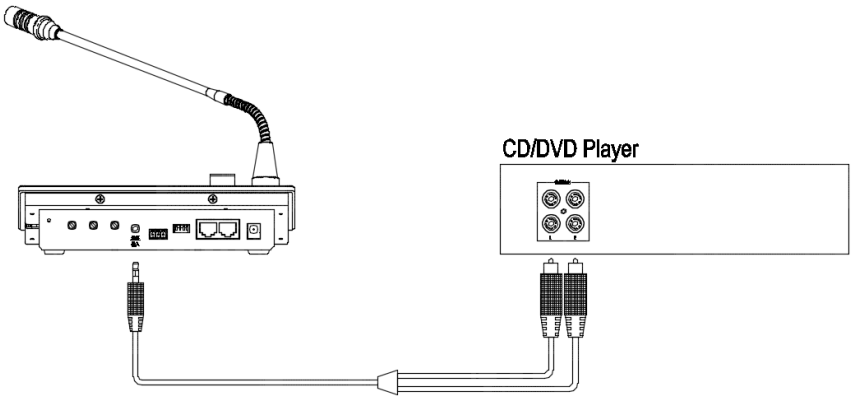
Please refer to the chapter “Call Station Interface” for specific information on the RK-MIC interface. Use the twisted pair to connect the call station interface of the RK-MCU to the input interface of the RK-MIC. There are 2 call station interfaces on the RK-MCU; RK-MIC can connect to either of them.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



Connecting External Audio Source

RK-MIC has 1 audio input interface to connect to an external audio source, which is used for BGM broadcast. Since the interface has a TRS port with a cross-section of 3.5mm, it is necessary to use an attached cable to connect to an audio device. When connecting, insert 2 RCA plugs into the

output port of the left and right channel of the audio device and insert the terminal with a cross-section of 3.5mm into the line in port.

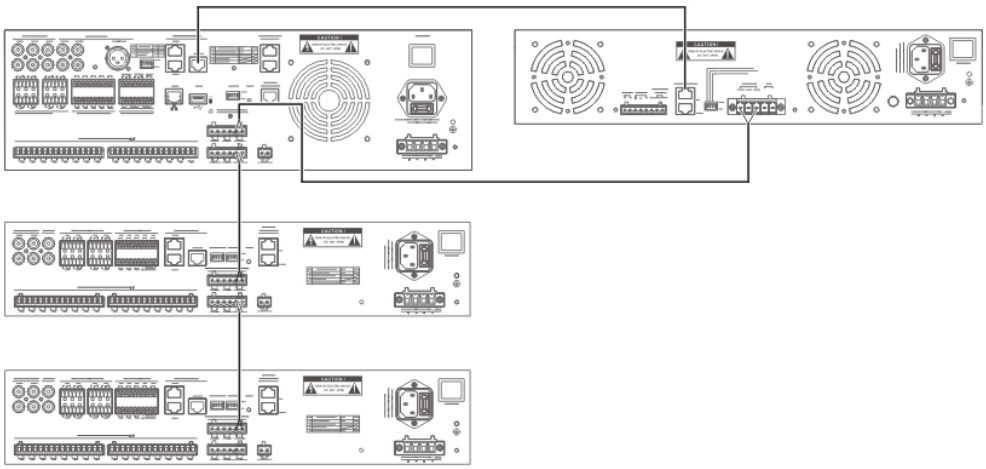


Connecting Spare Power Amplifier

If a backup 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 the spare amplifier.

- Connect the PA interface of the spare power amplifier to the spare interface of a controller (which may be RK-MCU or RK-ZONE8).
- Connect the 100V output of the spare power amplifier to SPARE IN of the controller.
- Connect SPARE OUT of the controller to SPARE IN of another controller one by one.

The connection is shown below:



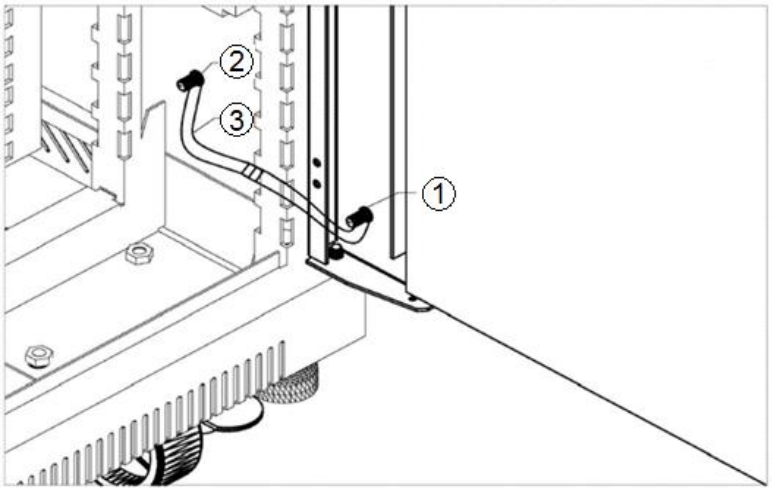
To ensure correct function, the configuration must follow the actual connection of the spare power amplifier.

Grounding

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

1. Connecting Cabinet Grounding Wire

Generally, the cabinet has a special grounding terminal. The ground of the doors should be connected with the ground of the cabinet. In the figure, ① and ② are grounding screws, which need to be connected.



2. Connecting Device Grounding Wire

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

Note:

To prevent a grounding loop, connecting the output grounding to the input grounding is prohibited.

Basic Settings

After installation, some basic settings for work mode are required.

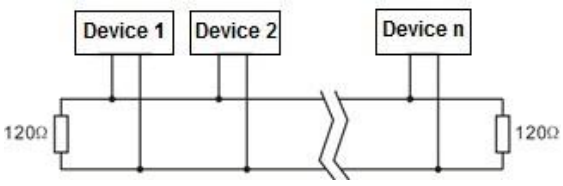
Address Setting

Before system debugging, set the address of the zone expander and remote call station. Start with address 1 and increase by one number for each additional zone expander or remote call station. The setting range for the RK-ZONE8 is from 1 to 15 and the RK-MIC is from 1 to 6.

Use the address DIP switch located on the back panel of the device to set the address using binary numbering. Refer to the chapter “Relation Table of Address & DIP” for DIP switch settings.

End-of-Line Resistor

Devices can communicate with each other via CAN bus. End-of-line resistors need to be installed to keep communications between devices normal. Both sides of CAN bus should be installed with a 120Ω resistor as shown below:



A 120Ω resistor is built into the interface of each device. Users can easily connect or disconnect the resistor to the bus via DIP switch.

System Extension Bus

The inside of the system extension interface of the RK-MCU is connected to a 120Ω resistor. After the Master Control Unit is connected to the zone expanders, users need to turn on the 4th pin of the DIP switch “MODE” to connect the end-of-line resistor of the last zone expander.

Remote Call Station Bus

The RK-MCU has 2 interfaces without a 120Ω resistor used to connect remote call stations. After the Master Control Unit is connected to the remote call stations, turn on “ELR” to connect to the end-of-line resistor on the last RK-MIC. If the Master Control Unit is at the end of the bus, it is necessary to insert a plug with a 120Ω resistor into the other interfaces.

Work Mode Setting

The work mode setting for RK-MCU, RK-ZONE8, and RK-AMP500 is shown below.

RK-MCU Master Control Unit

1. Mic/Line Setting

   The input range and phantom power output of the input interface can be set via 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

   The system can support a maximum of 2 audio channels. The RK-MCU and RK-ZONE8 can support both single and dual audio channels. Before use, set the audio channel via the “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 disabled by setting the “MODE” switch.

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

RK-ZONE8 Zone Expander

1. Standalone & Networking Mode Setting

   Zone expanders can work in standalone and networking mode, which can be set using the “MODE” switch. When the device works in STANDALONE mode, it only broadcasts line input audio in audio channel 1. The loudspeaker line can be enabled and disabled by setting the

contact input. When the device is in networking mode, the 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 expanders can be forcibly disabled by setting the “work mode” switch.

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

RK-AMP500 500W Class-D Power Amplifier

1. Main Power Supervision

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

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

3. Power-saving Mode

To ensure a long backup period in case of a back-up power failure, the INTEVIO system can work in power-saving mode. In this mode, all the non-emergency functions are disabled, all power amplifiers are switched off but ready for operation again and are woken up regularly for power amplifier monitoring.

Power-saving settings must also be made in the configuration tool to have proper functionality.

System Hardware Checking

To avoid damage from incorrect connection, carefully check the following:

1. Check the power connection of all devices, especially those with AC backup power. Note that the polarity should match.
2. Check the connection of the system extension circuit and the end device should be connected to the EOL resistor.
3. Check the wiring connection from the RK-MCU and the zone expander to the power amplifier.
4. Check the wiring connection between the backup power amplifier and related devices.

5. Check the wiring connection from the RK-MIC to the RK-MCU and the connection between the RK-MICs. Note that the end device should be connected to the end resistor.
6. To avoid short circuit, ensure there is no burr on the wire terminal.
7. Check all the settings for the device addresses and work mode.
8. Check the connection of the loudspeaker lines.

Do not apply power to the power supply before all checks are complete. For power supply information, please refer to “Power On & Off”.

System Basic Information

Please pay attention to the following information before configuring the system.

Below is the default setting of RK-MCU:

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

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



Note:

After the installation of a new system, the nameplate which is provided in the packaging of the MCU must be filled in and pasted onto the cabinet.

3 System Configurations

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

Operating Environment

The system configuration software sends data to devices via the Ethernet communication. Refer to the specifications below for the minimum computer requirements to run the system configuration software:

- 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
- Enabled access to network by firewall

Installation and Uninstallation

Installation

Please follow the instructions below to install the software:

1. Double-click the installation program “INTEVIO Configuration Tool Setup.exe” and the installation window will be 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** to confirm the installation location.

   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.

Note:

If the installation folder is read only, such as Program Files, because of user permissions, please select another path. The folder should be writable, otherwise, some functions will be unavailable.

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 continuing with 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 the steps below to uninstall the software.

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

Note:

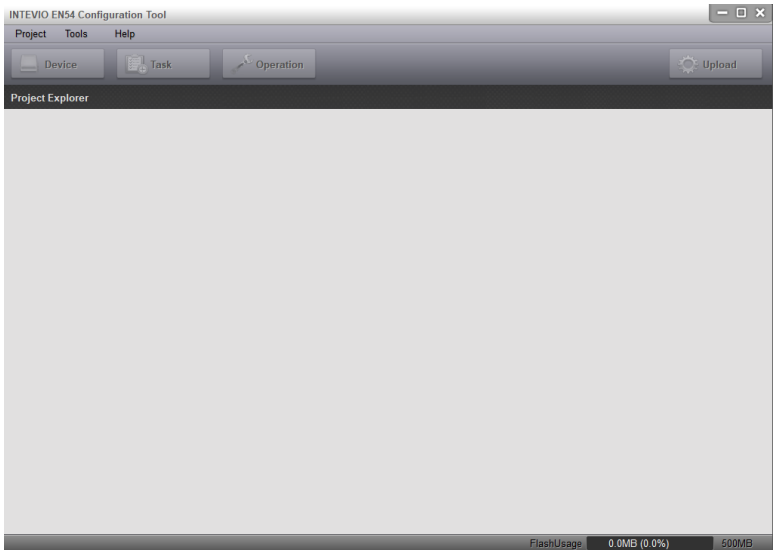
If users want to delete the remaining files manually, find the *INTEVIO Configuration Tool* folder in the installation directory and delete it.

Configuration Operation

General Introduction

Running & Exiting Software

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



To exit the software, select the menu commands *Project→ Exit or click the "X" icon* in the upper right corner 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 perform the operations below via 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.
  - Close

    Close the current project without exiting the software.
  - Exit

    Exit the software.
- Tools
  - Browse Recorded Files

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

    Read the system configuration files and audio files from the MCU.
  - Browse RK-MCU log

    Users can read log data from the MCU and check it.
  - Upgrade MCU Firmware

    Upgrade the firmware of the Master Control Unit via Ethernet.
  - Upgrade Peripheral Firmware

    Upgrade the firmware of zone expanders or remote call stations.
  - Update RK-MIC chime tone

Set pre-chime and end-chime for RK-MIC.

- APP&TEL Authorization

  To authorize APP&TEL

- Change Device Password

  To change the password of device.

- Select Language

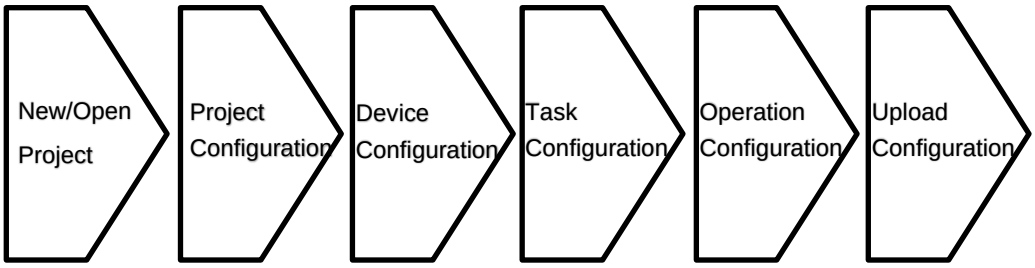
  Select the displayed language.

- Help
  - About

    Display the software version and copyright information.

Configuration Guide

Please follow steps below to configure the INTEVIO system:



1. New/Open

   Before configuration, it is necessary to create a new project file or open an existing project file.

2. Project Configuration

   Set 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, playlists and task parameters.

5. Operation Configuration

   Set the function for broadcast operation, such as button, contact input and timing broadcast.

6. Upload Configuration

   Upload the configuration file and audio file, etc. to the Master Control Unit.

For new users, please follow the steps above for configuration. Users familiar with the software can perform operations flexibly according to need.

Note:

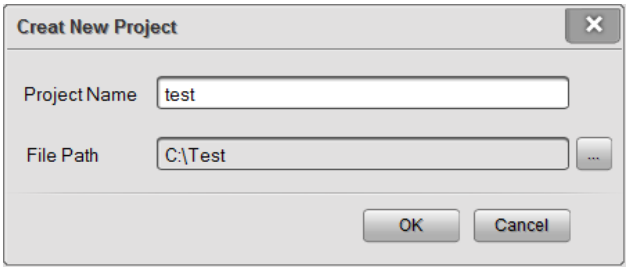
Due to the dependencies between the settings, the software will save all the settings automatically while configuring the system to avoid incorrect operation.

Project

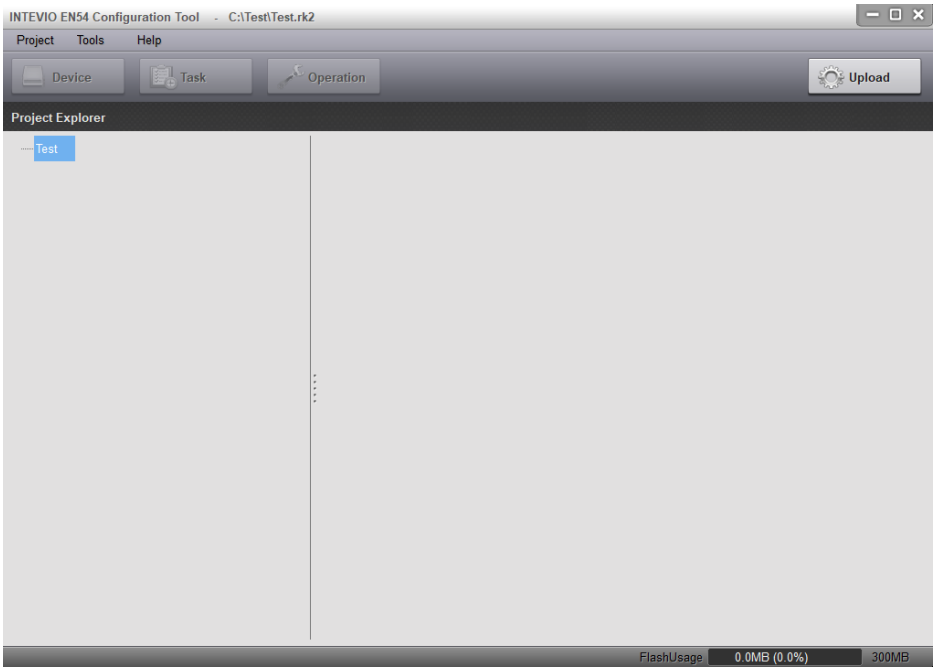
New

The following are the steps to create a new file:

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

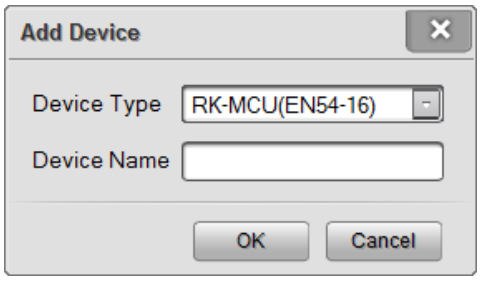


2. Set the project name, file path and MCU name. The directory can be changed and the default path is “My Documents”. Click the ... icon beside the path field to select a different directory.
3. Click the “OK” button to create the project. The window will be displayed as below:



Clicking “Cancel” will close the new project window.

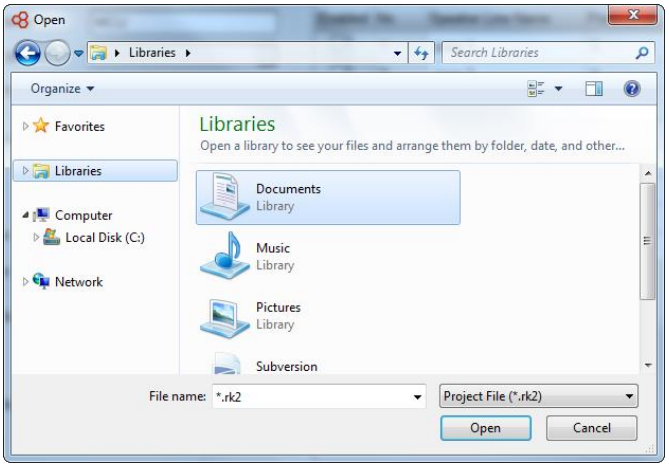
4. Right click the project name in “Project Explorer” and select “Add” in the menu to display the “Add Device” window. Select “RK-MCU (EN54-16)” in device type, then click the “OK” button to add an MCU to the project.



Open

The following are the steps to open a project:

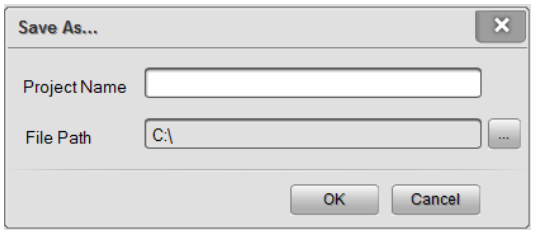
1. Select the menu *Project* → *Open*. The window is displayed as below:



2. Select the project file according to the location path.
3. Click the “Open” button to open the project file. The “Cancel” button will 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. The project is then saved as another file, but the current one is still the original file.

Recent Projects

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

Close

Select the menu *Project* → *Close* to close the projects.

Exit

Select the menu *Project* → *Exit* to close the projects and exit the software.

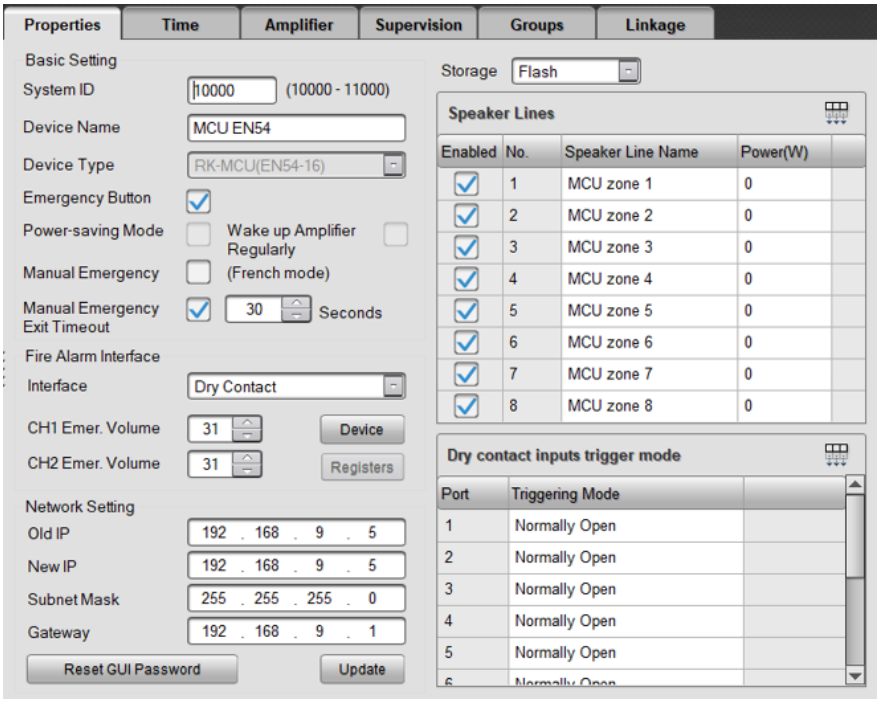
Device

RK-MCU

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

1. Properties

   Set the RK-MCU working parameters as follows:



- Basic Setting

Basic setting includes System ID, Device Name, Emergency Button, Power-saving Mode, Wake up Amplifier Regularly and Manual Emergency Exit Timeout.

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

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

“Power-saving Mode” and “Wake up Amplifier Regularly” only become available after activating “Main Power Supply” supervision.

Both checkboxes must be activated to have proper amplifier supervision during energy-saving cycles (sleep & wake).

If the Power-saving Mode checkbox is enabled, when the main power supply (AC power) of any control unit in the system is faulty, the system will disable all non-emergency functions. This option is only available when supervision of the main power supply is enabled.

Manual Emergency Exit Timeout means if there is no manual emergency task activated, the system will exit emergency mode automatically when the time elapsed.

- Fire Alarm Interface

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

LPI-ModBus is currently not available. If an FACP connection is needed, please use Dry Contact settings.

- Network Setting

Network Setting is used to set RK-MCU network parameters. To change the device IP address, users need to connect the computer to the Master Control Unit. The network segment of the computer should be the same as the Master Control Unit. Click the *Update* button to change the IP address. The IP address of the RK-MCU is 192.168.2.200 by default. Users can also query the IP address from the menu of the MCU; please refer to the chapter “Device Information” for details.

Note:

Downloading the configuration file won't change any network parameters; the network configuration can only be changed by updating. When setting the network, please keep the device and computer connected and ensure that the network configuration is correct.

- Storage

Storage shows the storage type used by the RK-MCU. It can be an SD card or Flash and this can be changed.

- Speaker Lines

Speaker Lines is used to enable speaker lines and to define the name and load power. Click the checkbox as required:  means enabled and  means disabled. Users can change the name and power of speaker lines. The load power is only used as reference.

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

- Dry Contact Inputs Trigger Mode

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

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

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

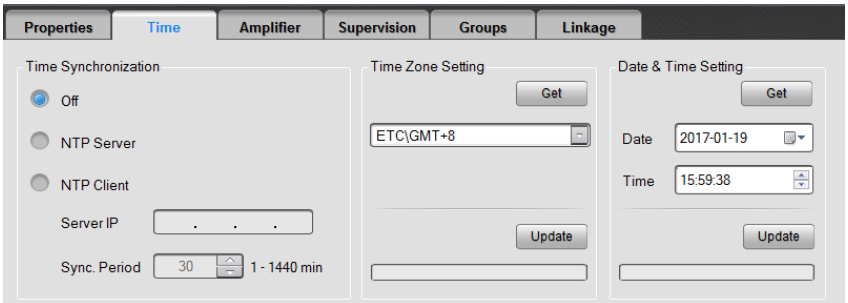
Note:

The Flash usage/SD card usage status bar shows the actual space of audio files within playlists assigned to tasks and free space in the MCU.

The capacity for audio files is a maximum of 60 minutes if using flash memory. If the memory is an SD card, the capacity will be bigger, depending on the capacity of the SD card.

2. Time

Time is used to set the parameters related to time, which is displayed as below:



- Time Synchronization

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

If NTP Server is enabled, the MCU will work as an NTP server and other devices will synchronize the time with it.

If NTP Client is enabled, the MCU will automatically synchronize the time with an NTP server; the "Server IP" and "Sync. Period" should be set.

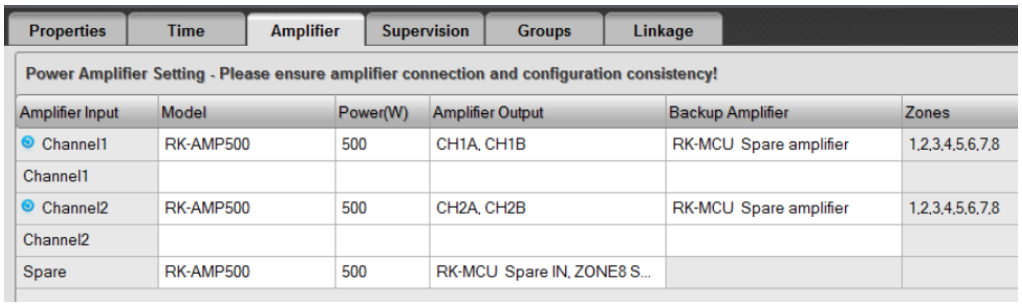
- Time Zone Setting

Time Zone Setting is used to set the time zone of the Master Control Unit. Choose the local time zone and click the “Update” button to change the time zone of the MCU. If the time zone is different to the local time zone, the time and date will be wrong during time synchronization.

- Date & Time Setting

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

3. Amplifier



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

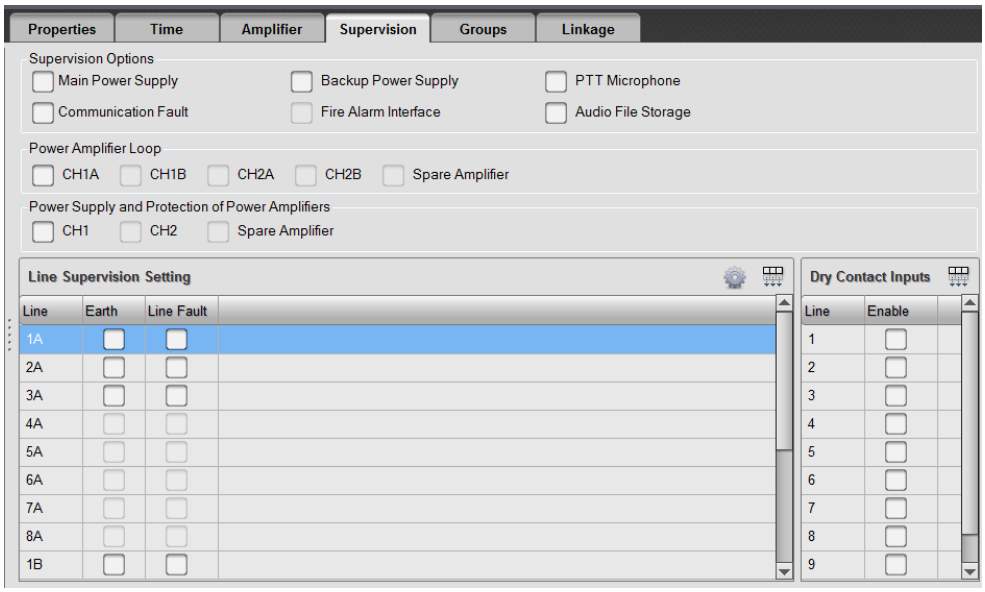
When users need the amplifier backup function, if the audio signal of a spare power amplifier is from the MCU, please set the model of the power amplifier in the Spare row, then set the spare ports of the devices which are connected to the output of the spare power amplifier.

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

Amplifier can be shared between RK-MCU and RK-Zone8. To use this method, the input and output of shared amplifier must be connected to the same input channel and the same output port of RK-MCU and RK-Zone8.

4. Supervision

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

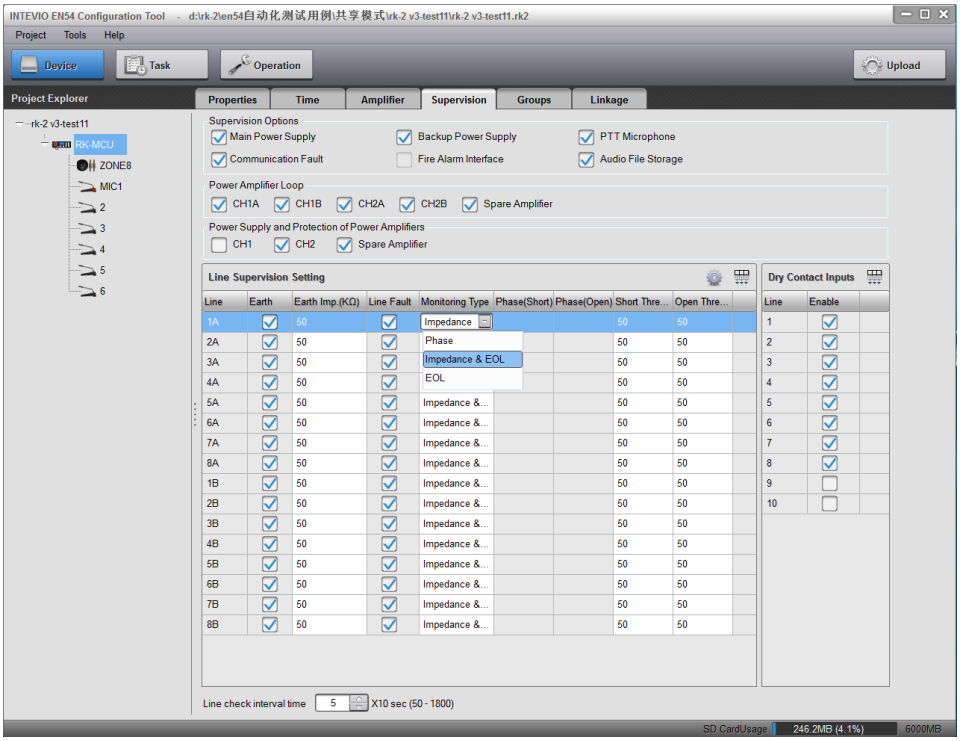


- Supervision Options

Users can use the software to enable or disable Main Power Supply, Backup Power Supply, PTT Microphone, Communication Fault, Fire Alarm Interface and Audio File Storage. Click the checkbox:  means enabled.

- Supervision Modes/Monitoring Types

There are three supervision modes:



1. **Phase mode**: Default mode, EOL installation is required.
2. **Impedance & EOL mode**: Speaker line calibration needed together with EOL installation. To calibrate, press the “CAL” button at the rear panel of RK-MCU or RK-ZONE8.
3. **EOL mode**: Suitable for use when volume controllers are installed. Speaker line calibration needed together with EOL installation. To calibrate, press the “CAL” button at the rear panel of RK-MCU or RK-ZONE8.

Note:

Parameters described above should be changed only after consultation with technical support.

- Power Amplifier Loop

The power amplifier loop options are used to enable or disable the supervision of the 100V cables between controllers and power amplifiers. The options include CH1A, CH1B, CH2A, CH2B, and spare amplifier.

- Power Supply and Protection of Power Amplifiers

The power supply and protection status of power amplifiers(signal cables) may be supervised if the corresponding options are enabled. The power supply failure of power amplifiers on the same audio channel cannot be identified separately. The MCU only shows the power supply failure of the audio channel and users must check the indicators on the front panels of the power amplifiers.

- Line Supervision Setting

Users can either enable or disable the supervision function of speaker lines and earth fault. In the Earth column, the supervision of Earth fault for every speaker line can be enabled or disabled.

If users are authorized by entering the password, it is possible to change the parameters of line supervision, including the impedance threshold between the speaker line and Earth and the phase threshold for the supervision of short circuit and open circuit.

This device supervises speaker lines by measuring the phase difference between the original testing signal and the pilot signal from speaker lines.

When the phase difference is higher than the threshold of short circuit and lower than the threshold of open circuit, a short circuit fault will be detected in the speaker line. When the phase difference is higher than the threshold of open circuit, an open circuit fault will be detected in the speaker line. Usually the phase difference should be lower than the threshold of short circuit.

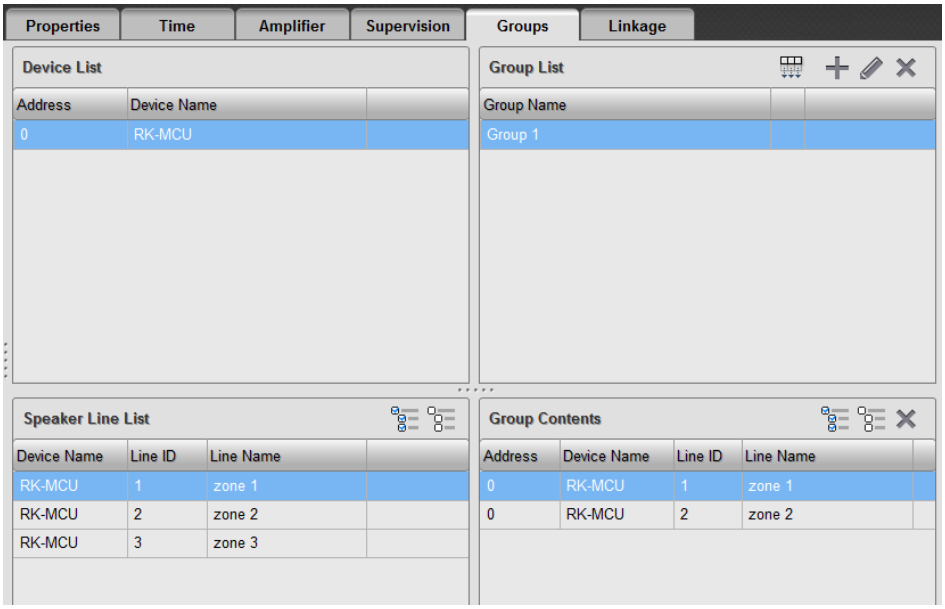
Select a line and click the  icon to set the rest of the parameters to be the same as the selected one.

- Dry Contact Input

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

5. Groups

Each group contains some speaker lines and users can configure groups via the software. The interface is displayed as below:

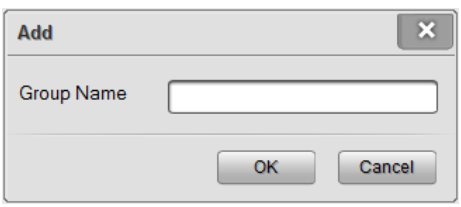


- Device List & Speaker Line List

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

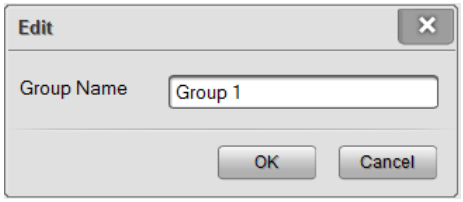
- Group List

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



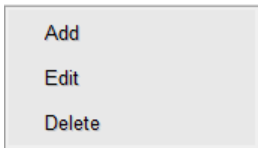
Enter the group name and click OK to create a new group.

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



In the group list, select a group and click the icon to delete the group.

Right clicking in the group list offers the options to add, rename and delete a group.



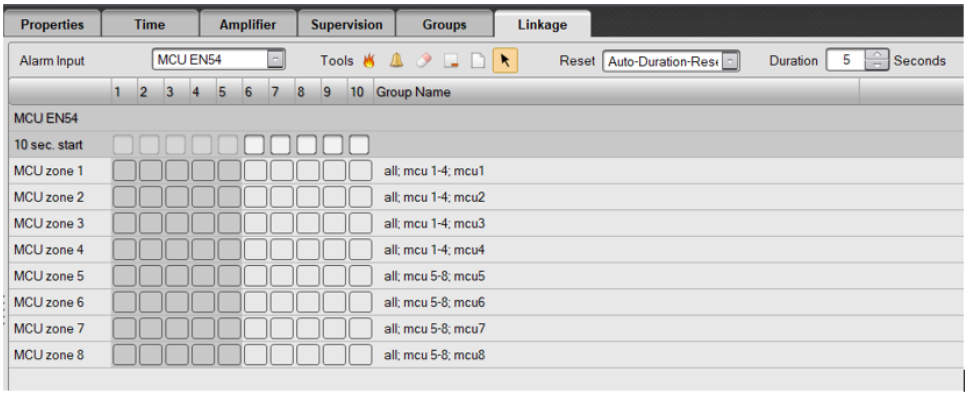
- Group Contents

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

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

6. Linkage

Linkage is used to set the fire alarm linkage function. Users can set each zone separately as shown below:



Each column is matched with a fire alarm input. The input signal can be the contact input or the fire signal sent by the fire alarm system via the LPI-ModBus module. Each page can display a maximum of 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.

Set each column's broadcast zones separately. Some tools are explained below:

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

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

Clear: This is used to clear a cell's settings.

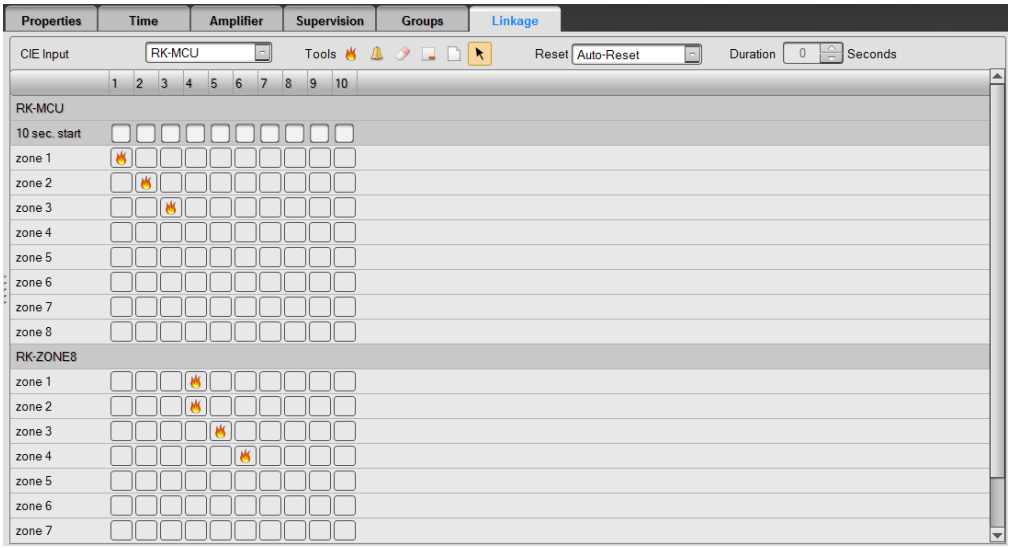
Clear current flags: This is used to clear all flags of a device.

Clear all flags: This is used to clear all cells' settings.

Select: This is used to select a cell.

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

If the system is configured to be connected to a fire alarm system via contact inputs, there are more parameters. Each page displays the contact inputs of each device. If more devices need to be used for the fire alarm system, please select the devices from *CIE Input*. The interface is displayed as below:



Users can select the reset mode for the fire alarm:

- Auto-Reset

  If *Auto-Reset* is selected, when the system receives a fire alarm signal from contact inputs, it will start to broadcast the voice alarm automatically. When the fire alarm signals are cleared, the voice alarm broadcast will be reset automatically.

- Auto-Duration-Reset

  If *Auto-Duration-Reset* is selected, when the system receives a fire alarm signal from contact inputs, it will start to broadcast the voice alarm automatically. When the fire alarm signals are cleared, the voice alarm broadcast will be reset automatically after a certain number of seconds, which can be set in *Duration*.

- Manual-Reset

  If *Manual-Reset* is selected, when the system receives a fire alarm signal from contact inputs, it will start to broadcast the voice alarm automatically. When the fire alarm signals are cleared, the voice alarm broadcast won't be reset automatically and the operators need to press the reset button on the devices. The voice alarm broadcast will then be reset.

- Manual-Duration-Reset

  If *Manual-Duration-Reset* is selected, when the system receives a fire alarm signal from contact inputs, it will start to broadcast the voice alarm automatically. When the fire alarm signals are cleared, the voice alarm broadcast won't be reset automatically and the operators need to press the reset button on the devices. The voice alarm broadcast will then be reset after a certain number of seconds, which can be set in *Duration*.

- Minimum Duration

  If *Minimum-Duration* is selected, when the system receives a fire alarm signal from dry contact inputs, it will start to broadcast the voice alarm automatically. When the fire alarm signals are cleared, the voice alarm broadcast will be reset automatically after a certain number of seconds, which can be set in *Duration*. But if there is other signal interrupting during the duration, the duration will be retimed.

The checkboxes in the row "10 sec. start" are used to enable or disable the fire alarm broadcast by starting a "siren sound" within 10 seconds after the system has powered on and, after complete start-up, the emergency announcement will be broadcast.

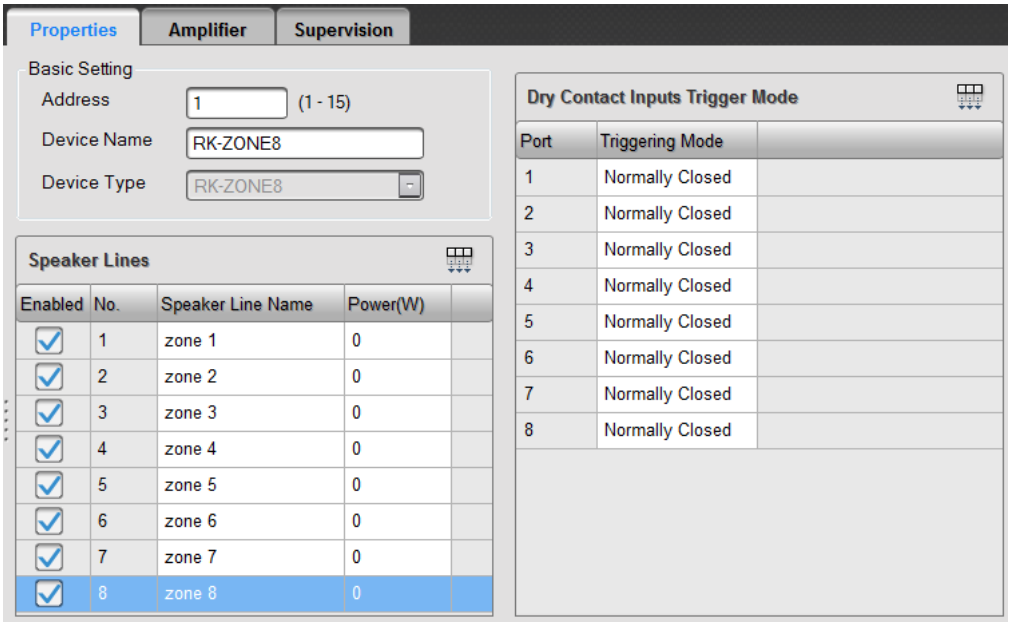
To meet UK regulations, a contact input needs to be set to “Reset RK-MCU” and reset mode should be set to “Manual-Reset”. When the system is activated by a fire alarm signal (contact inputs), it can only be reset by activating the “Reset RK-MCU” contact input.

To meet French regulations, the reset mode should be set to “Manual-Duration-Reset” and the duration must be at least 600 seconds. In this case, once the system is activated, the voice alarm won’t be reset manually or automatically until the time has elapsed.

RK-ZONE8

1. Properties

Set the related working parameters as below:



- Basic Setting

Basic setting includes the address and device name. The address should be the same as the address set via the DIP switch on the rear panel of the device, which ranges from 1–15. Please refer to the chapter “Address Setting” for related device settings. The device name can be renamed by users. Ensure that the same name is not created twice within one project.

- Speaker Lines

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

Selecting a speaker line and clicking the  button sets all the powers to be the same as the current one

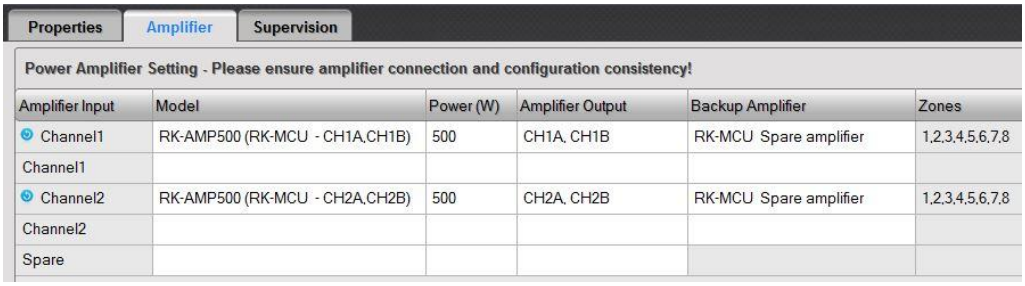
- Dry Contact Inputs Trigger Mode

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

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

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

2. Amplifier



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

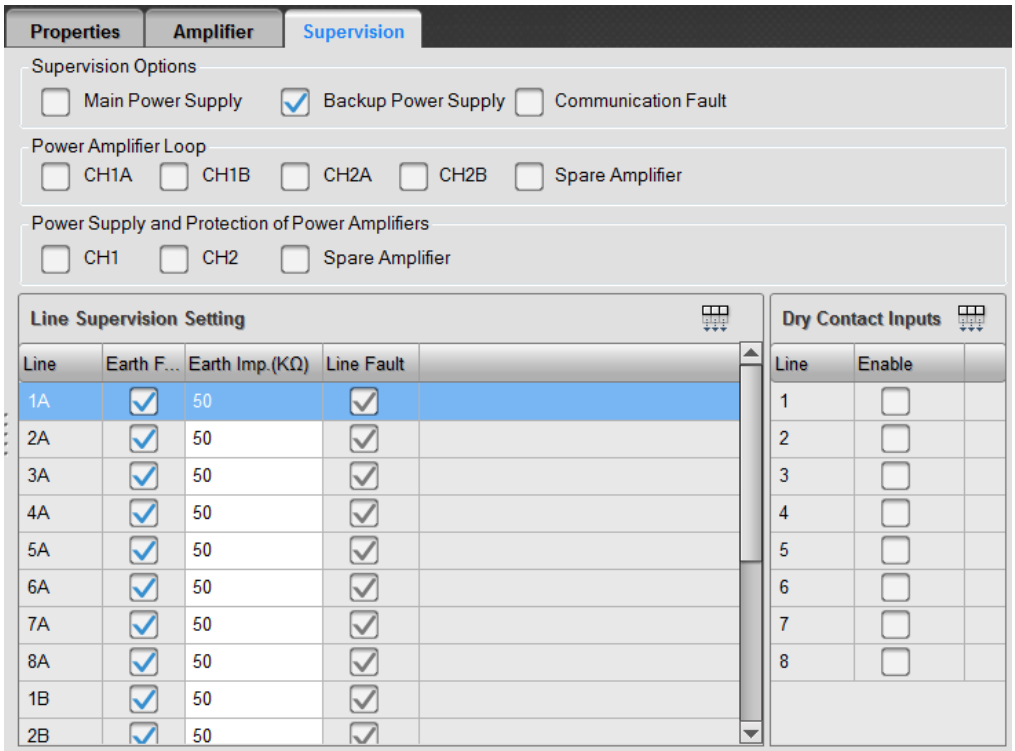
When the amplifier backup function is needed, if the audio signal of the spare power amplifier is from this device, set the model of the power amplifier in the Spare row, then set the spare ports of the devices which are connected to the output of the spare power amplifier.

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

Amplifier can be shared between RK-MCU and RK-Zone8. To use this method, the input and output of shared amplifier must be connected to the same input channel and the same output port of RK-MCU and RK-Zone8.

3. Supervision

Supervision is used to set the related parameters of the supervision function, which is displayed as below:



- Supervision Options

Users can use the software to enable or disable the main power supply, backup power supply and communication fault. Click the checkbox:  means enabled.

- Power Amplifier Loop

The power amplifier loop options are used to enable or disable the supervision of the 100V cables between controllers and power amplifiers. The options include CH1A, CH1B, CH2A, CH2B, and spare amplifier.

- Power Supply and Protection of Power Amplifiers

The power supply and protection status of power amplifiers (signal cables) may be supervised if the corresponding options are enabled. The power supply failure of power amplifiers on the same audio channel cannot be identified separately. The MCU only shows the power supply failure of the audio channel and users must check the indicators on the front panels of the power amplifiers.

- Line Supervision Setting

Users can either enable or disable the supervision function of speaker lines and earth fault. In the Earth column, the supervision of Earth fault for every speaker line can be enabled or disabled.

If users are authorized by entering the password, it is possible to change the parameters of line supervision, including the impedance threshold between the speaker line and Earth and the phase threshold for the supervision of short circuit and open circuit.

This device supervises speaker lines by measuring the phase difference between the original testing signal and the pilot signal from speaker lines.

When the phase difference is higher than the threshold of short circuit and lower than the threshold of open circuit, a short circuit fault will be detected in the speaker line. When the phase difference is higher than the threshold of open circuit, an open circuit fault will be detected in the speaker line. Usually the phase difference should be lower than the threshold of short circuit.

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

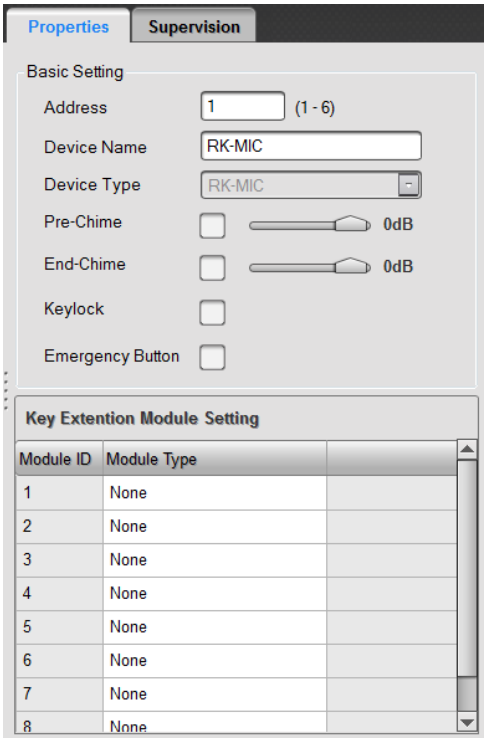
- Contact Inputs

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

RK-MIC

1. Properties

   Set the related working parameters as below:



- Basic Setting

Basic setting includes Device ID, Device Name, Pre-Chime, End-Chime, Keylock and Emergency Button.

Device ID is the actual ID address, which ranges from 1–6. Please refer to the chapter “Address Setting” for the related device setting.

The chime option is used to enable or disable a pre-signal and end-signal for live announcement. The checkbox means enabled. The bar is used to set the chime volume by dragging.

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

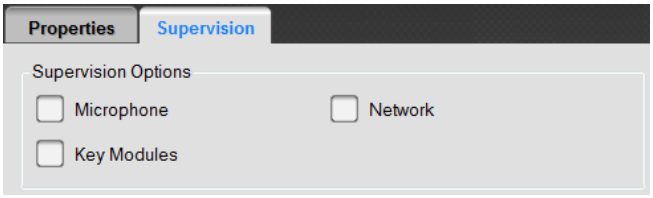
The emergency button option is used to enable or disable the emergency button of the RK-MIC. The checkbox means enabled.

- Key Extension Module Setting

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

2. Supervision

   Supervision is used to set related parameters of the supervision function, which is displayed as below:



- Supervision Options

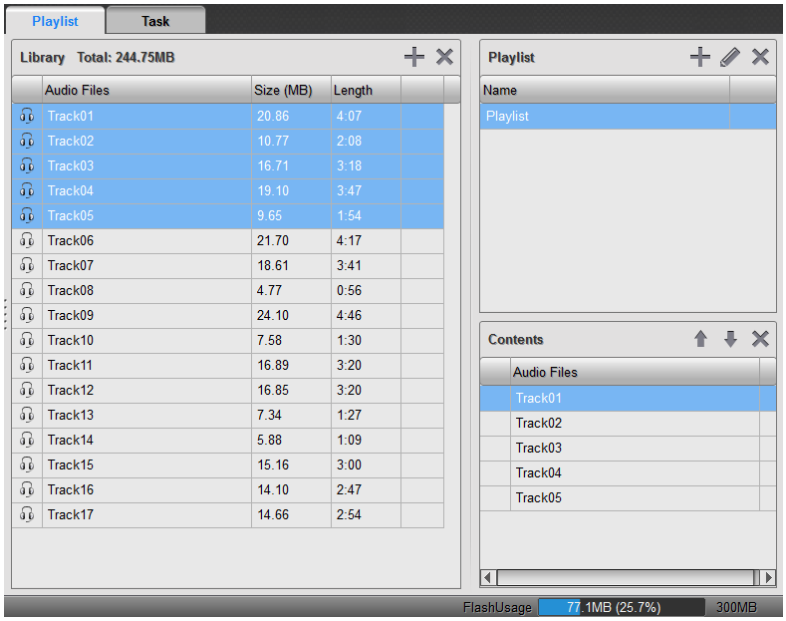
  Users can use the software to enable or disable the supervision of the Microphone, Network and Key Modules. Click the checkbox: ☑ means enabled.

Task

Task settings include Playlist and Task. Playlist is used to set audio files and lists; Task is used to set broadcast functions.

Playlist

The audio source can be set via Playlist, which includes Library, Playlist and Contents as shown below:



- Library

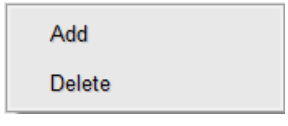
If users need to broadcast audio files, they need to add the files to the library first. Library displays all the audio file names, sizes and lengths. RK-MCU and RK-MIC share the same library. Software will download the audio files to devices.

The total storage space of all audio files will be shown at the top of the library, which is not the same as the space used in the RK-MCU.

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

Select an audio file and click the icon ✖ to delete it from the list. If the file is already added into the playlist, a pop-up window will be displayed with a message showing it cannot be deleted.

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

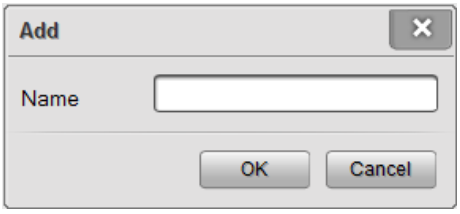


Click the icon 🎧 beside the file to listen to the audio.

- Playlist

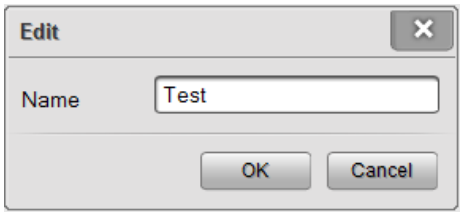
Users need to create a playlist after the audio file is added to the library.

Click the icon in playlist and the following pop-up window will be displayed:



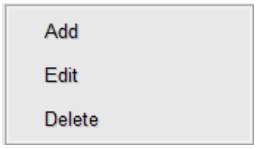
Enter the name of the playlist, then click OK to finish creating the new playlist.

Select a list and click the icon or double-click the list to display the window below in order to rename the playlist.



Select a list in the playlist window and click the icon to delete it.

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



- Contents

Select a playlist and *Contents* will show all the audio files. Users can add files into the playlist by dragging them into the list window.

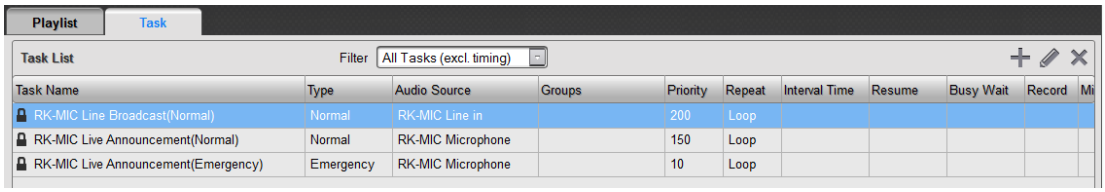
Select an audio file in *Contents* and click the icons and to adjust the order of broadcasting.

Select an audio file in *Contents* and click the icon to delete the audio file from the list.

Task

Task is used to set the broadcasting task. Each task includes Audio Source, Groups, Policy (Priority, Repeat, Interval Time, Resume, Busy Wait, Record, etc.).

Users can view tasks in the task list as shown below:



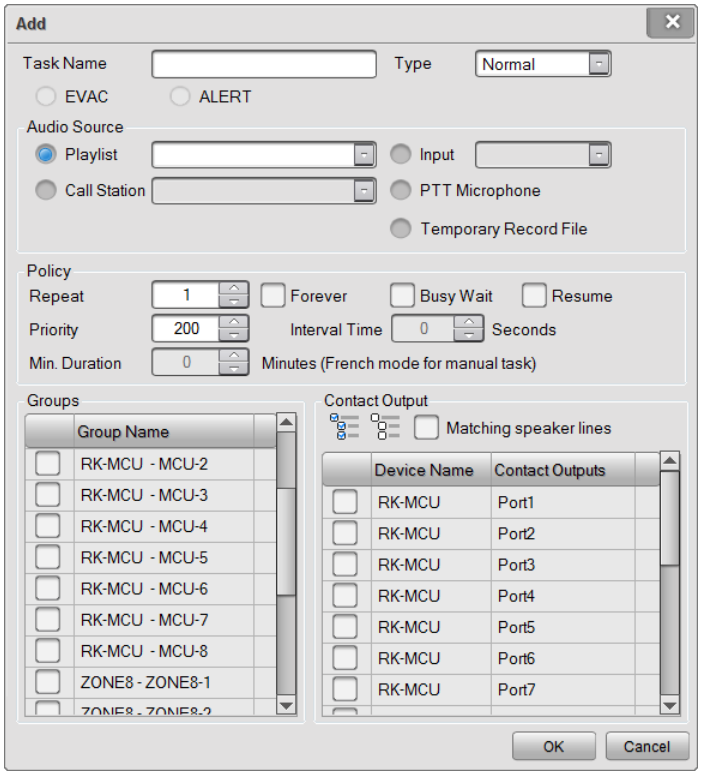
- Task List

There are many parameters for all tasks displayed in the task list, such as the task name, type, audio source, groups, priority, repeat, interval time, resume, busy wait, record, Min. Duration, etc.

Tasks shown in the list can be filtered according to the condition at the top. The filters conditions can be All Tasks, Normal Tasks, Emergency Tasks or Timing Tasks.

- Adding Play Task

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



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

- Task name

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

- Type

Broadcast tasks are divided into normal and emergency tasks, which have different priorities. The lower the value, the higher priority it has.

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

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

- Audio Source

There are many audio sources, such as playlist, input, call station, PTT microphone and temporary recorded files.

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

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

- Repeat: means the number of times a playlist is repeated. The range is 1–65534. If the *forever* checkbox is enabled, it means the playlist will be repeated until operation is stopped. This parameter is invalid for external audio input.
- Forever: Enable/disable forever loop playback.

- Busy Wait: select the checkbox to enable the lower priority task which conflicts with a higher priority one and this will play when the running task is finished. Otherwise the task will be canceled automatically.
- Resume: enable or disable the shortcut task which was broken off by the higher priority task to resume automatically when the inserted task is finished.
- Priority: the range of the value is different based on different task types. 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 lower the value, the higher priority it has.
- Interval Time: this is the time between two broadcasts of a playlist. The range is 0–3600s. This parameter is not available for the external audio input and it is only used to meet the requirement of fire alarm loop playback in an emergency. In interval time, the ALARM relay is activated.

- Groups

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

- Contact Output

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

Select the checkbox of matching speaker lines; the dry contact output channel will correspond with the zones. For example, Port 1 will be enabled when Zone 1 is running. The function is used for volume control. The dry contact here means the corresponding dry contact output of the zones and it cannot control other dry contacts without a broadcast task.

Click OK to save the settings.

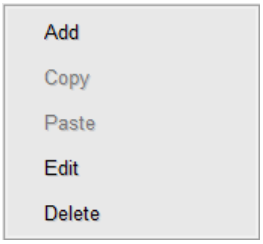
- Editing Play Task

Select one play task in the task list and click the  icon in the top right corner of the task list or double-click to display the Edit window. The user can edit the parameters described above as needed.

- Deleting Play Task

Select one play task in the task list and click the  icon in the top right corner of the task list. The deletion confirmation window will be displayed. Click YES to delete that task.

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



Operation

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

RK-MCU

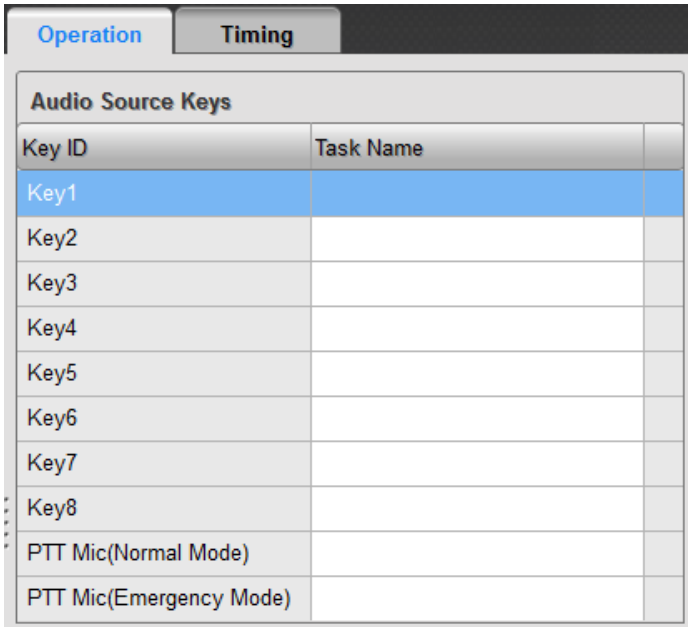
Operation

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

1. Audio Key Setting

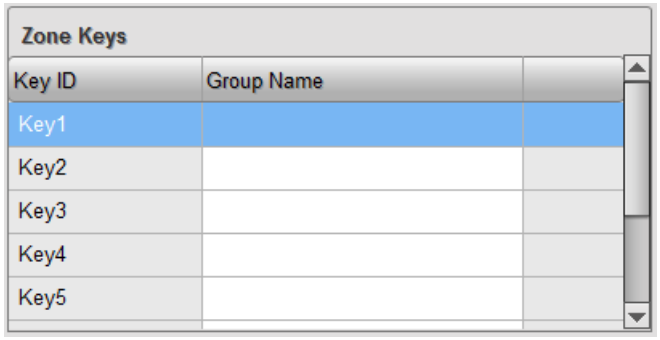
This is used to set the broadcast function on the RK-MCU. Key1 to Key8 separately correspond to the 8 audio buttons on the front panel. The PTT Mic. (Normal Mode) and PTT Mic. (Emergency Mode) correspond to operation under normal broadcast and emergency broadcast.

Click the task table which corresponds to the key or Mic. to select tasks from the dropdown list.

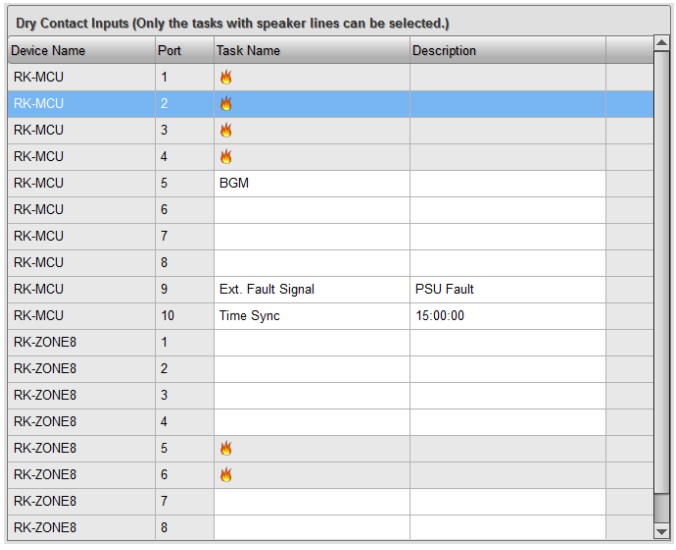


2. Zone Key Setting

This is used to set the 8 groups which correspond to the group keys of the panel. Click the group table to select groups from the dropdown list.



3. Contact Inputs Setting



The function of each contact input can be set to:

- Activate the voice alarm of specified zones
- Activate a normal task
- Synchronize the system time
- Input the fault status of external devices
- Reset the system

If the contact inputs are configured to activate a voice alarm in *Linkage*, the icon of evacuation or alert will be displayed in the corresponding rows and the ports cannot be set to other functions.

If a contact input is used to activate a normal task, click the corresponding table and select a normal task from the drop-down list.

If a contact input is used to synchronize the system time, click the drop-down list and select *Setup Clock*, then set the clock. When the contact input is activated, the system clock will be set to the specified time. This function cannot be used with *Time Synchronization* at the same time.

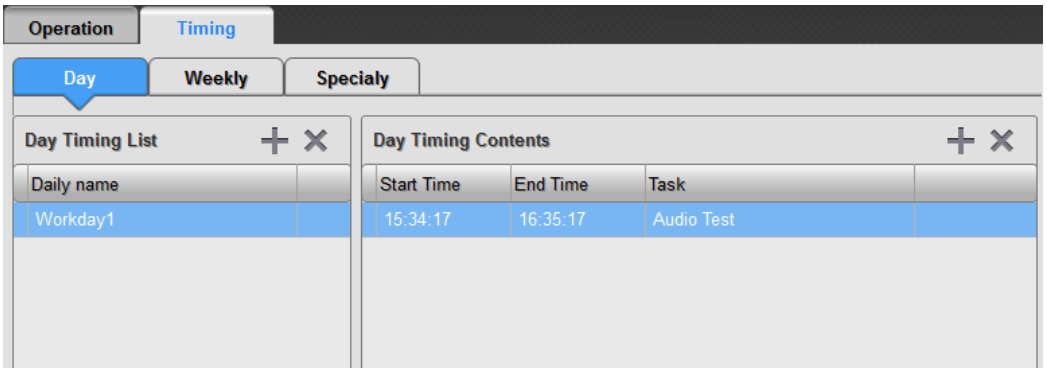
If a third-party device is used in the system, such as PSU, the fault status can be supervised via a contact input by selecting Custom Fault from the drop-down list. Connect the fault output (dry contact) of the third-party device to the contact input, then connect a 10kΩ resistor network to the same dry contact output in parallel. If the device has a fault, a short circuit fault of the contact input will be detected by the MCU. The fault description displayed in the MCU can be set in the table.

If a contact input is used to reset the system, click the drop-down list and select *Reset RK-MCU*.

This function can be used to reset a voice alarm. If *Manual-Reset* or *Manual-Duration-Reset* mode is configured, CIE can reset the voice alarm by activating the contact input when the fire alarm is cleared or reset.

Timing

The timing broadcast function can be set via the configuration software and the MCU can work automatically according to the timing setting. The timing setting includes Day, Weekly and Special. The day timing is the foundation setting. Before configuring any timing program, users should create a day program first. Then use the day program to configure the weekly and special program as needed.



- Day

Day timing should be set first during the configuration as it is the basic element and can be used when setting the weekly timing and special timing. Click the icon to create a new day timing in the top right corner of the day timing list and enter the name. Click the icon to delete the 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 the 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 with up to a maximum of 65535 timing items.

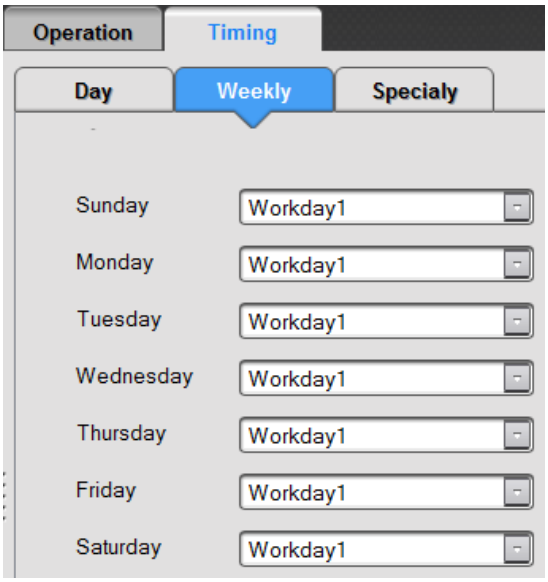
Note:

Make sure the day timing is set within the span of one 24-hour day and the end time must be at least 5 seconds after the start time.

The tasks used for the timing function should be configured while the filter is set to “Timing Task” in the task configuration windows. The timing function is only used for normal broadcast.

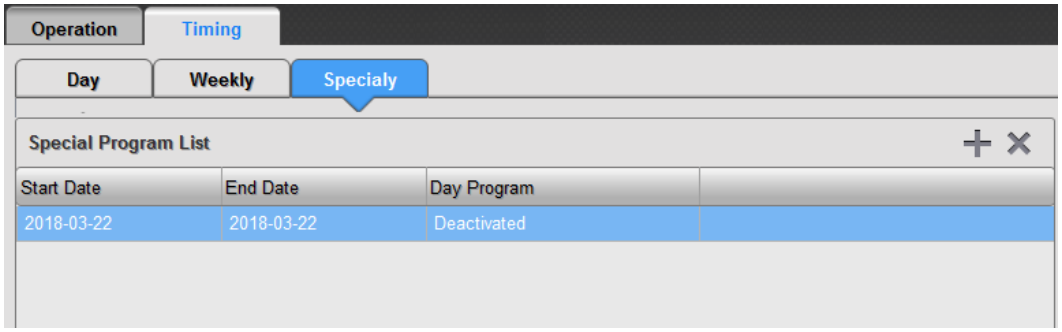
- Weekly

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, this means that day has no timing program.



- Specialy

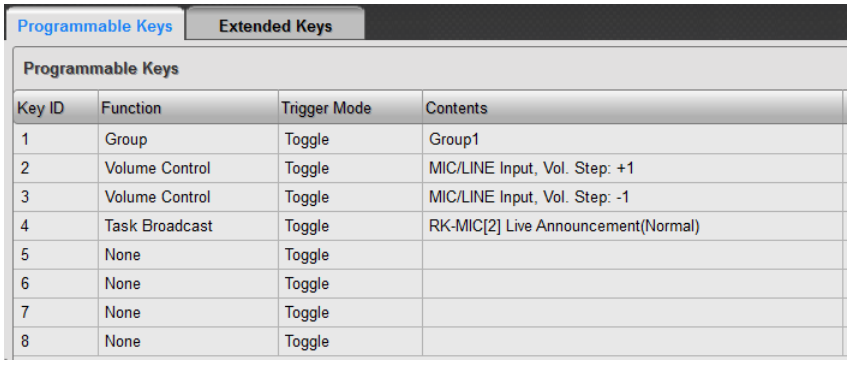
Special timing is the program beyond the weekly timing. The priority of special timing is higher than weekly timing. If one day is set in special timing, then other timing settings will be invalid.



RK-MIC

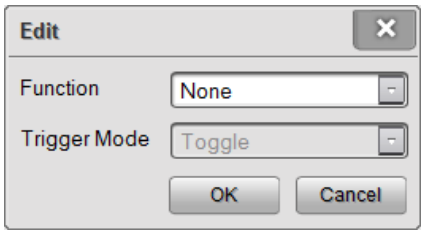
Select RK-MIC and click the *Operation Setting* button. Users can set all related broadcast functions in the window below.

Programmable Keys



Key ID	Function	Trigger Mode	Contents
1	Group	Toggle	Group1
2	Volume Control	Toggle	MIC/LINE Input, Vol. Step: +1
3	Volume Control	Toggle	MIC/LINE Input, Vol. Step: -1
4	Task Broadcast	Toggle	RK-MIC[2] Live Announcement(Normal)
5	None	Toggle	
6	None	Toggle	
7	None	Toggle	
8	None	Toggle	

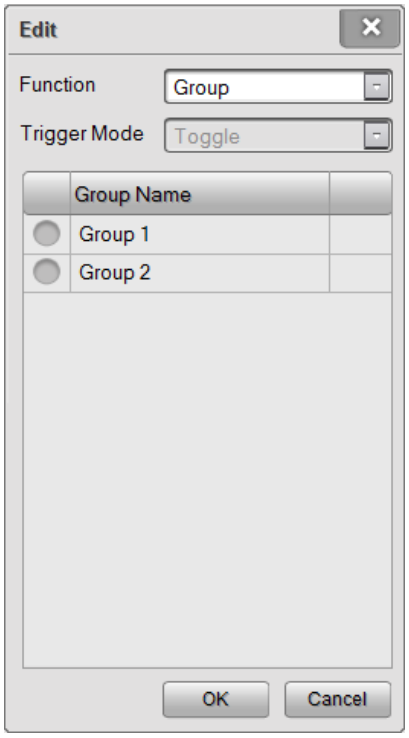
There are 8 programmable keys on the panel of the RK-MIC and their function can be set via the configuration software. Double-click an item in the table, select it, and click the icon to set its function.



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

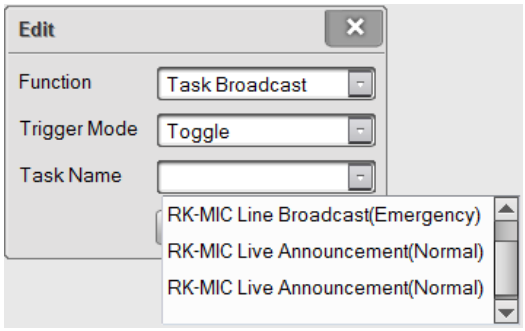
- Group

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



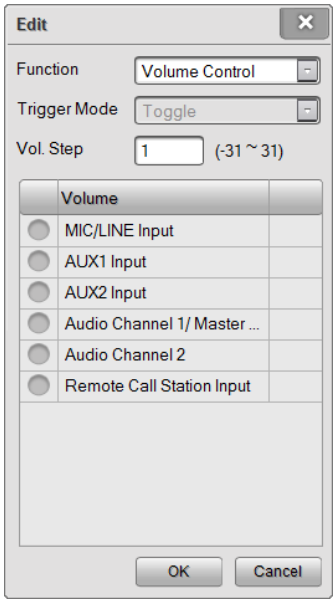
- Task Broadcast

If the function is the task broadcast, the trigger mode and task name must be set. Click the trigger mode to select toggle or press. *Toggle* means the user must press the trigger once to start the broadcast and press again to stop. *Press* means press and hold the trigger during the broadcast and release to stop. Select the task name from the drop-down list.



- Volume Control

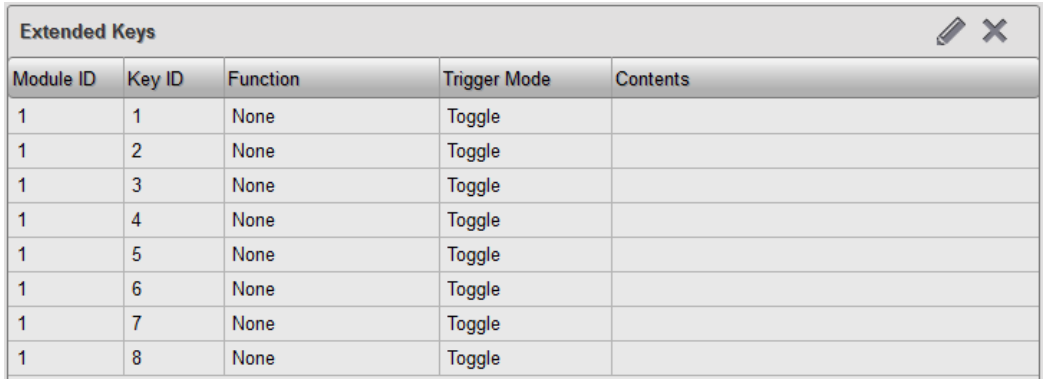
If the function is volume control, users need to set the volume type and step. The volume step range step is from -31 to +31. If it is negative, the volume will be decreased. If it is positive, the volume will be increased. The volume type includes “MIC/LINE input”, “AUX1 Input”, “AUX2 Input”, “Audio Channel1/Master volume”, “Audio Channel 2” and “Remote Call Station Input”. Other volumes can be set via the menu of the MCU.



- System Reset

If a programmable key is set to *System Reset*, it may be used to reset a fault status or fire alarm.

Extended Keys



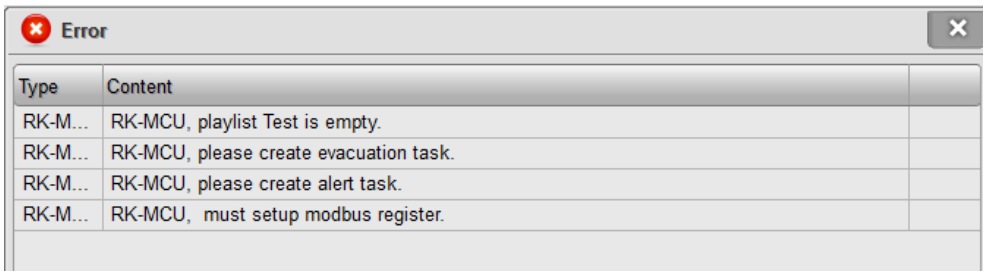
Module ID	Key ID	Function	Trigger Mode	Contents
1	1	None	Toggle	
1	2	None	Toggle	
1	3	None	Toggle	
1	4	None	Toggle	
1	5	None	Toggle	
1	6	None	Toggle	
1	7	None	Toggle	
1	8	None	Toggle	

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

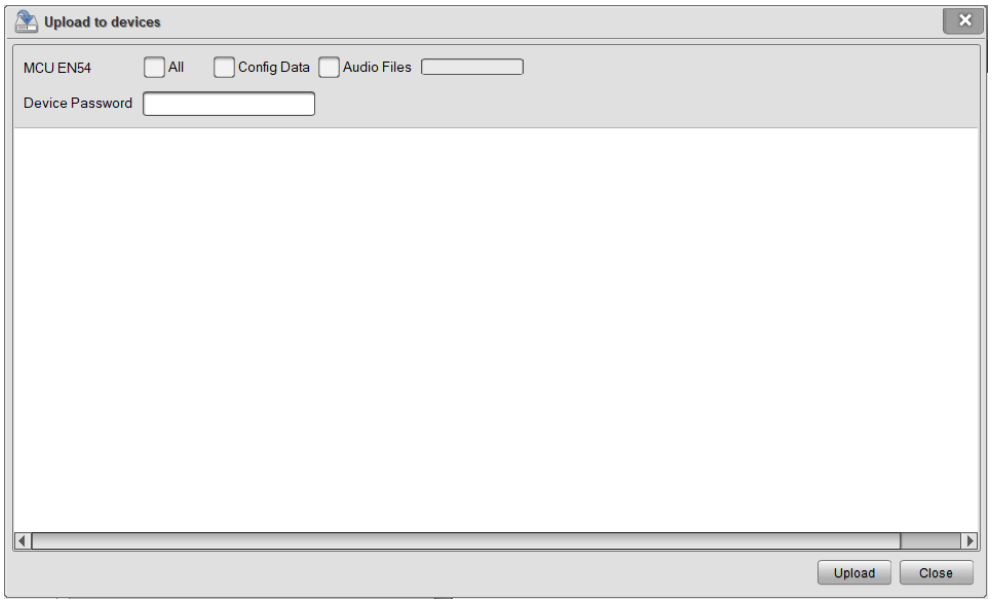
Upload Configuration File

Before uploading configuration data, all devices and the computer need to be connected to the Master Control Unit via the Ethernet and the IP address of the computer and MCU should be in the same segment.

Click the ***Upload*** button and the software will verify the configuration data automatically. If there are any errors, they will appear in the message window as shown below:



Correct the configuration according to the messages. If there aren't any errors, click the *Upload* button. The-upload window will be displayed as below:



Click the checkbox to select the items (configuration file or audio file) to upload as needed. Click the Upload button to send data via the Ethernet connection. The progress bar and description show the current upload status. Click the *Close* button to exit the window.

If the data upload fails, check the following:

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

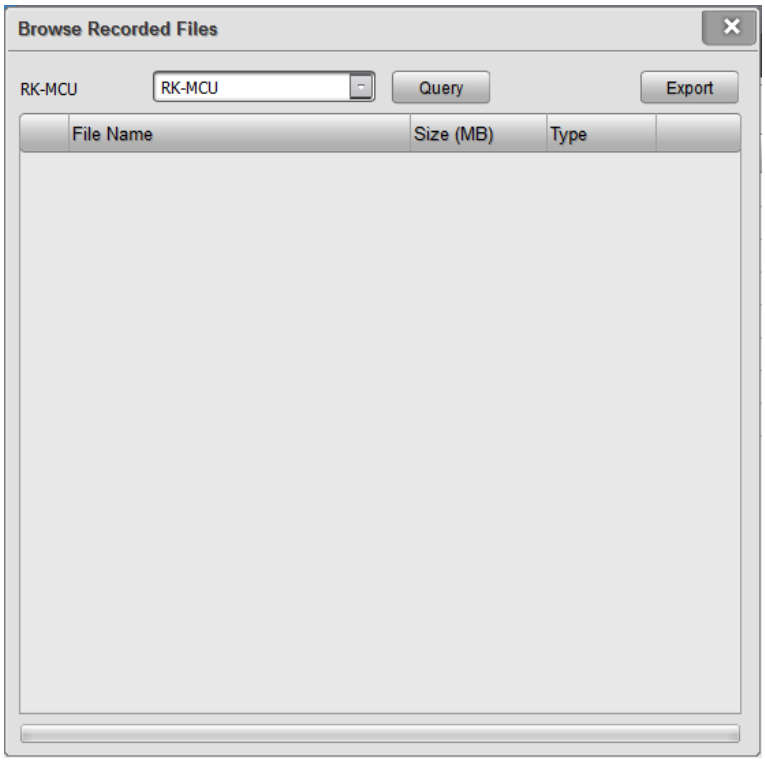
Note:

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

Other Operations

Browse Recorded Files

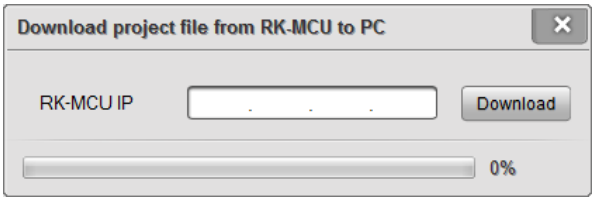
If users need to query the auto-recorded files in the RK-MCU, users can read the file list via the configuration software and upload the specified file to a PC. Click the menu *Tools —〉 Browse recorded files* and the window below will be displayed.



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

Download Project File From RK-MCU to PC

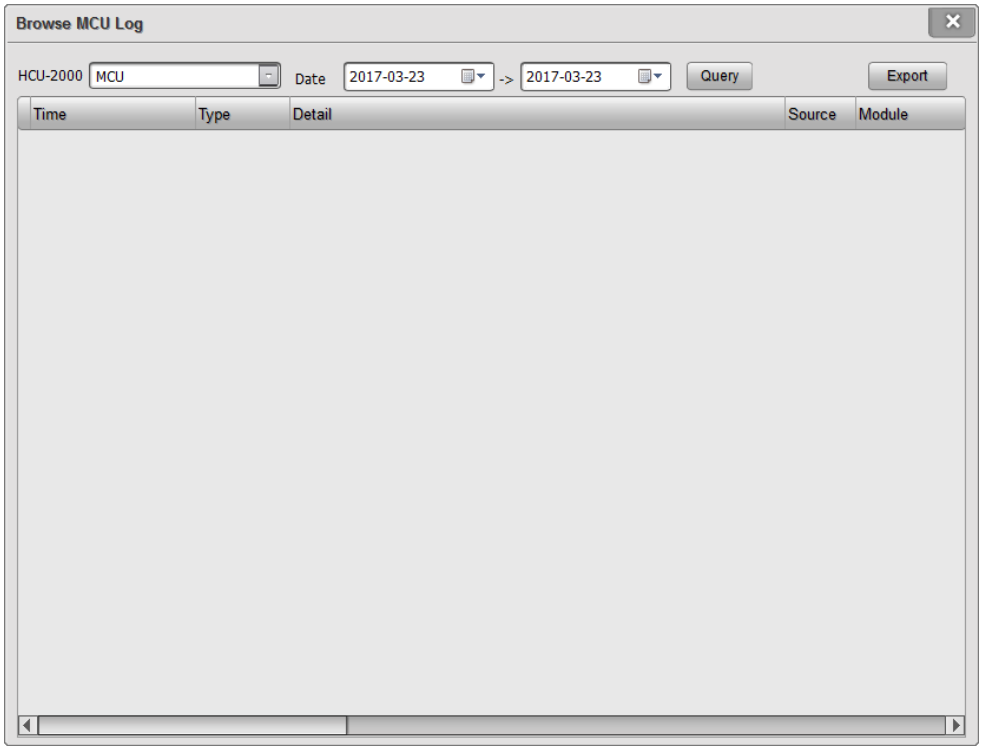
It is possible to download the project file from the MCU to a computer, so users can check and edit the configuration. Click the menu Tools —〉 Download project file from MCU to PC and the window below will be displayed.



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

Browse RK-MCU Log

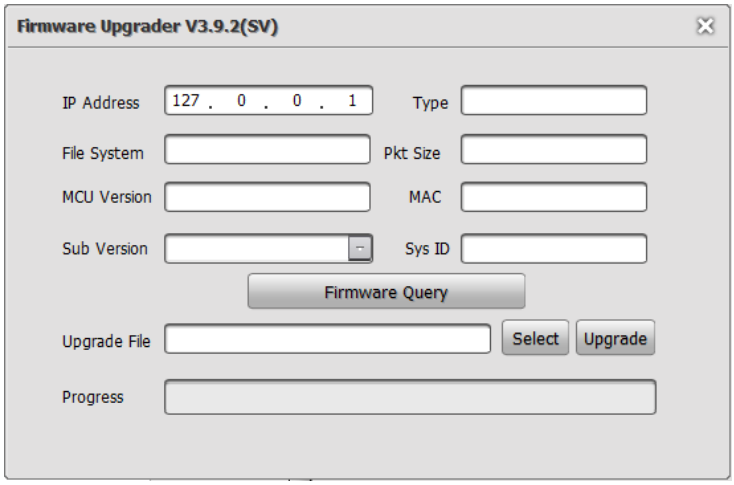
Users can browse the log of the MCU including the operation recording and fault log. Click the menu Tools—〉 Browse MCU Log and the window below will be displayed.



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

Upgrade RK-MCU Firmware

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

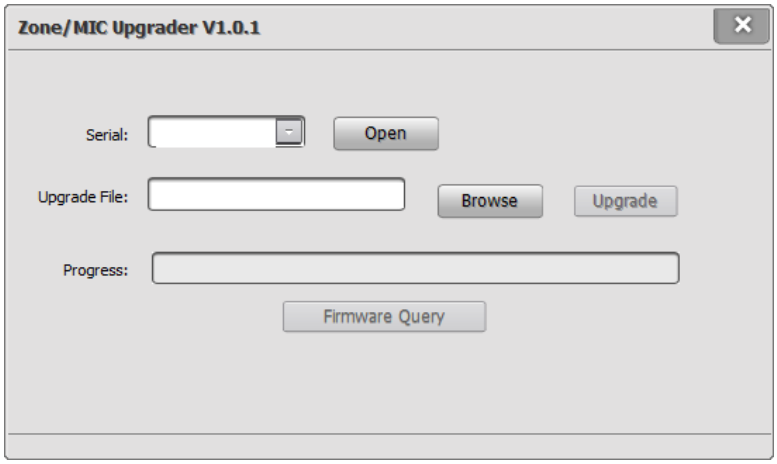


Enter the IP address of the MCU and click the *Firmware Query* button, the software will read and display all the firmware versions, including the device type, file system version, kernel version, MCU version, MAC address and system ID, etc.

If users need to upgrade the device firmware, click the button *Select* and select the program file in *.bin format, then click the *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.

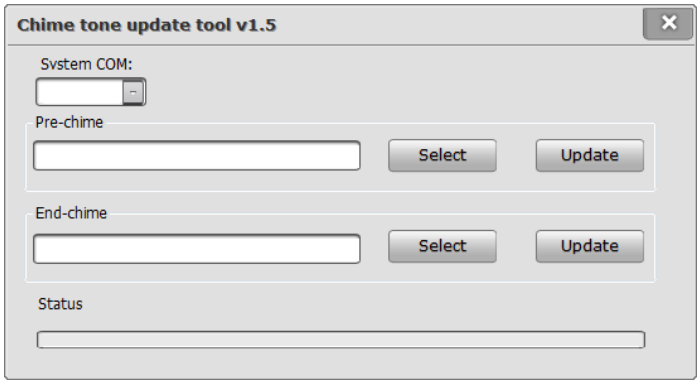


Before operation, an RS-232 port of the computer must be connected to the DEBUG port of the target device. Select the connected serial port from the drop-down list, then click the “Open” button to open the serial port.

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

Update RK-MIC Chime Tone

Users can click the menu Tools —〉 Update RK-MIC Chime Tone to change the chime of remote call stations.



Before operation, an RS-232 port of the computer must be connected to the DEBUG port of the target device. Select the connected serial port from the drop-down list and select the pre-chime file and end-chime file by clicking the Select button, then click the “Update” button to send the file to the connected device.

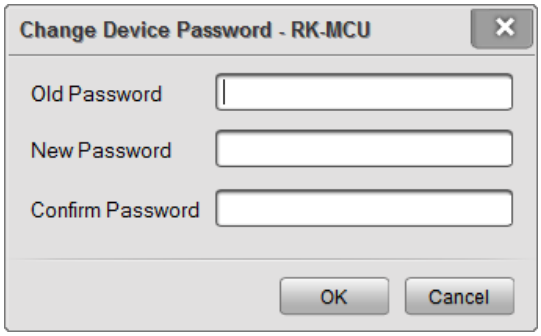
Note：The device can store max. 15 seconds of audio file. If the selected file is too big, only 15 seconds of the content from the beginning will be stored on the device.

APP&TEL Authorization

Users need to authorize before using APP&TEL. For detail usage instruction please refer to IntevioSystem APP User Manual and X-TELS User Manual.

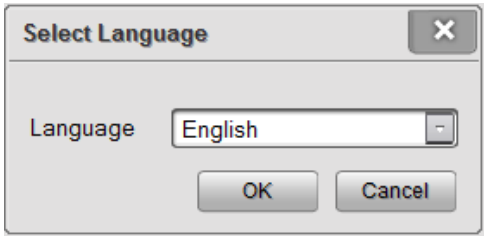
Change Device Password

Users can change device's password by inputting below required information.



Select Language

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



Select the language from the drop-down list and click OK to save it.

4 System Commissioning

This chapter mainly introduces debugging operations.

- Checking system function

Checking System Function

After the installation and configuration, it is necessary to test and confirm system functions before delivery. The following items need to be checked:

1. While in standby mode, check that each device works normally. If the fault detection function is enabled, users can simulate a fault to check whether it can be detected by the device.
2. If the amplifier backup function is available, check whether the spare power amplifier can replace the main power amplifier and continue to operate as expected.
3. Check that all broadcast functions work according to user requirements.

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-saving mode.
GENERAL FAULT	Yellow	OFF	The system is normal.
		Flashing	A new fault is detected.
		ON	A fault exists in the system and has been confirmed.
CPU	Yellow	OFF	CPU works normally.
		ON	The CPU of the MCU has an error or stops working.
EARTH	Yellow	OFF	No earth fault is detected.
		ON	An earth fault is detected in the 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 currently working.
	Green	ON	Paging by PTT microphone.
	Yellow	ON	Failure of the PTT microphone is detected.
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 a 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 the *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	Open circuit or short circuit fault is detected in the group.
Audio Source Indicator	Green	OFF	The task has not started.
		Flashing	Pre-listening, reserved and unavailable.
		ON	The task is being played in normal mode.

Indicator	Color	Status	Description
	Red	ON	The task is being played in emergency mode.
	Yellow	ON	Audio source error is detected, e.g. audio file storage fault.

Buttons/Switches

Button/Switch	Action	Description
Power Switch	Press	Connect or disconnect main power supply.
MIC Button	Press	Start live broadcast or temporary recording.
Emergency Button	Press	Enter or exit manual emergency mode.
Wheel Knob of Master Volume	Counterclockwise Rotation	Decrease CH1/master and CH2 volume.
	Clockwise Rotation	Increase CH1/master and CH2 volume.
	Press	Exit volume setting.
Wheel Knob of Menu	Counterclockwise 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 recording.
Reset	Press	Clear all fault statuses; all indicators will return to normal status and the buzzer will be muted.
ACK	Press	Confirm new fault; the indicator of the general fault will be 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-saving mode.
MAINS	Yellow	OFF	Main power supply works normally.
		ON	Main power failure is detected.
BACKUP	Yellow	OFF	Backup power supply works normally.
		ON	Backup power failure is detected.
EARTH	Yellow	OFF	No earth fault is detected.
		ON	Earth fault is detected in speaker lines.
CPU	Yellow	OFF	CPU works normally.
		ON	The CPU of MCU is faulty or stops working.
NETWORK	Yellow	OFF	The connection with the MCU is normal or the device is in standalone mode.
		ON	Connection failure to the MCU is detected.
DCT SHORT	Yellow	OFF	No short circuit fault is detected on contact inputs.
		ON	Short circuit fault is detected on the wiring of contact inputs. For more details, please check the menu of the MCU.
DCT OPEN	Yellow	OFF	No open circuit fault is detected on contact inputs.
		ON	Open circuit fault is detected on the wiring of contact inputs. For more details, please check the menu of the MCU.
POWER AMPLIFIER STATUS	Yellow	OFF	The connection between power amplifier and zone expander is normal.
		ON	Connection failure detected 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	Open circuit or short circuit fault is detected 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 in power-saving mode.
MAINS	Yellow	OFF	Main power supply works normally.
		ON	Main power failure detected.
BACKUP	Yellow	OFF	Backup power supply works normally.
		ON	Backup power failure detected.
PROTECTION	Yellow	OFF	Device works normally.
		ON	The output of the power amplifier is turned off due to the over-temperature protection, overload or output short circuit.
Level Meter		OFF	The power amplifier has no signal input.
	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-saving 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 MCU is normal or the device is in standalone mode.
		ON	Connection failure with MCU is detected.
BUSY	Yellow	OFF	The audio channel to MCU is idle.
		Flashing	The audio channel is occupied by the microphone of another remote call station which has lower priority than this device.
		ON	The audio channel is occupied by the microphone of another remote call station which has higher priority than this device.
ALL	Green	OFF	Function is disabled.

Indicator	Color	Status	Description
		Flashing	Select all speaker lines.
CLOSE	Green	OFF	The key has not been pressed.
		Flashing once	The key has been 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 recording operation.
		Flashing	The device is in the process of recording operation.
PLAYBACK	Green	OFF	No playback operation.
		ON	Playing the temporary recorded file in the loudspeaker.
LINE IN	Green	OFF	The task isn't activated.
		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	Microphone failure is detected.
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 have a 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 recording 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.

Operations

Power On & Off

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

Reset

All the fault statuses of the system can be cleared manually by pressing the *RESET* button on the front panel of the RK-MCU. If the fault still exists, the device will show a notification again.

If the fire alarm reset mode is configured as “Manual-Reset” or “Manual-Duration-Reset”, users need to press the RESET button to clear the alarm status after a fire alarm.

Please refer to RK-MCU reset for setting the button to “System Reset”.

ACK

When system detects any new fault, the buzzer of the RK-MCU will beep. Meanwhile, the general fault indicator will turn yellow and start flashing to notify operators. The operator can press the “ACK” button on the front panel of the MCU to confirm the fault, then the buzzer will be muted and the general fault indicator will be constantly yellow.

When the system receives new fire alarm signals, it will enter emergency mode and the buzzer of the RK-MCU will continue to beep. Press the ACK button to mute the buzzer.

Test

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

1. Press the *TEST* button on the front panel of the MCU to start test function. The test will not affect other functions. During the test:
   - All indicators will forcibly light up, the multi-color indicator will flash different colors in turn.
   - The screen displays red, green, and blue in turn.
   - Buzzer sounds.

2. Press the *TEST* button again to stop the function. All indicators will resume normal working condition. During testing, if there is no operation within 1 minute, the test will be stopped automatically.

Monitor

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

Please follow the steps below to start monitor operation on the RK-MCU:

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

The loudspeaker volume can be adjusted via the menu; please refer to the related chapter for detailed operation.

Please follow the steps below to start monitor operation on the RK-MIC:

1. Press the *MONITOR CH1* button on the RK-MIC. The indicator turns green and audio channel 1 will be monitored via the built-in loudspeaker.
2. Press the *MONITOR CH1* button again to stop the monitor function. The indicator turns off and the built-in loudspeaker will be muted.
3. Press the *MONITOR CH2* button on the RK-MIC. The indicator turns green and audio channel 2 will be monitored via the built-in loudspeaker.
4. Press the *MONITOR CH2* button again to stop the monitor function. The indicator turns off and the built-in loudspeaker will be muted.
5. Users can change the monitored audio channel during monitoring.
6. Because there is only one audio channel from RK-MCU to RK-MIC, new operation will replace the older operation.

Note:

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

Volume Setting

There is a knob on the front panel of the RK-MCU to adjust the master volume corresponding to audio channel 1 and 2. Background music and external audio source will be played in audio channel 1. Please refer to “Master Volume Adjustment” for operations.

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

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

Zone/Group Selection

Before broadcasting, users need to select a target zone first. The speaker lines which have a short circuit fault 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 the selected zone or group to cancel the selection. The indicators will resume normal working condition.

The device will cancel the entire selection if there is no operation within 1 minute after zone selection.

Close Zones

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

Live Announcement

Users may start a live announcement via the microphone of the RK-MCU or RK-MIC. The following are steps to use the microphone of the 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 the broadcast.

The following are steps to use the microphone of the 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 the pre-signal or chime. After that, it is illuminated green.
3. Press the microphone button again to stop the broadcast and the indicator will go out.

Broadcast Audio Files

Audio files can be stored in the RK-MCU with the format of WAV, 44.1 kHz/16bit. The capacity for audio files is a maximum of 60 minutes if using flash memory. If the memory is an SD card, the capacity will be bigger, depending on the capacity of the SD card.

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

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

If the broadcast does not start, 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 tasks automatically.

Broadcast External Audio

The RK-MCU has MIC/Line, AUX1 and AUX2 audio input interfaces. The following are 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 the broadcast starts.

If the broadcast does not start, 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 tasks automatically.

Auto-record

During live announcement in an emergency, the MCU can record voice automatically. Max. 99 recorded files can be stored and the total time is up to 1 hour. If the total recording time exceeds the capacity of 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 an emergency and there isn't any additional operation. Users may check the recorded files from the LCD screen of the RK-MCU; please refer to the "Check Recorded Files" chapter for detailed information.

Temporary Record

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

Recording

Please follow the steps below to start temporary recording on the RK-MCU:

1. Press the “Record” button and the screen will display the temporary recording.
2. Press the side button of the PTT microphone to start recording. The indicator turns green and the screen shows the recording time.
3. Release the side button of the PTT microphone to stop recording. The indicator goes out and the screen returns to the previous screen.

Please follow the steps below to start temporary recording on the RK-MIC:

1. Press the “Record” button to start temporary recording. The indicator turns green and flashes.
2. Press the “Record” button again to stop recording. The indicator goes out.

Playback

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

It is also possible to listen to recordings on the RK-MIC. The following are the steps to do so:

1. Press the “Playback” button on the front panel. The indicator turns green and flickers. Recording will be broadcast via the RK-MIC built-in loudspeaker.
2. Press the “Playback” button again to stop listening.

Recording Broadcast

Steps for broadcasting a recording via the RK-MIC:

1. Press the zone button.
2. Press the “Playback” button to broadcast the recording. The indicator turns green.

Enter/Exit Manual Emergency Mode

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

When one or more emergency buttons are pressed to enter emergency mode, the indicators of the buttons will turn red and other emergency indicators will flash in red. The emergency indicator of the RK-MCU will turn red when the system is in manual emergency mode.

When more than one emergency buttons are pressed to enter emergency mode, the system will only exit manual emergency mode when all emergency buttons are deactivated.

Note:

- All non-emergency functions will be disabled automatically when the system is working in emergency mode. The volume of the CH1/CH2 output will be changed to the default value which is configured.
- The emergency button of the RK-MCU or each RK-MIC can be enabled or disabled via the configuration tool.
- In manual emergency mode, the system will continue emergency broadcast, but not respond to the fire alarm signal.

Emergency Voice Alarm

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

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

Emergency Live Announcement

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

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

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

1. Press the emergency button to enter manual emergency mode.
2. Press zone buttons to select target zones.
3. Press the “Microphone” button on the RK-MIC to enable live announcement. The indicator turns red and flashes, which shows it is playing the pre-signal or chime. While paging, the indicator lights up red constantly.
4. Press the “Microphone” button again to stop paging. The indicator goes out.

Lock & Unlock

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

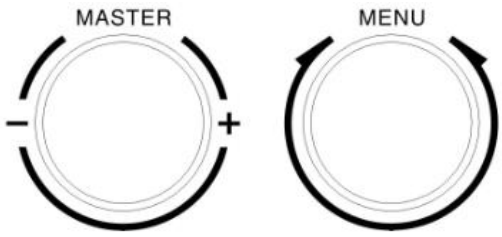
1. Press key 7; the indicator will be off.
2. Then press key 6 and key 8 simultaneously; their indicators will be off.
3. Release all keys; the keys of the RK-MIC are locked.

Follow below steps to unlock the device:

1. Press key 7; the indicator will light up.
2. Press key 6 and key 8 simultaneously; their indicators will light up.
3. Release all keys; the keys of the RK-MIC are unlocked.

Menu Operation

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



Master Volume Adjustment

The master volume knob can be used to adjust audio channel 1 and 2 in public address mode and cannot be used in emergency alarm mode. Channel 1 is typically used to broadcast background music. The volume can be adjusted from 0 to 31. Rotate the knob clockwise to increase volume or counterclockwise to decrease volume. Then press and release the knob, users can adjust channel 2 following the same instructions. The knob will only adjust the volume within its allowable range.





During adjustment, the screen shows the current volume. When no operation has been performed for 3 seconds, the device will automatically return to its previous condition. Manually pressing the knob can also exit the interface.

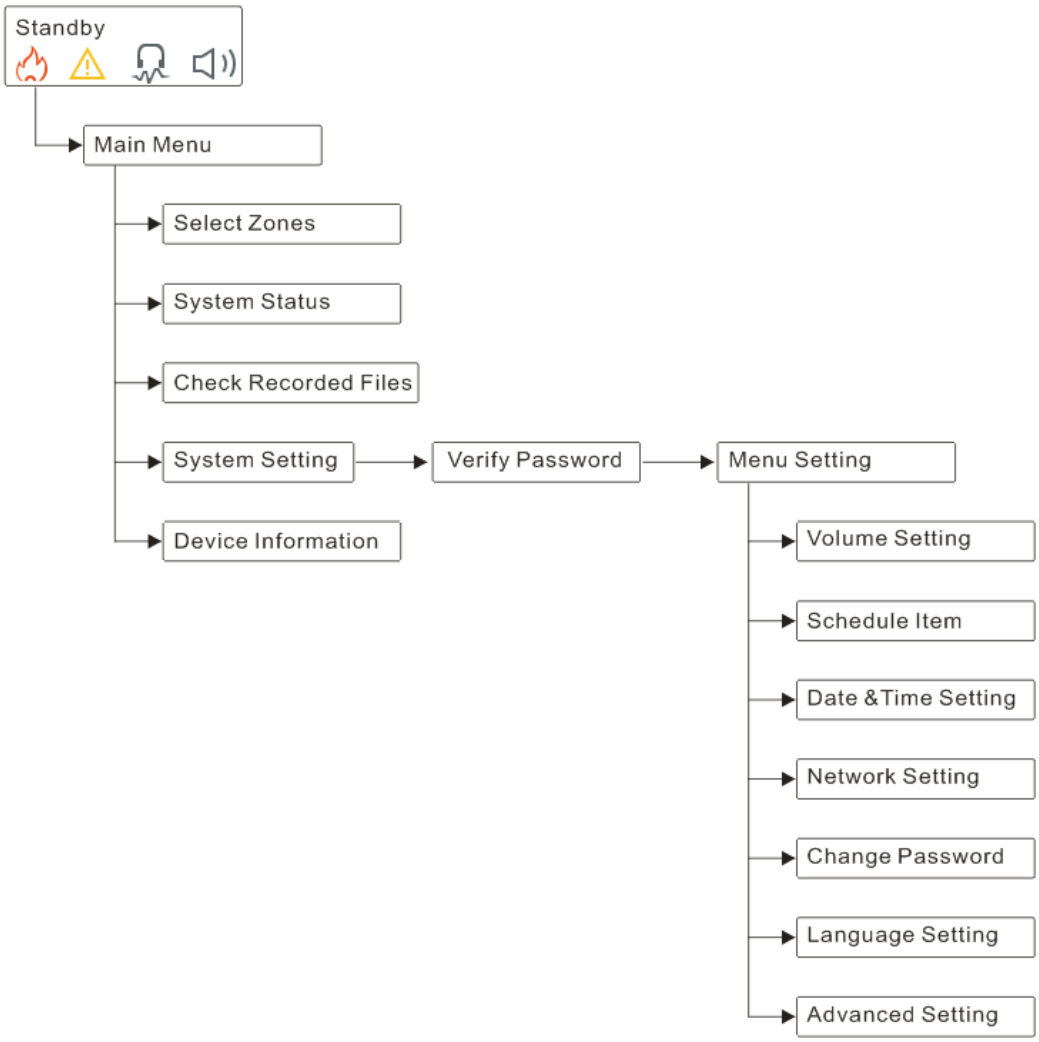
Menu Operation

The menu knob can execute the following operations:

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

Pressing the “Home” button on the front of the panel will return the screen to the homepage without jumping back step by step.

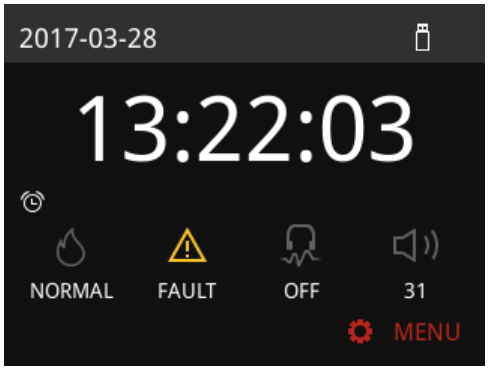
Menu Structure



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.



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 signals and is working in auto. emergency mode, the icon turns red and the description is “AUTO”.
- If the emergency button is pressed and the system is working in manual emergency mode, the icon turns red and the description will be “MANUAL”.

General Fault Status

- If the system is working normally and no faults are detected, the icon will be grey.
- If there is a fault, the icon will turn yellow.

Monitor Status

The characters show 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 and 2; background music is usually played in audio channel 1.

Menu Button

- The device will display the main menu by pressing the menu knob.

USB

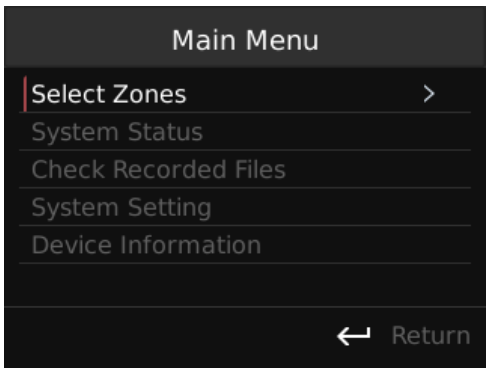
- When a USB storage is inserted into the device, this icon will be displayed.

Timing

- When the timing function is enabled, the screen will show the task’s name and time. If there isn’t a timing task, the icon will be hidden.

Main Menu

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



Select Zones

All the zones will be displayed in Select Zones. Users can rotate the knob to move the cursor, then press the knob to select or unselect. The icon ✓ will be displayed beside the selected zones. After selecting the zones, press the audio button to broadcast.

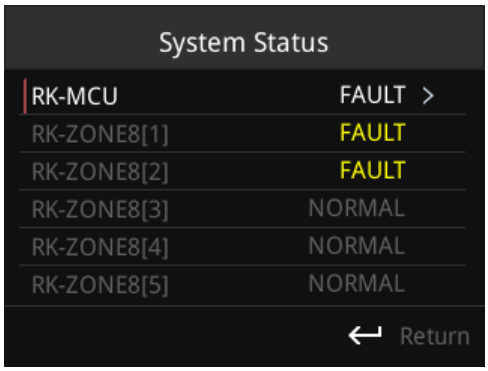
If an exclamation icon is displayed beside the zones, then the corresponding zone has a fault. Users can select Return and press the knob to go back to the homepage.



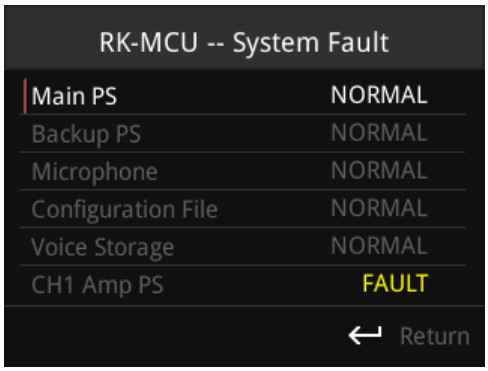
System Status

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

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



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



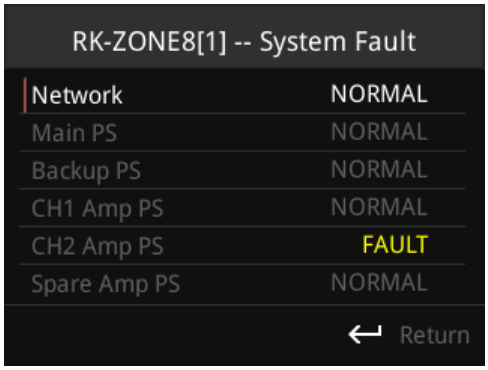
The fault list of the RK-MCU is as follows:

No.	Component	Status	Description
1	Main PS	Normal/Fault	Display the main PS fault status.
2	Backup PS	Normal/Fault	Display the 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 the audio file storage.
6	CH1 Amp PS	Normal/Fault	Display the status of the power supply of the power amplifiers which are connected to CH1.

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

No.	Component	Status	Description
33	Contact Input 4	Normal/Open/ Short	Display the wiring status of contact input 4.
34	Contact Input 5	Normal/Open/ Short	Display the wiring status of contact input 5.
35	Contact Input 6	Normal/Open/ Short	Display the wiring status of contact input 6.
36	Contact Input 7	Normal/Open/ Short	Display the wiring status of contact input 7.
37	Contact Input 8	Normal/Open/ Short	Display the wiring status of contact input 8.
38	Fire Alarm Interface (RS-485)	Normal/Fault	When the MCU is connected to the fire alarm system via the fire alarm interface (RS-485), it displays the interface status.
39	Program	Normal/Fault	The software program is supervised. If there are any errors, the MCU will show a program fault.

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

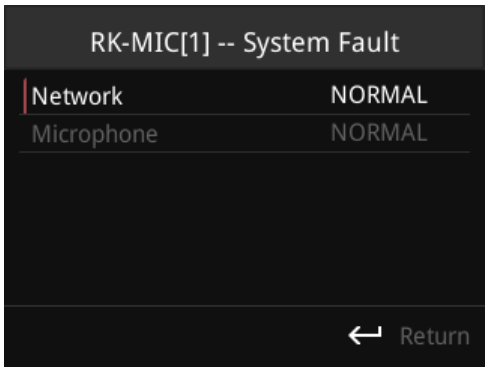


The fault list of the RK-ZONE8 is as follows:

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 CH2A power amplifier.
10	CH2B Amp Loop	Normal/Fault	Display the loop status of CH2B power amplifier.
11	Spare Amp Loop	Normal/Fault	Display the loop status of spare power amplifier.
12	Speaker Line 1A/B	Normal/Open/ Short	Display the status of speaker line 1A/B.

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

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



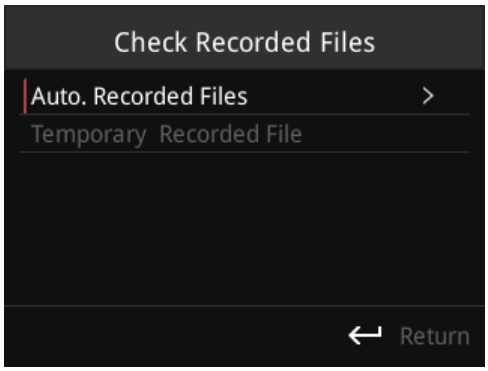
The fault list of the RK-MIC is as follows:

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.

Rotate the menu knob to view more content in the fault list. Press the knob to return to the previous menu.

Check Recorded Files

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

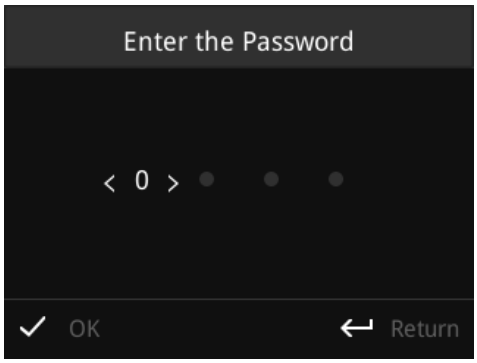


Rotate the menu knob and press it to view the file list. In the file list, rotate the knob to select a recorded file and press the knob to play it. The device can play the recorded files via the built-in loudspeaker.

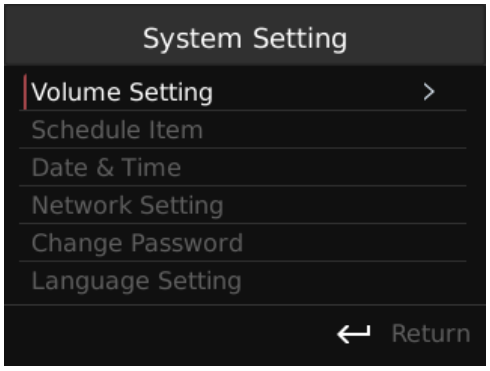
System Setting

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

Password Verification

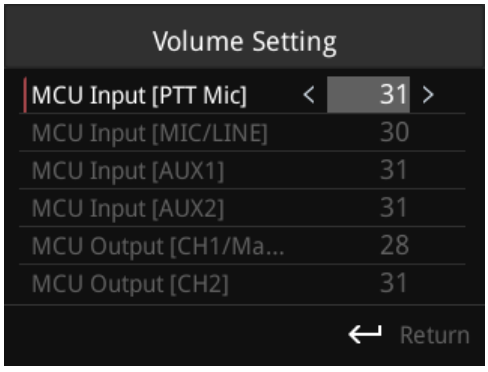


On the password verification screen, input the password by rotating the knob to select the desired character and then press the knob. Once all the characters are entered, select *OK* and press the knob. If the password is correct, the screen will display the system setting menu. If incorrect, it will return to the main menu. Select the *Return* option and press the knob and the device will return to the main menu.



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

Volume Setting



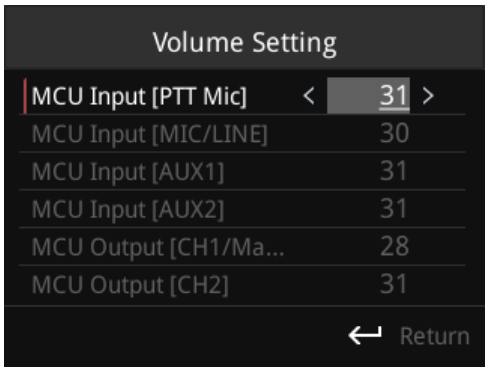
Users can adjust the input and output volume in the volume setting interface.

The following items can be set:

No.	Item	Range	Description
1	MCU Input [PTT Mic]	0~31	Set the volume of PTT Mic input of MCU.
2	MCU Input [MIC/LINE]	0~31	Set the volume of MIC/LINE input of MCU.
3	MCU Input [AUX1]	0~31	Set the volume of AUX1 input of MCU.
4	MCU Input [AUX2]	0~31	Set the volume of AUX2 input of MCU.

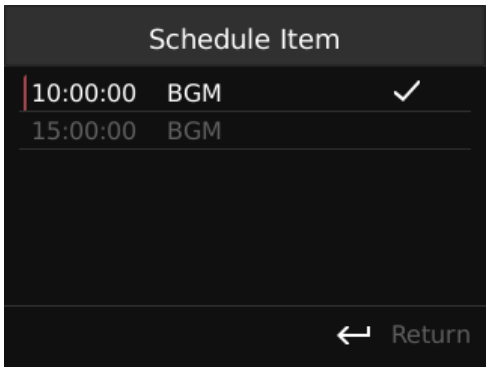
No.	Item	Range	Description
5	MCU Output [CH1/Master]	0~31	Set the volume of audio channel 1 of MCU.
7	MCU Output [CH2]	0~31	Set the volume of audio channel 2 of MCU.
8	MCU Output [Monitor]	0~31	Set the volume of monitor output of MCU.
9	MCU Amp [CH1]	0~31	Set the volume of power amplifiers which are connected to CH1 of MCU.
10	MCU Amp [CH2]	0~31	Set the volume of power amplifiers which are connected to CH2 of MCU.
11	MIC Input	0~31	Set the volume of the audio signal from remote call stations.
12	Z8-x Amp [CH1]	0~31	Set the volume of power amplifiers which are connected to CH1 of RK-ZONE8 with the address x.
13	Z8-x Amp [CH2]	0~31	Set the volume of power amplifiers which are connected to CH2 of RK-ZONE8 with the address x.

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



Select *Return* and press the knob to exit the volume setting interface and return to the previous menu.

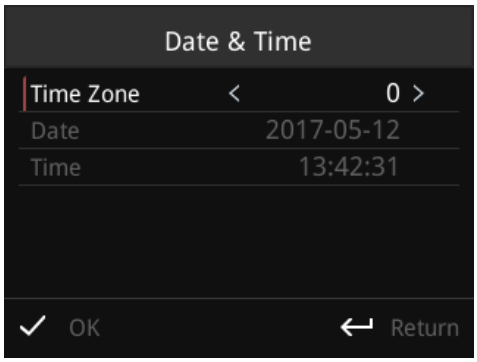
Schedule Item



Users can view, enable, or disable the timing task via Schedule Item. The setting is only valid for the current day. All the timing tasks will be displayed in Schedule Item. The icon ✓ beside the timing task means it is enabled and pressing the knob again will disable it. Users can view more tasks by rotating the knob.

Users can select Return and press the knob to go back to the “System Setting” page.

Date & Time



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

- Time Zone

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

  Note:

  If the time zone setting on the device does not match the local time zone, the time displayed on the device will be incorrect when synchronizing time via the network.

- Date

  Select *Date* and press the knob to enter the setting interface. The default is the year setting. Users can rotate the knob to adjust and press it to proceed to the month setting. After all the settings have been made, the device will automatically exit the interface.

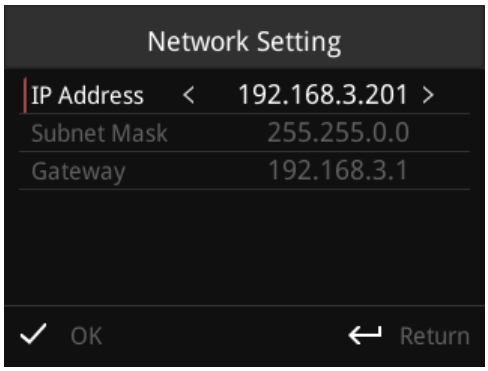
- Time

  Select *Time* and press the knob to enter the setting interface. Set the time in the same manner as the date. After all options have been set, the device will automatically exit the interface.

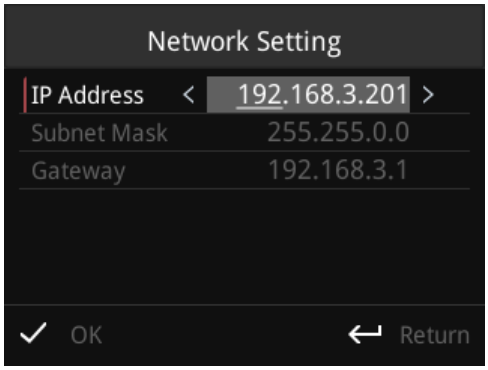
After setting the time zone, date, and time, rotate the knob to select *OK* and press it. If users select *Return*, the device will return to the previous menu without saving.

Network Setting

When the MCU is connected to other devices via Ethernet, such as a computer, users need to set network parameters.

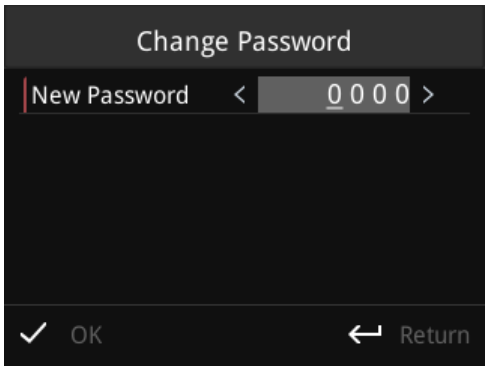


In the Network Setting interface, users can set the IP address, subnet mask, and gateway. Select the items which need to be set and press the knob to set them. Rotate the knob to adjust the setting and press it to move to the next setting . After making all the settings, press the knob to exit.



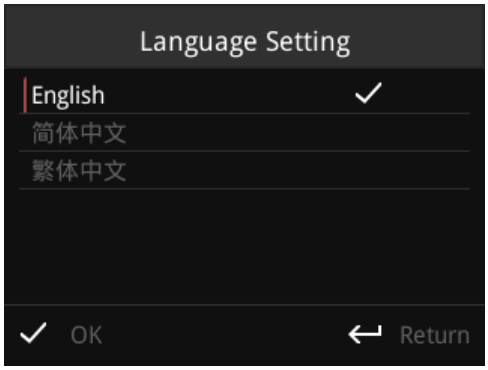
Please follow the steps above to make the settings and rotate the knob to select *OK*. Then press the knob to save and return to the previous menu. If users select *Return*, the device will return to the previous menu without saving.

Change Password



Users can set a new password in the Change Password interface. Press the knob to enter the setting interface and rotate it to set. Press it again to move to the next setting. After making the settings, rotate the knob to select *OK* and press it to save. If users select *Return*, the device will return to the previous menu without saving.

Language Setting



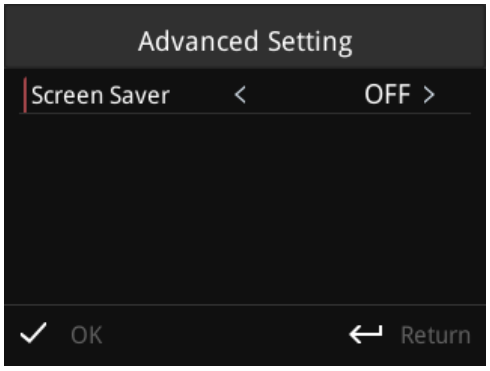
The MCU supports multi-language display. Users can set the language in the menu shown above. If the language list does not meet the user's requirements, they can also add new languages via the configuration software. Rotate the knob and move the cursor to the required language. Press the knob and the icon ✓ will be displayed. Select *OK* and press the knob to save the settings. If users select *Return*, the device will return to the previous menu without saving.

Note:

Device will restart after clicking *Save*.

Advanced Setting

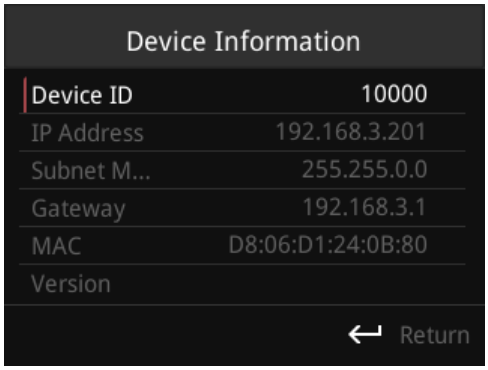
Users can set a screen saver function in the advanced setting menu.



Rotate the knob and move the cursor to “Screen Saver”. Press the knob to enable or disable the function. Select *OK* and press the knob to save the setting. If users select *Return*, the device will return to the previous menu without saving.

Device Information

Users can view “Device ID”, “IP Address”, “Subnet Mask”, “Gateway”, “MAC”, and firmware versions. This data cannot be changed. Rotate the knob to move the cursor and press it to return to the main menu.



6 Maintenance

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

Regular Maintenance

When using the system, maintenance staff and operators need to regularly check the system's running status and resolve problems promptly to keep the device operating consistently in the long term.

1. Regularly test system function.
2. Periodically clean the dust around cooling holes.
3. The battery model of the MCU is CR 2032 (Panasonic). If the device clock appears abnormal, please insert a new battery.

Note:

- Please resolve problems found during maintenance promptly. If the device has a fault, contact the retailer.
- It is recommended to replace the battery using the same model.

Troubleshooting

Checking Problems

The steps below can be followed to check the system:

1. Record the condition and status in detail:
   - Fault status
   - What operations are being commenced when the fault occurs
   - Other existing abnormal phenomena
   - Export fault log file
2. Please make sure the operations being carried out comply with the manual. If not, please record the actual operations.
3. If the fault is not caused by incorrect operation, please test it again and make sure the problem occurs again.
4. Please contact the supplier or sales representative and provide the configuration file and additional information. They will help to resolve the problem.

Troubleshooting

The following are common faults, 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.

No.	Fault	Causes	Actions
3	Microphone	The microphone may be the PTT microphone of the MCU or the microphone of the remote call station. The problem may be: - The socket is disconnected or loose. - The microphone is damaged.	Please check the connection of the microphone socket. Check the microphone's installation and whether the interface is locked. If the microphone is connected properly, please replace the microphone.
4	Configuration File	The device cannot find the configuration file or there is an error.	Please upload the 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 a power amplifier corresponding to CH1 is disconnected. - The backup power supply of a power amplifier corresponding to CH1 is disconnected. - Any fuse of CH1 power amplifiers is burned.	Please check the connection and fuse of the power supply of CH1 power amplifiers.
7	CH2 Amp PS	The possible reasons are: - The main power supply of a power amplifier corresponding to CH2 is disconnected. - The backup power supply of a power amplifier corresponding to CH2 is disconnected. - Any fuse of CH2 power amplifiers is burned.	Please check the connection and fuse of the power supply of CH2 power amplifiers.
8	Spare Amp PS	The possible reasons are: - The main power supply of the spare power amplifier is disconnected. - The backup power supply of the spare power amplifier is disconnected. - Any fuse of the spare power amplifiers is burned.	Please check the connection and fuse of the power supply of spare power amplifiers.
9	CHxx Amp Loop	The possible reasons are: - The connections between power amplifier and controller are faulty. - The power amplifier cannot work normally.	Please check the power amplifier and its connections to the controller.
10	Spare Amp Loop	The possible reasons are: - The connections between spare power amplifier and controller are faulty. - The spare power amplifier cannot work normally.	Please check the power amplifier and its connections to the controller.

No.	Fault	Causes	Actions
11	Speaker Line xx - Open	Some loudspeakers on the speaker line are disconnected or not calibrated.	Please check the connection of loudspeakers on the speaker line. If no issue is found, please calibrate the device.
12	Speaker Line xx - Short	The speaker line has shorted, is overloaded, or not calibrated.	Please check the connection of loudspeakers on the speaker line. If no issue 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	Contact Input xx -Open	The wiring of the contact input is open or disconnected.	Please check the wiring of contact input.
15	Contact Input xx - Short	The wiring of the contact input is shorted.	Please check the wiring of contact input.
16	Fire Alarm Interface (RS-485)	The possible reasons are: - The connection between MCU and LPI-ModBus module is short, open or reversed. - The connection between LPI-ModBus module and fire alarm control panel is faulty. - No power supply to LPI-ModBus module. - Mistakes in configuration	Please check the connection from fire alarm control panel to MCU, the power supply of LPI-ModBus module and the related configuration. If you don't use the fire alarm interface, please disable its supervision.
17	Network	The possible reasons are: - No connection or wrong connection from device to MCU. - Device is powered off. - No end-of-line resistor is connected to the communication bus.	Please check the connection of the communication bus and make sure the last device is connected to an end-of-line resistor. Please check the power status of all the devices on the communication bus.

Maintenance

Changing Fuse

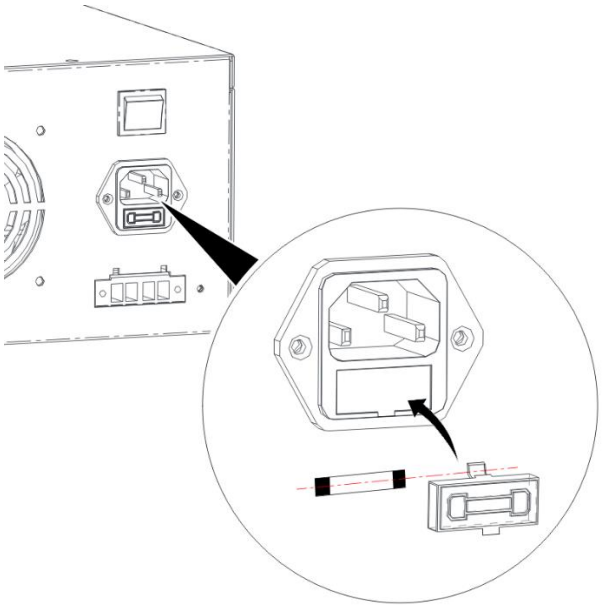
Available only at the main power socket.

A fuse is attached to each device. If a fuse rupture is detected, it must be changed by appropriately trained people.

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

The following are the steps to change the fuse of the backup power supply:

1. Pull out the fuse plug underneath the AC power socket.
2. Exchange the fuse.
3. Replace the fuse plug.



Upgrading Device Firmware

If device firmware needs to be upgraded, the task must only be performed by appropriately trained people. Before upgrading, please ensure compatibility between the new firmware and other devices to ensure the system continues to work normally.

Appendix

Access Level

According to the user classification, there are three access levels to operate the system.

- Access Level 1

  By a member of the general public or persons with a general responsibility for safety supervision who might be expected to investigate and initially respond to a fire alarm or a fault warning.

- Access Level 2:

  By persons having a specific responsibility for safety and who are trained and authorized to operate the VACIE in the:

  - Quiescent condition

  - Voice alarm output condition

  - Fault warning condition

  - Disablement condition

- Access Level 3

  By persons who are trained and authorized:

  - To reconfigure the site-specific data held within the controller or controlled by it (e.g. labelling, zoning, alarm organization)

  - To store and change emergency tones and messages

  - To maintain the VACIE in accordance with the manufacturer's published instructions and data

- Access Level 4

  By persons who are trained and authorized by the manufacturer to either repair the system or upgrade the firmware, thereby changing its basic mode of operation.

The users of access level 1 can supervise the system status directly via the indicators without special operation.

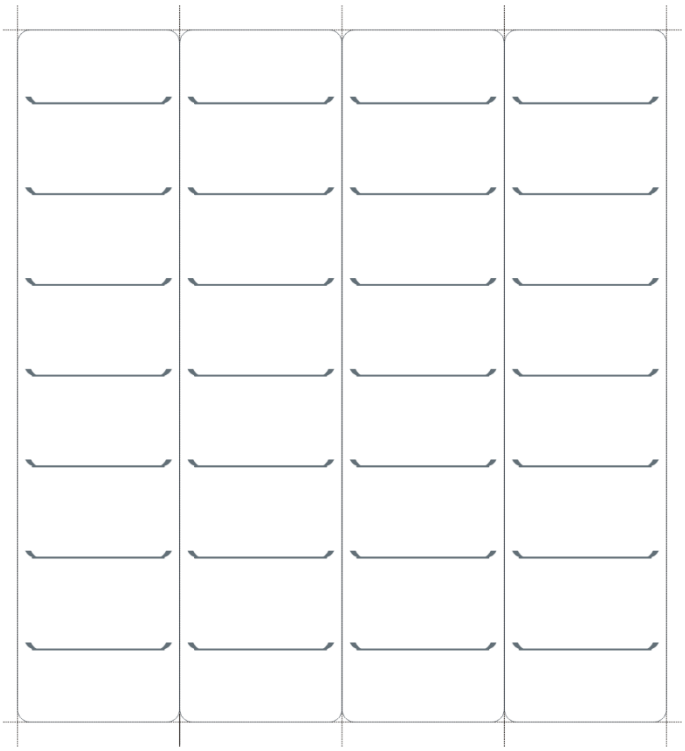
If users of access level 2 need to access the operation, use the keys to open the doors of the racks first, then operate the system from the front panel. If they want to operate the remote call station outside of the rack, the device must be unlocked by pressing the buttons.

If users of access level 3 need to reconfigure the system and change the settings, they need to input the password to enter the menu or configure the system via the INTEVIO configuration tool.

If users of access level 4 need to repair the system, they need to open the rack using a key and screwdriver and use a special software tool to upgrade the firmware.

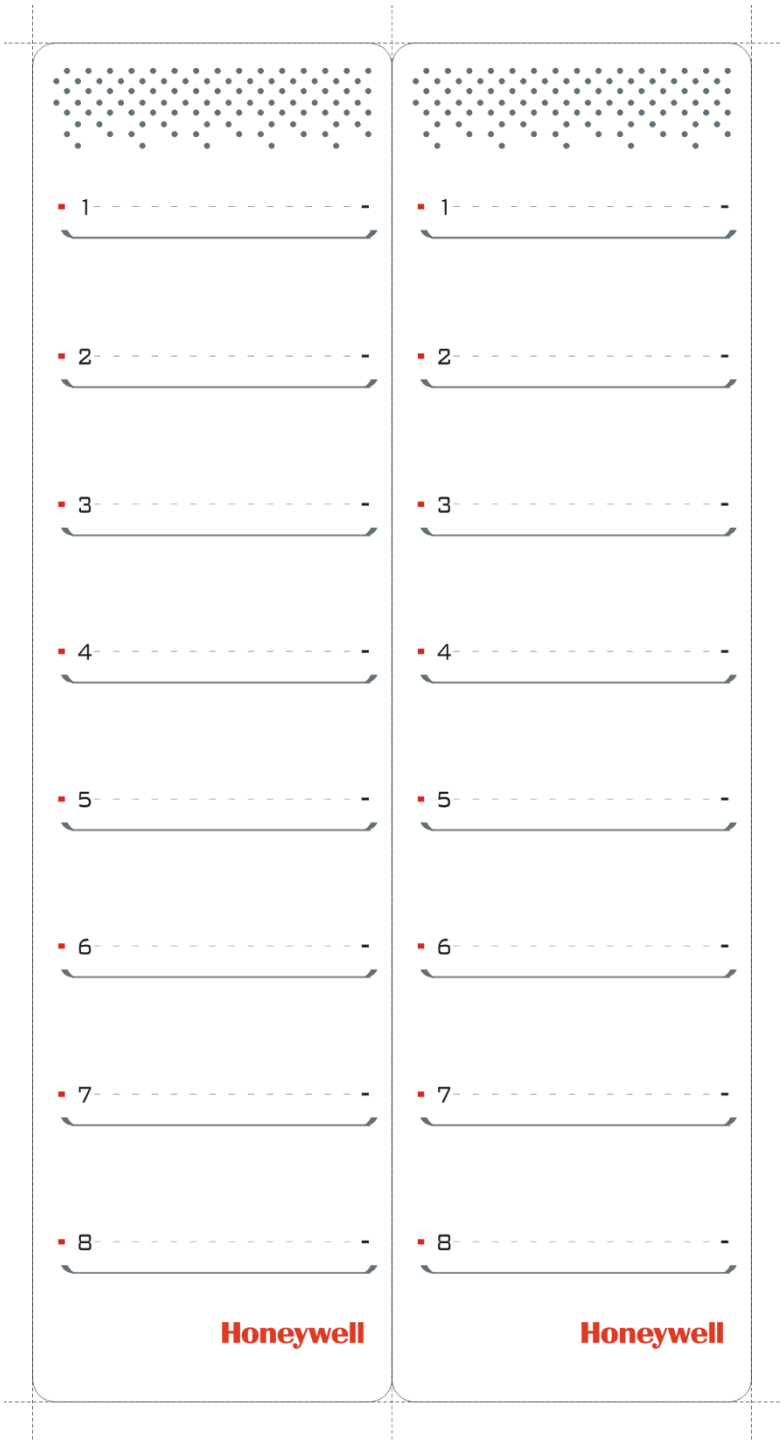
RK-MCU Label

If users need to make RK-MCU button labels, print the labels below and write the names on the labels. Refer to the chapter “Installing RK-MCU Labels” for information on installation.



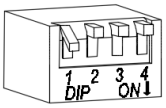
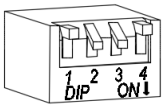
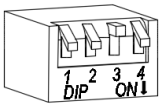
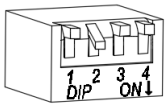
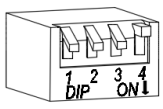
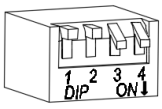
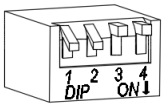
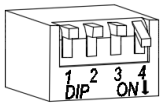
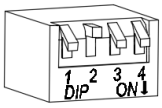
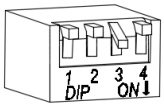
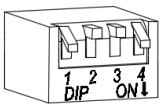
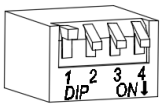
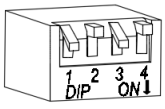
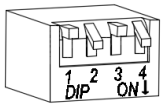
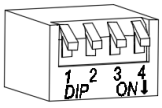
RK-MIC Label

If the user needs to make RK-MIC button labels, print the labels below and write the numbers on the labels. Refer to the chapter “Installing RK-MIC Labels” for information on installation.



DIP Switch Setting

4-pin DIP switches are used to set the device address. The figure below shows the DIP switch settings that correspond to the address code in 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	

Typical Applications - Amplifier Sharing

The amplifiers connected to a RK-MCU can be shared to a RK-ZONE8 to drive more speaker lines. Here we introduce the applications in single channel mode and dual channel mode.

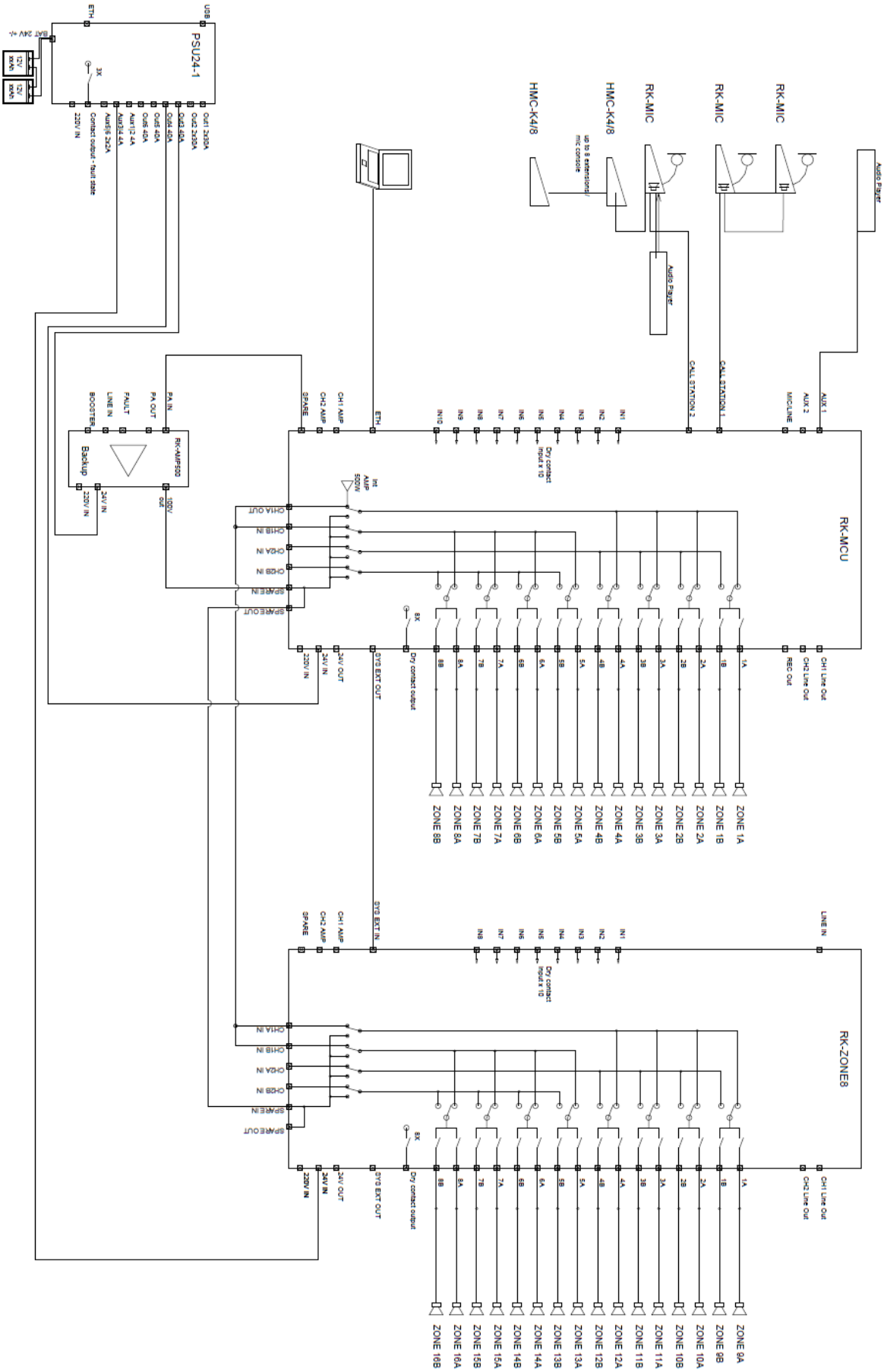
- In single channel mode, share the internal amplifier of RK-MCU to RK-ZONE8, up to 16 zones (32 speaker lines) will share the built-in amplifier(500W) and the backup amplifier. The total load should be less than 500W.
- In single channel mode, share the internal amplifier and an external amplifier of RK-MCU to RK-ZONE8, the external amplifier will be shared by the speaker lines of RK-MCU and RK-ZONE8. The total load should be less than 1000W.
- In dual channel mode, share the internal amplifier and an external amplifier of RK-MCU to RK-ZONE8, the external amplifier will be shared by the speaker lines of RK-MCU and RK-ZONE8. The total load should be less than 500W.
- In dual channel mode, share the internal amplifier and three external amplifiers of RK-MCU to RK-ZONE8, the amplifiers will be shared by the speaker lines of RK-MCU and RK-ZONE8. The total load should be less than 1000W.



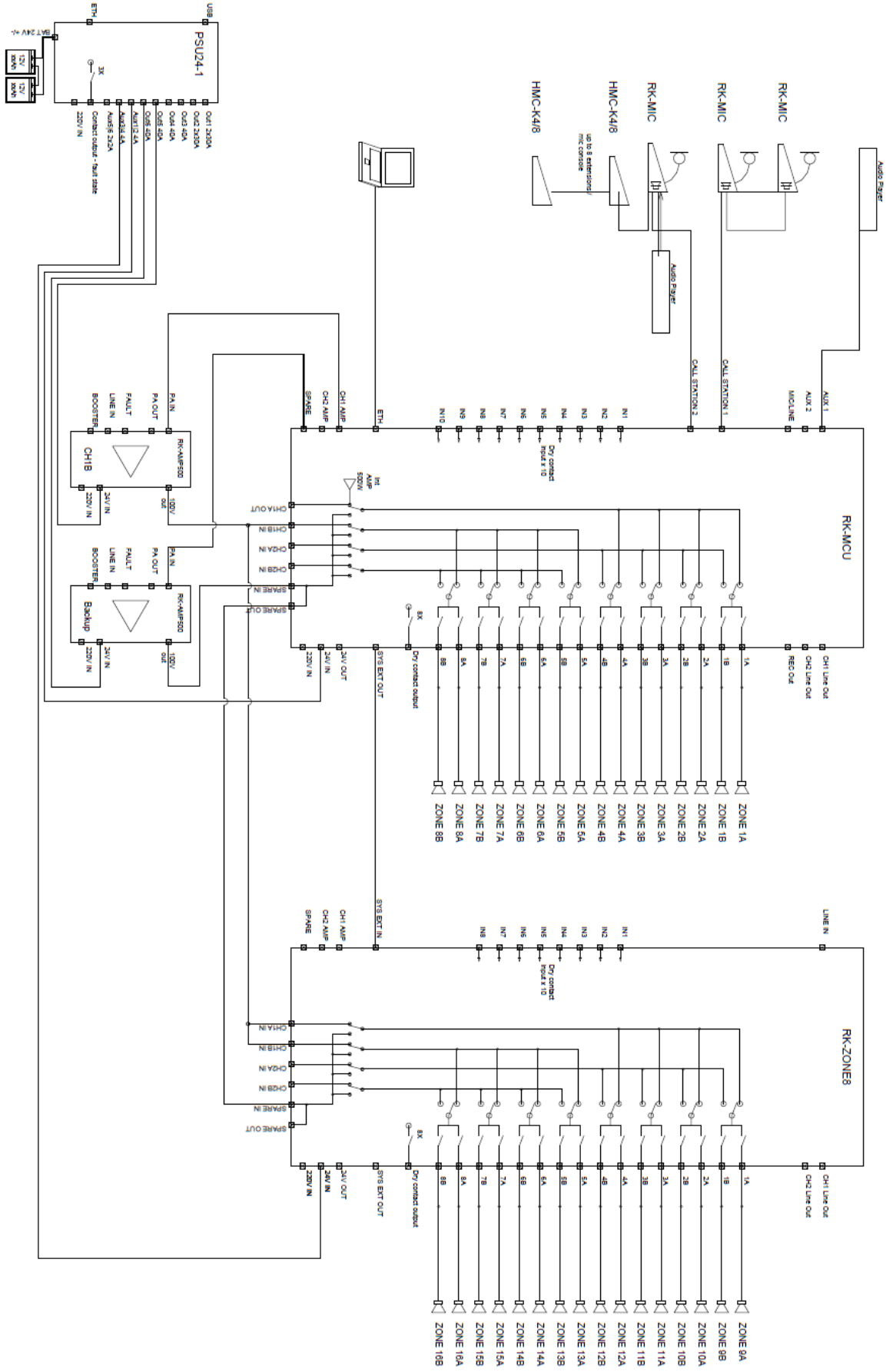
Note:

The amplifiers of a RK-MCU can be shared to no more than one RK-ZONE8.

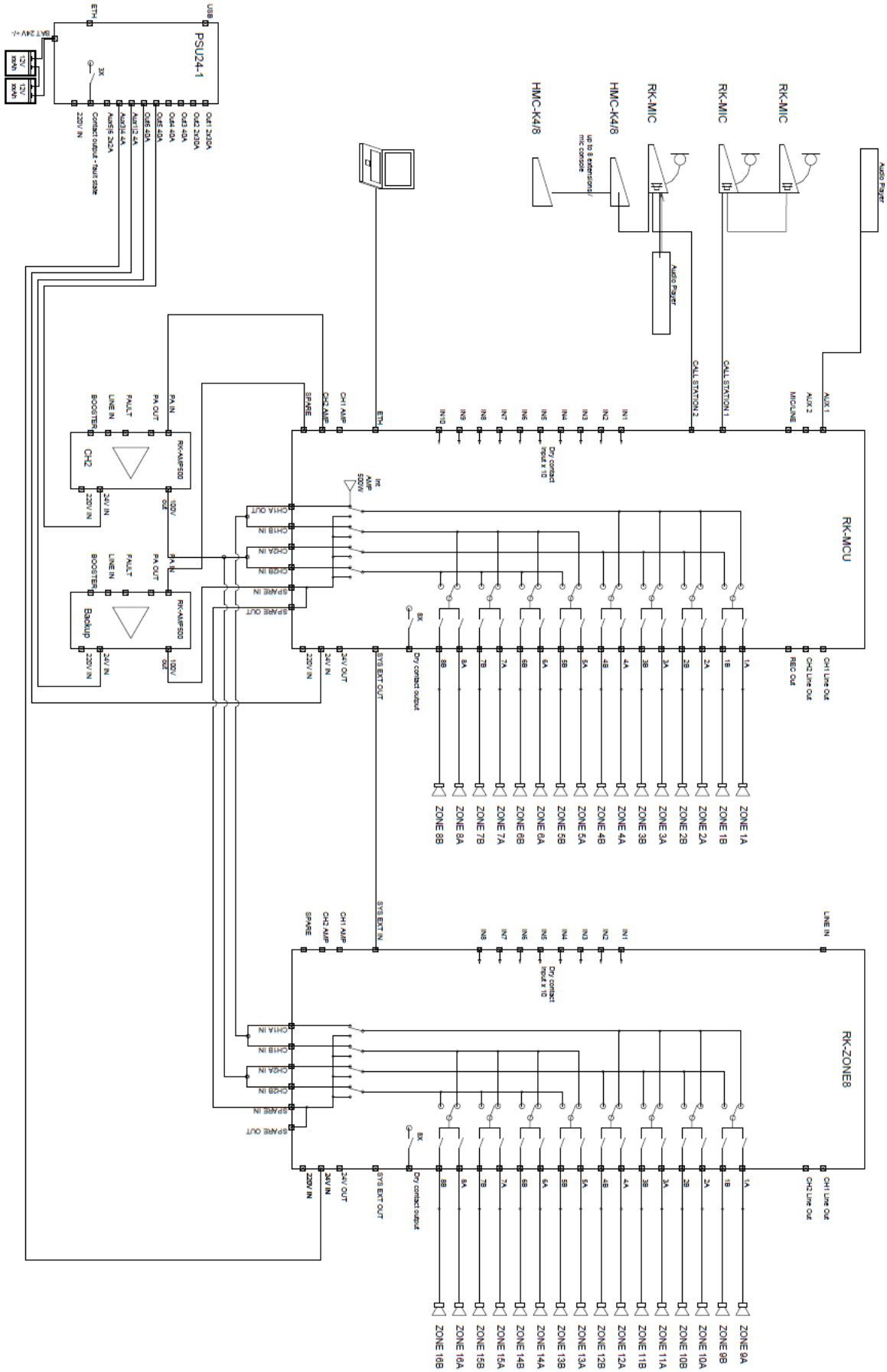
Single channel mode(500W)



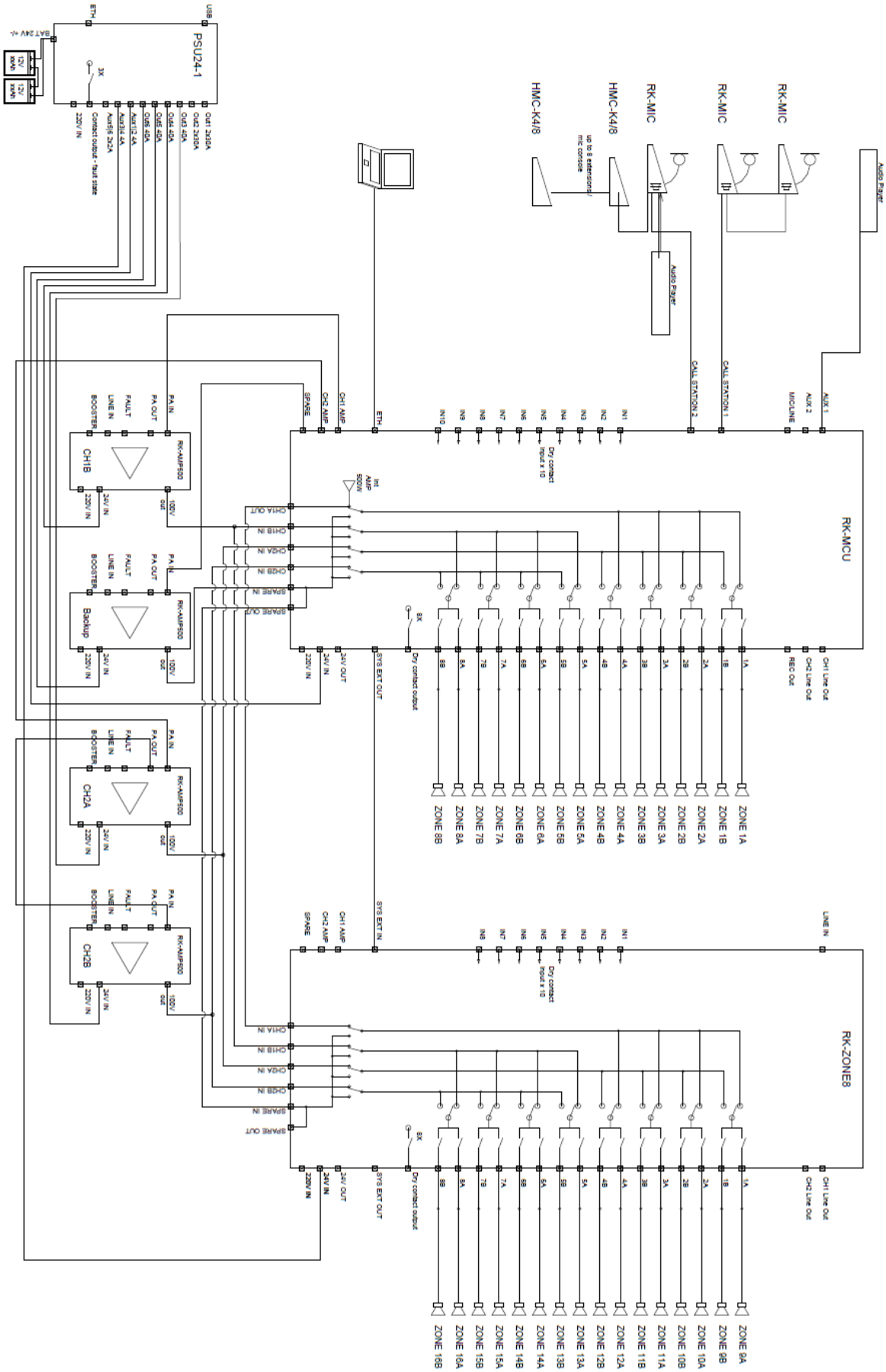
Single channel mode(1000W)



Dual channel mode(500W)



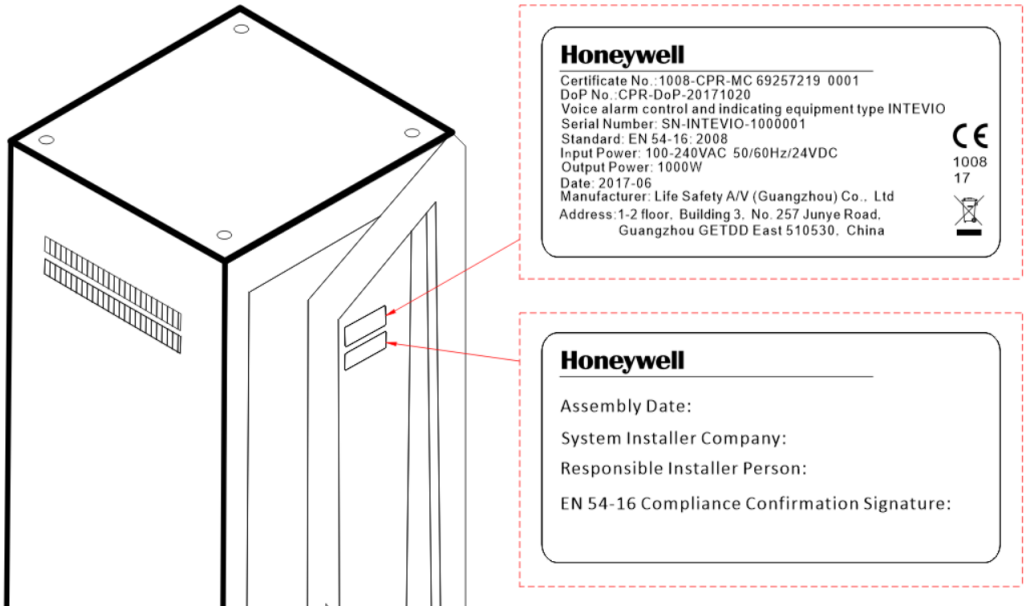
Dual channel mode(1000W)



EN 54-16 Marking of INTEVIO

RK-MCU controller is delivered with INTEVIO EN 54-16 nameplate - 2 stickers as shown in below figure. For compliance with EN54-16 standard, installer is obliged to apply nameplate to front door of INTEVIO 19” rack in upper corner of the door, so that it is visible and readable when rack door is closed. Installer is obliged to fill in the nameplate with the following information:

- assembly date – date when INTEVIO rack was assembled, configured and wired in accordance with this manual
- system installer company – name of the company, which was responsible for INTEVIO rack assembly, wiring and configuration
- responsible installer person – name and surname of person from installer company, who is responsible for INTEVIO rack assembly, wiring and configuration
- EN54-16 compliance confirmation signature – signature of responsible installer person



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