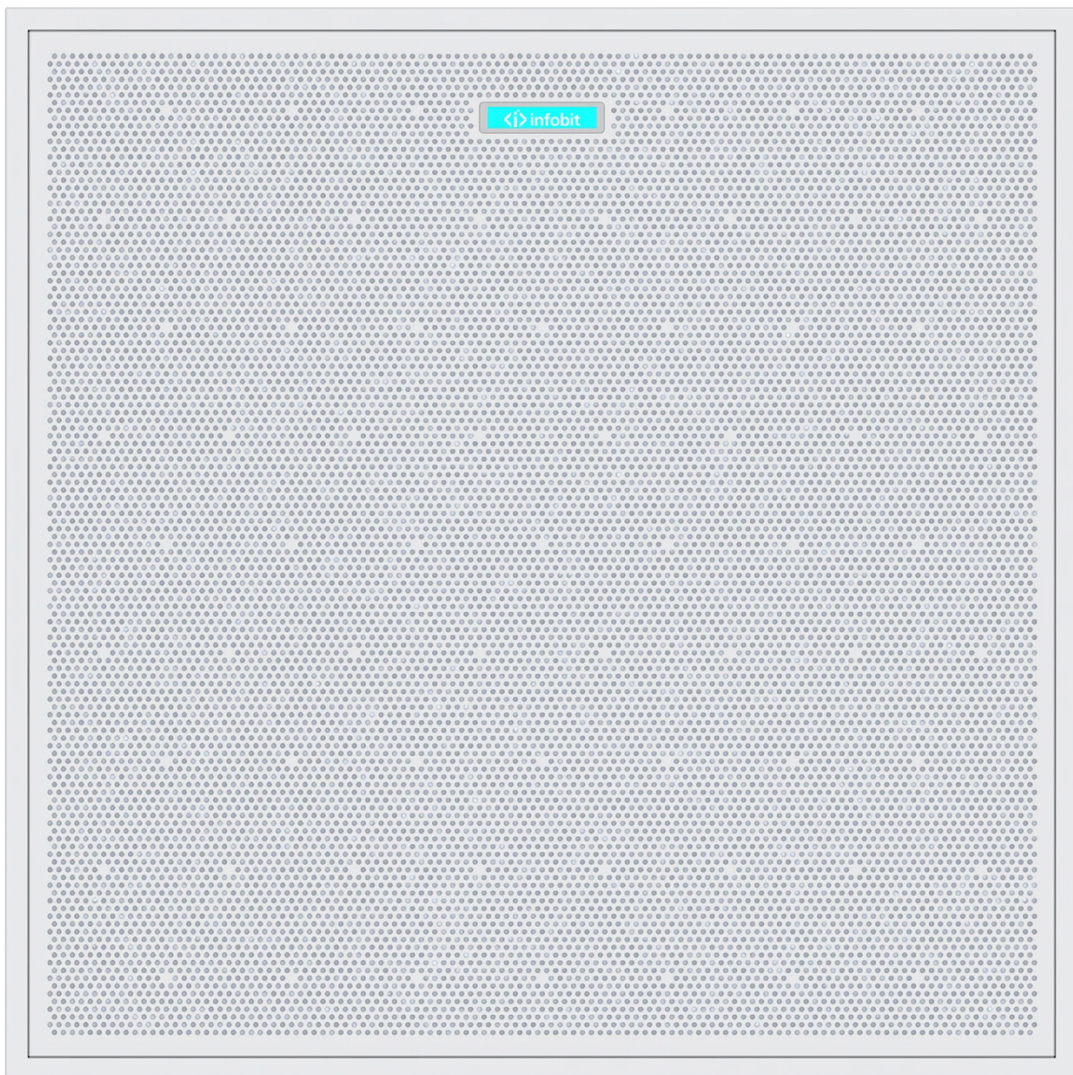


# iSpeaker CM365

## AI Ceiling Array Microphone

*Hardware User Manual V1.0*



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# 1. INTRODUCTION

Thank you for using **iSpeaker CM365**- the seamless sound reinforcement ceiling array microphone. Please read this manual carefully to ensure safe and correct operation of the equipment. Please keep this manual properly for future reference.

The seamless sound amplification ceiling array microphone consists of **129 high fidelity microphones**, designed with a composite circular array layout to provide the necessary pickup sampling conditions for the algorithm; The CPU adopts a professional audio processor (8-core, 6T high computing power) and is equipped with industry-leading audio signal processing algorithms, such as low latency **ClearVoice AI** algorithm, real-time feedback suppression engine, adaptive sound field control technology, multimodal AI noise reduction system, spatial sound field modeling technology, traditional audio processing AI deep algorithm dual engine architecture, dynamic beamforming, etc., which can effectively improve the quality of voice amplification interaction; The design adopts a professional audio composite circular array layout microphone, which can achieve **17 amplification zones** and **33 pickup zones**, with a **amplification distance of 4 meters** and a **pickup distance of 8 meters**, effectively picking up sound from any position in the pickup area; Built in **cascading** function module, capable of cascading multiple seamless sound reinforcement ceiling array microphones; Built in **Dante** module to achieve network audio transmission function. Built in advanced algorithms that automatically match various scenes, whether it is the effect of local amplification or the effect of outputting to remote terminals, can achieve clear and high-fidelity vocals.

***Note:** Our company may upgrade our products and firmware in the future, which may differ slightly from this user manual. All interpretation rights belong to our company.*

# 2. ATTENTION

1. Please comply with relevant national laws and not use this product for any illegal purposes;
2. Working temperature: 0-40 degrees Celsius, please use at the specified temperature;
3. Working humidity: <90%, this product does not have complete waterproof function;
4. During transportation and storage, it is necessary to prevent heavy pressure to avoid damage to the product;
5. Except for the installation of the suspension rod, other installation methods of this product must be fixed by hoisting with ropes;
6. Built in cascading function, capable of cascading multiple CM365 seamless sound reinforcement ceiling array microphones;
7. Built in Dante module, capable of digital audio network transmission function;



8. Please do not disassemble the product without authorization. If you encounter any problems during use, please contact after-sales service;
9. When installing and deploying, it is necessary to ensure that the suspended microphone is installed firmly to prevent it from falling off;
10. During installation and deployment, cables and equipment should be kept as far away as possible from strong electrical signal sources;

### 3. UNPACKING INSPECTION

When opening the outer packaging box, please check for any obvious damage to the appearance and confirm that the items match the list. Please refer to the table below for the specific list.

Accessory	No.	Quantity
iSpeaker CM365 ceiling array microphone	PCS	1
Power adapter (output: DC24V/2.7A)	PCS	1
Power cord (1.5M)	PCS	1
Infrared remote controller	PCS	1
3.81 spacing, 6P Phoenix wiring plug	PCS	4
3.81 spacing, 4P Phoenix wiring plug	PCS	1
Lifting accessories package (4x M5 lifting rings, 4x 3-meter steel wire ropes, 4x spring hooks, 4x disc codes, 12x self-tapping wires, and 12x rubber plugs)	Set	1
User manual	PCS	1

### 4. FEATURES

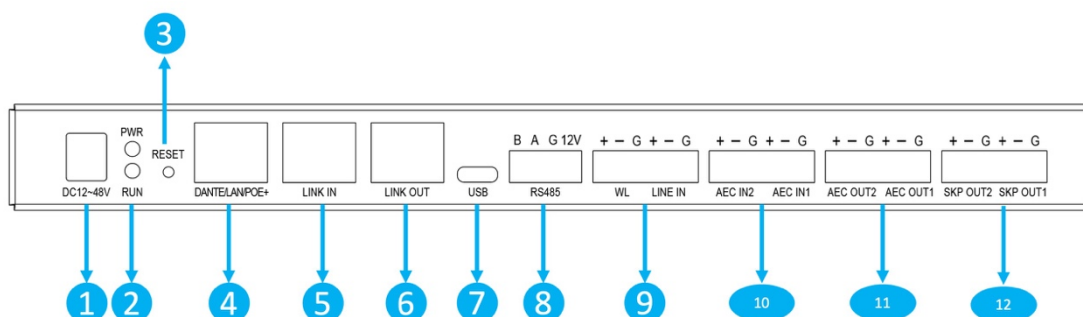
- **Wide-range sound pickup:** The seamless sound amplification ceiling array microphone is composed of a 129x omnidirectional array microphones, with a sound amplification distance of 4 meters and a sound pickup distance of 8 meters, achieving true seamless sound amplification wherever you go.
- **High volume:** The sound feedback gain is  $\geq 15\text{dB}$ . With a higher volume, it is less likely to

- howl and makes speaking without burden.
- **Clear sound:** Implant ClearVoice AI deep algorithm to accurately recognize sound, remove various noises, and enhance speech signals.
- **High flexibility:** Supports custom setting of positioning pickup, supports 33x pickup zones and 17x amplification zone mode settings, and support multiple cascaded adaptation to different scenarios.
- **Easy to expand:** Rich analog and digital (Dante, USB) audio interfaces, can be used independently, and can be connected to wireless microphones, without the need for additional audio processors.
- **Easy to manage:** The system is simple and provides multiple external control methods such as IR, RS485, and network to meet different needs and make the system more flexible.

## 5. OVERVIEW

The seamless sound amplification ceiling array microphone makes conference sound administrators simple and efficient, with an ultra-wide pickup range. Whether it's a small room with 30 people or a large auditorium with 800 people, every corner can hear the speech clearly. Equipped with low latency ClearVoice AI algorithm, it can automatically block interference such as keyboard sound and air conditioning noise, greatly improving meeting focus. Using dynamic beams, intelligent zone recording during discussions, and automatic tracking of the speaker's voice during speeches. During remote meetings, the sound is as authentic and natural as face-to-face communication. Simplify the system, no longer need to fill it with microphones, devices are hidden in the ceiling, and their presence is almost imperceptible during meetings, providing a clear and smooth communication experience.

### 5.1 INTERFACE FUNCTION

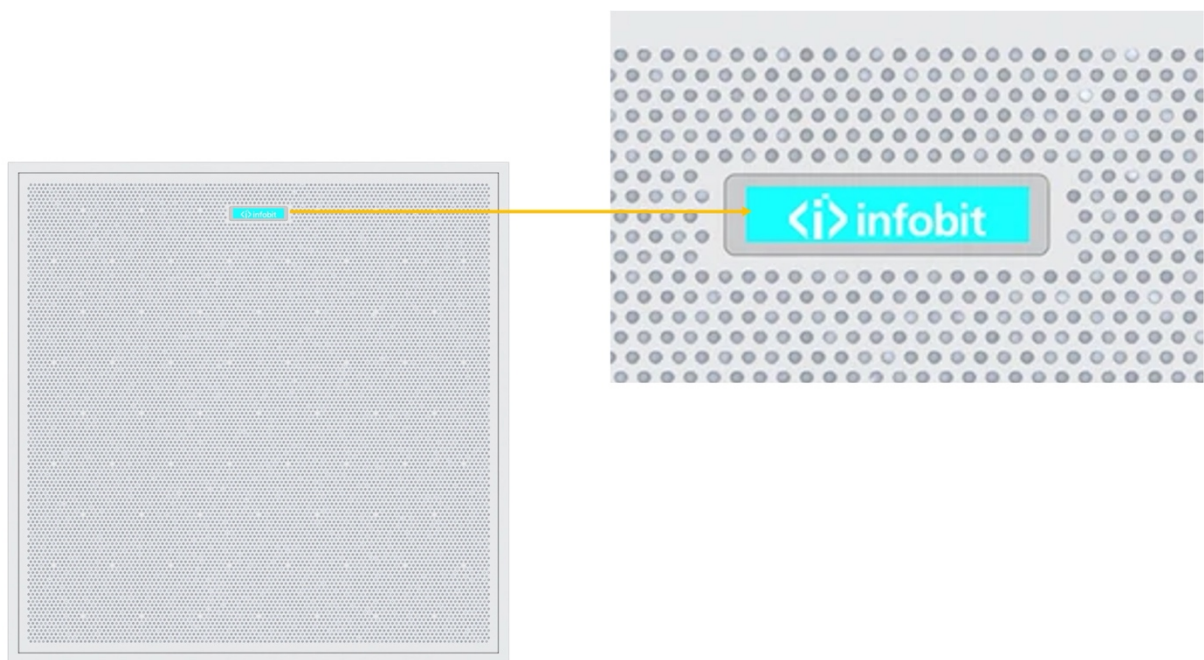


1. **DC12-48V:** power in, input voltage range DC12V-48V.
2. **PWR/RUN:** Normal power on, the red light is always on. When the system is running normally, and the green light is constantly on.



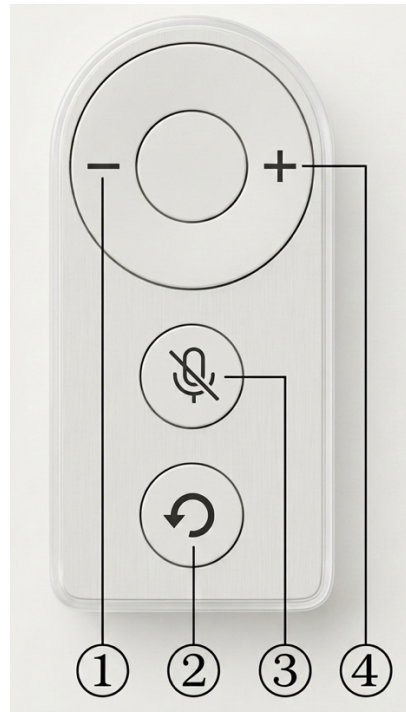
3. **RESET:** Restore factory settings.
4. **DANTE/LAN/POE+:** Dante signal transmission interface/ network interface/ POE power supply.
5. **LINKE IN:** Cascade link input port to the previous set.
6. **LINK OUT:** Cascade link output port to the next set.
7. **USB:** Type C firmware upgrade interface, USB 2.0 audio (UAC) transmission interface.
8. **RS485:** Device control interfaces; Output voltage DC12V/0.4A.
9. **WL/LINE IN:** Wireless microphone analog input; External audio source (PC) analog input.
10. **AEC IN1/2:** Remote audio (reference signal) analog input.
11. **AEC OUT1/2:** Remote analog audio output.
12. **SPK OUT1/2:** The audio output to power amplifier or active speaker.

## 5.2 INDICATOR LIGHT FUNCTION



1. When the power is turned on, the red, blue, and green lights cycle on.
2. During normal operation, the green light remains on continuously.
3. When the microphone is muted for local amplification, the red light remains on.

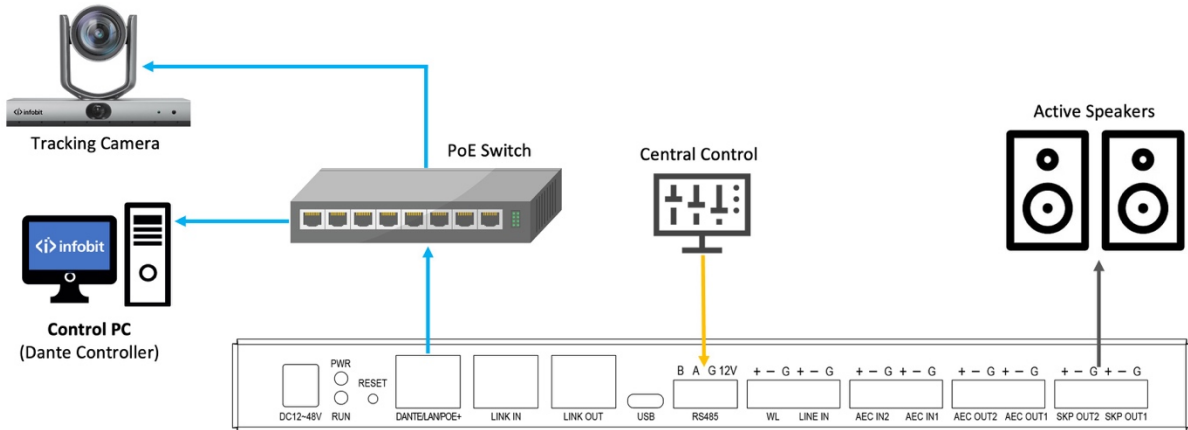
## 5.3 INFRARED REMOTE-CONTROL



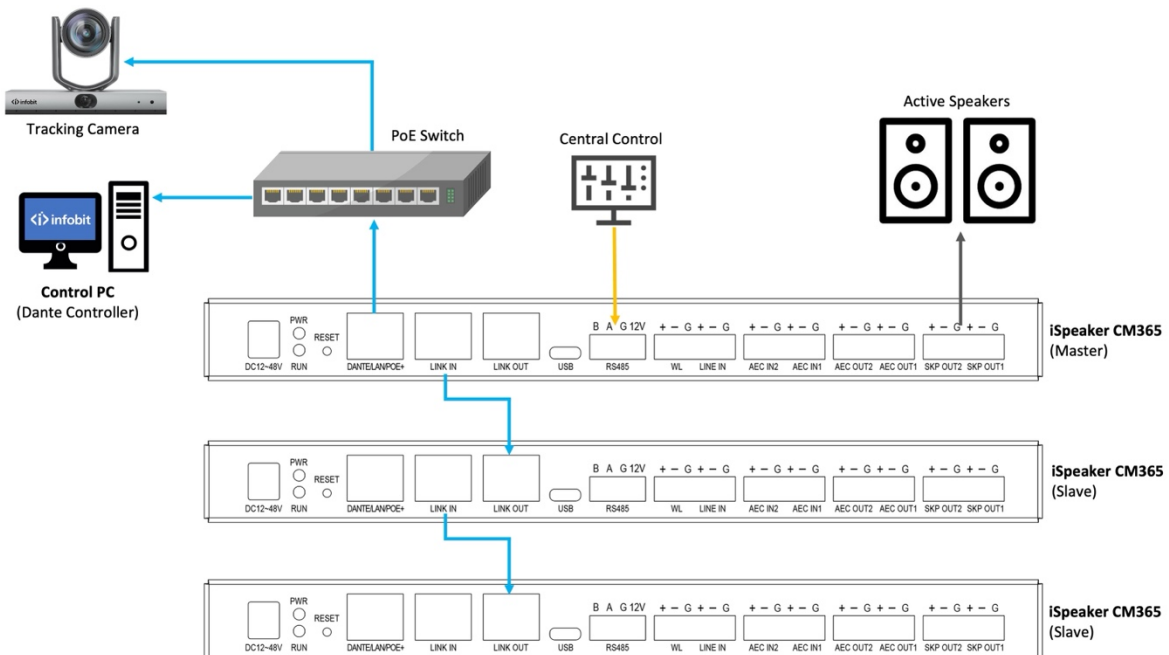
1. **Volume -**: Reduce the local amplification volume.
2. **Restore default**: Control the ceiling array microphone to restore the default volume.
3. **Mute/ Un-mute**: Control the mute or unmute of ceiling array microphone.
4. **Volume +**: Increase the local amplification volume.

## 6. CONNECTION

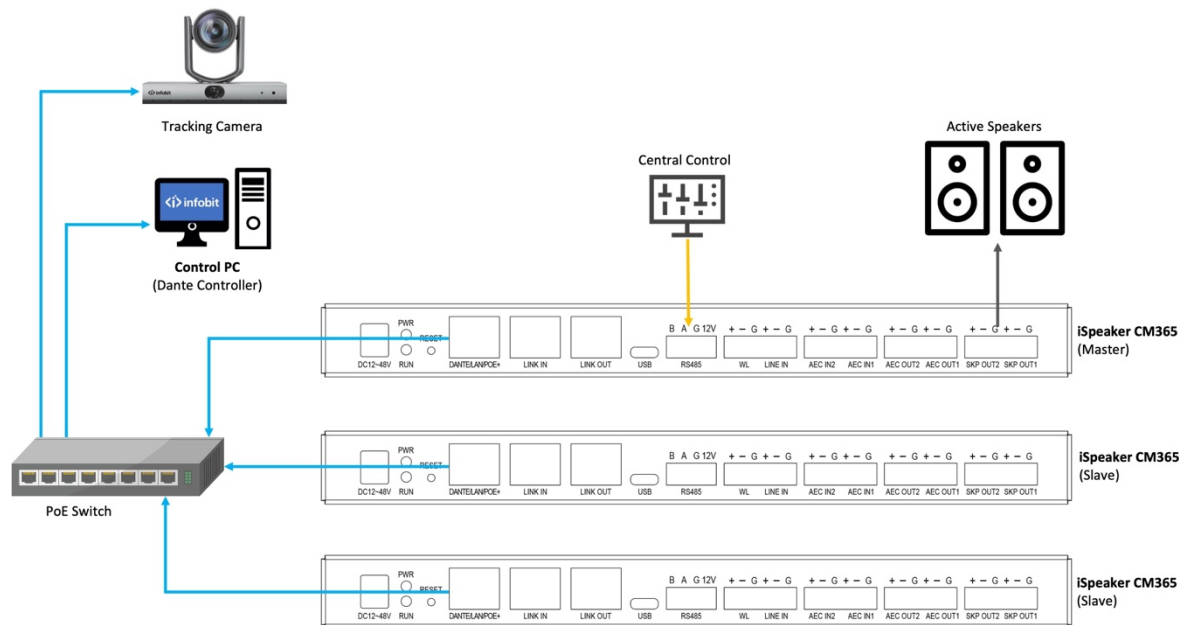
### 6.1 SINGLE MICROPHONE



### 6.2 DAISY-CHAIN CASCADING



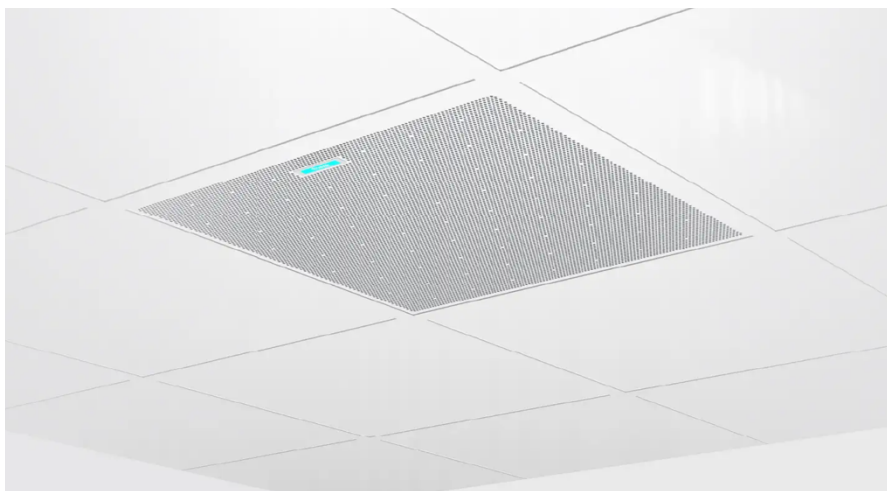
## 6.3 PARALLEL CASCADING



## 7. INSTALLATION

### 7.1 EMBEDDED

**INSTALLATION WAY 1:** Embedded into the ceiling (must be suspended and fixed with ropes)



## 7.2 HOISTING

INSTALLATION WAY 2: Rope hoisting



## 7.3 MOUNTED

INSTALLATION WAY 3: Suspension Mounted



## 8. SPECIFICATION

Items	Function	Parameters
Algorithm	Support algorithm	AFC, ANS, AEC, AGC, ARR
	Sound feedback gain	≥18dB
	Noise reduction amplitude	≥30dB
	Echo cancellation amplitude	≥90dB
	Echo cancellation length	≥1s
	Reverberation suppression	≥18dB
	Maximum gain	≥30dB
	AI noise reduction	Support
	Automatic mixing	Support
	Beamforming	Support
	Sound source localization	Support
Microphone	Number of microphones	129
	Sensitivity	-32 ± 2dB
	Signal to Noise Ratio (SNR)	70dB
	Frequency response	75- 20KHz
Hardware	Sampling rate	48K
	Frequency response	20Hz~20KHz, ±0.5dB
	Signal to Noise Ratio (SNR)	100dB
	Degree of distortion	≤0.1%
	Input impedance (Balanced)	20KΩ
	Output impedance (Balanced)	200Ω
	Maximum input level (Balanced)	4dBu

	Maximum output level (Balanced)	10dBu
	Dante Audio	Support
	Cascade function	Support
	485Central control interface	Support
	Input power supply	DC 12V-48V/POE
	Power Consumption	25W
General	Dimensions (length x width x height)	600×600×42.8mm
	Net weight	6.03kg
	Operation temperature	0°C~40°C
	Storage temperature	-20°C~60°C
	Color	Pearl White

## 9. TROUBLESHOOTING

Problems	Reasons	Troubleshoot
PC tool cannot be opened	Antivirus software restrictions	Close antivirus software.
	Tool damage	Update PC Tools.
The network cannot communicate normally	Network connection	Check the device status light.
		Check the PC network to ensure consistency between network segments and devices.
		Hardware RESET restores default, using default network for search.

		When cascading in series, the LINK IN of the previous unit is connected to the LINK OUT of the next unit, and the last unit cannot be connected to the network.
		When cascaded in parallel, each device can only have one network port connected to the network.
		Three network ports cannot be connected to the same network at the same time, only one port can be connected to the network.
	Network port malfunction	Check the status of the PC network port light.
	Equipment failure	Depot repair
Low output volume	Configuration issues	Check the input and output configuration status.
	Output gain level	Each output of AEC OUT and SPK OUT has hardware analog gain adjustment, with a total of 4 levels: 0dB, -12dB, -18dB, -24dB; The default is 0dB.
	Wiring malfunction	Check if the input and output wiring is correct.