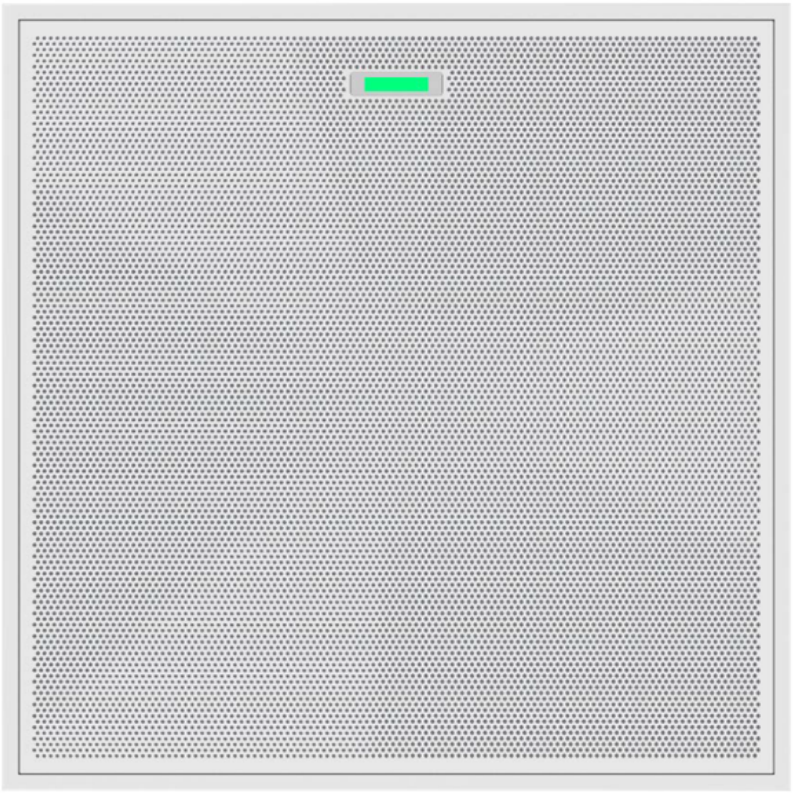
adertech

MCB-129D

129-Array Ceiling Microphone



User manual

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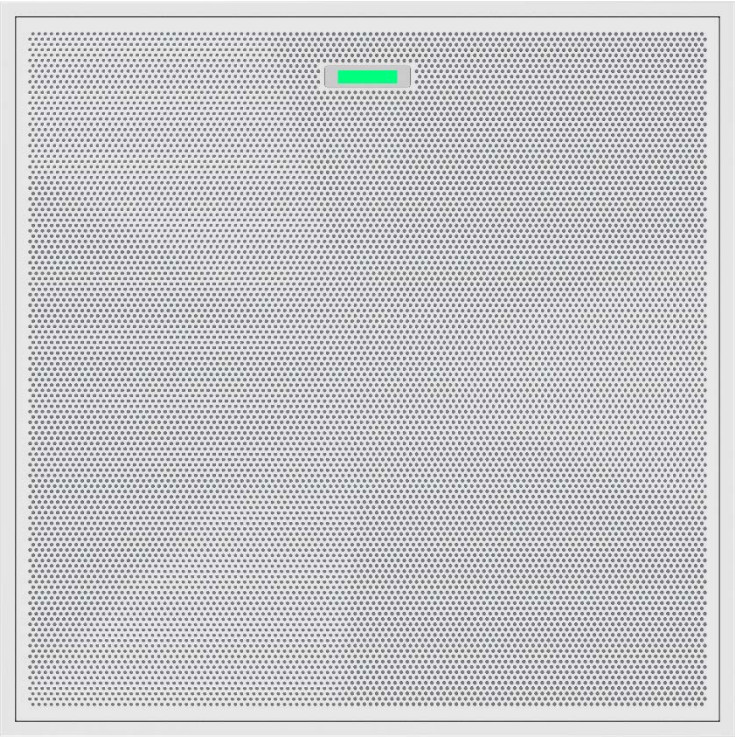
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1. Product Overview

1.1 Product Appearance



1.2 Product Overview

- The non-contact sound reinforcement ceiling array microphone consists of 129 high-fidelity microphones, designed with a composite circular array layout to provide the necessary sound pickup sampling conditions for the algorithm; the CPU uses a professional audio processing chip (8 cores, 6T high computing power).
- Equipped with industry-leading audio signal processing algorithms, including 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, and dynamic beamforming, which can effectively enhance the quality of voice reinforcement interaction.
- With 33 sound reinforcement zones and 33 pickup zones, the sound reinforcement distance reaches 4 meters, and the pickup distance reaches 8 meters, effectively capturing sound from any position within the pickup area.
- Built-in cascading function module, allowing multiple non-contact sound reinforcement ceiling array microphones to be cascaded.
- Built-in Dante module, supporting digital audio network transmission functionality.

2. Product Interface Description

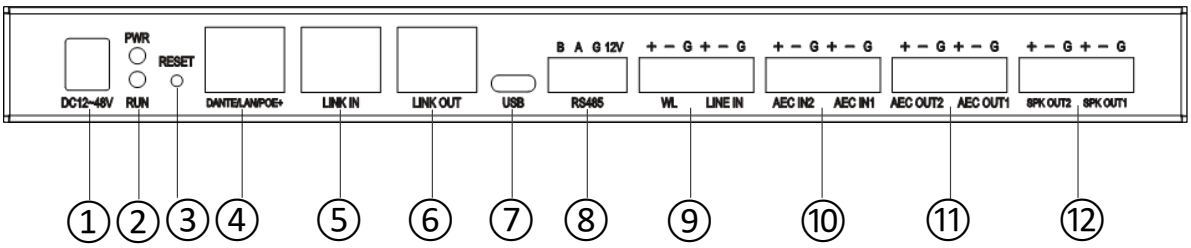


Figure 2.1 Ceiling Array Microphone Interface Figure

① DC12-48V interface: Power interface, input voltage range DC12V-48V.

② PWR/RUN: Normal power on, red light is always on. System is running normally, green light is always on.

③ RESET: Restore factory settings.

④ DANTE/LAN/POE+: Dante signal transmission interface/network interface/POE powered network port.

⑤ LINK IN: Cascading link input network port.

⑥ LINK OUT: Cascading link output network port.

⑦ USB: Type C firmware upgrade interface, USB2.0 audio transmission interface.

⑧ RS485: 485 device control interface; 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: Speaker analog audio output.

3. PC Management Software Operation Instructions

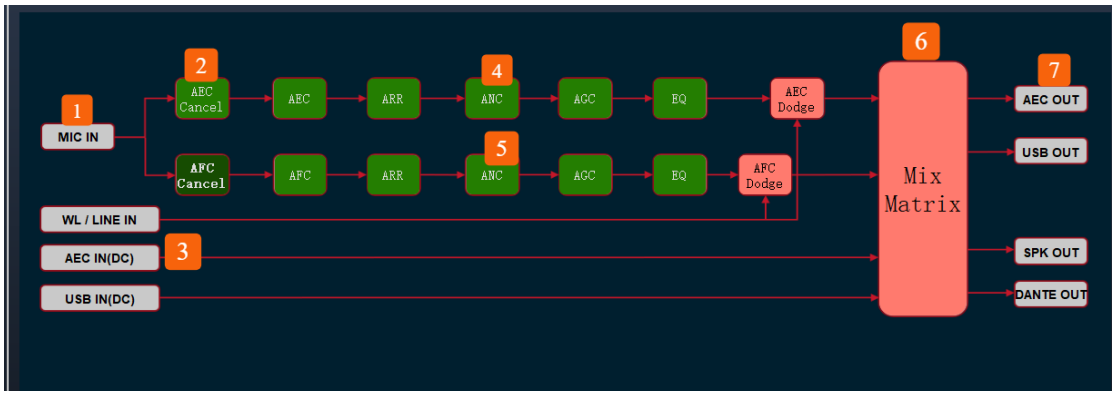
The default IP address of the device is: 192.168.1.100, subnet mask: 255.255.255.0, gateway: 192.168.1.1; please first add an IP address in this subnet on the PC (not the same as the device IP to avoid conflicts, it is recommended to disable firewalls, antivirus software, and other interception systems) to ensure normal connection of the device.

3.1 Overview of Management Software



1. Device search and parameter saving.
2. The searched device will display the IP area; select the IP anddouble-click to log in.
3. System flow area, device signal flow.
4. Main parameter display area of the device, showing device software version information.
5. 5. Flow control area: audio data flow chart, icons can be clicked to set parameters for each processing module in detail.
6. 6. Processor parameter control area: parts can be dragged or scrolled to display hidden sections.

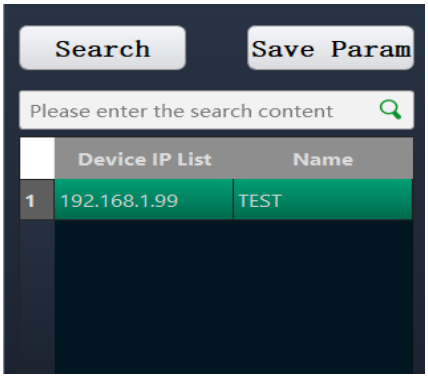
3.2 System Process



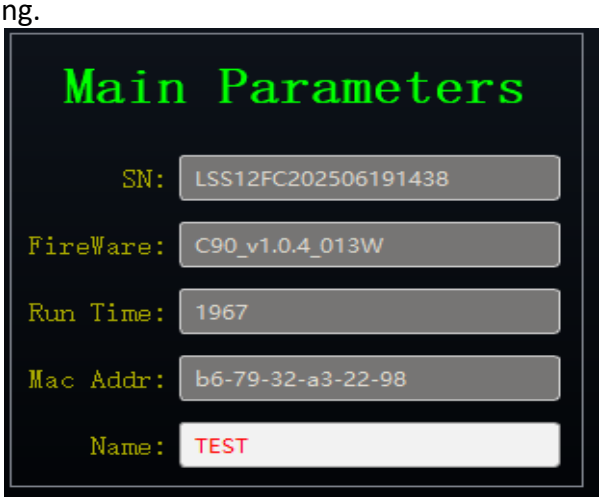
1. Microphone input channel.
2. The microphone channel algorithm switch is enabled, green represents enabled, and red represents disabled.
3. WL\LINE IN and AEC IN, USB IN input channels.
4. Echo channel algorithm function configuration, click to toggle, green represents enabled, and red represents disabled.
5. Feedback channel algorithm function configuration, click to toggle, green represents enabled, and red represents disabled.
6. Mixing selection: click to toggle, switch to the mixing matrix interface in the processor parameter control area.
7. Output channel.

3.3 Software Features

3.3.1 Device search function: click on device search to search for all devices on the same local area network, displaying their IP addresses. Select the IP you want to log in to, double-click to log in. Click on parameter save to save the currently adjusted parameters.



3.3.2 Main device parameters: SN: displays the device's serial number; Fire Ware: displays the software firmware version number; Run Time: indicates the normal operating time; Mac Addr: displays MAC address information; Name: modify the device name, press enter to confirm after changing.



3.3.3 Process control area: click to toggle, select processor functions for parameter configuration.



3.4 Processor Module

3.4.1 Input Settings



1. Array microphone input channel

- Mute function: Turn on the array microphone input signal, turn off the array microphone signal.
- Level value: Real-time display of the volume level, not adjustable.
- Level display bar: Displays the current volume changes of the array microphone.

2. LINE IN1 input channel

- Mute function: Turn on the LINE IN1 channel input signal, turn on the LINE IN1 channel input signal.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
- Level display bar: Displays the current volume changes of the LINE IN1 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

3. LINE IN2 Input Channel

- Mute function: Open the LINE IN2 channel input signal, open the LINE IN2 channel input signal.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.

- Level display bar: Displays the current volume changes of the LINE IN2 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

4. AEC IN1 input channel

- Mute function: Open the AEC IN1 channel input signal, open the AEC IN1 channel input signal.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
- Level display bar: Displays the current volume changes of the AEC IN1 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

5. AEC IN2 input channel

- Mute function: Open the AEC IN2 channel input signal, open the AEC IN2 channel input signal.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
- Level display bar: Displays the current volume changes of the AEC IN2 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

6. USB IN1 input channel

- Mute function: Open the USB IN1 channel input signal, open the USB IN1 channel input signal.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.

- Level display bar: Displays the current volume changes of the USB IN1 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

7. USB IN2 input channel

- Mute function: Turn on the input signal of the USB IN2 channel, turn on the input signal of the USB IN2 channel.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
- Level display bar: Displays the current volume changes of the USB IN2 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

8. DANTE IN1: These two inputs are only available in Dante mode and are the input channels for the Dante module signal.

- Mute function: Turn on the input signal of the DANTE IN1 channel, turn on the input signal of the DANTE IN1 channel.
- Level value: Real-time display of the volume level, not adjustable.
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
- Level display bar: Displays the current volume changes of the DANTE IN1 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

9. DANTE IN2: These two inputs are only available in Dante mode and are the input channels for the Dante module signal.

- Mute function: Turn on the input signal of the DANTE IN2 channel, turn on the input signal of the DANTE IN2 channel.
- Level value: Real-time display of the volume level, not adjustable.

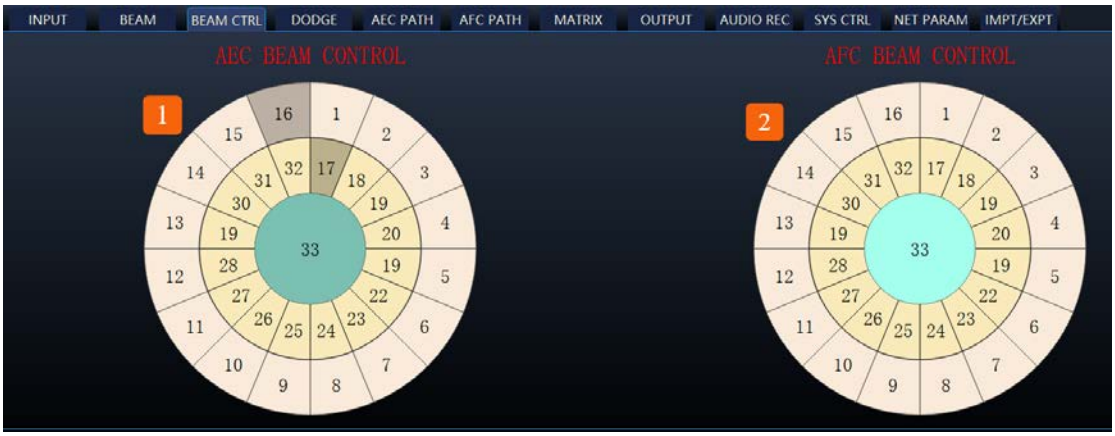
- Volume setting value: Input number to change the volume gain, with a maximum adjustment range from -18 to 18.
- Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
- Level display bar: Displays the current volume changes of the DANTE IN2 channel.
- Maximum value: Set the maximum value for volume gain adjustment, which should not exceed 18.
- Minimum value: Set the minimum value for volume gain adjustment, which should not be lower than -18.

3.4.2 Beam Level



1. ANGEL: HORI (horizontal angle from sound source to device), VERT (vertical angle from sound source to device).
2. 33 beams with real-time level fluctuations.
3. Beam level display page turning.
4. Beam level display page turning.

3.4.3 Beam Control

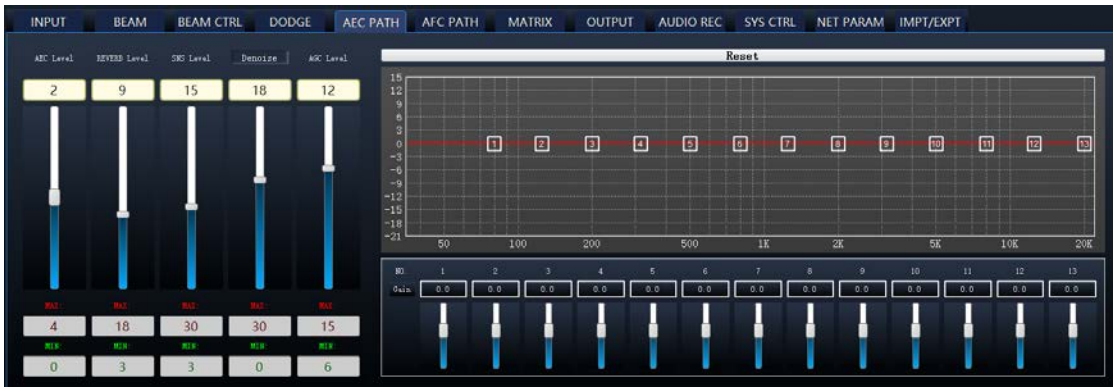


1. Echo path beam control: 33 beam switches for the echo path, gray indicates off, bright color indicates on.
2. Feedback path beam control: 33 beam switches for the feedback path, gray indicates off, bright color indicates on.

3.4.4 Path Selection



1. Echo path switch: Click the selected channel to indicate that the signal from this channel is output after echo cancellation processing.
2. Feedback path switch: Click the selected channel to indicate that the signal from this channel is output after feedback processing. 3.4.5 Echo Path

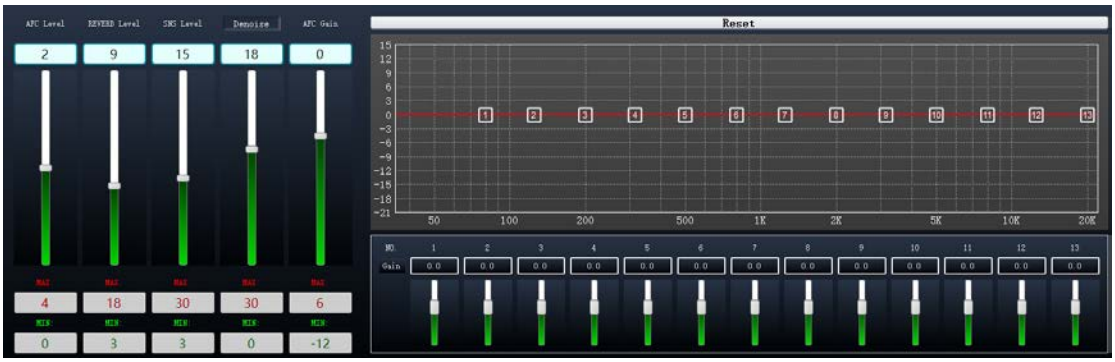


1. Echo suppression level: The numerical display shows the current level; the slider can change the level, with a range of 0 to 4; the maximum value sets the echo suppression level, which must not exceed 4; the minimum value sets the echo suppression level, which must not be lower than 0.
2. Reverberation suppression amount: The numerical display shows the current level; the slider can change the level, with a range of 3 to 18; the maximum value sets the level, which must not exceed 18; the minimum value sets the level, which must not be lower than 3.
3. Smooth noise suppression level: The numerical display shows the current level; the slider can change the level, adjustable range from 3 to 30; maximum value setting level, maximum value not exceeding 30; minimum value setting level, minimum value not lower than 3.
4. AI noise reduction: Transient noise suppression level, the numerical display shows the current level; the slider can change the level, adjustable range from 0 to 30; maximum value setting level, maximum value not exceeding 30; minimum value setting level, minimum value not lower than 0.

5. Automatic maximum gain: The numerical display shows the current level; the slider can change the level, adjustable range from 6 to 15; maximum value setting level, maximum value not exceeding 15; minimum value setting level, minimum value not lower than 6.

6. 13-band equalization adjustment, click on the label with the mouse, drag the label up and down to change the amplitude of that frequency band; gain function, directly input gain parameters to change the amplitude of that frequency band; move the slider to change the amplitude of that frequency band.

3.4.6 Feedback Path



1. Feedback suppression level: The numerical display shows the current level; the slider can change the level, adjustable range from 0 to 4; maximum value setting echo suppression level, maximum value not exceeding 4; minimum value setting echo suppression level, minimum value not lower than 0.

2. Reverberation suppression amount: The numerical display shows the current level; the slider can change the level, with a range of 3 to 18; the maximum value sets the level, which must not exceed 18; the minimum value sets the level, which must not be lower than 3.

3. Smooth noise suppression level: The numerical display shows the current level; the slider can change the level, adjustable range from 3 to 30; maximum value setting level, maximum value not exceeding 30; minimum value setting level, minimum value not lower than 3.

4. AI noise reduction: Transient noise suppression level, the numerical display shows the current level; the slider can change the level, adjustable range from 0 to 30; maximum value setting level, maximum value not exceeding 30; minimum value setting level, minimum value not lower than 0.

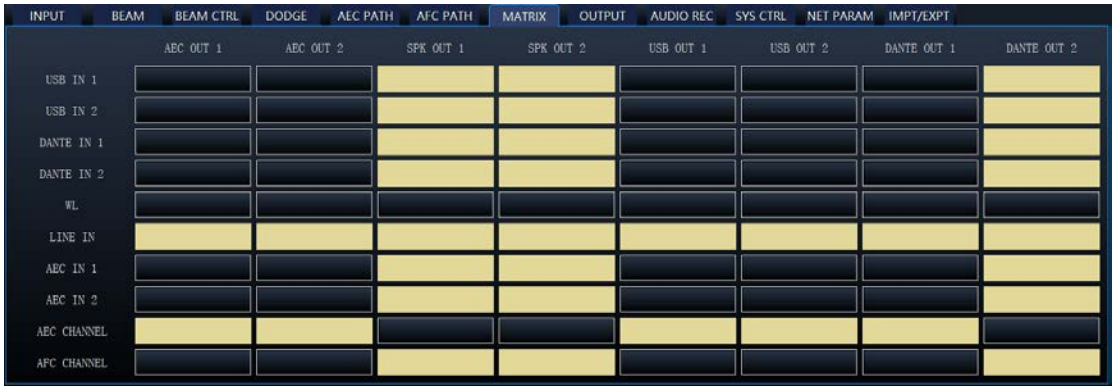
5. Automatic maximum gain: The numerical display shows the current level; the slider can change the level, adjustable range from 6 to 15; maximum value setting level, maximum value not exceeding 15; minimum value setting level, minimum value not lower than 6.

6、Feedback gain: The numerical display shows the current level; the slider can change the level, adjustable range from -12 to 6; maximum value setting level, maximum value not exceeding 6; minimum value setting level, minimum value not lower than -12.

7, amplification angle: The numerical display shows the current angle; the slider can change the level, adjustable range of 180 degrees and 360 degrees.

8, 13-band equalization adjustment, click on the label with the mouse, drag the label up and down to change the amplitude of that frequency band; gain function, directly input gain parameters to change the amplitude of that frequency band; move the slider to change the amplitude of that frequency band.

3.4.7 Mixing Matrix



1. Input channel:

USB IN: USB input channel.
DANTE IN1: Dante mode remote interactive input channel.
DANTE IN2: Local amplification input channel in Dante mode
WL\LINE IN: Line input channel, mainly for computers or other line-output devices.
AEC IN: Echo reference input channel.
AEC CHANNEL: Signal after echo cancellation, an internal channel in the software with no structured interface definition.
AFC CHANNEL: Signal after feedback suppression, an internal channel in the software with no structured interface definition.

2. Output channels:

AEC OUT: Output for remote interaction signal, the signal after echo cancellation.

SPK OUT: Local amplification output without cascading, connected to the amplifier.

USB OUT: USB interface output channel.

DANTE OUT1: Remote interaction output in Dante mode, the signal after echo cancellation.

DANTE OUT2: Local amplification signal output in Dante mode, with the signal processed after feedback suppression.

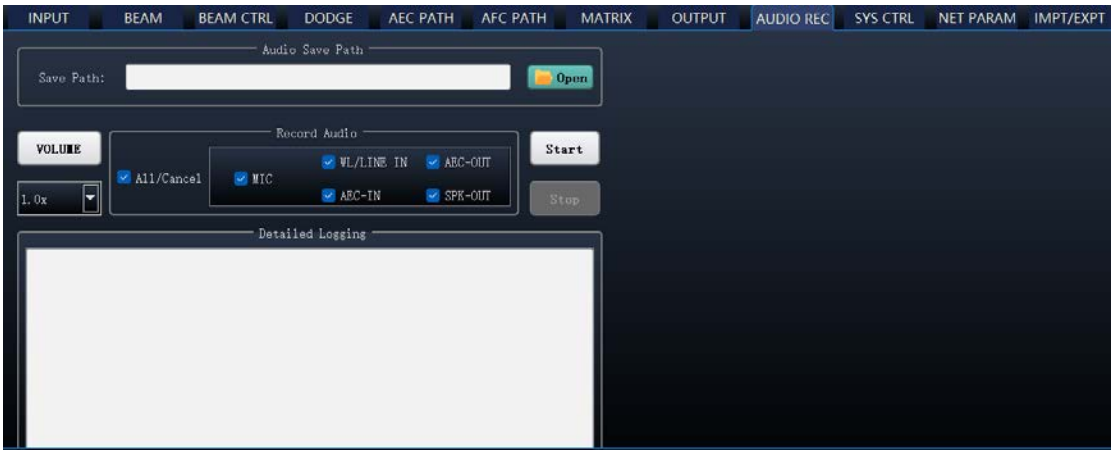
3.4.8 Output Settings



1. AEC OUT output channel
   - Mute function: Enable AEC OUT channel input signal, enable AEC OUT channel input signal.
   - Audio output: Enable audio output function (yellow), indicating output with feedback function; disable audio output function (gray), indicating normal output of AEC OUT as defined by the channel.
   - Level value: Real-time display of volume level, not adjustable.
   - Volume display: Displays the current volume gain.
   - Level display bar: Shows the current volume level changes o the output channel.
   - Gain fader: Can change the volume gain, with a maximum adjustment range from -18 to 18.
   - Maximum value: Set the maximum value for volume gain adjustment, input a number to change the maximum value, which must not exceed 18.
   - Minimum value: Set the minimum value for volume gain adjustment, input a number to change the minimum value, which must not be lower than -18.
   - Output decibel values: 0DB, -12DB, -18DB, and -24DB are available for selection. After selecting, click the set button to apply.

2. The settings for SPK OUT, USB OUT, and DANTE OUT are the same as above.

3.4.9 Audio Recording



1. Audio source save path: Click to open and set the path where the recorded audio files will be saved on the computer.
2. Recording audio sources: There are 5 audio sources available for selective recording, with the default being all selected for recording. Checking the box indicates the audio source to be recorded; after selecting the audio sources, click start to begin recording. Click stop to end the recording, and the audio source files will be saved in the designated folder on the computer.
3. Log detailed records: Records some information about the device's operation.

3.4.10 System Control



1. Device SN code setting: Write the actual SN code as needed, and click to write the SN code; a prompt will appear indicating that the SN code has been successfully modified after writing.
2. Firmware upgrade: Click to open, find the save path of the firmware to be upgraded, select it, open it, and click to start the upgrade; after a successful upgrade, a prompt will indicate that the upgrade was successful! The device will automatically restart, please search for the device again.
3. Log capture: Click to open, set the target path for capturing logs, and save it on the computer, then click to capture logs.

4. Log settings: There are two log modes, terminal output and file writing; there are 4 log levels: INFO, DEBUG, WRN, ERR.
5. Restart system: Restart the device that is operating normally. 6、Restore factory settings: Restore parameters to the default configuration from the factory.

3.4.11 Network Parameters



1. Set to automatically obtain the IP address, manual changes to the IP are not allowed (default IP: 192.168.1.100).
2. When set to use the IP address below, the IP can be changed manually.
3. IP address: You can enter the IP address to be set, such as 192.168.1.3.
4. Subnet mask: Enter the subnet mask, such as 255.255.255.0.
5.Default gateway: Enter the gateway, such as 192.168.1.1.
6. After entering the IP, subnet mask, and gateway, click confirm. After the upgrade is successful, a pop-up will indicate that the upgrade was successful! The device will automatically restart, please search for the device again.
7. Cascade settings: Set the corresponding device as the main microphone or sub-microphone and click confirm.

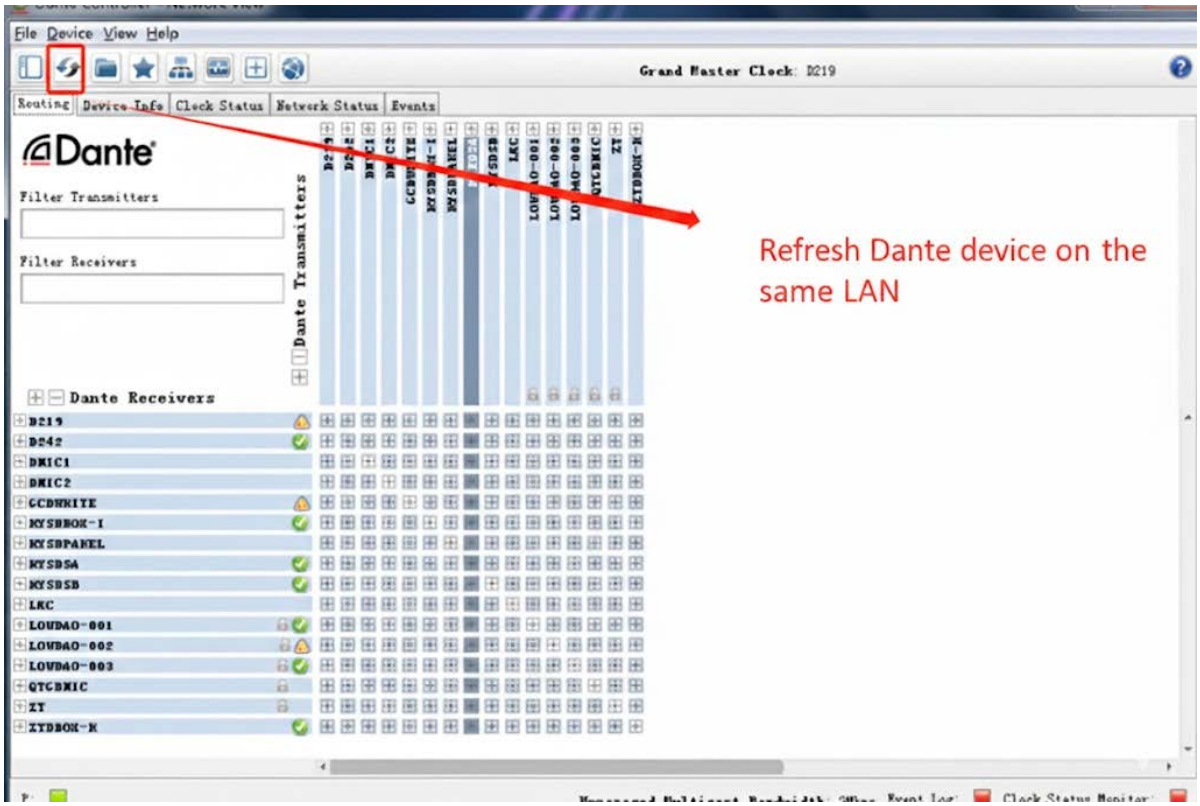
3.4.12 Import and Export

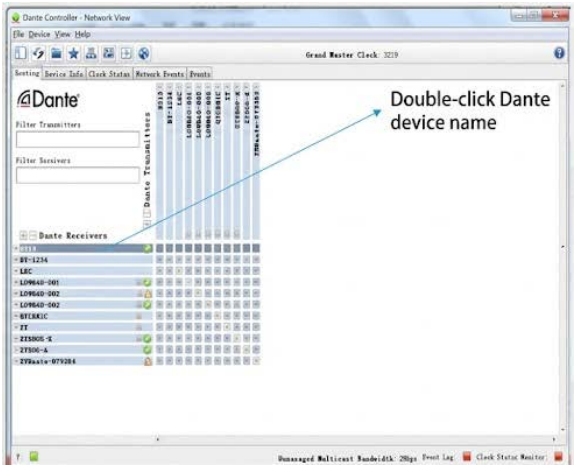


1. Export configuration: Click to open, set the path to save the exported file on the computer. Click the downward triangle of the current configuration, select the scene to be exported, and finally click export configuration; a pop-up will indicate that the export configuration was successful.
2. Import configuration: Click to open, find the file saved on the computer. Click the selected file; click the downward triangle of the current configuration, select the scene to import into, and finally click import configuration; a pop-up will indicate that the import configuration was successful.
3. Import file: Click to open, find the file saved on the computer. Click the selected file; click import file; a pop-up will indicate that the import configuration was successful.
4. Scene switching, there are a total of 10 scenes, with the default being the clear mode scene.
5. Scene Save: Save the scene after debugging.
6. Scene Application: After selecting the scene, click this button to switch the scene.

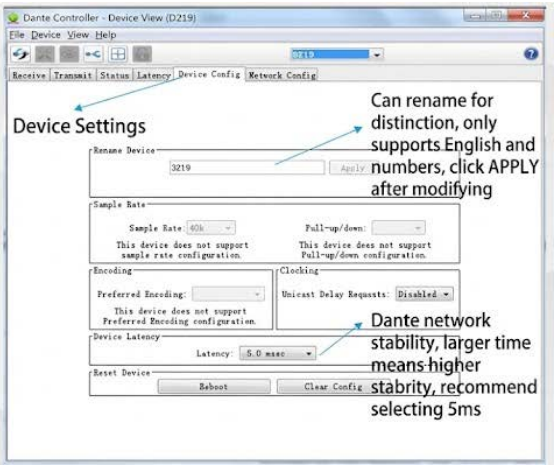
4. Dante Controller

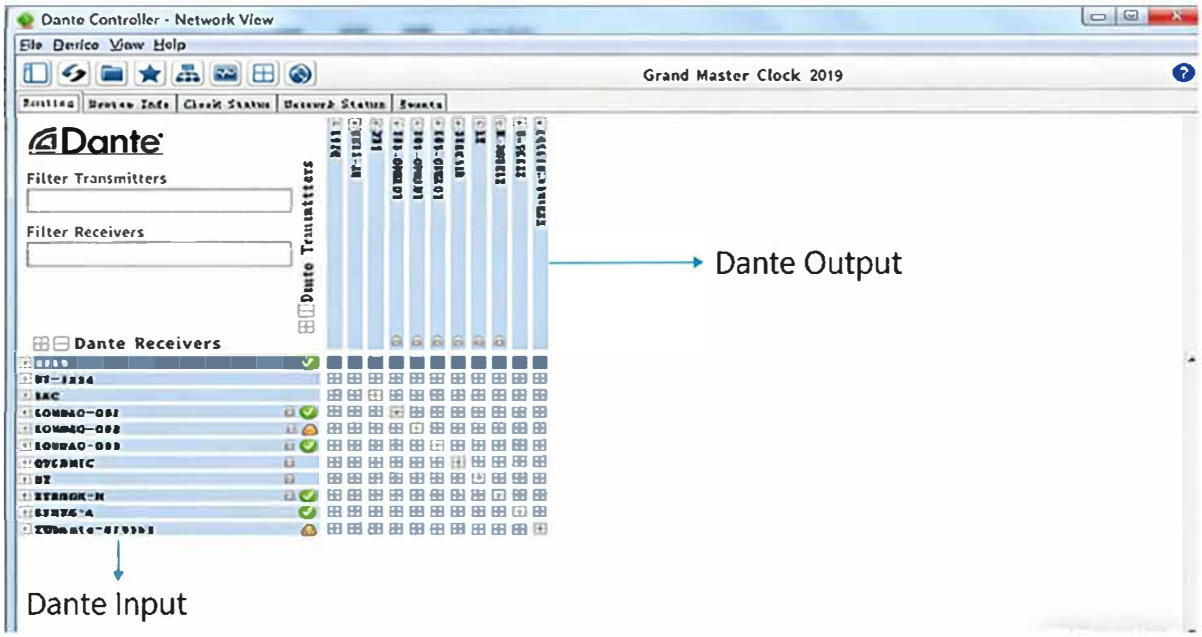
4.1 Basic Operations

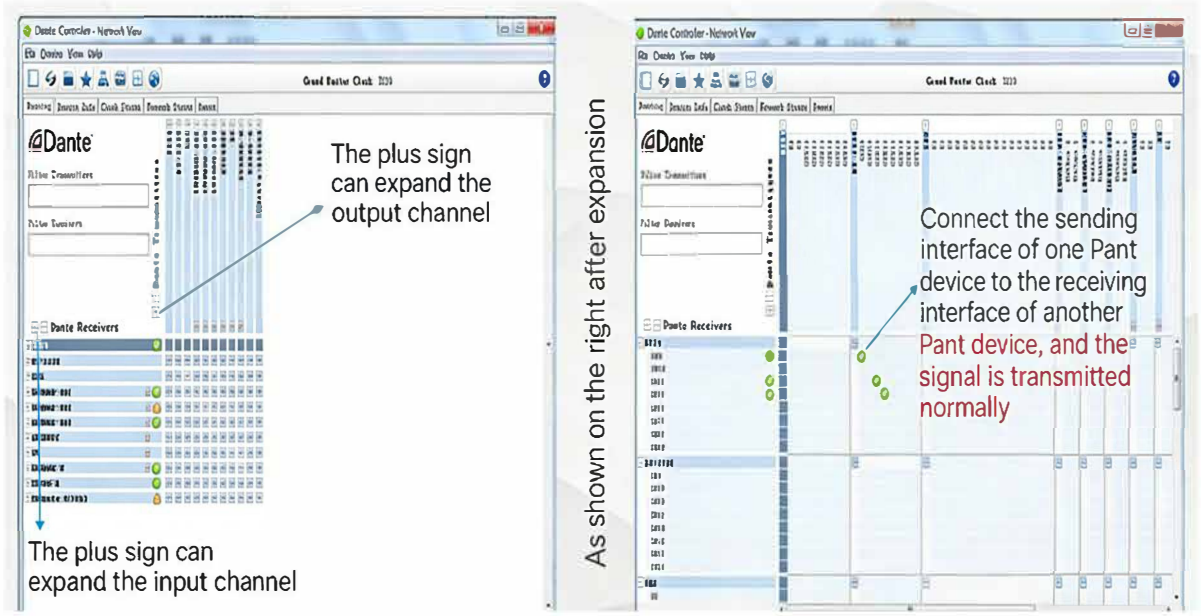


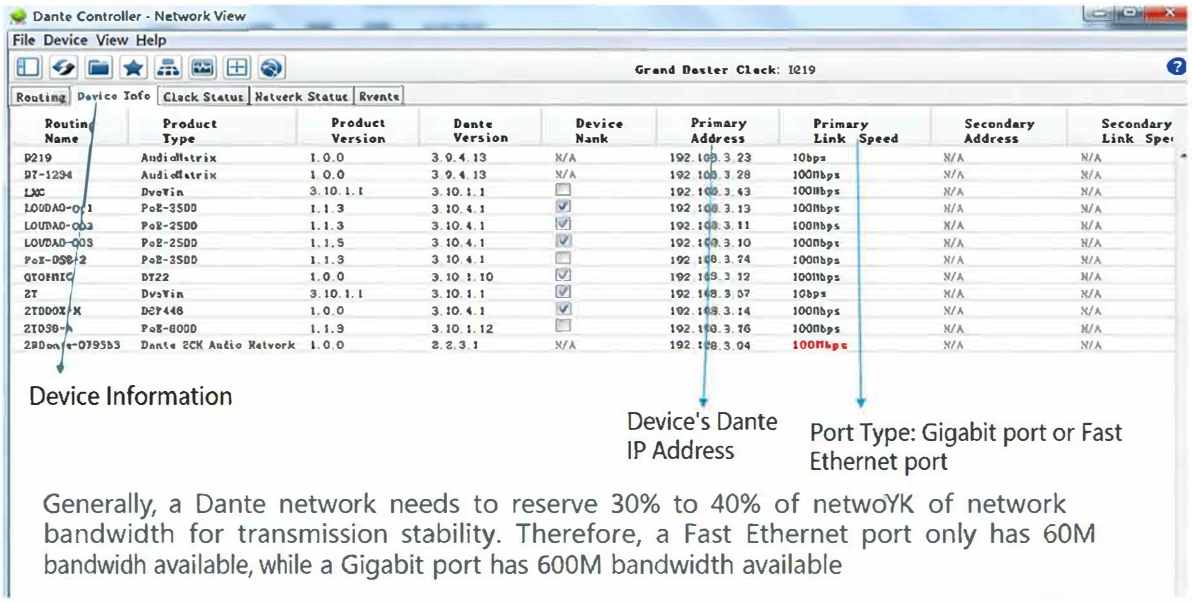


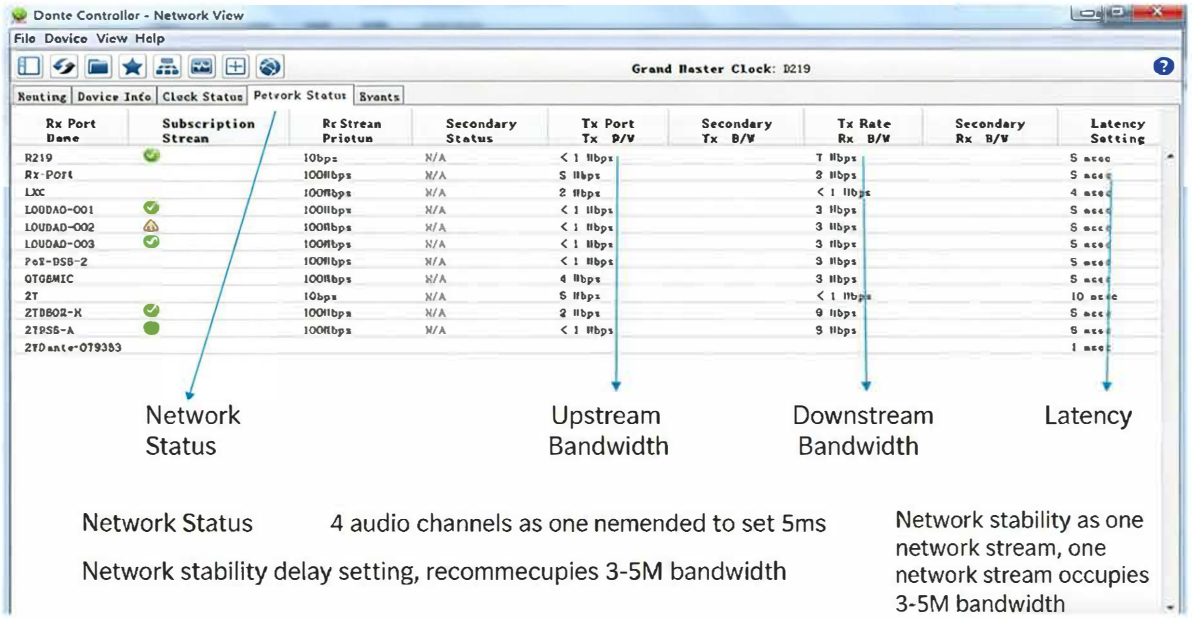
After opening, see right figure




Dante Controller - Network View
File Device View Help
Grand Master Clock 2019
Dante
Filter Transmitters
Filter Receivers
Dante Transmitters
Dante Receivers
Dante Output
Dante Input


The plus sign can expand the output channel
The plus sign can expand the input channel
As shown on the right after expansion
Connect the sending interface of one Pant device to the receiving interface of another Pant device, and the signal is transmitted normally


Dante Controller - Network View
File Device View Help
Grand Master Clock: R219
Routing
Device Info
Clock Status
Network Status
Events
Device Information
Device's Dante IP Address
Port Type: Gigabit port or Fast Ethernet port
Generally, a Dante network needs to reserve 30% to 40% of netwoYK of network bandwidth for transmission stability. Therefore, a Fast Ethernet port only has 60M bandwidh available, while a Gigabit port has 600M bandwidth available


Dante Controller - Network View
File Device View Help
Grand Master Clock: R219
Routing
Device Info
Clock Status
Network Status
Events
Network Status
Upstream Bandwidth
Downstream Bandwidth
Latency
Network Status
4 audio channels as one nemended to set 5ms
Network stability delay setting, recommecupies 3-5M bandwidth
Network stability as one network stream, one network stream occupies 3-5M bandwidth

4.2 Ceiling Array Routing Configuration Logic

Pure Amplification Routing Configuration Order: The output channel 2 of the last cascaded device ==》 input channel 2 of the previous device, and so on until it reaches the main cascaded device, where the output channel 2 of the main device (output 2 of the main device is SPK OUT) ==》 connects to other devices receiving Dante signals; then the output channel 2 of the previous device must connect to the input channel 2 of the next device;

Pure Interaction Routing Configuration Order: The output channel 1 of the last cascaded device ==》input channel 1 of the previous device, and so on until it reaches the main cascaded device, where the output channel 1 of the main device (output 1 of the main device is AEC OUT) ==》 connects to the input channels of other devices receiving Dante signals; then the output channel 1 of the previous device must connect to the input channel 1 of the next device; output channels of other devices receiving Dante signals ==》 input channel 1 of the main device;

5. Product Parameter Indicators

Module	Function	Specific Parameters
Algorithm Specifications	Supported Algorithms	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 Specifications	Number of Microphones	129
	Sensitivity	-32±2dB
	Signal-to-Noise Ratio	70dB
	Frequency Response	75-20KHz
Hardware Specifications	Sampling Rate	48K
	Frequency Response	20Hz~20KHz, ±0.5dB
	Signal-to-Noise Ratio	100dB
	Distortion	≦0.1%

Hardware Specifications	Input Impedance (Balanced)	20KΩ
	Output Impedance (Balanced)	200Ω
	Maximum Input Level (Balanced)	4dBu
	Maximum Output Level (Balanced)	10dBu
	Dante Audio	Support
	Cascading Function	Support
	485 Control Interface	Support
	Input Power	DC 12V-48V/POE power supply
	Power	25W
Other specifications	Dimensions (LxWxH)	600×600×42.8mm
	Net weight of the device	6kg
	Operating temperature	0°C~40°C
	Storage Temperature	-20°C~60°C
	Color	Pearl White

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