CRYSOUND

# CRY2623M Fixed Acoustic Imager User Manual V2.0

Measure Better Sound

## Warranty and Calibration

Within two years from the date of purchase, we provide free warranty service for abnormal and malfunction caused by product quality. Free warranty service does not include the non-product quality problems caused by improper use, accidental drop, etc.

In case of equipment failure caused by improper use or accidental drop, we promise to provide maintenance service at cost price.

The equipment has been calibrated when delivered to the user. However, in the long term use process, we suggest that you send the equipment to our office every two years for equipment calibration, testing and maintenance.

## Contact us

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# Overview

CRY2623M is a fixed acoustic imager that supports ultrasonic frequency band The equipment uses the microphone array beamforming technology to obtain sound source distribution data, and cooperates with high-definition cameras to collect video images in real-time.

CRY2623M fixed acoustic imager can help you detect possible pressurized gas leaks and vacuum leaks in noisy industrial sites; when used in power systems, it can help you find and monitor potential partial discharge fault points.

Fixed acoustic imager adopts an all-aluminum alloy shell, which is strong and durable, and can adapt to the complex and changeable working environment.

The device is easy to install and operate. It only needs to configure two parameters: test frequency range and test dynamic range to meet most monitoring needs; and private network, etc. remote monitoring system. Help users achieve industrial digital transformation. Support remote real-time monitoring of video images.

# Safety Instruction

- To prevent possible fire or personal injury, please note:
- The explosion-proof mark of this equipment is Ex ic IIC T4 Gc, please use it in an explosive environment that matches the explosion-proof mark.
- During the installation and use of the product, all electrical safety regulations of the country and region of use must be strictly observed. Please be sure to disconnect the power supply of the device during disassembly and assembly operations such as wiring, opening the cover, etc., and do not operate with power on; if the device is in an explosive environment, do not perform the above operations.
- An easy-to-use disconnect device should be incorporated into the building installation wiring.
- When installing on a wall or ceiling, make sure the product is securely fastened.
- This product is an explosion-proof product, please carry out explosion-proof treatment on the cable.
- If the device emits smoke, produces peculiar smell, or makes noise, please turn off the power immediately and unplug the power cord, and contact the manufacturer in time. If the product does not work properly, please contact the manufacturer, do not disassemble or modify the product in any way, so as to avoid affecting the flameproof performance of the flameproof surface. (The company does not

assume any responsibility for problems caused by unauthorized modifications or repairs).

## Reminder

- Avoid installing the product in a vibration or shock environment, and keep the product away from electromagnetic interference. (Ignoring this may damage the product)
- Do not directly touch the heat dissipation parts of the product to avoid burns.
- Please be careful not to bump the explosion-proof surface of the product, so as not to affect the explosion-proof performance.
- Do not use the product in extremely hot, cold, dusty or high-humidity environments. For specific temperature and humidity requirements, please refer to the product parameter table.
- The equipment needs to be stored in a dry and non-corrosive gas environment and avoid direct sunlight.
- Avoid aiming the lens at strong light (such as lighting, sunlight, or laser beams, etc.), otherwise the image sensor will be damaged.
- Avoid heat accumulation and keep ventilation around the product smooth.
- Do not touch the image sensor directly, and if cleaning is necessary, to prevent static buildup, wipe the surface with a damp cloth or other substitutes that are soft enough to gently remove dust.
- Do not use corrosive solvents or strong, abrasive cleaners, otherwise will damage the surface of the product or reduce the performance of the product.
- Equipments connected to the Internet may face network security

issues. Please strengthen the protection of personal information and data security. When you find that the device may have network security risks, please contact us in time.

- Please keep all the original packaging materials of the fixed acoustic imager properly, so that when there is a problem, use the packaging materials to pack the Audio-Visual Guard and send it to the agent or return it to the factory for processing. Accidental damage during transportation caused by non-original packaging materials is the responsibility of the user.

## Directions

Quality requirements for installation and maintenance personnel
Have the "Explosion-proof Electrical Equipment Installation and Maintenance Qualification Certificate", have the qualification certificate or experience to engage in the installation and maintenance of video surveillance systems, and have the qualifications to engage in related work (such as high-altitude work, etc.). Moreover, must have the following knowledge and operating skills,

-Basic knowledge and installation skills of AIG monitoring systems and components.

- Basic knowledge and operational skills in low-voltage wiring and low-voltage electronic wiring.

- Have basic network security knowledge and skills, and be able to read the contents of this manual.

Requirements for lifting equipment

- Use safe lifting equipment suitable for where and how it is installed.
- Lifting equipment with sufficient lift height to reach the installation location.
- Lifting equipment has good safety performance.

# Terminology

### *Sound Pressure Level (SPL)*

A physical quantity used to express the magnitude of sound waves; the unit is decibels (dB). It is also used as dBSPL.

### *Audible domain*

The frequency range of sound that can be perceived by human ears generally refers to the sound that frequency is in the frequency band of 20Hz- 20KHz.

### *Ultrasonic*

Generally, refers to the frequency of more than 20kHz sound, the human ear cannot perceive.

### *Sound image*

It refers to the two-dimensional data table representing the intensity distribution of sound sources in the space plane after the signal collected by microphone array is calculated by the sound source location algorithm.

### *Palette*

The color data used in the color mapping of a Sound cloud chart.

### *Sound cloud image*

The sound pressure level data of each resolution point on the sound image is mapped to a certain color number on the palette according to a certain conversion formula to form a color image, and then it is fused with the visible image to form an sound cloud image.

### *Test frequency range*

When a frequency range is selected within the full frequency range supported by the device, the device will only measure and display a sound cloud image that is within this frequency range. Sound outside this frequency range will not be displayed.

### *Frequency peak*

A peak in spectrum, it denotes a strong sound energy distribution at this particular frequency.

### *Dynamic range*

The scale of the intensity of the sound source that can be shown on the sound cloud image.

### *Field of view*

For camera, it is an angle formed by camera and the two diagonal points of the rectangular picture which is captured by the camera.

For sound cloud image, it is an angle formed by microphone array and the two diagonal points of the rectangular sound image which is captured by the microphone array.

### *ADS:*

Acoustic Data Server——Acoustic Imaging Intelligent Data Server

## *ACS:*

Acoustic Compute Server —— Acoustic imaging intelligent computing Server.

# Product Features

## Photo/Video/Audio and Video Streaming

It can take photos/videos, save the audio and video files in the local folder, and push the monitored audio and video images in real time.

## Dynamic Range

The dynamic range is the numerical range in which the cloud image energy is drawn in the cloud image. For example, 12dB dynamic range indicates that the energy interval of 12 dB in the cloud image energy is drawn in the cloud image.

## Cloud Map Color

It can change the color of the cloud image of the video.

## Frequency Range

The frequency range for device detection can be changed.

## Split Screen Focus Function

This function supports up to 4 rectangular focus windows. After the split-screen focusing function is enabled, multiple split-screen focusing windows can be set, and the size and position of each window can be set arbitrarily. After the split-screen focus function is enabled, the cloud image is only displayed in the focus window. When in use, the focus window is generally aligned with the target detection area, which can reduce interference to a certain extent.

## Automatic Alarm Function

Set a sound pressure threshold and turn on the function. When the device detects a leak exceeding the sound pressure level, an alarm message will be sent to the system.

## Local Storage Function

After enabling this function, the detected video files will be saved in the external memory card in real time.

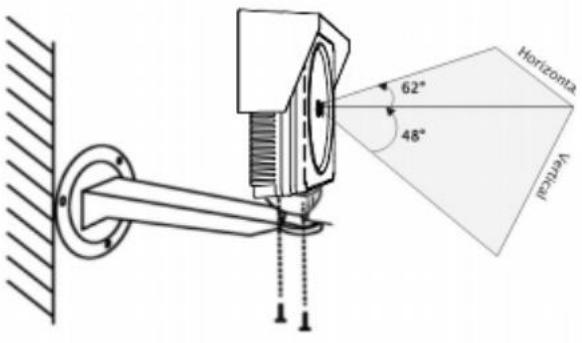
## Log Export

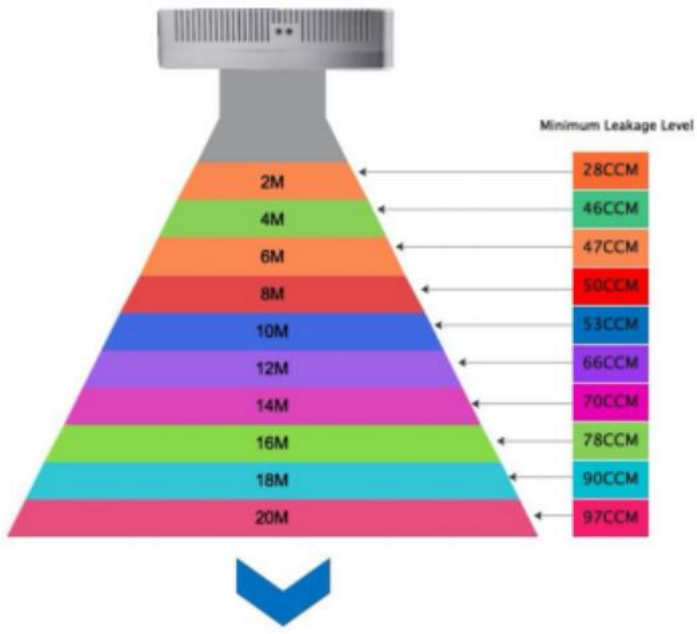
Export logs during equipment operation for engineers to analyse device operation status.

## Monitoring Range & Equipment Sensitivity

The device monitoring range is horizontal 62 ° vertical 48 ° . The monitoring sensitivity is related to the monitoring distance. The relationship is as follows:

| Fixed Acoustic Imager Minimum Leakage<br>(Pressure 0.5Mpa, 20-40kHz site environment noise 40dB) | |
|---|---|
| Distance to Sound Source (m) | Leakage CCM(±1) |
| 0.5-2 | 28 |
| 2-4 | 46 |
| 4-6 | 47 |
| 6-8 | 50 |
| 8-10 | 53 |
| 10-12 | 66 |
| 12-14 | 70 |
| 14-16 | 78 |
| 16-18 | 90 |
| 18-20 | 97 |

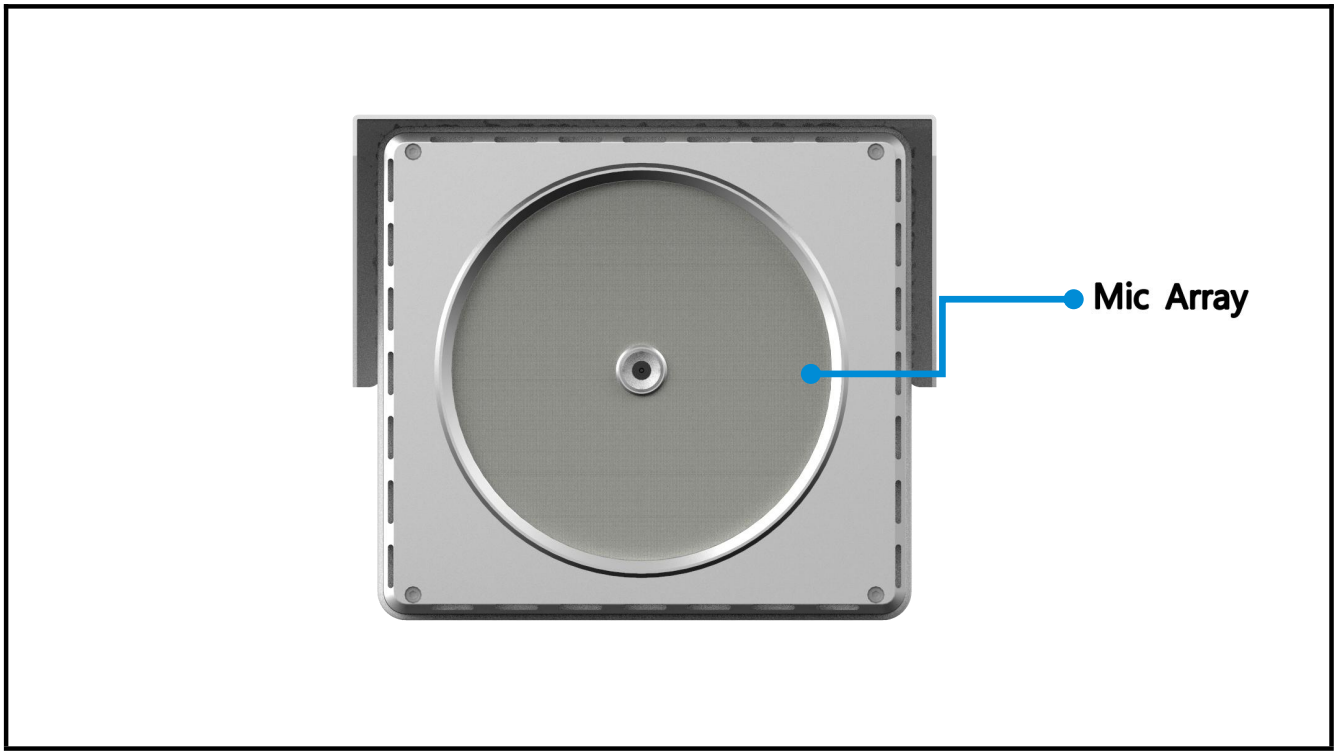


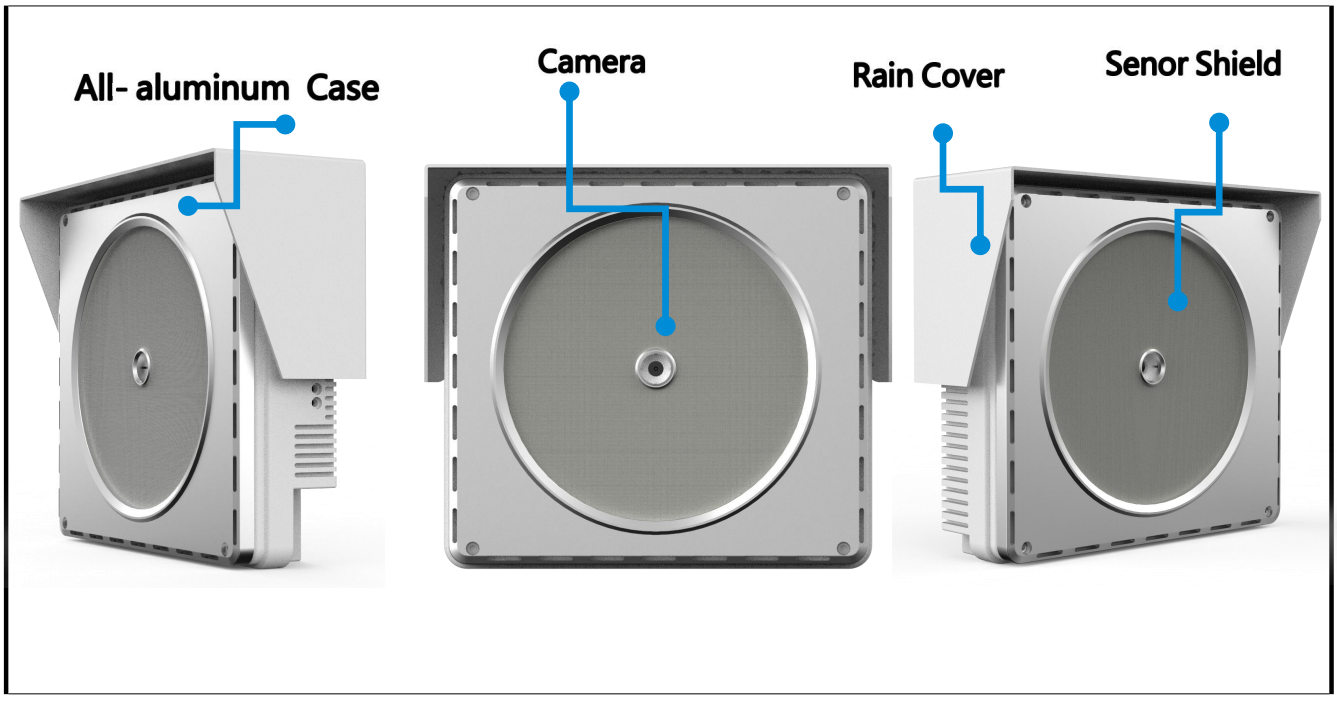



# Equipment and Accessories

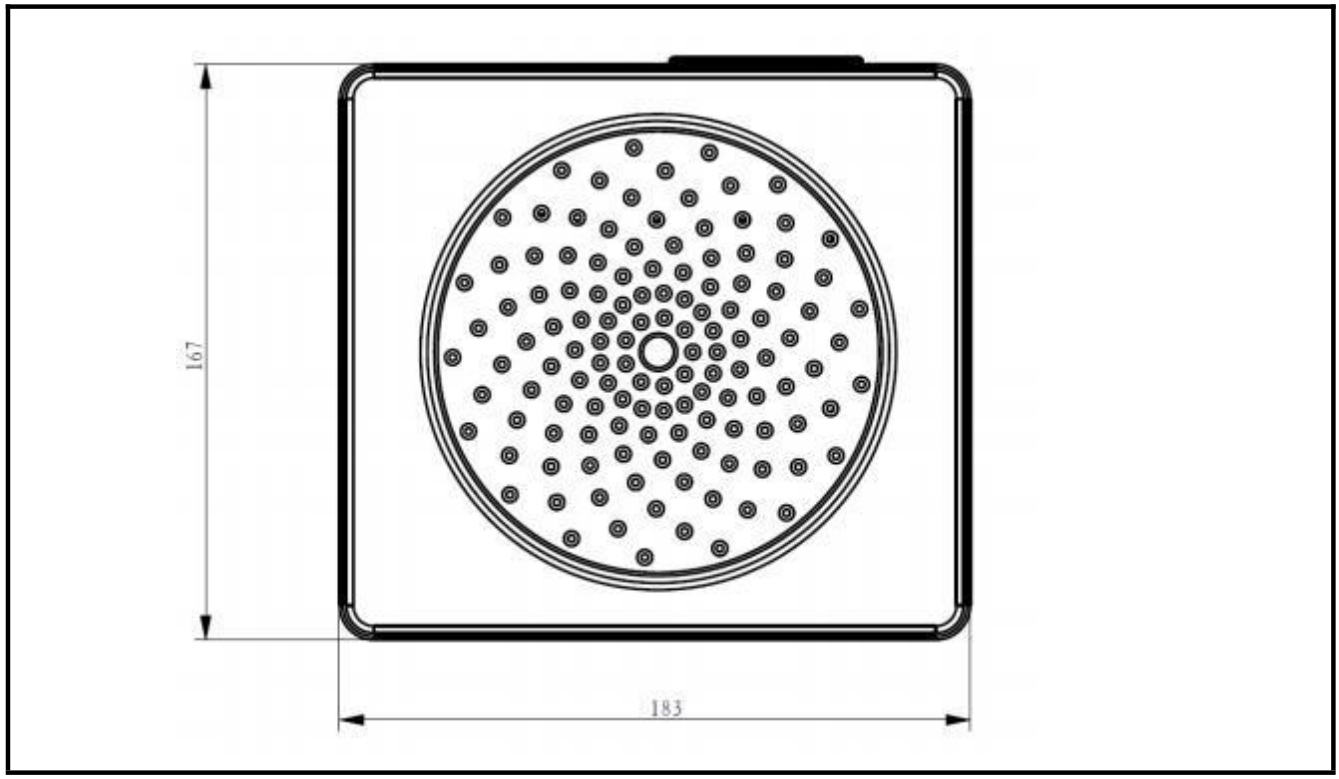
| Name | Introduction |
| --- | --- |
| CRY2623M | Product host |
| Explosion- proof Junction Box | Internally installed digital signal barrier and intrinsically safe power supply |
| Digital Signal Barrier | Limit the voltage and current of the digital signal of the network cable to prevent overvoltage and overcurrent from affecting the explosion- proof performance of the equipment |
| Network Switch | Provide network communication for Fixed Acoustic Imager |
| ADS | Provides storage and forwarding of video streams |
| Intrinsically Safe Power Supply | Provides operating voltage and current for Fixed Acoustic Imager |

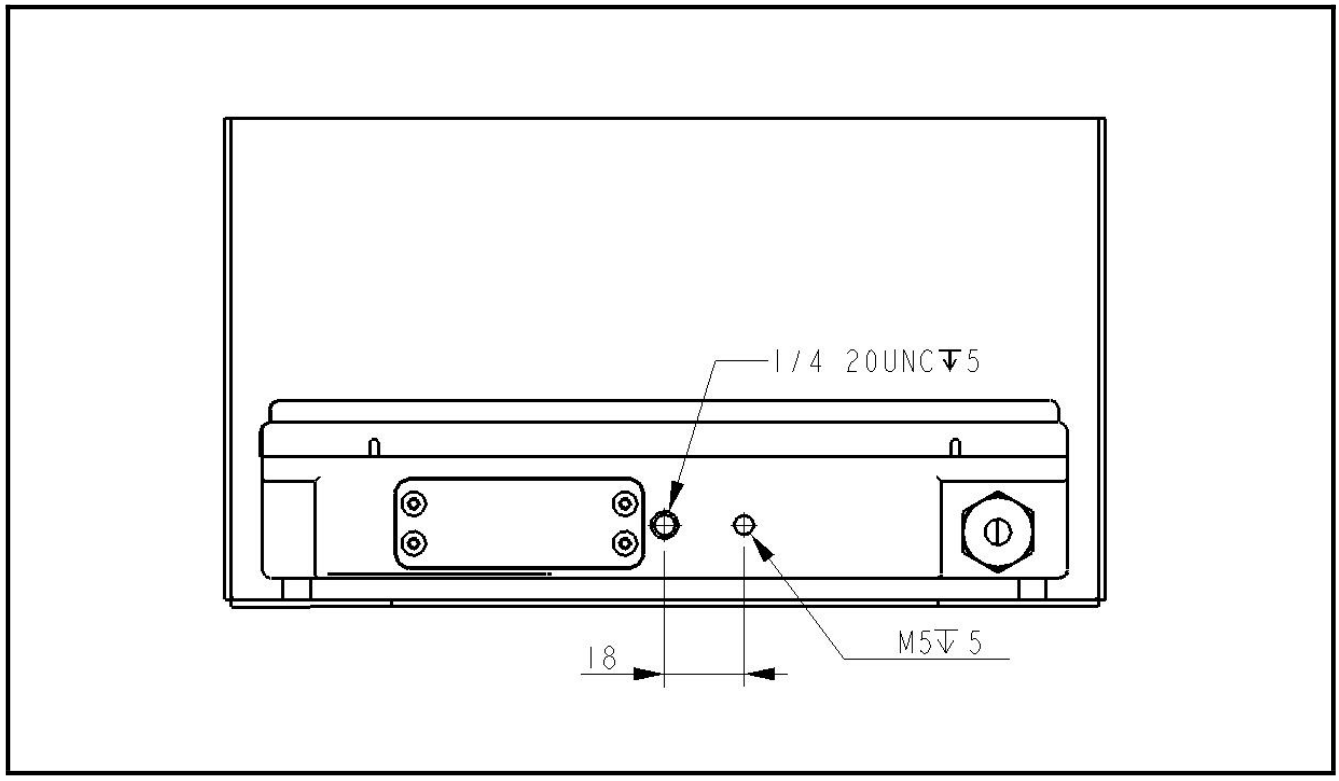
# Functions



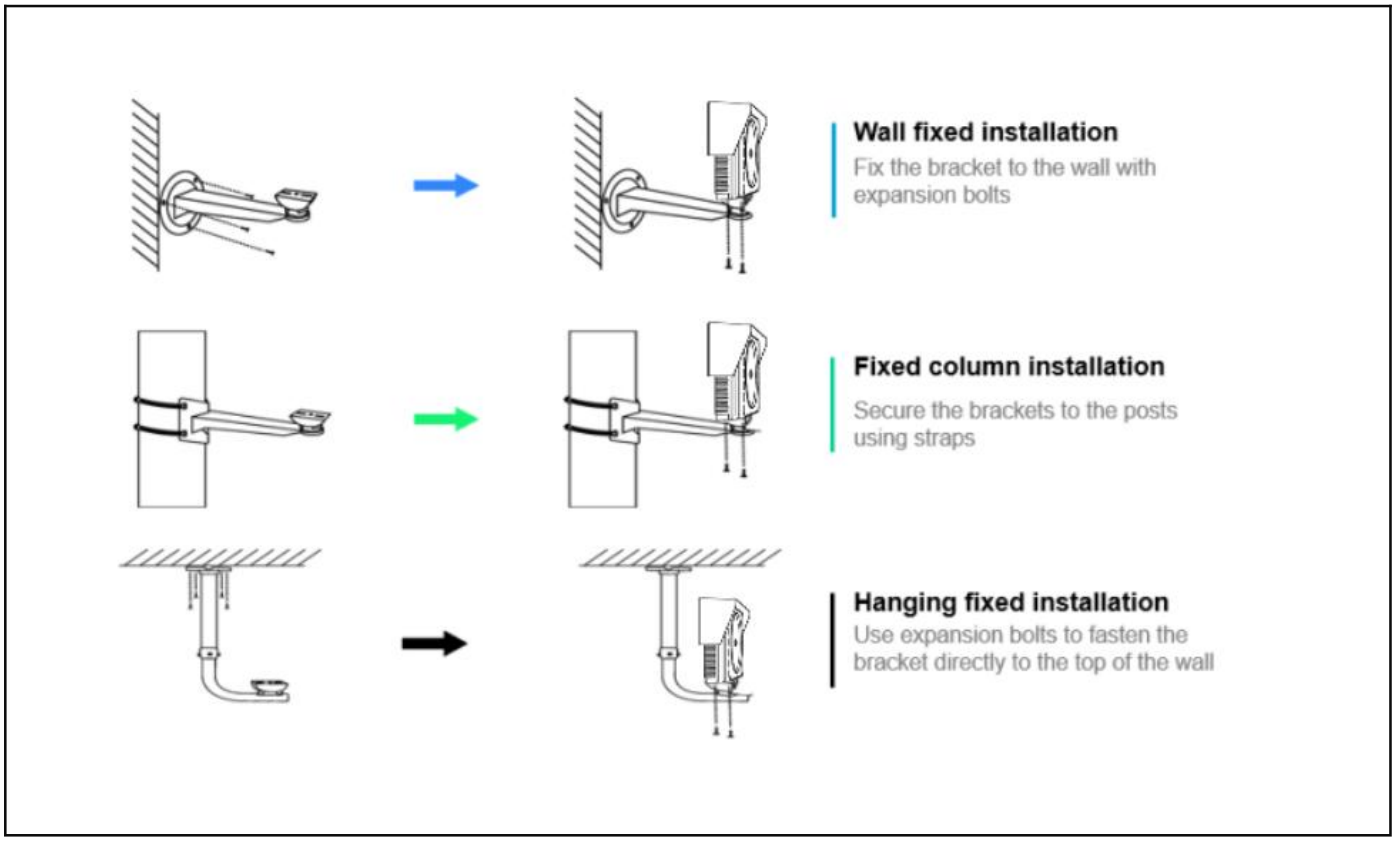
# Dimension



# On- site Installation

- Installation



- Installation Renderings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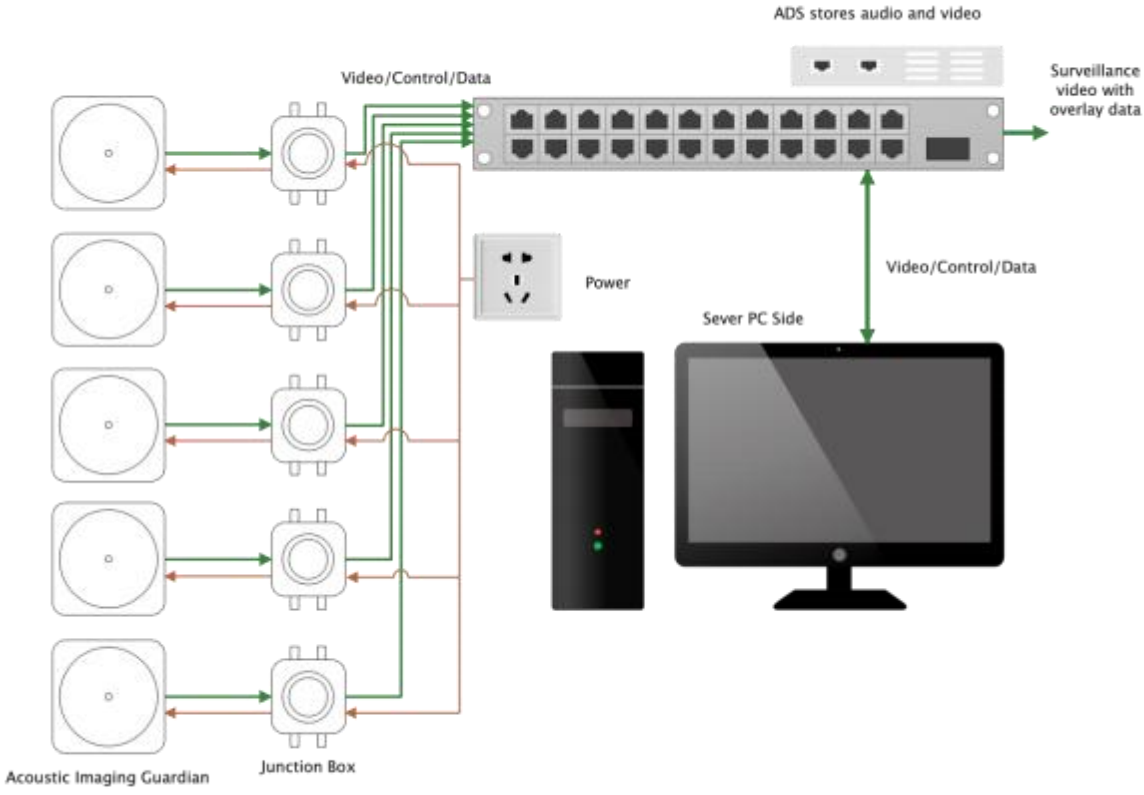
## Installation Renderings

# Typical Installation

## Basic System Topology Map



# Monitoring Platform Software

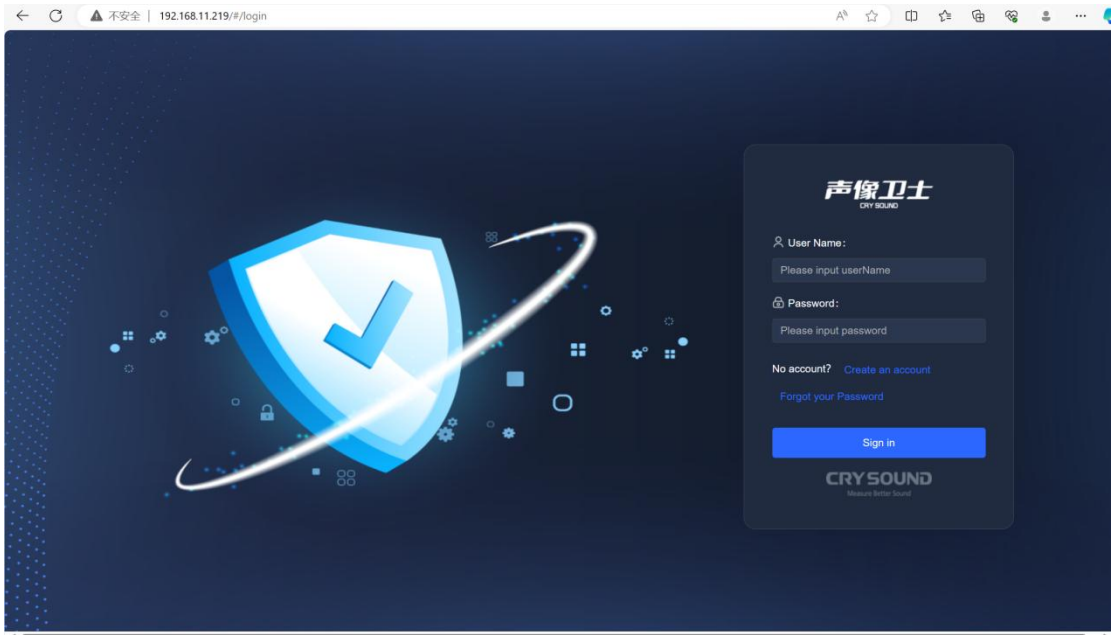
## 1.1.Monitor platform access

It is recommended to use the Google Chrome (kernel version ≥72.0) browser, while supporting other major browsers such as Firefox and Edge.

## 1.2.Network configuration instructions

- Use the instrument for the first time

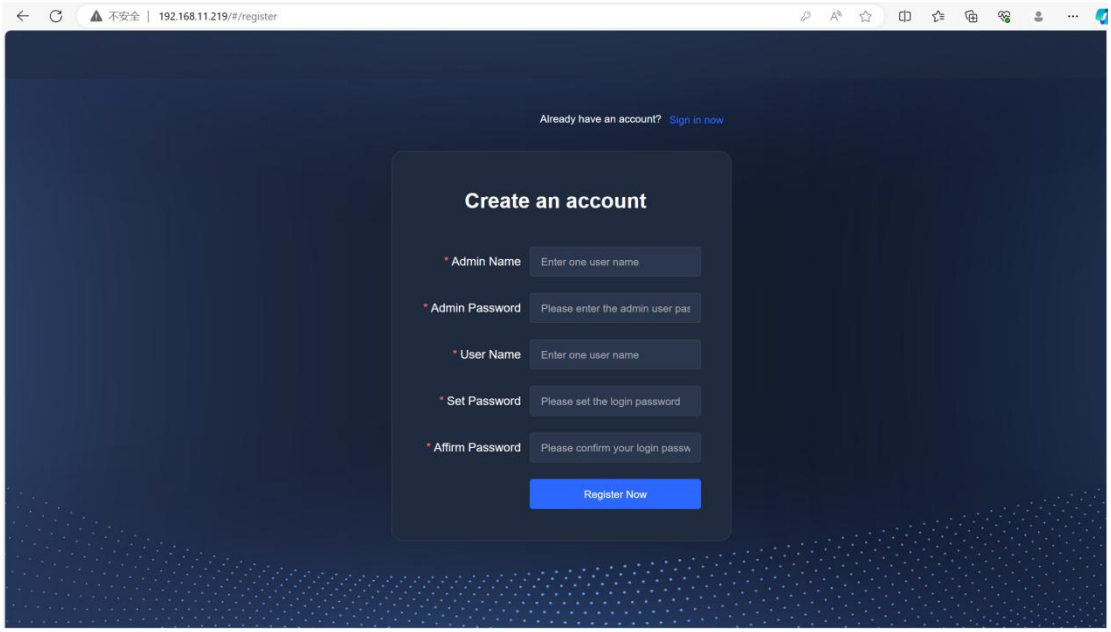
-Step 1: Make sure your PC and device are on the same network. Open a browser and type in the address bar: http://ip/ or http://ip:80， where IP is the IP address of the device, open the following interface:



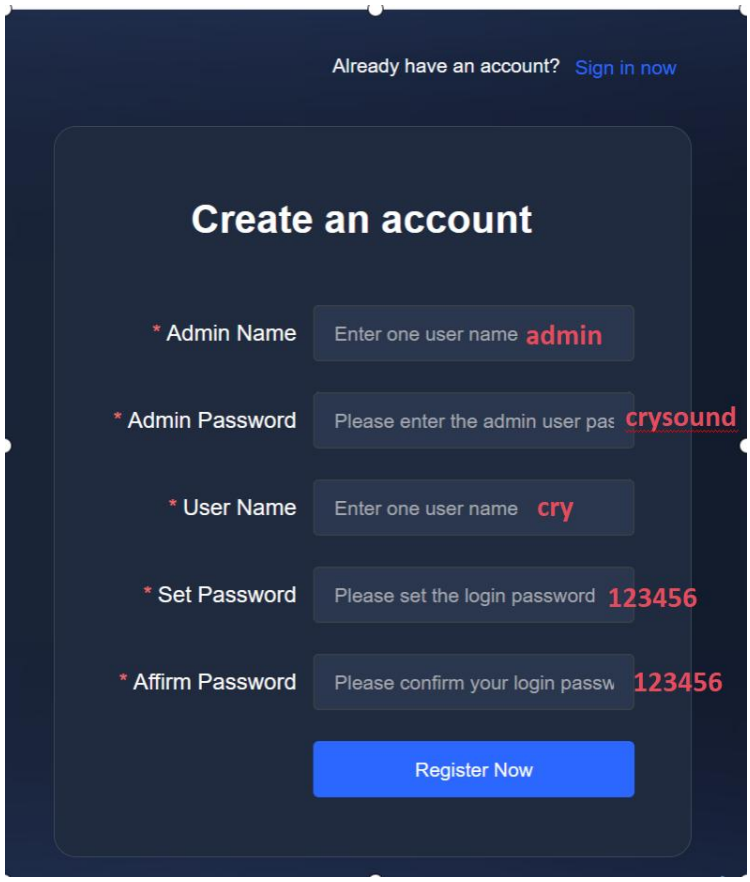

-Step 2: Log in to your account. Enter the username and password (default user admin, password admin) to access the Fixed Acoustic imager device.

- Create a new user

-Step 1: Click Create Account to open the following interface

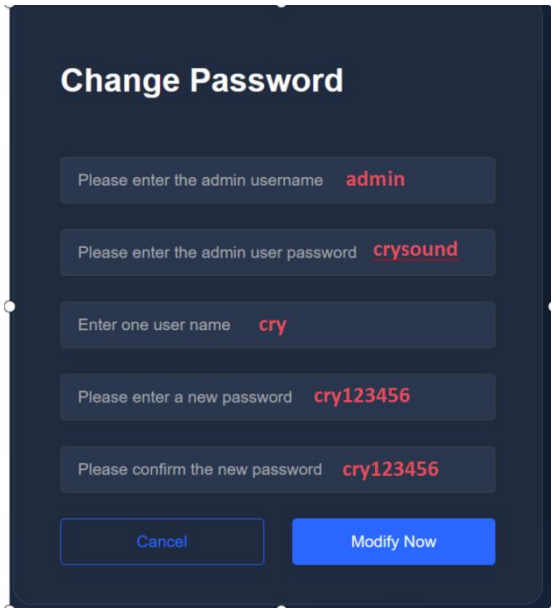



Note: To create a new user, you need to use the admin user for authentication, as shown in the figure below:



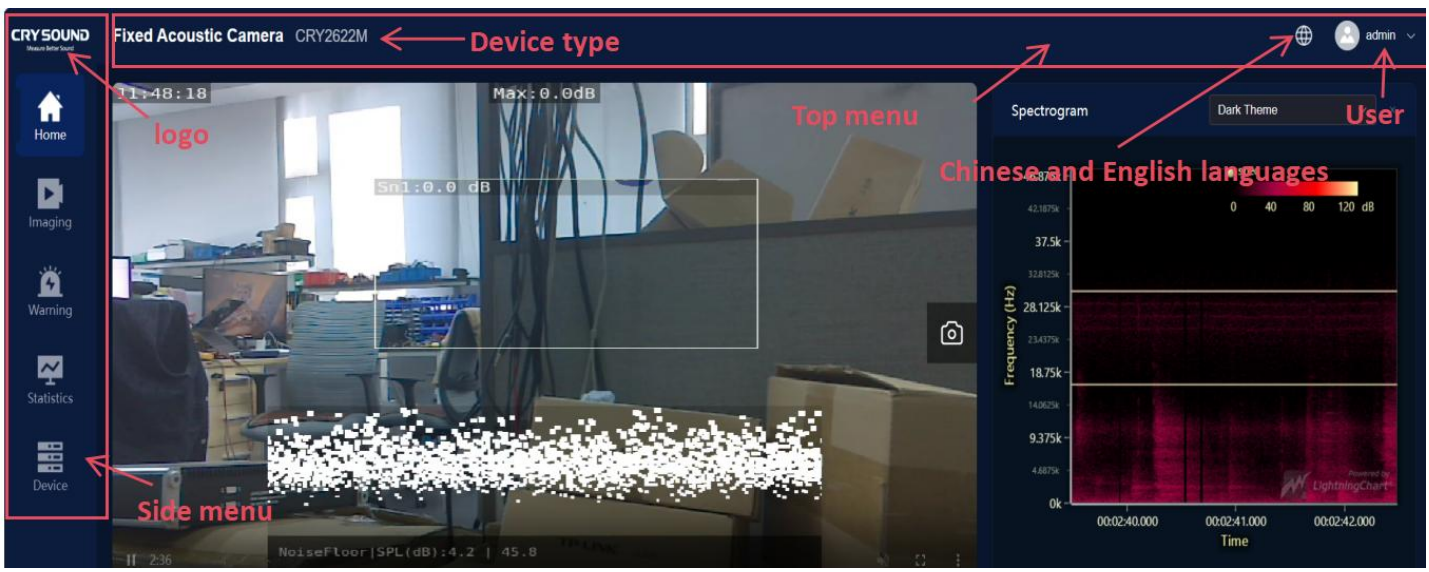
- Forget password, change password

Note: To change the password, you need to use the admin user to authenticate. It is recommended not to change the password of the admin user. The reference interface is as follows:




## 1.3.Detailed function introduction

- Menu bar

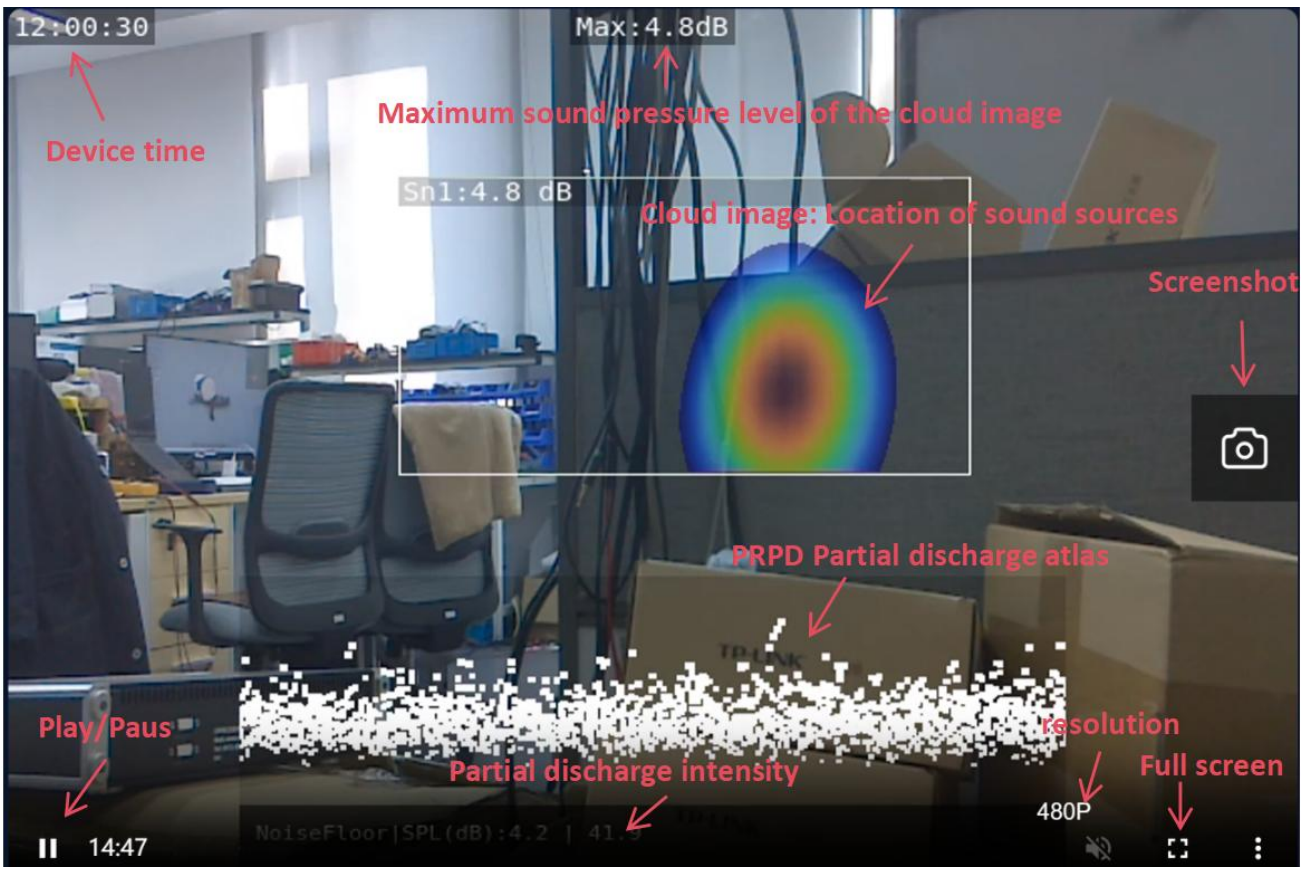


-Side menu bar: The side menu bar realizes jumps between pages, and the top is the company logo icon. There are five main interfaces: Home, Imaging Configuration, Alarm Configuration, Statistics Playback, and Device Configuration.

-Top menu bar:

- The top menu bar displays the current device type;
- Language switching: Support Chinese and English;
- User: Displays the currently logged in user, click to opt out of login.

  - Video Preview

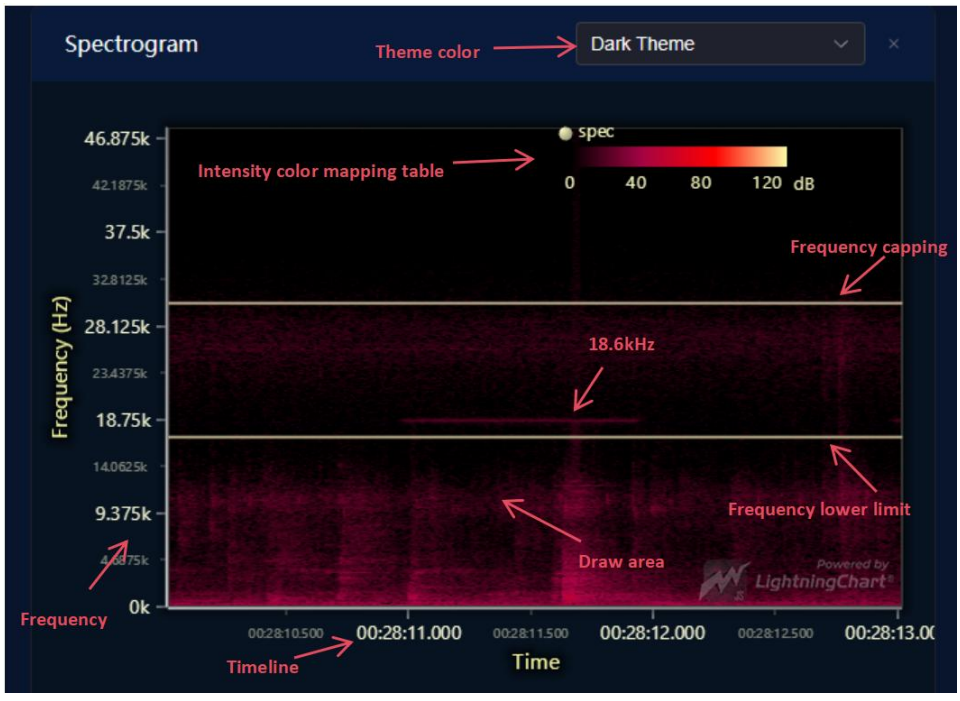



The video playback window is shown above:

- **Screenshot**: The browser takes a screenshot of the current screen and saves it as an image;

- **Resolution**: Read-only image size that displays the current video frame;
- **Full screen**: The browser plays the video in full screen;
- **Start/Pause**: Start or pause the video playback;
- **Device time, Sound Image, Maximum Sound Pressure Level of Sound Image and PRPD Graph**: The image is fused for the video cloud image, which cannot be separated from the original video picture;
- **Floating window**: When the video window is blocked by sliding up or down on the page, a floating window of live video is automatically generated at the bottom right of the interface.

- Spectrogram



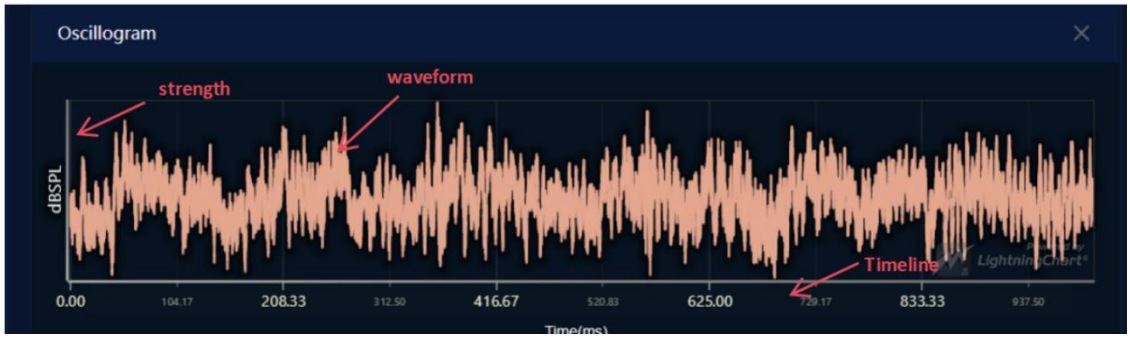

The spectral chart shows the effect above:

- **Spectrogram**: The abscissa is the time, the ordinate is the frequency, and the coordinate point value is the speech data energy. The use of two-

dimensional planes to express three-dimensional information is to reflect the magnitude of energy values through color;

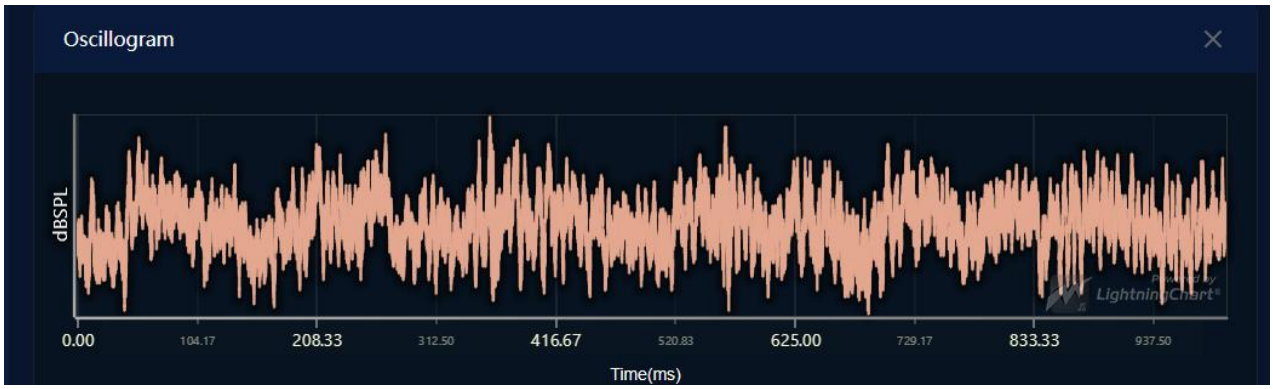
- **Theme Color**: Toggles the spectrum map display color;
- **Intensity Color Mapping bar**: Indicates the relationship between energy intensity and drawing color;
- **Upper/Lower Frequency Limit**: Indicates the frequency range of the sound monitored by the sound and Image Defender device,with units of Hz;
- **18.6kHz**: Indicates that the currently monitored sound source frequency is 18.6kHz;
- **Plotting Area** : Plotting a two-dimensional plane of sound energy data for a certain period of time;
- **Frequency Axis :** The vertical axis, which indicates the frequency, ranges from 0-48kHz;
- **Time Axis**: Horizontal axis, indicating the time, in s.

- Waveform graph

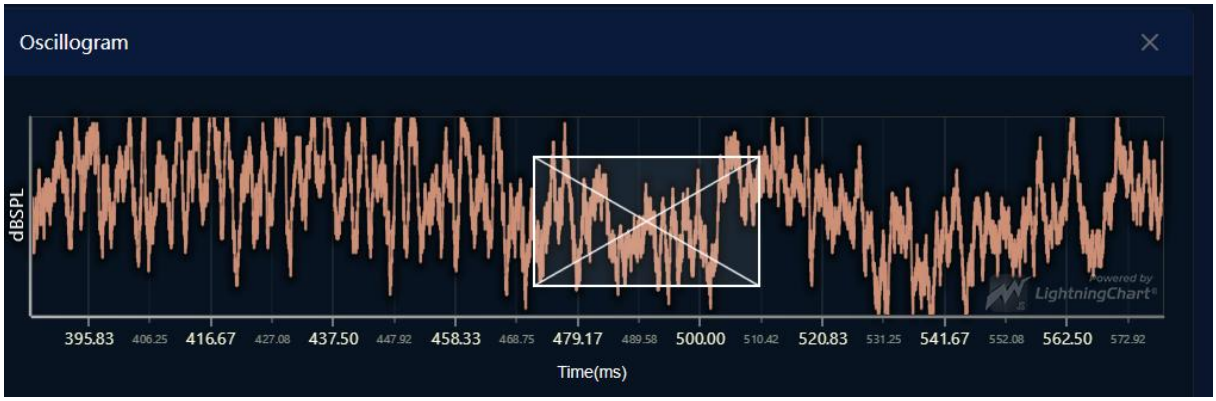



The waveform chart operation is as follows:

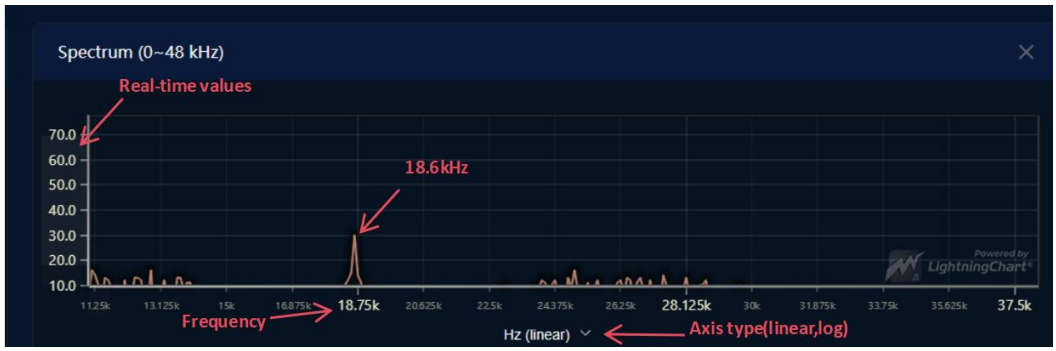
- **Specific data display**: The mouse is placed on a squiggle to display data for the mouse position point waveform;
- **Zooming**: Place the mouse over the horizontal or vertical axis, slide the scroll wheel to zoom, or use the left mouse button to zoom in on the selected rectangular area (from left to right), as shown in the following figure:




- **Restore**: Draw a rectangular area (right-to-left) with the left mouse button to restore the original display effect, as shown in the following figure:

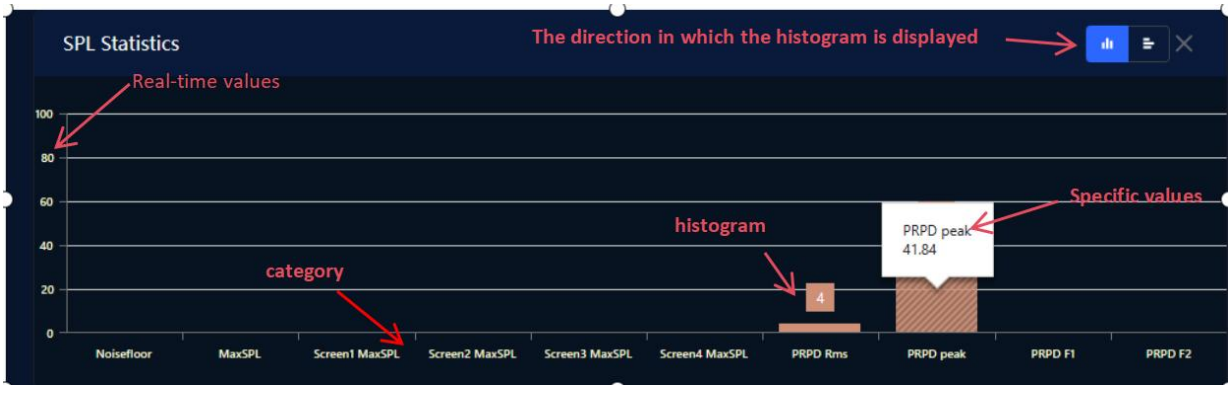


- FFT




- **FFT**：The frequency-amplitude curve calculated from short-time Fourier transform of the raw audio data；
- **Intensity**：The vertical axis, which represents the intensity, in dBSpl；
- **Frequency**：Horizontal axis, range 0-48kHz；
- **Axis type**：Divided into linear axis and logarithmic axis, click to switch；
- **18.6kHz**：The currently detected source frequency spike；
- Zooming in/out, resetting the view, and numerical value display are the same operations as in the waveform graph.

- SPL Histogram



- **Category**: Horizontal axis, column chart showing item categories;
- **Real-time value**: Vertical axis;
- **Specific value**: The mouse is placed on the bar and the corresponding bar value is displayed;
- **Orientation of histogram bars**: The orientation of the histogram bars can be switched between vertical and horizontal.

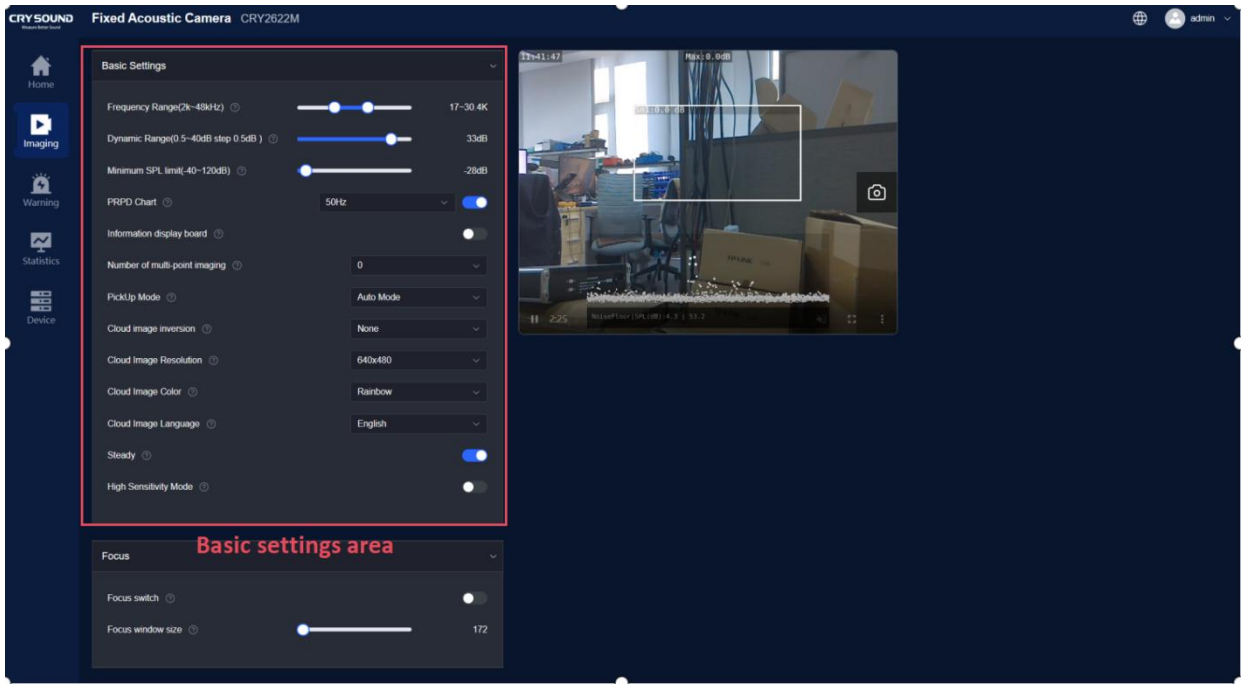
- Alarm Statistics Chart


- **Event name**: The horizontal axis represents the name of the counted event, corresponding to the alarm policy name;
- **Statistics value**: The vertical axis, which represents the number of events that have occurred;
- **Orientation of histogram bars**: You can switch the column chart in landscape and portrait orientation;
- **Event scope**: Query the number of events within the specified time range, and if you do not specify the specified day, the default query is the current day;

- **Specific value**： Displays the specific statistics of the event when the mouse is placed.

## 1.4.Imaging configuration

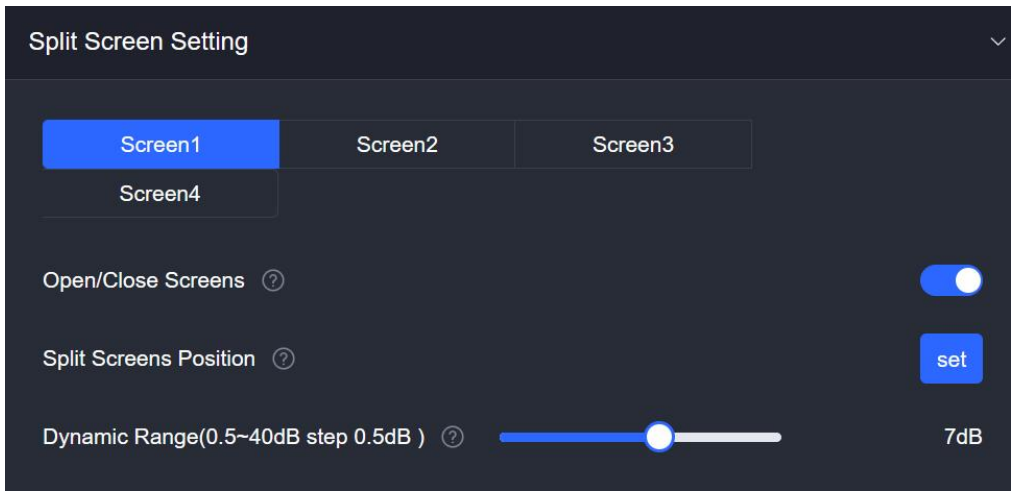
- Basic settings




- **Frequency Range**：Set the frequency range of the sound in the environment picked up by the microphone array. The range is 2k-48kHz, and the maximum difference between the upper and lower frequency limits is 2kHz.
- **Dynamic Range**：Set the dynamic range of the energy cloud display, ranging from 0.5-12dB.
- **Minimum Sound Pressure Level Limit**：Set the minimum sound pressure level limit of the device, which can be set to a value between -40-120dB.
- **PRPD Spectrum**：The power version allows you to choose a power frequency of 50Hz or 60Hz. The toggle button indicates whether to enable the PRPD spectrum and PRPD data transmission.

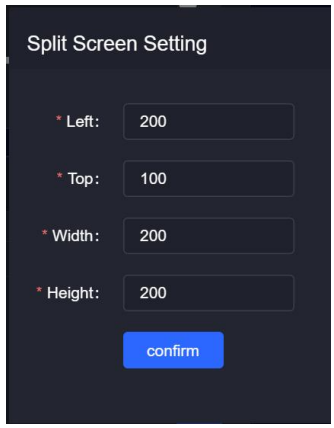
- **Information Display Board:** When enabled, the information display board is shown in the upper right corner of the video image.
- **Cloud Map Flip:** Set the video image flip state: none, horizontal flip, vertical flip, or 180°flip.
- **Cloud Map Resolution:** Display the current resolution setting. The device supports three resolutions: 480P(640x480), 720P (1280x720), and 1080P (1920x1080). To set a new resolution, the device needs to be restarted to take effect.
- **Cloud Map Language:** The language of the font displayed in the video image, supporting both Chinese and English.
- **Cloud Map Color:** Set the color of the cloud map. There are three colors to choose from: rainbow, iron red, and grayscale.
- **Steady State Mode:** Enable/disable the energy cloud map steady state mode.
- **High Sensitivity Mode:** High Sensitivity Modrequency Range.

- Split Screen Settings



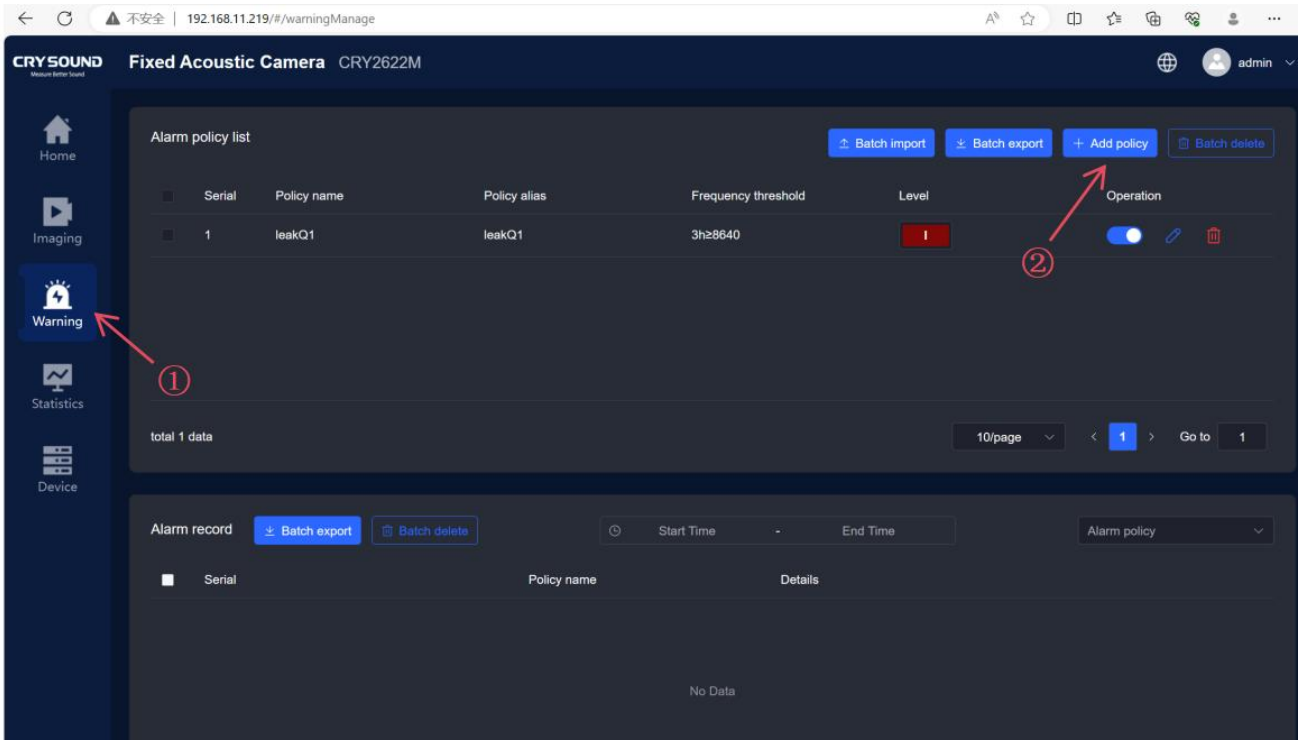

Choose a split screen, as shown in the figure, the selected split screen is Split Screen 1.

- **Enable/disable Split Screen**: Toggle the Split Screen on/off.
- **Split Screen Position**: Left - the distance from the left side of the image, Top - the distance from the top of the image, Width - the width of the Split Screen rectangle, Height - the height of the Split Screen rectangle. The following is an example input:

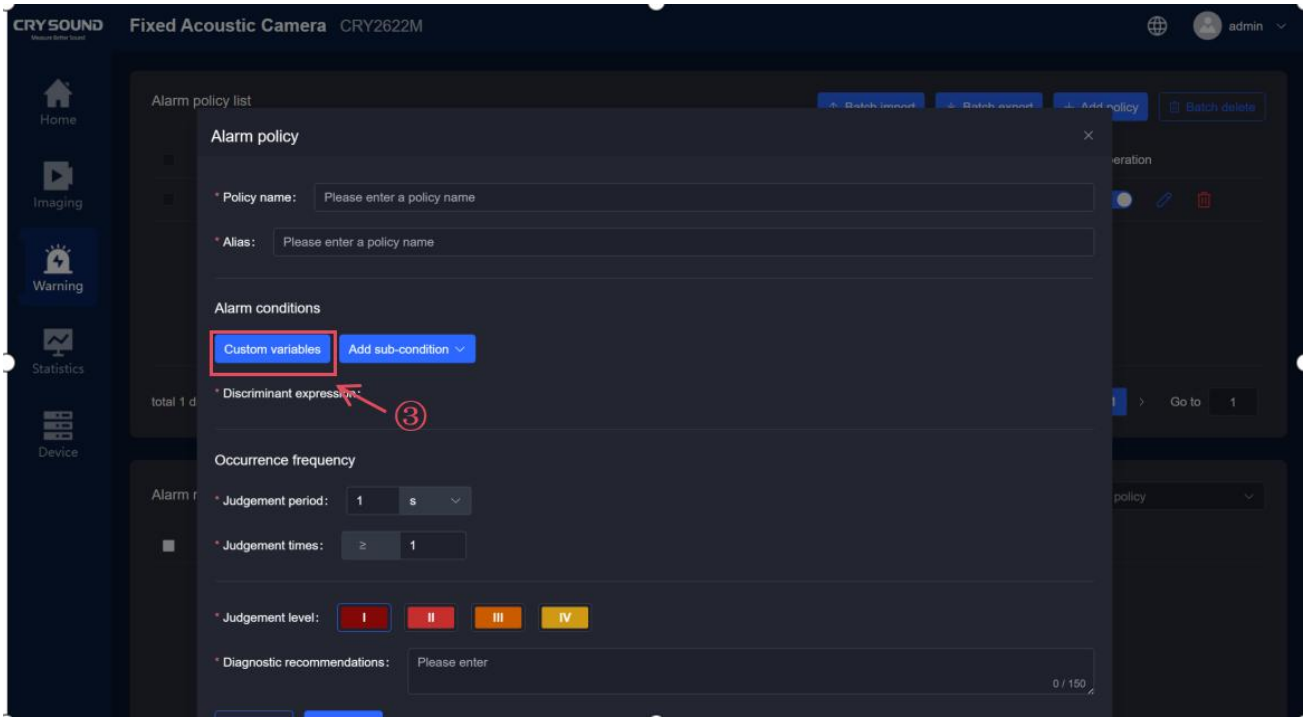



## 1.5.Alarm configuration

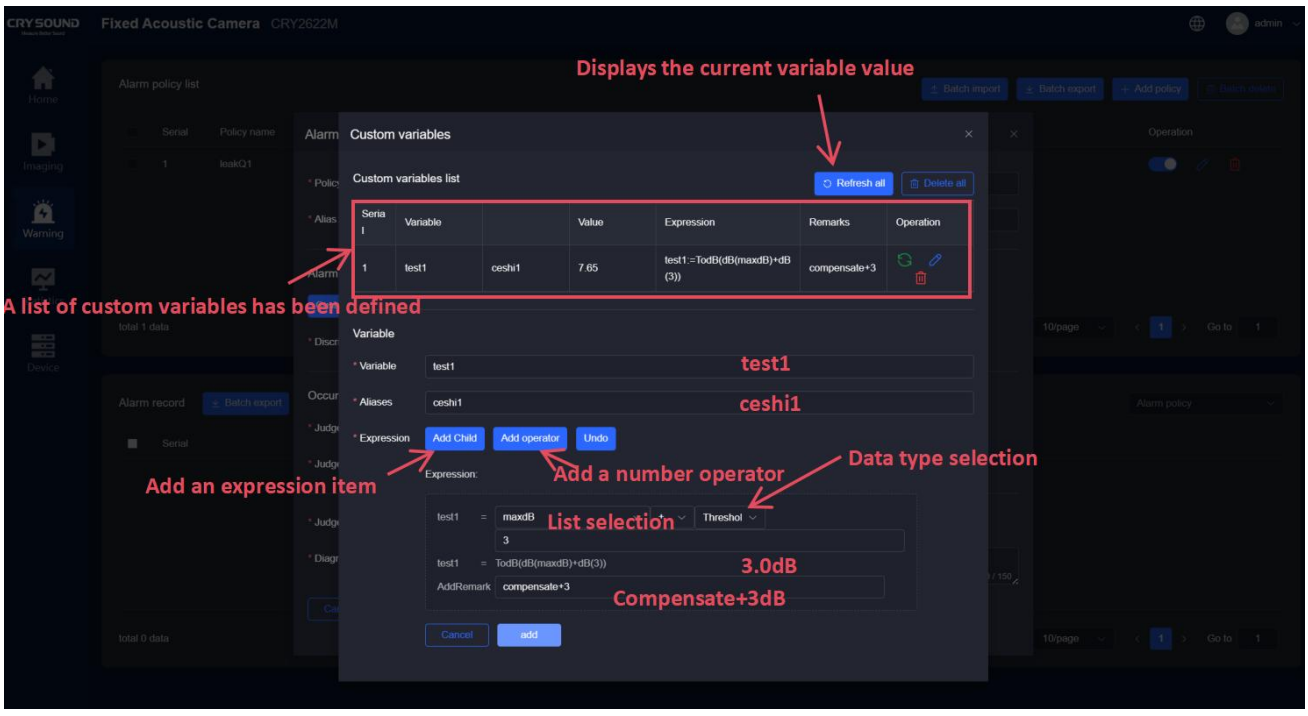
- Custom Variable Settings



Click 1 and 2 in sequence to open the "Add Policy" interface




Click on 3 to open the "Custom Variables" interface, as shown below:




The upper part of the page is the area to display the list of custom variables.

- **Custom variable list**: Displays the custom variables that have already been added.
- **Refresh button**: Refreshes the real-time value of the current variable.
- **Edit button**: Edits the current variable.
- **Delete button**: Deletes the current variable.
- **Refresh all**: Refreshes the real-time values of all custom variables in the list.
- **Delete all**: Deletes all variables in the listhe upper part of the page is the custom variable list display area;

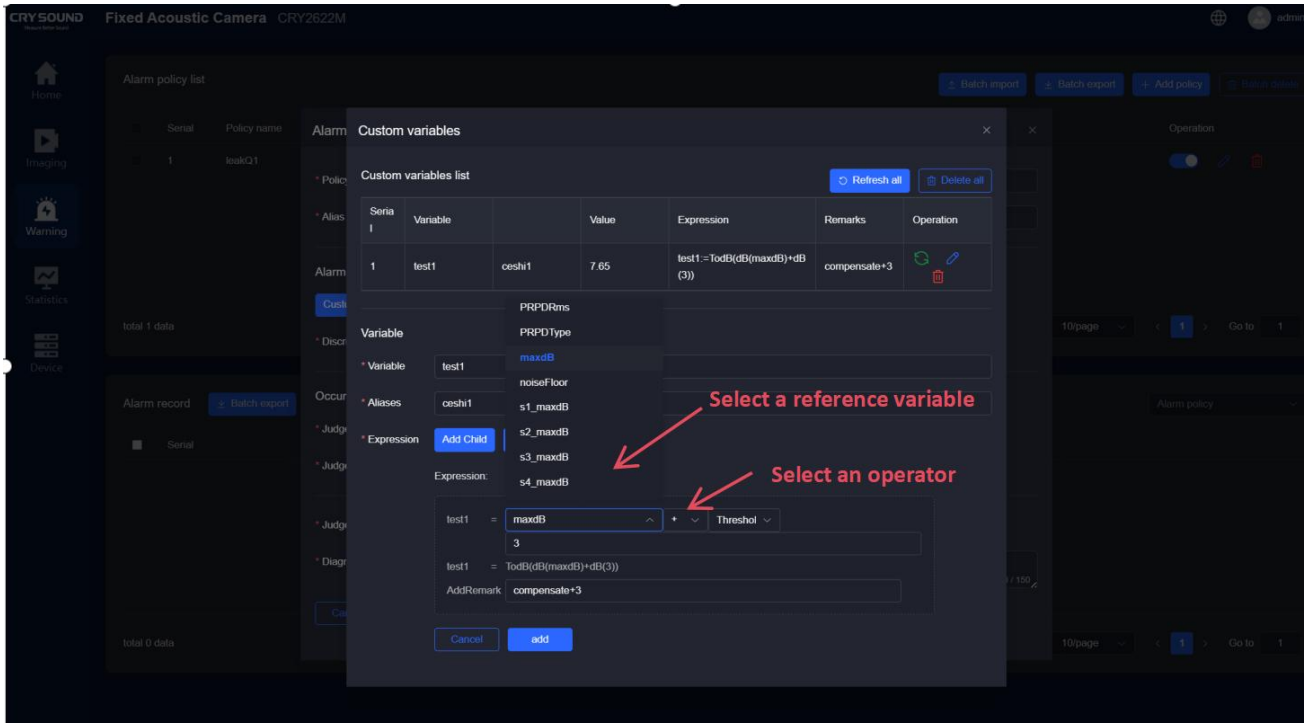
Below is the area for editing custom variables. To add or edit a custom variable, follow these steps:

1.Enter a variable name

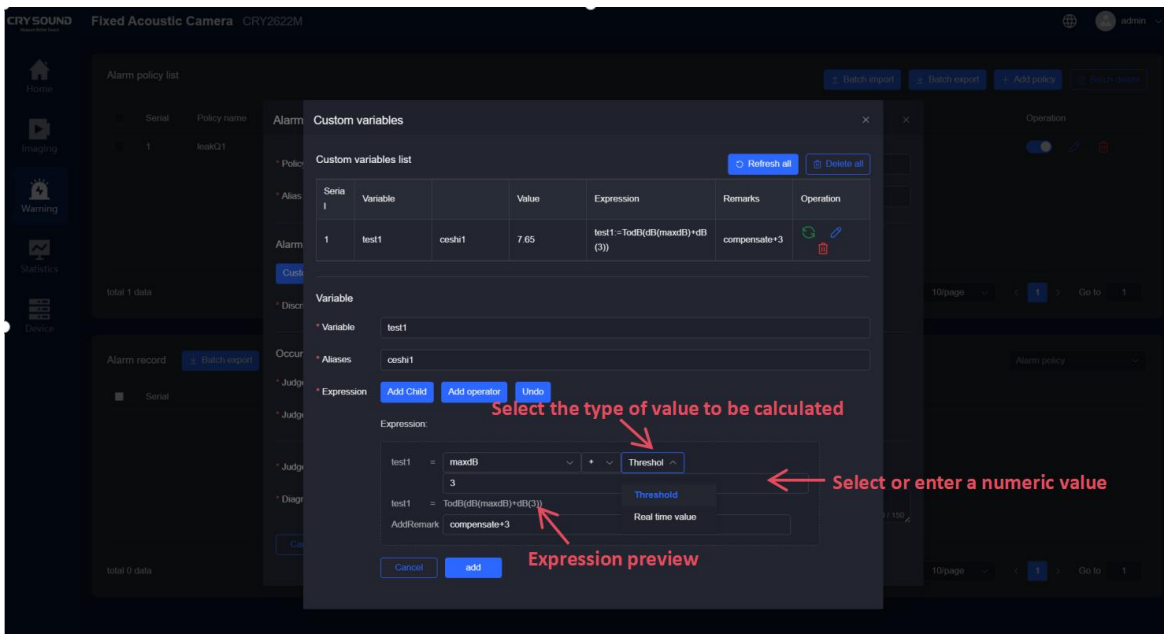
2.Enter the display alias

3. Create an expression

3.1. Select the reference variable and operator symbol, as shown in the following figure:

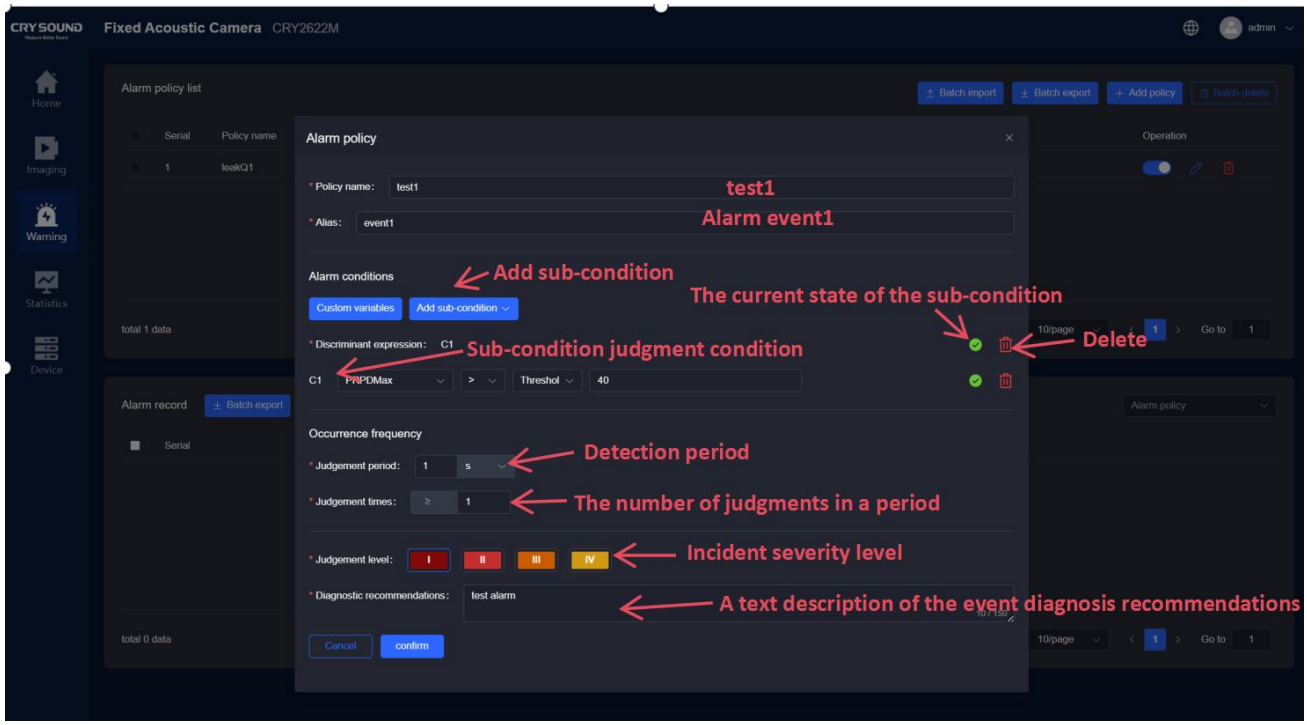



3.2. Select the type of value to be calculated, which is divided into two types: real-time value and threshold, where the real-time value is the reference variable in 3.1 above, and the threshold value is the manually entered value, as shown in the following figure:



3.3. Preview the expression of the custom variable, where dB(x) means that the unit of the current variable x is dB, and TodB(y) means that the output value of the current variable y is in dB.

- Custom Event Configuration



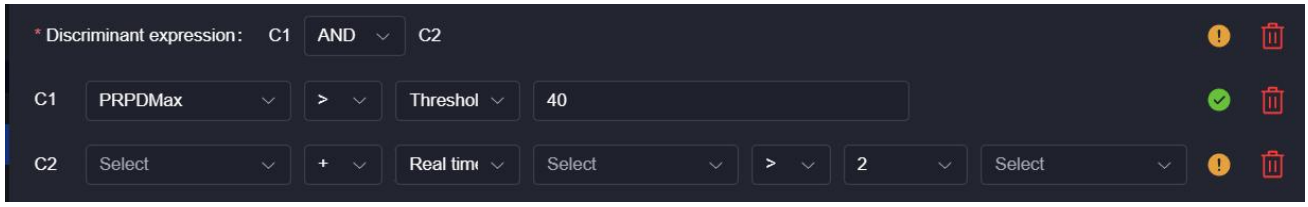

To add or edit an alert policy, perform the following steps:

1.Enter a policy name and policy display alias;

2.Set the alarm condition, that is, the judgment expression;

2.1. Click Add subcondition to add a subcondition: named C1, C2, C3...;

2.2. There are two types of subconditions, as follows, C1 is the relative value comparison condition, C2 is the absolute value comparison condition, and the logical relationship between C1 and C2 is determined, and the current is and:




2.3. Fill in the C1 and C2 contents, select and fill in in the order;

2.4. The current status of the subcondition determines whether the current setting determines whether the rule is established, and this step is only indicative;

3. Set the frequency, if it exceeds 1 time within 1 minute, the event will be triggered;

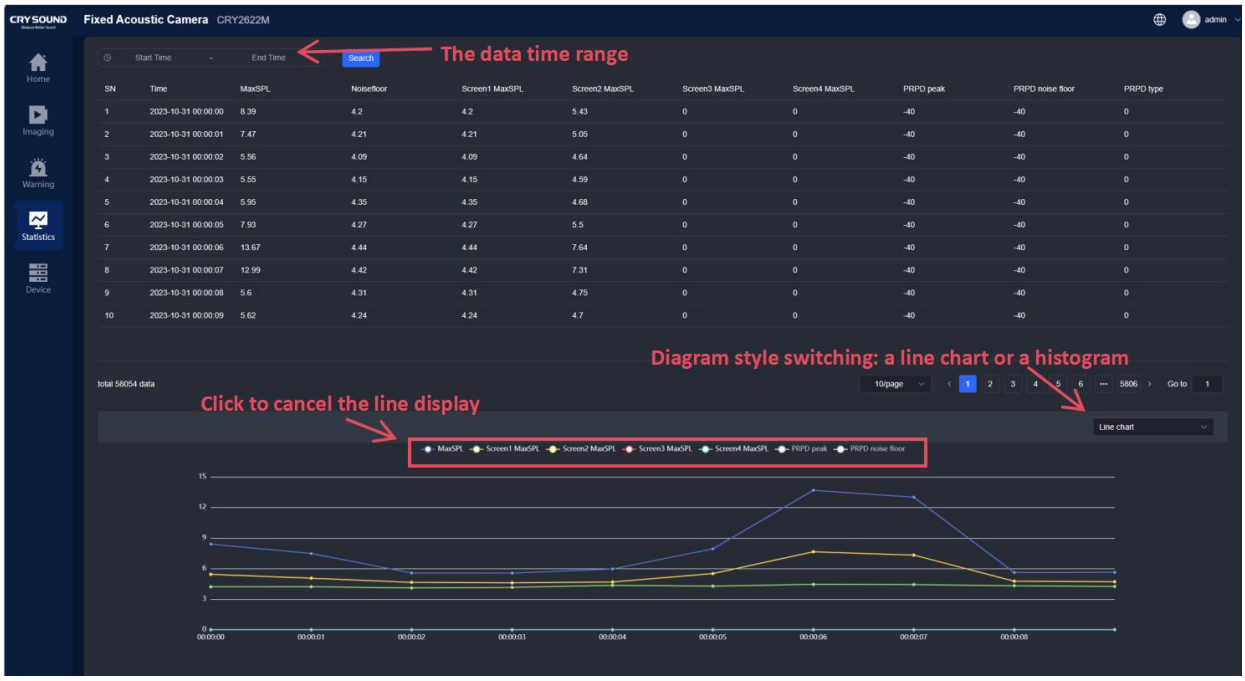
4. The preset severity level of the alarm is I., II., III., and IV. from high to low;

5. Enter diagnostic recommendations;

6. Click Confirm to finish adding or modifying the policy.

## 1.6.Statistical Playback

- Overall Preview

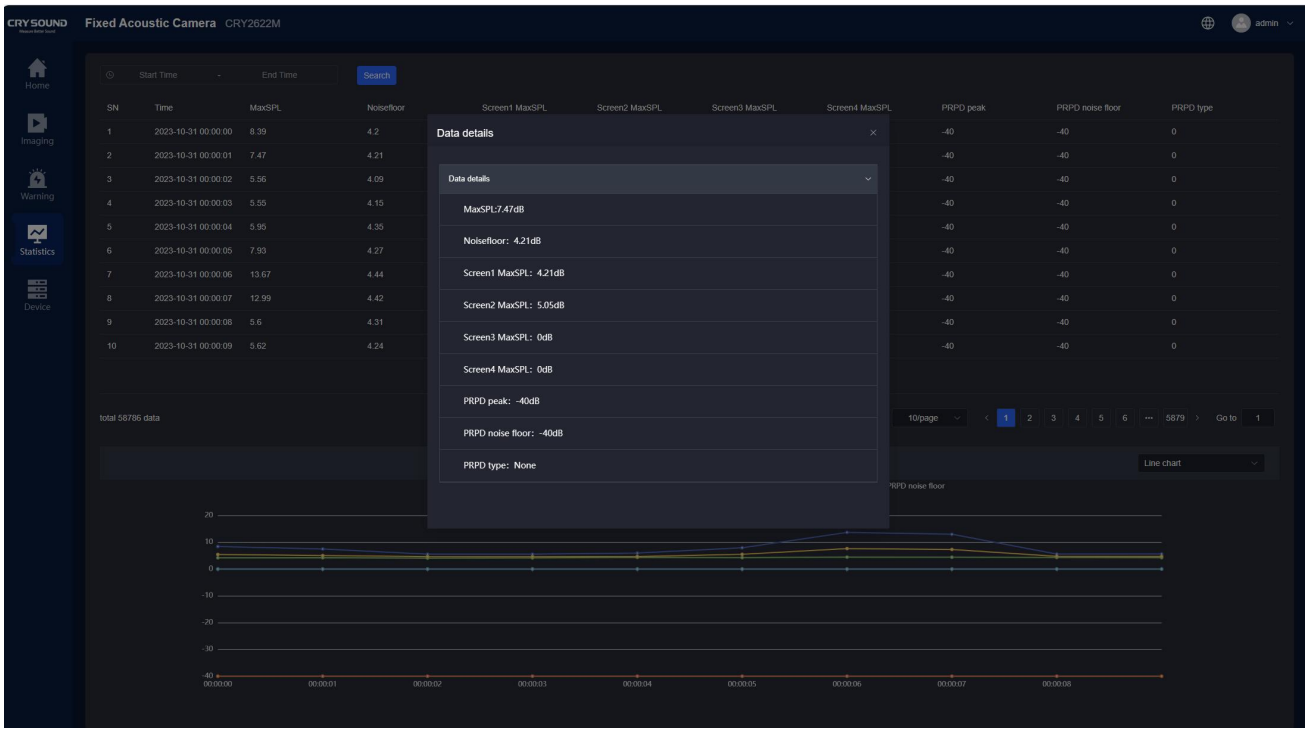


The statistics playback page mainly queries the historical monitoring data of the device, and queries the data of the current day when the time period is not specified.

The figure below can be switched to a line chart or a column chart by clicking on the chart style.

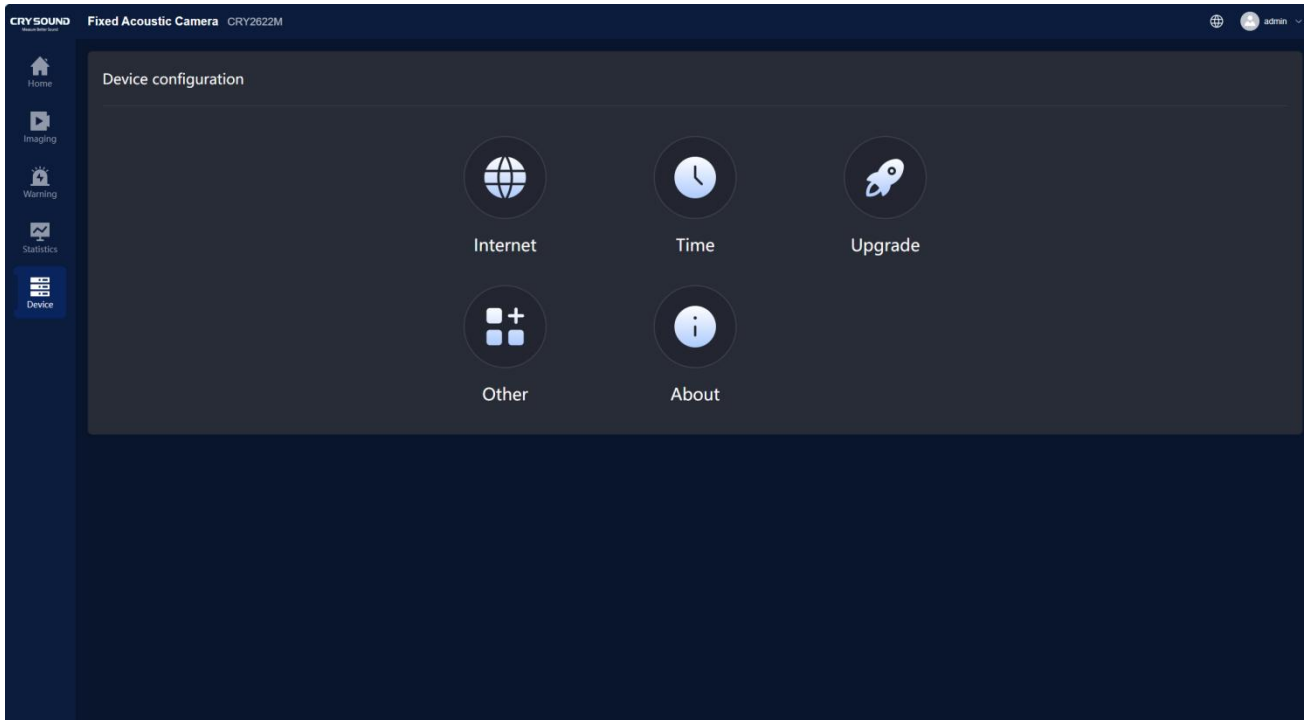
The plot displays all curves by default, and you can click the legend to cancel the display, as shown above: only the three polylines of the maximum sound pressure level of the cloud map, the screen1 maxSPL, and the screen2 maxSPL are displayed.

- Data details



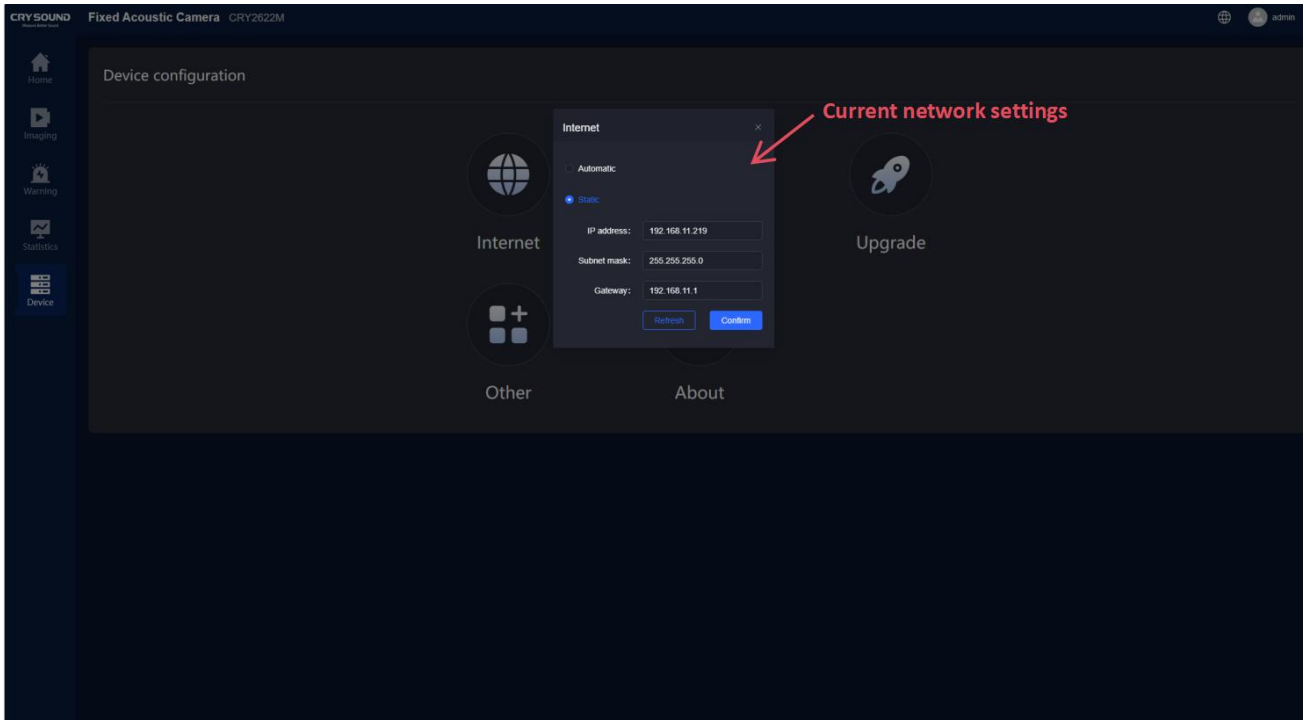

Click each piece of data to view the details of the corresponding entry.

## 1.7.Device Configuration




The device configuration is mainly divided into the following five parts: Network, Time, Firmware Upgrade, Other, About.

- Network Settings

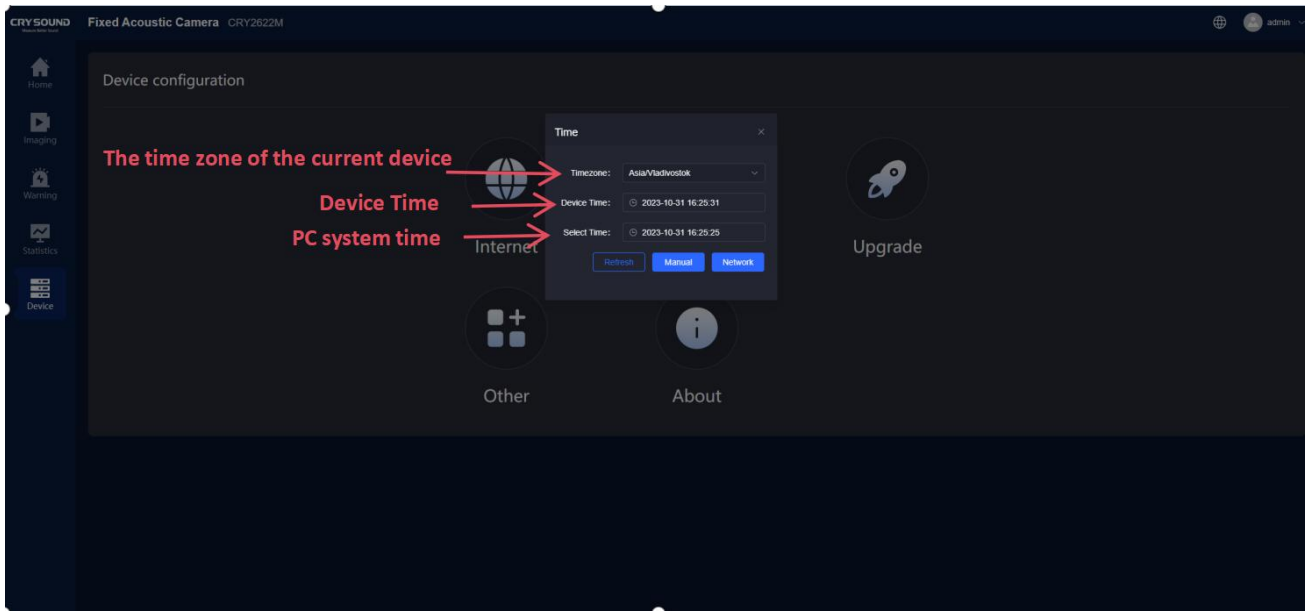


The network can be set to automatically obtain IP address mode (O) or use the following IP address pattern (P). As shown in the figure P static address mode, the current network configuration is displayed by default when the window is opened.

To modify the network settings, click or enter the corresponding network settings parameters and click the Confirm Modification button.

Note: It is recommended that you restart the device after modifying the network configuration to avoid the network settings not taking effect.

- Time settings



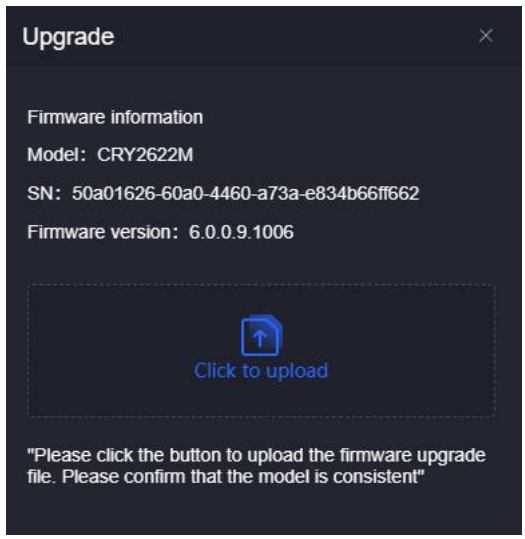

On the time setting interface, the three display boxes are; Current device time zone, current device time, PC system time.

Manual Calibration Time: Set the time manually. Select the time zone, set the target time in the "Select Time" column, and click "Manual Calibration Time" to apply the currently selected time zone and time to the device;

Network timekeeping: Click directly to calibrate the network time, and when the device is connected to the Internet, the network timing can be successfully performed;

Note: When the device is connected to the Internet, the device will automatically calibrate, and the manual calibration time will not take effect.

- Firmware Upgrade




Click the "Click to upload" icon to select the upgrade firmware file and upload it.

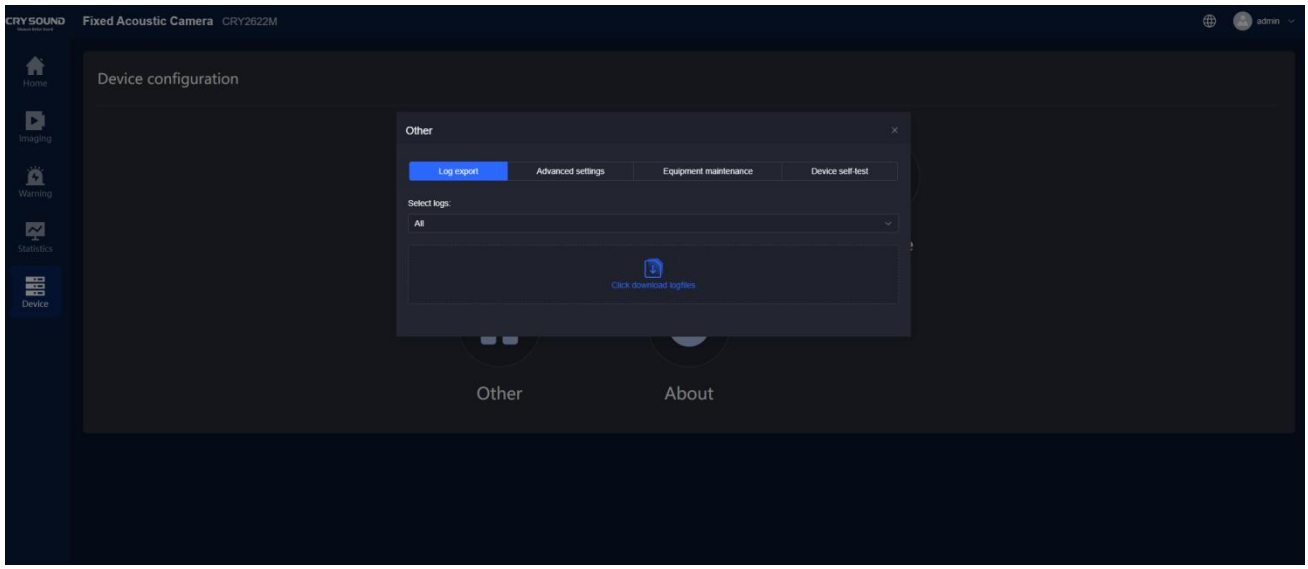
After the upload is complete, the Confirm Upgrade dialog box appears.

Confirmation: The device is upgraded and automatically restarts after 3 seconds.

Cancel: Delete the uploaded upgrade package and abandon the upgrade process.

- Other settings

1. Log Export

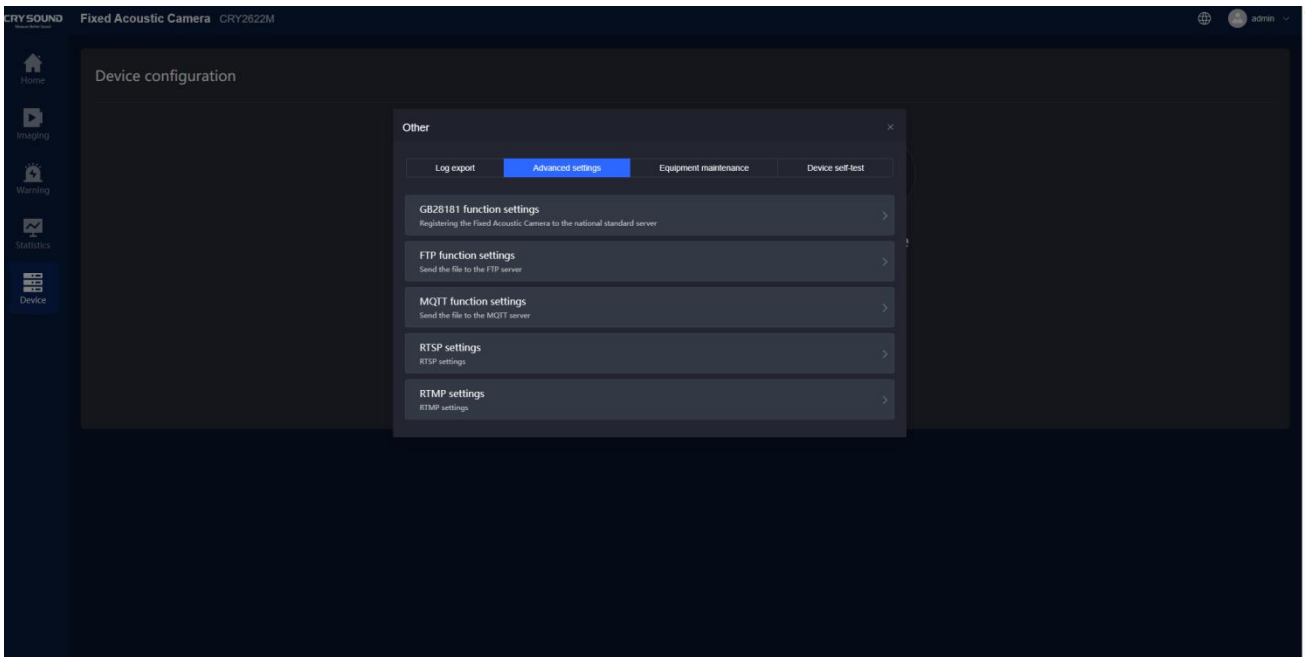



Log export process:

1.1. Click Select Log to select All Logs or Today's Logs;

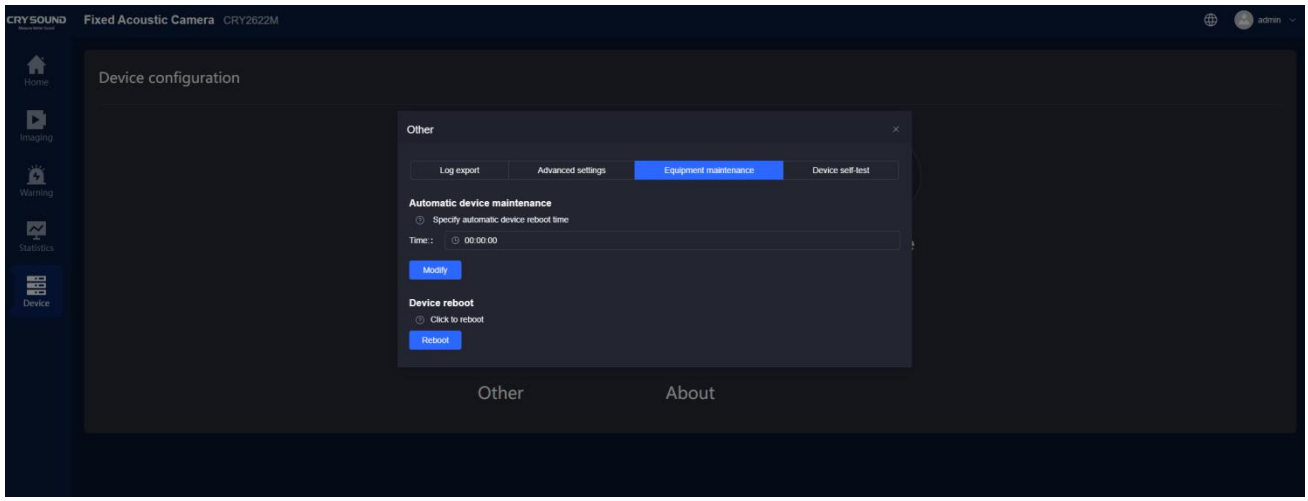
1.2. Click the "Click to download log file" icon, the current log can be directly opened and previewed in the browser; All logs are compressed into a zip archive for download.

2. Advanced Settings



Advanced settings are mainly other uncommon functions supported by the device, including: GB28181 settings, FTP settings, MQTT settings, RTSP settings, and RTMP settings.

3. Equipment Maintenance

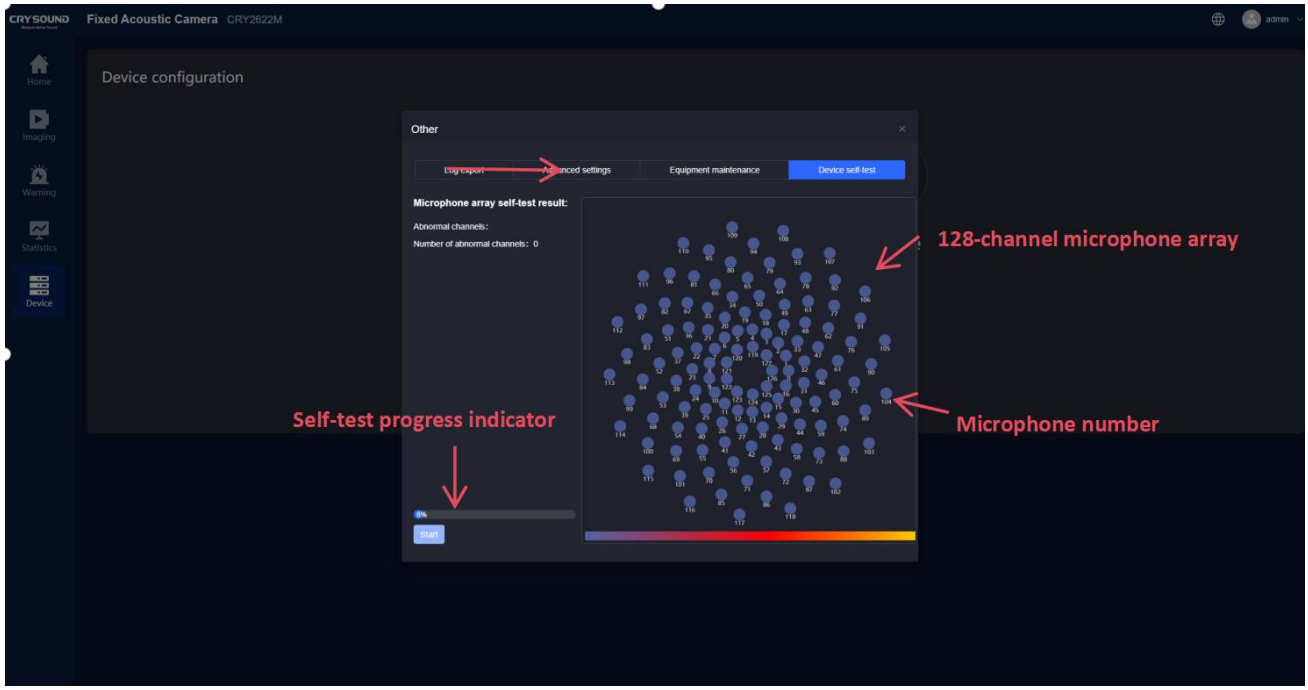



Set the daily scheduled restart time of the current device to 00:00:00 as shown in the figure.

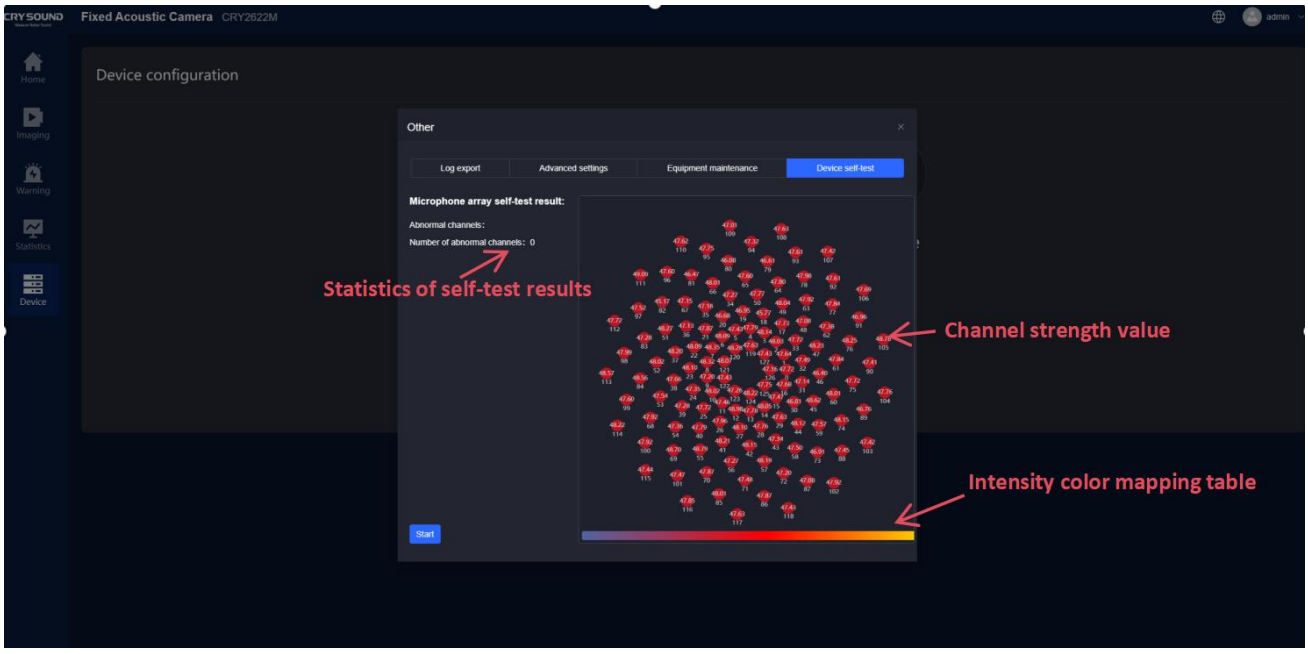
Click the Restart button to confirm the completion of the device restart.

4. Device Self-test

The figure below shows the AVS self-test page, with a schematic diagram of the relative position of the device's microphone array to each channel in the middle of the page, and the number of each microphone channel below;



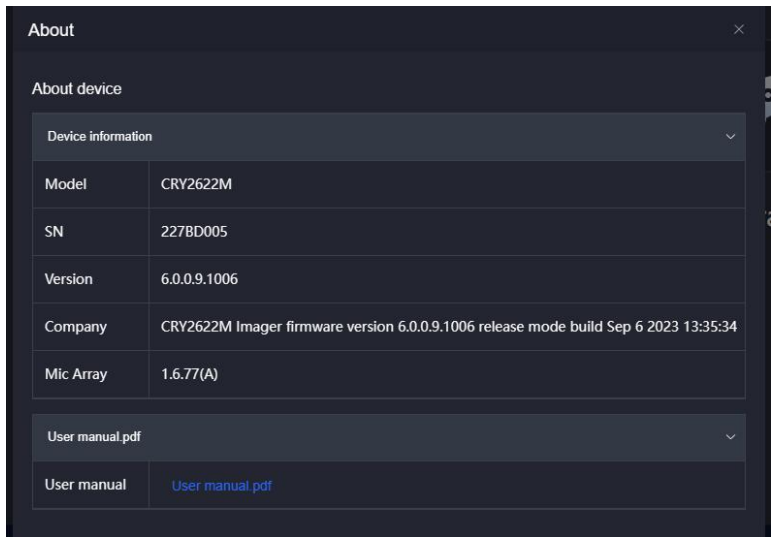

Click the Start Self-Test button to display a self-test process progress bar above the Start Self-Test button. The self-test process takes 90-120S.




After the self-test is completed, each channel displays its sound intensity value in dBSpl, and the channel color corresponds to the color map bar below. The color bar is 0-120dB from left to right.

The left side of the page shows the statistical self-test results, as shown in the figure above, the current 128-channel self-test has all passed.

- About




This page displays basic information about the device and provides access to the Fixed acoustic imager user manual.

## 1.8.Attention

1. It is recommended to restart the device after setting up the network.

2. After the device restarts, you need to manually refresh the page.

3. The video screen on the home page and imaging configuration page needs to wait 5-6S for the video to load.

4. After the device is abnormal, we recommend that you restart the device and wait 2 minutes to refresh the webpage.

5. The same device can be accessed through multiple simultaneous logins through the browser, and there is currently no limit to the number.

# Technical Indicators

| Device Model | CRY2623M |
|---|---|
| Number of Microphone Channels | 128 channels |
| Test Frequency Range | 2kHz ~ 48kHz |
| Camera pixel | 8M pixel |
| Frame Rate | 25FPS |
| Test Distance | 0.5~50-m |
| Weight | About 1.6kg |
| Size | 183mm X 169mm X 85.35mm |
| Storage | 8G internal storage, 64G TF card expansion storage |
| Operating Temperature | -10℃~+50℃ |
| Supply Voltage | DC12-20V |
| Power Consumption | About 14W |
| IP Degree of Protection | IP66 |
| Fixed way | Bottom 1/4 -20UNC thread/M5 screw fixing |